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REPORT

QUARTERLY GROUNDWATER MONITORING RESULTS, FEBRUARY-MARCH, 1997

at the:

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EXECUTIVE SUMMARY

Presented in this report are the results of the third long-term groundwater monitoring event (February-March, 1997) of the Comprehensive Environmental Response, Compensation and Liability Act Remedial Investigation/Feasibility Study at the NASA-Jet Propulsion Laboratory (JPL). A long-term quarterly groundwater monitoring program was initiated in response to requests from the United States Environmental Protection Agency. From February 3 to March 7, 1997, groundwater samples were collected from 15 JPL on-site monitoring wells and from 5 JPL off-site monitoring wells. A summary of the sampling procedures is included in Section 2.0. Samples were analyzed for volatile organic compounds (VOCs), metals (arsenic, lead, total chromium, and hexavalent chromium), and major anions/cations. Additional analyses for tributyltin were performed on samples from MW-13 and from the upper two screens of MW-12.

Results indicate that only three VOCs (carbon tetrachloride, trichloroethene, and 1,2-dichloroethane) were detected in concentrations above state and federal Maximum Contaminant Levels (MCLs) for drinking water. Tributyltin was not detected, and hexavalent chromium was found in four wells. To date, MCLs have not been established for hexavalent chromium. Arsenic, lead, and total chromium were not detected at concentrations above their MCLs. Laboratory and field quality assurance/quality control results indicate that the data are acceptable for their intended use. A summary of the analytical results is included in Section 3.0.

Results from water chemistry analyses (major anions/cations) 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, during, and after sampling activities, are presented in Section 5.0.

1.0 INTRODUCTION

Presented in this report are the results of the third long-term quarterly groundwater monitoring event completed at the Jet Propulsion Laboratory (JPL) as a result of the JPL Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Remedial Investigation/ Feasibility Study (RI/FS). From February 3 to March 7, 1997, the JPL groundwater monitoring wells (both on and off-site) were sampled by Foster Wheeler Environmental Corporation (Foster Wheeler) personnel. The purpose of the long-term quarterly groundwater sampling program is to monitor the elevation, flow direction, and quality of the groundwater beneath and adjacent to the JPL site.

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, MW-17, MW-18, MW-19, MW-20, and MW-21 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 at 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. Montgomery Watson Laboratories is certified by the California Department of Health Services. The following analyses were performed.

Analysis	EPA Method
Volatile Organic Compounds (all samples)	524.2
Total Chromium (all wells)	200.8
Hexavalent Chromium (all wells)	7196
Total Lead (all wells)	200.8
Total Arsenic (all wells)	200.9
Major Cations and Major Anions (all wells)	Various
Tributyltin (MW-13 and MW-12, screens 1 and 2 only)	GC/FPD

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

2.0 SAMPLING AND FIELD QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

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

2.1 SHALLOW MONITORING WELLS

The sampling procedure described below was applied to all the JPL shallow monitoring wells, which includes wells MW-1, MW-5, MW-6, MW-7, MW-8, MW-9, MW-10, MW-13, MW-15, and MW-16.

The primary equipment used to sample the shallow wells included dedicated 2-inch Grundfos Redi-Flo2® pumps, a pump controller, and a 220-volt generator. All of the dedicated 2-inch Grundfos Redi-Flo2® pump systems were decontaminated prior to their installation before the long-term quarterly monitoring program began. Decontamination procedures were previously described in detail (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 1992a).

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

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

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

2.2 DEEP MULTI-PORT MONITORING WELLS

Sampling of the deep 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 (FSAPs) (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 deionized water followed by washing each bottle in a solution of an acidic detergent (Citranox®) and deionized water.
- Rinse each bottle twice with deionized water.
- The interior surfaces of the Westbay sampling probe, and the hoses and valves associated with the Westbay sample bottles, were decontaminated by forcing several volumes of a solution of Liquinox® and deionized water through the sampling equipment. This was followed by forcing several volumes of a Citranox® and deionized water solution through the sampling equipment with a clean plastic squeeze bottle used only for this purpose.

Purging before sampling is not required in the deep, MP monitoring wells because the groundwater sample is collected directly from the aquifer, and is not exposed to the atmosphere. However, at each screened interval an initial sample was collected in order to check pH, conductivity 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 (Section 2.1). A final sample was collected and again analyzed for pH, conductivity and turbidity to ensure continuity of aquifer conditions during sampling. Results of the field analyses are given in Appendix B on well development logs. 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.

In accordance with established protocol, a minimum of one duplicate groundwater sample was collected for approximately every 20 groundwater samples (Ebasco, 1993b). Duplicate samples for VOCs and metals 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 1). The duplicate samples from MW-12 (screen 1) and MW-13 were also analyzed for tributyltin (TBT). In addition, one matrix spike (MS) sample and one matrix spike duplicate (MSD) sample were collected and analyzed for VOCs for every 20 samples submitted to the laboratory. The MS/MSD samples were used to verify the accuracy of the analytical method.

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

A trip blank, consisting of laboratory reagent grade 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. Further details of the field QA/QC program are available (Ebasco, 1993b).

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. This 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.

3.0 ANALYTICAL RESULTS

JPL groundwater monitoring wells MW-1 and MW-3 through MW-21 were sampled from February 3 to March 7, 1997. MW-2 was not sampled as it was replaced as a JPL monitoring point by deep multi-port well MW-14.

The groundwater samples were analyzed for VOCs, total chromium (Cr), hexavalent chromium (Cr^{6+}), total lead (Pb), total arsenic (As), and TBT (MW-13 and MW-12, screens 1 and 2 only). All samples were also analyzed for general water chemistry parameters that included major cations and anions [sodium (Na), potassium (K), calcium (Ca), magnesium (Mg), iron (Fe), alkalinity (CO_3 + HCO_3), chloride (Cl), sulfate (SO_4), nitrate (NO_3), total phosphorus (P)], total dissolved solids (TDS), specific conductivity and pH. A summary of the samples collected, sample numbers used, and the analyses performed on each sample is presented in Table 3-1. Analytical laboratory reports and associated chain-of-custody forms are included in Appendix D.

3.1 VOLATILE ORGANIC COMPOUNDS RESULTS

Groundwater samples collected during the February-March 1997 sampling event were analyzed for over 60 different VOCs in accordance with EPA Method 524.2. Results of the analyses for VOCs in the February-March 1997 samples are summarized in Table 3-2 along with the Maximum Contaminant Levels (MCLs) for drinking water as listed in Title 22 of the California Code of Regulations and in the EPA Health Advisory Guidelines. A small number of compounds were detected in these samples, and only three VOCs [carbon tetrachloride (CCl_4), trichloroethene (TCE), and 1,2-dichloroethane (1,2-DCA)] were found in concentrations exceeding the state and federal MCLs (Table 3-2). The concentrations of CCl_4, TCE, 1,2-DCA, and tetrachloroethylene (PCE) are presented on maps to show their locations (Figures 3-1, 3-2, 3-3, and 3-4, respectively). A summary of VOC data collected during all of the long-term quarterly sampling events completed to date (August 1996-March 1997) is provided in Table 3-3.

CCl_4 in excess of both state and federal MCLs (0.5 μg/l) was found in seven of the on-site wells, and two of the off-site wells (Table 3-2, Figure 3-1). Overall, the highest concentrations of CCl_4 were found in shallow on-site wells MW-7 and MW-16.

TCE in excess of state and federal MCLs (5.0 μg/l) was detected in five on-site wells, and three off-site wells (Table 3-2, Figure 3-2). The highest levels of TCE were found in shallow on-site wells MW-7 and MW-13, and deep off-site well MW-21.

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

PCE was detected in 3 on-site wells and 4 off-site wells, although not at concentrations exceeding state and federal MCLs (5.0 μg/l). The highest levels of PCE were measured at off-site wells MW-18, MW-19, and MW-21.

3.2 TRIBUTYLTIN RESULTS

Analyses for TBT were performed on groundwater samples collected from screens 1 and 2 of deep (MP) well MW-12 and from shallow well MW-13. Duplicate samples from MW-12 (screen 1) and MW-13 were also analyzed for TBT. This analysis was conducted because TBT has been used throughout industry as an anti-foulant in cooling towers such as those in use at JPL. Well MW-13 is the closest well to JPL's central cooling tower system (Building 296) and well MW-12 was chosen by Department of Toxic Substances Control (DTSC) as being downgradient of potential TBT releases.

TBT was not detected in any of the groundwater samples analyzed for that constituent during the February-March 1997 sampling event.

3.3 METALS RESULTS

Groundwater samples from the February-March 1997 sampling event were analyzed for the following suite of metals: total As, total Pb, total Cr, and Cr^{6+}. The results of these analyses are summarized in Table 3-4.

Arsenic was not detected in any samples, and Pb and total Cr concentrations were below the state and federal MCLs (0.05 mg/l) in all cases. Hexavalent chromium was detected in samples from shallow on-site wells MW-7, MW-13, MW-16 and deep off-site well MW-18 (at this time, MCLs for Cr^{6+} have not been established by state or federal agencies). These results are presented by well location for Pb, total Cr, and Cr^{6+} in Figures 3-5, 3-6 and 3-7, respectively.

Table 3-5 contains metals data from all long-term quarterly sampling events completed to date.

3.4 QUALITY ASSURANCE/QUALITY CONTROL RESULTS

Review of the QA/QC data provided with the laboratory analytical results (Appendix D) indicates that results obtained from February-March 1997 samples are acceptable for use. Surrogate compounds, matrix and blank spikes, and method blanks were used by the laboratory to determine the accuracy and precision of the analytical techniques and to identify any anomalous results due to laboratory contamination or instrument malfunction.

In addition to the laboratory QA/QC procedures, QA/QC measures were implemented in the field by Foster Wheeler personnel. These field measures included the collection of 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 VOC and metals analyses were collected from MW-4 (screen 2), MW-10, MW-12 (screen 1), and MW-13. All of the analytical results for the duplicate samples were within an acceptable range for comparison to the results of the original groundwater samples (Tables 3-2, 3-4).

Twenty-two equipment blanks were submitted for analysis during the February-March 1997 sampling event. Acetone was found in 9 of the equipment blanks, and dichloromethane was found along with acetone in 1 of these blanks. Dichloromethane was not detected in the associated groundwater sample, and therefore does not reflect cross-contamination of samples through the sampling equipment. Acetone was also detected in 4 of the corresponding laboratory method blanks. Lead was found in one equipment blank and one associated groundwater sample indicating the possibility of cross-contamination of that sample.

A total of 22 trip blanks were also submitted along with the February-March 1997 groundwater samples. Acetone was detected in 5 of the 22 trip blanks, and in 4 of the corresponding laboratory method blanks. The occurrence of acetone in the trip blanks, the equipment blanks, and the laboratory method blanks, and its widespread use in the laboratory indicates that its presence is likely a result of contamination by laboratory procedures.

Low concentrations of dichloromethane were also detected in three trip blanks, and carbon disulfide (CS_2) in another. Of these constituents, only CS_2 was also detected in groundwater samples (four samples - Table 3-2). However, the groundwater samples and the trip blank which contained CS_2 were unassociated.

Lead (0.003 mg/l) was the only constituent detected in the field blank from the February-March 1997 event. This indicates virtually no effect of ambient conditions or sample containers on analytical results.

4.0 GENERAL WATER CHEMISTRY

As part of this groundwater monitoring event, groundwater samples were also submitted for analysis of major cations and anions in an effort to further understand the natural water chemistry of the groundwater beneath JPL, and for use in interpreting groundwater flow. Samples from each of the JPL shallow monitoring wells, and each of the deep MP wells, were analyzed for major cations (Ca, Mg, Na, and K), major anions (Cl, SO_4, NO_3, CO_3 + HCO_3, and total soluble phosphates), 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 February-March 1997 event have been compiled as stiff diagrams (Figures 4-1 and 4-2). 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. 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 the dominant anion, but with relatively elevated Cl and SO_4 concentrations.

Based on this scheme, waters classified as type 1 and type 3 are very similar in that both types contain calcium as the predominant cation and bicarbonate as the predominant anion. Type 3 groundwaters, however, contain slightly higher concentrations of chloride and sulfate anions than those of type 1. Elevated NO_3 levels were detected in some wells, but since NO_3 is probably not of geologic origin, it is not used in classifying the water types. It may be useful to further investigate the source of the NO_3 in the future. Currently the source of NO_3 is suspected to be the historic use of cesspools in the surrounding community.

All of the shallow wells contained calcium-bicarbonate, calcium-bicarbonate/chloride sulfate waters, or blends of these water types during the February-March 1997 sampling event (Figure 4-1). Calcium-bicarbonate and calcium-bicarbonate/chloride/sulfate waters were the predominant compositional types found in the uppermost screened intervals of all the deep multi-port wells (Figures 4-1 and 4-2). Intervals containing higher concentrations of chloride and sulfate (type 3 waters) include MW-14 (screens 1, 2, and 3), MW-19 (screen 3), and MW-21

(screens 1, 2 and 3). Blending of types 1 and 3 is suggested by data from MW-4 (screen 2), MW-6, MW-10, MW-13, MW-16, MW-19 (screen 2) and MW-21 (screens 4 and 5).

Sodium-bicarbonate waters (type 2) were found in the lower intervals of deep multi-port wells MW-3 (screens 3, 4, and 5), MW-11 (screen 5), MW-14 (screen 5), MW-18 (screen 5), and MW-20 (screens 3, 4, and 5). Apparent blending of type 2 water with type 1 was noted [MW-4 (screens 4 and 5), MW-12 (screen 5), MW-17 (screen 5), and MW-18 (screen 4)] and with type 3 water [MW-19 (screens 4 and 5)].

4.2 QUALITY ASSURANCE/QUALITY CONTROL RESULTS

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

The charge balances for samples analyzed for major anions and cations during the February-March 1997 sampling event are within the ideal range (± 5 percent) for 49 of the 60 sets of water chemistry results. The charge balances for the remaining sets of water chemistry analyses range between 5 and 7 percent, with only one value falling outside the acceptable limit of $\pm 10\%$. This indicates that the results are acceptable for their intended use (Table 4-2).

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 lie between 1.0 and 1.2 (Oppenheimer and Eaton, 1986).

The ratio between measured and calculated TDS values for the February-March 1997 water-chemistry results fell within the ideal range (1.0 to 1.2) for 55 of the 60 sets of water chemistry analyses performed (Table 4-2). The ratio for the remaining three sets of water chemistry data fell slightly outside this ideal range suggesting sample inhomogeneity or small error in the measured TDS values. However, these data are suitable for identifying differences in water chemistry across the site.

5.0 WATER-LEVEL MEASUREMENTS

Water-level measurements were taken before sampling, on January 30, 1997, during sampling, on February 25, 1997, and after sampling on March 10 and 11, 1997. Water-level data in the shallow wells were collected using a Solinst® water-level indicator 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 the reel. Depth to groundwater was then read directly from the measuring tape at the top of the well casing.

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

Water table elevation measurements taken before sampling are provided in Table 5-1 and have been contoured in Figure 5-1. Water table elevation measurements taken during sampling are provided in Table 5-2 and measurements taken after sampling are given in Table 5-3 and are contoured in Figure 5-2.

As indicated by Figures 5-1 and 5-2, groundwater flow was primarily to the south and east both before and after sampling. The "trough" of depression observed in Figure 5-2 suggests that the city of Pasadena municipal production wells were pumping at the end of this sampling event. The absence of this feature in Figure 5-1 indicates that these wells were not pumping at the beginning of the sampling event.

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

The effects of pumping by the city of Pasadena production wells can be seen in the difference in potentiometric head between the upper- and lower-most screened intervals in Figure 5-4.

6.0 REFERENCES

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

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

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

Ebasco, 1993b. Quality Assurance Program for Performing a Remedial Investigation for the National Aeronautics and Space Administration-Jet Propulsion Laboratory. December, 1993.

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

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

Oppenheimer, J., and Eaton, D., 1985. Quality Control in Mineral Analysis, WQTC, Houston, Texas. Proceedings, pp. 15-34.

TABLES

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

Well Number	Well Type	Year Installed	Drilling Method	Depth to Bottom of Casing (feet)	Depth of Screened Interval (feet)	Elevation Top 4 inch Casing (feet above mean sea level)	Elevation of Screened Interval (feet above mean sea level)	Multi-Port Well Screen Number	Sand Pack (feet)	Screen Slot Size (inch)	Casing Material
MW-1	Shallow Standpipe	1989	Mud Rotary	120	70-110	1116.7	1006.70-1046.70	-	99	0.02	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')

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-11	Deep Multi-Port	1992	Mud Rotary	680	140-150	1139.35	989.35-999.35	1	24	0.010	4" low-carbon steel
					250-260		879.35-889.35	2	22	0.010	4" low-carbon steel
					420-430		709.35-719.35	3	26	0.010	4" low-carbon steel
					515-525		614.35-624.35	4	26	0.010	4" low-carbon steel
					630-640		499.35-509.35	5	28	0.010	4" low-carbon steel
MW-12	Deep Multi-Port	1994	Mud Rotary	596	135-145	1102.14	957.14-967.14	1	22	0.010	4" low-carbon steel
					240-250		852.14-862.14	2	19	0.010	4" low-carbon steel
					315-325		777.14-787.14	3	21	0.010	4" low-carbon steel
					430-440		662.14-672.14	4	22	0.010	4" low-carbon steel
					546-556		546.14-556.14	5	21	0.010	4" low-carbon steel
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

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-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
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

TABLE 3-1

SUMMARY OF ANALYSES PERFORMED ON GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, FEBRUARY-MARCH 1997

Sample Location	Sample Number	Sampling Date	Sample Type	VOC's EPA 524.2	Total Cr, As, Pb, Major Cations EPA 200 Series	Hexavalent Chrome EPA 7196	Major Anions and TDS EPA 300 Series/160.1	Total Phosphate EPA 365.4	Tributyltin GC/FPD
MW-1	MW-971-01	3/7/97	GW	X	X	X	X	X	
MW-3									
Screen 1	MW-971-02	3/7/97	GW	X	X	X	X	X	
Screen 2	MW-971-03	3/6/97	GW	X	X	X	X	X	
Screen 3	MW-971-04	3/6/97	GW	X	X	X	X	X	
Screen 4	MW-971-05	3/6/97	GW	X	X	X	X	X	
Screen 5	MW-971-06	3/6/97	GW	X	X	X	X	X	
MW-4									
Screen 1	MW-971-07	2/28/97	GW	X	X	X	X	X	
Screen 2	MW-971-08	2/28/97	GW	X	X	X	X	X	
Screen 2	MW-971-09	2/28/97	DUP	X	X (no cations)	X			
Screen 3	MW-971-10	2/27/97	GW	X	X	X	X	X	
Screen 4	MW-971-11	2/27/97	GW	X	X	X	X	X	
Screen 5	MW-971-12	2/27/97	GW	X	X	X	X	X	
MW-5	MW-971-13	3/5/97	GW	X	X	X	X	X	
MW-6	MW-971-14	3/4/97	GW	X	X	X	X	X	
MW-7	MW-971-15	3/5/97	GW	X	X	X	X	X	
MW-8	MW-971-16	3/7/97	GW	X	X	X	X	X	
MW-9	MW-971-17	3/7/97	GW	X	X	X	X	X	
MW-10	MW-971-18	3/5/97	GW	X	X	X	X	X	
MW-10	MW-971-19	3/5/97	DUP	X	X (no cations)	X			
MW-11									
Screen 1	MW-971-20	3/5/97	GW	X	X	X	X	X	
Screen 2	MW-971-21	3/5/97	GW	X	X	X	X	X	
Screen 3	MW-971-22	3/5/97	GW	X	X	X	X	X	
Screen 4	MW-971-23	3/5/97	GW	X	X	X	X	X	
Screen 5	MW-971-24	3/5/97	GW	X	X	X	X	X	

GW: Groundwater Sample
DUP: Duplicate Sample
*Not Sampled because there was no water in the screened interval at each of these wells

TABLE 3-1

SUMMARY OF ANALYSES PERFORMED ON GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, FEBRUARY-MARCH 1997

Sample Location	Sample Number	Sampling Date	Sample Type	VOC's EPA 524.2	Total Cr, As, Pb, Major Cations EPA 200 Series	Hexavalent Chrome EPA 7196	Major Anions and TDS EPA 300 Series/160.1	Total Phosphate EPA 365.4	Tributyltin GC/FPD
MW-12									
Screen 1	MW-971-25	3/4/97	GW	X	X	X	X	X	X
Screen 1	MW-971-26	3/4/97	DUP	X	X (no cations)	X			X
Screen 2	MW-971-27	3/3/97	GW	X	X	X	X	X	X
Screen 3	MW-971-28	2/28/97	GW	X	X	X	X	X	
Screen 4	MW-971-29	2/28/97	GW	X	X	X	X	X	
Screen 5	MW-971-30	2/28/97	GW	X	X	X	X	X	
MW-13	MW-971-31	3/7/97	GW	X	X	X	X	X	X
MW-13	MW-971-32	3/7/97	DUP	X	X (no cations)	X			X
MW-14									
Screen 1	MW-971-33	2/27/97	GW	X	X	X	X	X	
Screen 2	MW-971-34	2/26/97	GW	X	X	X	X	X	
Screen 3	MW-971-35	2/26/97	GW	X	X	X	X	X	
Screen 4	MW-971-36	2/26/97	GW	X	X	X	X	X	
Screen 5	MW-971-37	2/26/97	GW	X	X	X	X	X	
MW-15	MW-971-38	3/7/97	GW	X	X	X	X	X	
MW-16	MW-971-39	3/4/97	GW	X	X	X	X	X	
MW-17									
Screen 1	MW-971-40	2/6/97	GW	X	X	X	X	X	
Screen 2	MW-971-41	2/6/97	GW	X	X	X	X	X	
Screen 3	MW-971-42	2/7/97	GW	X	X	X	X	X	
Screen 4	MW-971-43	2/5/97	GW	X	X	X	X	X	
Screen 5	MW-971-44	2/5/97	GW	X	X	X	X	X	

GW: Groundwater Sample
DUP: Duplicate Sample
*Not Sampled because there was no water in the screened interval at each of these wells

TABLE 3-1

SUMMARY OF ANALYSES PERFORMED ON GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, FEBRUARY-MARCH 1997

Sample Location	Sample Number	Sampling Date	Sample Type	VOC's EPA 524.2	Total Cr, As, Pb, Major Cations EPA 200 Series	Hexavalent Chrome EPA 7196	Major Anions and TDS EPA 300 Series/160.1	Total Phosphate EPA 365.4	Tributyltin GC/FPD
MW-18									
Screen 1	MW-971-45	2/4/97	GW	X	X	X	X	X	
Screen 2	MW-971-46	2/4/97	GW	X	X	X	X	X	
Screen 3	MW-971-47	2/3/97	GW	X	X	X	X	X	
Screen 4	MW-971-48	2/3/97	GW	X	X	X	X	X	
Screen 5	MW-971-49	2/3/97	GW	X	X	X	X	X	
MW-19									
Screen 1	MW-971-50	2/13/97	GW	X	X	X	X	X	
Screen 2	MW-971-51	2/19/97	GW	X	X	X	X	X	
Screen 3	MW-971-52	2/12/97	GW	X	X	X	X	X	
Screen 4	MW-971-53	2/14/97	GW	X	X	X	X	X	
Screen 5	MW-971-54	2/11/97	GW	X	X	X	X	X	
MW-20									
Screen 1	MW-971-55	2/10/97	GW	X	X	X	X	X	
Screen 2	MW-971-56	2/10/97	GW	X	X	X	X	X	
Screen 3	MW-971-57	2/10/97	GW	X	X	X	X	X	
Screen 4	MW-971-58	2/7/97	GW	X	X	X	X	X	
Screen 5	MW-971-59	2/7/97	GW	X	X	X	X	X	
MW-21									
Screen 1	MW-971-60	2/21/97	GW	X	X	X	X	X	
Screen 2	MW-971-61	2/20/97	GW	X	X	X	X	X	
Screen 3	MW-971-62	2/20/97	GW	X	X	X	X	X	
Screen 4	MW-971-63	2/20/97	GW	X	X	X	X	X	
Screen 5	MW-971-64	2/24/97	GW	X	X	X	X	X	

GW: Groundwater Sample
DUP: Duplicate Sample
*Not Sampled because there was no water in the screened interval at each of these wells

TABLE 3-2
SUMMARY OF VOLATILE ORGANIC COMPOUNDS DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, FEBRUARY-MARCH 1997

(concentrations in µg/l)

Values above state or federal MCLs are shaded

Sampling Location	Sample Number	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds
MW-1	MW-971-01	--	--	--	--	--	--	--	--	--
MW-3										
Screen 1	MW-971-02	--	--	--	--	--	--	--	--	2.6 Carbon Disulfide
Screen 2	MW-971-03	--	--	--	--	--	--	--	4.4	8.0 Carbon Disulfide
Screen 3	MW-971-04	--	--	--	--	--	--	--	0.8	--
Screen 4	MW-971-05	--	--	--	--	--	--	--	--	1.0 Hexane
Screen 5	MW-971-06	--	--	--	--	--	--	--	--	1.5 Carbon Disulfide 2.7 Sulfur Dioxide 1.3 Unknown (RT=2.51)
MW-4										
Screen 1	MW-971-07	--	--	--	--	--	--	--	--	--
Screen 2	MW-971-08	**7.9**	**19**	--	--	**0.8**	0.8	--	7.8	--
Screen 2 (DUP)	MW-971-09	**7.4**	**22**	--	--	**0.8**	0.7	--	7.1	--
Screen 3	MW-971-10	--	--	--	--	--	--	--	--	--
Screen 4	MW-971-11	--	--	--	--	--	--	--	--	--
Screen 5	MW-971-12	--	--	--	--	--	--	--	--	--
MW-5	MW-971-13	--	--	--	--	--	--	--	--	--
MW-6	MW-971-14	--	--	--	0.8	--	--	--	--	--
MW-7	MW-971-15	**45**	**27**	0.6	--	**0.8**	0.9	5.1	9.9	--
MW-8	MW-971-16	**1.5**	4.5	--	--	--	--	--	1.3	1.1 Freon 11 1.9 Carbon Disulfide
MW-9	MW-971-17	--	--	--	--	--	--	--	--	--
MW-10	MW-971-18	--	**5.2**	--	--	--	--	--	0.6	--
MW-10 (DUP)	MW-971-19	--	**5.2**	--	--	--	--	--	0.6	--

B: Compound detected in the laboratory method blank.
EB: Compound detected in associated equipment blank.
--: Not detected.
TB: Compound detected in associated trip blank.
DUP: Duplicate

TABLE 3-2
SUMMARY OF VOLATILE ORGANIC COMPOUNDS DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, FEBRUARY-MARCH 1997

(concentrations in μg/l)

Values above state or federal MCLs are shaded

Sampling Location	Sample Number	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds
MW-11										
Screen 1	MW-971-20	--	--	--	--	--	--	--	--	--
Screen 2	MW-971-21	**1.7**	--	--	--	--	--	--	1.0	--
Screen 3	MW-971-22	--	--	--	--	--	--	--	1.1	--
Screen 4	MW-971-23	--	--	--	--	--	--	--	--	1.5 2-Methyl-1-Propene
Screen 5	MW-971-24	--	--	--	--	--	--	--	--	--
MW-12										
Screen 1	MW-971-25	--	--	--	--	--	--	--	5.8	--
Screen 1 (DUP)	MW-971-26	--	--	--	--	--	--	--	5.7	--
Screen 2	MW-971-27	**1.1**	0.5	--	--	--	--	--	--	1.1 (B) Acetone
Screen 3	MW-971-28	**6.4**	--	--	--	--	--	--	1.4	1.3 (B) Acetone
Screen 4	MW-971-29	**4.9**	--	--	--	--	--	--	1.3	--
Screen 5	MW-971-30	**1.7**	--	--	--	--	--	--	0.5	--
MW-13	MW-971-31	**18**	**28**	--	--	**0.9**	1.1	0.6	9.2	--
MW-13 (DUP)	MW-971-32	**18**	**29**	--	--	**0.9**	1.0	0.6	9.4	--
MW-14										
Screen 1	MW-971-33	--	--	0.7	1.5	--	--	--	0.7	--
Screen 2	MW-971-34	--	0.9	1.9	1.3	--	--	--	0.8	0.8 1,2,3-Trichlorobenzene 1.1 Acetone
Screen 3	MW-971-35	--	--	--	--	--	--	--	--	--
Screen 4	MW-971-36	--	--	--	--	--	--	--	--	--
Screen 5	MW-971-37	--	--	--	--	--	--	--	--	--
MW-15	MW-971-38	--	--	--	--	--	--	--	--	--
MW-16	M2-971-39	**91**	**23**	1.3	--	**1.7**	2.6	1.6	29	--

B: Compound detected in the laboratory method blank.
EB: Compound detected in associated equipment blank.
--: Not detected.
TB: Compound detected in associated trip blank.
DUP: Duplicate

TABLE 3-2
SUMMARY OF VOLATILE ORGANIC COMPOUNDS DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, FEBRUARY-MARCH 1997

(concentrations in μg/l)

Values above state or federal MCLs are shaded

Sampling Location	Sample Number	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds
MW-17										
Screen 1	MW-971-40	--	--	--	--	--	--	--	--	--
Screen 2	MW-971-41	--	--	--	--	--	--	--	5.2	--
Screen 3	MW-971-42	**5.1**	**23**	1.1	--	--	--	--	6.2	--
Screen 4	MW-971-43	--	**5.8**	--	--	--	--	--	0.7	--
Screen 5	MW-971-44	--	**14**	0.7	--	--	--	--	1.3	--
MW-18										
Screen 1	MW-971-45	--	--	--	--	--	--	--	3.0	--
Screen 2	MW-971-46	--	--	--	--	--	--	--	1.9	--
Screen 3	MW-971-47	**0.8**	**6.6**	2.9	--	--	--	--	5.1	--
Screen 4	MW-971-48	**2.2**	--	1.5	--	--	--	--	0.6	--
Screen 5	MW-971-49	--	--	--	--	--	--	--	--	--
MW-19										
Screen 1	MW-971-50	--	--	--	--	--	--	--	0.8	--
Screen 2	MW-971-51	--	--	--	--	--	--	--	--	--
Screen 3	MW-971-52	--	--	2.1	--	--	--	--	--	--
Screen 4	MW-971-53	--	1.1	0.6	--	--	--	--	1.5	--
Screen 5	MW-971-54	--	--	1.7	--	--	--	--	--	--
MW-20										
Screen 1	MW-971-55	--	--	--	--	--	--	--	1.4	2.4 (EB) Acetone
Screen 2	MW-971-56	--	--	--	--	--	--	--	3.2	--
Screen 3	MW-971-57	--	--	--	--	--	--	--	--	--
Screen 4	MW-971-58	--	--	--	--	--	--	--	--	--
Screen 5	MW-971-59	--	--	--	--	--	--	--	--	--

B: Compound detected in the laboratory method blank.
EB: Compound detected in associated equipment blank.
--: Not detected.
TB: Compound detected in associated trip blank.
DUP: Duplicate

TABLE 3-2
SUMMARY OF VOLATILE ORGANIC COMPOUNDS DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, FEBRUARY-MARCH 1997

(concentrations in µg/l)
Values above state or federal MCLs are shaded

Sampling Location	Sample Number	Carbon Tetrachloride	TCE	PCE	1,1-DCA	1,2-DCA	1,1-DCE	Freon 113	Total Trihalomethanes (Primarily Chloroform)	Other Volatile Organic Compounds
MW-21										
Screen 1	MW-971-60	--	29	--	--	--	--	--	2.2	--
Screen 2	MW-971-61	--	--	1.1	--	--	--	--	--	--
Screen 3	MW-971-62	--	0.8	1.6	--	--	--	--	--	--
Screen 4	MW-971-63	--	--	1.8	--	--	--	--	--	--
Screen 5	MW-971-64	--	--	3.0	--	--	--	--	--	--
Practical Quantitation Limit		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
California Maximum Contaminant Level		0.5	5.0	5.0	5.0	0.5	6.0	1,200	100	-- Acetone
EPA Region IX Maximum Contaminant Level		5.0	5.0	5.0	--	5.0	7.0	--	100	-- Acetone

B: Compound detected in the laboratory method blank.
EB: Compound detected in associated equipment blank.
--: Not detected.
TB: Compound detected in associated trip blank.
DUP: Duplicate

TABLE 3-3
SUMMARY OF VOLATILE ORGANIC COMPOUNDS DETECTED DURING THE LONG-TERM QUARTERLY GROUNDWATER SAMPLING PROGRAM
JET PROPULSION LABORATORY

(concentrations in µg/l)

Values above state and federal MCLs 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
MW-1	Aug/Sep 1996	--	--	--	--	--	--	--	--	--
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.9 Acetone
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--
MW-3										
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	1.2	--
	Oct/Nov 1996	--	--	--	--	--	--	--	8.3	0.7 (B) Naphthalene
	Feb/Mar 1997	--	--	--	--	--	--	--	--	2.6 Carbon Disulfide
Screen 2	Aug/Sep 1996	--	--	--	--	--	--	--	5.5	--
	Oct/Nov 1996	--	--	--	--	--	--	--	4.8	1.9 (B) Naphthalene
	Feb/Mar 1997	--	--	--	--	--	--	--	4.4	8.0 Carbon Disulfide
Screen 3	Aug/Sep 1996	**0.6**	0.8	--	--	--	--	--	1.6	--
	Oct/Nov 1996	--	--	--	--	--	--	--	0.7	--
	Feb/Mar 1997	--	--	--	--	--	--	--	0.8	--
Screen 4	Aug/Sep 1996	--	--	--	--	--	--	--	--	--
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.2 Acetone
	Feb/Mar 1997	--	--	--	--	--	--	--	--	1.0 Hexane
Screen 5	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.1 Methylene chloride
	Oct/Nov 1996	--	--	--	--	--	--	--	--	2.1 Acetone 1.2 Carbon disulfide
	Feb/Mar 1997	--	--	--	--	--	--	--	--	1.5 Carbon Disulfide 2.7 Sulfur Disulfide 1.3 Unknown (RT=2.51)
MW-4										
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.9(B) Acetone
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--
Screen 2	Aug/Sep 1996	**5.5**	**19**	--	--	**0.9**	0.7	--	6.7	3.2(B) Acetone
	Oct/Nov 1996	**5.3**	**15**	--	--	**0.6**	0.8	--	5.4	1.8 Acetone
	Feb/Mar 1997	**7.9**	**19**	--	--	**0.8**	0.8	--	7.8	--

Note: Numbers in bold and shaded are above MCLs
B: Compound detected in the laboratory method blank.
--: Not detected.
TB: Compound detected in associated trip blank.
* Not sampled, no water over screen

TABLE 3-3
SUMMARY OF VOLATILE ORGANIC COMPOUNDS DETECTED DURING THE LONG-TERM QUARTERLY GROUNDWATER SAMPLING PROGRAM
JET PROPULSION LABORATORY

(concentrations in µg/l)

Values above state and federal MCLs 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
Screen 3	Aug/Sep 1996	--	--	--	--	--	--	--	--	3.0(B) (Acetone
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.5 Acetone
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--
Screen 4	Aug/Sep 1996	--	--	--	--	--	--	--	--	3.9(B) Acetone
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.6 Acetone
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--
Screen 5	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.9 Acetone
	Aug/Sep 1996	--	--	--	--	--	--	--	--	--
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--
MW-5	Aug/Sep 1996	--	--	--	--	--	--	--	--	--
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--
MW-6	Aug/Sep 1996	--	--	--	--	--	--	--	1.3(TB)	--
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--
	Feb/Mar 1997	--	--	--	0.8	--	--	--	--	--
MW-7	Aug/Sep 1996	**90**	**39**	0.8	--	**1.2**	1.1	7.2	13(TB)	--
	Oct/Nov 1996	**170**	**27**	1.3	--	**0.8**	2.3	7.7	14	4.3 (B) 1,1 Difluoroethane 2.8 (B) Acetone
	Feb/Mar 1997	**45**	**27**	0.6	--	**0.8**	0.9	5.1	9.9	--
MW-8	Aug/Sep 1996	**4.0**	4.6	--	--	--	--	--	1.3	--
	Oct/Nov 1996	**2.8**	2.2	--	--	--	--	0.6	0.6	1.7 Acetone
	Feb/Mar 1997	**1.5**	4.5	--	--	--	--	--	1.3	1.1 Freon 11 1.9 Carbon Disulfide
MW-9	Aug/Sep 1996	--	--	--	--	--	--	--	--	--
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--
MW-10	Aug/Sep 1996	**0.7**	**18**	0.5	--	--	--	1.2	1.4(TB)	--
	Oct/Nov 1996	**0.6**	**6.6**	1.0	1.9	--	--	0.8	1.1	3.0 (B) Acetone 1.1 Unknown scan #350
	Feb/Mar 1997	--	**5.2**	--	--	--	--	--	0.6	--

Note: Numbers in bold and shaded are above MCLs
B: Compound detected in the laboratory method blank.
--: Not detected.
TB: Compound detected in associated trip blank.
* Not sampled, no water over screen

TABLE 3-3
SUMMARY OF VOLATILE ORGANIC COMPOUNDS DETECTED DURING THE LONG-TERM QUARTERLY GROUNDWATER SAMPLING PROGRAM JET PROPULSION LABORATORY

(concentrations in µg/l)

Values above state and federal MCLs 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
MW-11										
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.6(B) Acetone
	Oct/Nov 1996	--	--	--	--	--	--	--	--	7.1 MTBE 1.8 Acetone
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--
Screen 2	Aug/Sep 1996	**2.4**	--	--	--	--	--	--	1.0	--
	Oct/Nov 1996	**1.1**	--	--	--	--	--	--	1.2	--
	Feb/Mar 1997	**1.7**	--	--	--	--	--	--	1.0	--
Screen 3	Aug/Sep 1996	**0.9**	--	--	--	--	--	--	1.3	2.9(B) Acetone
	Oct/Nov 1996	--	--	--	--	--	--	--	1.4	--
	Feb/Mar 1997	--	--	--	--	--	--	--	1.1	--
Screen 4	Aug/Sep 1996	--	--	--	--	--	--	--	0.5	2.4(B) Acetone
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--
	Feb/Mar 1997	--	--	--	--	--	--	--	--	1.5 2-Methyl-1-Propene
Screen 5	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.4(B) Acetone
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.1 Acetone
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--
MW-12										
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	4.1	--
	Not Sampled*	--	--	--	--	--	--	--	--	--
	Feb/Mar 1997	--	--	--	--	--	--	--	5.8	--
Screen 2	Aug/Sep 1996	**0.9**	--	--	--	--	--	--	--	--
	Oct/Nov 1996	**1.5**	0.6	--	--	--	--	0.5	--	--
	Feb/Mar 1997	**1.1**	0.5	--	--	--	--	--	--	1.1 (B) Acetone
Screen 3	Aug/Sep 1996	**4.5**	--	--	--	--	--	--	1.3	--
	Oct/Nov 1996	**3.8**	--	--	--	--	--	--	1.3	1.6 Acetone
	Feb/Mar 1997	**6.4**	--	--	--	--	--	--	1.4	1.3 (B) Acetone
Screen 4	Aug/Sep 1996	**6.3**	--	--	--	--	--	--	1.4	--
	Oct/Nov 1996	**5.1**	--	--	--	--	--	--	1.4	2.5 Acetone
	Feb/Mar 1997	**4.9**	--	--	--	--	--	--	1.3	--

Note: Numbers in bold and shaded are above MCLs
B: Compound detected in the laboratory method blank.
--: Not detected.
TB: Compound detected in associated trip blank.
* Not sampled, no water over screen

TABLE 3-3
SUMMARY OF VOLATILE ORGANIC COMPOUNDS DETECTED DURING THE LONG-TERM QUARTERLY GROUNDWATER SAMPLING PROGRAM
JET PROPULSION LABORATORY

(concentrations in μg/l)

Values above state and federal MCLs 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
Screen 5	Aug/Sep 1996	**3.4**	--	--	--	--	--	--	0.7	--
	Oct/Nov 1996	**1.3**	--	--	--	--	--	--	--	1.5 Acetone
	Feb/Mar 1997	**1.7**	--	--	--	--	--	--	0.5	--
MW-13	Aug/Sep 1996	**21**	**47**	0.6	--	**2.5**	1.5	0.7	21(TB)	--
	Oct/Nov 1996	**27**	**27**	--	--	**1.9**	1.5	0.6	14	--
	Feb/Mar 1997	**18**	**28**	--	--	**0.9**	1.1	0.6	9.2	--
MW-14										
Screen 1	Aug/Sep 1996	--	--	--	2.4	--	--	--	0.6	--
	Oct/Nov 1996	--	--	--	2.9	--	--	--	--	--
	Feb/Mar 1997	--	--	0.7	1.5	--	--	--	0.7	--
Screen 2	Aug/Sep 1996	--	2.8	1.6	1.4	--	--	--	1.5	--
	Oct/Nov 1996	--	1.5	1.6	1.0	--	--	--	0.9	0.6 1,2,3-Trichlorobenzene 1.1 Acetone
	Feb/Mar 1997	--	0.9	1.9	1.3	--	--	--	0.8	0.8 1,2,3-Trichlorobenzene 1.1 Acetone
Screen 3	Aug/Sep 1996	--	--	--	--	--	--	--	--	--
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--
Screen 4	Aug/Sep 1996	--	--	--	--	--	--	--	--	--
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--
Screen 5	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.1(B) Acetone
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.6 (TB) Acetone 1.3 Carbon disulfide
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--
MW-15	Aug/Sep 1996	--	--	--	--	--	--	--	--	--
	Oct/Nov 1996	--	--	--	--	--	--	--	--	2.6 Acetone
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--

Note: Numbers in bold and shaded are above MCLs
B: Compound detected in the laboratory method blank.
--: Not detected.
TB: Compound detected in associated trip blank.
* Not sampled, no water over screen

TABLE 3-3
SUMMARY OF VOLATILE ORGANIC COMPOUNDS DETECTED DURING THE LONG-TERM QUARTERLY GROUNDWATER SAMPLING PROGRAM JET PROPULSION LABORATORY

(concentrations in μg/l)

Values above state and federal MCLs 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
MW-16	Aug/Sep 1996	**125**	**33**	1.3	–	**2.4**	2.2	2.0	40(TB)	–
	Not Sampled*	–	–	–	–	–	–	–	–	–
	Feb/Mar 1997	**91**	**23**	1.3	–	**1.7**	2.6	1.6	29	–
MW-17										
Screen 1	Aug/Sep 1996	–	–	–	–	–	–	–	–	4.3(B) Acetone
	Oct/Nov 1996	–	–	–	–	–	–	–	–	1.4 Acetone
	Feb/Mar 1997	–	–	–	–	–	–	–	–	–
Screen 2	Aug/Sep 1996	–	–	–	–	–	–	–	3.8	4.5(B) Acetone
	Oct/Nov 1996	–	–	–	–	–	–	–	6.0	–
	Feb/Mar 1997	–	–	–	–	–	–	–	5.2	–
Screen 3	Aug/Sep 1996	**2.0**	**7.9**	–	–	–	–	–	7.5	–
	Oct/Nov 1996	**3.3**	**18**	0.8	–	–	–	–	8.7	–
	Feb/Mar 1997	**5.1**	**23**	1.1	–	–	–	–	6.2	–
Screen 4	Aug/Sep 1996	–	**9.5**	0.5	–	–	–	–	1.1	–
	Oct/Nov 1996	–	**8.9**	–	–	–	–	–	1.5	–
	Feb/Mar 1997	–	**5.8**	–	–	–	–	–	0.7	–
Screen 5	Aug/Sep 1996	–	**13**	0.6	–	–	–	–	1.7	3.4(B) Acetone
	Oct/Nov 1996	–	**16**	0.7	–	–	–	–	1.7	–
	Feb/Mar 1997	–	**14**	0.7	–	–	–	–	1.3	–
MW-18										
Screen 1	Aug/Sep 1996	–	–	–	–	–	–	–	1.6	–
	Not Sampled*	–	–	–	–	–	–	–	–	
	Feb/Mar 1997	–	–	–	–	–	–	–	3.0	–
Screen 2	Aug/Sep 1996	–	–	–	–	–	–	–	7.3	–
	Oct/Nov 1996	–	–	–	–	–	–	–	8.2	
	Feb/Mar 1997	–	–	–	–	–	–	–	1.9	–
Screen 3	Aug/Sep 1996	**0.7**	4.7	2.8	–	–	–	–	5.1	–
	Oct/Nov 1996	**0.7**	**6.4**	3.2	–	–	–	–	5.6	–
	Feb/Mar 1997	**0.8**	**6.6**	2.9	–	–	–	–	5.1	–

Note: Numbers in bold and shaded are above MCLs
B: Compound detected in the laboratory method blank.
–: Not detected.
TB: Compound detected in associated trip blank.
* Not sampled, no water over screen

TABLE 3-3
SUMMARY OF VOLATILE ORGANIC COMPOUNDS DETECTED DURING THE LONG-TERM QUARTERLY GROUNDWATER SAMPLING PROGRAM
JET PROPULSION LABORATORY

(concentrations in µg/l)

Values above state and federal MCLs 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
Screen 4	Aug/Sep 1996	**2.2**	--	0.7	--	--	--	--	0.5	--
	Oct/Nov 1996	**2.2**	--	0.7	--	--	--	--	0.5	1.4 (TB) Acetone
	Feb/Mar 1997	**2.2**	--	1.5	--	--	--	--	0.6	--
Screen 5	Aug/Sep 1996	--	--	--	--	--	--	--	--	--
	Oct/Nov 1996	--	--	--	--	--	--	--	--	1.6 Acetone
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--
MW-19										
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	0.9	3.7(B) Acetone
	Oct/Nov 1996	--	--	--	--	--	--	--	0.6	2.9 Acetone
	Feb/Mar 1997	--	--	--	--	--	--	--	0.8	--
Screen 2	Aug/Sep 1996	--	--	0.8	--	--	--	--	--	3.0(B) Acetone
	Oct/Nov 1996	--	--	1.1	--	--	--	--	--	--
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--
Screen 3	Aug/Sep 1996	--	--	3.1	--	--	--	--	--	2.6(B) Acetone
	Oct/Nov 1996	--	--	2.5	--	--	--	--	--	--
	Feb/Mar 1997	--	--	2.1	--	--	--	--	--	--
Screen 4	Aug/Sep 1996	**0.5**	1.5	--	--	--	--	--	2.1	--
	Oct/Nov 1996	--	1.5	--	--	--	--	--	1.9	--
	Feb/Mar 1997	--	1.1	0.6	--	--	--	--	1.5	--
Screen 5	Aug/Sep 1996	--	--	3.0	--	--	--	--	0.6	1.6(B) Unknown scan #940
	Oct/Nov 1996	--	--	2.4	--	--	--	--	--	--
	Feb/Mar 1997	--	--	1.7	--	--	--	--	--	--
MW-20										
Screen 1	Aug/Sep 1996	--	--	--	--	--	--	--	0.7	3.4(B) Acetone
	Not Sampled*	--	--	--	--	--	--	--	--	--
	Feb/Mar 1997	--	--	--	--	--	--	--	1.4	2.4 (EB) Acetone
Screen 2	Aug/Sep 1996	--	--	--	--	--	--	--	7.7	4.0(B) Acetone
	Oct/Nov 1996	--	--	--	--	--	--	--	4.4	--
	Feb/Mar 1997	--	--	--	--	--	--	--	3.2	--

Note: Numbers in bold and shaded are above MCLs
B: Compound detected in the laboratory method blank.
--: Not detected.
TB: Compound detected in associated trip blank.
* Not sampled, no water over screen

TABLE 3-3
SUMMARY OF VOLATILE ORGANIC COMPOUNDS DETECTED DURING THE LONG-TERM QUARTERLY GROUNDWATER SAMPLING PROGRAM JET PROPULSION LABORATORY

(concentrations in μg/l)

Values above state and federal MCLs 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
Screen 3	Aug/Sep 1996	--	--	--	--	--	--	--	--	2.7(B) Acetone
	Oct/Nov 1996	--	--	--	--	--	--	--	0.6	2.3 Acetone
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--
Screen 4	Aug/Sep 1996	--	--	--	--	--	--	--	--	3.8(B) Acetone
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--
Screen 5	Aug/Sep 1996	--	--	--	--	--	--	--	--	4.8(B) Acetone
	Oct/Nov 1996	--	--	--	--	--	--	--	--	--
	Feb/Mar 1997	--	--	--	--	--	--	--	--	--
MW-21										
Screen 1	Aug/Sep 1996	--	**33**	0.7	--	--	--	--	1.8	2.3(B) Acetone
	Not Sampled*	--	--	--	--	--	--	--	--	--
	Feb/Mar 1997	--	**29**	--	--	--	--	--	2.2	--
Screen 2	Aug/Sep 1996	--	--	0.9	--	--	--	--	0.5	--
	Oct/Nov 1996	--	0.6	2.3	--	--	--	--	0.6	1.4 (TB) Acetone
	Feb/Mar 1997	--	--	1.1	--	--	--	--	--	--
Screen 3	Aug/Sep 1996	--	0.7	1.5	--	--	--	--	0.5	--
	Oct/Nov 1996	--	0.9	1.6	--	--	--	--	--	1.2 Acetone
	Feb/Mar 1997	--	0.8	1.6	--	--	--	--	--	--
Screen 4	Aug/Sep 1996	--	0.8	4.2	--	--	--	--	--	--
	Oct/Nov 1996	--	--	2.5	--	--	--	--	--	1.6 Acetone
	Feb/Mar 1997	--	--	1.8	--	--	--	--	--	--
Screen 5	Aug/Sep 1996	--	--	4.5	--	--	--	--	0.6	--
	Oct/Nov 1996	--	--	3.1	--	--	--	--	--	--
	Feb/Mar 1997	--	--	3.0	--	--	--	--	--	--
Practical Quantitation Limit		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
California Maximum Contaminant Level		0.5	5.0	5.0	5.0	0.5	6.0	1,200	100	-- Methylene chloride -- Acetone
EPA Region IX Maximum Contaminant Level		5.0	5.0	5.0	--	5.0	7.0	--	100	5.0 Methylene chloride -- Acetone

Note: Numbers in bold and shaded are above MCLs
B: Compound detected in the laboratory method blank.
--: Not detected.
TB: Compound detected in associated trip blank.
* Not sampled, no water over screen

TABLE 3-4

SUMMARY OF METALS DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, FEBRUARY-MARCH 1997

(concentrations in mg/l)

Sample Location	Sample Number	Arsenic	Lead	Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-1	MW-971-01	--	--	--	--	2.5
MW-3						
Screen 1	MW-971-02	--	--	--	--	6.1
Screen 2	MW-971-03	--	--	--	--	3.8
Screen 3	MW-971-04	--	--	--	--	1.7
Screen 4	MW-971-05	--	--	--	--	4.5
Screen 5	MW-971-06	--	--	--	--	2.5
MW-4						
Screen 1	MW-971-07	--	--	--	--	4.6
Screen 2	MW-971-08	--	--	0.011	--	4.5
Screen 2 (DUP)	MW-971-09	--	--	0.011	--	4.5
Screen 3	MW-971-10	--	--	--	--	2.8
Screen 4	MW-971-11	--	--	--	--	2.5
Screen 5	MW-971-12	--	--	--	--	4.4
MW-5	MW-971-13	--	--	--	--	1.5
MW-6	MW-971-14	--	--	0.014	--	4.3
MW-7	MW-971-15	--	--	--	0.01	2.2
MW-8	MW-971-16	--	--	--	--	3.1
MW-9	MW-971-17	--	--	--	--	4.2
MW-10	MW-971-18	--	--	--	--	2.2
MW-10 DUP	MW-971-19	--	--	--	--	2.2
MW-11						
Screen 1	MW-971-20	--	--	--	--	2.5
Screen 2	MW-971-21	--	--	--	--	3.1
Screen 3	MW-971-22	--	--	--	--	1.7
Screen 4	MW-971-23	--	0.009	--	--	5.2
Screen 5	MW-971-24	--	0.002	--	--	1.6
MW-12						
Screen 1	MW-971-25	--	--	--	--	3.8
Screen 1 (DUP)	MW-971-26	--	0.003	--	--	3.8
Screen 2	MW-971-27	--	--	--	--	2.5
Screen 3	MW-971-28	--	--	--	--	5.0
Screen 4	MW-971-29	--	--	--	--	2.4
Screen 5	MW-971-30	--	--	--	--	1.5
MW-13	MW-971-31	--	--	0.032	0.035	0.5
MW-13 DUP	MW-971-32	--	--	0.032	0.035	0.5
MW-14						
Screen 1	MW-971-33	--	--	--	--	4.3
Screen 2	MW-971-34	--	--	--	--	4.8
Screen 3	MW-971-35	--	--	--	--	2.5
Screen 4	MW-971-36	--	--	--	--	4.1
Screen 5	MW-971-37	--	0.028	--	--	2.3

TABLE 3-4

SUMMARY OF METALS DETECTED IN GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS, FEBRUARY-MARCH 1997

(concentrations in mg/l)

Sample Location	Sample Number	Arsenic	Lead	Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-15	MW-971-38	--	--	--	--	2.6
MW-16	MW-971-39	--	--	--	0.007	0.2
MW-17						
Screen 1	MW-971-40	--	--	--	--	2.0
Screen 2	MW-971-41	--	--	--	--	2.7
Screen 3	MW-971-42	--	--	--	--	6.0
Screen 4	MW-971-43	--	--	--	--	5.6
Screen 5	MW-971-44	--	0.003	--	--	24.5
MW-18						
Screen 1	MW-971-45	--	--	--	--	1.9
Screen 2	MW-971-46	--	--	--	--	2.8
Screen 3	MW-971-47	--	--	0.015	0.007	3.3
Screen 4	MW-971-48	--	--	--	--	2.8
Screen 5	MW-971-49	--	--	--	--	2.9
MW-19						
Screen 1	MW-971-50	--	--	--	--	6.6
Screen 2	MW-971-51	--	--	--	--	21.9
Screen 3	MW-971-52	--	--	--	--	4.9
Screen 4	MW-971-53	--	0.003	--	--	15.8
Screen 5	MW-971-54	--	--	--	--	3.8
MW-20						
Screen 1	MW-971-55	--	--	--	--	2.3
Screen 2	MW-971-56	--	--	--	--	2.1
Screen 3	MW-971-57	--	--	--	--	1.9
Screen 4	MW-971-58	--	--	--	--	3.3
Screen 5	MW-971-59	--	0.004	--	--	1.6
MW-21						
Screen 1	MW-971-60	--	--	--	--	1.1
Screen 2	MW-971-61	--	--	--	--	3.9
Screen 3	MW-971-62	--	0.003	--	--	4.6
Screen 4	MW-971-63	--	0.004	--	--	4.4
Screen 5	MW-971-64	--	--	--	--	28.0
Practical Quantitation Limit		0.005	0.002	0.01	0.005	
California Maximum Contaminant Level		0.05	0.05	0.05	--	
EPA Maximum Contaminant Level		0.05	(2)	0.1	--	

(DUP): Duplicate

--: Not detected at laboratory detection limits

(1): Secondary MCL

(2): Treatment technique and public notification triggered at 0.015 mg/l

TABLE 3-5

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

(concentrations in mg/l)

Sample Location	Sampling Date	Arsenic	Lead	Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-1	Aug/Sep 1996	--	--	--	--	0.8
	Oct/Nov 1996	--	--	--	--	0.5
	Feb/Mar 1997	--	--	--	--	2.5
MW-3						
Screen 1	Aug/Sep 1996	--	--	--	--	7.2
	Oct/Nov 1996	--	--	--	--	3.1
	Feb/Mar 1997	--	--	--	--	6.1
Screen 2	Aug/Sep 1996	--	--	--	--	1.7
	Oct/Nov 1996	--	--	--	--	2.7
	Feb/Mar 1997	--	--	--	--	3.8
Screen 3	Aug/Sep 1996	--	--	--	--	5.2
	Oct/Nov 1996	--	--	--	--	2.7
	Feb/Mar 1997	--	--	--	--	1.7
Screen 4	Aug/Sep 1996	--	--	--	--	4.3
	Oct/Nov 1996	--	--	--	--	2.6
	Feb/Mar 1997	--	--	--	--	4.5
Screen 5	Aug/Sep 1996	0.011	--	--	--	1.5
	Oct/Nov 1996	0.007	--	--	--	1.9
	Feb/Mar 1997	--	--	--	--	2.5
MW-4						
Screen 1	Aug/Sep 1996	--	--	--	--	2.6
	Oct/Nov 1996	--	--	--	--	1.7
	Feb/Mar 1997	--	--	--	--	4.6
Screen 2	Aug/Sep 1996	--	--	0.023	--	3.8
	Oct/Nov 1996	--	--	0.014	--	4.2
	Feb/Mar 1997	--	--	0.011	--	4.5
Screen 3	Aug/Sep 1996	--	--	--	--	0.6
	Oct/Nov 1996	--	--	--	--	1.5
	Feb/Mar 1997	--	--	--	--	2.8
Screen 4	Aug/Sep 1996	--	--	--	--	3.0
	Oct/Nov 1996	--	--	--	--	1.4
	Feb/Mar 1997	--	--	--	--	2.5
Screen 5	Aug/Sep 1996	--	--	--	--	4.5
	Oct/Nov 1996	--	--	--	--	4.1
	Feb/Mar 1997	--	--	--	--	4.4
MW-5	Aug/Sep 1996	--	--	--	--	2.7
	Oct/Nov 1996	--	0.003	--	--	2.7
	Feb/Mar 1997	--	--	--	--	1.5
MW-6	Aug/Sep 1996	--	--	0.050	--	4.5
	Oct/Nov 1996	--	--	0.011	--	1.1
	Feb/Mar 1997	--	--	0.014	--	4.3
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

TABLE 3-5
SUMMARY OF METALS DETECTED DURING LONG-TERM QUARTERLY SAMPLING PROGRAM JET PROPULSION LABORATORY
(concentrations in mg/l)

Sample Location	Sampling Date	Arsenic	Lead	Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-8	Aug/Sep 1996	--	--	--	--	4.0
	Oct/Nov 1996	--	0.003	--	--	4.7
	Feb/Mar 1997	--	--	--	--	3.1
MW-9	Aug/Sep 1996	--	--	--	--	2.1
	Oct/Nov 1996	--	--	--	--	2.5
	Feb/Mar 1997	--	--	--	--	4.2
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
MW-11						
Screen 1	Aug/Sep 1996	--	--	--	--	4.0
	Oct/Nov 1996	--	--	--	--	2.5
	Feb/Mar 1997	--	--	--	--	2.5
Screen 2	Aug/Sep 1996	--	--	--	--	4.5
	Oct/Nov 1996	--	--	--	--	4.7
	Feb/Mar 1997	--	--	--	--	3.1
Screen 3	Aug/Sep 1996	--	--	--	--	0.5
	Oct/Nov 1996	--	--	--	--	2.3
	Feb/Mar 1997	--	--	--	--	1.7
Screen 4	Aug/Sep 1996	--	--	--	--	3.9
	Oct/Nov 1996	--	--	--	--	3.3
	Feb/Mar 1997	--	0.009	--	--	5.2
Screen 5	Aug/Sep 1996	0.007	--	--	--	0.6
	Oct/Nov 1996	0.005	--	--	--	1.9
	Feb/Mar 1997	--	0.002	--	--	1.6
MW-12						
Screen 1	Aug/Sep 1996	--	0.004	--	--	50.4
	Not Sampled	NA	NA	NA	NA	NA
	Feb/Mar 1997	--	0.003	--	--	3.8
Screen 2	Aug/Sep 1996	--	0.024	--	--	4.0
	Oct/Nov 1996	--	--	--	--	4.0
	Feb/Mar 1997	--	--	--	--	2.5
Screen 3	Aug/Sep 1996	--	--	--	--	2.5
	Oct/Nov 1996	--	--	--	--	3.1
	Feb/Mar 1997	--	--	--	--	5.0
Screen 4	Aug/Sep 1996	--	0.005	--	--	1.8
	Oct/Nov 1996	--	--	--	--	0.7
	Feb/Mar 1997	--	--	--	--	2.4
Screen 5	Aug/Sep 1996	--	--	--	--	2.0
	Oct/Nov 1996	--	--	--	--	2.0
	Feb/Mar 1997	--	--	--	--	1.5
MW-13	Aug/Sep 1996	--	--	0.046	0.047	4.1
	Oct/Nov 1996	--	0.005	0.031	0.028	3.0
	Feb/Mar 1997	--	--	0.032	0.035	0.5

TABLE 3-5
SUMMARY OF METALS DETECTED DURING LONG-TERM QUARTERLY SAMPLING PROGRAM JET PROPULSION LABORATORY
(concentrations in mg/l)

Sample Location	Sampling Date	Arsenic	Lead	Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-14						
Screen 1	Aug/Sep 1996	--	--	--	--	3.3
	Oct/Nov 1996	--	--	--	--	4.5
	Feb/Mar 1997	--	--	--	--	4.3
Screen 2	Aug/Sep 1996	--	--	--	--	4.4
	Oct/Nov 1996	--	--	--	--	3.8
	Feb/Mar 1997	--	--	--	--	4.8
Screen 3	Aug/Sep 1996	--	--	--	--	1.7
	Oct/Nov 1996	--	--	--	--	2.0
	Feb/Mar 1997	--	--	--	--	2.5
Screen 4	Aug/Sep 1996	--	--	--	--	3.1
	Oct/Nov 1996	--	--	--	--	2.5
	Feb/Mar 1997	--	--	--	--	4.1
Screen 5	Aug/Sep 1996	--	--	--	--	1.5
	Oct/Nov 1996	--	--	--	--	4.1
	Feb/Mar 1997	--	0.028	--	--	2.3
MW-15	Aug/Sep 1996	--	--	--	--	1.3
	Oct/Nov 1996	--	--	NA	--	0.5
	Feb/Mar 1997	--	--	--	--	2.6
MW-16	Aug/Sep 1996	--	--	0.018	--	3.4
	Not Sampled	NA	NA	NA	NA	NA
	Feb/Mar 1997	--	--	--	0.007	0.2
MW-17						
Screen 1	Aug/Sep 1996	--	--	NA	NA	1.0
	Oct/Nov 1996	--	--	--	--	2.9
	Feb/Mar 1997	--	--	--	--	2.0
Screen 2	Aug/Sep 1996	--	--	NA	NA	4.5
	Oct/Nov 1996	--	--	--	--	2.5
	Feb/Mar 1997	--	--	--	--	2.7
Screen 3	Aug/Sep 1996	--	0.002	NA	NA	4.9
	Oct/Nov 1996	--	--	--	--	4.8
	Feb/Mar 1997	--	--	--	--	6.0
Screen 4	Aug/Sep 1996	--	--	NA	NA	2.8
	Oct/Nov 1996	--	--	--	--	2.6
	Feb/Mar 1997	--	--	--	--	5.6
Screen 5	Aug/Sep 1996	--	--	NA	NA	5.0
	Oct/Nov 1996	--	0.005	--	--	5.2
	Feb/Mar 1997	--	0.003	--	--	24.5
MW-18						
Screen 1	Aug/Sep 1996	--	--	NA	NA	0.9
	Not Sampled	NA	NA	NA	NA	NA
	Feb/Mar 1997	--	--	--	--	1.9
Screen 2	Aug/Sep 1996	--	--	NA	NA	3.5
	Oct/Nov 1996	--	0.003	--	--	3.4
	Feb/Mar 1997	--	--	--	--	2.8

TABLE 3-5
SUMMARY OF METALS DETECTED DURING LONG-TERM QUARTERLY SAMPLING PROGRAM JET PROPULSION LABORATORY
(concentrations in mg/l)

Sample Location	Sampling Date	Arsenic	Lead	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
Screen 4	Aug/Sep 1996	--	--	NA	NA	2.0
	Oct/Nov 1996	--	0.003	--	--	1.9
	Feb/Mar 1997	--	--	--	--	2.8
Screen 5	Aug/Sep 1996	--	--	NA	NA	2.8
	Oct/Nov 1996	--	0.002	--	--	3.6
	Feb/Mar 1997	--	--	--	--	2.9
MW-19						
Screen 1	Aug/Sep 1996	--	--	NA	NA	5.0
	Oct/Nov 1996	--	--	--	--	3.4
	Feb/Mar 1997	--	--	--	--	6.6
Screen 2	Aug/Sep 1996	--	--	NA	NA	4.5
	Oct/Nov 1996	--	--	--	--	3.6
	Feb/Mar 1997	--	--	--	--	21.9
Screen 3	Aug/Sep 1996	--	--	NA	NA	3.0
	Oct/Nov 1996	--	--	--	--	5.0
	Feb/Mar 1997	--	--	--	--	4.9
Screen 4	Aug/Sep 1996	--	--	NA	NA	4.2
	Oct/Nov 1996	--	--	--	--	8.0
	Feb/Mar 1997	--	0.003	--	--	15.8
Screen 5	Aug/Sep 1996	--	--	NA	NA	4.9
	Oct/Nov 1996	--	--	NA	--	4.6
	Feb/Mar 1997	--	--	--	--	3.8
MW-20						
Screen 1	Aug/Sep 1996	--	--	--	NA	3.5
	Not Sampled	NA	NA	NA	NA	NA
	Feb/Mar 1997	--	--	--	--	2.3
Screen 2	Aug/Sep 1996	--	--	NA	NA	3.9
	Oct/Nov 1996	--	--	--	--	1.1
	Feb/Mar 1997	--	--	--	--	2.1
Screen 3	Aug/Sep 1996	--	--	NA	NA	1.7
	Oct/Nov 1996	--	--	--	--	1.6
	Feb/Mar 1997	--	--	--	--	1.9
Screen 4	Aug/Sep 1996	--	--	NA	NA	1.0
	Oct/Nov 1996	--	--	--	--	1.3
	Feb/Mar 1997	--	--	--	--	3.3
Screen 5	Aug/Sep 1996	--	--	NA	NA	1.8
	Oct/Nov 1996	--	--	NA	--	1.3
	Feb/Mar 1997	--	0.004	--	--	1.6

TABLE 3-5
SUMMARY OF METALS DETECTED DURING LONG-TERM QUARTERLY SAMPLING PROGRAM JET PROPULSION LABORATORY
(concentrations in mg/l)

Sample Location	Sampling Date	Arsenic	Lead	Chromium	Hexavalent Chromium	Field Turbidity (NTUs)
MW-21						
Screen 1	Aug/Sep 1996	--	--	NA	NA	0.9
	Not Sampled	NA	NA	NA	NA	NA
	Feb/Mar 1997	--	--	--	--	1.1
Screen 2	Aug/Sep 1996	--	--	NA	NA	2.1
	Oct/Nov 1996	--	--	--	--	1.2
	Feb/Mar 1997	--	--	--	--	3.9
Screen 3	Aug/Sep 1996	--	--	NA	NA	4.6
	Oct/Nov 1996	--	--	--	--	4.9
	Feb/Mar 1997	--	0.003	--	--	4.6
Screen 4	Aug/Sep 1996	--	--	NA	NA	2.5
	Oct/Nov 1996	--	--	--	--	3.3
	Feb/Mar 1997	--	0.004	--	--	4.4
Screen 5	Aug/Sep 1996	--	--	NA	NA	4.9
	Oct/Nov 1996	--	--	--	--	5.0
	Feb/Mar 1997	--	--	--	--	28.0
Practical Quantitation Limit		0.005	0.002	0.01	0.005	
Calif. Maximum Contaminant Level		0.05	0.05	--	--	
EPA Maximum Contaminant Level		0.05	(2)	--	--	

NA: Not analyzed

--: Not detected at laboratory detection limits

(1): Secondary MCL

(2): Treatment technique and public notification triggered at 0.015 mg/l

TABLE 4-1
SUMMARY OF WATER-CHEMISTRY RESULTS FOR GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS FEBRUARY-MARCH 1997
(concentrations in mg/L)

Well Number	ANIONS						CATIONS					Measured Alkalinity	Measured pH
	Cl	CO_3	HCO_3	NO_3-N	SO_4	Total P	Na	Mg	K	Ca	Fe		
MW-1	13	1.1	219	1.4	35	<0.05(2)	27	16	4.5	48	<0.100(4)	180	7.9
MW-3													
Screen 1	7.4	0.54	207	0.8	38	<0.05(2)	18	16	2.7	48	1.7	170	7.6
Screen 2	12	0.32	195	0.9	34	<0.05(2)	19	17	2.6	51	0.51	160	7.4
Screen 3	29	7.4	143	0.1	19	<0.05(2)	40	11	3.2	21	0.17	120	8.9
Screen 4	10	5.9	181	0.4	17	<0.05(2)	49	9.1	2.2	17	0.83	150	8.7
Screen 5	9.8	14.4	140	<0.1(1)	7.6	<0.05(2)	68	<0.1(3)	1.2	4.9	0.19	120	9.2
MW-4													
Screen 1	9.3	0.20	195	1.3	40	<0.05(2)	19	15	2.9	50	0.36	160	7.2
Screen 2	39	0.31	189	7.6	61	<0.05(2)	25	23	2.3	64	0.57	155	7.4
Screen 3	21	0.73	177	7.5	10	<0.05(2)	31	13	1.9	43	<0.100(4)	145	7.8
Screen 4	15	1.2	189	4.7	7.7	<0.05(2)	38	10	1.9	34	0.15	155	8.0
Screen 5	8.5	1.3	195	1.0	16	<0.05(2)	36	9.3	2.0	37	0.65	160	8.0
MW-5	8.1	0.08	159	1.6	28	<0.05(2)	14	14	2.9	43	0.28	130	6.9
MW-6	63	0.14	207	6.5	58	0.08	25	26	1.8	74	0.18	170	7.0
MW-7	20	0.35	171	5.7	44	<0.05(2)	18	17	2.4	52	0.15	140	7.5
MW-8	15	0.28	171	2.8	40	<0.05(2)	16	16	2.6	47	<0.100(4)	140	7.4
MW-9	6.9	0.42	256	1.3	24	<0.05(2)	23	18	3.6	56	<0.100(4)	210	7.4
MW-10	36	0.14	207	5.8	66	<0.05(2)	18	24	2.5	68	<0.100(4)	170	7.0
MW-11													
Screen 1	16	1.2	231	0.5	38	0.25	25	19	3.2	52	0.19	190	7.9
Screen 2	13	1.3	195	0.7	34	<0.05(2)	22	17	2.9	47	0.38	160	8.0
Screen 3	12	3.2	194	<0.1(1)	22	0.18	28	13	2.3	42	0.49	160	8.4
Screen 4	11	3.2	194	<0.1(1)	19	<0.05(2)	24	13	2.2	36	0.95	160	8.4
Screen 5	11	2.6	158	<0.1(1)	18	<0.05(2)	47	2.1	1.1	24	0.18	130	8.4

Notes:
(1) Based on a detection limit of 0.100 mg/L for NO_3-N
(2) Based on a detection limit of 0.05 mg/L for H_2PO_4
(3) Based on a detection limit of 1.0 mg/L for Mg
(4) Based on a detection limit of 0.100 mg/L for Fe

TABLE 4-1
SUMMARY OF WATER-CHEMISTRY RESULTS FOR GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS FEBRUARY-MARCH 1997
(concentrations in mg/L)

Well Number	ANIONS						CATIONS					Measured Alkalinity	Measured pH
	Cl	CO_3	HCO_3	NO_3-N	SO_4	Total P	Na	Mg	K	Ca	Fe		
MW-12													
Screen 1	15	0.41	201	1.0	36	<0.05(2)	28	17	3.6	48	0.20	165	7.5
Screen 2	14	0.58	225	1.9	38	<0.05(2)	24	18	3.1	57	0.15	185	7.6
Screen 3	15	1.1	213	1.2	30	<0.05(2)	24	15	2.9	57	0.44	175	7.9
Screen 4	13	1.5	225	1.2	27	<0.05(2)	23	14	2.3	58	0.29	185	8.0
Screen 5	11	1.4	213	0.9	17	<0.05(2)	36	11	2.3	42	<0.100(4)	175	8.0
MW-13	25	0.33	158	9.6	58	<0.05(2)	23	18	2.5	54	<0.100(4)	130	7.5
MW-14													
Screen 1	120	0.16	238	19	155	<0.05(2)	42	46	2.5	150	0.66	195	7.0
Screen 2	110	0.50	244	14	165	<0.05(2)	34	55	2.6	160	1.4	200	7.5
Screen 3	82	1.4	207	13	105	<0.05(2)	37	43	3.0	76	0.10	170	8.0
Screen 4	29	1.2	189	10	18	<0.05(2)	26	18	1.9	51	0.46	155	8.0
Screen 5	7.9	5.7	175	0.2	16	<0.05(2)	37	12	2.3	21	0.16	145	8.7
MW-15	9.9	0.43	207	3.0	35	<0.05(2)	22	17	3.0	51	<0.100(4)	170	7.5
MW-16	21	0.15	116	18	33	<0.05(2)	23	19	2.2	48	<0.100(4)	95	7.3
MW-17													
Screen 1	6.1	0.20	152	0.6	27	<0.05(2)	13	12	1.9	40	0.08	125	7.3
Screen 2	8.2	0.67	164	0.7	26	<0.05(2)	13	14	2.1	43	1.2	135	7.8
Screen 3	14	0.78	189	1.8	31	<0.05(2)	20	18	1.9	43	0.43	155	7.8
Screen 4	12	1.2	231	2.0	26	<0.05(2)	27	16	1.5	52	0.61	190	7.9
Screen 5	12	1.8	219	1.7	25	<0.05(2)	42	12	1.7	40	2.9	180	8.1
MW-18													
Screen 1	11	0.41	158	1.8	31	<0.05(2)	14	14	2.2	44	0.18	130	7.6
Screen 2	15	0.69	213	2.1	41	<0.05(2)	19	18	2.6	57	0.20	175	7.7
Screen 3	13	1.1	256	1.1	33	<0.05(2)	21	20	2.8	60	0.28	210	7.8
Screen 4	8.1	4.4	169	0.6	20	<0.05(2)	30	13	1.5	26	0.29	140	8.6
Screen 5	12	1.9	182	<0.1(1)	6.5	<0.05(2)	50	5.7	1.6	18	0.20	150	8.2

Notes:
(1) Based on a detection limit of 0.100 mg/L for NO_3-N
(2) Based on a detection limit of 0.05 mg/L for H_2PO_4
(3) Based on a detection limit of 1.0 mg/L for Mg
(4) Based on a detection limit of 0.100 mg/L for Fe

TABLE 4-1
SUMMARY OF WATER-CHEMISTRY RESULTS FOR GROUNDWATER SAMPLES COLLECTED FROM JPL MONITORING WELLS FEBRUARY-MARCH 1997
(concentrations in mg/L)

Well Number	ANIONS						CATIONS					Measured Alkalinity	Measured pH
	Cl	CO_3	HCO_3	NO_3-N	SO_4	Total P	Na	Mg	K	Ca	Fe		
MW-19													
Screen 1	6.2	0.31	152	0.7	28	<0.05(2)	11	12	2.4	42	0.41	125	7.5
Screen 2	38	0.15	183	4.7	64	<0.05(2)	15	22	1.7	62	2.4	150	7.1
Screen 3	78	0.43	262	11	74	<0.05(2)	28	35	2.7	93	0.24	25	7.4
Screen 4	39	1.5	231	4.8	48	<0.05(2)	27	27	2.4	56	0.29	190	8.0
Screen 5	74	1.3	195	4.2	53	<0.05(2)	36	27	2.6	56	0.29	160	8.0
MW-20													
Screen 1	55	0.66	201	13	145	<0.05(2)	22	32	3.6	95	0.11	165	7.7
Screen 2	18	0.62	189	3.4	37	<0.05(2)	14	18	2.2	52	0.24	155	7.7
Screen 3	30	26	203	1.4	18	<0.05(2)	66	18	2.8	11	<0.100(4)	175	9.3
Screen 4	10	8.6	167	<0.1(1)	20	<0.05(2)	69	2.1	1.0	8.6	0.21	140	8.9
Screen 5	8.2	18	181	<0.1(1)	22	<0.05(2)	80	1.6	1.4	7.4	0.14	155	9.2
MW-21													
Screen 1	76	0.21	207	14	105	<0.05(2)	28	32	2.0	92	<0.100(4)	170	7.2
Screen 2	130	0.35	341	8.0	145	<0.05(2)	54	46	2.9	150	0.11	280	7.2
Screen 3	93	0.63	305	9.0	90	<0.05(2)	36	38	2.9	130	1.6	250	7.5
Screen 4	38	0.36	219	7.8	29	<0.05(2)	25	20	2.0	65	0.91	180	7.4
Screen 5	58	1.1	256	9.9	64	<0.05(2)	30	30	2.6	82	2.7	210	7.8

Notes:
(1) Based on a detection limit of 0.200 mg/L for NO_3-N
(2) Based on a detection limit of 0.05 mg/L for H_2PO_4
(3) Based on a detection limit of 1.0 mg/L for Mg
(4) Based on a detection limit of 0.100 mg/L for Fe

TABLE 4-2
SUMMARY OF QUALITY CONTROL ANALYSES OF WATER-CHEMISTRY
DATA FROM GROUNDWATER SAMPLES COLLECTED
FROM JPL MONITORING WELLS
(FEBRUARY-MARCH 1997)

Well Number	Total Anions	Total Cations	Total Ions	Charge Balance	Measured TDS	Calculated TDS	Measured TDS/ Calculated TDS
MW-1	4.8	5.01	9.81	2.14	270	258.5	1.0
MW-3							
Screen 1	4.46	4.57	9.03	1.22	260	237.7	1.1
Screen 2	4.31	4.84	9.15	5.79	260	236.3	1.1
Screen 3	3.62	3.78	7.4	2.16	210	201.5	1.0
Screen 4	3.66	3.79	7.45	1.74	190	201.8	0.9
Screen 5	2.83	3.23	6.06	6.60	190	174.9	1.1
MW-4							
Screen 1	4.39	4.63	9.02	2.66	260	234	1.1
Screen 2	6.01	6.24	12.3	1.88	570	341.8	1.1
Screen 3	4.24	4.62	8.86	4.29	270	240.9	1.1
Screen 4	4.02	4.22	8.24	2.43	250	221.7	1.1
Screen 5	3.84	4.23	8.07	4.83	230	286	1.0
MW-5	3.53	3.99	7.52	6.12	220	195.6	1.1
MW-6	6.85	6.97	13.8	0.87	400	378.8	1.1
MW-7	4.69	4.84	9.53	1.57	280	263.2	1.1
MW-8	4.26	4.43	8.69	1.96	230	233.4	1.0
MW-9	4.99	5.37	10.4	3.67	300	263.6	1.1
MW-10	6.2	6.22	12.4	0.16	350	342.4	1.0
MW-11							
Screen 1	5.08	5.33	10.41	2.40	280	270.6	1.0
Screen 2	4.33	4.78	9.11	4.94	270	236.5	1.1
Screen 3	4	4.45	8.45	5.33	230	218.5	1.1
Screen 4	3.91	3.97	7.88	0.76	220	204.7	1.1
Screen 5	3.29	3.44	6.73	2.23	200	183.6	1.1

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

TABLE 4-2
SUMMARY OF QUALITY CONTROL ANALYSES OF WATER-CHEMISTRY
DATA FROM GROUNDWATER SAMPLES COLLECTED
FROM JPL MONITORING WELLS
(FEBRUARY-MARCH 1997)

Well Number	Total Anions	Total Cations	Total Ions	Charge Balance	Measured TDS	Calculated TDS	Measured TDS/ Calculated TDS
MW-12							
Screen 1	4.54	5.11	9.65	5.91	270	251.5	1.1
Screen 2	5.02	5.45	10.5	4.11	310	273.9	1.1
Screen 3	4.63	5.2	9.83	5.80	290	255.5	1.1
Screen 4	4.71	5.11	9.82	4.07	270	255	1.1
Screen 5	4.23	4.63	8.86	4.51	260	229.4	1.1
MW-13	5.2	5.25	10.5	0.48	310	301.1	1.0
MW-14							
Screen 1	11.9	13.2	25.1	5.18	680	717.5	1.0
Screen 2	11.5	14.1	25.6	10.20	680	710.6	1.0
Screen 3	8.83	9.02	17.9	1.06	480	506.8	1.0
Screen 4	5.01	5.21	10.2	1.96	270	282.9	1.0
Screen 5	3.47	3.71	7.18	3.34	180	189	1.0
MW-15	4.62	4.98	9.6	3.75	260	253.4	1.0
MW-16	4.47	5.02	9.49	5.8	310	263.1	1.1
MW-17							
Screen 1	3.28	3.6	6.88	4.65	190	177.7	1.1
Screen 2	3.52	3.92	7.44	5.38	220	191.9	1.2
Screen 3	4.27	4.55	8.82	3.17	250	230	1.1
Screen 4	4.82	5.13	9.95	3.12	240	258.7	0.9
Screen 5	4.58	4.86	9.44	2.97	240	252.6	1.0
MW-18							
Screen 1	3.86	4.02	7.7	4.42	210	202.5	1.0
Screen 2	4.93	5.22	10.2	2.86	292	267.5	1.1
Screen 3	5.33	5.63	11	2.74	295	281.9	1.1
Screen 4	3.49	3.71	7.2	3.06	195	189	1.1
Screen 5	3.47	3.58	7.05	1.56	200	185.4	1.1

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

TABLE 4-2
SUMMARY OF QUALITY CONTROL ANALYSES OF WATER-CHEMISTRY
DATA FROM GROUNDWATER SAMPLES COLLECTED
FROM JPL MONITORING WELLS
(FEBRUARY-MARCH 1997)

Well Number	Total Anions	Total Cations	Total Ions	Charge Balance	Measured TDS	Calculated TDS	Measured TDS/ Calculated TDS
MW-19							
Screen 1	3.31	3.63	6.94	4.61	210	180.2	1.2
Screen 2	5.74	5.61	11.4	-1.15	290	316	0.9
Screen 3	8.83	8.82	17.7	-0.06	480	491.5	1.0
Screen 4	6.24	6.26	12.5	-0.16	350	336.6	1.0
Screen 5	6.69	6.65	13.3	-0.30	370	364.6	1.0
MW-20							
Screen 1	8.8	8.43	17.2	-2.15	460	509.8	0.9
Screen 2	4.62	4.75	9.37	1.39	250	250	1.0
Screen 3	4.82	4.97	9.79	1.53	240	278.1	0.9
Screen 4	3.5	3.63	7.13	1.82	200	220.5	1.0
Screen 5	3.79	4.02	7.81	2.94	230	228.3	1.0
MW-21							
Screen 1	8.73	8.5	17.2	-1.83	490	499	1.0
Screen 2	12.9	13.7	26.6	3.01	730	731.5	1.0
Screen 3	10.1	11.3	21.4	5.61	590	582	1.0
Screen 4	5.83	6.03	11.9	1.69	330	322.5	1.0
Screen 5	7.88	7.94	15.8	0.38	460	440.1	1.1

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

TABLE 5-1

SUMMARY OF GROUNDWATER ELEVATIONS, JANUARY 30, 1997

Well Number	Screen Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-1	-	1/30/97	24.93	1116.69	1091.76
MW-3	1 (top)	1/30/97	102.77	1100.34	997.57
	2	1/30/97	116.38	1100.34	983.96
	3	1/30/97	117.67	1100.34	982.67
	4	1/30/97	124.28	1100.34	976.06
	5	1/30/97	126.54	1100.34	973.80
MW-4	1 (top)	1/30/97	79.87	1082.84	1002.97
	2	1/30/97	97.69	1082.84	985.15
	3	1/30/97	98.19	1082.84	984.65
	4	1/30/97	99.48	1082.84	983.36
	5	1/30/97	106.13	1082.84	976.71
MW-5	-	1/30/97	72.56	1071.62	999.06
MW-6	-	1/30/97	199.02	1188.54	989.52
MW-7	-	1/30/97	226.32	1212.90	986.58
MW-8	-	1/30/97	146.67	1139.55	992.88
MW-9	-	1/30/97	12.34	1106.06	1093.72
MW-10	-	1/30/97	100.02	1087.73	987.71
MW-11	1 (top)	1/30/97	113.08	1139.30	1026.22
	2	1/30/97	145.71	1139.30	993.59
	3	1/30/97	152.31	1139.30	986.99
	4	1/30/97	150.08	1139.30	989.22
	5	1/30/97	162.15	1139.30	977.15
MW-12	1 (top)	1/30/97	90.31	1102.14	1011.83
	2	1/30/97	115.40	1102.14	986.74
	3	1/30/97	117.03	1102.14	985.11
	4	1/30/97	118.77	1102.14	983.37
	5	1/30/97	125.09	1102.14	977.05
MW-13	-	1/30/97	197.61	1183.49	985.88
MW-14	1 (top)	1/30/97	181.86	1173.47	991.61
	2	1/30/97	181.15	1173.47	992.32
	3	1/30/97	179.90	1173.47	993.57
	4	1/30/97	179.65	1173.47	993.82
	5	1/30/97	179.21	1173.47	994.26
MW-15	-	1/30/97	21.95	1120.68	1098.73

TABLE 5-1

SUMMARY OF GROUNDWATER ELEVATIONS, JANUARY 30, 1997

Well Number	Screen Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-16	-	1/30/97	251.22	1236.29	985.07
MW-17	1 (top)	1/30/97	207.67	1191.21	983.54
	2	1/30/97	216.51	1191.21	974.70
	3	1/30/97	226.06	1191.21	965.15
	4	1/30/97	222.27	1191.21	968.94
	5	1/30/97	226.53	1191.21	964.68
MW-18	1 (top)	1/30/97	264.19	1225.41	961.22
	2	1/30/97	261.21	1225.41	964.20
	3	1/30/97	253.30	1225.41	972.11
	4	1/30/97	260.15	1225.41	965.26
	5	1/30/97	266.95	1225.41	958.46
MW-19	1 (top)	1/30/97	170.07	1142.94	972.87
	2	1/30/97	171.31	1142.94	971.63
	3	1/30/97	170.27	1142.94	972.67
	4	1/30/97	170.17	1142.94	972.77
	5	1/30/97	170.11	1142.94	972.83
MW-20	1 (top)	1/30/97	220.45	1165.05	944.60
	2	1/30/97	216.99	1165.05	948.06
	3	1/30/97	212.55	1165.05	952.50
	4	1/30/97	215.48	1165.05	949.57
	5	1/30/97	212.11	1165.05	952.94
MW-21	1 (top)	1/30/97	76.39	1059.10	982.71
	2	1/30/97	73.61	1059.10	985.49
	3	1/30/97	73.21	1059.10	985.89
	4	1/30/97	72.75	1059.10	986.35
	5	1/30/97	72.73	1059.10	986.37

TABLE 5-2

SUMMARY OF GROUNDWATER ELEVATIONS, FEBRUARY 25, 1997

Well Number	Screen Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-1	-	2/25/97	21.38	1116.69	1095.31
MW-3	1 (top)	2/25/97	106.60	1100.34	993.74
	2	2/25/97	127.82	1100.34	972.52
	3	2/25/97	132.91	1100.34	967.43
	4	2/25/97	200.92	1100.34	899.42
	5	2/25/97	218.48	1100.34	881.86
MW-4	1 (top)	2/25/97	73.30	1082.84	1009.54
	2	2/25/97	103.46	1082.84	979.38
	3	2/25/97	108.88	1082.84	973.96
	4	2/25/97	116.60	1082.84	966.24
	5	2/25/97	185.36	1082.84	897.48
MW-5	-	2/25/97	64.82	1071.62	1006.80
MW-6	-	2/25/97	187.55	1188.54	1000.99
MW-7	-	2/25/97	211.04	1212.90	1001.86
MW-8	-	2/25/97	131.93	1139.55	1007.62
MW-9	-	2/25/97	17.01	1106.06	1089.05
MW-10	-	2/25/97	85.83	1087.73	1001.90
MW-11	1 (top)	2/25/97	106.32	1139.30	1032.98
	2	2/25/97	143.94	1139.30	995.36
	3	2/25/97	160.68	1139.30	978.62
	4	2/25/97	160.20	1139.30	979.10
	5	2/25/97	223.77	1139.30	915.53
MW-12	1 (top)	2/25/97	84.29	1102.14	1017.85
	2	2/25/97	119.58	1102.14	982.56
	3	2/25/97	125.62	1102.14	976.52
	4	2/25/97	140.03	1102.14	962.11
	5	2/25/97	194.59	1102.14	907.55
MW-13	-	2/25/97	181.32	1183.49	1002.17
MW-14	1 (top)	2/25/97	170.83	1173.47	1002.64
	2	2/25/97	171.53	1173.47	1001.94
	3	2/25/97	171.38	1173.47	1002.09
	4	2/25/97	171.43	1173.47	1002.04
	5	2/25/97	171.68	1173.47	1001.79
MW-15	-	2/25/97	27.30	1120.68	1093.38

TABLE 5-2

SUMMARY OF GROUNDWATER ELEVATIONS, FEBRUARY 25, 1997

Well Number	Screen Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-16	-	2/25/97	234.02	1236.29	1002.27
MW-17	1 (top)	2/25/97	187.99	1191.21	1003.22
	2	2/25/97	222.82	1191.21	968.39
	3	2/25/97	233.18	1191.21	958.03
	4	2/25/97	285.20	1191.21	906.01
	5	2/25/97	279.14	1191.21	912.07
MW-18	1 (top)	2/25/97	243.08	1225.41	982.33
	2	2/25/97	248.09	1225.41	977.32
	3	2/25/97	259.01	1225.41	966.40
	4	2/25/97	285.74	1225.41	939.67
	5	2/25/97	286.15	1225.41	939.26
MW-19	1 (top)	2/25/97	165.31	1142.94	977.63
	2	2/25/97	183.10	1142.94	959.84
	3	2/25/97	187.13	1142.94	955.81
	4	2/25/97	273.62	1142.94	869.32
	5	2/25/97	277.08	1142.94	865.86
MW-20	1 (top)	2/25/97	211.22	1165.05	953.83
	2	2/25/97	209.77	1165.05	955.28
	3	2/25/97	216.19	1165.05	948.86
	4	2/25/97	208.05	1165.05	957.00
	5	2/25/97	204.81	1165.05	960.24
MW-21	1 (top)	2/25/97	63.70	1059.10	995.40
	2	2/25/97	63.77	1059.10	995.33
	3	2/25/97	64.26	1059.10	994.84
	4	2/25/97	64.47	1059.10	994.63
	5	2/25/97	64.47	1059.10	994.63

TABLE 5-3

SUMMARY OF GROUNDWATER ELEVATIONS, MARCH 10 AND 11, 1997

Well Number	Screen Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-1	-	3/10/97	18.92	1116.69	1097.77
MW-3	1 (top)	3/10/97	109.72	1100.34	990.62
	2	3/10/97	129.99	1100.34	970.35
	3	3/10/97	134.90	1100.34	965.44
	4	3/10/97	205.22	1100.34	895.12
	5	3/10/97	226.20	1100.34	874.14
MW-4	1 (top)	3/10/97	77.73	1082.84	1005.11
	2	3/10/97	105.70	1082.84	977.14
	3	3/10/97	109.56	1082.84	973.28
	4	3/10/97	118.25	1082.84	964.59
	5	3/10/97	189.56	1082.84	893.28
MW-5	-	3/10/97	69.28	1071.62	1002.34
MW-6	-	3/10/97	187.64	1188.54	1000.90
MW-7	-	3/10/97	210.45	1212.90	1002.45
MW-8	-	3/10/97	136.67	1139.55	1002.88
MW-9	-	3/10/97	14.70	1106.06	1091.36
MW-10	-	3/10/97	89.54	1087.73	998.19
MW-11	1 (top)	3/11/97	107.22	1139.30	1032.08
	2	3/11/97	146.24	1139.30	993.06
	3	3/11/97	163.47	1139.30	975.83
	4	3/11/97	168.12	1139.30	971.18
	5	3/11/97	229.04	1139.30	910.26
MW-12	1 (top)	3/10/97	89.57	1102.14	1012.57
	2	3/10/97	120.83	1102.14	981.31
	3	3/10/97	126.68	1102.14	975.46
	4	3/10/97	141.43	1102.14	960.71
	5	3/10/97	198.14	1102.14	904.00
MW-13	-	3/10/97	183.65	1183.49	999.84
MW-14	1 (top)	3/10/97	170.85	1173.47	1002.62
	2	3/10/97	171.75	1173.47	1001.72
	3	3/10/97	171.69	1173.47	1001.78
	4	3/10/97	171.64	1173.47	1001.83
	5	3/10/97	172.07	1173.47	1001.40
MW-15	-	3/10/97	24.34	1120.68	1096.34

TABLE 5-3

SUMMARY OF GROUNDWATER ELEVATIONS, MARCH 10 AND 11, 1997

Well Number	Screen Number	Date Measured	Depth to Water (ft)	Reference Elevation (ft msl)	Water Level Elevation (ft msl)
MW-16	-	3/10/97	235.68	1236.29	1000.61
MW-17	1 (top)	3/10/97	192.43	1191.21	998.78
	2	3/10/97	223.93	1191.21	967.28
	3	3/10/97	233.69	1191.21	957.52
	4	3/10/97	289.82	1191.21	901.39
	5	3/10/97	297.62	1191.21	893.59
MW-18	1 (top)	3/10/97	242.55	1225.41	982.86
	2	3/10/97	247.83	1225.41	977.58
	3	3/10/97	259.87	1225.41	965.54
	4	3/10/97	288.09	1225.41	937.32
	5	3/10/97	297.74	1225.41	927.67
MW-19	1 (top)	3/10/97	167.22	1142.94	975.72
	2	3/10/97	183.69	1142.94	959.25
	3	3/10/97	187.83	1142.94	955.11
	4	3/10/97	276.98	1142.94	865.96
	5	3/10/97	280.53	1142.94	862.41
MW-20	1 (top)	3/10/97	208.06	1165.05	956.99
	2	3/10/97	207.67	1165.05	957.38
	3	3/10/97	216.16	1165.05	948.89
	4	3/10/97	226.02	1165.05	939.03
	5	3/10/97	206.56	1165.05	958.49
MW-21	1 (top)	3/10/97	63.43	1059.10	995.67
	2	3/10/97	64.27	1059.10	994.83
	3	3/10/97	64.90	1059.10	994.20
	4	3/10/97	65.15	1059.10	993.95
	5	3/10/97	65.15	1059.10	993.95

FIGURES

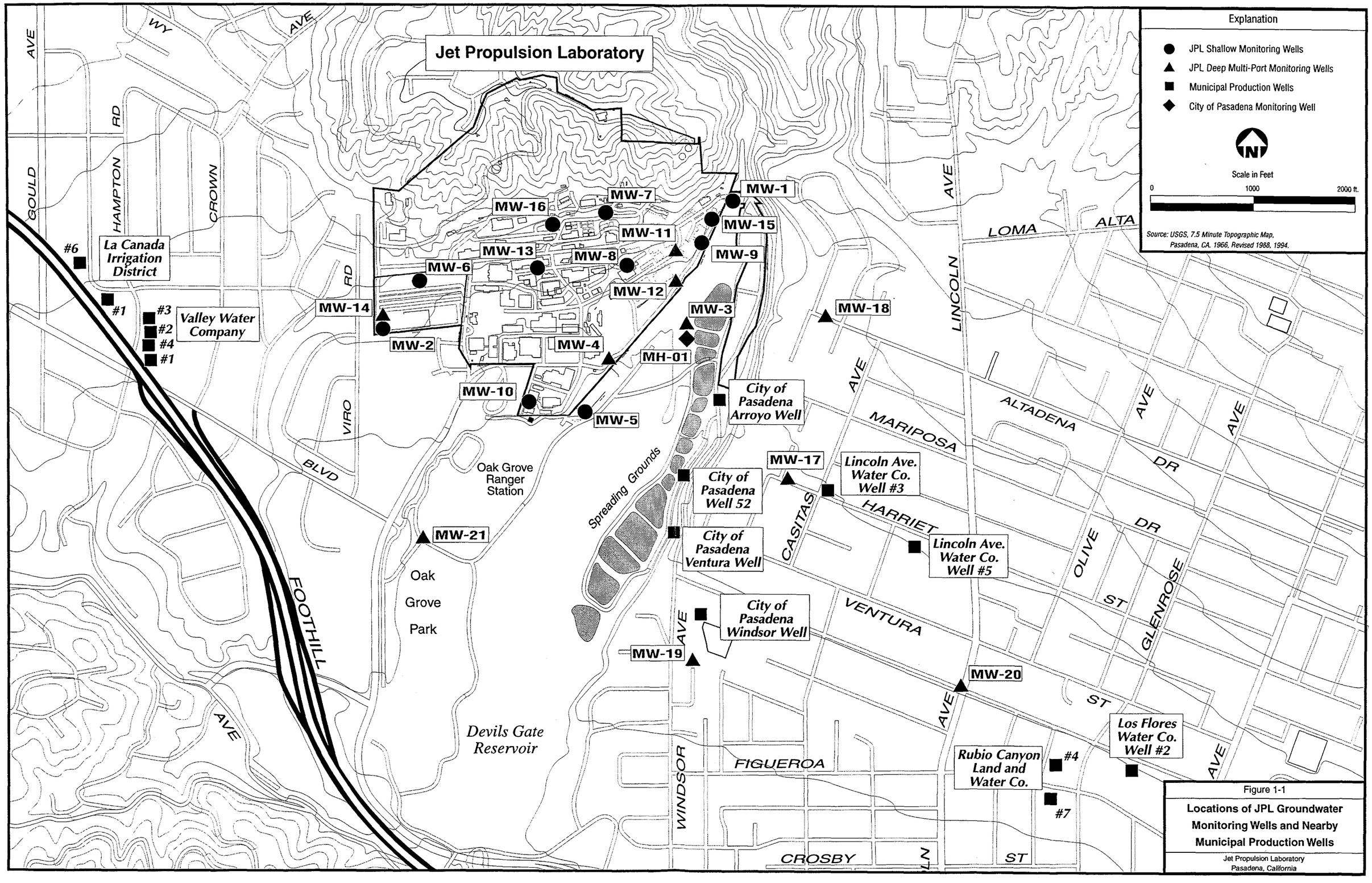

Figure 1-1

Locations of JPL Groundwater Monitoring Wells and Nearby Municipal Production Wells

Jet Propulsion Laboratory
Pasadena, California

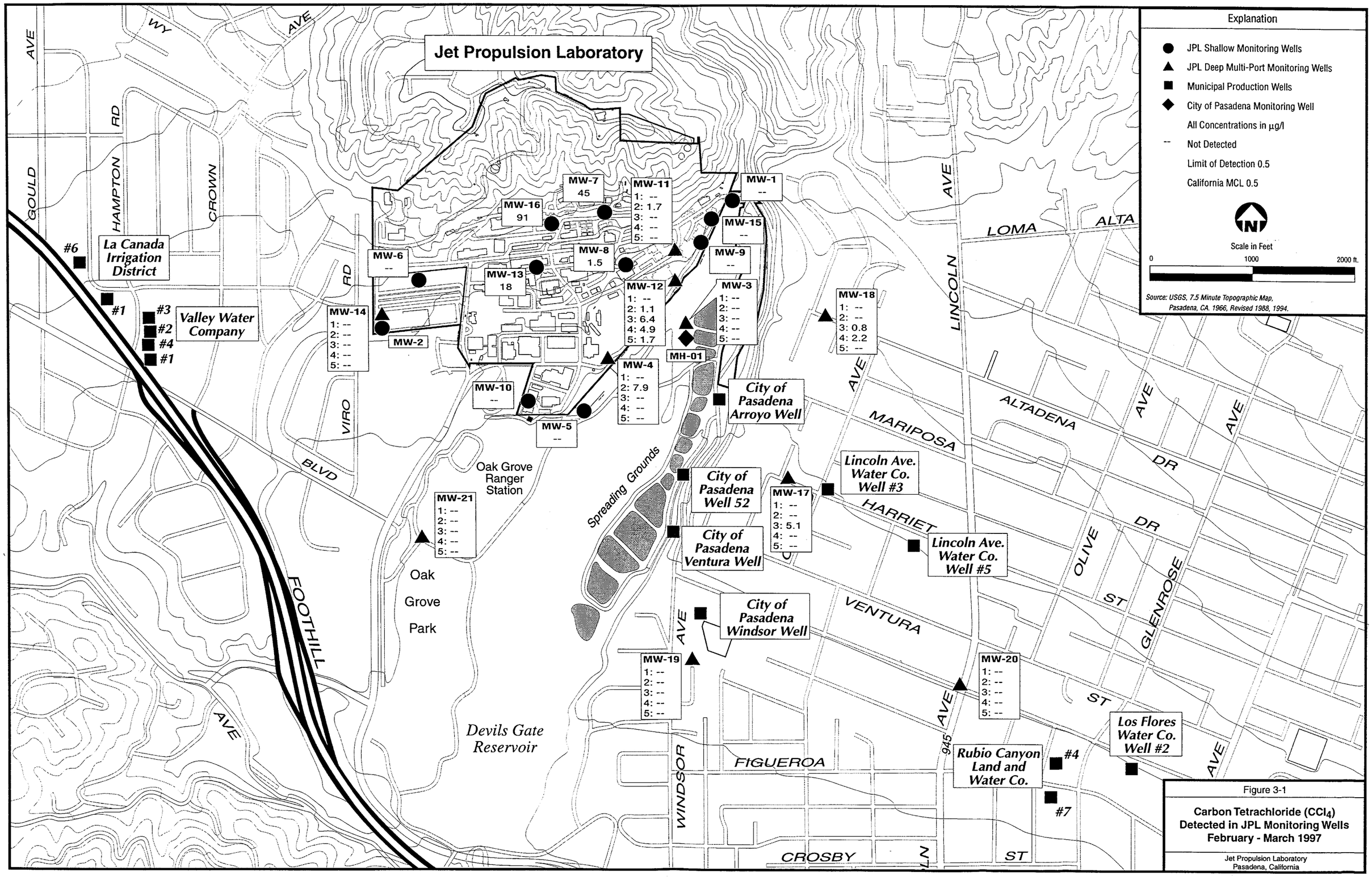

Figure 3-1

Carbon Tetrachloride (CCl_4) Detected in JPL Monitoring Wells February - March 1997

Jet Propulsion Laboratory
Pasadena, California

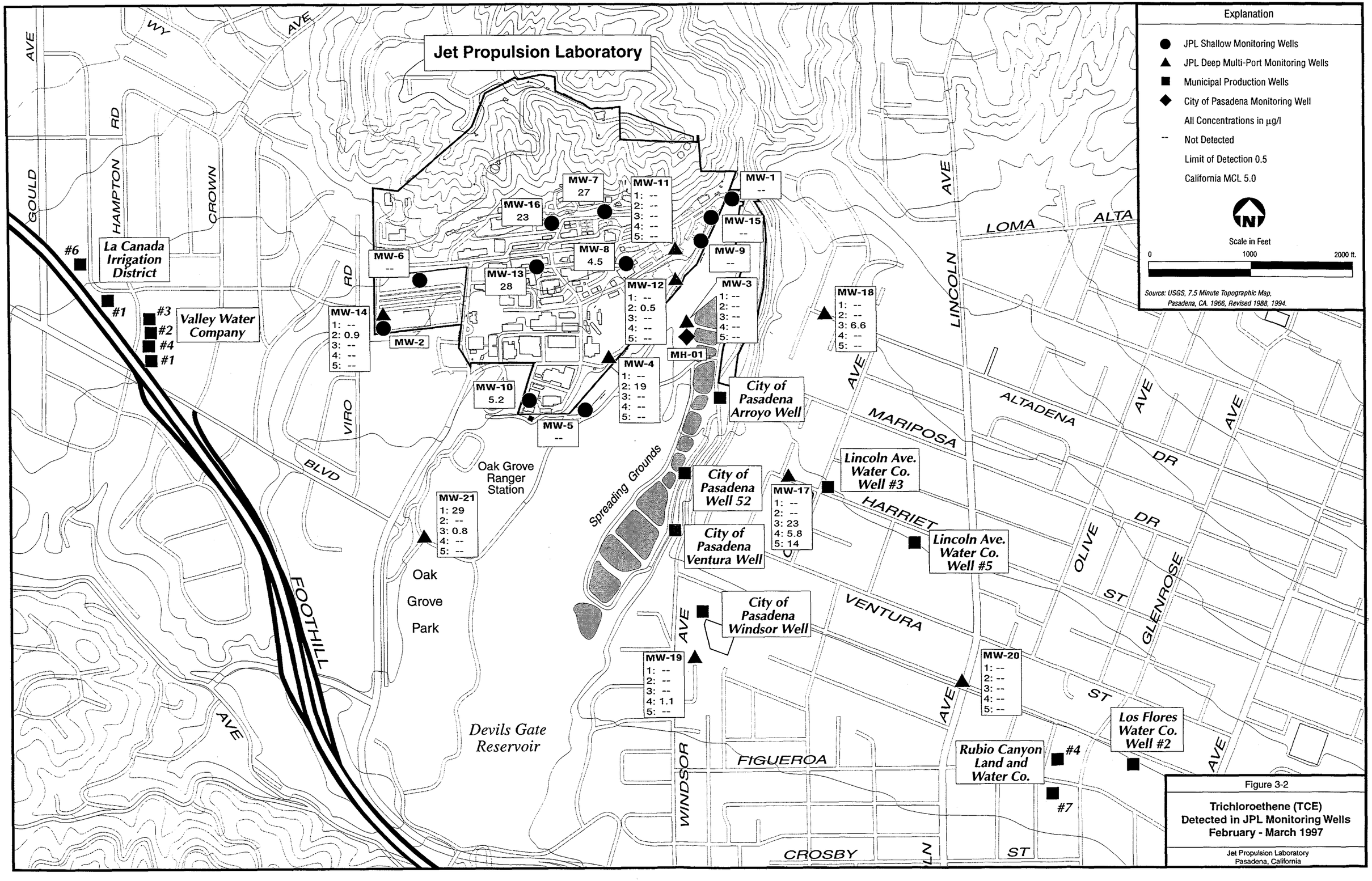

Figure 3-2

Trichloroethene (TCE) Detected in JPL Monitoring Wells February - March 1997

Jet Propulsion Laboratory
Pasadena, California

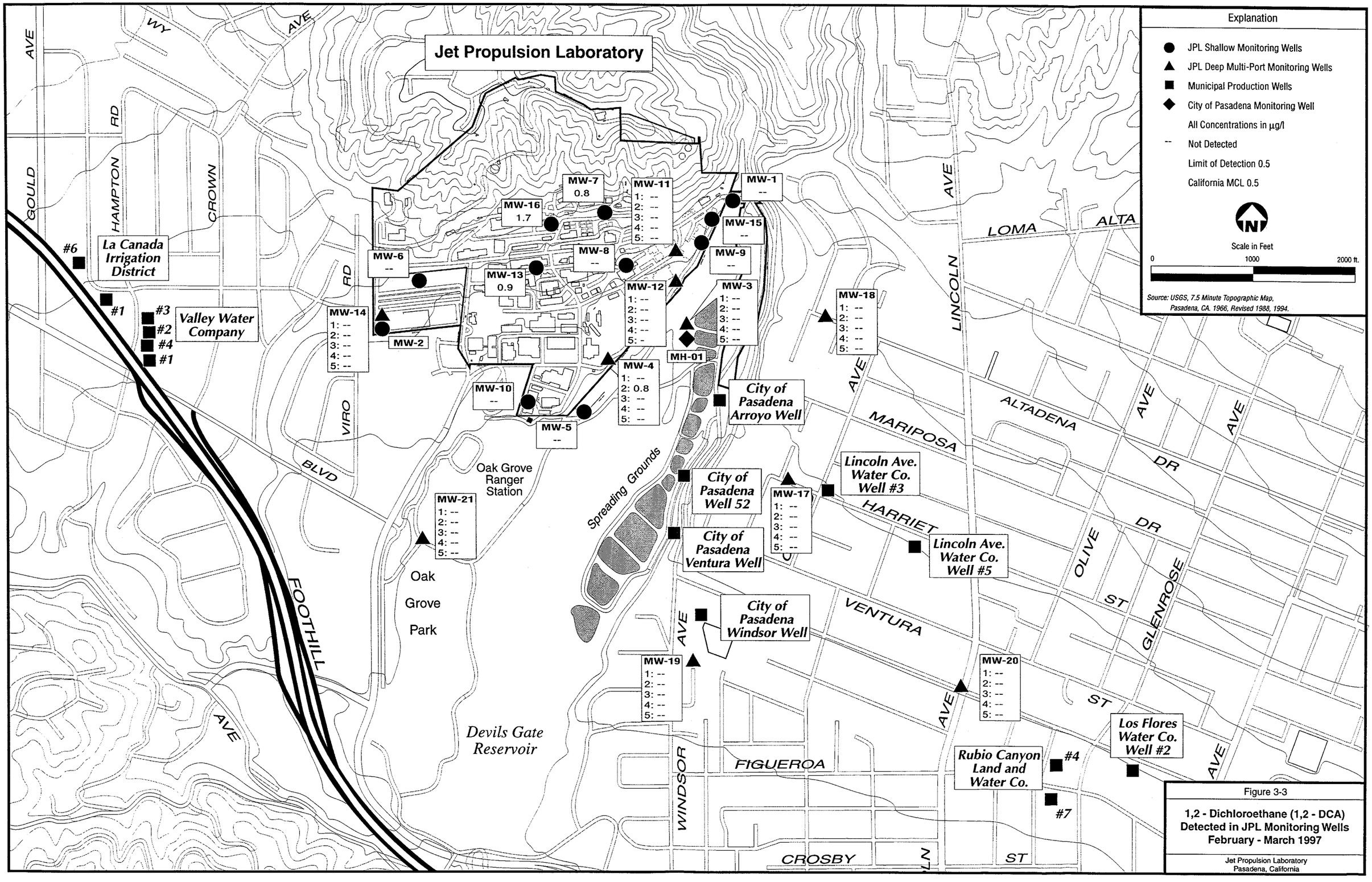

Figure 3-3

1,2 - Dichloroethane (1,2 - DCA) Detected in JPL Monitoring Wells February - March 1997

Jet Propulsion Laboratory
Pasadena, California

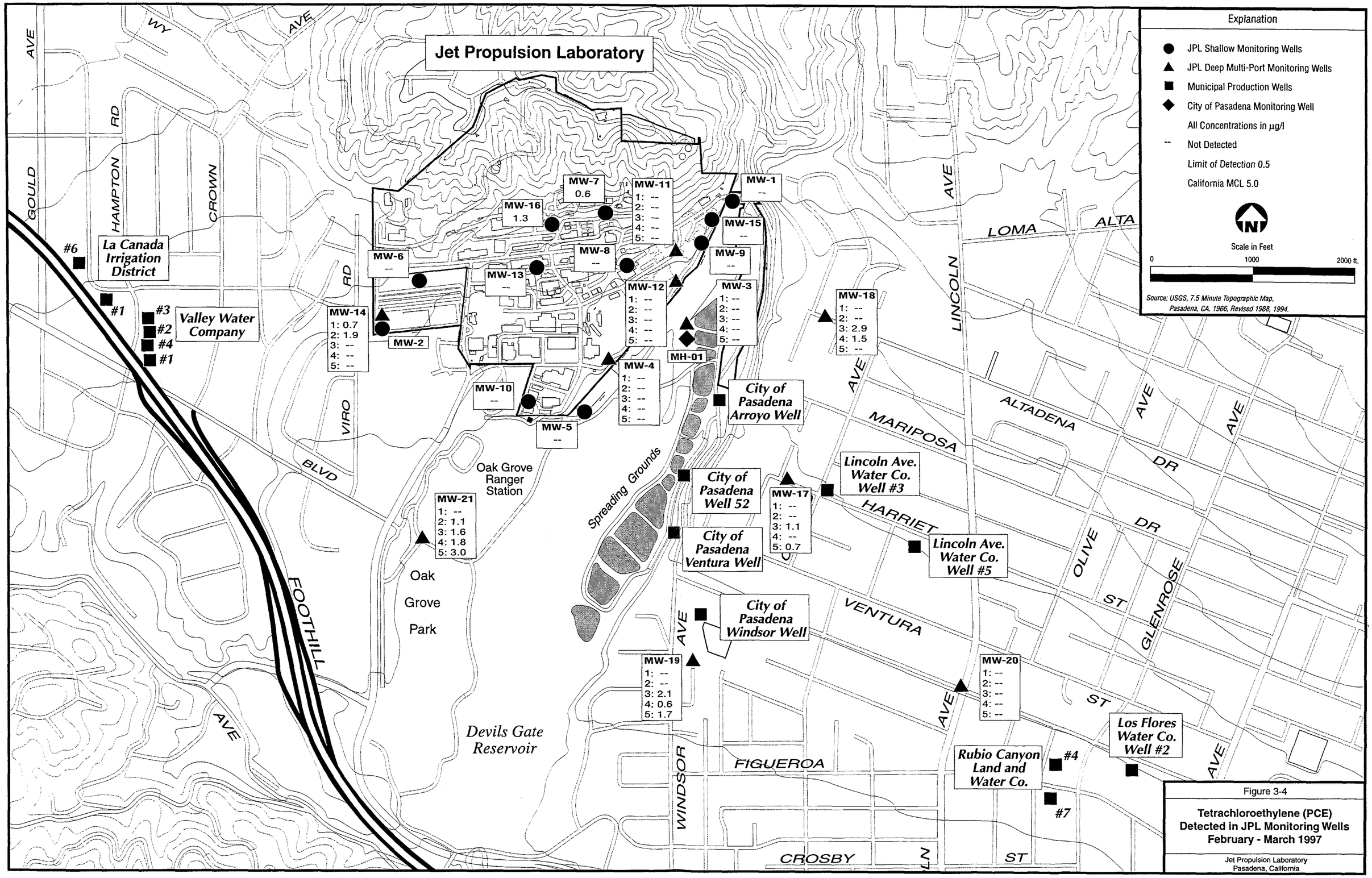

Figure 3-4

Tetrachloroethylene (PCE) Detected in JPL Monitoring Wells February - March 1997

Jet Propulsion Laboratory
Pasadena, California

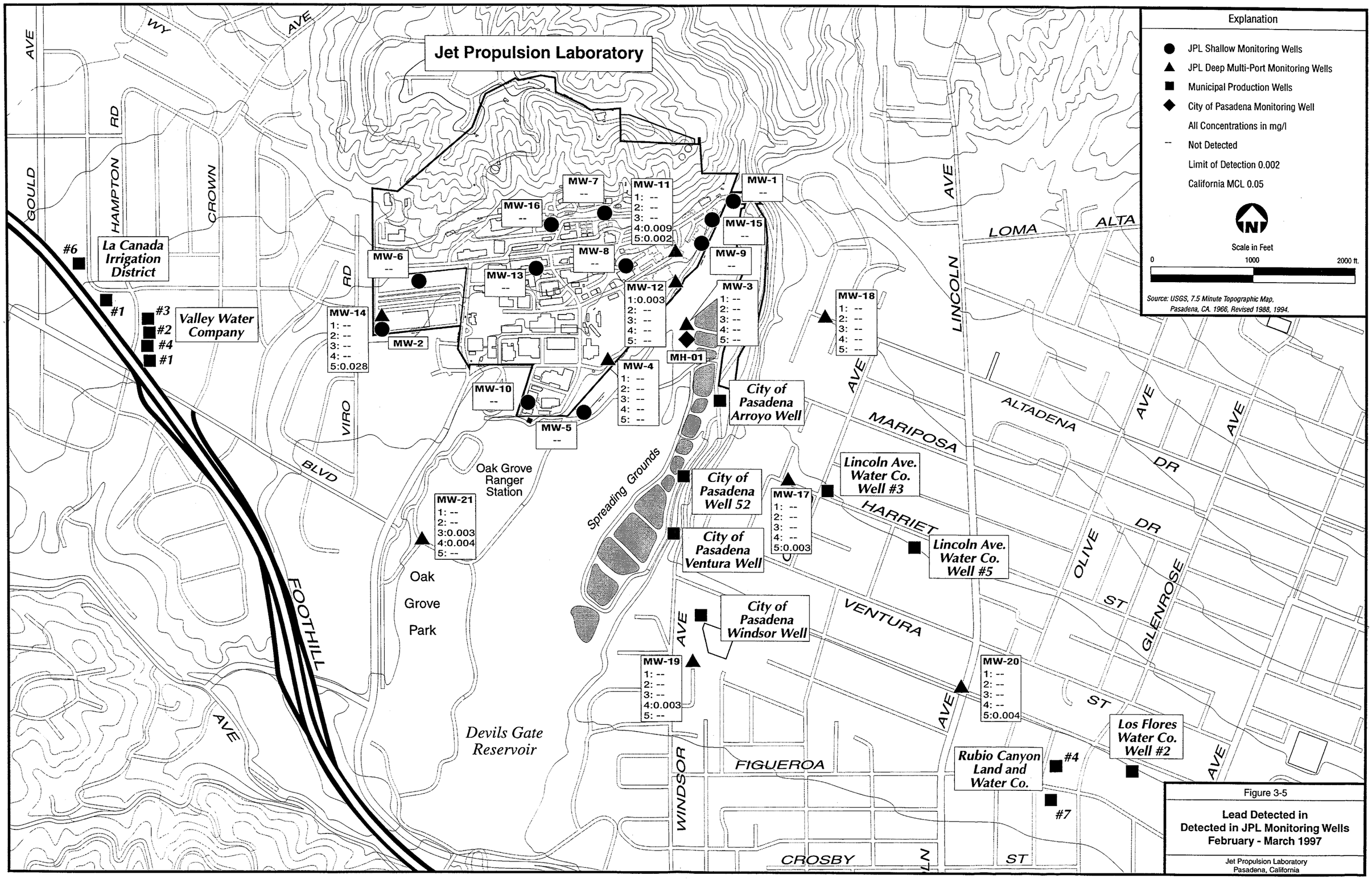

Figure 3-5

Lead Detected in Detected in JPL Monitoring Wells February - March 1997

Jet Propulsion Laboratory
Pasadena, California

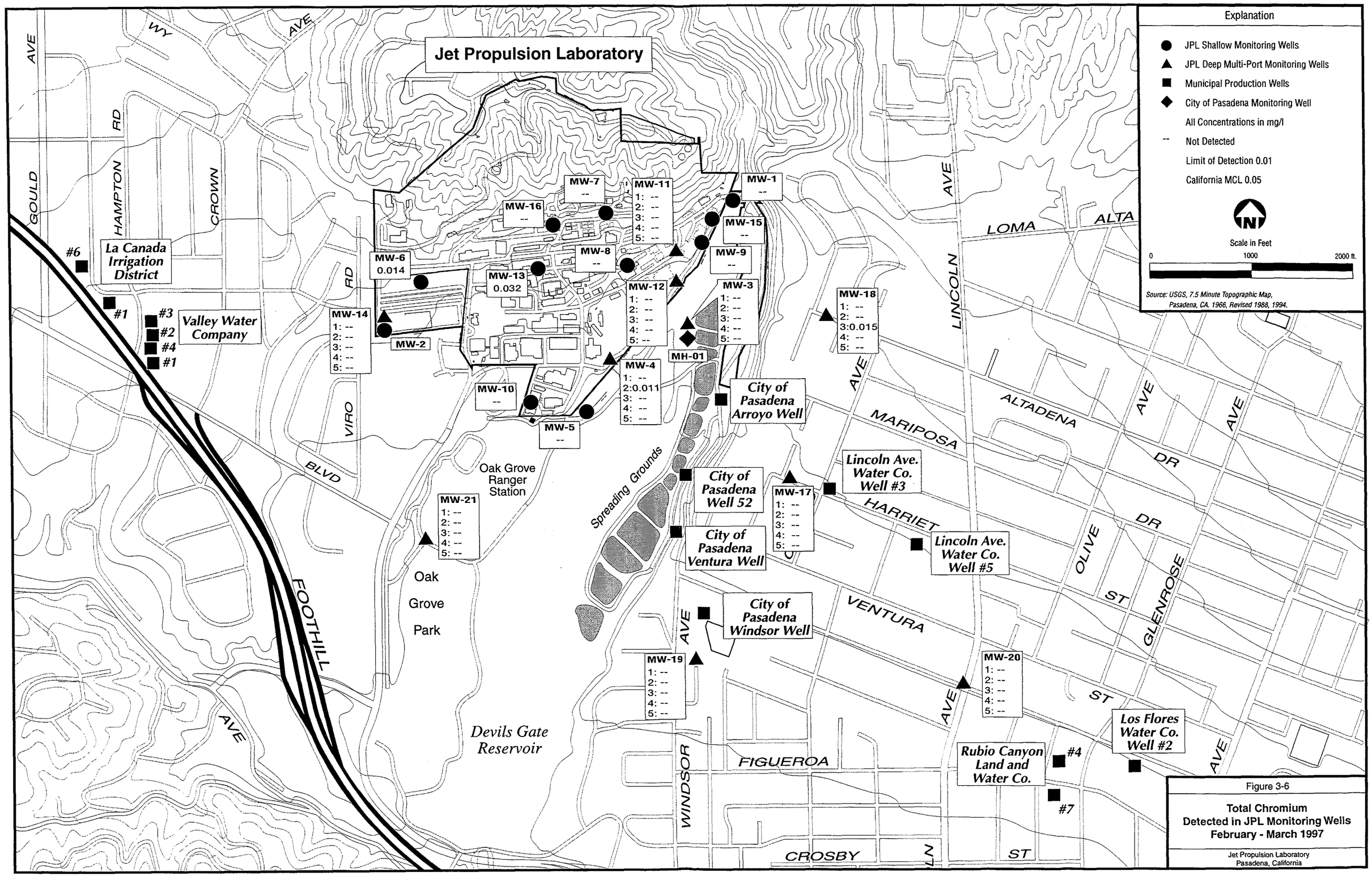

Figure 3-6

Total Chromium Detected in JPL Monitoring Wells February - March 1997

Jet Propulsion Laboratory
Pasadena, California

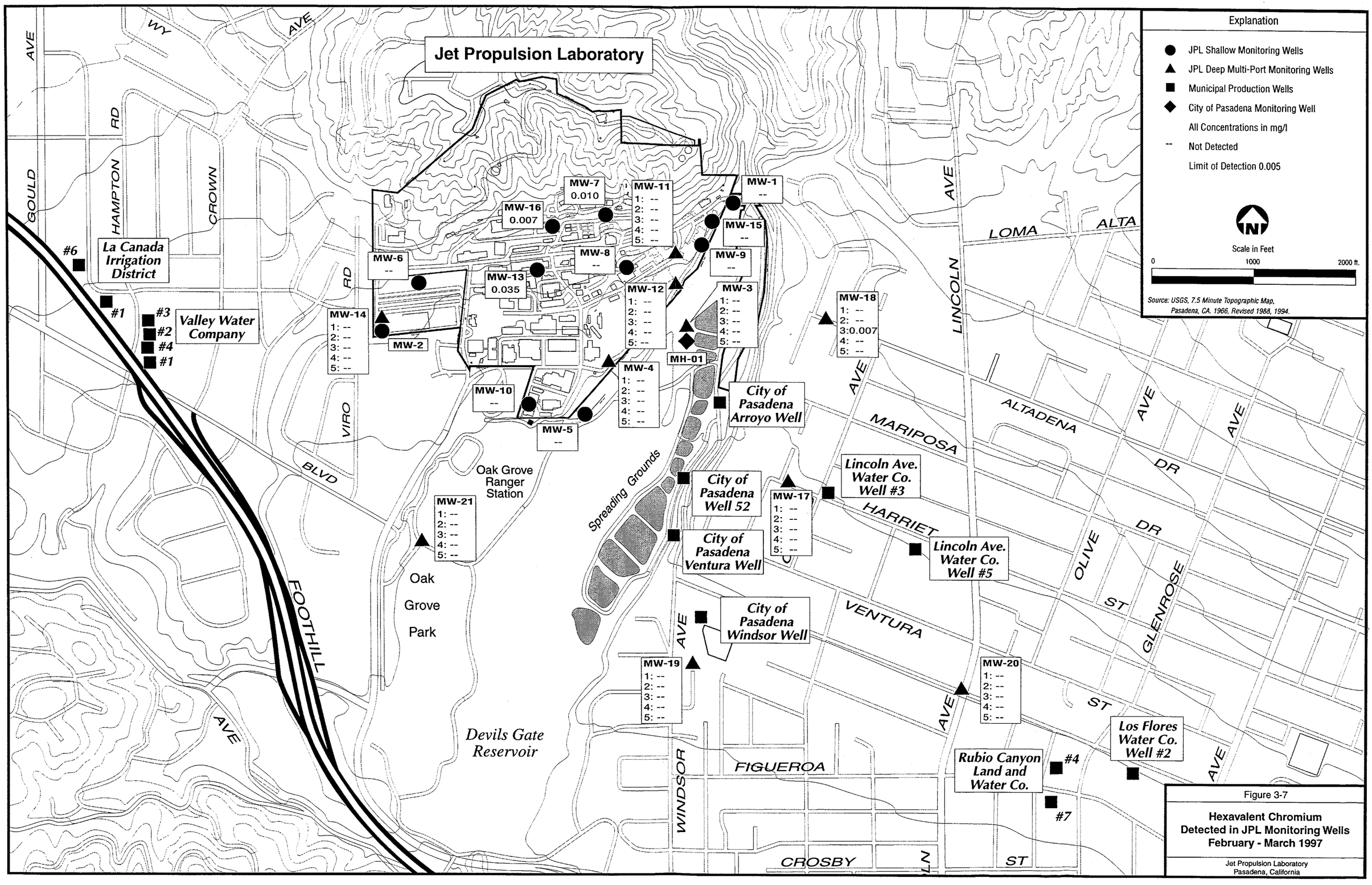

Figure 3-7

Hexavalent Chromium Detected in JPL Monitoring Wells February - March 1997

Jet Propulsion Laboratory
Pasadena, California

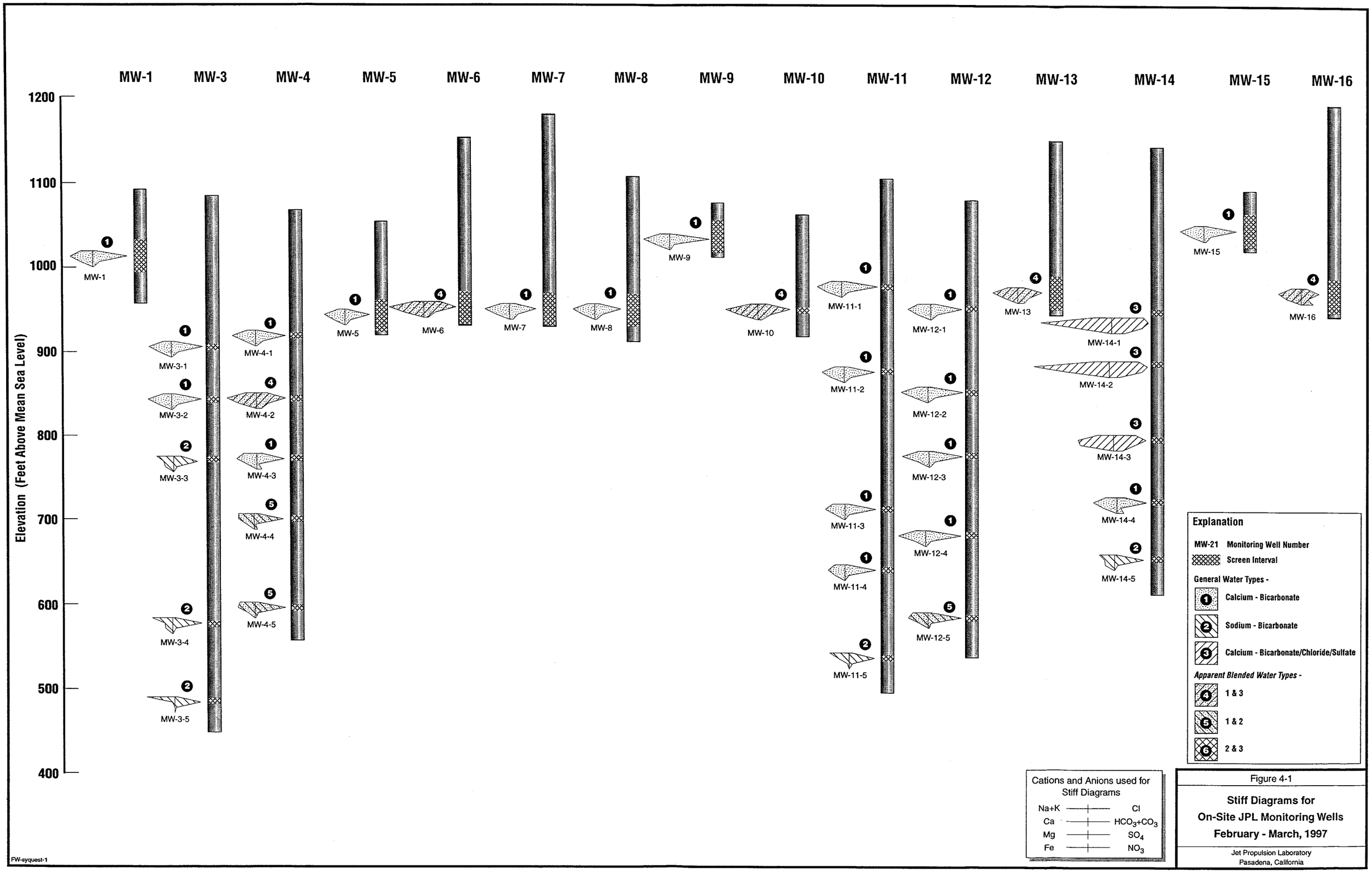

Figure 4-1

Stiff Diagrams for On-Site JPL Monitoring Wells February - March, 1997

Jet Propulsion Laboratory
Pasadena, California

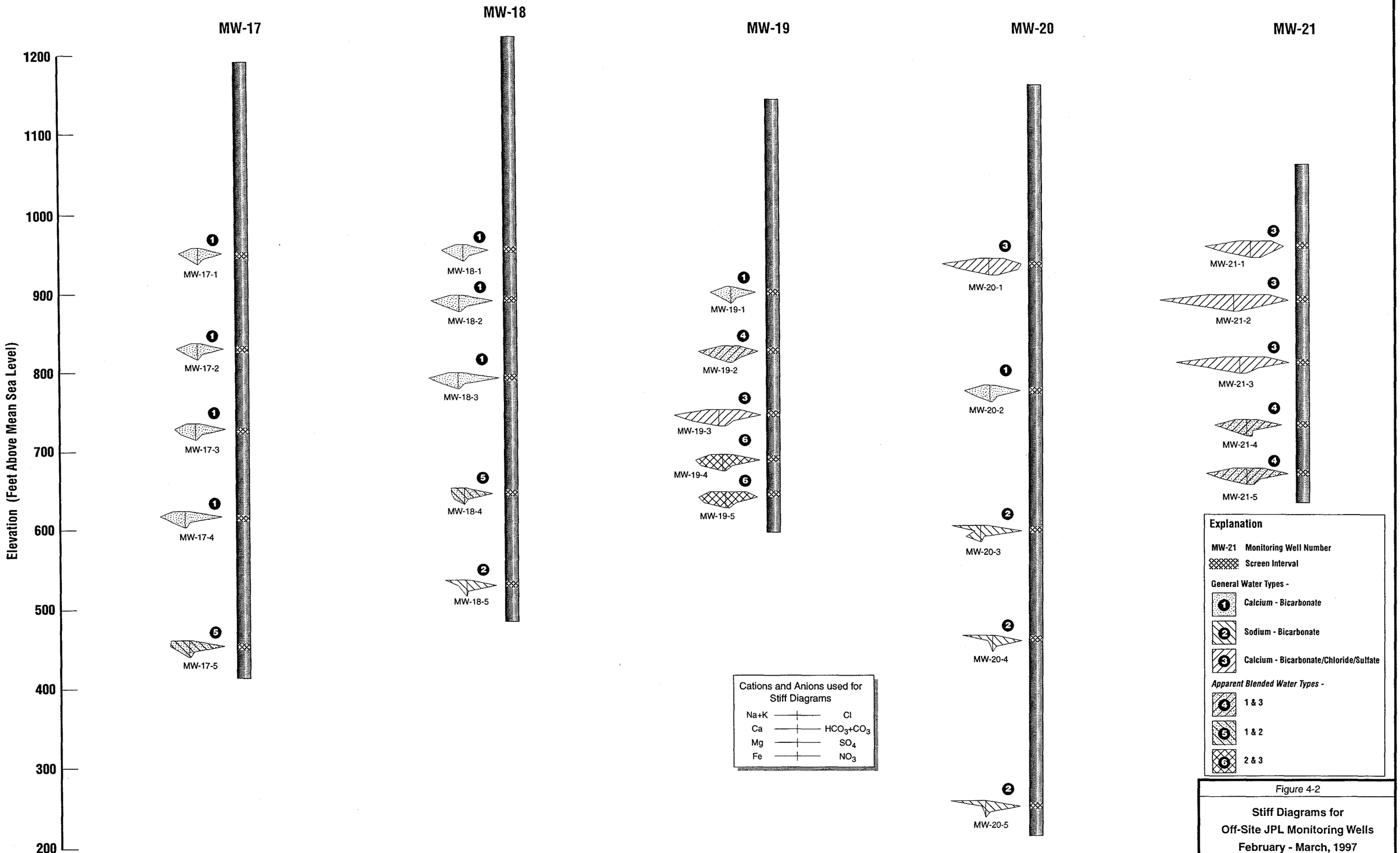

Figure 4-2

Stiff Diagrams for Off-Site JPL Monitoring Wells February - March, 1997

Jet Propulsion Laboratory
Pasadena, California

FW-syquest-1

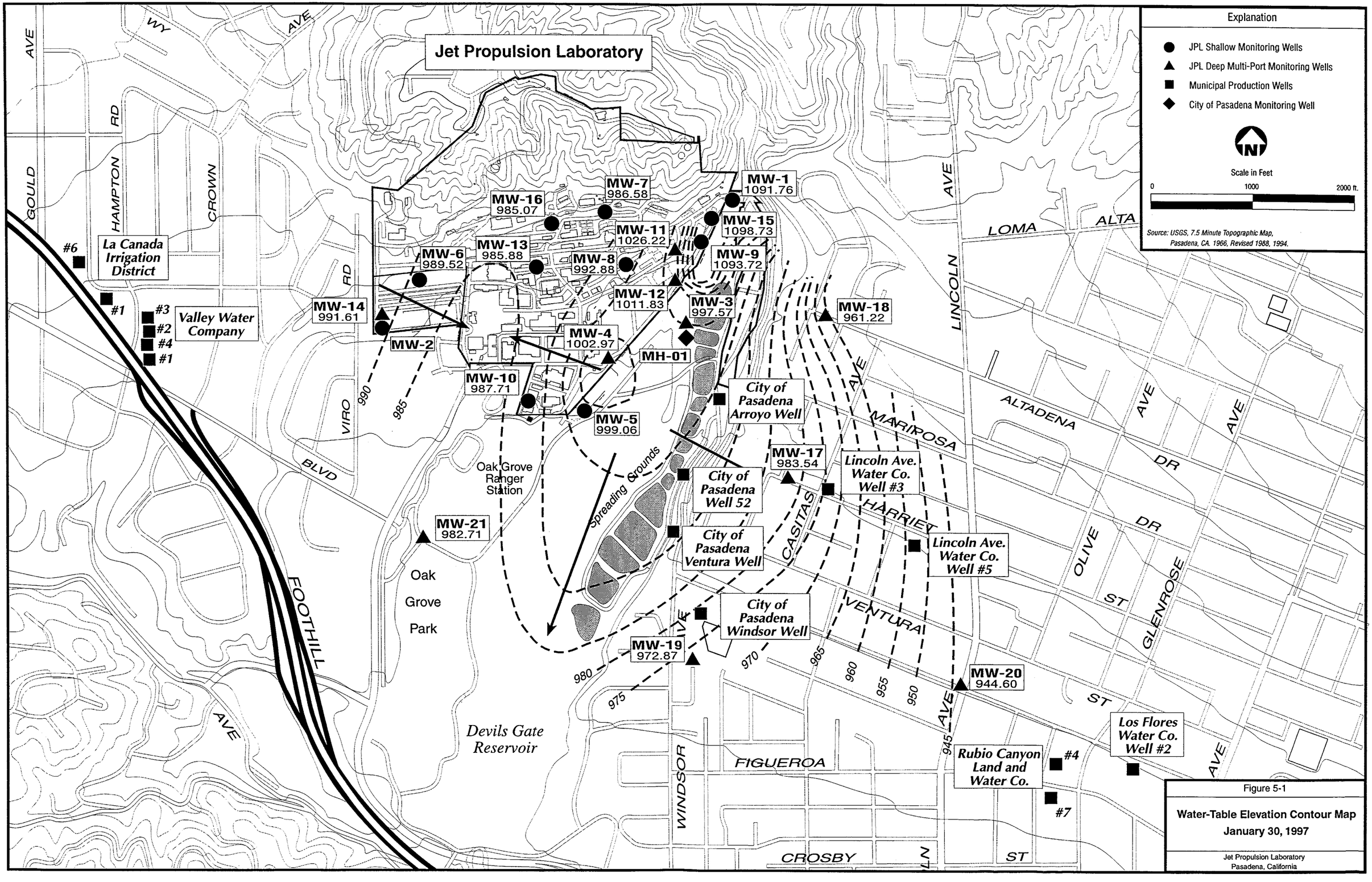

Figure 5-1

Water-Table Elevation Contour Map
January 30, 1997

Jet Propulsion Laboratory
Pasadena, California

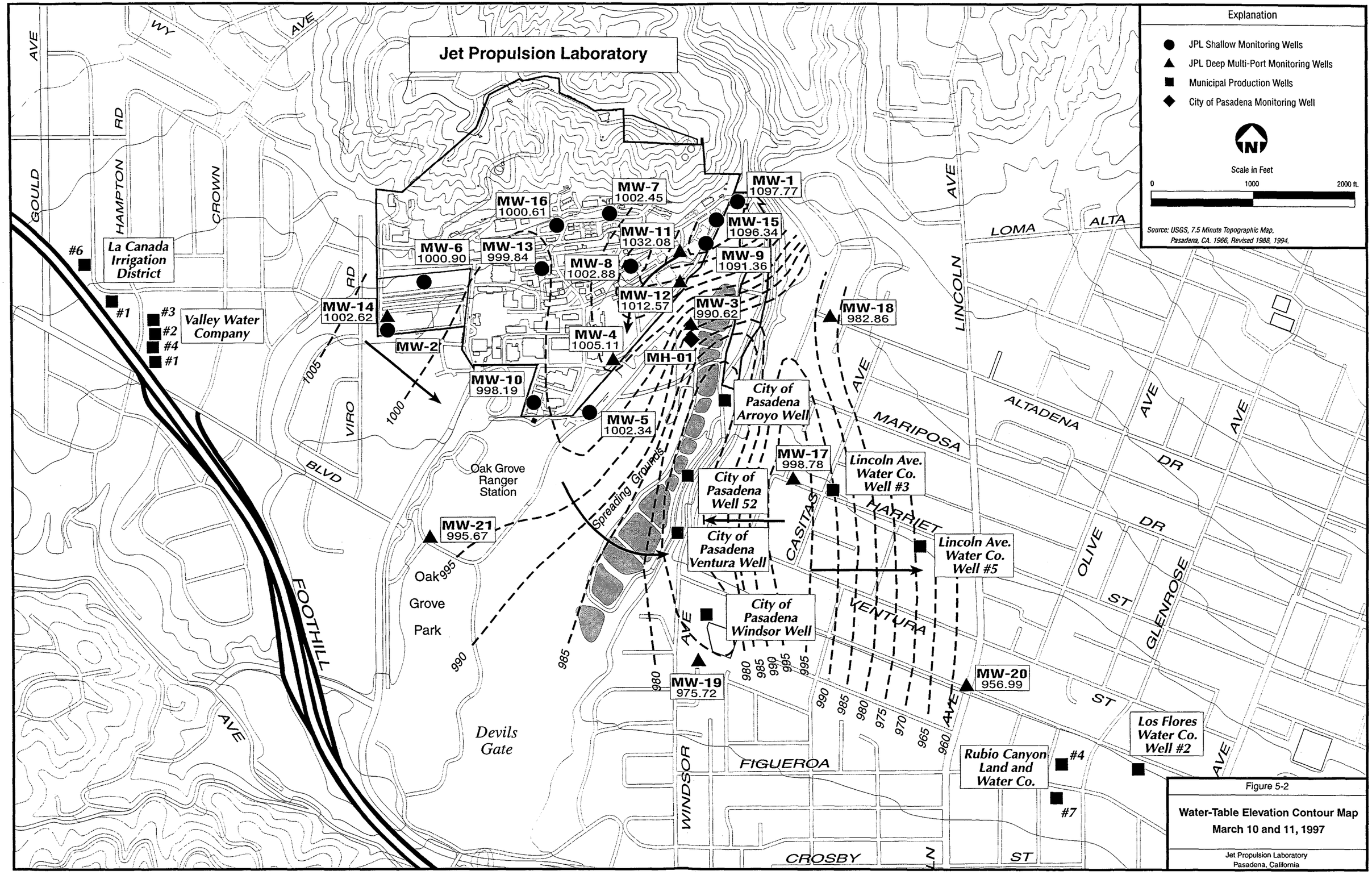

Figure 5-2

Water-Table Elevation Contour Map
March 10 and 11, 1997

Jet Propulsion Laboratory
Pasadena, California

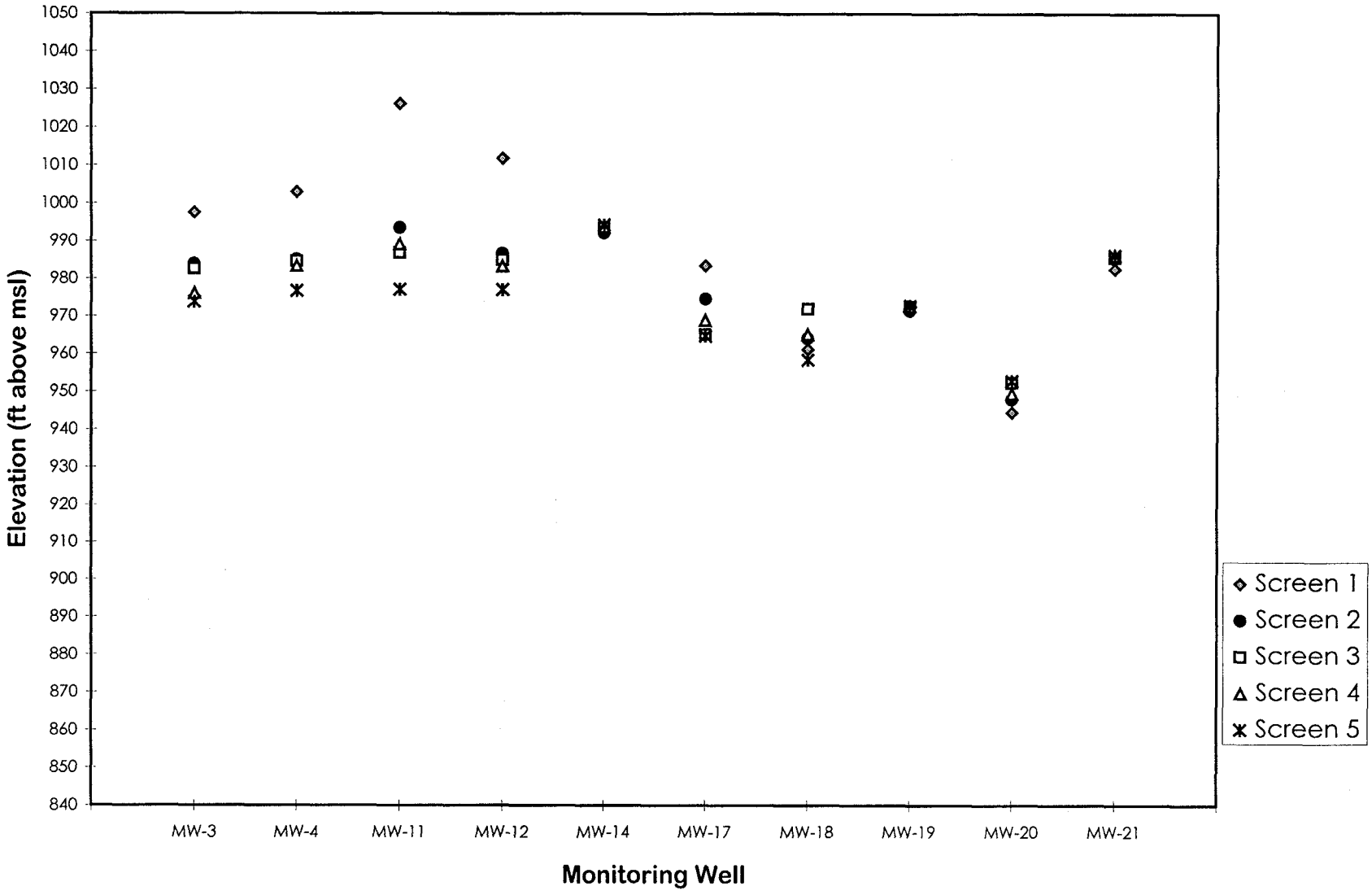

Figure 5-3

PIEZOMETRIC WATER LEVELS FROM DEEP (MP) WELLS

January 30, 1997

Jet Propulsion Laboratory
Pasadena, California

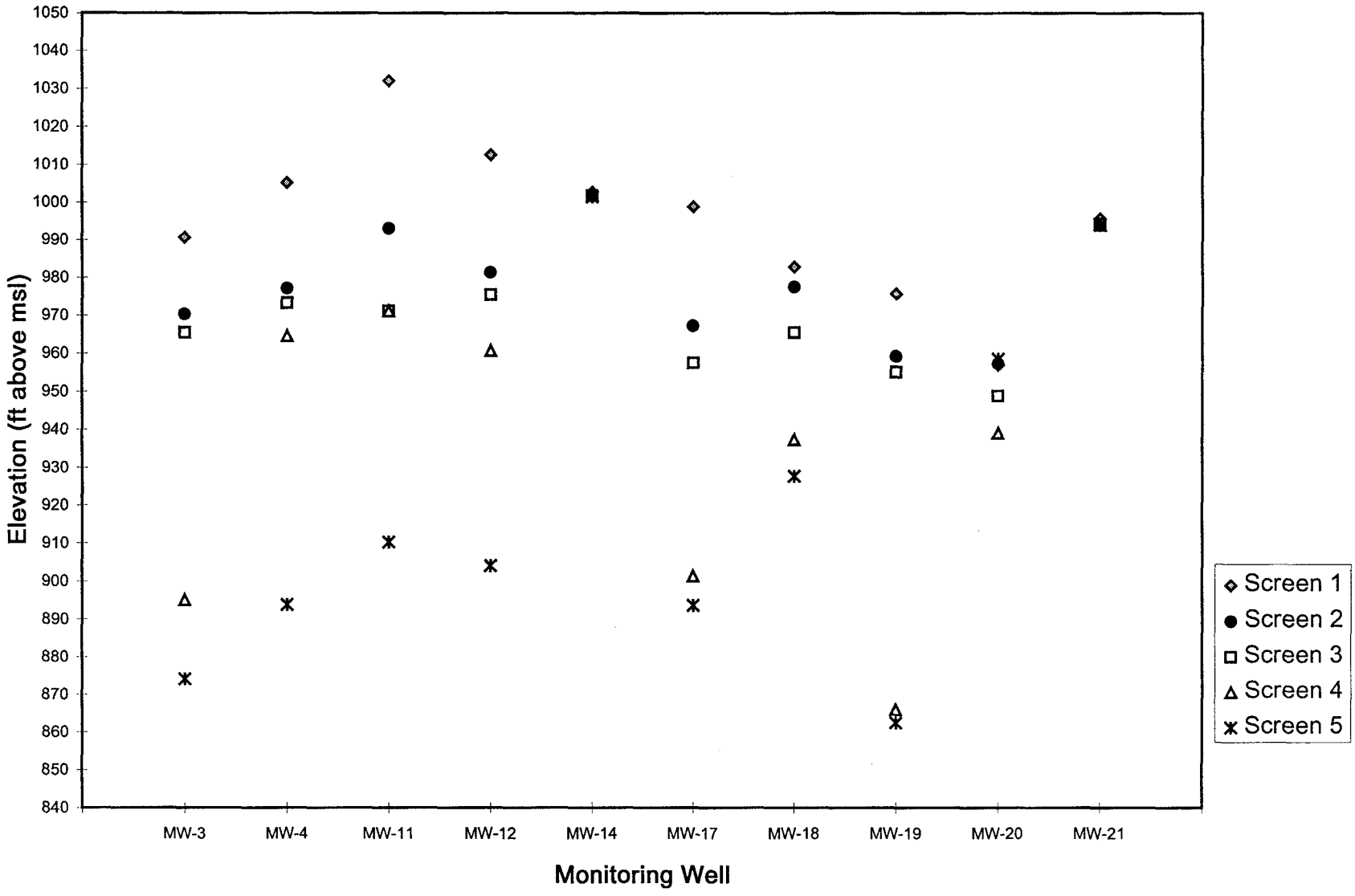

Figure 5-4

PIEZOMETRIC WATER LEVELS
FROM DEEP (MP) WELLS
March 10 and 11, 1997

Jet Propulsion Laboratory
Pasadena, California

APPENDIX A

WELL DEVELOPMENT/WELL SAMPLING LOG FORMS FOR SHALLOW WELLS

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0208
Date : 3-7-97
Site Engineer : J. BRENNER / T. CHOI

Well Number : MW-1
Equipment : HF SCIENTIFIC DRT-15CE
YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	19.04	TOP OF 4" CASING	19.04
Depth to Sediment (ft)	119.29	TOP OF 4" CASING	119.29
Thickness of Sediment (ft)	0.71		0.71

Depth of Well (ft) 120.0
Diameter of Casing (ft) 0.333
Water Column Height (ft) 100.25
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 65.31
Casing Volumes Purged ≈ 0.77

Total Volume Purged (gals) ≈50

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1220	—	—	—	—	2.5	PUMP ON, CONTROL BOX @ 27 Hz
1223	9.43	5.66	13.6	390	2.5	WATER CLEAR
1226	9.34	5.19	14.7	372	2.5	WATER CLEAR
1229	8.23	10.20	15.7	384	2.5	WATER SLIGHTLY CLOUDY
1232	7.89	8.41	16.0	390	2.5	" " "
1235	7.58	3.65	15.9	389	2.5	WATER CLEAR
1238	7.48	2.32	15.8	390	2.5	READY TO SAMPLE
1240	7.48	2.45	16.2	392	2.5	READY TO SAMPLE
1245	—	—	—	—	0.02	SAMPLE MW-9.71-01, FLOW
						REDUCED
1250	—	—	—	—	—	PUMP OFF

Notes Sampling Procedures: PUMP SET @ 25' BTOC

F4

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0208
Date : 3/5/97
Site Engineer : T. BLANCY

Well Number : MW-5
Equipment : DRT-15CE, YSI 3500
Contractor :

	Before	Reference Point	After
Depth to Water (ft)	67.32	TOP OF 4" CASING	67.32
Depth to Sediment (ft)	139.15	TOP OF 4" CASING	139.15
Thickness of Sediment (ft)	0.85		0.85

Depth of Well (ft) 140
Diameter of Casing (ft) 0.333
Water Column Height (ft) 71.83
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 46.79
Casing Volumes Purged ≈0.85
Total Volume Purged (gals) ≈40

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1325	—	—	—	—	1.90	START PUMP @ 250 HZ
1330	7.73	9.3	18.6°	336	1.90	WATER CLEAR
1335	7.07	6.02	17.4	322	1.90	WATER CLEAR
1340	6.78	3.50	17.5	318	1.90	READY TO SAMPLE
1343	6.77	2.60	17.3	319	1.90	READY TO SAMPLE
1346	6.77	1.50	17.6	318	1.90	READY TO SAMPLE
1350	—	—	—	—	0.02	SAMPLE MW-971-13
1355	—	—	—	—	0.02	SAMPLE MW-971-13-MS
1400	—	—	—	—	0.02	SAMPLE MW-971-13-MSD

Notes Sampling Procedures:
MOVE PUMP TO 71' BELOW TOC.

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0208
Date : 3-4-99
Site Engineer : T. BURNEY

Well Number : MW-6
Equipment : HF SCIENTIFIC DRT-15CE
YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	187.81	TOP OF 4" CASING	187.81
Depth to Sediment (ft)	244.45	TOP OF 4" CASING	244.45
Thickness of Sediment (ft)	0.55		0.55

Depth of Well (ft) 245.0
Diameter of Casing (ft) 0.333
Water Column Height (ft) 56.64
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 36.70
Casing Volumes Purged ≈1.44
Total Volume Purged (gals) ≈53.0

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1045	—	—	—	—		START PUMP @ 325 Hz
1050	7.76	22.0	21.9	709	1.3	WATER CLOUDY
1055	7.06	24.5	21.6	676	1.3	WATER CLOUDY
1100	6.95	18.0	21.5	669	1.3	WATER CLOUDY
1105	6.96	25.3	21.7	669	1.3	WATER CLOUDY
1108	—	—	—	—	1.86	INCREASE PUMP RATE TO 340 Hz
1110	7.18	32.0	21.0	660	1.86	WATER CLOUDY
1115	7.01	24.5	21.2	658	1.86	WATER CLOUDY
1120	7.02	8.25	22.0	654	1.86	WATER SLIGHTLY CLOUDY
1123	7.03	4.30	21.6	649	1.86	READY TO SAMPLE
1126	6.98	4.27	21.4	649	1.86	READY TO SAMPLE
1130	—	—	—	—	0.02	SAMPLE MW-971-14

Notes Sampling Procedures: MOVE PUMP TO 191' BTOC

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0208
Date : 3-5-97
Site Engineer : T. BLANEY

Well Number : MW-7
Equipment : HF SCIENTIFIC DRT-15CE
YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	210.44	TOC	210.44
Depth to Sediment (ft)	268.50	TOC	268.50
Thickness of Sediment (ft)	6.50		6.50

Depth of Well (ft) 275.0
Diameter of Casing (ft) 0.333
Water Column Height (ft) 58.06
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 37.82
Casing Volumes Purged ≈0.77
Total Volume Purged (gals) 29.07

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0845	—	—	—	—	1.53	START PUMP @ 350 Hz
0850	8.32	4.12	20.1	452	1.53	WATER SLIGHTLY CLOUDY
0855	7.86	3.70	20.1	445	1.53	WATER CLEAR
0858	7.60	3.50	20.0	439	1.53	READY TO SAMPLE
0901	7.41	3.42	20.5	443	1.53	READY TO SAMPLE
0904	7.38	2.21	20.2	441	1.53	READY TO SAMPLE
0905	—	—	—	—	0.02	SAMPLE MW-971-15
0910	—	—	—	—	0.02	SAMPLE MW-971-200

Notes Sampling Procedures: MOVE PUMP TO 214 BTOC

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0208
Date : 3-7-97
Site Engineer : J. BRENNER/T. CHOI

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

	Before	Reference Point	After
Depth to Water (ft)	133.82'	TOP OF 4" CASING	133.82
Depth to Sediment (ft)	203.40'	TOP OF 4" CASING	203.40
Thickness of Sediment (ft)	1.6'		1.6

Depth of Well (ft) 205'
Diameter of Casing (ft) 0.333
Water Column Height (ft) 69.59
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 45.33
Casing Volumes Purged ≈ 0.61
Total Volume Purged (gals) ≈ 27.5

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1000	-	—	—	—	2.5	PUMP ON; CONTROL BLOCK AT 38 Hz
1005	7.69	3.62	19.0	410	2.5	WATER CLEAR
1008	7.17	3.81	18.4	401	2.5	WATER CLEAR
1011	7.01	3.12	18.7	392	2.5	WATER CLEAR; READY
						TO SAMPLE
1015	—	—	—	—	—0.02	MW-971-16 COLLECTED,
						FLOW REDUCED TO
						0.02 gpm ( )
1020	—	—	—	—	—	PUMP OFF

Notes Sampling Procedures: PUMP SET AT 140' BGS

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0208
Date : 3-7-97
Site Engineer : J. BRENNER / T. CHOI

Well Number : MW-9
Equipment : HF SCIENTIFIC DRT-15CE
YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	15.76	TOC	15.76
Depth to Sediment (ft)	69.82	TOC	69.82
Thickness of Sediment (ft)	0.18		0.18

Depth of Well (ft) 70
Diameter of Casing (ft) 0.333
Water Column Height (ft) 54.06
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 35.22
Casing Volumes Purged ≈1.92
Total Volume Purged (gals) 67.5

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1115	—	—	—	—	3.0	PUMP ON; CONTROL BOX @ 327 Hz
1120	7.08	69.8	19.7	476	3.0	WATER CLOUDY
1122	—	—	—	—	2.5	CONTROL BOX @ 218 Hz
1125	7.05	11.24	19.9	455	2.5	SLIGHTLY CLOUDY
1130	7.04	6.06	19.8	454	2.5	WATER CLEARING
1135	7.03	6.77	19.9	458	2.5	WATER CLEAR
1140	6.99	3.01	19.8	456	2.5	WATER CLEAR
1143	7.06	4.20	19.4	457	2.5	READY TO SAMPLE
1145	—	—	—	—	0.02	SAMPLE MW-971-17; REDUCE
						FLOW RATE
1150	—	—	—	—	—	PUMP OFF

Notes Sampling Procedures: PUMP SET @ 20' BTOC

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0208
Date : 3-5-97
Site Engineer : T. BLANEY

Well Number : MW-16
Equipment : HF SCIENTIFIC DRT-15CE
YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	88.88	TOC	88.88
Depth to Sediment (ft)	153.95	TOC	153.95
Thickness of Sediment (ft)	1.05		1.05

Depth of Well (ft) 155.00
Diameter of Casing (ft) 0.333
Water Column Height (ft) 65.07
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 42.39
Casing Volumes Purged ≈0.40
Total Volume Purged (gals) ≈16.8

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1025	—	—	—	—	0.8	START PUMP @ 250 Hz
1035	7.89	4.28	20.4	526	0.8	WATER CLEAR
1040	6.97	2.94	19.6	516	0.8	WATER CLEAR
1043	6.96	2.42	19.2	519	0.8	READY TO SAMPLE
1046	6.95	2.23	19.3	529	0.8	READY TO SAMPLE
1050	—	—	—	—	0.02	SAMPLE MW-971-18
1100	—	—	—	—	0.02	SAMPLE MW-971-19

Notes Sampling Procedures: MOVE PUMP TO 92' BTOC

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0208
Date : 3/7/97
Site Engineer : J. BRENNAR, T. CHOI, T. BLANDY

Well Number : MW-13
Equipment : DRT-15CE, YSI 3500
GRUNDFOS RED. FLO 2
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	182.81'	TOP OF 4" CASING	182.81
Depth to Sediment (ft)	235.35	TOP OF 4" CASING	235.35
Thickness of Sediment (ft)	0.15		0.15

Depth of Well (ft) 235.5
Diameter of Casing (ft) 0.333
Water Column Height (ft) 52.54
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 34.23
Casing Volumes Purged ≈4.04
Total Volume Purged (gals) ≈35.7

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1350	—	—	—	—	2.1	PUMP ON; CONTROL BOX
						SET AT 341 Hz
1355	7.09	1.52	23.3	489	2.1	WATER CLEAR
1358	7.04	1.72	23.2	488	2.1	WATER CLEAR
1401	7.03	0.82	22.3	487	2.1	WATER CLEAR
1404	7.03	1.09	22.8	487	2.1	READY TO SAMPLE
1407	7.03	0.53	22.6	490	2.1	" " "
1410	—	—	—	—	0.02	START COLLECTING MW 971-31
1430	—	—	—	—	0.02	MW-971-32 COLLECTED
1435	—	—	—	—	—	PUMP OFF

Notes Sampling Procedures: PUMP SET AT 188'

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0208
Date : 3-7-97
Site Engineer : J. BRENNER, T. CHOI

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

	Before	Reference Point	After
Depth to Water (ft)	24.58	TOC	24.58
Depth to Sediment (ft)	74.31	TOC	74.31
Thickness of Sediment (ft)	0.69		0.69

Depth of Well (ft) 75.0
Diameter of Casing (ft) 0.333
Water Column Height (ft) 49.73
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 32.40
Casing Volumes Purged 0.95
Total Volume Purged (gals) ≈30.8

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1508	—	—	—	—	2.2	PUMP ON; CONTROL BOX @ 200 Hz
1513	7.30	5.09	18.1	408	2.2	WATER CLEAR
1516	7.18	2.08	17.9	403	2.2	WATER CLEAR
1519	7.20	2.55	18.4	400	2.2	READY TO SAMPLE
1522	7.20	2.55	18.4	400	2.2	READY TO SAMPLE
1525	—	—	—	—	0.02	FLOW REDUCED; SAMPLE
						MW-971-38 COLLECTED
1530	—	—	—	—	—	PUMP OFF

Notes Sampling Procedures: PUMP SET @ 30' BTOC

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0208
Date : 3-4-97
Site Engineer : T. BLANEY

Well Number : MW-16
Equipment : HF SCIENTIFIC DRT-15CE
YSI 3500
Contractor : NONE

	Before	Reference Point	After
Depth to Water (ft)	234.95	TOC	234.95
Depth to Sediment (ft)	284.94	TOC	284.94
Thickness of Sediment (ft)	0.06		0.06

Depth of Well (ft) 285.0
Diameter of Casing (ft) 0.333
Water Column Height (ft) 49.99
Casing Volume (gals) = π(Diam. of Casing (ft)/2)^2 (Water Column Height (ft))(7.48 gals/ft^3) = 32.57
Casing Volumes Purged ≈0.67
Total Volume Purged (gals) ≈21.96

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1255	—	—	—	—	—	START PUMP @ 380 Hz
1300	—	—	—	—	—	PUMP STOPPED
1305	—	—	—	—	1.22	START PUMP @ 365 Hz
1315	7.85	0.52	23.0	508	1.22	READY TO SAMPLE
1320	7.80	0.10	22.7	501	1.22	READY TO SAMPLE
1323	7.31	0.15	23.1	501	1.22	READY TO SAMPLE
1325	—	—	—	—	0.02	REDUCE FLOW; SAMPLE MW-971-39
1330	—	—	—	—	—	PUMP OFF

Notes Sampling Procedures: PUMP SET @ 239' 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

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0208
Date : 3-6-97
Site Engineer : J. BRENNER, T. CHO

Well Number : MW-3
Equipment : HF SCIENTIFIC DRT-15CE
YSI 3500
Contractor : N/A

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

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0850	8.93	2.85	19.1	297	N/A	1ST RUN PRIOR SAMPLING @ SCREEN 5
0915	—	—	—	—	—	2ND RUN; SAMPLE MW-971-06
1000	9.08	2.17	19.9	298	N/A	LAST RUN; FINAL PARAMETERS
1035	8.65	4.31	20.5	325	N/A	1ST RUN PRIOR SAMPLING @ SCREEN 4
1115	—	—	—	—	—	2ND RUN; SAMPLE MW-971-05
1150	8.34	4.25	21.9	337	N/A	LAST RUN; FINAL PARAMETERS
1215	8.76	1.62	20.9	341	N/A	1ST RUN PRIOR SAMPLING @ SCREEN 3
1245	—	—	—	—	—	2ND RUN; SAMPLE MW-971-04
1250	—	—	—	—	—	3RD RUN; SAMPLE MW-971-04MS
1255	—	—	—	—	—	4TH RUN; SAMPLE MW-971-04MSD
1315	8.76	1.84	22.1	353	N/A	LAST RUN; FINAL PARAMETERS
1340	8.02	3.35	18.5	395	N/A	1ST RUN PRIOR SAMPLING SCREEN 2
1355	—	—	—	—	—	2ND RUN; SAMPLE MW-971-03
1425	7.35	4.30	19.2	407	N/A	LAST RUN; FINAL PARAMETERS

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0208
Date : 3-7-97
Site Engineer :

Well Number : MW-3
Equipment : HF SCIENTIFIC DRT-CC
YSI 3500
Contractor :

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

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0815	7.25	1.11	15.4	348	N/A	1ST RUN @ SCREEN 1 PRIOR SAMPLING
0845	—	—	—	—	—	SAMPLE MW-971-02
0900	7.19	11.1	16.4	563	N/A	FINAL RUN AT SCREEN 1

Notes Sampling Procedures:

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0208
Date : 2/27/97
Site Engineer : T. Blaney

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

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

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1230	7.69	4.44	17.0	349	N/A	1st Run to Screen #5
						Prior to Sampling.
1250	—	—	—	—	—	Sample MW-971-12
1315	7.98	4.42	17.0	346	N/A	Last Run; Final Parameters After Sampling
1330	7.85	2.87	18.5	361	N/A	1st Run to Screen #4; Prior to Sampling
1340	—	—	—	—	—	Sample MW-971-11
1415	7.87	2.02	19.4	364	N/A	Final Parameters after Sampling
1435	7.74	4.20	19.0	399	N/A	1st Run @ Screen #3; Prior to Sampling
1450	—	—	—	—	—	Sample MW-971-10
1505	7.66	1.44	19.1	402	N/A	Last Run; Final Parameters

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0208
Date : 2-28-97
Site Engineer : T. CHOI / J BIRENNER

Well Number : MW-4
Equipment : HF SCIENTIFIC DRT-15CE
YSI 3500
Contractor : NONE

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

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0840	6.96	4.2	16.5	521	N/A	1st Run @ Screen #2 Prior to Sampling.
0855	—	—	—	—	—	Sample MW-971-08
0915	—	—	—	—	—	Sample MW-971-09
0916	6.78	4.84	18.3	532	N/A	Final Parameters After Sampling
0930	6.88	4.52	16.3	365	N/A	1st Run @ Screen 1 Prior Sampling
0945	—	—	—	—	—	Sample MW-971-07
1004	6.75	4.70	18.2	373	N/A	Final Parameters After Sampling

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0208
Date : 3-5-97
Site Engineer : T. CHOI / J. BROWNER

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

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

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0840	7.92	1.31	20.4	307	N/A	1ST RUN @ SCREEN 5 PRIOR SAMPLING
0910	—	—	—	—	—	SAMPLE MW-971-24
0935	7.89	1.89	22.3	313	N/A	LAST RUN, FINAL PARAMETERS
1005	7.92	4.89	21.7	347	N/A	1ST RUN @ SCREEN 4 PRIOR SAMPLING
1040	—	—	—	—	—	SAMPLE MW-971-23
1105	7.87	5.48	21.6	379	N/A	LAST RUN; FINAL PARAMETERS
1130	7.95	2.18	21.1	395	N/A	1ST RUN @ SCREEN 3 PRIOR SAMPLING
1200	—	—	—	—	~~N/A~~	SAMPLE MW-971-22
1220	7.94	1.26	22.3	385	N/A	LAST RUN FINAL PARAMETERS
1250	7.56	2.69	22.8	499	N/A	1ST RUN @ SCREEN 2 PRIOR SAMPLING
1325	—	—	—	—	—	SAMPLE MW-971-21
1335	7.49	3.53	23.4	428	N/A	LAST RUN FINAL PARAMETERS
1410	7.56	3.17	22.1	467	N/A	1ST RUN AT SCREEN 1 PRIOR TO SAMPLING
1430	—	—	—	—	—	SAMPLE MW-971-20
1450	7.72	1.90	21.3	475	N/A	FINAL RUN AT SCREEN 1

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0208
Date : 3/3/97
Site Engineer : T. CHOI, J. BRENNER

Well Number : MW-12
Equipment : H.F. SCIENTIFIC DRT-15CE
YSI 3500
Contractor : NONE

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

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0820	7.38	2.45	16.4	436	N/A	1ST RUN @ SCREEN 2 PRIOR SAMPLING
0840	—	—	—	—	N/A	SAMPLE MW 971-27 COLLECTED
0845	—	—	—	—	N/A	SAMPLE MW 971-27MS COLLECTED
0850	—	—	—	—	N/A	SAMPLE MW 971-27MSD COLLECTED
1035	7.21	2.55	18.2	434	N/A	FINAL RUN AT SCREEN 2
1015	8.21	30.9	17.7	365	N/A	1ST RUN @ SCREEN 1 PRIOR SAMPLING
1030	8.17	33.1	18.5	367	N/A	2nd RUN; TRYING TO REDUCE TURBIDITY
1130	7.37	28.9	19.5	379	N/A	3rd RUN ATTEMPTING TO REDUCE TURBIDITY
1415	7.29	6.8	19.4	415	N/A	4th RUN "
1445	—	—	—	—	—	UNABLE TO REDUCE TURBIDITY,
						WILL RETURN TO SCREEN 1
						TOMORROW, 3-4-97

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0208
Date : 2-28-97
Site Engineer : T. Blaney

Well Number : MW-12
Equipment : HF SCIENTIFIC DRT-CE
YSI 3600
Contractor : N/A

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

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1059	9.25	1.53	19.4	375	N/A	1st Run @ Screen #5 Prior to Sampling
1120	—	—	—	—	—	Sample MW-971-30
1145	9.24	1.52	19.3	375	N/A	Final Parameters after Sampling
1207	7.53	2.22	19.3	418	N/A	1st RUN @ SCREEN #4 PRIOR SAMPLING
1230	—	—	—	—	—	SAMPLE MW-971-29
1255	7.78	2.50	20.2	426	N/A	LAST RUN, FINAL PARAMETERS
1315	7.81	4.98	20.4	432	N/A	1st RUN @ SCREEN # 3 PRIOR SAMPLING
1335	—	—	—	—	—	SAMPLE MW-971-28
1355	7.75	5.05	19.4	433	N/A	LAST RUN FINAL PARAMETERS

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 15720208
Date : 3/4/97
Site Engineer : J BRENNER/T. CHOI

Well Number : MW-12
Equipment : DRS-15CE
YSI 3500
Contractor : NONE

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

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0900	7.44	8.39	15.3	407	N/A	1st RUN TO SCREEN 1 PRIOR
						TO SAMPLING
0915	7.57	9.88	15.5	398	N/A	2ND RUN TO SCREEN 1 PRIOR
						TO SAMPLING
1050	7.38	3.28	17.7	407	N/A	1st RUN TO SCREEN 1 AFTER
						PURGING BUT PRIOR TO SAMPLING
1135	—	—	—	—	—	SAMPLE MW-971-25 COLLECTED
1140	—	—	—	—	—	SAMPLE MW-971-26 (DUP) COLLECTED
1447	7.20	4.25	18.7	427	N/A	FINAL PARAMETERS @ SCREEN 1

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0208
Date : 2-26-97
Site Engineer : T. BLANEY

Well Number : MW-44
Equipment : HF SCIENTIFIC DRT-CE
YSI 3500
Contractor : N/A

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

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0910	0814	2.69	17.18	307	N/A	1ST RUN PRIOR SAMPLING @ SCREEN 5
0945	—	—	—	—	—	SAMPLE MW-971-37
1000	0834	1.96	18.40	309	N/A	LAST RUN @ SCREEN 5, FINAL PARAMETERS
1035	7.83	4.10	18.9	452	N/A	1ST RUN PRIOR SAMPLING @ SCREEN 4
1100	—	—	—	—	—	SAMPLE MW-971-36
1125	7.73	4.09	18.9	452	N/A	LAST RUN @ SCREEN 4, FINAL PARAMETERS
1150	781	3.22	20.0	775	N/A	1ST RUN PRIOR SAMPLING @ SCREEN 3
1210	—	—	—	—	—	SAMPLE MW-971-35
1225	7.76	1.79	20.8	798	N/A	LAST RUN @ SCREEN 3, FINAL PARAMETERS
1247	7.44	15.2	19.8	1059	N/A	1ST RUN PRIOR SAMPLING @ SCREEN 2
1305	7.46	14.4	20.6	1081	N/A	2ND RUN, TRYING TO REDUCE TURBIDITY
1320	7.27	4.99	20.5	1090	N/A	3RD RUN, " "
1340	—	—	—	—	—	SAMPLE MW-971-34
1355	7.41	4.89	21.0	1085	N/A	LAST RUN @ SCREEN 2, FINAL PARAMETERS

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0202
Date : 2/27/97
Site Engineer : T. BLANEY

Well Number : MW-14
Equipment : DET-15CE
YSI 350
Contractor : N/A

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

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0956	7.00	4.02	14.1	968	N/A	1st Run to Screen w/ Prior to
						Sampling. Ready to Sample
1010	—	—	—	—	—	Sample MW-971-33
1136	6.74	4.51	12.1	1005	N/A	Last Run; Final Parameters
						After Sampling

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.02.08
Date : 2-4-97
Site Engineer : T CHOI / J BRENNER

Well Number : MW-17
Equipment : HE SCIENTIFIC DRT-CE
YSI 3500
Contractor : NONE

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

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1250	7.96	78.9	19.3	392	N/A	1ST RUN TO SCREEN PRIOR TO
						SAMPLING. NTU'S = 78.9
1350	7.96	60.0	19.3	392	N/A	2ND RUN TO SCREEN 5 PRIOR TO
						SAMPLING
1500	7.98	17.5	17.5	374	N/A	3RD RUN TO SCREEN 5 PRIOR TO
						SAMPLING; THIS RUN IS AFTER
						PURGING ≈ 5.6 gal INTO INNER
						CASING FROM OUTSIDE OF CASING
1545	7.96	26.9	16.5	369	N/A	4TH RUN TO SCREEN 5 PRIOR TO
						SAMPLING
1600	—	—	—	—	—	FINISHED FOR TODAY WILL
						RETURN TO SCREEN 5
						ON 2-5-97

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0208
Date : 2-5-97
Site Engineer : T. CHOI / J. BRENNER

Well Number : MW-17
Equipment : HF SCIENTIFIC, PRT-CE
YSI 3500
Contractor : NONE

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

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0845	7.80	12.9	15.5	363	NA	1st RUN TO SCREEN 5; INITIAL
						PARAMETERS PRIOR SAMPLING
0930	7.84	12.4	16.5	364	NA	2nd RUN TO SCREEN 5 PRIOR TO
						SAMPLING
—	—	—	—	—	—	*3rd RUN; PURGING SCREEN BY OPENING
						VALVE & ALLOWING INNER CASING TO
						FILL, RAISE INSIDE PRESS ≈15 psIA
1110	7.80	26.7	18.4	381	NA	4th RUN PRIOR SAMPLING; TRYING
						TO REDUCE TURBIDITY
1145	7.84	28.3	17.2	376	NA	5th RUN PRIOR SAMPLING; TRYING
						TO REDUCE TURBIDITY. WILL TRY LATER
1225	7.63	9.76	17.2	395	NA	**1st RUN TO SCREEN 4; NTU'S = 9.76
						PRIOR TO SAMPLING
1300	7.61	5.00	17.8	398	N/A	2nd RUN TO SCREEN 4 PRIOR SAMPLING
1325	—	—	—	—		3rd RUN; SAMPLE MW-971-43
						BEGIN SAMPLING
1350	7.51	6.21	17.2	398	NA	4th RUN; FINISH SAMPLING
						MW-971-43
1420	7.77	20.4	16.8	370	NA	6th RUN TO SCREEN 5 PRIOR SAMPLING
						~~7th RUN TO SCREEN~~

Notes Sampling Procedures: *DUE TO HIGH TURBIDITY WE ~~[illegible]~~ PURGED 15 PSIA INTO INNER CASING

** MOVING TO SCREEN #4 & HOPING SCREEN #5 WILL CLEAR IN THIS MEAN-TIME

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0208
Date : 2-5-97
Site Engineer : T. CHOI / J. BRENNER

Well Number : MW-17
Equipment : HF SCIENTIFIC ; DRT-CE
YSI 3500
Contractor : NONE

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

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1455	7.85	22.0	17.8	368	N/A	7th RUN @ SCREEN 5; SAMPLING
						MW-971-44 BEGINS
1535	7.71	26.9	17.5	371	N/A	8th RUN @ SCREEN 5; FINISH
						SAMPLING MW-971-44; FINAL
						PARAMETERS

Notes Sampling Procedures:

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0203
Date : 2-6-97
Site Engineer : T. CHOI / J. BRENNER

Well Number : MW-17
Equipment : HC SCIENTIFIC DRT-CL
VSI 3800
Contractor : NONE

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

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0910	7.25	8.79	17.8	368	N/A	1ST RUN FOR PARAMETERS [redacted] AT SCREEN 3
						PRIOR TO SAMPLING
0940	7.50	8.82	17.2	366	N/A	2ND RUN TO SCREEN 3
1010	7.53	9.58	17.5	368	N/A	3RD RUN TO SCREEN 3
1035	7.50	16.2	18.1	367	N/A	4TH RUN TO SCREEN 3
1200	7.54	12.89	18.1	371	N/A	6th RUN TO SCREEN 3 WILL
						LEAVE THIS SCREEN TO DO SCREENS 2 & 1
1230	7.54	2.20	17.4	296	N/A	1ST RUN TO SCREEN 2, INITIAL
						PARAMETERS PRIOR TO SAMPLING
1250						SAMPLE MW-971-41 COLLECTED
1315	7.43	3.21	17.2	306	N/A	FINAL RUN AT SCREEN 2, AFTER
						SAMPLING
1335	7.22	2.85	17.1	287	N/A	1ST RUN TO SCREEN 1; INITIAL
						PARAMETERS PRIOR TO SAMPLING
1350						SAMPLE MW-971-40 COLLECTED
1420	6.93	1.30	17.8	293	N/A	FINAL RUN AT SCREEN 1
						AFTER SAMPLING

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0208
Date : 2-7-97
Site Engineer : T. CHOI / J. BRENNER

Well Number : MW-97
Equipment : HF SCIENTIFIC PRE-SE
YSI 3500
Contractor : NONE

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

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0850	7.41	4.57	18.1	364	N/A	1st RUN PRIOR SAMPLING NTU = 4.57
						INITIAL PARAMETERS
0920	—	—	—	—	—	SAMPLE MW-97-42 COLLECTED
0945	7.34	7.41	17.8	360	N/A	FINAL RUN TO SCREEN 3,
						AFTER SAMPLING

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0208
Date : 2-3-97
Site Engineer : T. BLANEY

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

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

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0952	7.99	3.20	17.9	307	N/A	1ST RUN PRIOR SAMPLING @ SCREEN 5
1025	—	—	—	—	—	2ND RUN; SAMPLE MW-971-49
1100	8.01	2.65	19.2	309	N/A	LAST RUN; FINAL PARAMETERS
1130	8.35	3.63	18.7	304	N/A	1ST RUN PRIOR SAMPLING @ SCREEN 4
1205	—	—	—	—	—	2ND RUN; SAMPLE MW-971-48
1230	8.33	1.97	19.0	308	N/A	LAST RUN; FINAL PARAMETERS
1300	7.56	3.27	18.9	458	N/A	1ST RUN PRIOR SAMPLING @ SCREEN 3
1320	—	—	—	—	—	2ND RUN; SAMPLE MW-971-47
1325	—	—	—	—	—	3RD RUN; SAMPLE MW-971-47 MS/MSD
1330	7.56	3.27	18.9	458	N/A	LAST RUN; FINAL PARAMETERS

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572-0203
Date : 2-4-97
Site Engineer : T. CHOI / J. BRENNAN

Well Number : MW-13
Equipment : HF SCIENTIFIC DRT-CF
YSI 3500
Contractor : NONE

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

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0920	7.35	0.71	15.7	416	N/A	1ST RUN TO SCREEN 2, INITIAL
						PARAMETERS PRIOR TO SAMPLING
0940						SAMPLE MW-971-46 COLLECTED
1010	7.28	4.85	16.0	410	N/A	FINAL RUN TO SCREEN 2 AFTER
						SAMPLING
1030	7.21	2.45	16.3	323	N/A	1ST RUN TO SCREEN #1, INITIAL
						PARAMETERS PRIOR TO SAMPLING
1055						SAMPLE MW-971-45 COLLECTED
1125	7.14	1.35	17.7	326	N/A	FINAL RUN TO SCREEN 1 AFTER
						SAMPLING

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 15972.02008
Date : 2-11-97
Site Engineer : T. CHOI / J. BRENNER

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

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

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0910	8.34	11.26	14.0	470	N/A	1st RUN @ SCREEN 5 PRIOR
						SAMPLING; INITIAL PARAMETERS
0935	8.32	11.11	15.0	473	N/A	2nd RUN; TRYING TO REDUCE TURB.
1015	8.31	5.60	15.1	486	N/A	3rd RUN " " "
1045	8.27	11.36	15.7	485	N/A	4th RUN " " "
1115	8.26	12.09	15.6	471	N/A	5th RUN " " "
1310	8.13	20.11	17.5	452	N/A	1st RUN @ SCREEN 4; INITIAL
						PARAMETERS PRIOR SAMPLING
1330	8.19	15.0	18.0	464	N/A	2nd RUN; TRYING TO REDUCE TURB.
1400	7.8	3.78	18.5	563	N/A	6th RUN; RETURN TO SCREEN 5
						AFTER PURGING
1400	—	—	—	—	—	SAMPLE MW-971-54
1430	7.70	3.87	18.4	567	N/A	LAST RUN @ SCREEN 5, FINALS
1500	8.16	14.1	17.6	466	N/A	3rd RUN @ SCREEN 4
1510	—	—	—	—	—	FINISHED @ SCREEN 4 FOR TODAY
						WILL RETURN TOMORROW 2/12/97

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : MW-19
Project Number : 1572.0208
Date : 2-12-97
Site Engineer : T. CHOI / J. BRENNER

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

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

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0920	8.01	9.73	15.7	445	N/A	1st RUN @ SCREEN 4 PRIOR SAMPLING INITIAL PARAMETERS; NTU'S = 9.73
0950	8.25	10.40	15.6	445	N/A	2nd RUN; ATTEMPTING TO REDUCE TURBIDITY
1010	8.25	10.60	15.1	450	N/A	3rd RUN; ATTEMPTING TO REDUCE TURBIDITY
1040	8.25	~~10.60~~ 14.16	15.1	450	N/A	4th RUN; ATTEMPTING TO REDUCE TURBIDITY
1158	—	—	—	—	—	5th RUN; PURGING SCREEN 4 ≈ 2.75 gals INTO INNER CASING
1300	8.23	10.1	16.3	477	N/A	6th RUN; ATTEMPTING TO REDUCE TURBIDITY
1330	8.00	12.1	17.0	483	N/A	7th RUN; ATTEMPTING TO REDUCE TURBIDITY; WILL RETURN ~~TOMORROW~~ LATER
1355	7.41	4.30	17.1	717	N/A	1st RUN @ SCREEN 3 PRIOR SAMPLING
1500	—	—	—	—	—	SAMPLE MW-971-SR COLLECTED
1525	7.24	5.43	17.1	729	N/A	FINAL RUN AT SCREEN 3

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0208
Date : 2-13-97
Site Engineer : TCHOI / J BRENNER

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

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

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0910	7.92	9.2	15.7	469	N/A	1ST RUN TO SCREEN 4 TODAY PRIOR TO SAMPLING
0940	8.18	13.2	16.2	475	N/A	2ND RUN TO SCREEN 4; WILL
0950						PURGE FROM SCREEN 4 AND
						RETURN LATER
1055	6.84	16.1	16.9	449	N/A	1ST RUN TO SCREEN 2 PRIOR
#						TO SAMPLING
115	6.85	16.4	16.0	462	N/A	2ND RUN TO SCREEN 2
1135	6.79	18.6	16.8	460	N/A	3RD RUN TO SCREEN 2
1155	6.87	14.7	17.1	461	N/A	4TH RUN TO SCREEN 2
1440	7.2	4.6	18.7	299	N/A	1ST RUN TO SCREEN 1 PRIOR
						TO SAMPLING
1500	—	—	—	—	—	SAMPLE MW-971-50 COLLECTED
1520	7.16	8.64	17.3	294	N/A	FINAL RUN TO SCREEN 1

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0008
Date : 2/14/97
Site Engineer : T. CHOI / J. BRENNER

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

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

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1400	7.79	9.61	20.1	532	N/A	1ST RUN @ SCREEN 4, INITIAL PARAMETERS
						PRIOR SAMPLING ; SAMPLE MW-97-53
1430	7.76	22.00	19.6	545	N/A	2ND RUN FINISH SAMPLING MW-97-53
						FINAL PARAMETERS
						PURGED 3 BETWEEN PACKER
						VOLUMES TO DATE PRIOR TO
						SAMPLING

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0208
Date : 2-18-97
Site Engineer : T. CHOI / J. BRENNER

Well Number : MW-9
Equipment : HF SCIENTIFIC DRT-CE
YSI 3500
Contractor : NONE

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

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0850	6.86	47.5	16.7	456	N/A	1st RUN @ SCREEN 2 PRIOR SAMPLING
1400	—	—	—	—	—	FINISH PURGING ~12.2 GALLONS
						FROM SCREEN 2 IN AN ATTEMPT
						TO REDUCE TURBIDITY

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0208
Date : 2/19/97
Site Engineer : T. BLANEY

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

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

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
10.48	7.28	18.6	18.5	484	N/A	1ST RUN PRIOR SAMPLING @ SCREEN 2
1110	—	—	—	—	—	SAMPLE MW-971-51
1124	6.67	25.2	18.2	478	N/A	LAST RUN @ SCREEN 2. FINAL PARAMETERS

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.02.08
Date : 2-7-97
Site Engineer : T. CHOI / J. BRENNER

Well Number : MW-2.0
Equipment : HF SCIENTIFIC DRT-CE
YSI 3500
Contractor : NONE

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

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1040	8.63	2.23	17.9	339	NA	1ST RUN PRIOR TO SAMPLING. INITIAL
						PARAMETERS; NTU'S = 2.23
1120	—	—	—	—	—	SAMPLE MW-971-59
1150	8.98	0.96	17.7	341	NA	LAST RUN; FINISH MW-971-59;
						FINAL PARAMETERS
1440	8.42	3.60	17.9	312	NA	1ST RUN @ SCREEN 4
1510	—	—	—	—	—	2ND RUN SAMPLE MW-971-58
1605	8.50	3.09	17.9	312	N/A	3RD RUN FINAL PARAMETERS ATP

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0208
Date : 2/10/97
Site Engineer : T. CHOI / J BRENNAN

Well Number : MW-20
Equipment : HF SCIENTIFIC DRT-55
YSI 3500
Contractor : NONE

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

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0930	9.08	2.43	16.1	406	N/A	1ST RUN @ SCREEN 3; INITIAL
						PARAMETERS PRIOR SAMPLING; NTU'S=2.43
1000	—	—	—	—	—	SAMPLE MW-971-57
1030	9.10	1.35	16.2	407	N/A	LAST RUN @ SCREEN 3; FINISH
						SAMPLING MW-971-57; FINAL
						PARAMETERS
1045	7.60	2.20	16.5	378	N/A	1ST RUN @ SCREEN 2; INITIAL PARA-
						METERS PRIOR SAMPLING; NTU'S=2.20
1115	—	—	—	—	—	2ND RUN; SAMPLE MW-971-56
1130	7.55	2.01	16.4	372	N/A	LAST RUN @ SCREEN 2; FINISH
						SAMPLING MW-971-56; FINAL
						PARAMETERS
1155	7.40	2.91	17.6	694	N/A	1ST RUN @ SCREEN 1; INITIAL PARA-
						METERS PRIOR SAMPLING; NTU'S=2.91
1220	—	—	—	—	—	2ND RUN; SAMPLE MW-971-55
1230	7.32	2.60	17.8	695	N/A	LAST RUN @ SCREEN 1; FINISH
						SAMPLING MW-971-55; FINAL
						PARAMETERS

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : SPL
Project Number : 1572.0208
Date : 2-20-97
Site Engineer : T. BLANEY

Well Number : MW-21
Equipment : HF SCIENTIFIC PRT-15CE
YSI 3562
Contractor : N/A

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

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0910	7.81	26.2	18.8	641	N/A	1ST RUN PRIOR SAMPLING, SCREEN 5
0935	8.12	41.8	18.7	626	N/A	2ND RUN TRYING TO REDUCE TURB.
0955	7.82	35.2	19.4	644	N/A	3RD RUN " " "
1015	7.80	67.3	19.6	646	N/A	4TH RUN " " "
						WILL RETURN TO SCREEN 5 LATER
1045	7.31	75.0	20.0	525	N/A	1ST RUN PRIOR SAMPLING, SCREEN 4
1105	7.37	4.9	20.0	527	N/A	2ND RUN; TRYING TO REDUCE TURB
1130	—	—	—	—	—	3RD RUN, SAMPLE MW-971-63
1150	7.33	3.9	20.7	533	N/A	LAST RUN @ SCREEN 4, FINAL PARAMETERS
1212	7.51	17.35	20.4	857	N/A	1ST RUN @ SCREEN 3 PRIOR SAMPLING
1225	7.58	12.7	20.3	867	N/A	2ND RUN; TRYING TO REDUCE TURB.
1240	7.52	10.4	20.2	875	N/A	3RD RUN " " "
1305	7.55	4.93	20.3	872	N/A	4TH RUN " " "
1330	—	—	—	—		5TH RUN; SAMPLE MW-971-62
1340	7.37	4.21	20.5	890	N/A	LAST RUN @ SCREEN 3, FINAL
						PARAMETERS
1350	7.15	3.32	20.2	1070	N/A	1ST RUN @ SCREEN 2, INITIAL PARAMETERS
1410	—	—	—	—	—	2ND RUN; SAMPLE MW-971-61
1425	7.03	4.38	20.7	1088	N/A	LAST RUN @ SCREEN 3, FINALS

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0208
Date : 2/22/97
Site Engineer : T. BLANEY

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

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

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
0907	7.07	0.90	16.9	724	N/A	1ST RUN PRIOR SAMPLING @ SCREEN 1
0920	—	—	—	—	—	SAMPLE MW-971-60
0940	7.07	1.29	16.9	724	N/A	LAST RUN @ SCREEN 1, FINAL PARAMETERS

Notes Sampling Procedures:

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

WELL DEVELOPMENT LOG / WELL SAMPLING LOG

Project Name : JPL
Project Number : 1572.0208
Date : 2/24/97
Site Engineer : T. CHOI / J. BRENNER

Well Number : MW-21
Equipment : YSI 3500, DRT-CC
Contractor : NONE

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

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

Time	pH	Turbidity (NTU)	Temp. (°C)	Conductivity (µmhos)	Pump Rate (gpm)	Comments
1050	—	—	—	—	—	PURGED ≈14.14 gal OUT OF SCREEN
						5 IN ATTEMPT TO REDUCE TURBIDITY
1120	7.20	14.54	17.1	674	N/A	1st RUN PRIOR SAMPLING
1140	7.34	31.60	18.9	682	N/A	2nd RUN ATTEMPTING TO REDUCE TURBIDITY
1200	7.39	42.90	18.2	683	N/A	3rd RUN " " "
1220	7.40	33.50	18.1	622	N/A	4th RUN " " "
1240	7.44	32.9	18.7	675	N/A	5th RUN " " "
1300	7.39	28.9	18.6	684	N/A	6th RUN " " "
1325	7.42	26.6	18.8	683	N/A	7th RUN " " "
1350	—	—	—	—	—	SAMPLE MW-971-64
1410	7.44	29.3	19.0	682	—	FINAL PARAMETERS

Notes Sampling Procedures: _____

F4

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: op of 1.5" Casing Probe Type: Westbay Date: 1/30/97 Job No.: 1572

Serial No.: 1455 Well Name: MW-3

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

Weather: Sunny and 80 °F Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.39/20.27/1310 Finish: 14.41/18.21/1340

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	653	173.61			22.98	1313	284.74	126.54	973.80
			242.19			1314			
			242.17			1315			
			242.19			1316			
				173.59		1317			
4	558	132.33			23.21	1318	285.18	124.28	976.06
			202.04			1319			
			202.06			1320			
			202.06			1321			
				132.26		1322			
3	346	40.40			22.19	1324	286.18	117.67	982.67
			113.43			1325			
			113.45			1326			
			113.45			1327			
				40.38		1328			
2	252	14.39			20.68	1329	0.00	116.38	983.96
			73.18			1330			
			73.21			1331			
			73.18			1332			
				14.41		1333			
1	172	14.34			19.45	1334	0.00	102.77	997.57
			44.39			1335			
			44.37			1336			
			44.37			1337			
				14.39		1338			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: op of 1.5" Casing Probe Type: Westbay Date: 1/30/97 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: Sunny and 75 °F Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.40/22.90/1150 Finish: 14.44/20.06/1220

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	513	126.63			22.62	1155	252.96	106.13	976.71
			190.27			1156			
			190.32			1157			
			190.32			1158			
				126.66		1159			
4	392	74.12			22.17	1200	253.57	99.48	983.36
			140.93			1201			
			140.92			1202			
			140.90			1203			
				74.11		1204			
3	322	43.70			22.06	1205	253.90	98.19	984.65
			111.23			1206			
			111.21			1207			
			111.20			1208			
				43.72		1209			
2	240	14.49			21.31	1210	0.00	97.69	985.15
			76.23			1211			
			76.25			1212			
			76.23			1213			
				14.61		1214			
1	150	14.39			20.69	1215	0.00	79.87	1002.97
			44.76			1216			
			44.79			1217			
			44.79			1218			
				14.37		1219			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: op of 1.5" Casing Probe Type: Westbay Date: 1/30/97 Job No.: 1572

Serial No.: 1455 Well Name: MW-11

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

Weather: Sunny and 80 °F Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.41/19.30/1346 Finish: 14.31/18.53/1415

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	639	159.55			20.79	1350	300.33	162.15	977.15
			219.45			1351			
			219.48			1352			
			219.46			1353			
				159.56		1354			
4	524	110.13			21.62	1355	300.88	150.08	989.22
			175.51			1356			
			175.50			1357			
			175.50			1358			
				110.13		1359			
3	429	69.19			20.10	1400	301.44	152.31	986.99
			133.86			1401			
			133.88			1402			
			133.81			1403			
				69.21		1404			
2	259	14.39			19.26	1405	0.00	145.71	993.59
			63.52			1406			
			63.50			1407			
			63.50			1408			
				14.41		1409			
1	149	14.41			18.65	1410	0.00	113.08	1026.22
			29.95			1411			
			29.97			1412			
			29.95			1413			
				14.36		1414			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: op of 1.5" Casing Probe Type: Westbay Date: 1/30/97 Job No.: 1572

Serial No.: 1455 Well Name: MW-12

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

Weather: Sunny and 75 °F Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.49/21.61/1226 Finish: 14.34/18.26/1253

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	548	148.47			21.71	1227	238.63	125.09	977.05
			197.71			1228			
			197.72			1229			
			197.69			1230			
				148.50		1231			
4	436	99.83			19.83	1232	239.19	118.77	983.37
			152.01			1233			
			152.04			1234			
			152.01			1235			
				99.80		1236			
3	323	50.64			19.67	1238	239.91	117.03	985.11
			103.91			1239			
			103.93			1240			
			103.93			1241			
				50.66		1242			
2	243	15.97			18.68	1243	240.29	115.40	986.74
			70.08			1244			
			70.13			1245			
			70.11			1246			
				15.97		1247			
1	140	14.39			18.36	1248	0.00	90.31	1011.83
			35.92			1249			
			35.95			1250			
			35.90			1251			
				14.36		1252			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: op of 1.5" Casing Probe Type: Westbay Date: 1/30/97 Job No.: 1572

Serial No.: 1455 Well Name: MW-14

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

Weather: Sunny and 75 °F Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.41/20.53/1116 Finish: 14.32/19.77/1142

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	145.14			21.30	1118	238.38	179.21	994.26
			170.76			1119			
			170.79			1120			
			170.76			1121			
				145.09		1122			
4	456	108.59			21.70	1123	238.84	179.65	993.82
			134.24			1124			
			134.24			1125			
			134.24			1126			
				108.56		1127			
3	382	76.40			20.80	1128	239.21	179.90	993.57
			102.11			1129			
			102.09			1130			
			102.11			1131			
				76.37		1132			
2	277	30.76			20.15	1133	239.79	181.15	992.32
			56.18			1134			
			56.21			1135			
			56.18			1136			
				30.78		1137			
1	207	14.41			19.81	1138	0.00	181.86	991.61
			25.29			1139			
			25.32			1140			
			25.29			1141			
				14.39		1142			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: op of 1.5" Casing Probe Type: Westbay Date: 1/30/97 Job No.: 1572

Serial No.: 1455 Well Name: MW-17

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

Weather: Sunny and 65 °F Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.39/15.82/0831 Finish: 14.29/15.79/0859

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	726	168.44			19.89	834	371.07	226.53	964.68
			231.09			835			
			231.12			836			
			231.10			837			
				168.43		838			
4	582	105.87			19.91	839	371.80	222.27	968.94
			170.69			840			
			170.71			841			
			170.70			842			
				105.88		843			
3	468	56.37			20.07	844	372.36	226.06	965.15
			119.79			845			
			119.83			846			
			119.81			847			
				56.41		848			
2	370	14.46			16.49	849	0.00	216.51	974.70
			80.98			850			
			81.03			851			
			81.02			852			
				14.48		853			
1	250	14.44			16.00	854	0.00	207.67	983.54
			32.79			855			
			32.82			856			
			32.79			857			
				14.46		858			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: op of 1.5" Casing Probe Type: Westbay Date: 1/30/97 Job No.: 1572

Serial No.: 1455 Well Name: MW-18

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

Weather: Sunny and 65 °F Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.34/17.65/0750 Finish: 14.31/17.51/0821

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	684	151.57			21.09	756	367.18	266.95	958.46
			195.02			757			
			195.03			758			
			195.01			759			
				151.56		800			
4	564	99.40			21.15	801	367.35	260.15	965.26
			145.87			802			
			145.84			803			
			145.87			804			
				99.37		805			
3	424	38.64			19.48	806	368.41	253.30	972.11
			88.55			807			
			88.52			808			
			88.54			809			
				38.63		810			
2	330	14.48			18.39	811	0.00	261.21	964.20
			44.29			812			
			44.29			813			
			44.29			814			
				14.46		815			
1	270	14.46			17.78	816	0.00	264.19	961.22
			16.97			817			
			16.99			818			
			16.99			819			
				14.46		820			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: op of 1.5" Casing Probe Type: Westbay Date: 1/30/97 Job No.: 1572

Serial No.: 1455 Well Name: MW-19

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

Weather: Sunny and 65 °F Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.39/17.91/0958 Finish: 14.31/17.61/1025

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	498	117.21			18.70	1000	260.08	170.11	972.83
			156.22			1001			
			156.20			1002			
			156.20			1003			
				117.21		1004			
4	444	93.69			18.37	1005	260.39	170.17	972.77
			132.79			1006			
			132.79			1007			
			132.81			1008			
				93.69		1009			
3	392	71.08			18.32	1010	260.60	170.27	972.67
			110.24			1011			
			110.27			1012			
			110.27			1013			
				71.11		1014			
2	314	37.19			17.72	1015	261.04	171.31	971.63
			76.08			1016			
			76.08			1017			
			76.10			1018			
				37.19		1019			
1	242	14.46			17.30	1020	0.00	170.07	972.87
			45.63			1021			
			45.65			1022			
			45.65			1023			
				14.46		1024			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: op of 1.5" Casing Probe Type: Westbay Date: 1/30/97 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: Sunny and 65 °F Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.34/17.43/0903 Finish: 14.46/17.46/0930

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	900	270.45			21.75	904	308.37	212.11	952.94
			312.17			905			
			312.18			906			
			312.17			907			
				270.42		908			
4	700	183.49			22.82	910	309.34	215.48	949.57
			224.18			911			
			224.20			912			
			224.17			913			
				183.49		914			
3	562	123.50			22.03	915	310.04	212.55	952.50
			165.78			916			
			165.75			917			
			165.74			918			
				123.49		919			
2	392	49.67			19.90	920	310.85	216.99	948.06
			90.38			921			
			90.35			922			
			90.37			923			
				49.68		924			
1	230	14.39			17.81	925	0.00	220.45	944.60
			18.53			926			
			18.56			927			
			18.56			928			
				14.43		929			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: op of 1.5" Casing Probe Type: Westbay Date: 1/30/97 Job No.: 1572

Serial No.: 1455 Well Name: MW-21

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

Weather: Sunny and 65 °F Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.44/18.63/1045 Finish: 14.51/19.11/1113

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	372	111.77			19.52	1048	147.70	72.73	986.37
			144.26			1049			
			144.29			1050			
			144.24			1051			
				111.75		1052			
4	310	84.79			20.26	1053	148.00	72.75	986.35
			117.39			1054			
			117.42			1055			
			117.42			1056			
				84.79		1057			
3	240	54.79			19.82	1058	148.37	73.21	985.89
			87.45			1059			
			87.42			1100			
			87.40			1101			
				54.88		1102			
2	161	20.49			19.73	1103	148.70	73.61	985.49
			53.05			1104			
			53.03			1105			
			53.05			1106			
				20.48		1107			
1	90	14.46			19.09	1108	0.00	76.39	982.71
			20.36			1109			
			20.34			1110			
			20.36			1111			
				14.44		1112			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: op of 1.5" Casing Probe Type: Westbay Date: 2/25/97 Job No.: 1572

Serial No.: 1455 Well Name: MW-3

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

Weather: Sunny and 75 °F Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.36/19.43/1555 Finish: 14.24/19.48/1614

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	179.44			22.49	1600	271.19	218.48	881.86
			202.29			1600			
			202.27			1600			
			202.32			1601			
				179.43		1601			
4	558	138.22			22.91	1602	271.67	200.92	899.42
			168.87			1602			
			168.90			1603			
			168.87			1603			
				138.19		1604			
3	346	46.16			22.11	1605	272.68	132.91	967.43
			106.76			1605			
			106.74			1606			
			106.76			1607			
				46.16		1607			
2	252	14.44			20.76	1608	0.00	127.82	972.52
			68.29			1608			
			68.24			1609			
			68.27			1609			
				14.44		1610			
1	172	14.37			19.95	1610	0.00	106.60	993.74
			42.71			1611			
			42.73			1612			
			42.71			1613			
				14.36		1614			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: op of 1.5" Casing Probe Type: Westbay Date: 2/25/97 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: Sunny and 75 °F Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.31/24.45/1445 Finish: 14.40/22.7/1510

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	513	126.59			23.59	1445	252.95	185.36	897.48
			155.90			1446			
			155.92			1447			
			155.87			1448			
				126.61		1449			
4	392	74.00			22.74	1450	253.56	116.60	966.24
			133.38			1451			
			133.35			1452			
			133.38			1453			
				73.99		1454			
3	322	43.68			22.42	1454	254.90	108.88	973.96
			107.01			1455			
			106.98			1456			
			106.96			1457			
				43.67		1458			
2	240	14.44			23.46	1459	0.00	103.46	979.38
			73.66			1500			
			73.63			1501			
			73.68			1502			
				14.50		1503			
1	150	14.45			23.14	1504	0.00	73.30	1009.54
			47.71			1505			
			47.68			1506			
			47.71			1507			
				14.45		1508			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: op of 1.5" Casing Probe Type: Westbay Date: 2/25/97 Job No.: 1572

Serial No.: 1455 Well Name: MW-11

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

Weather: Sunny and 75 °F Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.34/20.38/1649 Finish: 14.34/19.06/1709

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	639	159.68			21.43	1657	300.01	223.77	915.53
			192.72			1658			
			192.75			1659			
			192.70			1700			
				159.66		1701			
4	524	110.20			21.20	1702	300.62	160.20	979.10
			171.10			1702			
			171.07			1702			
			171.07			1703			
				110.22		1703			
3	429	69.37			20.76	1703	301.05	160.68	978.62
			130.18			1704			
			130.25			1705			
			130.23			1705			
				69.36		1706			
2	259	14.44			19.89	1706	0.00	143.94	995.36
			64.31			1706			
			64.33			1707			
			64.31			1707			
				14.44		1708			
1	149	14.39			19.31	1708	0.00	106.32	1032.98
			32.88			1708			
			32.88			1709			
			32.90			1709			
				14.39		1709			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: op of 1.5" Casing Probe Type: Westbay Date: 2/25/97 Job No.: 1572

Serial No.: 1455 Well Name: MW-12

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

Weather: Sunny and 75 ^{0}F Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.37/28.18/1522 Finish: 14.48/18.50/1543

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	548	148.30			24.05	1526	238.93	194.59	907.55
			167.54			1527			
			167.51			1528			
			167.54			1529			
				148.32		1530			
4	436	99.66			22.42	1532	239.50	140.03	962.11
			142.76			1532			
			142.78			1533			
			142.78			1533			
				99.63		1534			
3	323	50.60			20.85	1534	240.08	125.62	976.52
			100.21			1535			
			100.23			1536			
			100.20			1537			
				50.57		1538			
2	243	15.88			19.07	1539	240.48	119.58	982.56
			68.28			1540			
			68.26			1541			
			68.30			1541			
				15.85		1542			
1	140	14.36			18.65	1542	0.00	84.29	1017.85
			38.51			1542			
			38.53			1543			
			38.48			1543			
				14.36		1543			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: op of 1.5" Casing Probe Type: Westbay Date: 2/25/97 Job No.: 1572

Serial No.: 1455 Well Name: MW-14

Elevation of Datum(ft msl): 1173.47 Range: 0 to 750 psia Weather: Sunny and 75 °F

Client: Jet Propulsion Laboratory

Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.29/20.14/1358 Finish: 14.25/22.23/1426

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	540	145.03			20.94	1401	238.51	171.68	1001.79
			173.98			1402			
			174.01			1403			
			173.96			1404			
				144.99		1405			
4	456	108.51			21.10	1406	238.97	171.43	1002.04
			137.78			1407			
			137.76			1408			
			137.80			1409			
				108.49		1410			
3	382	76.32			20.80	1411	239.32	171.38	1002.09
			105.77			1412			
			105.75			1413			
			105.75			1414			
				76.30		1415			
2	277	30.71			20.57	1416	239.88	171.53	1001.94
			60.33			1417			
			60.31			1418			
			60.36			1419			
				30.68		1420			
1	207	14.34			22.32	1421	0.00	170.83	1002.64
			30.03			1422			
			30.06			1423			
			30.03			1424			
				14.37		1425			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: op of 1.5" Casing Probe Type: Westbay Date: 2/25/97 Job No.: 1572

Serial No.: 1455 Well Name: MW-17

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

Weather: Sunny and 75 °F Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.34/13.39/0740 Finish: 14.29/15.54/0810

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	726	215.36			20.01	745	262.42	279.14	912.07
			208.10			746			
			208.09			747			
			208.10			748			
				215.33		749			
4	582	152.73			19.41	750	263.08	285.20	906.01
			143.12			751			
			143.11			752			
			143.11			753			
				152.66		754			
3	468	103.11			16.85	755	263.63	233.18	958.03
			116.35			756			
			116.35			757			
			116.33			758			
				103.17		759			
2	370	60.63			16.03	800	264.11	222.82	968.39
			78.53			801			
			78.51			802			
			78.56			803			
				60.62		804			
1	250	14.41			15.60	805	0.00	187.99	1003.22
			41.26			806			
			41.30			807			
			41.30			808			
				14.41		809			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: op of 1.5" Casing Probe Type: Westbay Date: 2/25/97 Job No.: 1572

Serial No.: 1455 Well Name: MW-18

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

Weather: Sunny and 65 ^{0}F Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.32/14.89/0823 Finish: 14.22/17.51/0848

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	151.19			19.14	826	367.93	286.15	939.26
			186.62			827			
			186.64			828			
			186.63			829			
				151.16		830			
4	564	99.01			20.42	831	368.55	285.74	939.67
			134.91			832			
			134.91			833			
			134.91			834			
				99.00		835			
3	424	38.27			19.69	836	369.25	259.01	966.40
			86.06			837			
			86.03			838			
			86.05			839			
				38.24		840			
2	330	14.41			18.21	841	0.00	248.09	977.32
			49.90			841			
			49.92			842			
			49.95			842			
				14.39		843			
1	270	14.36			17.79	843	0.00	243.08	982.33
			26.02			844			
			26.02			844			
			26.02			845			
				14.34		845			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: op of 1.5" Casing Probe Type: Westbay Date: 2/25/97 Job No.: 1572

Serial No.: 1455 Well Name: MW-19

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

Weather: Sunny, windy, and 70 ^{0}F Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.42/25.23/1250 Finish: 14.51/16.76/1315

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	498	140.02			21.69	1253	206.84	277.08	865.86
			109.59			1254			
			109.57			1255			
			109.59			1256			
				140.03		1257			
4	444	116.59			19.40	1258	206.98	273.62	869.32
			87.69			1259			
			87.72			1300			
			87.72			1301			
				116.60		1302			
3	392	94.08			19.06	1303	207.11	187.13	955.81
			102.73			1304			
			102.73			1305			
			102.75			1306			
				94.08		1307			
2	314	60.41			17.88	1307	207.30	183.10	959.84
			70.91			1308			
			70.88			1309			
			70.91			1310			
				60.41		1311			
1	242	29.21			17.06	1311	207.41	165.31	977.63
			47.46			1312			
			47.41			1313			
			47.48			1314			
				29.19		1315			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: op of 1.5" Casing Probe Type: Westbay Date: 2/25/97 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: Sunny and 70 °F Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.29/16.89/0857 Finish: 14.34/16.98/0930

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings			Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
		Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)					
5	900	269.83			21.49	904	309.61	204.81	960.24
			315.25			905			
			315.26			906			
			315.28			907			
				269.82		908			
4	700	182.88			22.30	909	310.61	208.05	957.00
			227.35			910			
			227.33			911			
			227.35			912			
				182.87		913			
3	562	122.92			20.99	914	311.25	216.19	948.86
			164.15			915			
			164.18			916			
			164.15			917			
				122.97		918			
2	392	49.21			17.43	920	312.10	209.77	955.28
			93.58			921			
			93.60			922			
			93.60			923			
				49.24		924			
1	230	14.56			17.04	925	0.00	211.22	953.83
			22.68			926			
			22.70			927			
			22.70			928			
				14.53		929			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: op of 1.5" Casing Probe Type: Westbay Date: 2/25/97 Job No.: 1572

Serial No.: 1455 Well Name: MW-21

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

Weather: Sunny, windy, and 75 °F Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.39/19.74/1328 Finish: 14.44/19.32/1340

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	372	131.71			20.18	1329	101.17	64.47	994.63
			147.62			1329			
			147.64			1330			
			147.59			1330			
				131.71		1331			
4	310	104.77			20.44	1332	101.49	64.47	994.63
			120.82			1332			
			120.79			1333			
			120.79			1333			
				104.72		1334			
3	240	74.78			19.77	1334	101.81	64.26	994.84
			91.01			1334			
			91.04			1335			
			91.06			1335			
				74.73		1335			
2	161	40.46			19.28	1336	102.18	63.77	995.33
			57.13			1336			
			57.08			1336			
			57.13			1337			
				40.46		1337			
1	90	14.38			19.31	1337	0.00	63.70	995.40
			25.78			1338			
			25.75			1339			
			25.78			1340			
				14.36		1340			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: op of 1.5" Casing Probe Type: Westbay Date: 3/10/97 Job No.: 1572

Serial No.: 1455 Well Name: MW-3

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

Weather: Sunny and 80 °F Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.80/24.16/1035 Finish: 14.36/18.95/1115

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	653	179.34			23.65	1035	271.78	226.20	874.14
			199.11			1036			
			199.13			1037			
			199.08			1038			
				179.35		1039			
4	558	138.15			23.61	1044	272.28	205.22	895.12
			167.22			1045			
			167.22			1046			
			167.19			1047			
				138.13		1048			
3	346	46.16			22.16	1052	273.29	134.90	965.44
			106.15			1053			
			106.13			1054			
			106.15			1055			
				46.14		1056			
2	252	14.69			20.79	1100	0.00	129.99	970.35
			67.56			1101			
			67.58			1102			
			67.58			1103			
				14.66		1104			
1	172	14.58			19.61	1008	0.00	109.72	990.62
			41.59			1009			
			41.56			1010			
			41.56			1011			
				14.56		1012			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: op of 1.5" Casing Probe Type: Westbay Date: 3/10/97 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: Sunny and 80 °F Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.79/23.47/1310 Finish: 14.56/20.61/1335

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	513	126.74			23.43	1310	253.37	189.56	893.28
			154.38			1311			
			154.38			1312			
			154.40			1313			
				126.71		1314			
4	392	74.17			22.84	1316	253.96	118.25	964.59
			132.86			1317			
			132.89			1318			
			132.89			1319			
				73.92		1320			
3	322	43.75			23.62	1321	254.31	109.56	973.28
			106.52			1322			
			106.49			1323			
			106.52			1324			
				43.77		1325			
2	240	14.71			21.60	1326	0.00	105.70	977.14
			72.96			1327			
			72.94			1328			
			72.94			1329			
				14.74		1330			
1	150	14.64			20.98	1331	0.00	77.73	1005.11
			45.99			1332			
			46.01			1333			
			46.03			1334			
				14.71		1335			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: op of 1.5" Casing Probe Type: Westbay Date: 3/10/97 Job No.: 1572

Serial No.: 1455 Well Name: MW-11

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

Datum(ft msl): 1139.30 Weather: Sunny and 80 °F Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 15.16/31.10/1005 Finish: 15.10/29.63/1045

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	159.36			21.35	1005	301.31	229.04	910.26
			190.66			1006			
			190.69			1007			
			190.66			1008			
				159.32		1009			
4	524	110.05			21.40	1013	301.80	168.12	971.18
			168.00			1014			
			168.00			1015			
			168.00			1016			
				110.05		1017			
3	429	68.91			21.49	1021	302.18	163.47	975.83
			129.07			1022			
			129.02			1023			
			129.04			1024			
				68.91		1025			
2	259	14.83			27.51	1029	0.00	146.24	993.06
			63.68			1030			
			63.73			1031			
			63.71			1032			
				14.83		1033			
1	149	15.03			29.90	1037	0.00	107.22	1032.08
			33.08			1038			
			33.13			1039			
			33.10			1040			
				14.95		1041			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: op of 1.5" Casing Probe Type: Westbay Date: 3/10/97 Job No.: 1572

Serial No.: 1455 Well Name: MW-12

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

Weather: Sunny and 80 °F Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.74/25.69/1340 Finish: 14.43/17.99/1410

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	548	192.25			22.84	1340	137.40	198.14	904.00
			165.91			1341			
			165.94			1342			
			165.91			1343			
				192.25		1344			
4	436	143.56			21.64	1346	137.95	141.43	960.71
			142.04			1347			
			142.09			1348			
			142.06			1349			
				143.58		1350			
3	323	94.39			20.17	1352	138.51	126.68	975.46
			99.54			1353			
			99.51			1354			
			99.54			1355			
				94.41		1356			
2	243	59.64			19.29	1358	138.89	120.83	981.31
			67.48			1359			
			67.50			1400			
			67.50			1401			
				59.67		1402			
1	140	14.90			18.31	1405	0.00	89.57	1012.57
			36.73			1406			
			36.75			1407			
			36.73			1408			
				14.85		1409			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: op of 1.5" Casing Probe Type: Westbay Date: 3/10/97 Job No.: 1572

Serial No.: 1455 Well Name: MW-14

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

Weather: Sunny and 80 °F Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.75/26.93/1235 Finish: 14.46/20.17/1305

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	540	144.78			23.81	1235	239.47	172.07	1001.40
			174.02			1236			
			173.99			1237			
			173.99			1238			
				144.77		1239			
4	456	108.26			22.48	1241	239.90	171.64	1001.83
			137.82			1242			
			137.85			1243			
			137.85			1244			
				108.23		1245			
3	382	76.06			21.40	1247	240.29	171.69	1001.78
			105.80			1248			
			105.79			1249			
			105.80			1250			
				76.06		1251			
2	277	30.44			20.57	1252	240.82	171.75	1001.72
			60.36			1253			
			60.41			1254			
			60.38			1255			
				30.44		1256			
1	207	14.56			20.23	1257	0.00	170.85	1002.62
			30.22			1258			
			30.24			1259			
			30.24			1300			
				14.56		1301			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: op of 1.5" Casing Probe Type: Westbay Date: 3/10/97 Job No.: 1572

Serial No.: 1455 Well Name: MW-17

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

Weather: Sunny and 65 °F Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.62/22.75/0805 Finish: 14.239/17.73/0835

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	726	215.17			21.16	807	262.65	297.62	893.59
			200.03			808			
			200.00			809			
			200.03			810			
				215.19		811			
4	582	152.65			19.28	815	263.38	289.82	901.39
			141.18			816			
			141.16			817			
			141.16			818			
				152.61		819			
3	468	103.07			18.38	821	263.96	233.69	957.52
			116.20			822			
			116.18			823			
			116.22			824			
				103.08		825			
2	370	60.46			16.68	826	264.44	223.93	967.28
			78.03			827			
			77.98			828			
			78.03			829			
				60.43		830			
1	250	14.41			16.00	831	0.00	192.45	998.76
			39.41			832			
			39.38			833			
			39.41			834			
				14.48		835			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: op of 1.5" Casing Probe Type: Westbay Date: 3/10/97 Job No.: 1572

Serial No.: 1455 Well Name: MW-18

Elevation of Datum(ft msl): 1225.41 Range: 0 to 750 psia Weather: Sunny and 80 °F

Client: Jet Propulsion Laboratory

Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.51/19.59/0850 Finish: 14.29/17.86/0925

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	684	151.15			21.04	850	368.12	297.74	927.67
			181.68			851			
			181.66			852			
			181.66			853			
				151.17		854			
4	564	99.08			21.07	857	368.78	288.09	937.32
			134.07			858			
			134.09			859			
			134.07			900			
				99.11		901			
3	424	38.39			18.92	905	369.42	259.87	965.54
			85.81			906			
			85.81			907			
			85.83			908			
				38.29		909			
2	330	14.53			18.26	913	0.00	247.83	977.58
			50.14			914			
			50.17			915			
			50.19			916			
				14.56		917			
1	270	14.46			17.95	920	0.00	242.55	982.86
			26.38			921			
			26.33			922			
			26.36			923			
				14.46		924			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: op of 1.5" Casing Probe Type: Westbay Date: 3/10/97 Job No.: 1572

Serial No.: 1455 Well Name: MW-19

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

Weather: Sunny and 80 °F Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.56/20.11/0945 Finish: 14.31/16.65/1015

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	498	140.16			19.57	945	206.92	280.53	862.41
			108.23			946			
			108.25			947			
			108.23			948			
				140.13		949			
4	444	116.70			18.82	953	207.04	276.98	865.96
			86.37			954			
			86.34			955			
			86.39			956			
				116.67		957			
3	392	94.25			18.32	1000	207.16	187.83	955.11
			102.62			1001			
			102.65			1002			
			102.60			1003			
				94.22		1004			
2	314	60.44			18.12	1006	207.33	183.69	959.25
			70.67			1007			
			70.66			1008			
			70.64			1009			
				60.37		1010			
1	242	29.19			17.19	1010	207.52	167.22	975.72
			46.68			1011			
			46.63			1012			
			46.65			1013			
				29.16		1014			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: op of 1.5" Casing Probe Type: Westbay Date: 3/10/97 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: Sunny and 70 °F Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.56/19.96/1150 Finish: 14.39/17.46/1230

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	269.74			21.90	1150	309.93	206.56	958.49
			314.55			1151			
			314.58			1152			
			314.53			1153			
				269.73		1154			
4	700	182.91			22.63	1158	310.89	226.02	939.03
			219.72			1159			
			219.70			1200			
			219.72			1201			
				182.93		1202			
3	562	123.05			21.38	1206	311.55	216.16	948.89
			164.38			1207			
			164.40			1208			
			164.38			1209			
				123.02		1210			
2	392	49.20			18.69	1214	312.42	207.67	957.38
			94.55			1215			
			94.62			1216			
			94.59			1217			
				49.16		1218			
1	230	14.46			17.58	1222	0.00	208.06	956.99
			23.99			1223			
			23.97			1224			
			23.98			1225			
				14.48		1226			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

PIEZOMETRIC PRESSURES/LEVELS

FIELD DATA SHEET FOR MULTI-PORT MONITORING WELLS

Datum: op of 1.5" Casing Probe Type: Westbay Date: 3/10/97 Job No.: 1572

Serial No.: 1455 Well Name: MW-21

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

Weather: Sunny and 80 °F Casing Size: 1.5-inch Westbay Casing

Operator: J. Brenner, T. Choi

Ambient Reading (Pressure/Temperature/Time) Start: 14.82/24.37/1125 Finish: 14.49/19.48/1146

Screen No.:	Depth (ft btoc)	Fluid Pressure Readings: Inside Casing (psia)	Outside Casing (psia)	Inside Casing (psia)	Temp. (C)	Time (hrs:min)	Depth to Water (ft)	Piezometric Level Outside Port (ft)	Water Level Elevation (ft)
5	372	131.91			22.86	1125	101.25	65.15	993.95
			147.58			1126			
			147.58			1127			
			147.55			1128			
				131.93		1129			
4	310	104.95			21.56	1130	101.55	65.15	993.95
			120.71			1131			
			120.73			1132			
			120.73			1133			
				104.92		1134			
3	240	74.88			20.17	1135	101.88	64.90	994.20
			90.92			1136			
			90.89			1137			
			90.92			1138			
				74.88		1139			
2	161	40.61			19.62	1139	102.24	64.27	994.83
			57.06			1140			
			57.08			1141			
			57.03			1142			
				40.59		1143			
1	90	14.56			19.44	1143	0.00	63.43	995.67
			26.09			1144			
			26.07			1145			
			26.05			1146			
				14.53		1147			

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-18 Depth: 684 Date: 2-3-97

Well Name: MW-18 Sampling Zone No.: SCREEN 5 Starting Time: 0900 Finishing Time: 11:00

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

Water Level Inside MP Casing (Beginning of Session) 153.26 PSIA (End of Session) 153.14 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	153.26	✓	0932	0935	✓	153.26	1.0	1st RUN PRIOR SAMPLING; RINSE BOTTLE. INITIAL PARAMETERS; NTU's = 3.20
2	✓	✓	✓	✓	✓	✓	153.20	✓	1004	1007	✓	153.23	1.0	2nd RUN; SAMPLE MW-971-49; ~~2VOA~~ METALS, ANIONS
3	✓	✓	✓	✓	✓	✓	153.11	✓	1044	1047	✓	153.14	1.0	3rd RUN; ~~2VOA~~ 2VOA's, Cr+6, T-P; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-18 Depth: 564 Date: 2-3-97

Well Name: MW-18 Sampling Zone No.: SCREEN 4 Starting Time: 11:07 Finishing Time: 1230

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

Water Level Inside MP Casing (Beginning of Session) 101.01 ~~14.28~~ PSIA (End of Session) 100.55 ~~14.12~~ PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	101.01	✓	1119	1122	✓	101.03	1.0	1st RUN TO SCREEN 4; NTU = 3.63 INITIAL PARAMETERS PRIOR SAMPLING
2	✓	✓	✓	✓	✓	✓	101.01	✓	1149	1152	✓	101.03	1.0	2nd RUN TO SCREEN 3; ~~NTU~~ SAMPLE MW-971-48: LUCAS, METALS, ANIONS
3	✓	✓	✓	✓	✓	✓	100.54	✓	1215	1217	✓	100.55	0.75	3rd RUN @ SCREEN 3; FINISH SAMPLING MW-971-48: Cr+6, T-P, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 2.75

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Samplin

Field Data Sheet for Multi-Port We

Project: JPL Location: MW-18 Depth: 424 Date: 2-3-97

Well Name: MW-18 Sampling Zone No.: SCREEN 3 Starting Time: 1235 Finishing Time: 1350

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

Water Level Inside MP Casing (Beginning of Session) 40.20 ~~14.25~~ PSIA (End of Session) 40.15 ~~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	✓	✓	✓	✓	✓	✓	40.20	✓	1241	1245	✓	40.22	1.0	1st RUN SCREEN 3; NTU's = ~~0.71~~ 3.27; INITIAL PARAMETERS
2	✓	✓	✓	✓	✓	✓	40.18	✓	1307	1310	✓	40.20	1.0	2nd RUN SCREEN 3; ~~FEE~~ SAMPLE MW-97-[illegible] 6 VOAs, METALS, ANIONS, Σ MW-97-47MS/[illegible]
3	✓	✓	✓	✓	✓	✓	40.11	✓	1332	1335	✓	40.15	1.0	3rd RUN SCREEN 3; T-P, Cr+6, FINAL PARAMETERS.
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-18 Depth: 330 Date: 2-[illegible]-97

Well Name: MW-18 Sampling Zone No.: SCREEN 2 Starting Time: 0900 Finishing Time: 1005

Technicians: J. BRENNER, T. CHO

Water Level Inside MP Casing (Beginning of Session) ~~14.39~~ 14.39 PSIA (ATMOSPHERIC) (End of Session) 14.41 PSIA (ATMOSHER

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	✓	✓	✓	✓	✓	✓	14.39	✓	0907	0910	✓	14.43	1.0	1ST RUN TO SCREEN 2, INITIAL PARAMETERS NTUS = 0.71
2	✓	✓	✓	✓	✓	✓	14.39	✓	0931	0934	✓	14.39	1.0	2ND RUN, VOA'S, METALS, ANIONS
3	✓	✓	✓	✓	✓	✓	14.39	✓	0955	0958	✓	14.41	1.0	3RD RUN, HEX. Cr, TP, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-18 Depth: 270 Date: 2-4-97

Well Name: MW-18 Sampling Zone No.: SCREEN 1 Starting Time: 1015 Finishing Time: 1125

Technicians J. BRONNER, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 14.36 PSIA (ATMOSPHERIC) (End of Session) 14.36 PSIA (ATMOSPHERIC

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	✓	✓	✓	✓	✓	✓	14.36	✓	1019	1026	✓	14.38	1.0	1ST RUN TO SCREEN 1; INITIAL PARAMET NTUS = 2[illegible]
2	✓	✓	✓	✓	✓	✓	14.3[illegible]	✓	1041	1048	✓	14.36	1.0	2ND RUN; 2VOA'S, METALS, ANIONS
3	✓	✓	✓	✓	✓	✓	14.42	✓	1106	1114	✓	14.36	1.0	3RD RUN; HEX Cr, TDP, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-17 Depth: 726 Date: 2-4-97

Well Name: MW-17 Sampling Zone No.: SCREEN 5 Starting Time: 1215 Finishing Time: 1540

Technicians J. BRENNER, T. CHOI

Water Level Inside MP Casing (Beginning of Session) [redacted] 170.24 PSIA (End of Session) 191.07 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	✓	✓	✓	✓	✓	✓	170.24	✓	1227	1230	✓	170.22	1.0	1ST RUN TO SCREEN 5; INITIAL PARAMETERS, NTUS = 78.9
2	✓	✓	✓	✓	✓	✓	170.21	✓	1307	1310	✓	170.22	1.0	2ND RUN FOR PARAMETERS; NTUS = 65.1
3	✓	✓	✓	✓	✓	✓	*191.10	✓	1451	1453	✓	*191.09	1.0	3RD RUN PRIOR TO SAMPLING NTUS = 17.5
4	✓	✓	✓	✓	✓	✓	191.08	✓	1526	1524	✓	191.07	1.0	4TH RUN PRIOR TO SAMPLING
5														
6														
7														
8														
9														
10														
11														
12														

Comments: * WELL PURGED TO REDUCE TURBIDITY, WATER PURGED FROM OUTSIDE WESTBAY CASING FOR 35 MINUTES TO BRING WATER LEVEL UP APPROX. 20 PSIA INSIDE MP CASING

Total Volume: 4.0

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-17 Depth: 726 Date: 2-5-97

Well Name: MW-17 Sampling Zone No.: SCREEN 5 Starting Time: 0820 / 1355 Finishing Time: 1145 / 1530

Technicians: J. BRENNER, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 191.06 ~~19.40~~ PSIA (End of Session) 206.65 ~~19.43~~ PSIA

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	191.06	✓	0829	0832	✓	191.07	1.0	1st RUN; NTUs = 12.9; INITIAL PARAMETERS, RINSING BOTTLES
2	✓	✓	✓	✓	✓	✓	190.97	✓	0909	0912	✓	190.95	1.0	2nd RUN; NTUs = 12.4; PRIOR SAMPLING
3	✓	✓	✓	✓	✓	✓	188.90	✓	0954	1032	✓	* 204.91	Ø	3rd RUN; ATTEMPTING TO REDUCE TURBIDITY
4	✓	✓	✓	✓	✓	✓	206.85	✓	1059	1102	✓	206.85	1.0	4th RUN PRIOR TO SAMPLING; NTUs = 26.7
5	✓	✓	✓	✓	✓	✓	206.82	✓	1131	1134	✓	206.83	1.0	5th RUN PRIOR TO SAMPLING; NTUs = 28.3 WILL TRY AGAIN LATER
6														
7	✓	✓	✓	✓	✓	✓	206.66	✓	1408	1411	✓	206.68	1.0	6th RUN PRIOR TO SAMPLING; NTUs = 20.4 HAVE PURGED ≈ 12 GALLONS
8	✓	✓	✓	✓	✓	✓	206.65	✓	1440	1443	✓	206.63	1.0	7th RUN; SAMPLE MW-971-44 VOAs, METALS, ANIONS
9	✓	✓	✓	✓	✓	✓	206.63	✓	1514	1517	✓	206.65	1.0	8th RUN; FINISH SAMPLING MW 971-44; Cr^{+6}, T-P, FINAL PARAMETERS
10														
11														
12														

F-2

Comments: WELL PURGED TO REDUCE TURBIDITY, WATER PURGED FROM OUTSIDE WEST BAY CASING FOR ≈ 30 MINUTES TO BRING WATER LEVEL OF INSIDE CASING UP ≈ 19 PSIA

Total Volume: 7.0 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-17 Depth: 532 Date: 2-5-97

Well Name: MW-17 Sampling Zone No.: SCREEN 4 Starting Time: 1203 Finishing Time: ~~1203~~ 1349

Technicians J. BRENNER, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 144.18 ~~PSI~~ PSIA (End of Session) 144.13 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	144.18	✓	1211	1214	✓	144.21	1.0	1ST RUN PRIOR SAMPLING; NTUS = 9.76 RINSE BOTTLES
2	✓	✓	✓	✓	✓	✓	144.16	✓	1239	1242	✓	144.18	1.0	2nd RUN FOR PARAMETERS; NTUS = 5.00
3	✓	✓	✓	✓	✓	✓	144.09	✓	1312	1315	✓	144.16	1.0	3RD RUN; 2 VOAS, METALS, ANIONS Cr+6; BEGIN SAMPLING MW-971-43
4	✓	✓	✓	✓	✓	✓	144.11	✓	1336	1339	✓	144.13	1.0	4th RUN FINISH SAMPLING MW-971-43 T-P, FINAL PARAMETERS
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments:

Total Volume: 4.0

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-17 Depth: 468 Date: [illegible]

Well Name: MW-17 Sampling Zone No.: SCREEN 3 Starting Time: 0840 Finishing Time: 1155

Technicians: J. BRENNER, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 94.52 PSIA (End of Session) 105.56 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	✓	✓	✓	✓	✓	✓	94.52	✓	0856	0859	✓	94.52	1.0	1ST RUN FOR INITIAL PARAMETERS NTU'S = 8.79
2	✓	✓	✓	✓	✓	✓	94.50	✓	0922	0925	✓	94.50	1.0	2ND RUN; NTU'S = 8.82 PARAMETERS
3	✓	✓	✓	✓	✓	✓	94.41	✓	0951	0954	✓	94.43	1.0	3RD RUN; NTU'S = 9.58
4	✓	✓	✓	✓	✓	✓	94.30	✓	1020	1023	✓	94.33	1.0	4TH RUN; NTU'S = 16.2
5	✓	✓	✓	✓	✓	✓	94.33	✓	1050	1118	✓	*103.98	Ø	*5TH RUN; OPENING PORT VALVE INTERMITT TO REDUCE TURBIDITY
6	✓	✓	✓	✓	✓	✓	105.53	✓	1137	1140	✓	105.56	1.0	6TH RUN; WILL RETURN TO SCREEN AFTER SCREENS 2+1
7														
8														
9														
10														
11														
12														

F-2

Comments: * OPENED VALVE @ SCREEN 3 TO PURGE ≈ 7.6 L OF WATER FROM AQUIFER INTO INNER CASING.

Total Volume: 5.0L + 7.59L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-17 Depth: 370 Date: 2-6-97

Well Name: MW-17 Sampling Zone No.: SCREEN 2 Starting Time: 1205 Finishing Time: 1315

Technicians: J. BRONNER, T. CHO

Water Level Inside MP Casing (Beginning of Session) 62.83 PSIA (End of Session) 62.33 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	✓	✓	✓	✓	✓	✓	62.83	✓	1219	1222	✓	62.84	1.0	1ST RUN; INITIAL PARAMETERS NTU'S = 2.20
2	✓	✓	✓	✓	✓	✓	62.83	✓	1242	1245	✓	62.85	1.0	2ND RUN; 2 VOAS, METALS, ANIONS 3/4 HEX CHROMIUM
3	✓	✓	✓	✓	✓	✓	62.31	✓	1304	1301	✓	62.33	0.75	3RD RUN; 1/4 HEX CHROM, T-P / FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 2.75 l

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Wells

Project: JPL Location: MW-17 Depth: 250 Date: 2-5-97

Well Name: MW-17 Sampling Zone No.: SCREEN 1 Starting Time: 1320 Finishing Time: 1420

Technicians: J. BRENNER, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 14.43 PSIA (ATMOSPHERIC) (End of Session) 14.39 PSIA (ATMOSPHERIC)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.43	✓	1327	1332	✓	14.46	1.0	1st RUN; INITIAL PARAMETERS NTUs = 2.85
2	✓	✓	✓	✓	✓	✓	14.49	✓	1345	1352	✓	14.47	1.0	2nd RUN; 200Aξ, METALS, ANIONS
3	✓	✓	✓	✓	✓	✓	14.42	✓	1407	1412	✓	14.39	0.75	3rd RUN; Cr^{+6}, T-P, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 2.75 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-17 Depth: 468 Date: 2-1-97

Well Name: MW-17 Sampling Zone No.: SCREEN 3 Starting Time: 0825 Finishing Time: 0945

Technicians J. BRENNER, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 105.54 ~~14.42~~ PSIA (End of Session) 104.95 ~~14.36~~ PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	105.54	✓	0837	0840	✓	105.53	1.0	1ST RUN PRIOR SAMPLING, NTU=4.57 INITIAL PARAMETERS
2	✓	✓	✓	✓	✓	✓	105.48	✓	0905	0908	✓	105.48	1.0	2ND RUN; ~~[illegible]~~ ; SAMPLING MW-97-42 BEGINS; ZVOAS METALS RI
3	✓	✓	✓	✓	✓	✓	104.92	✓	0930	0933	✓	104.95	0.75	3RD RUN; FINISH SAMPLING MW-97-42; CO_2, T-P, FINAL PARAM
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 2.75 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-20 Depth: 900 Date: 2-7-97

Well Name: MW-20 Sampling Zone No.: SCREEN 5 Starting Time: 1010 Finishing Time: 1150

Technicians J. BRENNER, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 272.30 ~~[illegible]~~ PSIA (End of Session) 271.70 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	✓	✓	✓	✓	✓	✓	272.30	✓	1023	1024	✓	272.31	1.0	1ST RUN PRIOR SAMPLING, RINSING BOTTLES; NTU'S = 2.23
2	✓	✓	✓	✓	✓	✓	272.28	✓	1058	1100	✓	272.27	1.0	2ND RUN; ~~[illegible]~~ MW-971-59, 2 VOAS, METALS, ANIONS
3	✓	✓	✓	✓	✓	✓	271.69	✓	1135	1137	✓	271.70	0.75	3RD RUN; SAMPLE MW-971-59; Cr+6, T-P FINAL
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 2.75

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-20 Depth: 700 Date: 2-7-97

Well Name: MW-20 Sampling Zone No.: SCREEN 24 Starting Time: 1200 Finishing Time: 1545

Technicians J. BRENNER, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 185.20 PSIA (End of Session) 184.67 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	✓	✓	✓	✓	✓	✓	185.20	✓	1439	1442	✓	185.20	1.0	1st RUN: INITIAL PARAMETERS; NTU'S = 17.9
2	✓	✓	✓	✓	✓	✓	185.20	✓	1504	1506	✓	185.20	1.0	2nd RUN: SAMPLE MW-97-53; 2VOAS, METALS, ANIONS, Cr+6
3	✓	✓	✓	✓	✓	✓	184.67	✓	1533	1535	✓	184.67	0.75	3rd RUN; FINISH SAMPLE MW-97-58; T-P, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 2.75

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-20 Depth: 562 Date: 2-10-97

Well Name: MW-20 Sampling Zone No.: SCREEN 3 Starting Time: 0850 Finishing Time: 1020

Technicians J. BRENNER / T. CHOI

Water Level Inside MP Casing (Beginning of Session) 125.16 PSIA (End of Session) 124.55 PSIA

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	125.16	✓	0908	0910	✓	125.18	1.0	1ST RUN PRIOR SAMPLING; RINSE BOTTLES INITIAL PARAMETERS; NTU'S = 2.48
2	✓	✓	✓	✓	✓	✓	125.10	✓	0937	0940	✓	125.13	1.0	2ND RUN; SAMPLE MW-971-57; 2 VOA'S METALS, ANIONS, Cr^{+6}
3	✓	✓	✓	✓	✓	✓	124.56	✓	1004	1007	✓	124.55	1.0	3RD RUN; SAMPLE MW-971-57; T-P, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-20 Depth: 392 Date: 2-10-97

Well Name: MW-20 Sampling Zone No.: SCREEN 2 Starting Time: 1025 Finishing Time: 1130

Technicians: J. BRENNER / T. CHOI

Water Level Inside MP Casing (Beginning of Session) 14.26 PSIA (ATMOSPHERIC) (End of Session) 14.29 PSIA (ATMOSPHE

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	✓	✓	✓	✓	✓	✓	51.19	✓	1034	1037	✓	51.19	1.0	1st RUN; INITIAL PARAMETERS PRIOR SAMP NTUs = 2.20
2	✓	✓	✓	✓	✓	✓	51.16	✓	1055	1058	✓	51.16	1.0	2nd RUN; SAMPLE MW-971-56; 2 VOAs METALS, ANIONS, 1/2 Cr+6
3	✓	✓	✓	✓	✓	✓	51.17	✓	1118	1121	✓	51.16	(1.0) ~~0.75~~	3rd RUN; FINISH SAMPLING MW-971-56 1/2 Cr+6, T-P; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-20 Depth: 250 Date: 2-10-97

Well Name: MW-20 Sampling Zone No.: SCREEN 1 Starting Time: 11:35 Finishing Time: 1239

Technicians J. BRENNER / T. CHOI

Water Level Inside MP Casing (Beginning of Session) 1439 PSIA (ATMOSPHERIC) (End of Session) 14.22 PSIA (ATMOSPHE

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	✓	1139	1149	✓	14.39	1.0	1ST RUN PRIOR SAMPLING, INITIAL PARAMETERS; NTUS = 29
2	✓	✓	✓	✓	✓	✓	14.39	✓	1202	1210	✓	14.36	1.0	2ND RUN, SAMPLE MW-971-SS; 2 VOAS METALS, ANIONS
3	✓	✓	✓	✓	✓	✓	14.27	✓	1224	1232	✓	14.34	1.0	3RD RUN: FINISH MW-971-SS; Cr^{+6}, T-P FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-19 Depth: 498' Date: 2-11-97

Well Name: MW-19 Sampling Zone No.: SCREEN 5 Starting Time: 0840 Finishing Time: 1430

Technicians: J. BRENNER / T. CHOI

Water Level Inside MP Casing (Beginning of Session) 119.16 PSIA (End of Session) 135.73* 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	✓	✓	✓	✓	✓	✓	119.16	✓	0854	0857	✓	119.13	1.0	1ST RUN; INITIAL PARAMETERS, NTU'S = 11.26
2	✓	✓	✓	✓	✓	✓	119.00	✓	0926	0929	✓	119.11	1.0	2ND RUN; NTU'S = 11.11
3	✓	✓	✓	✓	✓	✓	119.06	✓	1000	1003	✓	119.09	1.0	3RD RUN; NTU'S = 5.60 / FITTING ON BOTTLE NOT POSSIBLE LEAK
4	✓	✓	✓	✓	✓	✓	119.38	✓	1031	1034	✓	119.41	1.0	4TH RUN; NTU'S = 11.36
5	✓	✓	✓	✓	✓	✓	119.38	✓	1059	1102	✓	119.39	1.0	5TH RUN; NTU'S = 12.09
6	✓	✓	✓	✓	✓	✓	135.72	✓	1348	1351	✓	135.71	1.0	1ST RUN ~~SINCE~~ AFTER PURGING NTU'S = 3.78; METALS, ½ ANIONS
7	✓	✓	✓	✓	✓	✓	135.70	✓	1414	1417	✓	135.73	1.0	FINAL RUN; 2 VOAS, ½ ANIONS, HEX. Cr, T-P, ~~NTU~~ FINAL PARAMS, NTU'S =
8														
9														
10														
11														
12														

Comments: *PRESSURE INSIDE CASING ~~AFTER~~ PURGING 4.1 GALS OR 0.73 CASING VOLUMES FROM BETWEEN PACKERS, OUTSIDE WESTBAY CASING AT SCREEN 5

Total Volume: 70 l

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW - 19 Depth: 444 Date: 2/11/97

Well Name: MW - 19 Sampling Zone No.: SCREEN 4 Starting Time: 1245/1435 Finishing Time: 1330/1500

Technicians J. BRENNER / T. CHOI

Water Level Inside MP Casing (Beginning of Session) 112.36 PSIA (End of Session) 112.34 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	112.36	✓	1254	1257	✓	112.38	1.0	1ST RUN; INITIAL PARAMETERS NTUS = 20.1
2	✓	✓	✓	✓	✓	✓	112.34	✓	1318	1321	✓	112.34	1.0	2ND RUN; NTUS = 150 * WILL LEAVE SCREEN 4 TEMPORARILY TO RETURN TO SCREEN 5
3														
4	✓	✓	✓	✓	✓	✓	112.37	✓	1442	1447	✓	112.34	1.0	3RD RUN; NTUS = 14.1
5														* WILL LEAVE SCREEN 4 FOR
6														TODAY RETURN 2/12/97
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0

F-2

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-19 Depth: 392 Date: 2-11-97

Well Name: MW-19 Sampling Zone No.: SCREEN 3 Starting Time: 1336 Finishing Time: 1520

Technicians J. BRENNER / T. CHOI

Water Level Inside MP Casing (Beginning of Session) 76.15 ~~[illegible]~~ PSIA (End of Session) 74.94 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	76.15	✓	1344	1347	✓	76.16	1.0	1ST RUN PRIOR SAMPLING; RINSE BOTTLES; INITIAL PARAMETERS; NTUs = 4.30
2	✓	✓	✓	✓	✓	✓	74.93	✓	1424	1427	✓	74.96	1.0	2nd RUN PRIOR SAMPLING; RINSE NEW BOTTLES
3	✓	✓	✓	✓	✓	✓	74.93	✓	1446	1449	✓	74.94	1.0	3rd RUN; SAMPLE MW-971-52; 2 VOAs, MET ANIONS, ½ Cr+6
4	✓	✓	✓	✓	✓	✓	74.93	✓	1507	1510	✓	74.94	1.0	4th RUN; SAMPLE MW-971-52; ½ Cr+6, T-P, FINAL PARAMETERS
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 4.0

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-19 Depth: 444 Date: 2-12-97

Well Name: MW-19 Sampling Zone No.: SCREEN 4 Starting Time: 0850 Finishing Time: 1330

Technicians J.BRENNER / T.CHOI

Water Level Inside MP Casing (Beginning of Session) 14.38 PSIA (ATMOSPHERIC) (End of Session) 14.40 PSIA (ATMOSPHE

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	✓	✓	✓	✓	✓	✓	112.37	✓	0908	0901	✓	112.35	1.0	1ST RUN PRIOR SAMPLING, INITIAL PARAME RINSE BOTTLES; NTUs=9.73
2	✓	✓	✓	✓	✓	✓	112.28	✓	0933	0936	✓	112.28	1.0	2nd RUN; NTUs=10.46
3	✓	✓	✓	✓	✓	✓	112.28	✓	0959	1002	✓	112.28	1.0	3rd RUN; NTUs=10.60
4	✓	✓	✓	✓	✓	✓	112.28	✓	1025	1028	✓	112.28	1.0	4th RUN; NTUs=14.16
5	✓	✓	✓	✓	✓	✓	83.23	✓	1158	1232	✓	*≈97.76	(11.91)	*5th RUN OPENING SCREEN 4 VALVE TO PURG SCREEN IN ATTEMPT TO REDUCE TURBIDITY
6	✓	✓	✓	✓	✓	✓	98.73	✓	1251	1254	✓	98.73	1.0	6th RUN NTUs=10.1
7	✓	✓	✓	✓	✓	✓	98.76	✓	1315	1318	✓	98.76	1.0	7th RUN CONTINUE REDUCING TURBIDIT NTUs=12.1
8														
9														
10														
11														
12														

Comments: *OPENED VALVE @ SCREEN 4, MW-19, IN ATTEMPT TO REDUCE TURBIDITY. ALLOWED ≈11.91 L TO FLOW INTO INNER CASING FROM FORMATION

Total Volume: 6L
retrieve
17.91 L
from form

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-19 Depth: 444 Date: 7/13/97

Well Name: MW-19 Sampling Zone No.: SCREEN 4 Starting Time: 0845 Finishing Time: 0940

Technicians J. BRENNER / T. CHOI

Water Level Inside MP Casing (Beginning of Session) 97.61 PSIA (End of Session) 97.59 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	97.61	✓	0900	0901	✓	97.63	1.0	1ST RUN; INITIAL PARAMETERS NTU'S = 9.2
2	✓	✓	✓	✓	✓	✓	97.57	✓	0925	0928	✓	97.59	1.0	2ND RUN; NTU'S = 13.2
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 2.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-19 Depth: 242 Date: 2/13/97

Well Name: MW-19 Sampling Zone No.: SCREEN 1 Starting Time: 1420 Finishing Time: 1520

Technicians: J. BRENNER / T. CHOI

Water Level Inside MP Casing (Beginning of Session) 20.73 PSIA (End of Session) 20.75 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	~~20.73~~ ✓	20.73	✓	1425	1429	✓	20.73	1.0	1ST RUN; INITIAL PARAMETERS NTU'S = 9.6
2	✓	✓	✓	✓	✓	✓	20.73	✓	1446	1450	✓	20.75	1.0	2ND RUN: 2 VOAS, METALS, ANIONS, 1/2 HEX. Cr
3	✓	✓	✓	✓	✓	✓	20.70	✓	1506	1511	✓	20.75	1.0	FINAL RUN; 1/2 HEX Cr, T-P, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 30

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-19 Depth: 314 Date: 2/13/97

Well Name: MW-19 Sampling Zone No.: SCREEN 2 Starting Time: 1035 Finishing Time: 1200

Technicians J. BRENNER / T. CHOI

Water Level Inside MP Casing (Beginning of Session) 52.19 PSIA (End of Session) 51.97 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	✓	✓	✓	✓	✓	✓	52.19	✓	1042	1046	✓	52.19	1.0	1ST RUN; INITIAL PARAMETERS, NTU'S = 16
2	✓	✓	✓	✓	✓	✓	52.17	✓	1101	1105	✓	52.14	1.0	2ND RUN NTU'S = 16.4
3	✓	✓	✓	✓	✓	✓	52.09	✓	1124	1128	✓	52.12	1.0	3RD RUN; NTU'S = 18.6
4	✓	✓	✓	✓	✓	✓	52.03	✓	1144	1148	✓	51.97	1.0	4TH RUN. NTU'S = 14.7
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 4.0

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-19 Depth: 444 ft. Date: 2/14/9

Well Name: MW-19 Sampling Zone No.: SCREEN 4 Starting Time: 1310 Finishing Time: 1430

Technicians T. CHOI, J. BRENNER

Water Level Inside MP Casing (Beginning of Session) 118.18 ~~[illegible]~~ PSIA (End of Session) 118.18 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	118.18	✓	1345	1348	✓	118.14	1.0	1ST RUN @ SCREEN 4 PRIOR SAMPLING NTU's INITIAL PARAMETERS; METALS + 1/2 ANIONS ~~CINSE BOTTLES~~
2	✓	✓	✓	✓	✓	✓	118.16	✓	1409	1412	✓	118.18	1.0	2nd RUN FINISH SAMPLING MW-9 [illegible]-53; 2 VOA's, 1/2 ANIONS, Cr^{+6}, T-P
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 2.0

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-19 Depth: 314 Date: 2/18/97

Well Name: MW-19 Sampling Zone No.: SCREEN 2 Starting Time: 0830 Finishing Time: 1300

Technicians: T. BLANEY, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 61.85 ~~[illegible]~~ PSIA (End of Session) * PSIA

Run No.	Surface Function Checks: Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Position Sampler: Deactivate Set Arm Locate Port	Surface Collection Checks: Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	Comments
1	✓	✓	✓	✓	✓	✓	61.85	✓	0840	0843	✓	61.85	1.0	1ST RUN PRIOR SAMPLING; INITIAL PARAMETER
2						✓	14.44	✓	1115	1353	✓	* —	~~[illegible]~~	ATTEMPTING TO REDUCE TURBIDITY; PURGING 12.2 GALLONS
3													47.28	
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments: SAMPLE TOOL FAILED . . UNABLE TO TAKE FINAL MEASUREMENTS

Total Volume: ≈ ~~[illegible]~~ 12.4 gal or 48.28 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-19 Depth: 314 Date: 2-19-97

Well Name: MW-19 Sampling Zone No.: SCREEN 2 Starting Time: 1030 Finishing Time: 1125

Technicians T. BLANEY, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 61.21 ~~[illegible]~~ PSIA (End of Session) 60.72 ~~[illegible]~~ 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	✓	✓	✓	✓	✓	✓	61.21	✓	1037	1040	✓	61.22	1.0	1ST RUN PRIOR SAMPLING; RINSE BOTTLES; INITIAL PARAMETERS: NTU'S = 18.6
2	✓	✓	✓	✓	✓	✓	61.21	✓	1057	1100	✓	61.20	1.0	2ND RUN; SAMPLE MW-971-S1; 2 VOA'S, METALS, ANIONS, 1/2 Cr^{+6}
3	✓	✓	✓	✓	✓	✓	60.74	✓	1115	1117	✓	60.72	0.5	3RD RUN; SAMPLE MW-971-S1; 1/2 Cr^{+6} T-P, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 2.5 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-21 Depth: 372 Date: 2-20-97

Well Name: MW-21 Sampling Zone No.: SCREEN 5 Starting Time: 0845 Finishing Time: 1018

Technicians T. BLANEY, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 113.63 ~~PSIA~~ PSIA (End of Session) 113.52 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	113.63	✓	0857	0900	✓	113.61	1.0	1st RUN PRIOR SAMPLING, RINSE BOTTLES, NTUs = 26.2
2	✓	✓	✓	✓	✓	✓	113.58	✓	0920	0923	✓	113.59	1.0	2nd RUN, ATTEMPTING TO REDUCE TURBIDITY
3	✓	✓	✓	✓	✓	✓	113.55	✓	0942	0945	✓	113.59	1.0	3rd RUN, ATTEMPTING TO REDUCE TURBIDITY
4	✓	✓	✓	✓	✓	✓	113.51	✓	1005	1008	✓	113.52	1.0	4th RUN, ATTEMPTING TO REDUCE TURBIDITY
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 4.0 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-21 Depth: 310 Date: 2/20/97

Well Name: MW-21 Sampling Zone No.: SCREEN 4 Starting Time: 1021 Finishing Time: 1150

Technicians: T. BLANEY, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 86.52 ~~[illegible]~~ PSIA (End of Session) 86.43 ~~[illegible]~~ 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	✓	✓	✓	✓	✓	✓	86.52	✓	1036	1039	✓	86.55	1.0	1ST RUN PRIOR SAMPLING, RINSE BOTTLES; INITIAL PARAMETERS; NTU'S = 75.0
2	✓	✓	✓	✓	✓	✓	86.43	✓	1055	1058	✓	86.45	1.0	2ND Run Prior to Sampling NTU'S = 5.0; Ready to Sample
3	✓	✓	✓	✓	✓	✓	86.43	✓	1116	1119	✓	86.45	1.0	VOAS, metals, Anions, ½ Cr+6
4	✓	✓	✓	✓	✓	✓	86.41	✓	1137	1140	✓	86.43	1.0	½ Cr+6, T-P, Final Parameters
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 4.0 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-21 Depth: 240 Date: 2-20-97

Well Name: MW-21 Sampling Zone No.: SCREEN 3 Starting Time: 1155 Finishing Time: 1335

Technicians T. BLANEY, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 56.38 ~~[illegible]~~ PSIA (End of Session) 55.74 ~~[illegible]~~ 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	✓	✓	✓	✓	✓	✓	56.38	✓	1200	1203	✓	56.40	1.0	1st RUN PRIOR SAMPLING, RINSE ESTIMES; INITIAL PARAMETERS; NTUs = 17.35
2	✓	✓	✓	✓	✓	✓	56.39	✓	1216	1219	✓	56.40	1.0	2nd RUN ~~[illegible]~~ ATTEMPTING TO REDUCE TURBIDITY; NTUs = 12.7
3	✓	✓	✓	✓	✓	✓	56.34	✓	1234	1237	✓	56.35	1.0	3rd RUN ATTEMPTING TO REDUCE TURBIDITY; NTUs = 10.4
4	✓	✓	✓	✓	✓	✓	56.29	✓	1253	1256	✓	56.28	1.0	4th RUN ATTEMPTING TO REDUCE TURBIDITY; NTUs = 4.93
5	✓	✓	✓	✓	✓	✓	56.29	✓	1310	1313	✓	56.28	1.0	5th RUN; SAMPLE-MW 971-62; 200A's METALS, ANIONS 1/2 Cr+6
6	✓	✓	✓	✓	✓	✓	55.73	✓	1325	1328	✓	55.74	0.75	1/2 Cr+6 T-P Final Parameters
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 5.75 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-21 Depth: 161 Date: 2/20/97

Well Name: MW-21 Sampling Zone No.: 2 Starting Time: 1340 Finishing Time: 1422

Technicians T. Blaney, T. Choi

Water Level Inside MP Casing (Beginning of Session) 22.03 ~~[illegible]~~ PSIA (End of Session) 21.42 ~~[illegible]~~ PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	22.03	✓	1344	1348	✓	21.97	1.0	1ST RUN PRIOR SAMPLING; RINSE BOTTLES INITIAL PARAMETERS; NTU; =
2	✓	✓	✓	✓	✓	✓	22.01	✓	1358	1402	✓	21.97	1.0	2nd RUN; SAMPLE MW-971-61; 2 VOA's, METALS, ANIONS, ½ Cr^{+6}
3	✓	✓	✓	✓	✓	✓	21.55	✓	1415	1419	✓	21.42	1.0	3rd RUN; SAMPLE MW-971-61; ½ Cr^{+6}, T-P, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port Well

Project: JPL Location: MW-21 Depth: 90 Date: 2/21/97

Well Name: MW-21 Sampling Zone No.: 1 Starting Time: 0855 Finishing Time: 0940

Technicians: T. BLANY, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 14.49 ~~14.48~~ PSIA (ATMOSPHERIC) (End of Session) 14.53 ~~14.52~~ PSIA (ATMOSPHERIC)

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.49	✓	0857	0902	✓	14.53	1.0	125 Run @ Screen #1. Prior to Sampling. NTU's = 0.9.
2	✓	✓	✓	✓	✓	✓	14.53	✓	0911	0917	✓	14.53	1.0	Sample MW-971-60. VOA's, metals, Anions
3	✓	✓	✓	✓	✓	✓	14.53	✓	0927	0933	✓	14.53	1.0	Cr^{+6}, T-P + Final Parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

F-2

Comments:

Total Volume: 3.0 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-21 Depth: 372 Date: 2-24-97

Well Name: MW-21 Sampling Zone No.: SCREEN 5 Starting Time: 1058 Finishing Time: 1410

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

Water Level Inside MP Casing (Beginning of Session) 66.57 ~~[illegible]~~ PSIA (End of Session) *133.75 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						✓	66.57	✓	0828	1045	✓	* 132.14	≈14.14 gal 54.8 L	PURGING SCREEN 5 IN ATTEMPT TO REDUCE TURBIDITY
2	✓	✓	✓	✓	✓	✓	134.13	✓	1106	1109	✓	134.11	1.0	1st RUN @ SCREEN 5, RINSE BOTTLES; INITIAL PARAMETERS PRIOR SAMPLING N/U
3	✓	✓	✓	✓	✓	✓	134.06	✓	1128	1131	✓	134.07	1.0	2nd RUN ATTEMPTING TO REDUCE TURBIDITY
4	✓	✓	✓	✓	✓	✓	134.04	✓	1150	1153	✓	134.04	1.0	3rd RUN " "
5	✓	✓	✓	✓	✓	✓	133.97	✓	1212	1215	✓	133.97	1.0	4th RUN " "
6	✓	✓	✓	✓	✓	✓	133.89	✓	1235	1238	✓	133.92	1.0	5th RUN " "
7	✓	✓	✓	✓	✓	✓	133.89	✓	1255	1258	✓	133.89	1.0	6th RUN " "
8	✓	✓	✓	✓	✓	✓	133.86	✓	1316	1319	✓	133.87	1.0	7th RUN " "
9	✓	✓	✓	✓	✓	✓	133.79	✓	1338	1341	✓	133.80	1.0	8th RUN SAMPLE MW-971-64; 2 VOMS, METALS, ANIONS, CR+6
10	✓	✓	✓	✓	✓	✓	133.75	✓	1402	1404	✓	133.75	1.0	9th RUN; SAMPLE MW-971-64; T-P, FINAL PARAMETERS
11														
12														

Comments: * OPENED VALVE @ SCREEN 5, MW-21, IN AN ATTEMPT TO REDUCE TURBIDITY. PURGED ≈ 54.8 L FROM FORMATION INTO INNER CASING.

Total Volume: 63.8 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-14 Depth: 540 Date: 2-26-97

Well Name: MW-14 Sampling Zone No.: SCREEN 5 Starting Time: 0845 Finishing Time: 1000

Technicians T. BLANEY / T. CHOI

Water Level Inside MP Casing (Beginning of Session) 146.93 ~~14.57~~ PSIA (End of Session) 146.83 ~~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	✓	✓	✓	✓	✓	✓	146.93	✓	0859	0902	✓	146.95	1.0	1ST RUN PRIOR SAMPLING; RINSE BOTTLES; INITIAL PARAMETERS; NTU'S = 2.69
2	✓	✓	✓	✓	✓	✓	146.85	✓	0925	0927	✓	146.86	1.0	2ND RUN; SAMPLE MW-971-37; 2 VOA'S, METAL ANIONS, ½ Cr^{+6}
3	✓	✓	✓	✓	✓	✓	146.87	✓	0950	0953	✓	146.83	1.0	~~3RD RUN~~ SAMPLE MW-971-37; ½ Cr^{+6}, T-P; FINAL PARAMETERS; NTU'S =
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-14 Depth: 456 Date: 2-26-97

Well Name: MW-14 Sampling Zone No.: SCREEN 4 Starting Time: 1005 Finishing Time: 1125

Technicians T. BLANCY, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 110.27 PSIA (End of Session) 110.27 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	✓	✓	✓	✓	✓	✓	110.27	✓	1023	1026	✓	110.32	1.0	1ST RUN PRIOR SAMPLING; RINSE BOTTLES INITIAL PARAMETERS; NTU'S 410
2	✓	✓	✓	✓	✓	✓	110.25	✓	1045	1048	✓	110.27	1.0	2ND RUN; SAMPLE MW-971-36; 2WDAS METALS, ANIONS, Cr^{+6}
3	✓	✓	✓	✓	✓	✓	110.24	✓	1110	1113	✓	110.27	1.0	3RD RUN; SAMPLE: MW-971-36; T-P; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-14 Depth: 382 Date: 2-26-97

Well Name: MW-14 Sampling Zone No.: SCREEN 3 Starting Time: 1130 Finishing Time: 1225

Technicians T.BLANDY / T.CHOI

Water Level Inside MP Casing (Beginning of Session) (ATMOSPHERIC) 14.34 PSIA (End of Session) 14.32 PSIA (ATMOSPHE

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	✓	✓	✓	✓	✓	✓	78.03	✓	1137	1140	✓	78.05	1.0	1st PRIOR SAMPLING; RINSE BOTTLES; INITIAL PARAMETERS
2	✓	✓	✓	✓	✓	✓	78.05	✓	1156	1158	✓	78.05	1.0	2nd RUN: SAMPLE MW-971-35: 2 VOA Metals, ANIONS, Cr+6
3	✓	✓	✓	✓	✓	✓	78.03	✓	1216	1219	✓	78.03	1.0	3rd RUN: SAMPLE MW-971-35; T-P; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-14 Depth: 277 Date: 2-26-97

Well Name: MW-14 Sampling Zone No.: SCREEN 2 Starting Time: 1230 Finishing Time: 1357

Technicians T. BLANEY / T. CHOI

Water Level Inside MP Casing (Beginning of Session) 32.40 ~~PSI~~ PSIA (End of Session) 32.32 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	✓	✓	✓	✓	✓	✓	32.40	✓	1240	1243	✓	32.42	1.0	1ST RUN PRIOR SAMPLING; RINSE BOTTLES; INITIAL PARAMETERS; NTU'S = 15.2
2	✓	✓	✓	✓	✓	✓	32.37	✓	1256	1259	✓	32.34	1.0	2nd RUN; TRYING TO REDUCE TURBIDITY; NTU'S = 14.4
3	✓	✓	✓	✓	✓	✓	32.35	✓	1313	1316	✓	32.32	0.25 ~~1.0~~	3rd RUN; TRYING TO REDUCE TURBIDITY NTU'S = 4.99
4	✓	✓	✓	✓	✓	✓	32.35	✓	1327	1330	✓	32.32	1.0	~~3rd~~ 4th RUN; SAMPLE MW-971-34; 2 VOA'S, Metals, Anions, Cr^{+6}
5	✓	✓	✓	✓	✓	✓	32.35	✓	1344	1347	✓	32.32	1.0	5th RUN; SAMPLE MW-971-34; T-P; FINAL PARAMETERS
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 4.25 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-14 Depth: 207 Date: 2/27/97

Well Name: MW-14 Sampling Zone No.: 1 Starting Time: 0930 Finishing Time: 1130

Technicians: T. Blaney, T. Choi

Water Level Inside MP Casing (Beginning of Session) 14.42 psia (ATMOSPHERIC) (End of Session) 14.27 psia (ATMOSPHER

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	✓	0935	0942	✓	14.42	1.0	1ST Run Prior to Sampling NTUs = 4.02 Ready to Sample
2	✓	✓	✓	✓	✓	✓	14.36	✓	0957	1004	✓	14.36	1.0	Sample MW-971-33 VOAs, metals, Anions
3	✓	✓	✓	✓	✓	✓	14.24	✓	1113	1120	✓	14.27	1.0	Cr+6, T-P + Final Parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-4 Depth: 513 Date: 2/27/97

Well Name: MW-4 Sampling Zone No.: 5 Starting Time: 1205 Finishing Time: 1315

Technicians: T. Blaney

Water Level Inside MP Casing (Beginning of Session) 128.48 psia (End of Session) 127.92 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	✓	✓	✓	✓	✓	✓	128.48	✓	1216	1219	✓	128.51	1	1ST Run prior to Sampling NTU's = 4.44 ; Ready to Sample
2	✓	✓	✓	✓	✓	✓	128.40	✓	1242	1245	✓	128.41	1	Sample MW-971-12 VOA's, metals, Anions, + 1/2 Cr+6
3	✓	✓	✓	✓	✓	✓	127.91	✓	1305	1307	✓	127.92	0.75	1/2 Cr+6, T-P + Fixed Parameters.
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 2.75 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-4 Depth: 392 Date: 2/27/97

Well Name: MW-4 Sampling Zone No.: 4 Starting Time: 1320 Finishing Time: 1415

Technicians: T. BLANEY, T. Choi

Water Level Inside MP Casing (Beginning of Session) 75.80 psia (End of Session) 75.77 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	✓	✓	✓	✓	✓	✓	75.80	✓	1326	1329	✓	75.81	1	1st Run to Screen #4 Prior to Sampling. NTU's = 2.87
2	✓	✓	✓	✓	✓	✓	75.79	✓	1345	1347	✓	75.79	1	Sample MW-971-11 VOA's, metals, ANIONS
3	✓	✓	✓	✓	✓	✓	75.71	✓	1404	1407	✓	75.77	1	Cr+6, T-P, Field Parameters AFTER Sampling
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-4 Depth: 322 Date: 2/27/9

Well Name: MW-4 Sampling Zone No.: 3 Starting Time: 1420 Finishing Time: 1510

Technicians T. Blaney, T. Choi

Water Level Inside MP Casing (Beginning of Session) 45.34 psia (End of Session) 45.37 psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	45.34	✓	1426	1428	✓	45.37	1	1st Run to Screen #3 Prior to Sampling NTU's =
2	✓	✓	✓	✓	✓	✓	45.34	✓	1442	1445	✓	45.37	1	Sample MW-971-10 VOA's, metals, anions
3	✓	✓	✓	✓	✓	✓	45.33	✓	1500	1503	✓	45.37	1	Cr+6, T-P, Final Parameters After Sampling
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: ~~340~~ MW-4 Depth: 240 Date: 2-28-97

Well Name: MW-4 Sampling Zone No.: SCREEN 2 Starting Time: 0826 Finishing Time: 0916

Technicians: T. BLANEX / T. CHOI

Water Level Inside MP Casing (Beginning of Session) 14.34 PSIA (ATMOSPHERIC) (End of Session) 14.39 PSIA (ATMOSP

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	✓	0831	0834	✓	14.36	1.0	1ST RUN PRIOR SAMPLING RINSE BOTTLES; NTUS = 4.2
2	✓	✓	✓	✓	✓	✓	14.34	✓	0846	0849	✓	14.36	1.0	Sample MW-971-08; 2 VOAs, METALS Sample MW-971-09; 2 VOAs, METALS
3	✓	✓	✓	✓	✓	✓	14.31	✓	0903	0907	✓	14.39	1.0	SAMPLE MW-971-08; ANIONS; Cr^{+6}; T-P; FINA SAMPLE MW-971-09; ANIONS; Cr^{+6}; T-P; PARAM
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-4 Depth: 150 Date: 2/28/97

Well Name: MW-4 Sampling Zone No.: SCREEN 1 Starting Time: 0917 Finishing Time: 1005

Technicians T.BLANER/T.CHOI

Water Level Inside MP Casing (Beginning of Session) 14.26 PSIA (ATMOSPHERIC) (End of Session) 14.29 PSIA (ATMOSPHE

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	✓	0924	0928	✓	14.29	1.0	1ST Run Prior to Sampling. NTUs = 4.52
2	✓	✓	✓	✓	✓	✓	14.29	✓	0937	0942	✓	14.29	1.0	2nd RUN: SAMPLE MW-971-07; 2 VOAs, METALS, & ANIONS
3	✓	✓	✓	✓	✓	✓	14.29	✓	0954	0958	✓	14.29	1.0	LAST Run to Screen #1 Final Parameters
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-12 Depth: 548 Date: 2/28/97

Well Name: MW-12 Sampling Zone No.: SCREEN 5 Starting Time: ~~548~~ 1035 Finishing Time: 1145

Technicians T. BLANEY / T. CHOI

Water Level Inside MP Casing (Beginning of Session) 150.20 PSIA (End of Session) 150.18 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	150.20	✓	1042	1044	✓	150.21	1.0	1ST Run @ Screen #5 PRIOR TO Sampling. NTU's =
2	✓	✓	✓	✓	✓	✓	150.14	✓	1106	1108	✓	150.16	1.0	Sample MW-971-30. VOAS, metals, ANIONS
3	✓	✓	✓	✓	✓	✓	150.14	✓	1130	1132	✓	150.18	1.0	Final Run to Screen #5 Final Parameters, Cr^{+6}, T-P
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-12 Depth: 436 Date: 2/28/96

Well Name: MW-12 Sampling Zone No.: SCREEN 4 Starting Time: 1148 Finishing Time: 1255

Technicians: T. BLANEY / T. CHO

Water Level Inside MP Casing (Beginning of Session) 101.41 PSIA (End of Session) 101.34 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	101.41	✓	1156	1159	✓	101.44	1.0	1ST RUN PRIOR SAMPLING, RINSE BOTTLES; INITIAL PARAMETERS
2	✓	✓	✓	✓	✓	✓	101.39	✓	1218	1221	✓	101.44	1.0	2nd RUN, SAMPLE MW-971-29; 2 VOA'S, METALS, ANIONS
3	✓	✓	✓	✓	✓	✓	101.34	✓	1241	1244	✓	101.34	1.0	Cr^{+6}, T-P AND FINAL PARAMETERS AFTER SAMPLING
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-12 Depth: 323 Date: 2-28-97

Well Name: MW-12 Sampling Zone No.: 3 Starting Time: 1256 Finishing Time: 1356

Technicians T. BLANEY, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 52.29 psia (End of Session) 52.24 psia

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	52.29	✓	1303	1307	✓	52.29	1.0	1ST RUN PRIOR SAMPLING; RINSE BOTTLE INITIAL PARAMETERS; NTUs = 4.98
2	✓	✓	✓	✓	✓	✓	52.26	✓	1324	1327	✓	52.27	1.0	2ND RUN; SAMPLE MW-971-28; 2 VOAs, METALS, ANIONS
3	✓	✓	✓	✓	✓	✓	52.24	✓	1343	1346	✓	52.24	1.0	3RD RUN; SAMPLE MW-971-28; Cr^{+6}, T-P; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-12 Depth: 140 Date: 3/3/97

Well Name: MW-12 Sampling Zone No.: 1 Starting Time: 1030 Finishing Time: 1435

Technicians T. CHOI, J. BRENNER

Water Level Inside MP Casing (Beginning of Session) 14.44 PSIA (ATMOSPHERIC) (End of Session) 14.36 PSIA (ATMOSPHER

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	✓	✓	✓	✓	✓	✓	14.44	✓	1037	042	✓	14.44	1.0	1st RUN PRIOR SAMPLING, RINSE BOTTLES; INITIAL PARAMETERS; NTU's = 30.9
2	✓	✓	✓	✓	✓	✓	14.44	✓	1053	1058	✓	14.41	1.0	2nd RUN ATTEMPTING TO REDUCE TURBIDITY; NTU's = 35.1
3	✓	✓	✓	✓	✓	✓	14.44	✓	1108	1113	✓	14.44	1.0	3rd RUN; ATTEMPTING TO REDUCE TURBIDITY, NTU's = 28.9
4						✓	14.43	✓	1205	1350	✓	* 14.44		PURGING PORT TO REDUCE TURBIDITY
5	✓	✓	✓	✓	✓	✓	14.41	✓	1404	1409	✓	14.39	1.0	4th RUN; ATTEMPTING TO REDUCE TURBIDITY; NTU's = 6.8
6	✓	✓	✓	✓	✓	✓	14.41	✓	1422	1427	✓	14.36	1.0	
7														
8														
9														
10														
11														
12														

Comments: * OPENED VALVE @ SCREEN 1, MW-12, IN AN ATTEMPT TO REDUCE TURBIDITY.
PURGED ≈ 24.02 L OF FORMATION WATER INTO INNER CASING
INSIDE CASING: W/L (INITIAL) = 242.54' W/L (FINAL) = 175.16'

Total Volume: 5.0 L
+ 24.02 L
29.02 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-12 Depth: 243 Date: 3-3-97

Well Name: MW-12 Sampling Zone No.: SCREEN 2 Starting Time: 0810 Finishing Time: 1025

Technicians: T. CHOI, J. BRENNER

Water Level Inside MP Casing (Beginning of Session) 17.56 PSIA (End of Session) 17.53 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	✓	✓	✓	✓	✓	✓	17.56	✓	0815	0817	✓	17.65	1.0	1st RUN PRIOR SAMPLING, RINSE BOTTLES; INITIAL PARAMETERS; NTU'S = 2.45
2	✓	✓	✓	✓	✓	✓	17.58	✓	0830	0834	✓	17.60	1.0	2nd RUN; SAMPLE MW-971-27; METALS; ANIONS; Cr+6
3	✓	✓	✓	✓	✓	✓	17.56	✓	0852	0854	✓	17.60	1.0	3rd RUN; SAMPLE MW-971-27; 2 VOA's, T-F, 1/4 TBT; MW-971-27MS 2 VOA's; MW-971-27MSD
4	✓	✓	✓	✓	✓	✓	17.54	✓	0913	0917	✓	17.56	1.0	4th RUN; SAMPLE MW-971-27; 1/4 TBT; MW-971-27MS 1/4 TBT; MW-971-27MSD 1/4 TB
5	✓	✓	✓	✓	✓	✓	17.56	✓	0932	0935	✓	17.56	1.0	5th RUN; SAMPLE MW-971-27 1/4 TBT; MW-971-27MS 1/4 TBT, MW-971-27MSD 1/4 TBT
6	✓	✓	✓	✓	✓	✓	17.54	✓	0949	0952	✓	17.53	1.0	6th RUN; SAMPLE MW-971-27 1/4 TBT; MW-971-27MS 1/4 TBT, MW-971-27MSD 1/4 TB
7	✓	✓	✓	✓	✓	✓	17.54	✓	1005	1008	✓	17.53	1.0	7th RUN; MW-971-27MS 1/4 TBT; MW-971-27MSD 1/4 TBT
8	✓	✓	✓	✓	✓	✓	16.54	✓	1020	1022	✓	16.53	0.5	8th RUN; FINAL PARAMETERS
9														
10														
11														
12														

Comments:

Total Volume: 7.5L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-12 Depth: 140 Date: 3/4/97

Well Name: MW-12 Sampling Zone No.: 1 Starting Time: 0845 Finishing Time: 1450

Technicians J. BRENNAN, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 14.44 PSIA (ATMOSPHERIC) (End of Session) 17.02 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	✓	✓	✓	✓	✓	✓	14.44	✓	0850	0855	✓	14.46	1.0	1ST RUN; INITIAL PARAMETERS. NTU'S = 8.59
2	✓	✓	✓	✓	✓	✓	14.46	✓	0900	0913	✓	14.46	1.0	END 1RUN; NTU'S = 9.88
3	.					✓	14.46	✓	0936	1020	✓	*17.20	12.62*	3RD RUN – PURGING, TOOL SET IN PORT W/O SAMPLE BOTTLES
4	✓	✓	✓	✓	✓	✓	17.19	✓	1040	1045	✓	17.17	1.0	4TH RUN; NTU'S = 3.28 PRIOR TO SAMPLING
5	✓	✓	✓	✓	✓	✓	17.22	✓	1103	1100	✓	17.17	1.0	5TH RUN; 4 VOAS, ~~[illegible]~~ 2 METALS, 2 HEX Cr.
6	✓	✓	✓	✓	✓	✓	17.17	✓	1148	1153	✓	17.18	1.0	6TH RUN; ANIONS, T.P. 1/2 TBT
7	✓	✓	✓	✓	✓	✓	17.19	✓	1214	1219	✓	17.14	1.0	1 TBT
8	✓	✓	✓	✓	✓	✓	17.19	✓	1232	1237	✓	17.15	1.0	1 TBT
9	✓	✓	✓	✓	✓	✓	17.12	✓	1251	1256	✓	17.09	1.0	1 TBT
10	✓	✓	✓	✓	✓	✓	17.05	✓	1313	1318	✓	17.05	1.0	3/4 TBT
11	✓	✓	✓	✓	✓	✓	17.05	✓	1332	1338	✓	17.04	1.0	3/4 TBT
12	✓	✓	✓	✓	✓	✓	17.00	✓	1350	1403	✓	17.04	1.0	3/4 TBT

Comments: * VALVE OPENED @ SCREEN 1, MW-12, IN AN ATTEMPT TO REDUCE TURBIDITY.
PURGED ≈ 12.62L OF FORMATION WATER INTO INNER CASING
W/L (initial) = 175.19' W/L (final) = 139.79' IN INNER CASING

Total Volume: 13.0L + 12.62 = 25.62L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-12 Depth: 140 Date: 3/4/97

Well Name: MW-12 Sampling Zone No.: 1 Starting Time: 0845 Finishing Time: 1450

Technicians: J. BRENNER, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 14.44 PSIA (End of Session) 17.02 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	17.00	✓	1419	1424	✓	16.99	1.0	3/4 TBT
2	✓	✓	✓	✓	✓	✓	16.97	✓	1436	1441	✓	17.02	1.0	FINAL PARAMETERS
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 2.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-11 Depth: 639 Date: 3-5-97

Well Name: MW-11 Sampling Zone No.: SCREEN 5 Starting Time: 0800 Finishing Time: 0925

Technicians J.BRENNER / T.CHOI

Water Level Inside MP Casing (Beginning of Session) 161.83 PSIA (End of Session) 161.82 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	161.83	✓	0817	0819	✓	161.84	1.0	1ST RUN PRIOR SAMPLING; RINSE BOTTLES, INITIAL PARAMETERS; NTU'S = 1.31
2	✓	✓	✓	✓	✓	✓	161.81	✓	0848	0852	✓	161.84	1.0	2ND RUN; SAMPLE MW-97F-24; 2 VOA'S, METALS, ANIONS, CN'S
3	✓	✓	✓	✓	✓	✓	161.79	✓	0921	0924	✓	161.82	1.0	3RD RUN; SAMPLE MW-97F-24; T-P; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-11 Depth: 524 Date: 3-5-97

Well Name: MW-11 Sampling Zone No.: SCREEN 4 Starting Time: 0942 Finishing Time: 1103

Technicians: J. BRENNER/T. CHOI

Water Level Inside MP Casing (Beginning of Session) 112.18 PSIA (End of Session) 112.18 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	112.18	✓	0952	0955	✓	112.18	1.0	1ST RUN PRIOR SAMPLING; RINSE BOTTLES; INITIAL PARAMETERS; NTUS=4.89
2	✓	✓	✓	✓	✓	✓	112.17	✓	1020	1025	✓	112.17	1.0	2nd RUN; SAMPLE MW-971-23; 2 VOAS; METALS, ANIONS, Cr^{+6}
3	✓	✓	✓	✓	✓	✓	112.10	✓	1053	1056	✓	112.18	1.0	3rd RUN, SAMPLE MW-971-23; T-P FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Samplin
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-11 Depth: 429 Date: 3-5-97

Well Name: MW-11 Sampling Zone No.: SCREEN 3 Starting Time: 1115 Finishing Time: 1220

Technicians J.BRENNER/T.CHOI

Water Level Inside MP Casing (Beginning of Session) 71.33 PSIA (End of Session) 71.22 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	71.33	✓	1120	1123	✓	71.32	1.0	1ST RUN PRIOR SAMPLING; RINSE BOTTLES INITIAL PARAMETERS; NTUS=
2	✓	✓	✓	✓	✓	✓	71.32	✓	1149	1152	✓	71.29	1.0	2nd RUN; SAMPLE MW-971-22; 2VOAS, METALS, ANIONS, Cr+6
3	✓	✓	✓	✓	✓	✓	71.29	✓	1210	1213	✓	71.22	1.0	3rd RUN; SAMPLE MW-971-22; T-P, FINA PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-11 Depth: 259 Date: 3-5-97

Well Name: MW-11 Sampling Zone No.: SCREEN 2 Starting Time: 1227 Finishing Time: 1338

Technicians J. BRENNER / T. CHOI

Water Level Inside MP Casing (Beginning of Session) 14.82 PSIA (ATMOSPHERIC) (End of Session) (ATMOSPHERIC) 14.68 PSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level in MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level in MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	14.82	✓	1233	1237	✓	14.76	1.0	1ST RUN PRIOR SAMPLING, RINSE BOTTLES, INITIAL PARAMETERS
2	✓	✓	✓	✓	✓	✓	14.71	✓	1303	1308	✓	14.71	1.0	2nd RUN; SAMPLE MW-971-21, 2 VOAS, METALS, ANIONS, Cr+6
3	✓	✓	✓	✓	✓	✓	14.71	✓	1328	1332	✓	14.68	1.0	3rd RUN; SAMPLE MW-971-21, T-P FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Samplin
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-11 Depth: 149 Date: 3-5-97

Well Name: MW-11 Sampling Zone No.: SCREEN 1 Starting Time: 1345 Finishing Time: 1445

Technicians J. BRENNER / T. CHOI

Water Level Inside MP Casing (Beginning of Session) 14.83 PSIA (ATMOS) (End of Session) 14.64 PSIA (ATMO

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	✓	✓	✓	✓	✓	✓	14.83	✓	1350	1356	✓	14.69	1.0	1ST RUN PRIOR SAMPLING; RINSE BOTTLES; INITIAL PARAMETERS; NTU'S
2	✓	✓	✓	✓	✓	✓	14.77	✓	1409	1415	✓	14.64	1.0	2nd RUN; SAMPLE MW-97I-20; 200A'S; METALS; ANIONS; Cr^{+6}
3	✓	✓	✓	✓	✓	✓	14.72	✓	1427	1433	✓	14.64	1.0	3rd RUN; SAMPLE MW-97I-20; T-P; FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-3 Depth: 653 Date: 3/6/97

Well Name: MW-3 Sampling Zone No.: SCREEN 5 Starting Time: 0820 Finishing Time: 1000

Technicians: J. BRENNER, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 181.68 PSIA (End of Session) 181.67 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	✓	✓	✓	✓	✓	✓	181.68	✓	0836	0839	✓	181.74	1.0	1ST RUN TO SCREENS, PRIOR TO SAMPLING INITIAL PARAMETERS, NOTE
2	✓	✓	✓	✓	✓	✓	181.71	✓	0910	0913	✓	181.71	1.0	2ND RUN; 2 VOAS, METALS, ANIONS, HEX. Cr
3	✓	✓	✓	✓	✓	✓	181.66	✓	0944	0947	✓	181.67	1.0	3RD RUN; TOP, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Samplin
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-3 Depth: 558 Date: 3/6/97

Well Name: MW-3 Sampling Zone No.: SCREEN 4 Starting Time: 1005 Finishing Time: 1145

Technicians J. BRENNER, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 140.36 TSIA (End of Session) 140.32 TSIA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	140.36	✓	1021	1025	✓	140.39	1.0	1ST RUN, INITIAL PARAMETERS, NTU'S = 4.8
2	✓	✓	✓	✓	✓	✓	140.39	✓	1055	1059	✓	140.34	1.0	2ND RUN; 2VOAS, METALS, ANIONS, HEX. Cr
3	✓	✓	✓	✓	✓	✓	140.30	✓	1131	1135	✓	140.32	1.0	3RD RUN; T-P, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0 l

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Samplin
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-3 Depth: 346 Date: 3/6/97

Well Name: MW-3 Sampling Zone No.: SCREEN 3 Starting Time: 1200 Finishing Time: 1310

Technicians: J. BRENNER, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 48.30 TSA (End of Session) 48.28 TSA

Run No.	Surface Function Checks					Position Sampler	Surface Collection Checks							Comments
	Activate	Vacuum Check Valve Closed	Valve Open	Evacuate Container	Valve Closed	Deactivate Set Arm Locate Port	Water Level In MP (ft)	Activate	Valve Open Time	Valve Closed Time	Deactivate	Water Level In MP (ft) Remove Tape	Volume Retrieved (liters)	
1	✓	✓	✓	✓	✓	✓	48.30	✓	1207	1211	✓	48.28	1.0	1ST RUN PRIOR TO SAMPLING; INITIAL PARAMETERS, VTSS;
2	✓	✓	✓	✓	✓	✓	48.26	✓	1234	1238	✓	48.30	1.0	2ND RUN; 6 VOAS, METALS; ANIONS
3	✓	✓	✓	✓	✓	✓	48.19	✓	1301	1305	✓	48.28	1.0	3RD RUN; HEX. Cr, T.P, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0 L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-3 Depth: 252 Date: 3/6/97

Well Name: MW-3 Sampling Zone No.: SCREEN 2 Starting Time: 1320 Finishing Time: 1425

Technicians: J. BRENNER, T. CHOI

Water Level Inside MP Casing (Beginning of Session) 14.66 PSIA (ATMOSPHERIC) (End of Session) 14.63 PSIA (ATMO

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	✓	✓	✓	✓	✓	✓	14.66	✓	1329	1333	✓	14.68	1.0	1ST RUN; INITIAL PARAMETERS PRIOR TO SAMPLING; NTU'S = 3.3
2	✓	✓	✓	✓	✓	✓	14.72	✓	1350	1354	✓	14.59	1.0	2ND RUN; 2 VOAS, METALS, ANIONS HEX. Cr
3	✓	✓	✓	✓	✓	✓	14.72	✓	1411	1416	✓	14.63	1.0	3RD RUN; T-P, FINAL PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0L

FOSTER WHEELER ENVIRONMENTAL CORPORATION

Groundwater Sampling
Field Data Sheet for Multi-Port We

Project: JPL Location: MW-3 Depth: 172 Date: 3-7-97

Well Name: MW-3 Sampling Zone No.: SCREEN 1 Starting Time: 0805 Finishing Time: 0910

Technicians J.BRENNER, T.CHOI, S.FAULK

Water Level Inside MP Casing (Beginning of Session) 14.39 PSIA (ATMOS) (End of Session) 14.46 PSIA (ATMOS)

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	✓	0808	0812	✓	14.49	1.0	1ST RUN PRIOR SAMPLING
2	✓	✓	✓	✓	✓	✓	14.44	✓	0826	0831	✓	14.44	1.0	2nd RUN; SAMPLE MW-971-02; 2 VOAS METALS, ANIONS, ½ Cr^{+6}
3	✓	✓	✓	✓	✓	✓	14.43	✓	0844	0848	✓	14.46	1.0	3rd RUN; SAMPLE MW-971-02; T-P, FINA PARAMETERS
4														
5														
6														
7														
8														
9														
10														
11														
12														

Comments:

Total Volume: 3.0 L

APPENDIX C

FIELD INSTRUMENT CALIBRATION FORMS

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. CHOI Date: 2-13-97

Instrument Manufacturer: YSI Model: 3500

Serial Number: 92H422260

Probe Manufacturer: YSI Model: 3226

Serial Number: 92[illegible]465

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1,000 µS/cm Solution Expiration Date: 12/97

FIELD CALIBRATION

Time: 0820 Temperature of Solution: 03.7

Temperature Compensated Solution Conductivity (µ S/cm) * 694

Instrument Response to Calibration Solution: 719 µS/cm

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1400 Temperature of Solution: 18.2

Temperature Compensated Solution Conductivity (µ S/cm) * 869

Instrument Response to Calibration Solution: 874

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale; ≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300 mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale; and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale; ≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: TCHO1 Date: 2-4-97

Instrument Manufacturer: YSI Model: 3500

Serial Number: 92H42260

Probe Manufacturer: YSI Model: 3520

Serial Number: 92G49465

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1000 µS/cm Solution Expiration Date: 12/97

FIELD CALIBRATION

Time: 0805 Temperature of Solution: 9.4

Temperature Compensated Solution Conductivity (µ S/cm) * 707

Instrument Response to Calibration Solution: 748

Instrument Response within Instrument and Probe Limits of Error: ** Yes: X No: ____

Time: 1545 Temperature of Solution: 18.1

Temperature Compensated Solution Conductivity (µ S/cm) * ____

Instrument Response to Calibration Solution: 899

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale; ≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300 mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale; and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale; ≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. Choi Date: 2-5-97

Instrument Manufacturer: YSI Model: 3500

Serial Number: 92442260

Probe Manufacturer: YSI Model: 3520

Serial Number: 92649465

Calibration Solution Manufacturer: YSI

Solution Conductivity: 10000 µS/cm Solution Expiration Date: 12/97

FIELD CALIBRATION

Time: 0840 Temperature of Solution: 10.2

Temperature Compensated Solution Conductivity (µ S/cm) * 721

Instrument Response to Calibration Solution: 732

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1620 Temperature of Solution: 19.4

Temperature Compensated Solution Conductivity (µ S/cm) * 892

Instrument Response to Calibration Solution: 926

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale; ≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300 mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale; and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale; ≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. CHOI Date: 2-6-97

Instrument Manufacturer: YSI Model: 3500

Serial Number: 92H42260

Probe Manufacturer: YSI Model: 3520

Serial Number: 92G9946S

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1,000 µS/cm Solution Expiration Date: 12/97

FIELD CALIBRATION

Time: 0815 Temperature of Solution: 9.5

Temperature Compensated Solution Conductivity (µ S/cm) * 709

Instrument Response to Calibration Solution: 760

Instrument Response within Instrument and Probe Limits of Error: ** Yes:____ No:____

Time: 1425 Temperature of Solution: 19.4

Temperature Compensated Solution Conductivity (µ S/cm) * 892

Instrument Response to Calibration Solution: 918

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No:____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale; ≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300 mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale; and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale; ≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPC

Calibration by: T. CHOI Date: 2-7-97

Instrument Manufacturer: YSI Model: 3500

Serial Number: 02H4226 0

Probe Manufacturer: YSI Model: 3920

Serial Number: 02GH1465

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1000 µS/cm Solution Expiration Date: 12/97

FIELD CALIBRATION

Time: 0825 Temperature of Solution: 13.6

Temperature Compensated Solution Conductivity (µ S/cm) * 794

Instrument Response to Calibration Solution: 810

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1600 Temperature of Solution: 19.7

Temperature Compensated Solution Conductivity (µ S/cm) * 898

Instrument Response to Calibration Solution: 919

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale; ≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300 mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale; and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale; ≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T.CHOI Date: ~~2/9~~ 2/10/97

Instrument Manufacturer: YSI Model: 3500

Serial Number: 02H42260

Probe Manufacturer: YSI Model: 3520

Serial Number: 92049465

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1,000 µS/cm Solution Expiration Date: 12/97

FIELD CALIBRATION

Time: 0836 Temperature of Solution: 10.3

Temperature Compensated Solution Conductivity (µ S/cm) * 725

Instrument Response to Calibration Solution: 767

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1245 Temperature of Solution: 14.8

Temperature Compensated Solution Conductivity (µ S/cm) * 906

Instrument Response to Calibration Solution: 842

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale; ≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300 mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale; and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale; ≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER FIELD CALIBRATION FORM

Project Name: JFL

Calibration by: T. Choi Date: 2-11-97

Instrument Manufacturer: YSI Model: 3500

Serial Number: 92H42265

Probe Manufacturer: YSI Model: 3520

Serial Number: 92G49465

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1,000 µS/cm Solution Expiration Date: 12/97

FIELD CALIBRATION

Time: 0820 Temperature of Solution: 8.0

Temperature Compensated Solution Conductivity (µ S/cm) * 682

Instrument Response to Calibration Solution: 714

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1515 Temperature of Solution: 16.6

Temperature Compensated Solution Conductivity (µ S/cm) * 840

Instrument Response to Calibration Solution: 864

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:

± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale; ≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.

± 4.5% to 6% of calibration solution if reading is > 150 and < 300 mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale; and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.

± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale; ≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. CHOI Date: 2-12-97

Instrument Manufacturer: YSI Model: 3500

Serial Number: 92442260

Probe Manufacturer: YSI Model: 3520

Serial Number: 92649465

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1,000 µS/cm Solution Expiration Date: 12/97

FIELD CALIBRATION

Time: 0840 Temperature of Solution: 10.1

Temperature Compensated Solution Conductivity (µ S/cm) * ~~780~~ 755

Instrument Response to Calibration Solution: 766

Instrument Response within Instrument and Probe Limits of Error: ** Yes: X No: ____

Time: 1535 Temperature of Solution: 14.2

Temperature Compensated Solution Conductivity (µ S/cm) * 795

Instrument Response to Calibration Solution: 838

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:

± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale; ≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.

± 4.5% to 6% of calibration solution if reading is > 150 and < 300 mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale; and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.

± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale; ≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. CHOI Date: 2-13-97

Instrument Manufacturer: YSI Model: 3500

Serial Number: 92442260

Probe Manufacturer: YSI Model: 3520

Serial Number: 92649465

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1,000 µS/cm Solution Expiration Date: 12/97

FIELD CALIBRATION

Time: 0929 Temperature of Solution: 11.8

Temperature Compensated Solution Conductivity (µ S/cm) * 751

Instrument Response to Calibration Solution: 793

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1521 Temperature of Solution: 20.2

Temperature Compensated Solution Conductivity (µ S/cm) * 908

Instrument Response to Calibration Solution: 929

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale; ≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300 mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale; and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale; ≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: [illegible] Date: 2/14/07

Instrument Manufacturer: YSI Model: 3500

Serial Number: 02442260

Probe Manufacturer: YSI Model: 5420

Serial Number: 92649465

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1,000 µS/cm Solution Expiration Date: _____

FIELD CALIBRATION

Time: 1230 Temperature of Solution: 32.8

Temperature Compensated Solution Conductivity (µ S/cm) * 1154

Instrument Response to Calibration Solution: 1225

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: _____

Time: 1440 Temperature of Solution: 26.9

Temperature Compensated Solution Conductivity (µ S/cm) * 1037

Instrument Response to Calibration Solution: 1114

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: _____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale;
≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300
mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale;
and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale;
≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: J. BRENNER Date: 2/18/97

Instrument Manufacturer: YSI Model: 3500

Serial Number: 92442260

Probe Manufacturer: YSI Model: 3520

Serial Number: 92649465

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1,000 µS/cm Solution Expiration Date: 12/97

FIELD CALIBRATION

Time: 0930 Temperature of Solution: 13.9

Temperature Compensated Solution Conductivity (µ S/cm) *: 789

Instrument Response to Calibration Solution: 845

Instrument Response within Instrument and Probe Limits of Error: ** Yes:_____ No:_____

Time: * Temperature of Solution:_____

Temperature Compensated Solution Conductivity (µ S/cm) *:_____

Instrument Response to Calibration Solution:_____

Instrument Response within Instrument and Probe Limits of Error: ** Yes:_____ No:_____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale; ≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300 mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale; and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale; ≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

*NO SAMPLES TAKEN TODAY (EQUIPMENT FAILURE)

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T.CHOI Date: 2/19/97

Instrument Manufacturer: YSI Model: 3500

Serial Number: 92H42260

Probe Manufacturer: YSI Model: 3520

Serial Number: 92649465

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1,000 µS/cm Solution Expiration Date: 12/97

FIELD CALIBRATION

Time: 1010 Temperature of Solution: 15.6

Temperature Compensated Solution Conductivity (µ S/cm) * 821

Instrument Response to Calibration Solution: 855

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No:

Time: 1130 Temperature of Solution: 19.3

Temperature Compensated Solution Conductivity (µ S/cm) * ~~923~~ 891

Instrument Response to Calibration Solution: 923

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No:

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale; ≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300 mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale; and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale; ≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. CHOI Date: 2-20-97

Instrument Manufacturer: YSI Model: 3500

Serial Number: 92H2260

Probe Manufacturer: YSI Model: 3520

Serial Number: 92G49465

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1,000 µS/cm Solution Expiration Date: 12/97

FIELD CALIBRATION

Time: 0815 Temperature of Solution: 16.9

Temperature Compensated Solution Conductivity (µ S/cm) * 845

Instrument Response to Calibration Solution: 828

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1435 Temperature of Solution: 22.2

Temperature Compensated Solution Conductivity (µ S/cm) * 945

Instrument Response to Calibration Solution: 923

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale; ≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300 mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale; and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale; ≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. BLANCY Date: 2/21/97

Instrument Manufacturer: YSI Model: 3500

Serial Number: 92H42260

Probe Manufacturer: YSI Model: 3520

Serial Number: 92649465

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1,000 uS/cm Solution Expiration Date: 12/97

FIELD CALIBRATION

Time: 0815 Temperature of Solution: 12.7

Temperature Compensated Solution Conductivity (µ S/cm) * 767

Instrument Response to Calibration Solution: 741

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1200 Temperature of Solution: 14.4

Temperature Compensated Solution Conductivity (µ S/cm) * 799

Instrument Response to Calibration Solution: 775

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale; ≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300 mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale; and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale; ≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: -PL

Calibration by: J. BRENNER / T. CHOI Date: 2/24/97

Instrument Manufacturer: YSI Model: 3500

Serial Number: 92H22600

Probe Manufacturer: YSI Model: 3520

Serial Number: 92649465

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1,000 µS/cm Solution Expiration Date: 12/97

FIELD CALIBRATION

Time: 0845 Temperature of Solution: 11.2

Temperature Compensated Solution Conductivity (µ S/cm) * 739

Instrument Response to Calibration Solution: 727

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1425 Temperature of Solution: 17.7

Temperature Compensated Solution Conductivity (µ S/cm) * 860

Instrument Response to Calibration Solution: 844

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale; ≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300 mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale; and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale; ≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. CHOI Date: 2-26-97

Instrument Manufacturer: YSI Model: 3500

Serial Number: 92442260

Probe Manufacturer: YSI Model: 3520

Serial Number: 92649465

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1,000µS/cm Solution Expiration Date: 12/97

FIELD CALIBRATION

Time: 0815 Temperature of Solution: 10.3

Temperature Compensated Solution Conductivity (µ S/cm) * 718

Instrument Response to Calibration Solution: 723

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1100 Temperature of Solution: 27.9

Temperature Compensated Solution Conductivity (µ S/cm) * 1057

Instrument Response to Calibration Solution: 1039

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale; ≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300 mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale; and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale; ≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. Blaney Date: 2/27/97

Instrument Manufacturer: YSI Model: 3500

Serial Number: 92H2260

Probe Manufacturer: YSI Model: 3520

Serial Number: 92G4965

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1,000 uS/cm Solution Expiration Date: 12/97

FIELD CALIBRATION

Time: 0920 Temperature of Solution: 11.0

Temperature Compensated Solution Conductivity (μ S/cm) * 736

Instrument Response to Calibration Solution: 739

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1510 Temperature of Solution: 14.3

Temperature Compensated Solution Conductivity (μ S/cm) * 796

Instrument Response to Calibration Solution: 786

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (μ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (μ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale; ≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300 mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale; and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale; ≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. CHOI Date: 2-28-97

Instrument Manufacturer: YSI Model: 3500

Serial Number: 9242260

Probe Manufacturer: YSI Model: 3520

Serial Number: 9264965

Calibration Solution Manufacturer: YSI

Solution Conductivity: ~~1~~ 1,000 µS/cm Solution Expiration Date: 12/97

FIELD CALIBRATION

Time: 0750 Temperature of Solution: 8.5

Temperature Compensated Solution Conductivity (µ S/cm) *: 690

Instrument Response to Calibration Solution: 686

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1400 Temperature of Solution: 18.5

Temperature Compensated Solution Conductivity (µ S/cm) *: 875

Instrument Response to Calibration Solution: 869

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale; ≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300 mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale; and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale; ≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: J. BRENNER Date: 3/3/97

Instrument Manufacturer: YSI Model: 3500

Serial Number: 92H2240

Probe Manufacturer: YSI Model: 3520

Serial Number: 9264965

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1,000 µS/cm Solution Expiration Date: 12/97

FIELD CALIBRATION

Time: 0820 Temperature of Solution: 7.5

Temperature Compensated Solution Conductivity (µ S/cm) * 673

Instrument Response to Calibration Solution: 689

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1500 Temperature of Solution: 21.3

Temperature Compensated Solution Conductivity (µ S/cm) * 929

Instrument Response to Calibration Solution: 925

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale; ≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300 mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale; and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale; ≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. Blanley Date: 3/4/97

Instrument Manufacturer: YSI Model: 3500

Serial Number: 93H08703

Probe Manufacturer: YSI Model: 3520

Serial Number: 93H70521

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1,000 µS/cm Solution Expiration Date: 9/97

FIELD CALIBRATION

Time: 1005 Temperature of Solution: 13.9

Temperature Compensated Solution Conductivity (µ S/cm) * 789

Instrument Response to Calibration Solution: 820

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1335 Temperature of Solution: 21.6

Temperature Compensated Solution Conductivity (µ S/cm) * 934

Instrument Response to Calibration Solution: 940

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale; ≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300 mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale; and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale; ≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

CONDUCTIVITY/SALINITY/TEMPERATURE METER
FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: J. BRENNER Date: 3/4/97

Instrument Manufacturer: YSI Model: 3500

Serial Number: 92142260

Probe Manufacturer: YSI Model: 3520

Serial Number: 92649465

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1000 µS/cm Solution Expiration Date: 12/97

FIELD CALIBRATION

Time: 0840 Temperature of Solution: 9.1

Temperature Compensated Solution Conductivity (µ S/cm) * 701

Instrument Response to Calibration Solution: 700

Instrument Response within Instrument and Probe Limits of Error: ** Yes: X No: ____

Time: 1500 Temperature of Solution: 23.5

Temperature Compensated Solution Conductivity (µ S/cm) * 971

Instrument Response to Calibration Solution: 939

Instrument Response within Instrument and Probe Limits of Error: ** Yes: X No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale; ≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300 mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale; and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale; ≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.

Continue

CONDUCTIVITY/SALINITY/TEMPERATURE METER FIELD CALIBRATION FORM

Project Name: JPL

Calibration by: T. Blanny Date: 3/5/97

Instrument Manufacturer: YSI Model: 3500

Serial Number: 93H 08703

Probe Manufacturer: YSI Model: 3520

Serial Number: 93H 70521

Calibration Solution Manufacturer: YSI

Solution Conductivity: 1,000 µS/cm Solution Expiration Date: 9/97

FIELD CALIBRATION

Time: 0840 Temperature of Solution: 13.5

Temperature Compensated Solution Conductivity (µ S/cm) * 782

Instrument Response to Calibration Solution: 810

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

Time: 1405 Temperature of Solution: 24.6

Temperature Compensated Solution Conductivity (µ S/cm) * 992

Instrument Response to Calibration Solution: 1014

Instrument Response within Instrument and Probe Limits of Error: ** Yes: ✓ No: ____

The Temperature Compensated Solution Conductivity May Be Computed Using Following Equation:
Conductivity (µ S/cm) = (Conductivity at 25°C) $(A + BT + CT^2)$
Where T = Temperature in °C

And

Conductivity @ 25°C (µ S/cm)	A	B	C
1,000	0.5407	0.0173	0.000043
10,000	0.5538	0.0168	0.000042
100,000	0.5825	0.0157	0.000040

Instrument is Calibrated if Response is:
± 6% of calibration solution if reading is ≤ 150 mmhos/cm on 500 scale; ≤ 1500 mmhos/cm on 5000 Scale; or ≤ 15,000 mmhos/cm on 50,000 scale.
± 4.5% to 6% of calibration solution if reading is > 150 and < 300 mmhos/cm on 500 scale; > 1500 and < 3000 mmhos/cm an 5000 scale; and > 15,000 and < 30,000 mmhos/cm on 50,000 Scale.
± 4.5% of calibration solution if reading is ≥ 300 mmhos/cm on 500 scale; ≥ 3000 mmhos/cm on 5000 scale; and ≥ 30,000 mmhos/cm on 50,000 scale.