

**PALOS VERDES LANDFILL  
REMEDIAL INVESTIGATION REPORT**

**APPENDIX B.2**

**SOIL/SEDIMENT SAMPLES  
(DISCUSSION ON SOIL QA/QC)**

**QUALITY ASSURANCE/QUALITY CONTROL SUMMARY**  
**PALOS VERDES LANDFILL**  
**DRAFT PRELIMINARY REMEDIAL INVESTIGATION REPORT**

**1.0 INTRODUCTION**

The Sanitation Districts have conducted an extensive Quality Assurance/Quality Control (QA/QC) Program to ensure the reliability and validity of water and soil quality data generated by the San Jose Creek Water Quality Labs (SJCWQL) during the Remedial Investigation (RI). The Sanitation Districts have used QA/QC procedures outlined in the Site Sampling and Analysis Plan (SSAP) on all samples collected as part of the RI. Groundwater samples collected prior to 1991 were not collected using the same QA/QC procedures; however, the Sanitation Districts believe that the procedures implemented at that time were sufficient to ensure laboratory data reliability. This section discusses the QA/QC program conducted during the RI and presents the QA/QC data. Variations in the QA/QC procedures used prior to 1991 will be noted in this section.

**1.1 Field QA/QC Procedures**

Field QA/QC procedures ensure that the sample handling procedures maintain the integrity of the sample. Field QA/QC includes field log books, chain of custody, trip blanks, equipment blanks, rinsate blanks, and field duplicates. These procedures will be discussed below.

Sample Labeling System

A Sanitation Districts standardized sample labeling system is used to identify all samples collected during this investigation. Slight variations in the sample labels may occur from work plan to work plan. This system is designed to be compatible with the data input procedures for the SJCWQL. The system identifies the site, and provides information on sample location, sample type, and sample number. Laboratory receiving personnel assign each sample a unique job number. This expedites sample tracking from the field, to laboratory analysis, to database inputs, and into the final report.

#### Sample Documentation

Field observations and all other pertinent sampling information are recorded in field log books. The data to be recorded for each sample include date, time, sample number, type of sample, sample appearance, and name and signature of the person collecting the sample. In addition, general information is recorded in the field log book, including personnel present at the site, weather conditions, results of any field analyses, and any other information applicable to the sampling that is occurring. Prior to 1991, groundwater sampling technicians recorded sampling information on field log sheets. These sheets provided space primarily for the recording of field analysis results, although space is also provided for the recording of weather and sample conditions, date and time of sample collection, and personnel present.

#### Sample Tracking

Each sample collected is tracked by manifesting all pertinent information on a Chain of Custody Form (COC). A properly completed COC form accompanies all samples. Sampling technicians use the following procedures in completing the COC forms. Information such as sample number, location, depth, matrix, type (blank, duplicate), collection time and date, number of containers per sample, analyses to be performed, sampler's name, and general comments, such as weather conditions and date shipped, must be listed on the form. When transferring possession of samples, the individuals relinquishing and receiving sign,

date, and note the time on the COC form. Samples are properly packaged for shipment and dispatched to the appropriate laboratory, with a separate, signed COC form enclosed in each ice-cooled container.

#### Sample Preservation

Sample preservation is important to ensure that compounds in the sample do not degrade prior to laboratory analysis. In the field, the sample preservation procedures consist of keeping all full sample containers on ice until they are delivered to the laboratory. Once the sample is delivered to the laboratory, several preservation steps are taken. Laboratory personnel add nitric acid to acidify ( $\text{pH} < 2$ ) any sample containers to be sent to outside laboratories for metals analysis. Laboratory personnel also add sodium hydroxide to the portion of the sample to be used for cyanide analysis until the pH is greater than 13. The remainder of the sample is kept refrigerated until its analysis.

#### Trip Blanks

Trip blanks provide a check on contaminants which may have originated during sample handling and transportation activities, and/or in the laboratory. Trip blanks are prepared by the SJCWQL using certified organic free water placed into 40 ml glass vials. The trip blank is numbered, packaged, and sealed in an identical manner as the other water samples collected for volatile organic analysis. One trip blank is prepared each day, and is transported along with the samples until submittal to the laboratory. The sampling technicians have been transporting trip blanks since January 1988.

#### Equipment Blanks

Equipment blanks, also known as field blanks, provide a check on the effectiveness of equipment decontamination procedures. Equipment blanks are prepared in the field at the rate of one blank for each ten samples by pouring de-ionized water through recently decontaminated sampling equipment. The

de-ionized water is then poured into the appropriate sample containers, sealed, labeled, and stored along with all other samples in an ice-cooled container. The equipment blanks are analyzed for the same compounds as the samples collected with that sampling equipment. Prior to 1991, no equipment blanks were prepared by groundwater monitoring technicians. Equipment blanks were also prepared during the remedial investigation drilling program from June through October 1990.

#### Rinsate Blanks

Rinsate blanks provide an additional check on the effectiveness of equipment decontamination procedures. Rinsate blanks are prepared in the field at the end of each sampling day or after every ten samples by sampling the final rinse water from its container. The samples are sealed, labeled, and stored along with all other samples in the ice-cooled container. The rinsate blanks are analyzed for the same compounds as the samples collected on that day. Generally either rinsate or equipment blanks were collected, but not both. Prior to 1991, no rinsate blanks were prepared by groundwater monitoring technicians.

#### Field Duplicates

Field duplicates are collected for water samples only. They are analyzed to check sampling and analytical precision. They are collected from the same location at the same time as the actual field sample, and numbered, packaged, sealed and analyzed in an identical manner as the other water samples. Field duplicates are collected at the minimum rate of five percent of the total number of water samples collected. Other than the field duplicates collected during the RI boring program and during RI storm water sampling, no field duplicates were collected by groundwater monitoring technicians prior to 1991.

### **1.2 Laboratory QA/QC Procedures**

As a check on the quality and reliability of the laboratory analytical equipment, laboratory blanks and matrix spikes are prepared and analyzed by analytical laboratories. The following sections discuss the laboratory QA/QC procedures. The Quality Control Assurance Document of the San Jose Creek Water Quality Laboratories is included with this report as Appendix E.9.

#### Laboratory Blanks

Laboratory blanks, sometimes called reagent blanks or method blanks, are run daily to check for contamination in SJCWQL's equipment. Any contamination present could be indicative of improper laboratory decontamination procedures. The laboratory blanks are prepared by extracting and analyzing deionized water.

#### Laboratory Matrix Spike/Matrix Spike Duplicate

Since the sample matrix (water or sediment) may have an impact on the accuracy and precision of the laboratory results, matrix spikes are performed to evaluate the efficiency of the sample extraction and analysis procedures. The matrix spike is prepared by adding known concentrations of target compounds to a sample, and then extracting and analyzing the sample to see if the known concentrations were detected. The recovered target compounds must fall within an acceptable range of their original concentrations for the results to be considered valid. Matrix spikes are typically run twice (duplicates) to evaluate both the precision of the laboratory procedures as well as the accuracy of the equipment. The matrix spikes are run at a rate of ten percent of the total number of samples analyzed at the laboratory.

#### Surrogate Spikes

Surrogate spikes are used to determine the accuracy of analytical methods in the sample matrix. They differ from normal spiked samples in that the spiking compounds are not ones expected to be

found in the field samples. The spiking compounds are considered surrogates because they are chemically similar to classes of compounds that are analyzed. Surrogate spikes allow for tests of analytical accuracy without the interference problems that may occur with normal spikes due to the presence of the spiked compounds in the sample. Known amounts of the surrogate compounds are added to the field samples. The sample is analyzed for the surrogate compounds and the results are compared to the spiked amounts. The results are expressed as a percent recovery.

### **1.3 Outline of QA/QC Data Presentation**

This section presents laboratory QA/QC data for water samples collected between January 1, 1992 and June 30, 1992 and for soil samples collected during the remedial investigation boring program. All available field QA/QC data is presented. The outline of the section is as follows: Section 2 discusses field QA/QC data; Section 3 discusses laboratory QA/QC data; and Section 4 presents conclusions.

## **2.0 FIELD QA/QC DATA**

This section discusses field QA/QC procedures employed by the Sanitation Districts in the RI program. Section 2.1 discusses sample documentation, Section 2.2 presents the results of trip blanks, Section 2.3 presents the results of equipment blanks, and Section 2.4 presents the results of field duplicates.

### **2.1 Sample Documentation**

The following appendices contain the sample documentation records for samples collected as part of the RI program.

- Appendix C.3.1      Field logs for groundwater samples.
- Appendix C.3.2      Field logs for runoff samples.
- Appendix C.3.3      Field logs for the air samples.
- Appendix A.1.2      Chains of Custody for air samples.

Appendix A.2.1.2	Chains of Custody for RI soil boring samples.
Appendix A.2.2.2	Chains of Custody for soil cover samples.
Appendix A.2.3.2	Chains of Custody for Botanic Garden lake and stream sediment samples.
Appendix A.3.1.3	Chains of Custody for the groundwater samples taken in 1991 and 1992.  The Sanitation Districts store chains of custody for groundwater samples taken previous to 1991 in long term storage facilities. These documents are available upon request.
Appendix A.3.2.2	Chains of Custody for groundwater samples from RI borings.
Appendix A.3.3.2	Chains of Custody for runoff samples.
Appendix A.3.4.2	Chains of Custody for Botanic Garden lake and stream water samples and Hawthorne Blvd. storm drain samples.

The Sanitation Districts followed proper sample tracking and documentation procedures for all samples. Any inconsistencies in the sample tracking and documentation procedures that may have affected laboratory results are noted in the laboratory notes for that sample.

## **2.2 Trip Blanks**

The Sanitation Districts prepared trip blanks for water and soil samples collected during the RI program. The following section discusses the results of trip blank analysis for all landfill soil and water samples collected from 1988 through 1992.

The Sanitation Districts prepared 325 trip blank samples for groundwater, surface water, and soil sampling events. Appendix B.2.1 contains complete analysis results for the trip blank samples. Table B.2.1-1 in Appendix B.2.1 compares trip blank detections to detections in samples transported with the trip blank.



The detections of VOCs in the trip blank samples sometimes correspond to detections in water samples. Whenever the concentration of a contaminant is greater in the trip blank than in the samples transported with that trip blank, the Sanitation Districts assume that the contaminant concentration in the field sample is questionable. Methylene chloride, chloroform, toluene, and acetone are the only compounds that consistently appear in the trip blanks at the same concentrations levels as are detected in the corresponding samples. These cases are noted in the summary table. Benzene is detected in one trip blank sample at the same level as is detected in all the samples collected on that day. This case is also noted in the summary table. It is likely that the benzene detections in these runoff samples are caused by ambient conditions in the field or in the laboratory rather than from the landfill. In general, however, the trip blank analysis results indicate that water and soil samples were not affected by ambient contaminants in the field or in the laboratory.

### **2.3 Equipment Blanks**

The Sanitation Districts collect equipment blank samples at a rate of one blank for every ten groundwater samples. The preparation of equipment blanks began in January 1991 when the Sanitation Districts began to implement the SSAP at the PVLFF. Equipment blanks were also collected during the RI boring program and the surface water sampling program. The following paragraphs discuss the results of equipment blank analyses and their impact on the interpretation of groundwater and soil monitoring data.

#### **2.3.1 Equipment Blank Analysis Results: Groundwater Sampling**

Appendix B.2.2.1 contains the analysis results for equipment blank samples taken from January 1, 1991 through June 30, 1992. The Sanitation Districts prepared equipment blanks at a rate of one blank for each ten groundwater samples. Equipment blank results indicate that equipment decontamination procedures were sufficient to avoid cross contamination of groundwater samples. Occasionally, detected compounds in the equipment blanks correspond to detections in the samples collected with the equipment

blanks. Table B.2.2.1-1 in Appendix B.2.2.1 lists these occurrences. Whenever the concentration of a constituent is greater in the equipment blank than in the samples collected transported with that equipment blank, the Sanitation Districts assume that the constituent detection in the groundwater sample may have been caused by cross contamination from the sampling equipment.

### 2.3.2 Equipment Blank Analysis Results: RI Boring Program Soil Sampling

Appendix B.2.2.2 contains the analysis results for equipment blank samples collected during the RI boring program between June 1990 and September 1990. The Sanitation Districts prepared equipment blanks at a rate of one blank for each ten groundwater samples. Equipment blank results indicate that equipment decontamination procedures were sufficient to avoid cross contamination of groundwater samples. Occasionally, detected compounds in the equipment blanks correspond to detections in the samples collected with the equipment blanks. Table B.2.3.2-1 in Appendix B.2.2.2 lists these occurrences. Whenever the concentration of a constituent is greater in the equipment blank than in the samples collected transported with that equipment blank, the Sanitation Districts assume that the constituent detection in the soil sample may have been caused by cross contamination from the sampling equipment.

### 2.3.3 Equipment Blank Analysis Results: Surface Water Sampling Program

Appendix B.2.2.3 contains the analysis results for equipment blank and rinsate blank samples collected during the RI boring program between June 1990 and September 1990. The Sanitation Districts prepared equipment and rinsate blanks at a rate of one blank for each ten surface water samples. Equipment and rinsate blank results indicate that equipment decontamination procedures were sufficient to avoid cross contamination of groundwater samples. Occasionally, detected compounds in the equipment or rinsate blanks correspond to detections in the samples collected with the blanks. Table B.2.2.3-1 in Appendix B.2.2.3 lists these occurrences. Whenever the concentration of a constituent is greater in the blank than in the samples

collected transported with the blank, the Sanitation Districts assume that the constituent detection in the soil sample may have been caused by cross contamination from the sampling equipment.

#### **2.4 Field Duplicate Analyses**

Beginning in January 1991, the Sanitation Districts began to collect field duplicate samples at a rate of one duplicate sample for each ten groundwater samples. Relative percent differences (RPD) were calculated for each test in each duplicate sample. Appendix B.2.3 contains both the analysis results for field duplicate samples and a table (Table B.2.3-1) which tabulates the average RPD for each compound. There are no QA limits for field duplicate analyses.

#### **3.0 LABORATORY QA/QC RESULTS**

All analytical samples are sent to the Sanitation Districts' San Jose Creek Water Quality Laboratories (SJCWQL) for analysis. SJCWQL are certified by the State Department of Health Services for hazardous waste analyses. Appendix E.13 contains a copy of the laboratory certification. SJCWQL comply with all applicable QA/QC procedures as outlined in SW-846. Appendix E.9 contains the QA/QC document that the laboratory follows in its everyday operations. The Sanitation Districts routinely use data generated by the SJCWQL to prosecute cases involving illegal disposal of hazardous materials into the Sanitation Districts' sewer system.

All analytical results generated by SJCWQL are entered into the Sanitation Districts laboratory results computer database. The laboratory database has strict access control. Analysis results are entered into the database by the analyst who performed the test. Instrument based analysis results are transferred to the database electronically. Laboratory supervisors verify all test results. Once data is verified by a laboratory supervisor, laboratory analysts no longer have access to change the result in the database. Once all tests for a sample are completed, and all the results verified, the SJCWQL supervisor verifies the

sample as complete, and no further changes may be made without the supervisor's permission. The Sanitation Districts use the laboratory computer database for all their data analysis and data reporting.

The laboratory database does not contain laboratory QA/QC data such as analysis dates (except for VOCs and semi-VOCs), EPA method numbers, duplicate and spike analysis results, and method blank analysis results. SJCWQL maintain this data for in-house auditing. When QA samples are outside the QA limits or analysis results appear questionable, laboratory QA personnel generate an error resolution report. Section 10 of the SJCWQL QA Document outlines the procedures used to resolve any QA problem. A sample error resolution report is included with the QA document. No analytical data is reported in the laboratory database until the QA problem is resolved. The relevant QA/QC data for any sample may be found by reviewing records of the SJCWQL.

Each sample in the computer database contains a field for laboratory notes. This field contains the sample analysis dates for VOCs and semi VOCs as well as other QA information for the sample. The field contains references to any QA problems with the sample such as exceedances of holding times or reporting of matrix interference. The laboratory notes for each sample is reported with the analytical data for the sample in Appendices A.2 and A.3.

Complete quality assurance data (analysis dates, EPA method numbers, duplicate and spike analysis results, and method blanks) are reported by batch for all water samples collected between January 1, 1992 and June 30, 1992 in Appendix B.2.4. Because SJCWQL does not provide QA data in the computer database, it is not normal procedure for the Sanitation Districts to report analytical data in a batch format with all applicable QA data. The SJCWQL QA/QC program ensures that all reported data meets all requirements for analytical accuracy, therefore, should any sample result appear questionable, its QA/QC data may be reviewed. However the process of collecting and reporting the QA data applicable to all soil and water samples reported herein would be an extremely time and manpower intensive task. The Sanitation Districts

has collected and reported six months of QA data in order to demonstrate its availability and to perform QA checks on water samples collected at the PVLf.

Laboratory QA/QC data (duplicate and spike analyses) for the soil samples collected during the RI boring program are reported in Appendix B.2.4.5. This laboratory data is not available in batch format.

SJCWQL contract with several contract laboratories (primarily Montgomery Laboratories and Brown and Caldwell Laboratories) to perform analyses that SJCWQL are not certified to perform. The laboratory reports for the samples along with reported QA information are contained in Appendices A.2.3 and A.3.3.

This section reports the results of laboratory QA data for water samples collected between January 1, 1992 and June 30, 1992 and for soil samples collected during the RI boring program. The discussion focuses on duplicate and spike analyses and the results of method blanks. Any implications of these results on the interpretation of analytical data is discussed below.

### **3.1 Duplicate Sample Analysis Results**

The results of duplicate analyses are presented as a relative percent difference (RPD). The RPD is the absolute value of the difference between the duplicate results divided by the average of the duplicate results, expressed as a percentage. The RPD gives an indication of the precision of laboratory analyses. If precision objectives are not met, it indicates that the variability in the compound concentrations may be greater than is indicated by the laboratory method. RPD results are reported for both water and soil samples.

#### **3.1.1 Water Samples**

RPDs for individual batches of samples are reported in Appendix B.2.4. Table B.3-1 lists summary statistics of RPD results for each compound. When individual RPDs fall outside the QA limits, corrective action is taken by the laboratory to ensure that reported results are accurate. Except for silver, the average RPD results listed in Table B.3-1 are within the QA limits indicating that QA precision objectives are met. The elevated average RPD for the silver duplicates is the result of the EPA method for silver analysis. EPA method 6010 specifies a digestion agent that is not sufficiently aggressive. This causes silver to precipitate out of the sample during analysis. SJCWQL have experimented with more aggressive digestion agents and have had successful results, however, these methods are not approved.

### 3.1.2 Soil Samples

RPD results from soil samples collected during the RI boring program are listed in Appendix B.2.4.5. Table B.3-2 lists summary statistics of RPD results for each compound. Antimony, cobalt, manganese, phenol, N-nitrosodi-n-propylamine, and toluene have average RPDs greater than the QA standards for the project. The variability in these compound concentrations may therefore be greater than is indicated by the laboratory method.

## 3.2 **Spike Sample Analysis Results**

The results of spike sample analyses are expressed as a percent recovery. The percent recovery is the result of the analysis divided by the known amount added to the sample as a spike, expressed as a percentage. The percent recovery gives a measure of the accuracy of the laboratory method. Percent recoveries that consistently fall outside the acceptable range for a specific compound indicate that there is a matrix effect in the samples. The matrix effect affects the ability of the instrument to accurately detect that compound. Percent recovery results are presented for both soil and water samples.

### 3.2.1 Water Samples

Percent recoveries for individual batches of samples are reported in Appendix B.2.4. Table B.3-3 lists summary statistics of percent recovery results for water samples. When individual percent recoveries fall outside the QA limits, corrective action is taken by the laboratory to ensure that reported results are accurate. The average percent recovery values listed in Table B.3-3 all fall within the QA limits indicating there are no matrix effects in water samples from the PVLF.

### 3.2.2 Soil Samples

Percent recoveries for soil samples collected during the RI boring program are reported in Appendix B.2.4.5. Table B.3-4 lists summary statistics of percent recovery results for soil samples. The results indicate a slight positive matrix effect for arsenic, and a slight negative matrix effect for antimony, potassium and thallium.

### 3.3 Surrogate Spike Results

Surrogate spikes are used to determine the accuracy of analytical methods in the sample matrix. Known amounts of the surrogate compounds are added to the field samples. The sample is analyzed for the surrogate compounds and the results are compared to the spiked amounts. The results are expressed as a percent recovery.

#### 3.3.1 Water Samples

Table B.2-5 presents summary statistics of the results of the surrogate spikes for water samples. Complete results are reported by batch in Appendix B.2.4.4. The mean percent recoveries were within acceptance limits for all surrogate compounds (occasional recovery values were outside acceptance limits, as allowed by the method). The surrogate spike results for water samples do not indicate any matrix effects from PVLF water samples.

### 3.3.2 Soil Samples

Table B.2.-6 presents summary statistics for the results of the surrogate spikes for soil samples. complete results are presented in Appendix B.2.5 The mean percent recoveries were within acceptance limits for all surrogate compounds (occasional recovery values were outside acceptance limits, as allowed by the method) except for decafluorobiphenyl recoveries in soil samples. This is indicative of some type of matrix interference that is not present in the water matrices. Because there were no detections of biphenyl compounds in program samples, these matrix interferences do not affect the analysis of program data.

### 3.4 **Duplicates Samples Sent to Outside Laboratories**

Because the bulk of the laboratory analyses were performed by the Sanitation Districts' laboratories, the Sanitation Districts sent samples taken during the R1 soil boring program to outside laboratories as a check SJCWQL's analytical procedures. Tables B.2-7 and B.2-8 summarize the results of these analyses.

The large differences in values seen in Table B.2-8 may be attributed to the variability in soil samples. Due to the heterogeneous nature of soil samples it is difficult to get identical samples when splits are prepared. The water duplicates (Table B.2-7) were in closer agreement with each other. In general, the results of the split samples do not indicate a significant bias from one lab to the other.

### 3.5 **Method Blank Results**

A review of the method blank results reported with their respective batches in Appendix B.2.4 indicates that the blank results have no discernable effect on the analytical results. Table B.3-5 contains a summary of all batches where compounds are detected in the method blanks at a level greater than the level detected in the sample. Whenever compounds are detected in method blanks, SJCWQL personnel implement



corrective action as outlined in the SWCWQL QA document measures to ensure the reliability of analytical data. Any significant blank contamination is noted in the laboratory notes for that sample.

#### 4.0 CONCLUSIONS

QA/QC procedures used by sampling and laboratory personnel ensure that the data presented in this report are accurate and reliable. The SJCWQL perform all laboratory analyses in strict adherence to the quality assurance document developed by the laboratories's quality assurance section. Laboratory personnel do not report any data that have questionable QA analysis results until the QA problems are resolved. QA results that are important in data interpretation are reported in the laboratory notes for that sample. All QA data is available for review at SJCWQL.

The Sanitation Districts have presented six months of laboratory QA data for water samples reported by batch. The analysis of this data does not indicate any laboratory QA problems with analytical results from water samples. In addition, this report presents laboratory QA data from the RI soil boring samples. The analysis of this data also do not indicate any significant QA problems with the analytical results. The results of field QA analyses for both water and soil samples do not indicate any biases from sample collection procedures.

TABLE B.2-1  
SUMMARY OF RELATIVE PERCENT DIFFERENCE RESULTS  
FROM LABORATORY DUPLICATE ANALYSES

REMEDIAL INVESTIGATION WATER SAMPLES  
(01/01/92 - 06/30/92)

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CONSTITUENT	NUMBER OF LAB DUPLICATES	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION	QA LIMIT
ACENAPHTHENE	15	1.00	21.00	6.47	5.99	22.00
AMMONIA NITROGEN	24	0.00	2.20	0.67	0.82	12.30
ARSENIC	17	0.00	19.40	4.93	5.03	12.80
BARIUM	29	0.00	15.10	2.27	3.38	10.50
BENZENE	58	0.00	7.70	2.54	2.60	7.40
BICARBONATE ALKALINITY	23	0.00	0.80	0.13	0.21	2.48
BORON	8	0.80	7.90	4.36	2.87	12.12
CADMIUM	30	0.00	25.50	2.93	5.00	14.20
CALCIUM	3	0.80	1.40	1.20	0.35	11.00
CALCIUM-HARDNESS	34	0.00	6.20	1.77	1.97	11.00
CARBONATE ALKALINITY	23	0.00	0.80	0.13	0.21	2.48
CHLORIDE	30	0.00	6.90	1.33	1.75	3.82
CHLOROBENZENE(HALL)	58	0.00	13.80	4.18	3.22	12.90
CHLOROBENZENE(PID)	58	0.00	11.80	2.54	2.80	9.30
COBALT	2	0.00	0.00	0.00	0.00	10.10
CONDUCTIVITY	21	0.10	2.30	0.60	0.51	5.00
COPPER	24	0.00	15.80	2.87	3.31	8.90
DISSOLVED CARBON DIOXIDE	4	0.70	5.10	2.35	2.07	7.00
HEXAVALENT CHROMIUM	15	0.00	4.30	1.94	1.68	7.60
IRON	22	0.00	15.30	2.21	3.49	8.20

TABLE B.2-1  
SUMMARY OF RELATIVE PERCENT DIFFERENCE RESULTS  
FROM LABORATORY DUPLICATE ANALYSES

REMEDIAL INVESTIGATION WATER SAMPLES  
(01/01/92 - 06/30/92)

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CONSTITUENT	NUMBER OF LAB DUPLICATES	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION	QA LIMIT
LEAD	34	0.00	9.10	3.67	3.04	23.50
MAGNESIUM	2	0.30	1.20	0.75	0.64	15.30
MAGNESIUM-HARDNESS	32	0.00	4.70	0.99	1.20	15.30
MANGANESE	21	0.00	17.70	2.80	3.91	8.70
MERCURY	62	0.00	24.30	7.27	6.34	17.30
N-NITROSODI-N-PROPYLAMINE	15	1.00	20.00	7.00	6.13	29.00
NICKEL	26	0.00	17.30	3.14	4.07	9.40
NITRATE NITROGEN	31	0.00	90.00	4.12	15.99	19.10
OIL & GREASE	33	0.20	3.70	1.46	0.87	7.02
PENTACHLOROPHENOL	15	1.00	19.00	9.53	6.52	30.00
PH	31	0.10	0.80	0.25	0.17	0.52
PHENOL	15	0.00	29.00	10.13	10.11	30.00
PHENOLS	12	0.30	12.60	4.05	3.46	29.80
POTASSIUM	34	0.00	4.00	0.99	0.80	10.10
PYRENE	15	0.00	18.00	7.13	5.30	18.00
SELENIUM	15	0.00	12.30	3.57	3.82	5.30
SILVER	37	0.00	136.80	23.59	35.66	11.00
SODIUM	32	0.00	4.20	0.96	0.99	9.80
SOLUBLE BOD	28	0.00	200.00	11.04	39.32	30.60
SOLUBLE COD	33	0.00	8.90	1.36	1.93	14.40

TABLE B.2-1  
SUMMARY OF RELATIVE PERCENT DIFFERENCE RESULTS  
FROM LABORATORY DUPLICATE ANALYSES

REMEDIAL INVESTIGATION WATER SAMPLES  
(01/01/92 - 06/30/92)

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CONSTITUENT	NUMBER OF LAB DUPLICATES	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION	QA LIMIT
SULFATE	30	0.00	13.30	2.64	3.21	4.05
SUSPENDED SOLIDS	8	1.60	4.50	2.61	1.07	13.80
TOLUENE	58	0.00	7.70	2.63	2.37	6.20
TOTAL ALKALINITY	22	0.00	0.80	0.14	0.22	2.48
TOTAL CHROMIUM	32	0.00	14.80	2.10	2.86	8.50
TOTAL COD	11	0.00	3.40	1.07	1.09	14.40
TOTAL DISSOLVED SOLIDS	19	0.10	4.40	1.69	1.35	4.61
TOTAL KJELDAHL NITROGEN	26	0.00	4.50	0.71	1.09	12.30
TOTAL ORGANIC CARBON	25	0.10	5.50	1.44	1.27	9.51
TOTAL ORGANIC HALOGEN(TOX	2	0.00	0.00	0.00	0.00	20.00
TOTAL PHOSPHATE	5	0.80	7.40	3.16	2.54	9.83
TRICHLOROETHYLENE	58	0.60	13.80	4.42	3.07	17.60
ZINC	27	0.00	10.90	3.39	2.93	11.30
1,1-DICHLOROETHENE	58	0.00	11.70	4.75	3.82	15.40
1,2,4-TRICHLOROBENZENE	15	0.00	19.00	7.07	5.48	26.00
1,4-DICHLOROBENZENE	15	1.00	20.00	6.00	5.32	24.00
2-CHLOROPHENOL	15	0.00	25.00	7.20	7.66	23.00
2,4-DINITROTOLUENE	15	1.00	21.00	5.47	5.22	22.00
4-CHLORO-3-METHYLPHENOL	15	0.00	104.00	14.13	26.16	27.00
4-NITROPHENOL	15	2.00	53.00	14.07	13.19	21.00

TABLE B.2-2  
SUMMARY OF RELATIVE PERCENT DIFFERENCE RESULTS  
FROM LABORATORY DUPLICATE ANALYSES  
SOIL SAMPLES COLLECTED DURING RI/FS BORING PROGRAM  
(06/90 - 10/90)

PALOS VERDES LANDFILL - DRAFT PRELIMINARY REMEDIAL  
INVESTIGATION REPORT

CONSTITUENT	NUMBER OF LAB DUPLICATES	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION	QA LIMIT
pH	9	0.00	0.40	0.17	0.17	0.50
Acenaphthene	13	0.00	24.10	5.68	6.61	13.10
Antimony	16	0.00	20.00	3.35	6.47	1.00
Arsenic	10	0.00	11.76	3.43	4.04	10.57
Barium	6	0.55	11.13	4.72	4.04	15.40
Benzene	18	0.00	35.00	6.67	7.79	7.40
Beryllium	7	0.30	6.48	2.36	2.14	7.80
Cadmium	10	0.00	13.90	4.49	4.76	16.30
Calcium	9	0.16	20.10	4.88	6.05	11.00
Cation Exchange Capacity	3	1.30	12.50	7.10	5.61	0.00
Chloride	9	0.00	5.64	1.89	2.04	3.80
Chlorobenzene	18	0.00	20.00	7.00	5.14	12.90
Chlorophenol	13	0.00	48.50	9.77	12.90	19.40
Chromium	10	0.38	16.40	4.38	4.93	15.40
Cobalt	3	1.61	40.90	15.76	21.83	11.80
Conductivity	8	0.00	0.40	0.08	0.16	30.60
Copper	8	0.59	9.20	2.76	2.84	23.60
Dichlorobenzene	13	0.00	17.30	5.51	4.76	14.00
Dinitrotoluene	13	0.00	28.60	8.94	10.55	15.00
Iron	14	0.13	23.50	7.03	7.01	17.60
Lead	11	0.43	15.80	4.58	4.60	20.10

TABLE B.2-2  
SUMMARY OF RELATIVE PERCENT DIFFERENCE RESULTS  
FROM LABORATORY DUPLICATE ANALYSES

SOIL SAMPLES COLLECTED DURING RI/FS BORING PROGRAM  
(06/90 - 10/90)

PALOS VERDES LANDFILL - DRAFT PRELIMINARY REMEDIAL  
INVESTIGATION REPORT

CONSTITUENT	NUMBER OF LAB DUPLICATES	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION	QA LIMIT
Magnesium	10	0.07	9.30	3.76	3.36	9.50
Manganese	5	0.43	43.30	10.98	18.38	8.70
Mercury	17	1.70	35.80	8.06	8.69	11.60
Molybdenum	7	0.00	32.30	9.56	11.38	16.70
N-nitrosodi-n-propylamine	13	0.00	200.00	20.22	54.15	15.90
Nickel	10	0.39	11.67	4.51	4.19	16.70
Nitrate Nitrogen	10	0.00	13.01	4.08	4.64	5.90
Oil and Grease	7	0.00	14.00	5.11	5.26	9.30
Pentachlorophenol	14	0.00	23.40	8.49	7.81	28.50
Phenol	13	1.80	200.00	28.50	54.33	23.10
Potassium	10	0.28	9.34	3.79	2.73	13.40
Pyrene	14	0.00	11.00	4.17	4.09	17.70
Selenium	7	0.00	11.11	3.85	4.60	7.60
Silver	10	0.46	14.20	4.00	4.30	11.10
Sodium	10	0.16	7.67	2.76	2.35	9.80
Sulfate	10	0.00	2.36	1.18	0.93	12.90
Thallium	18	0.00	0.00	0.00	0.00	0.74
Toluene	18	1.00	35.00	7.17	8.19	6.20
Trichlorobenzene	12	1.90	15.40	6.09	4.32	14.20
Trichloroethene	18	1.00	25.00	7.89	6.66	17.60
Vanadium	7	1.09	7.21	3.51	2.27	9.40

TABLE B.2-2  
 SUMMARY OF RELATIVE PERCENT DIFFERENCE RESULTS  
 FROM LABORATORY DUPLICATE ANALYSES  
 SOIL SAMPLES COLLECTED DURING RI/FS BORING PROGRAM  
 (06/90 - 10/90)

PALOS VERDES LANDFILL - DRAFT PRELIMINARY REMEDIAL  
 INVESTIGATION REPORT

CONSTITUENT	NUMBER OF LAB DUPLICATES	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION	QA LIMIT
Zinc	10	0.19	13.40	4.87	4.27	15.70
1,1-Dichloroethene	18	0.00	20.00	6.17	5.26	15.50
8015	22	0.00	31.40	10.57	9.17	0.00

TABLE B.2-3  
SUMMARY OF PERCENT RECOVERY RESULTS  
FROM LABORATORY SPIKE SAMPLE ANALYSES

REMEDIAL INVESTIGATION WATER SAMPLES  
(01/01/92 - 06/30/92)

PALOS VERDES LANDFILL - DRAFT PRELIMINARY REMEDIAL  
INVESTIGATION REPORT

CONSTITUENT	NUMBER OF LAB RECOVERIES	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION	LOWER QA LIMIT	UPPER QA LIMIT
ACENAPHTHENE	15	61.00	100.00	82.93	8.75	63.00	106.00
AMMONIA NITROGEN	12	95.30	103.30	99.32	3.38	78.10	118.50
ARSENIC	15	78.00	118.00	98.41	12.82	63.00	141.00
BARIUM	24	74.70	105.60	92.80	7.72	72.00	124.30
BENZENE	58	89.10	161.10	106.76	9.10	93.00	119.00
BICARBONATE ALKALINITY	23	94.40	100.20	98.47	1.32	89.70	106.40
BORON	8	84.50	112.30	96.75	8.06	84.00	111.80
CADMIUM	21	80.00	119.20	90.90	8.04	71.50	111.90
CALCIUM	3	91.90	99.10	94.30	4.16	77.10	114.90
CALCIUM-HARDNESS	33	85.50	107.30	97.28	6.36	77.10	114.90
CARBONATE ALKALINITY	23	94.40	100.20	98.50	1.31	89.70	106.40
CHLORIDE	27	96.00	107.80	100.28	2.81	92.50	106.30
CHLOROBENZENE(HALL)	58	93.80	124.40	109.33	6.93	84.00	126.00
CHLOROBENZENE(PID)	58	91.80	162.60	107.04	9.50	89.00	117.00
COBALT	1	91.60	91.60	0.00	0.00	72.00	123.90
CONDUCTIVITY	0	0.00	0.00	0.00	0.00	0.00	0.00
COPPER	21	81.10	124.90	94.46	10.56	79.20	117.00
DISSOLVED CARBON DIOXIDE	0	0.00	0.00	0.00	0.00	0.00	0.00
HEXAVALENT CHROMIUM	15	84.00	106.20	95.99	6.48	77.00	121.60
IRON	15	73.10	103.70	87.73	9.70	64.70	136.30



TABLE B.2-3  
SUMMARY OF PERCENT RECOVERY RESULTS  
FROM LABORATORY SPIKE SAMPLE ANALYSES

REMEDIAL INVESTIGATION WATER SAMPLES  
(01/01/92 - 06/30/92)

PALOS VERDES LANDFILL - DRAFT PRELIMINARY REMEDIAL  
INVESTIGATION REPORT

CONSTITUENT	NUMBER OF LAB RECOVERIES	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION	LOWER QA LIMIT	UPPER QA LIMIT
LEAD	34	82.20	113.30	95.91	8.23	76.10	118.50
MAGNESIUM	2	96.20	96.60	96.40	0.28	79.40	119.50
MAGNESIUM-HARDNESS	28	87.30	104.00	95.03	3.72	79.40	119.50
MANGANESE	20	51.80	101.20	86.50	11.92	72.70	116.60
MERCURY	62	12.80	109.90	82.26	23.74	68.30	126.20
N-NITROSODI-N-PROPYLAMINE	15	69.00	105.00	86.00	11.35	56.00	117.00
NICKEL	24	73.80	108.60	89.15	9.43	74.10	116.90
NITRATE NITROGEN	28	46.00	112.50	97.26	11.41	86.90	109.80
OIL & GREASE	33	90.90	98.50	95.77	1.74	72.70	126.80
PENTACHLOROPHENOL	15	47.00	118.00	92.80	21.71	47.00	136.00
PH	0	0.00	0.00	0.00	0.00	0.00	0.00
PHENOL	15	61.00	101.00	79.87	12.56	45.00	113.00
PHENOLS	12	88.80	116.60	98.21	8.38	75.60	114.00
POTASSIUM	34	92.10	111.80	98.77	4.64	81.00	120.50
PYRENE	15	29.00	99.00	77.27	17.59	41.00	129.00
SELENIUM	10	86.00	106.00	98.03	5.65	74.00	127.00
SILVER	34	8.90	101.10	74.11	22.33	70.90	113.20
SODIUM	31	93.00	108.60	101.41	3.44	72.10	119.90
SOLUBLE BOD	27	94.00	119.50	105.30	6.98	80.00	120.00
SOLUBLE COD	33	86.20	111.30	95.85	5.62	81.90	111.30

TABLE B.2-3  
SUMMARY OF PERCENT RECOVERY RESULTS  
FROM LABORATORY SPIKE SAMPLE ANALYSES

REMEDIAL INVESTIGATION WATER SAMPLES  
(01/01/92 - 06/30/92)

PALOS VERDES LANDFILL - DRAFT PRELIMINARY REMEDIAL  
INVESTIGATION REPORT

CONSTITUENT	NUMBER OF LAB RECOVERIES	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION	LOWER QA LIMIT	UPPER QA LIMIT
SULFATE	29	87.00	115.00	100.06	5.77	87.70	108.00
SUSPENDED SOLIDS	0	0.00	0.00	0.00	0.00	0.00	0.00
TOLUENE	58	89.10	161.40	107.50	9.72	87.00	120.00
TOTAL ALKALINITY	22	94.40	100.20	98.51	1.34	89.70	106.40
TOTAL CHROMIUM	30	76.80	103.50	88.16	8.21	73.70	115.50
TOTAL COD	11	86.20	111.30	94.69	7.17	81.90	111.30
TOTAL DISSOLVED SOLIDS	0	0.00	0.00	0.00	0.00	85.70	114.60
TOTAL KJELDAHL NITROGEN	18	87.80	104.00	98.94	4.16	78.10	118.50
TOTAL ORGANIC CARBON	25	92.20	119.80	103.39	8.22	81.50	121.80
TOTAL ORGANIC HALOGEN(TOX	1	97.00	97.00	0.00	0.00	50.00	150.00
TOTAL PHOSPHATE	5	96.40	102.00	99.44	2.45	82.50	113.80
TRICHLOROETHYLENE	58	95.20	162.50	111.40	9.74	87.00	126.00
ZINC	25	69.60	115.20	89.04	11.65	68.50	112.20
1,1-DICHLOROETHENE	58	86.50	147.40	107.62	10.81	68.00	130.00
1,2,4-TRICHLOROBENZENE	15	63.00	117.00	89.00	12.52	53.00	119.00
1,4-DICHLOROBENZENE	15	60.00	104.00	82.47	11.39	48.00	115.00
2-CHLOROPHENOL	15	64.00	98.00	84.80	11.40	57.00	104.00
2,4-DINITROTOLUENE	15	55.00	121.00	89.53	17.18	57.00	124.00
4-CHLORO-3-METHYLPHENOL	14	72.00	115.00	89.93	13.34	63.00	112.00
4-NITROPHENOL	15	67.00	129.00	95.00	14.99	49.00	128.00

TABLE B.2-4  
SUMMARY OF PERCENT RECOVERY RESULTS  
FROM LABORATORY SPIKE SAMPLE ANALYSES

SOIL SAMPLES COLLECTED DURING RI/FS BORING PROGRAM  
(06/90 - 10/90)

PALOS VERDES LANDFILL - DRAFT PRELIMINARY REMEDIAL  
INVESTIGATION REPORT

CONSTITUENT	NUMBER OF LAB RECOVERIES	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION	LOWER QA LIMIT	UPPER QA LIMIT
Acenaphthene	13	82.00	116.00	93.46	9.20	45.00	122.00
Antimony	16	8.60	119.52	62.06	30.90	64.61	131.53
Arsenic	5	34.57	110.80	72.89	27.90	80.68	116.68
Barium	6	80.90	118.00	97.97	14.79	64.00	139.00
Benzene	18	82.00	117.00	101.17	9.33	82.00	118.00
Beryllium	7	66.00	120.80	104.59	20.58	90.00	138.00
Cadmium	10	77.80	102.30	92.63	8.46	82.00	119.00
Calcium	8	70.50	113.10	100.44	13.61	77.00	115.00
Chloride	9	91.60	112.10	100.72	6.93	93.00	106.00
Chlorobenzene	18	90.00	113.00	102.22	6.35	84.00	114.00
Chlorophenol	13	67.00	97.00	80.69	10.07	48.00	115.00
Chromium	10	71.60	100.00	87.86	10.21	66.00	117.00
Cobalt	3	113.60	158.00	130.53	24.00	101.00	129.00
Copper	8	86.80	103.00	97.64	5.13	78.00	121.00
Dichlorobenzene	13	80.00	103.00	91.52	6.46	31.00	111.00
Dinitrotoluene	13	58.00	92.00	74.92	8.58	37.00	132.00
Iron	14	53.00	1456.00	202.34	361.30	76.00	145.00
Lead	11	75.50	104.80	93.45	10.18	63.00	138.00
Magnesium	10	81.40	110.00	100.62	8.28	76.00	125.00
Manganese	5	80.00	110.00	89.66	12.20	73.00	117.00
Mercury	17	27.00	123.00	90.29	20.13	69.00	122.00

TABLE B.2-4  
SUMMARY OF PERCENT RECOVERY RESULTS  
FROM LABORATORY SPIKE SAMPLE ANALYSES

SOIL SAMPLES COLLECTED DURING RI/FS BORING PROGRAM  
(06/90 - 10/90)

PALOS VERDES LANDFILL - DRAFT PRELIMINARY REMEDIAL  
INVESTIGATION REPORT

CONSTITUENT	NUMBER OF LAB RECOVERIES	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION	LOWER QA LIMIT	UPPER QA LIMIT
Molybdenum	7	41.20	102.00	73.39	21.28	60.00	122.00
N-nitrosodi-n-propylamine	13	40.00	86.00	72.62	11.29	46.00	118.00
Nickel	10	71.60	100.87	87.96	10.39	65.00	118.00
Nitrate Nitrogen	9	90.00	110.00	98.87	6.44	87.00	110.00
Oil and Grease	7	87.80	127.00	111.26	17.79	72.00	130.00
Pentachlorophenol	13	65.00	92.00	80.62	7.67	12.00	145.00
Phenol	13	24.00	91.00	67.62	17.30	35.00	134.00
Potassium	10	45.40	103.60	83.41	20.82	81.00	121.00
Pyrene	13	67.00	113.00	87.38	11.91	32.00	126.00
Selenium	7	34.04	94.68	70.89	24.91	93.33	112.24
Silver	10	74.40	106.40	95.72	10.15	80.00	118.00
Sodium	10	44.20	101.17	88.88	22.34	95.00	104.00
Sulfate	10	92.50	147.40	106.03	17.05	71.00	121.00
Thallium	18	12.39	100.00	57.44	27.64	68.00	117.46
Toluene	18	82.00	117.00	103.33	9.68	82.00	144.00
Trichlorobenzene	12	86.00	105.00	93.83	5.29	36.00	110.00
Trichloroethene	18	89.00	117.00	98.44	9.02	89.00	119.00
Vanadium	7	45.80	117.00	86.41	22.09	68.00	131.00
Zinc	10	76.20	104.90	92.89	10.74	64.00	128.00
1,1-Dichloroethene	18	86.00	115.00	100.83	7.85	86.00	116.00
8015	22	82.00	116.00	96.86	10.61	58.50	142.70

Table B.2-5  
 SUMMARY OF SURROGATE SPIKE RECOVERIES

REMEDIAL INVESTIGATION WATER SAMPLES'  
 (01/01/92 - 06/30/92)

PALOS VERDES LANDFILL  
 DRAFT PRELIMINARY REMEDIAL INVESTIGATION REPORT

TDESC	Number of Samples	Minimum	Maximum	Mean	Standard Deviation	Lower QA Limit	Upper QA Limit
DECAFLUOROBIPHENYL	71	62	120	84.59	11.34	11	114
NITROBENZENE-D5	71	68	120	96.28	10.59	58	123
P-TERPHENYL-D14	71	32	119	79.18	21.05	26	149
PHENOL-D5	71	10	106	82.68	16.39	22	119
2-FLUOROBIPHENYL	71	79	118	96.17	8.13	47	116
2-FLUOROPHENOL	71	2	106	78.89	17.35	21	115
2,4,6-TRIBROMOPHENOL	71	6	126	93.28	17.94	40	149

Table B.2-6  
SUMMARY OF SURROGATE SPIKE RECOVERIES  
SOIL SAMPLES COLLECTED DURING RI BORING PROGRAM  
(06/90 - 10/90)

PALOS VERDES LANDFILL  
DRAFT PRELIMINARY REMEDIAL INVESTIGATION REPORT

Test	Number of Samples	Minimum	Maximum	Mean	Standard Deviation	Lower QA Limit	Upper QA Limit
DECAFLUOROBIPHENYL	122	11	134	103.57	15.72	27	95
NITROBENZENE-D5	122	3	112	81.33	17.70	50	119
P-TERPHENYL-D14	122	9	181	93.77	16.35	32	160
PHENOL-D5	122	8	106	68.81	14.97	33	120
2-FLUOROBIPHENYL	122	11	129	99.82	14.55	46	110
2-FLUOROPHENOL	122	8	99	66.26	14.62	26	111
2,4,6-TRIBROMOPHENOL	122	10	134	96.52	17.23	41	139

TABLE B.2-7  
RESULTS FROM OUTSIDE LABORATORY SPLIT SAMPLES

WATER SAMPLES FROM RI BORINGS  
(06/90 - 10/90)

PALOS VERDES LANDFILL  
DRAFT PRELIMINARY REMEDIAL INVESTIGATION REPORT

TEST			RESULT FROM SJCWQL	RESULT FROM OUTSIDE LAB	RELATIVE PERCENT DIFFERENCE
PH			7.08	7.40	-4.42
PH	PH		7.85	8.20	-4.36
PH	PH		3.60	3.80	-5.41
PH	PH		7.48	7.40	1.08
Average RPD					-3.28
CONDUCTIVITY	UMHOS/CM		3120.00	3100.00	0.64
CONDUCTIVITY	UMHOS/CM		810.00	790.00	2.50
CONDUCTIVITY	UMHOS/CM		2900.00	2900.00	0.00
CONDUCTIVITY	UMHOS/CM		21300.00	22000.00	-3.23
CONDUCTIVITY	UMHOS/CM		2280.00	2200.00	3.57
Average RPD					0.70
NITRATE NITROGEN	MG/L	N	0.26	0.07	115.15
NITRATE NITROGEN	MG/L	N	2.97	0.50	142.36
NITRATE NITROGEN	MG/L	N	1.66	1.50	10.13
NITRATE NITROGEN	MG/L	N	24.60	41.00	-50.00
NITRATE NITROGEN	MG/L	N	0.09	0.09	0.00
Average RPD					43.53
SULFATE	MG/L	SO4	1180.00	1200.00	-1.68
SULFATE	MG/L	SO4	24.00	39.00	-47.62
SULFATE	MG/L	SO4	213.00	280.00	-27.18
SULFATE	MG/L	SO4	16900.00	22000.00	-26.22
SULFATE	MG/L	SO4	110.00	110.00	0.00
Average RPD					-20.54
CHLORIDE	MG/L	CL	217.00	220.00	-1.37
CHLORIDE	MG/L	CL	60.00	69.00	-13.95
CHLORIDE	MG/L	CL	419.00	400.00	4.64
CHLORIDE	MG/L	CL	1320.00	1300.00	1.53
CHLORIDE	MG/L	CL	411.00	400.00	2.71
Average RPD					-1.29
CALCIUM	MG/L	CA	721.00	730.00	-1.24

Negative RPD's indicate that  
outside lab values are higher

TABLE B.2-7  
RESULTS FROM OUTSIDE LABORATORY SPLIT SAMPLES

WATER SAMPLES FROM RI BORINGS  
(06/90 - 10/90)

PALOS VERDES LANDFILL  
DRAFT PRELIMINARY REMEDIAL INVESTIGATION REPORT

TEST			RESULT FROM SJCWQL	RESULT FROM OUTSIDE LAB	RELATIVE PERCENT DIFFERENCE
CALCIUM	MG/L	CA	61.90	59.00	4.80
CALCIUM	MG/L	CA	175.00	190.00	-8.22
CALCIUM	MG/L	CA	< 0.01	210.00	-199.98
CALCIUM	MG/L	CA	472.00	570.00	-18.81
Average RPD					-44.69
MAGNESIUM	MG/L	MG	395.00	340.00	14.97
MAGNESIUM	MG/L	MG	35.90	36.00	-0.28
MAGNESIUM	MG/L	MG	124.00	130.00	-4.72
MAGNESIUM	MG/L	MG	0.02	110.00	-199.93
MAGNESIUM	MG/L	MG	76.90	82.00	-6.42
Average RPD					-39.28
BARIUM	MG/L	BA	0.06	0.06	0.00
BARIUM	MG/L	BA	0.11	0.07	41.76
BARIUM	MG/L	BA	< 0.02	0.19	-161.90
BARIUM	MG/L	BA	0.97	1.20	-21.20
Average RPD					-35.34
CADMIUM	MG/L	CD	0.16	0.10	46.15
CADMIUM	MG/L	CD	< 0.01	0.00	0.00
CADMIUM	MG/L	CD	< 0.01	0.05	-133.33
CADMIUM	MG/L	CD	0.02	0.02	0.00
Average RPD					-21.79
TOTAL CHROMIUM	MG/L	CR	1.08	1.10	-1.83
TOTAL CHROMIUM	MG/L	CR	< 0.02	0.01	0.00
TOTAL CHROMIUM	MG/L	CR	< 0.02	0.38	-180.00
TOTAL CHROMIUM	MG/L	CR	0.22	0.31	-33.96
Average RPD					-53.95
IRON	MG/L	FE	110.00	120.00	-8.70
IRON	MG/L	FE	0.62	0.10	144.44
IRON	MG/L	FE	1.50	0.01	197.35
IRON	MG/L	FE	< 0.02	8.70	-199.08

Negative RPD's indicate that  
outside lab values are higher



TABLE B.2-7  
 RESULTS FROM OUTSIDE LABORATORY SPLIT SAMPLES  
 WATER SAMPLES FROM RI BORINGS  
 (06/90 - 10/90)  
 PALOS VERDES LANDFILL  
 DRAFT PRELIMINARY REMEDIAL INVESTIGATION REPORT

TEST			RESULT FROM SJCWQL	RESULT FROM OUTSIDE LAB	RELATIVE PERCENT DIFFERENCE
IRON	MG/L	FE	32.40	40.00	-20.99
Average RPD					22.60
LEAD	MG/L	PB	0.09	0.09	-1.11
LEAD	MG/L	PB	< 0.04	< 0.00	0.00
LEAD	MG/L	PB	< 0.04	< 0.00	0.00
LEAD	MG/L	PB	< 0.04	0.01	147.83
LEAD	MG/L	PB	< 0.04	0.01	107.69
Average RPD					50.88
MANGANESE	MG/L	MN	2.44	1.20	68.13
MANGANESE	MG/L	MN	0.04	0.03	28.57
MANGANESE	MG/L	MN	0.18	0.11	48.28
MANGANESE	MG/L	MN	< 0.01	0.40	-190.24
MANGANESE	MG/L	MN	0.36	0.41	-12.99
Average RPD					-11.65
MERCURY	MG/L	HG	0.00	0.00	70.59
MERCURY	MG/L	HG	0.00	< 0.00	-85.71
MERCURY	MG/L	HG	0.00	< 0.00	-85.71
MERCURY	MG/L	HG	0.00	< 0.00	-85.71
MERCURY	MG/L	HG	0.00	< 0.00	-85.71
Average RPD					-54.45
NICKEL	MG/L	NI	1.17	1.10	6.17
NICKEL	MG/L	NI	0.03	< 0.04	-28.57
NICKEL	MG/L	NI	0.11	0.06	58.82
NICKEL	MG/L	NI	< 0.03	< 0.05	0.00
NICKEL	MG/L	NI	0.21	0.24	-13.33
Average RPD					4.62
POTASSIUM	MG/L	K	33.00	28.00	16.39
POTASSIUM	MG/L	K	4.00	3.40	16.22
POTASSIUM	MG/L	K	15.00	19.00	-23.53
POTASSIUM	MG/L	K	< 0.04	31.00	-199.48

Negative RPD's indicate that outside lab values are higher

TABLE B.2-7  
RESULTS FROM OUTSIDE LABORATORY SPLIT SAMPLES

WATER SAMPLES FROM RI BORINGS  
(06/90 - 10/90)

PALOS VERDES LANDFILL  
DRAFT PRELIMINARY REMEDIAL INVESTIGATION REPORT

TEST			RESULT FROM SJCWQL		RESULT FROM OUTSIDE LAB	RELATIVE PERCENT DIFFERENCE
POTASSIUM	MG/L	K	16.00		23.00	-35.90
Average RPD						-45.26
SILVER	MG/L	AG	0.03	<	0.01	88.89
SILVER	MG/L	AG	<	<	0.01	0.00
SILVER	MG/L	AG	<	<	0.01	0.00
SILVER	MG/L	AG	<	<	0.01	0.00
SILVER	MG/L	AG	<	<	0.01	0.00
Average RPD						17.78
SODIUM	MG/L	NA	125.00		120.00	4.08
SODIUM	MG/L	NA	46.00		51.00	-10.31
SODIUM	MG/L	NA	251.00		270.00	-7.29
SODIUM	MG/L	NA	0.40		290.00	-199.45
SODIUM	MG/L	NA	279.00		300.00	-7.25
Average RPD						-44.04
ZINC	MG/L	ZN	2.08		2.30	-10.05
ZINC	MG/L	ZN	0.07		0.03	80.00
ZINC	MG/L	ZN	0.07	<	0.02	111.11
ZINC	MG/L	ZN	0.10		0.06	50.00
ZINC	MG/L	ZN	0.85		0.70	19.35
Average RPD						50.08
BERYLLIUM	MG/L	BE	<		0.01	10.53
BERYLLIUM	MG/L	BE	<	<	0.01	0.00
BERYLLIUM	MG/L	BE	<	<	0.01	0.00
BERYLLIUM	MG/L	BE	<	<	0.00	0.00
BERYLLIUM	MG/L	BE	<	<	0.00	0.00
Average RPD						2.11
MOLYBDENUM	MG/L	MO	1.22		1.20	1.65
MOLYBDENUM	MG/L	MO	0.07	<	0.02	111.11
MOLYBDENUM	MG/L	MO	0.05	<	0.20	-120.00
MOLYBDENUM	MG/L	MO	<		0.50	-184.62

Negative RPD's indicate that outside lab values are higher

TABLE B.2-7  
RESULTS FROM OUTSIDE LABORATORY SPLIT SAMPLES

WATER SAMPLES FROM RI BORINGS  
(06/90 - 10/90)

PALOS VERDES LANDFILL  
DRAFT PRELIMINARY REMEDIAL INVESTIGATION REPORT

TEST			RESULT FROM SJCWQL	RESULT FROM OUTSIDE LAB	RELATIVE PERCENT DIFFERENCE
MOLYBDENUM	MG/L	MO	0.14	< 0.20	-35.29
Average RPD					-45.43
VANADIUM	MG/L	V	2.24	1.40	46.15
VANADIUM	MG/L	V	0.07	0.06	15.38
VANADIUM	MG/L	V	0.03	< 0.05	-50.00
VANADIUM	MG/L	V	< 0.02	0.06	-100.00
VANADIUM	MG/L	V	0.27	0.28	-3.64
Average RPD					-18.42

Negative RPD's indicate that  
outside lab values are higher

TABLE B.2-8  
RESULTS FROM OUTSIDE LABORATORY SPLIT SAMPLES  
SOIL SAMPLES FROM RI BORINGS  
(06/90 - 10/90)

PALOS VERDES LANDFILL  
DRAFT PRELIMINARY REMEDIAL INVESTIGATION REPORT

TEST		RESULT FROM SJCWQL	RESULT FROM OUTSIDE LAB	RELATIVE PERCENT DIFFERENCE
PH	PH	7.50	7.00	6.90
PH	PH	7.00	7.40	-5.56
PH	PH	8.30	7.60	8.81
PH	PH	7.15	7.70	-7.41
PH	PH	8.28	8.90	-7.22
PH	PH	8.50	8.30	2.38
PH	PH	8.00	7.50	6.45
Average RPD				0.62
CONDUCTIVITY	UMHOS/CM	3850.00	10000.00	-88.81
CONDUCTIVITY	UMHOS/CM	168.00	510.00	-100.88
CONDUCTIVITY	UMHOS/CM	1390.00	230.00	143.21
CONDUCTIVITY	UMHOS/CM	1980.00	400.00	132.77
CONDUCTIVITY	UMHOS/CM	930.00	190.00	132.14
CONDUCTIVITY	UMHOS/CM	1620.00	690.00	80.52
CONDUCTIVITY	UMHOS/CM	1850.00	8500.00	-128.50
Average RPD				24.35
CATION EXCH. CAPACITY	MEQ/100G	13.00	26.00	-66.67
CATION EXCH. CAPACITY	MEQ/100G	21.70	33.10	-41.61
CATION EXCH. CAPACITY	MEQ/100G	19.20	110.90	-140.97
CATION EXCH. CAPACITY	MEQ/100G	20.40	24.60	-18.67
CATION EXCH. CAPACITY	MEQ/100G	29.40	45.00	-41.94
CATION EXCH. CAPACITY	MEQ/100G	18.00	26.00	-36.36
CATION EXCH. CAPACITY	MEQ/100G	9.51	12.00	-23.15
Average RPD				-52.77
NITRATE NITROGEN	MG/KG N	< 0.01	< 0.50	0.00
NITRATE NITROGEN	MG/KG N	1.42	2.00	-33.92
NITRATE NITROGEN	MG/KG N	< 0.05	< 0.50	0.00
NITRATE NITROGEN	MG/KG N	0.45	2.00	-126.53
NITRATE NITROGEN	MG/KG N	3.84	5.00	-26.24
NITRATE NITROGEN	MG/KG N	72.80	0.50	197.27
NITRATE NITROGEN	MG/KG N	0.23	0.81	-111.54
Average RPD				-14.42

Negative RPD's indicate that outside lab results are is higher

TABLE B.2-8  
RESULTS FROM OUTSIDE LABORATORY SPLIT SAMPLES

SOIL SAMPLES FROM RI BORINGS  
(06/90 - 10/90)

PALOS VERDES LANDFILL  
DRAFT PRELIMINARY REMEDIAL INVESTIGATION REPORT

TEST			RESULT FROM SJCWQL	RESULT FROM OUTSIDE LAB	RELATIVE PERCENT DIFFERENCE
SULFATE	MG/KG	SO4	2760.00	4900.00	-55.87
SULFATE	MG/KG	SO4	9.00	84.00	-161.29
SULFATE	MG/KG	SO4	472.00	2400.00	-134.26
SULFATE	MG/KG	SO4	991.00	4900.00	-132.71
SULFATE	MG/KG	SO4	207.00	250.00	-18.82
SULFATE	MG/KG	SO4	183.00	1500.00	-156.51
SULFATE	MG/KG	SO4	840.00	2600.00	-102.33
Average RPD					-108.83
CHLORIDE	MG/KG	CL	125.00	220.00	-55.07
CHLORIDE	MG/KG	CL	31.00	90.00	-97.52
CHLORIDE	MG/KG	CL	136.00	72.00	61.54
CHLORIDE	MG/KG	CL	34.00	160.00	-129.90
CHLORIDE	MG/KG	CL	72.00	1400.00	-180.43
CHLORIDE	MG/KG	CL	39.00	5.40	151.35
CHLORIDE	MG/KG	CL	62.00	540.00	-158.80
Average RPD					-58.41
CALCIUM	MG/KG	CA	2450.00	3200.00	-26.55
CALCIUM	MG/KG	CA	4170.00	3200.00	26.32
CALCIUM	MG/KG	CA	26500.00	35000.00	-27.64
CALCIUM	MG/KG	CA	157000.00	160000.00	-1.89
CALCIUM	MG/KG	CA	3030.00	2800.00	7.89
CALCIUM	MG/KG	CA	5550.00	5000.00	10.43
CALCIUM	MG/KG	CA	2670.00	1400.00	62.41
CALCIUM	MG/KG	CA	6030.00	4900.00	20.68
CALCIUM	MG/KG	CA	6820.00	4500.00	40.99
Average RPD					12.51
MAGNESIUM	MG/KG	MG	4360.00	3100.00	33.78
MAGNESIUM	MG/KG	MG	4760.00	3300.00	36.23
MAGNESIUM	MG/KG	MG	14400.00	18000.00	-22.22
MAGNESIUM	MG/KG	MG	4250.00	3200.00	28.19
MAGNESIUM	MG/KG	MG	7090.00	5900.00	18.32
MAGNESIUM	MG/KG	MG	8270.00	6200.00	28.61
MAGNESIUM	MG/KG	MG	709.00	340.00	70.35
MAGNESIUM	MG/KG	MG	2840.00	2400.00	16.79

Negative RPD's indicate that  
outside lab results are is higher

TABLE B.2-8  
RESULTS FROM OUTSIDE LABORATORY SPLIT SAMPLES  
SOIL SAMPLES FROM RI BORINGS  
(06/90 - 10/90)

PALOS VERDES LANDFILL  
DRAFT PRELIMINARY REMEDIAL INVESTIGATION REPORT

TEST			RESULT FROM SJCWQL	RESULT FROM OUTSIDE LAB	RELATIVE PERCENT DIFFERENCE
MAGNESIUM	MG/KG	MG	2600.00	1600.00	47.62
Average RPD					28.63
BARIUM	MG/KG	BA	55.70	48.00	14.85
BARIUM	MG/KG	BA	488.00	180.00	92.22
BARIUM	MG/KG	BA	257.00	120.00	72.68
BARIUM	MG/KG	BA	119.00	100.00	17.35
BARIUM	MG/KG	BA	105.00	63.00	50.00
BARIUM	MG/KG	BA	120.00	69.00	53.97
BARIUM	MG/KG	BA	379.00	71.00	136.89
Average RPD					62.56
CADMIUM	MG/KG	CD	< 0.15	< 0.40	0.00
CADMIUM	MG/KG	CD	0.58	1.60	-93.58
CADMIUM	MG/KG	CD	2.84	2.30	21.01
CADMIUM	MG/KG	CD	8.11	8.10	0.12
CADMIUM	MG/KG	CD	1.80	1.90	-5.41
CADMIUM	MG/KG	CD	1.74	2.20	-23.35
CADMIUM	MG/KG	CD	2.36	3.10	-27.11
CADMIUM	MG/KG	CD	2.68	1.90	34.06
CADMIUM	MG/KG	CD	0.84	0.60	33.33
Average RPD					-6.77
TOTAL CHROMIUM	MG/KG	CR	149.00	90.00	49.37
TOTAL CHROMIUM	MG/KG	CR	81.20	50.00	47.56
TOTAL CHROMIUM	MG/KG	CR	47.30	35.00	29.89
TOTAL CHROMIUM	MG/KG	CR	102.00	79.00	25.41
TOTAL CHROMIUM	MG/KG	CR	88.00	69.00	24.20
TOTAL CHROMIUM	MG/KG	CR	89.90	57.00	44.79
TOTAL CHROMIUM	MG/KG	CR	24.80	19.00	26.48
TOTAL CHROMIUM	MG/KG	CR	46.70	35.00	28.64
TOTAL CHROMIUM	MG/KG	CR	15.30	7.30	70.80
Average RPD					38.57
COBALT	MG/KG	CO	6.15	6.00	2.47
COBALT	MG/KG	CO	9.40	7.00	29.27

Negative RPD's indicate that outside lab results are is higher

TABLE B.2-8  
RESULTS FROM OUTSIDE LABORATORY SPLIT SAMPLES

SOIL SAMPLES FROM RI BORINGS  
(06/90 - 10/90)

PALOS VERDES LANDFILL  
DRAFT PRELIMINARY REMEDIAL INVESTIGATION REPORT

TEST			RESULT FROM SJCWQL	RESULT FROM OUTSIDE LAB	RELATIVE PERCENT DIFFERENCE
COBALT	MG/KG	CO	8.53	6.00	34.82
Average RPD					22.19
IRON	MG/KG	FE	18700.00	14000.00	28.75
IRON	MG/KG	FE	22800.00	15000.00	41.27
IRON	MG/KG	FE	3760.00	11000.00	-98.10
IRON	MG/KG	FE	10800.00	10000.00	7.69
IRON	MG/KG	FE	13400.00	18000.00	-29.30
IRON	MG/KG	FE	13700.00	15000.00	-9.06
IRON	MG/KG	FE	3010.00	2000.00	40.32
IRON	MG/KG	FE	3590.00	6300.00	-54.80
IRON	MG/KG	FE	5170.00	2600.00	66.15
Average RPD					-0.79
LEAD	MG/KG	PB	3.80	< 10.00	-89.86
LEAD	MG/KG	PB	4.50	< 10.00	-75.86
LEAD	MG/KG	PB	< 2.50	< 10.00	0.00
LEAD	MG/KG	PB	2.38	< 10.00	-123.10
LEAD	MG/KG	PB	< 2.00	< 10.00	0.00
LEAD	MG/KG	PB	< 2.50	< 10.00	0.00
LEAD	MG/KG	PB	< 2.50	< 10.00	0.00
LEAD	MG/KG	PB	< 2.50	< 10.00	0.00
LEAD	MG/KG	PB	< 2.50	< 10.00	0.00
Average RPD					-32.09
MANGANESE	MG/KG	MN	45.50	48.00	-5.35
MANGANESE	MG/KG	MN	93.00	76.00	20.12
MANGANESE	MG/KG	MN	244.00	290.00	-17.23
MANGANESE	MG/KG	MN	94.90	81.00	15.80
MANGANESE	MG/KG	MN	186.00	140.00	28.22
MANGANESE	MG/KG	MN	205.00	160.00	24.66
MANGANESE	MG/KG	MN	12.20	14.00	-13.74
MANGANESE	MG/KG	MN	76.10	27.00	95.25
MANGANESE	MG/KG	MN	102.00	17.00	142.86
Average RPD					32.29

Negative RPD's indicate that  
outside lab results are is higher

TABLE B.2-8  
RESULTS FROM OUTSIDE LABORATORY SPLIT SAMPLES

SOIL SAMPLES FROM RI BORINGS  
(06/90 - 10/90)

PALOS VERDES LANDFILL  
DRAFT PRELIMINARY REMEDIAL INVESTIGATION REPORT

TEST			RESULT FROM SJCWQL	RESULT FROM OUTSIDE LAB	RELATIVE PERCENT DIFFERENCE
MERCURY	MG/KG	HG	0.09	< 0.20	-74.91
MERCURY	MG/KG	HG	0.20	< 0.20	0.00
MERCURY	MG/KG	HG	0.06	< 0.03	62.07
MERCURY	MG/KG	HG	0.28	< 0.02	173.77
MERCURY	MG/KG	HG	0.12	< 0.20	-48.45
MERCURY	MG/KG	HG	0.07	< 0.20	-98.51
MERCURY	MG/KG	HG	< 0.05	< 0.20	0.00
MERCURY	MG/KG	HG	< 0.05	< 0.20	0.00
MERCURY	MG/KG	HG	< 0.05	< 0.20	0.00
Average RPD					1.55
NICKEL	MG/KG	NI	29.80	28.00	6.23
NICKEL	MG/KG	NI	34.00	23.00	38.60
NICKEL	MG/KG	NI	41.70	37.00	11.94
NICKEL	MG/KG	NI	42.50	33.00	25.17
NICKEL	MG/KG	NI	73.60	75.00	-1.88
NICKEL	MG/KG	NI	72.10	65.00	10.36
NICKEL	MG/KG	NI	41.60	39.00	6.45
NICKEL	MG/KG	NI	43.70	37.00	16.60
NICKEL	MG/KG	NI	16.00	8.60	60.16
Average RPD					19.29
POTASSIUM	MG/KG	K	3280.00	3200.00	2.47
POTASSIUM	MG/KG	K	5970.00	4100.00	37.14
POTASSIUM	MG/KG	K	943.00	720.00	26.82
POTASSIUM	MG/KG	K	1740.00	1300.00	28.95
POTASSIUM	MG/KG	K	5635.00	4500.00	22.40
POTASSIUM	MG/KG	K	4515.00	4100.00	9.63
POTASSIUM	MG/KG	K	487.00	220.00	75.53
POTASSIUM	MG/KG	K	1370.00	1200.00	13.23
POTASSIUM	MG/KG	K	520.00	350.00	39.08
Average RPD					28.36
SILVER	MG/KG	AG	0.68	< 0.20	109.09
SILVER	MG/KG	AG	0.60	< 0.20	100.00
SILVER	MG/KG	AG	< 1.00	0.30	107.69
SILVER	MG/KG	AG	4.25	0.70	143.43

Negative RPD's indicate that  
outside lab results are is higher



TABLE B.2-8  
RESULTS FROM OUTSIDE LABORATORY SPLIT SAMPLES

SOIL SAMPLES FROM RI BORINGS  
(06/90 - 10/90)

PALOS VERDES LANDFILL  
DRAFT PRELIMINARY REMEDIAL INVESTIGATION REPORT

TEST			RESULT FROM SJCWQL	RESULT FROM OUTSIDE LAB	RELATIVE PERCENT DIFFERENCE
SILVER	MG/KG	AG	1.24	0.30	122.08
SILVER	MG/KG	AG	< 1.00	0.45	75.86
SILVER	MG/KG	AG	< 1.00	0.40	85.71
SILVER	MG/KG	AG	< 1.00	0.60	50.00
SILVER	MG/KG	AG	< 1.00	< 0.20	0.00
Average RPD					88.21
SODIUM	MG/KG	NA	1320.00	1300.00	1.53
SODIUM	MG/KG	NA	417.00	280.00	39.31
SODIUM	MG/KG	NA	670.00	370.00	57.69
SODIUM	MG/KG	NA	4560.00	4900.00	-7.19
SODIUM	MG/KG	NA	2200.00	2200.00	0.00
SODIUM	MG/KG	NA	405.00	350.00	14.57
SODIUM	MG/KG	NA	239.00	290.00	-19.28
SODIUM	MG/KG	NA	305.00	270.00	12.17
SODIUM	MG/KG	NA	194.00	130.00	39.51
Average RPD					15.37
ZINC	MG/KG	ZN	74.70	74.00	0.94
ZINC	MG/KG	ZN	97.00	69.00	33.73
ZINC	MG/KG	ZN	56.10	44.00	24.18
ZINC	MG/KG	ZN	119.00	120.00	-0.84
ZINC	MG/KG	ZN	135.00	120.00	11.76
ZINC	MG/KG	ZN	125.00	110.00	12.77
ZINC	MG/KG	ZN	35.80	30.00	17.63
ZINC	MG/KG	ZN	64.10	44.00	37.19
ZINC	MG/KG	ZN	24.50	13.00	61.33
Average RPD					22.08
BERYLLIUM	MG/KG	BE	0.57	0.22	88.61
BERYLLIUM	MG/KG	BE	< 0.50	0.27	59.74
BERYLLIUM	MG/KG	BE	< 0.50	0.15	107.69
BERYLLIUM	MG/KG	BE	1.59	1.00	45.56
BERYLLIUM	MG/KG	BE	< 0.50	0.20	85.71
BERYLLIUM	MG/KG	BE	< 0.50	0.14	112.50
BERYLLIUM	MG/KG	BE	0.70	0.05	173.33
BERYLLIUM	MG/KG	BE	0.52	0.12	125.00

Negative RPD's indicate that  
outside lab results are is higher

TABLE B.2-8  
RESULTS FROM OUTSIDE LABORATORY SPLIT SAMPLES

SOIL SAMPLES FROM RI BORINGS  
(06/90 - 10/90)

PALOS VERDES LANDFILL  
DRAFT PRELIMINARY REMEDIAL INVESTIGATION REPORT

TEST			RESULT FROM SJCWQL	RESULT FROM OUTSIDE LAB	RELATIVE PERCENT DIFFERENCE
BERYLLIUM	MG/KG	BE	< 0.50	0.07	150.88
Average RPD					105.45
MOLYBDENUM	MG/KG	MO	9.68	7.00	32.13
MOLYBDENUM	MG/KG	MO	10.40	< 4.00	88.89
MOLYBDENUM	MG/KG	MO	5.23	4.00	26.65
MOLYBDENUM	MG/KG	MO	14.90	12.00	21.56
MOLYBDENUM	MG/KG	MO	15.60	11.00	34.59
MOLYBDENUM	MG/KG	MO	22.50	29.00	-25.24
MOLYBDENUM	MG/KG	MO	11.50	7.00	48.65
MOLYBDENUM	MG/KG	MO	< 1.00	< 4.00	0.00
Average RPD					28.40
VANADIUM	MG/KG	V	85.50	37.00	79.18
VANADIUM	MG/KG	V	105.00	64.00	48.52
VANADIUM	MG/KG	V	226.00	180.00	22.66
VANADIUM	MG/KG	V	77.10	44.00	54.67
VANADIUM	MG/KG	V	81.30	42.00	63.75
VANADIUM	MG/KG	V	146.00	100.00	37.40
VANADIUM	MG/KG	V	113.00	68.00	49.72
VANADIUM	MG/KG	V	36.40	13.00	94.74
Average RPD					56.33
BENZO(A)PYRENE	MG/KG		< 7.00	1.50	129.41
Average RPD					129.41

Negative RPD's indicate that  
outside lab results are higher