WATER RECLAMATION
SOLID WASTE MANAGEMENT

COUNTY SANITATION DISTRICTS
OF LOS ANGELES COUNTY

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Chief Engineer and General Manager

February 28, 2007
File No. 31-370.40.4A

Via U.S. and Electronic Mail

Mr. Jonathan Bishop, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013

ATTN: Ms. Deborah Neiter

Dear Mr. Bishop:

Response to Public Solicitation of Water Quality Data and Information for 2008 Integrated Report – List of Impaired Waters and Surface Water Quality Assessment [303(d)/305(b)]

In response to the Public Solicitation of Water Quality Data and Information (Public Solicitation) from the State Water Resources Control Board (State Board), the Sanitation Districts of Los Angeles County[1] (Districts) are providing the enclosed data and information to be used by the State Board and Los Angeles Regional Water Quality Control Board (Regional Board) to assess the State's water bodies for possible inclusion on or removal from the existing Clean Water Act Section 303(d) List (303(d) list). The Districts are a consortium of 24 independent special districts serving the wastewater and solid waste management needs of over 5 million people and 3,300 industries in Los Angeles County, California. The Districts serve 78 cities and unincorporated areas within the County. We currently operate and maintain over 1,300 miles of trunk sewers and 11 wastewater treatment plants that collectively treat over 650 million gallons per day of wastewater. Of the 11 wastewater treatment plants, 7 discharge to inland surface waters in the San Gabriel River, Santa Clara River, and Rio Hondo watersheds (all in the Los Angeles Region), 1 discharges to the ocean (on the Palos Verdes Shelf), and 3 discharge to land and/or supply water for water recycling purposes.

The Districts would first like to note that the window for data solicitation for the 2008 Integrated Report is actually closing before the final 2006 303(d) list has been revealed by the U.S. Environmental Protection Agency (USEPA). Therefore, USEPA may list waterbody - pollutant combinations on the 2006 303(d) list after the time permitted to supply data to contest or support such listings. Hypothetically,

[1]District No. 2 on behalf of the Joint Outfall System and the Solid Waste System. The ownership and operation of the Joint Outfall System is proportionally shared among the signatory parties to the amended Joint Outfall Agreement effective July 1, 1995. These parties include County Sanitation Districts of Los Angeles County Nos. 1, 2, 3, 5, 8, 15, 16, 17, 18, 19, 21, 22, 23, 28, 29, and 34, and South Bay Cities Sanitation District of Los Angeles County. The ownership and operation of the Solid Waste System is proportionally shared among the signatory parties to the Sanitation Districts' Solid Waste Management System Agreement effective February 21, 1996.

data submitted in response to any action USEPA may take would therefore not be eligible for submitting until the solicitation for the 2010 303(d) list. In the effort to direct valuable resources toward waterbodies that are actually impaired, the Districts reserves the right to submit additional data as necessary for consideration after the February 28, 2007 data solicitation deadline in response to any action USEPA may take on the 2006 303(d) list.

The Districts are pleased that the Public Solicitation cites the State Board's Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (Listing Policy) and states the Regional Board will utilize the Listing Policy to assess the relevant data and information submitted. The Districts believe that the consistent use of the Listing Policy to make statewide listing decisions will result in a cohesive, well-documented, and scientifically valid 303(d) list. All the data and analyses presented in this submittal have been prepared in accordance with the provisions of the Listing Policy.

In Attachment 1 to this data submittal, the Districts are providing data and information pertaining to the following waterbody – pollutant combinations:

- San Gabriel River Reach 2 – lead
- Santa Clara River Reach 6 – chlorpyrifos
- San Jose Creek Reach 1 – selenium
- Coyote Creek – lead and zinc

The Districts are requesting reassessment of the existing 303(d) listing for lead in Reach 2 of San Gabriel River. Based on the data analysis provided with this letter, that waterbody is not impaired with regards to lead. The State Board had originally proposed to delist the subject waterbody – pollutant combination from the 2006 303(d) list in September 2005, but reversed its position and maintained the listing in October 2006. After reviewing the data per the provisions in the Listing Policy, it is clear that the subject waterbody is not impaired with regards to lead.

In addition, the Districts are requesting reassessment of the chlorpyrifos listing on Santa Clara River Reach 6 and the toxicity listing for Walnut Creek. None of the samples collected in Reach 6 of the Santa Clara River exceed the guideline established by the California Department of Fish and Game for chlorpyrifos. For Walnut Creek, the Districts submitted data supporting the delisting of that waterbody for toxicity in our September 2006 comments on the 2006 303(d) list. USEPA has indicated it may delist that waterbody – pollutant combination from the 2006 303(d) list[2], but the subject waterbody – pollutant combination has not yet been delisted at this time. The Districts submitted toxicity data for Walnut Creek in September 2006 as part of the 2006 303(d) update and, pursuant to the Regional Board's Public Solicitation, the Districts are not resubmitting this data as part of this submittal.

The other three waterbody – pollutant combinations addressed in this letter, selenium in San Jose Creek Reach 1 and lead and zinc in Coyote Creek, are not currently listed as impaired on the 2006 303(d) list. The Districts are submitting data to support the position that these pollutant – waterbody combinations are NOT impaired because USEPA has indicated recently that it may place them on the 2006 303(d) list as part of their partial disapproval of the 2006 303(d) list[3].

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[2] "USEPA has approved the State of California's inclusion of all waters and pollutants identified in its three part Section 303(d) list, with the exception of Walnut Creek, for toxicity", State Board website referencing USEPA's Partially Approval of California's 2004-2006 Section 303(d) Water Quality Limited Waters List, November 2006.

[3] USEPA's proposed Total Maximum Daily Loads for Metals and Selenium in San Gabriel River and Impaired Tributaries distributed in January 2007 contained the following footnote: "On November 30, 2006, EPA approved California's 2004-2006 303(d) list submittal of impaired waters as to the waterbody/pollutant combinations on the list; this includes lead in San Gabriel River Reach 2 and copper in Coyote Creek. EPA is still reviewing information concerning waterbody-pollutant combinations not included on the list. EPA anticipates proposing to add to California's 303(d) list the remaining waterbody-pollutant combinations identified in Table 1. Our action regarding the State's decision to not include certain waters on the list submittal is forthcoming."

We appreciate your efforts towards developing a cohesive statewide 2008 Integrated Report. If you have any questions concerning this letter, please contact Ms. Beth Bax at (562) 908- 4288, extension 2835.

Very truly yours,

Stephen R. Maguin

Robert Asgian
Division Engineer
Water Quality & Soils Engineering Section

RGA:BCB:drs
Attachments

cc: Craig J. Wilson, State Board

ATTACHMENT 1

REASSESSMENT OF EXISTING LISTINGS

LISTING: Lead in Reach 2 of San Gabriel River (Firestone Boulevard To Whittier Narrows Dam)

DATA SOURCE: Los Angeles County Department of Public Works (LADPW)

QUALITY ASSURANCE PROJECT PLAN: LADPW's October 2006 Environmental Toxicology Laboratory Quality Assurance Manual is attached as Exhibit A.1.

REASON EXISTING LISTING IS INAPPROPRIATE: Current Data Show Attainment of Water Quality Objectives

The Districts provide data and analysis herein demonstrating that Reach 2 of the San Gabriel River is not impaired for lead and thus the waterbody should *NOT* be listed as impaired for lead on the 2008 303(d) list. The analysis presented here uses three distinct provisions of the Listing Policy:

- First, the Listing Policy prescribes that non-detect data that are *above* the applicable criterion should not be used to ascertain impairment.[1]

- Secondly, the Listing Policy prescribes that data should be averaged over the same period of time for which the standard applies. Since the most conservative standard typically used by the Regional Board for lead, the chronic California Toxics Rule (CTR) criterion, is based on a four-day period, data falling within a single 4-day period were averaged before comparison to the CTR criterion.[2]

- Finally, the adopted Listing Policy contains no provisions for separating the wet and dry-weather data when determining if an impairment exists and in fact requires temporal representation. The Regional Board proposed seasonal impairments (separate wet and dry impairments) in the San Gabriel River watershed to the State Board in its September 2006 comments on the State's proposed 2006 303(d) list. In the State Board's Response to Comments on the 2006 Proposed Clean Water Act section 303(d) list, the State Board staff responded with the following statement: "Wet and dry weather data were not separated for the purposes of these assessments since the water quality objectives are not wet or dry weather specific. Additionally, the Basin Plan does not include any provisions for assessing data from wet or dry weather separately for this pollutant. The Listing Policy does not contain provisions to assess a water body based upon wet and dry weather conditions." State Water Resources Control Board, Revision of the Clean Water Act Section 303(d) List of Water Quality Limited Segments, Volume IV: Response to Comments (September 2006) at 99 (Comment Number 107.20).

The impairment analysis presented below was prepared by the Districts following the guidelines in the adopted Listing Policy for California. This analysis clearly finds that Reach 2 of the San Gabriel River is not impaired with respect to lead. All the representative samples were collected from the Los

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[1] Section 6.1.5.5 of the Listing Policy includes the text: "When the sample value is less than the quantitation limit and the quantitation limit is greater than the water quality standard, objective, criterion, or evaluation guideline, the result shall not be used in the analysis."

[2] Section 6.1.5.6 of the Listing Policy begins "Evaluation of Data Consistent with the Expression of Numeric Water Quality Objectives, Water Quality Criteria, or Evaluation Guidelines. If the water quality objectives, criteria, or guidelines state a specific averaging period and/or mathematical transformation, the data should be evaluated in a consistent manner prior to conducting any statistical analysis for placement of the water on the section 303(d) list."

Angeles County Department of Public Works' (LADPW) monitoring station designated as S14 in San Gabriel River Reach 2. The Quality Assurance Project Plan is attached in Exhibit A.1. A description of mass emission station S14 (an excerpt from the Los Angeles County 2005-2006 Stormwater Monitoring Report) is included as Exhibit A.2.

For this analysis, the Districts utilized data that were provided by the Regional Board for the draft TMDLs for Metals and Selenium in the San Gabriel River and Impaired Tributaries (distributed on May 5, 2006) for the time period of November 1, 1997 to January 1, 2005. In addition to these data, the Districts obtained dry weather data collected during the same period, as well as wet and dry weather data for the periods of August 1995 to October 1997 and January 2005 through April 2006 directly from LADPW. Samples for which lead measurements and associated water hardness values were available were used; so, the actual hardness of each event was used to determine if an impairment exists. The raw data from this extended data collection is in Table A.1 in Appendix A and consists of 90 data points. These results were averaged in accordance with the Listing Policy before being compared to the applicable water quality standard; the averaged samples are listed in Table A.2 in Appendix A. When averaged appropriately, there remain 79 representative samples to use for comparison. Table A.3 also in Appendix A compares the data collected to the CTR chronic criterion for lead. Following another provision of the Listing Policy, non-detected data that were above the CTR chronic criterion (once adjusted for event-specific hardnesses) were not used for the impairment analysis. This is a conservative measure; essentially, some non-detect values (often treated as zero values) are thrown out of the analysis, thereby making the sample size smaller. Therefore, of the total of 79 samples, only 64 data points were utilized for the impairment analysis. Of the 64 samples, four exceeded the CTR chronic criterion for lead. Per the Listing Policy, "Using the binomial distribution, waters shall be removed from the section 303(d) list if the number of measured exceedances supports rejection of the null hypothesis as presented in Table 4.1." Listing Policy at 11. Per Table 4.1 of the Listing Policy, if there are five or less exceedances of the applicable criterion in 60 - 71 samples, the impairment should be delisted. The frequency the standards are exceeded is too low to support continued listing of the pollutant for this waterbody. There were only four exceedances of the chronic criterion in 64 samples, so lead should be delisted for San Gabriel River Reach 2 in accordance with the State's Listing Policy.

Figure A.1 in Appendix A shows all the lead measurements graphically in comparison to both the acute and chronic CTR criteria. Clearly, all of the measurements were far below the CTR acute criterion. Figure A.2 in Appendix A shows the data in comparison to the chronic criterion alone. These data all had event-specific hardness values that were used to determine the allowable amount of lead for that particular event. Figure A.3 in Appendix A is included to illustrate the temporal nature of the observed exceedances. Of the four exceedances, three of them (also the three largest exceedances) occurred in one year. In actuality, the three exceedances occurred not only within one year and not only within one storm season but within a single two-month period. In the remaining data, there was only one exceedance in over ten and a half years, or 126 months. The Listing Policy states: "Samples used in the assessment must be temporally independent. If the majority of samples were collected on a single day or during a single short-term natural event (e.g., a storm, flood, or wildfire), the data shall not be used as the primary data set supporting the listing decision." Listing Policy at 23. The Districts contend that data from a single short-term natural event (a two-month period during an El Nino wet season) are being used as the primary data set to support continuation of this "impairment" on the 303(d) list. The fact that these data are NOT temporally independent provides further justification that this listing is not warranted.

Given that there are only 4 exceedances in 64 representative samples, and that Table 4.1 of the Listing Policy recommends delisting for that sample size if there are 5 or less exceedances, the Districts strongly believe that the data support delisting lead as an impairment on the 303(d) list in Reach 2 of the San Gabriel River.

LISTING: Chlorpyrifos in Santa Clara River Reach 6 (West Pier Hwy 99 (also known as the 'Old Road') to Bouquet Canyon Rd.)

DATA SOURCE: Los Angeles County Department of Public Works (LADPW)

QUALITY ASSURANCE PROJECT PLAN: LADPW's October 2006 Environmental Toxicology Laboratory Quality Assurance Manual is attached as Exhibit A.1.

REASON EXISTING LISTING IS INAPPROPRIATE: Current Data Show Attainment of Water Quality Objectives

Available receiving water data from Santa Clara River Reach 6 indicate that the waterbody is not impaired for chlorpyrifos; therefore, this waterbody should *NOT* be listed.

The Districts submitted comments on the State Board's proposed listing of Santa Clara River Reach 6 as impaired for chlorpyrifos in our January 31, 2006 and September 2006 submittals. Reviewing the available water quality data for Reach 6, none of the samples exceeded the chlorpyrifos evaluation guideline applied by the State Board (the chronic California Department of Fish and Game Aquatic Life guideline of 0.05 ug/L).

In its January 31, 2006 submittal, the Districts submitted data from six water quality samples collected at the boundary between Reach 5 and Reach 6 by the LADPW between August 2002 and April 2003. These samples were collected by LADPW at mass emission station S29; a description of mass emission station S29 (an excerpt from the Los Angeles County 2005-2006 Stormwater Monitoring Report) is included as Exhibit A.2. (The location of the station is listed as being at the Old Road. It is crucial to note this is the SAME road as West Pier Highway 99, which is the downstream boundary for Reach 6.) For this data solicitation, the Districts are submitting the results of 16 additional samples collected at the same location. The results of the sampling are included in Table B.1 in Appendix B. (The raw data sheets, complete with metadata, are included in Exhibit B.1 in Appendix B.) Chlorpyrifos was not detected, and the four-day Aquatic Life guideline for chlorpyrifos developed by the California Department of Fish and Game was not exceeded in any of the 22 water quality samples collected in this waterbody. Per Table 3.1 of the Listing Policy, 2 or more exceedances are required in a sample size of 22 for the waterbody to be listed. Listing Policy at 9. These data were collected at the downstream end of Reach 6 of the Santa Clara River and demonstrate that Reach 6 is not impaired for chlorpyrifos.

It is unclear why the waterbody was originally listed as impaired on the 2006 303(d) list. There are data available to indicate an impairment in a tributary, Bouquet Canyon, may be appropriate for this constituent. However, the listing was applied to a reach of the Santa Clara River (in which collected data demonstrate there is no impairment) instead of just listing Bouquet Canyon as impaired. The Listing Policy specifically states that "At a minimum, data shall be aggregated by the water body segments as defined in the Basin Plans. In the absence of a Basin Plan segmentation system, the Regional Boards should define distinct reaches based on hydrology and relatively homogeneous land use." Listing Policy at 23. Table 2.1 of the Regional Board's Water Quality Control Plan (Beneficial Uses of Inland Surface Waters) lists Bouquet Canyon as a separate waterbody with independent beneficial uses. It would seem that since the Regional Board specifically identifies Bouquet Canyon as an individual segment, any proposed 303(d) listing should be applied to it specifically. This precedent has already been established for this watershed; there are many tributary creeks in the Santa Clara River Watershed that are listed individually, including Brown/Barranca Canyon, Mint Canyon, Hopper Creek, Pole Creek, Torrey Canyon Creek and Wheeler Canyon. In addition, a tributary listing would ensure that the subsequent TMDL would be focused on the area with the identified impairment and not on an area where the water quality guideline is being attained.

Thus, the Districts believe that the data do not support a listing for chlorpyrifos in Santa Clara River Reach 6 and request that it be removed from the 303(d) list.

DATA TO SUPPORT WATERBODY ATTAINMENT

LISTING: Selenium in San Jose Creek Reach 1 (San Gabriel River Confluence to Temple Street)

DATA SOURCE(S): Los Angeles County Sanitation Districts (Districts)

QUALITY ASSURANCE PROJECT PLAN: The January 2007 Quality Assurance Program of the Districts' Laboratories Section is included in Appendix C as Attachment C.1.

REASON A NEW LISTING IS INAPPROPRIATE: Current Data Show Attainment of Water Quality Objectives

This data submittal is prompted by San Jose Creek Reach 1 being identified as impaired for selenium in the draft TMDLs for Metals and Selenium in the San Gabriel River and Impaired Tributaries distributed on May 5, 2006 by the Regional Board. After a thorough review of the representative data, it is clear that Reach 1 of San Jose Creek is *NOT* impaired for selenium and should not be listed as such on the 2008 303(d) list.

The draft TMDLs for Metals and Selenium in the San Gabriel River and Impaired Tributaries identified 78 measurements of selenium in San Jose Creek Reach 1 and its tributaries. Draft TMDL at 12. Upon evaluation, the Districts have identified additional representative data that should be considered in determining if San Jose Creek Reach 1 is impaired for selenium.

There are five receiving water locations that the Districts routinely sample in compliance with National Pollutant Discharge Elimination System permits for Water Reclamation Plants in the watershed. There are 156 selenium measurements available from those locations to be used in the impairment analysis for San Jose Creek Reach 1.

In addition, the Southern California Coastal Water Research Project conducted two "snapshot" surveys in the San Gabriel River Watershed: one in September 2002 and one in September 2003. The surveys consisted of sampling flow and metals concentrations from Water Reclamation Plants, storm drains and open channels. The goal was to evaluate the sources of metals in the watershed in dry weather. In that sampling effort, 33 grab samples were collected in San Jose Creek; 27 samples were from Reach 1 and six were from Reach 2. Those samples were grab samples taken in triplicate at each location, so the triplicate samples are averaged per the provisions of the Listing Policy. Listing Policy at 23. Thus, there are an additional nine representative selenium samples to be used in the impairment analysis for San Jose Creek Reach 1.

Furthermore, there are additional selenium data collected at two locations in San Jose Creek Reach 1 (R-14 and R-15) from monthly sampling conducted in part of 2005 and 2006. These monitoring locations are part of the Montebello Forebay Attenuation and Dilution Studies being conducted by the Districts. The proposed Sampling and Analysis Plan and the Field Work Program Plan for these studies were previously submitted to the Regional Board and were approved on April 15, 2005. From that sampling effort, there are an additional 38 representative samples available to be used in the impairment analysis for selenium in San Jose Creek Reach 1.

Figure C.1 in Appendix C shows the locations of all of these sampling locations. (Table C.3 in Appendix C contains the latitudes and longitudes for all the sampling locations.) Locations R-A, R-C, R-D, C-1 and C-2 are the Districts' routine receiving water monitoring stations in San Jose Creek. Locations that begin with a "SCCWRP" prefix are locations from the Southern California Coastal Water

Research Project's "snapshot" sampling efforts in 2002 and 2003, and locations R-14 and R-15 are the sampling locations associated with the Sampling and Analysis Plan for the Montebello Forebay studies. Taken together, there are 203 representative selenium samples for San Jose Creek Reach 1 (and the tributary South San Jose Creek which R-A is located on). Of these, 16 samples exceed the CTR criterion for selenium of 5 ug/L. Figure C.2 shows all the representative samples in comparison to the CTR criterion. Per Table 3.1 and the binomial distribution method recommended in the Listing Policy, the waterbody is not impaired for selenium. Table C.1 lists all the representative selenium data for this reach and Table C.2 contains an impairment analysis for this waterbody and pollutant.

Given that the frequency the standards are exceeded is too low to support a listing of the pollutant for this waterbody per the Listing Policy, the Districts strongly believe that a 303(d) listing for selenium for San Jose Creek Reach 1 is inappropriate.

LISTING: Lead and Zinc in Coyote Creek

DATA SOURCE(S): Los Angeles County Sanitation Districts (Districts) and Los Angeles County Department of Public Works (LADPW)

QUALITY ASSURANCE PROJECT PLAN: LADPW's October 2006 Environmental Toxicology Laboratory Quality Assurance Manual is attached as Exhibit A.1. The January 2007 Quality Assurance Program of the Districts' Laboratories Section is included as Attachment C.1.

REASON A NEW LISTING IS INAPPROPRIATE: Current Data Show Attainment of Water Quality Objectives

In 2002, this waterbody was listed for dissolved lead and dissolved zinc based solely upon available LADPW data. In 2004, the Districts submitted our data collected from Coyote Creek. The Districts have historically collected samples from three receiving water stations in Coyote Creek. After reviewing all the applicable data, the State Board decided that the lead and zinc listings on Coyote Creek were inappropriate and removed them from the 2006 303(d) list. The Districts are once again submitting the relevant data for this waterbody because the waterbody was inappropriately identified as impaired for lead and zinc in the draft TMDLs for Metals and Selenium in the San Gabriel River and Impaired Tributaries distributed on May 5, 2006 by the Regional Board.

Lead

Total and dissolved concentrations of lead are measured from samples collected at LADPW mass emission station S13 located at Spring Street on Coyote Creek. A description of mass emission station S13 (an excerpt from the Los Angeles County 2005-2006 Stormwater Monitoring Report) is included as Exhibit A.2. The raw lead data from the LADPW sampling are compiled in Table D.1 in Appendix D and consist of 93 data points. (The raw data sheets, complete with metadata, are included in Exhibit D.1 in Appendix D.) These results were averaged in accordance with the Listing Policy before being compared to the applicable water quality standard; the averaged samples are listed in Table D.2 in Appendix D. Following another provision of the Listing Policy, non-detected data that were above the CTR chronic criterion were not used for the impairment analysis. This is a conservative measure; essentially, some non-detect values (often treated as zero values) are thrown out of the analysis, thereby making the sample size smaller. Table D.2 shows the remaining averaged lead concentrations (in conjunction with the event-specific hardness) compared to the CTR chronic criterion for lead. Of the total of 93 raw data points, only 63 remain after the data are averaged and evaluated per the Listing Policy. Of the 63 samples, six exceeded the CTR chronic criterion for lead.

Total concentrations of lead are also measured by the Districts at three locations in Coyote Creek. Monitoring at these stations is required by the National Pollutant Discharge Elimination Permit for the Long Beach Water Reclamation Plant. See Figure D.1 for a map of the locations of the three Districts' monitoring stations and the one LADPW-monitored station. The Districts' data for the three Coyote Creek receiving water stations for lead are given in Table D.3. There are a total of 111 samples taken at the three monitoring stations for which lead and hardness were both analyzed on the same day. Of the 111 samples, there was only one exceedance of the CTR chronic criterion for lead. This comparison is conservative because the Districts only analyze for total lead whereas the criterion is for dissolved lead and the dissolved portion of a metal is often much less than the total concentration.

Figure D.2 in Appendix D shows all the lead measurements graphically in comparison to both the acute and chronic CTR criteria. Clearly, all of the measurements were far below the CTR acute criterion. Figure D.3 in Appendix D shows the data in comparison to the chronic criterion alone. Taken together, there are a total of 174 data points for lead with only seven exceedances of the chronic criterion. Given that the frequency the standards are exceeded is too low to support a listing of the pollutant for this

waterbody per the Listing Policy, the Districts strongly believe that a 303(d) listing for lead in Coyote Creek is inappropriate.

Zinc

Total and dissolved concentrations of zinc are also measured from samples collected at LADPW mass emission station S13 located at Spring Street on Coyote Creek. A description of mass emission station S13 (an excerpt from the Los Angeles County 2005-2006 Stormwater Monitoring Report) is included as Exhibit A.2. The compiled raw zinc data from the LADPW sampling are in Table E.1 in Appendix E and consist of 92 data points. (The raw data sheets, complete with metadata, are included in Exhibit E.1 in Appendix E.) These results were averaged in accordance with the Listing Policy before being compared to the applicable water quality standard; the averaged samples are listed in Table E.2 in Appendix E. Table E.2 shows the averaged zinc concentrations (in conjunction with the event-specific hardness) compared to the CTR chronic criterion for zinc. Of the total of 92 raw data points, only 79 remain after the data are averaged per the Listing Policy. Of the 79 samples, four exceeded the CTR chronic criterion for lead.

Total concentrations of zinc are also measured by the Districts at three locations in Coyote Creek. Monitoring at these stations is required by the National Pollutant Discharge Elimination Permit for the Long Beach Water Reclamation Plant. See Figure D.1 for a map of the locations of the three Districts' monitoring stations and the one LADPW-monitored station. The Districts' data for the three Coyote Creek receiving water stations for zinc are given in Table E.3. There are a total of 113 samples taken at the three monitoring stations for which zinc and hardness were both analyzed on the same day. Of the 113 samples, there was only one exceedance of the CTR chronic criterion for zinc. This comparison is conservative because the Districts only analyze for total zinc whereas the criterion is for dissolved zinc and the dissolved portion of a metal is often much less than the total concentration.

Figure E.2 in Appendix E shows all the zinc measurements graphically in comparison to both the acute and chronic CTR criteria. Clearly, all of the measurements were far below the CTR acute criterion. Taken together, there are a total of 192 data points for zinc with only five exceedances of the chronic criterion. Given that the frequency the standards are exceeded is too low to support a listing of the pollutant for this waterbody per the Listing Policy, the Districts strongly believe that a 303(d) listing for zinc in Coyote Creek is inappropriate.

APPENDIX A

Table A.1: Raw San Gabriel River Reach 2 lead data (data obtained from Regional Board and LADPW)

data source	site ID	date sampled	hardness MG/L	dissolved lead UG/L	total lead UG/L	Detection limit UG/L	EPA test method
LADPW	S14	8/23/1995	265	0	0	5	A239.2
LADPW	S14	11/7/1995	350	0	0	5	A239.2
LADPW	S14	12/12/1995	152	0	0	5	A239.2
LADPW	S14	12/23/1995	305	0	0	5	A239.2
LADPW	S14	1/9/1996	350	0	0	5	A239.2
LADPW	S14	1/21/1996	141	0	0	5	A239.2
LADPW	S14	1/31/1996	135	0	0	5	A239.2
LADPW	S14	2/3/1996	300	0	0	5	A239.2
LADPW	S14	2/19/1996	135	0	0	5	A239.2
LADPW	S14	3/19/1996	220	0	0	5	A239.2
LADPW	S14	5/14/1996	292	0	0	5	A239.2
LADPW	S14	7/9/1996	270	0	0	5	A239.2
LADPW	S14	9/10/1996	348	0	0	5	A239.2
LADPW	S14	10/8/1996	260	0	0	1	A239.2
LADPW	S14	10/30/1996	116	0	24	1	A239.2
LADPW	S14	11/21/1996	128	0	0	1	A239.2
LADPW	S14	12/9/1996	119.6	0	10	1	A239.2
LADPW	S14	1/24/1997	157	0	2.7	1	A239.2
LADPW	S14	10/14/1997	238	0	0	5	A239.2
Regional Board	S14	11/10/1997	195	0	0	5	A239.2
Regional Board	S14	11/13/1997	128	0	0	5	A239.2
Regional Board	S14	11/26/1997	100	35.5	44	5	A239.2
Regional Board	S14	12/5/1997	132	18	24.6	5	A239.2
Regional Board	S14	1/9/1998	120	20.4	27.9	5	A239.2
Regional Board	S14	1/29/1998	134	0	6.8	5	A239.2
Regional Board	S14	2/2/1998	120	0	7	5	A239.2
Regional Board	S14	2/6/1998	100	0	15.9	5	A239.2
LADPW	S14	10/14/1998	372	0	0	5	A239.2
LADPW	S14	10/22/1998	380	0	0	5	A239.2
Regional Board	S14	11/8/1998	230	0	0	5	A239.2
Regional Board	S14	12/6/1998	80	0	0	5	A239.2
LADPW	S14	1/12/1999	346	0	0	5	A239.2
Regional Board	S14	1/20/1999	276	0	0	5	A239.2
Regional Board	S14	1/25/1999	184	0	0	5	A239.2
Regional Board	S14	1/31/1999	280	0	0	5	A239.2
Regional Board	S14	2/6/1999	256	0	0	5	A239.2
Regional Board	S14	2/9/1999	286	0	0	5	A239.2
Regional Board	S14	3/15/1999	126	0	0	5	A239.2
Regional Board	S14	3/20/1999	265	0	0	5	A239.2
Regional Board	S14	3/25/1999	290	0	0	5	A239.2
Regional Board	S14	4/6/1999	178	0	0	5	A239.2
Regional Board	S14	4/8/1999	230	0	0	5	A239.2
Regional Board	S14	4/11/1999	110	0	0	5	A239.2
Regional Board	S14	1/26/2000	95	0	6.1	5	A239.2
Regional Board	S14	2/3/2000	170	0	0	5	A239.2
Regional Board	S14	2/12/2000	160	0	0	5	A239.2
Regional Board	S14	2/15/2000	128	0	0	5	A239.2
Regional Board	S14	2/17/2000	112	0	0	5	A239.2
Regional Board	S14	2/22/2000	95.2	0	0	5	A239.2
Regional Board	S14	2/25/2000	192	0	0	5	A239.2
Regional Board	S14	2/29/2000	230	0	0	5	A239.2

data source	site ID	date sampled	hardness MG/L	dissolved lead UG/L	total lead UG/L	Detection limit UG/L	EPA test method
Regional Board	S14	3/7/2000	85	0	0	5	A239.2
Regional Board	S14	3/9/2000	198	0	0	5	A239.2
Regional Board	S14	10/28/2000	266	0	0	5	A239.2
Regional Board	S14	11/1/2000	190	0	5.24	5	A239.2
Regional Board	S14	1/8/2001	300	0	0	5	A239.2
Regional Board	S14	1/17/2001	160	0	0	5	A239.2
Regional Board	S14	1/26/2001	360	0	0	5	A239.2
Regional Board	S14	2/14/2001	220	0	0	5	A239.2
Regional Board	S14	2/20/2001	240	0	0	5	A239.2
Regional Board	S14	2/28/2001	140	0	0	5	A239.2
Regional Board	S14	3/6/2001	210	0	0	5	A239.2
Regional Board	S14	11/12/2001	180	0	0.77	0.5	200.8
Regional Board	S14	11/27/2001	120	3.19	5.01	0.5	200.8
Regional Board	S14	11/30/2001	200	0	0.59	0.5	200.8
Regional Board	S14	12/3/2001	230	0.76	1.77	0.5	200.8
Regional Board	S14	12/27/2001	172	0	0.77	0.5	200.8
Regional Board	S14	1/31/2002	150	0	0	0.5	200.8
LADPW	S14	10/10/2002	270	0	1.38	0.5	200.8
Regional Board	S14	11/8/2002	210	0.67	56	0.5	200.8
Regional Board	S14	12/16/2002	108	1.21	2.52	0.5	200.8
Regional Board	S14	2/11/2003	80	1.55	2.16	0.5	200.8
Regional Board	S14	3/15/2003	103	0	5.39	0.5	200.8
LADPW	S14	10/28/2003	210	0	1.04	0.5	200.8
Regional Board	S14	10/31/2003	260	0	3.34	0.5	200.8
Regional Board	S14	12/25/2003	320	0.92	1.72	0.5	200.8
Regional Board	S14	1/1/2004	305	1.46	2.14	0.5	200.8
LADPW	S14	1/13/2004	195	0	0.72	0.5	200.8
Regional Board	S14	10/17/2004	208	0	3.78	0.5	200.8
Regional Board	S14	10/26/2004	130	0	4.42	0.5	200.8
Regional Board	S14	12/5/2004	130	0	9.05	0.5	200.8
Regional Board	S14	1/7/2005	124	11.4	37.5	0.5	200.8
LADPW	S14	3/17/2005	340	0	1.17	0.5	200.8
LADPW	S14	6/21/2005	330	0	1.07	0.5	200.8
LADPW	S14	10/17/2005	250	0	14.2	0.5	200.8
LADPW	S14	12/31/2005	112.5	0	1.01	0.5	200.8
LADPW	S14	1/14/2006	255	0	0.77	0.5	200.8
LADPW	S14	1/24/2006	250	0.71	0.94	0.5	200.8
LADPW	S14	2/17/2006	220	0	1.4	0.5	200.8
LADPW	S14	4/25/2006	345	0	1.12	0.5	200.8
		No. Samples	90				

Table A.2: Averaged San Gabriel River Reach 2 lead data

(averaged data are shown in red font within the gray highlighted area. The earlier date was used to report the averaged data; thus, for the data reported 1/31/1996 and 2/3/1996, averages of the hardness and lead values were reported on 1/31/1996.)

site ID	date sampled	hardness MG/L	dissolved lead UG/L	total lead UG/L	Detection limit	EPA test method
S14	8/23/1995	265	0	0	5	A239.2
S14	11/7/1995	350	0	0	5	A239.2
S14	12/12/1995	152	0	0	5	A239.2
S14	12/23/1995	305	0	0	5	A239.2
S14	1/9/1996	350	0	0	5	A239.2
S14	1/21/1996	141	0	0	5	A239.2
S14	1/31/1996	217.5	0	0	5	A239.2
S14	2/3/1996				5	A239.2
S14	2/19/1996	135	0	0	5	A239.2
S14	3/19/1996	220	0	0	5	A239.2
S14	5/14/1996	292	0	0	5	A239.2
S14	7/9/1996	270	0	0	5	A239.2
S14	9/10/1996	348	0	0	5	A239.2
S14	10/8/1996	260	0	0	1	A239.2
S14	10/30/1996	116	0	24	1	A239.2
S14	11/21/1996	128	0	0	1	A239.2
S14	12/9/1996	119.6	0	10	1	A239.2
S14	1/24/1997	157	0	2.7	1	A239.2
S14	10/14/1997	238	0	0	5	A239.2
S14	11/10/1997	161.5	0	0	5	A239.2
S14	11/13/1997				5	A239.2
S14	11/26/1997	100	35.5	44	5	A239.2
S14	12/5/1997	132	18	24.6	5	A239.2
S14	1/9/1998	120	20.4	27.9	5	A239.2
S14	1/29/1998	127	0	6.9	5	A239.2
S14	2/2/1998	110	0	11.45	5	A239.2
S14	2/6/1998				5	A239.2
S14	10/14/1998	372	0	0	5	A239.2
S14	10/22/1998	380	0	0	5	A239.2
S14	11/8/1998	230	0	0	5	A239.2
S14	12/6/1998	80	0	0	5	A239.2
S14	1/12/1999	346	0	0	5	A239.2
S14	1/20/1999	276	0	0	5	A239.2
S14	1/25/1999	184	0	0	5	A239.2
S14	1/31/1999	280	0	0	5	A239.2
S14	2/6/1999	271	0	0	5	A239.2
S14	2/9/1999				5	A239.2
S14	3/15/1999	126	0	0	5	A239.2
S14	3/20/1999	265	0	0	5	A239.2
S14	3/25/1999	290	0	0	5	A239.2
S14	4/6/1999	204	0	0	5	A239.2
S14	4/8/1999	170	0	0	5	A239.2
S14	4/11/1999				5	A239.2
S14	1/26/2000	95	0	6.1	5	A239.2
S14	2/3/2000	170	0	0	5	A239.2
S14	2/12/2000	144	0	0	5	A239.2
S14	2/15/2000	120	0	0	5	A239.2

site ID	date sampled	hardness MG/L	dissolved lead UG/L	total lead UG/L	Detection limit	EPA test method
S14	2/17/2000				5	A239.2
S14	2/22/2000	143.6	0	0	5	A239.2
S14	2/25/2000	211	0	0	5	A239.2
S14	2/29/2000				5	A239.2
S14	3/7/2000	141.5	0	0	5	A239.2
S14	3/9/2000				5	A239.2
S14	10/28/2000	228	0	2.62	5	A239.2
S14	11/1/2000				5	A239.2
S14	1/8/2001	300	0	0	5	A239.2
S14	1/17/2001	160	0	0	5	A239.2
S14	1/26/2001	360	0	0	5	A239.2
S14	2/14/2001	220	0	0	5	A239.2
S14	2/20/2001	240	0	0	5	A239.2
S14	2/28/2001	140	0	0	5	A239.2
S14	3/6/2001	210	0	0	5	A239.2
S14	11/12/2001	180	0	0.77	0.5	200.8
S14	11/27/2001	160	1.595	2.8	0.5	200.8
S14	11/30/2001	215	0.38	1.18	0.5	200.8
S14	12/3/2001				0.5	200.8
S14	12/27/2001	172	0	0.77	0.5	200.8
S14	1/31/2002	150	0	0	0.5	200.8
S14	10/10/2002	270	0	1.38	0.5	200.8
S14	11/8/2002	210	0.67	56	0.5	200.8
S14	12/16/2002	108	1.21	2.52	0.5	200.8
S14	2/11/2003	80	1.55	2.16	0.5	200.8
S14	3/15/2003	103	0	5.39	0.5	200.8
S14	10/28/2003	235	0	2.19	0.5	200.8
S14	10/31/2003				0.5	200.8
S14	12/25/2003	320	0.92	1.72	0.5	200.8
S14	1/1/2004	305	1.46	2.14	0.5	200.8
S14	1/13/2004	195	0	0.72	0.5	200.8
S14	10/17/2004	208	0	3.78	0.5	200.8
S14	10/26/2004	130	0	4.42	0.5	200.8
S14	12/5/2004	130	0	9.05	0.5	200.8
S14	1/7/2005	124	11.4	37.5	0.5	200.8
S14	3/17/2005	340	0	1.17	0.5	200.8
S14	6/21/2005	330	0	1.07	0.5	200.8
S14	10/17/2005	250	0	14.2	0.5	200.8
S14	12/31/2005	112.5	0	1.01	0.5	200.8
S14	1/14/2006	255	0	0.77	0.5	200.8
S14	1/24/2006	250	0.71	0.94	0.5	200.8
S14	2/17/2006	220	0	1.4	0.5	200.8
S14	4/25/2006	345	0	1.12	0.5	200.8
	No. Samples	79	79			

Notes:

Per the State Listing Policy, the data should be averaged over the period of time relative to the standard. Since the chronic CTR standard is based on a four-day period, data falling within a single 4-day period was averaged. See Section 6.1.5.6 of the Listing Policy.

Table A.3: Averaged San Gabriel River Reach 2 lead data in comparison to CTR criteria

site ID	date sampled	hardness MG/L	dissolved lead UG/L	total lead UG/L	Detection limit UG/L	EPA test method	Lead acute CTR UG/L	Exceed acute CTR?	Lead chronic CTR UG/L	Exceed chronic CTR?	is CTR (or measurement) above DL?
S14	8/23/1995	265	0	0	5	A239.2	183		7.1		OK to use
S14	11/7/1995	350	0	0	5	A239.2	245		9.5		OK to use
S14	12/12/1995	152	0	0	5	A239.2	102		4.0		don't use
S14	12/23/1995	305	0	0	5	A239.2	212		8.3		OK to use
S14	1/9/1996	350	0	0	5	A239.2	245		9.5		OK to use
S14	1/21/1996	141	0	0	5	A239.2	94		3.7		don't use
S14	1/31/1996	217.5	0	0	5	A239.2	149		5.8		OK to use
S14	2/19/1996	135	0	0	5	A239.2	89		3.5		don't use
S14	3/19/1996	220	0	0	5	A239.2	151		5.9		OK to use
S14	5/14/1996	292	0	0	5	A239.2	203		7.9		OK to use
S14	7/9/1996	270	0	0	5	A239.2	187		7.3		OK to use
S14	9/10/1996	348	0	0	5	A239.2	243		9.5		OK to use
S14	10/8/1996	260	0	0	1	A239.2	180		7.0		OK to use
S14	10/30/1996	116	0	24	1	A239.2	76		3.0		OK to use
S14	11/21/1996	128	0	0	1	A239.2	84		3.3		OK to use
S14	12/9/1996	119.6	0	10	1	A239.2	78		3.1		OK to use
S14	1/24/1997	157	0	2.7	1	A239.2	105		4.1		OK to use
S14	10/14/1997	238	0	0	5	A239.2	164		6.4		OK to use
S14	11/10/1997	161.5	0	0	5	A239.2	108		4.2		don't use
S14	11/26/1997	100	35.5	44	5	A239.2	65		2.5	Yes	OK to use
S14	12/5/1997	132	18	24.6	5	A239.2	87		3.4	Yes	OK to use
S14	1/9/1998	120	20.4	27.9	5	A239.2	79		3.1	Yes	OK to use
S14	1/29/1998	127	0	6.9	5	A239.2	84		3.3		OK to use
S14	2/2/1998	110	0	11.45	5	A239.2	72		2.8		OK to use
S14	10/14/1998	372	0	0	5	A239.2	261		10.2		OK to use
S14	10/22/1998	380	0	0	5	A239.2	266		10.4		OK to use
S14	11/8/1998	230	0	0	5	A239.2	158		6.2		OK to use
S14	12/6/1998	80	0	0	5	A239.2	51		2.0		don't use
S14	1/12/1999	346	0	0	5	A239.2	242		9.4		OK to use
S14	1/20/1999	276	0	0	5	A239.2	191		7.5		OK to use
S14	1/25/1999	184	0	0	5	A239.2	125		4.9		don't use
S14	1/31/1999	280	0	0	5	A239.2	194		7.6		OK to use
S14	2/6/1999	271	0	0	5	A239.2	188		7.3		OK to use
S14	3/15/1999	126	0	0	5	A239.2	83		3.2		don't use
S14	3/20/1999	265	0	0	5	A239.2	183		7.1		OK to use
S14	3/25/1999	290	0	0	5	A239.2	201		7.8		OK to use
S14	4/6/1999	204	0	0	5	A239.2	139		5.4		OK to use
S14	4/8/1999	170	0	0	5	A239.2	114		4.5		don't use
S14	1/26/2000	95	0	6.1	5	A239.2	61		2.4		OK to use
S14	2/3/2000	170	0	0	5	A239.2	114		4.5		don't use
S14	2/12/2000	144	0	0	5	A239.2	96		3.7		don't use
S14	2/15/2000	120	0	0	5	A239.2	79		3.1		don't use
S14	2/22/2000	143.6	0	0	5	A239.2	96		3.7		don't use

site ID	date sampled	hardness MG/L	dissolved lead UG/L	total lead UG/L	Detection limit UG/L	EPA test method	Lead acute CTR UG/L	Exceed acute CTR?	Lead -chronic CTR UG/L	Exceed chronic CTR?	Is CTR (or measurement) above DL?
S14	2/25/2000	211	0	0	5	A239.2	144		5.6		OK to use
S14	3/7/2000	141.5	0	0	5	A239.2	94		3.7		don't use
S14	10/26/2000	228	0	2.62	5	A239.2	156		6.1		OK to use
S14	1/8/2001	300	0	0	5	A239.2	209		8.1		OK to use
S14	1/17/2001	180	0	0	5	A239.2	107		4.2		don't use
S14	1/26/2001	360	0	0	5	A239.2	252		9.8		OK to use
S14	2/14/2001	220	0	0	5	A239.2	151		5.9		OK to use
S14	2/20/2001	240	0	0	5	A239.2	165		6.4		OK to use
S14	2/28/2001	140	0	0	5	A239.2	93		3.6		don't use
S14	3/6/2001	210	0	0	5	A239.2	143		5.6		OK to use
S14	11/12/2001	180	0	0.77	0.5	200.8	122		4.7		OK to use
S14	11/27/2001	160	1.595	2.8	0.5	200.8	107		4.2		OK to use
S14	11/30/2001	215	0.38	1.18	0.5	200.8	147		5.7		OK to use
S14	12/27/2001	172	0	0.77	0.5	200.8	116		4.5		OK to use
S14	1/31/2002	150	0	0	0.5	200.8	100		3.9		OK to use
S14	10/10/2002	270	0	1.38	0.5	200.8	187		7.3		OK to use
S14	11/8/2002	210	0.67	56	0.5	200.8	143		5.6		OK to use
S14	12/16/2002	108	1.21	2.52	0.5	200.8	70		2.7		OK to use
S14	2/11/2003	80	1.55	2.16	0.5	200.8	51		2.0		OK to use
S14	3/15/2003	103	0	5.39	0.5	200.8	67		2.6		OK to use
S14	10/28/2003	235	0	2.19	0.5	200.8	161		6.3		OK to use
S14	12/25/2003	320	0.92	1.72	0.5	200.8	223		8.7		OK to use
S14	1/1/2004	305	1.46	2.14	0.5	200.8	212		8.3		OK to use
S14	1/13/2004	195	0	0.72	0.5	200.8	133		5.2		OK to use
S14	10/17/2004	208	0	3.78	0.5	200.8	142		5.5		OK to use
S14	10/26/2004	130	0	4.42	0.5	200.8	86		3.3		OK to use
S14	12/5/2004	130	0	9.05	0.5	200.8	86		3.3		OK to use
S14	1/7/2005	124	11.4	37.5	0.5	200.8	82		3.2	Yes	OK to use
S14	3/17/2005	340	0	1.17	0.5	200.8	238		9.3		OK to use
S14	6/21/2005	330	0	1.07	0.5	200.8	230		9.0		OK to use
S14	10/17/2005	250	0	14.2	0.5	200.8	172		6.7		OK to use
S14	12/31/2005	112.5	0	1.01	0.5	200.8	73		2.9		OK to use
S14	1/14/2006	255	0	0.77	0.5	200.8	176		6.9		OK to use
S14	1/24/2006	250	0.71	0.94	0.5	200.8	172		6.7		OK to use
S14	2/17/2006	220	0	1.4	0.5	200.8	151		5.9		OK to use
S14	4/25/2006	345	0	1.12	0.5	200.8	241		9.4		OK to use

4 exceedances out of 64 useable points

Notes:

Section 6.1.5.5 of the Listing Policy states: "When the sample value is less than the quantitation limit and the quantitation limit is greater than the water quality standard, objective, criterion, or evaluation guideline, the result shall not be used in the analysis."

Figure A.1: Dissolved lead measured in San Gabriel River Reach 2 in comparison to CTR criteria

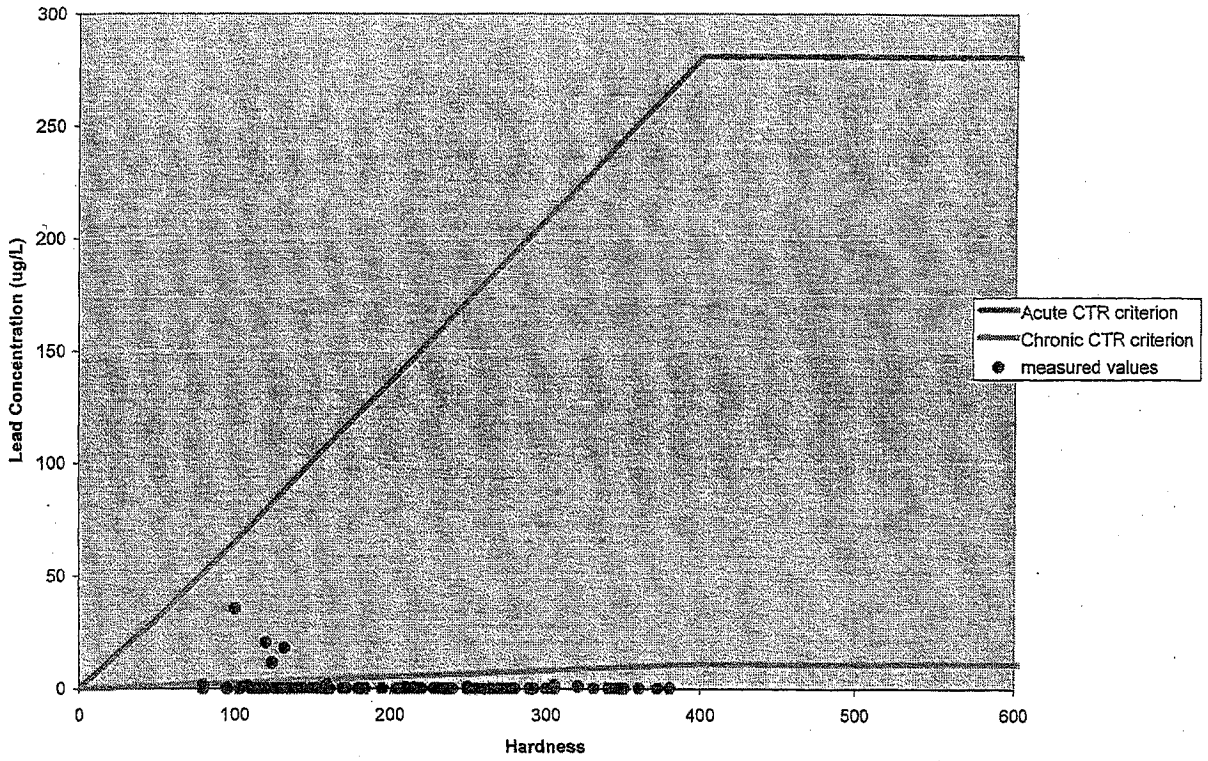

Figure A.2: Dissolved lead measured in San Gabriel River Reach 2 in comparison to CTR chronic criterion

orange triangles show the CTR chronic criterion (adjusted for event hardness) and blue dots are the actual or averaged measurements

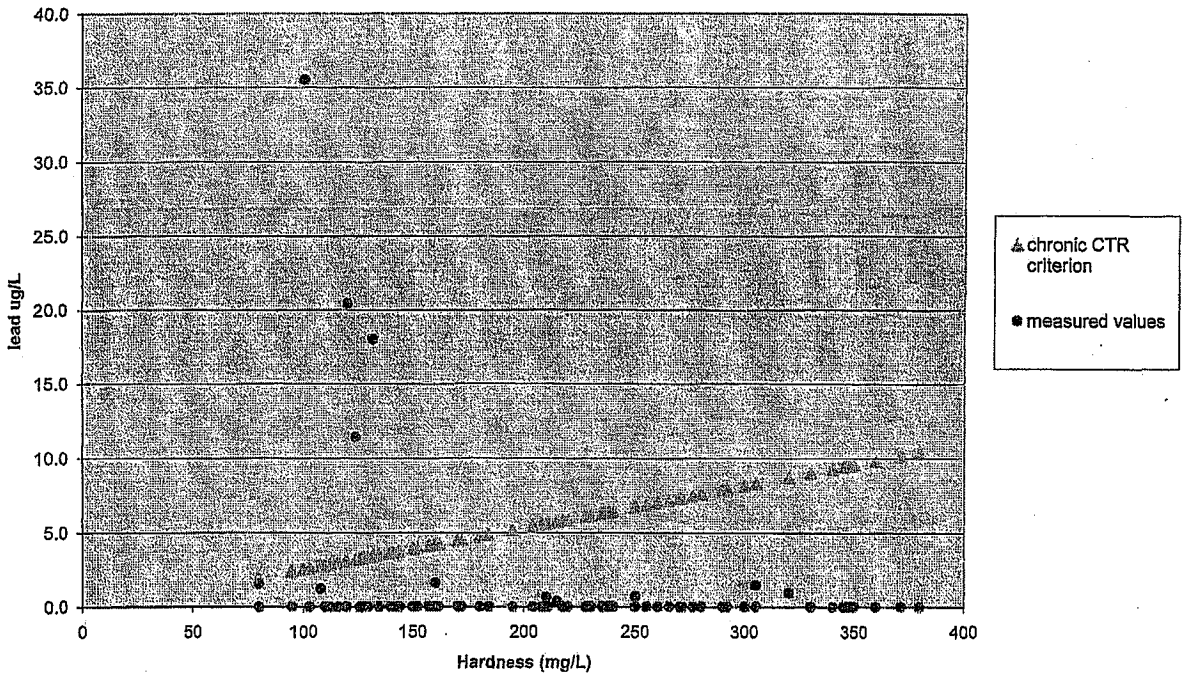

Figure A.3: Dissolved lead measured in San Gabriel River Reach 2 in comparison to CTR chronic criterion (graphed by date)

orange triangles show the CTR chronic criterion (adjusted for event hardness) and blue dots are the actual or averaged measurements

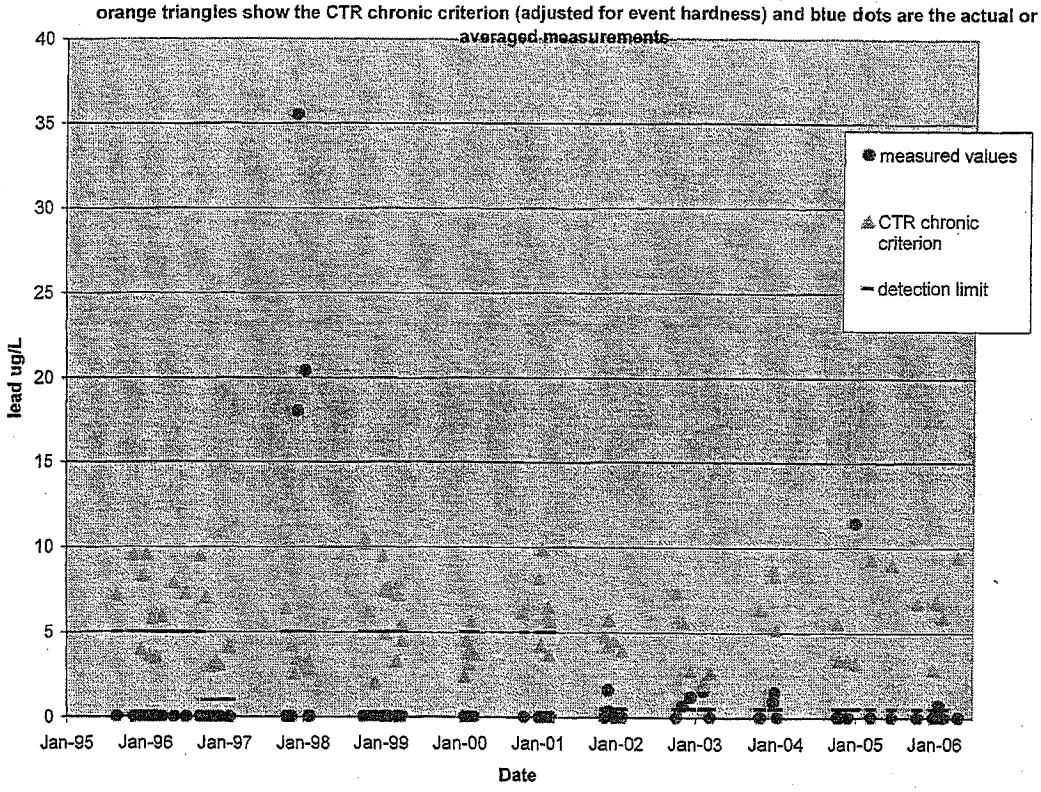

EXHIBIT A.1

County of Los Angeles
Agricultural Commissioner/Weights and Measures
ENVIRONMENTAL TOXICOLOGY LABORATORY

Quality Assurance Manual

Revision 5 - October 4, 2006

Approved for Use By:

_____
Chief

_____
Wasfy W. Shindy, Ph.D., Deputy Director

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19: Prepare Media QC Check Record
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APPENDIX A:

TABLE 1. Drinking water holding time, preservation and sample container requirements.

TABLE 2. Wastewater holding times, preservatives and containers.

TABLE 3. Preservation, holding times and sample containers for hazardous wastes samples, samples with aqueous matrices, and groundwater samples analyzed by SW-846.

TABLE 4. List of suppliers of standards and quality control sample provided by the California State Department of Health Services.

TABLE 5. Laboratory's analytical quality control requirements for drinking water, wastewater, hazardous waste, processed foods, raw commodities, dairy products, and feed products.

TABLE 6. Class A tolerances for volumetric devices.

APPENDIX B:

Lead Analyst/Technical Certification Packet

(END OF PAGE)

I. QUALITY ASSURANCE PROGRAM

Quality Assurance Objectives

The primary objective of the County of Los Angeles Agricultural Commissioner/Weights and Measures Department Environmental Toxicology Laboratory Quality Assurance Program is to ensure that all analytical results reported by the Laboratory are scientifically valid, defensible and of known precision and accuracy.

The Quality Assurance Program is a written plan to guide the Laboratory operations toward satisfying two general criteria for acceptance of analytical results. The first criterion evaluates the ability of the Laboratory and the method used to perform an analysis within established accuracy and precision limits. This criterion is determined through quality control samples and/or procedures required for all operations performed in the laboratory. The second criterion evaluates the defensibility of the reported results in a court of law. This criterion is met through the chain of documents that accompany the sample and verify the actual analyses performed.

Quality Assurance Manual - Maintenance and Updates

This quality assurance manual documents the necessary operating parameters of key elements of the laboratory operations required to achieve the Quality Assurance Program objectives. It is written by the laboratory Chief who also functions as the Quality Assurance Coordinator. The QA manual is updated when necessary, and reviewed and approved by the laboratory Chief and Deputy Director annually.

Documentation and Record keeping

Realizing the potential to legal court challenges of environmental sampling and testing, it is the laboratory's policy to guarantee the maintenance of all paper and electronic records generated by the laboratory in its day-to-day operations for a minimum of ten years. This may include, but not be limited to, the following:

Field collector's notes and records
Chain of Custody form
Logbooks
Analytical worksheets
Raw chromatogram
Final report
Internal and external audit reports
Temperature logs of equipment
Bottle and container background checks
Calibration logbooks
QA/QC control charts
Employee's training record
Corrective action report

Standard tracking and preparation
Sampling schedule

All entries on permanent records and documents are made in ink. Corrections are lined through with a single line and the individual making the corrections dates and initials it.

All electronic records are backed-up with hard copies. Annually, electronic records are archived on floppy discs.

Policy:

The laboratory is committed to good professional practice, quality testing, and service to clients.

All analysts within the laboratory must familiarize themselves with the quality documentation and implement the policies and procedures in their work.

The laboratory management is committed to comply with International Standards (ISO/IEC 17025) and to continuously improve the effectiveness of the management system.

Technical management and the quality manager ensure the compliance of International Standards.

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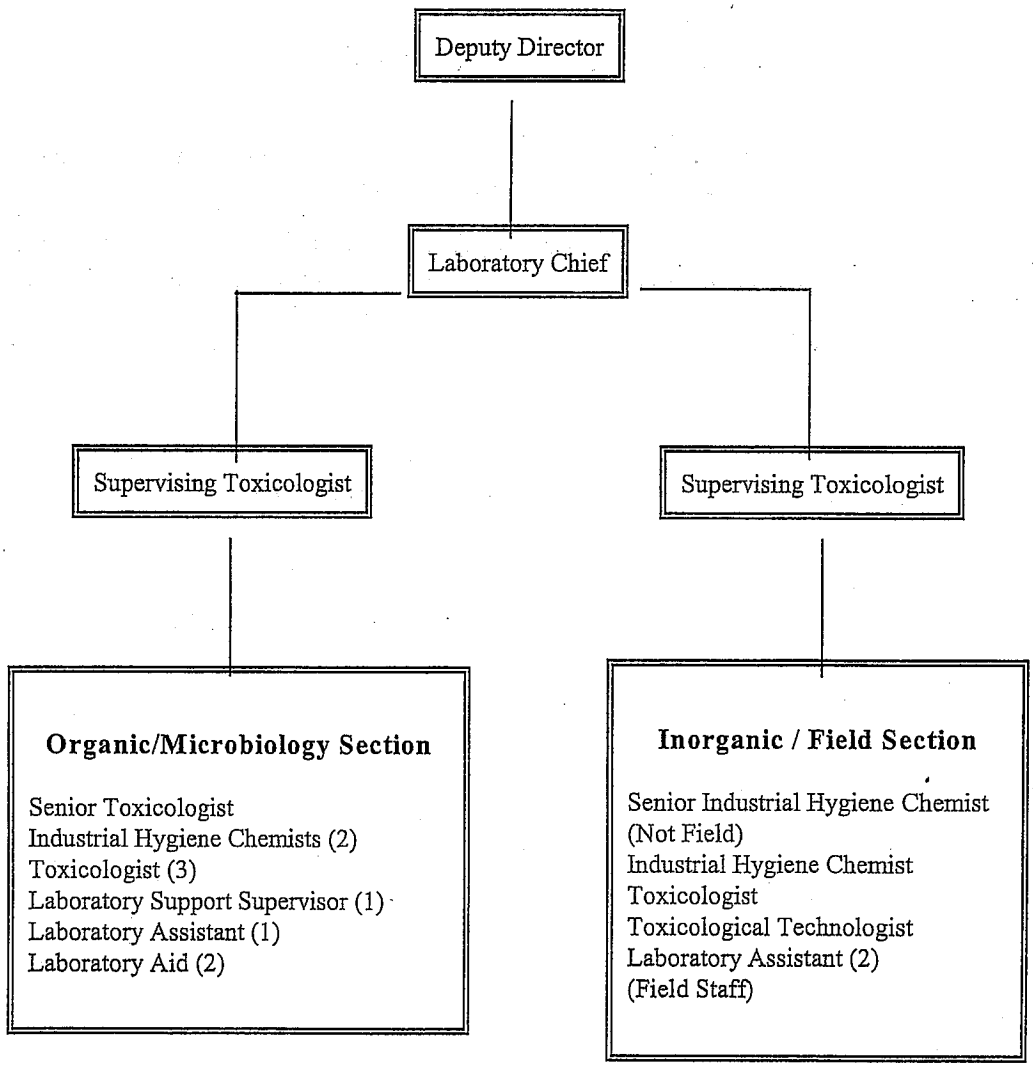
II. ORGANIZATION

Organizational Chart



Minimum Personnel Qualification and Background

Deputy Director - Graduation from an accredited college with specialization in chemistry or biochemistry. Experiences required include one year experience managing a major function for the County of Los Angeles Agricultural Commissioner/Weights and Measures Department or its equivalent with other State or County agencies and four years experience in analytical chemistry, biochemistry, pharmacology or toxicology laboratory, one year of which must have been at the level of Chief, Environmental Toxicology. An advance degree in toxicology, chemistry, or biochemistry will be accepted for the required non-supervisorial experience based on one year for a Master's Degree and two years for a Ph.D.

Chief (QA Coordinator) - Graduation from an accredited college with specialization in chemistry, biochemistry, biology, or agricultural chemistry, and three years experience in analytical chemistry, biochemistry, pharmacology, or toxicology laboratory. An advanced degree in chemistry or biochemistry will be accepted for the required experience based on one year for a Master's degree and two years for a Ph.D.

Supervising Toxicologist (Technical Manager) - A Bachelor of Science degree and at least three years experience in chemistry, biochemistry, pharmacology, biology, or toxicology, one year of which must have involved the chemical analysis of environmental samples. An advanced degree in chemistry or biochemistry will be accepted for the required experience on the basis of one year of a Master's degree and two years for a Ph.D.

Senior Industrial Hygiene Chemist - A Master of Science degree with a major in general or physical chemistry and five years experience as a professional chemist conducting basic analytical research in chemistry, or four years experience as an Industrial Hygiene Chemist.

Senior Toxicologist - Graduation from an accredited college with specialization in chemistry or biochemistry, and two years experience in analytical chemistry, biochemistry, pharmacology, or toxicology. An advanced degree in chemistry or biochemistry will be accepted for the required experience on the basis of one year for a Master's degree and two years for a Ph.D.

Industrial Hygiene Chemist - A Bachelor of Science degree with major in chemistry or biochemistry, and either have a Master's degree in chemistry, biochemistry, or a related field of environmental chemistry and two years experience as a professional chemist doing increasingly complex analytical procedures or four years experience as a professional chemist doing increasingly complex analytical procedures.

Toxicologist - Graduation from an accredited college with specialization in chemistry or biochemistry, and one year experience in analytical chemistry, biochemistry, pharmacology, or toxicology. Completion of one year graduate working in an accredited college with specialization in chemistry or biochemistry will be accepted for the required experience.

Toxicological Technologist - Same as Herbicide/Pesticide Technologist.

Laboratory Support Supervisor -Two years experience as a laboratory assistant or equivalent.

Laboratory Assistant -Six months experience in laboratory work in a public health, biological or chemical laboratory - or - completion of a course in laboratory science such as general chemistry or biology.

Personnel Responsibilities

Deputy Director

-Assist the Chief Deputy, Agricultural Commissioner/Weights and Measures and the Agricultural Commissioner/Director of Weights and Measures in the management of the department.

-Assists in the development and implementation of departmental objectives, policies and procedures.

-Reviews and evaluates court actions initiated by the department to enforce compliance with applicable laws and regulations.

-Coordinates the work of the department with that of other county departments and other agencies.

-Maintains effective relations with county-user departments and vendors.

-Plans, organizes, directs and evaluates the work of assigned divisions and coordinates their work with that of other organizational units of the department.

-Represents the department at meetings and conferences with administrators of other county departments, agencies and the public.

-Develops and directs the conduct of the department's staff development and training programs to ensure uniform departmental standards and procedures.

-May act for the chief deputy, Agricultural Commissioner/Weights and Measures in his absence.

-Assists and makes recommendations in the preparation of the bureau budget.

-Performs research, as required, and assists in keeping the department informed of technological changes.

Chief (QA Coordinator)

-Establishes minimum quality control guidelines for all methods and tests performed in the laboratory.

-Implements and oversees the laboratory's quality assurance program and quality control practices.

-Conducts periodic audits of the quality assurance program in place and maintains the record of laboratory and staff performance on internal and external audits.

-Implements corrections to the laboratory quality assurance program and practices found to be deficient through internal and/or external audits.

-Writes and maintains the laboratory's Quality Assurance Manual.

-Conducts periodic, thorough review of data packages to verify completeness and adherence to established quality control guidelines.

-Directs, plans, assigns, reviews, and evaluates work performed by laboratory personnel.

-Develops, implements, and oversees the laboratory's Quality Assurance Program.

-Provides consultation in analytical testing of environmental samples to the Agriculture Commissioner and other agencies.

-Testifies as an expert witness for Los Angeles County on the analysis and interpretation of findings.

-Supervises the analysis and interpretation of laboratory data.

-Publish scientific papers and reports. Make presentation concerning analytical testing services available to the community. Attends and participates in conventions, meetings and conferences of professional organizations concerning analytical testing of environmental samples.

Supervising Toxicologist (Technical Manager)

-Assists in the planning, assignments, supervision and review of work of laboratory personnel.

-Provides technical direction to laboratory personnel in performing a variety of chemical analyses of water, soil, plant, animal and other environmental samples using various techniques such as spectrophotometry, chromatography, gravimetric, and volumetric analyses.

-Establishes and sets up special test procedures for detecting pesticides and other chemicals for which the laboratory has the least or no experience, including all required and necessary quality control steps in such procedures.

-Conducts training of laboratory personnel.

-May testify as an expert witness for the Chief Environmental Toxicologist.

Senior Industrial Hygiene Chemist

-Prepares work schedules, assigns and rotates lower level staff to various jobs, evaluates work performance and recommends resolutions to employee relations problems.

-Tests or directs the testing of new equipment, prepares written evaluations, and makes recommendations for its acquisition. Prepares written instructions on the application and operation of new equipment for the Standard Operating Procedures Manual.

-Supervises a program of quality control to ensure the accuracy of test reports.

-Orients new employees to the overall operations of the section and trains or supervises their training.

-Serves as the consultant to Public Health Programs staff on problems relating to toxic and potentially dangerous chemicals.

-Analyzes samples that require the highest level of technical skill, experience and knowledge.

-Instructs environmental health personnel in the proper procedures for collecting field samples.

-Calibrates all laboratory equipment for the section.

Senior Toxicologist

-Provides technical guidance to laboratory personnel and performs chemical analyses to determine the presence and quantity of pesticides and other chemicals of interest in samples submitted to the laboratory for study utilizing wet and instrumental methods.

-Develops procedures for and conducts non-routine analysis on samples involving new and uncommon pesticides where standard methods are not established.

-Routinely monitors at regular intervals the accuracy and precision of laboratory results by checking quality control data obtained by laboratory personnel as part of their daily workload.

-Ensures that all quality control guidelines of the laboratory are met and recorded in specific quality control record books.

-Prepares daily work assignments of lower level laboratory personnel.

-Engages in continuing research and experimentation to develop and improve analytical procedures.

-Writes reports on analyses outlining methods used and results.

-Assists the Supervising Toxicologist in performing an analysis of unknown substances.

-Contacts pathologists, law enforcement officers, pharmacists and others to obtain information on cases as necessary.

Industrial Hygiene Chemist

-Collects field samples and conducts surveys regarding industrial hygiene, sanitation, and exposure of workers to health hazards.

-Conducts laboratory and field analyses of abrasive, solvents, and other materials used in industrial plants and makes specialized measurements of air samples to identify and measure contaminants.

-Maintains and operates a chemical laboratory, anticipating needs for ordering chemicals and equipment.

-Develops new and special methods, procedures and equipment to be used for chemical and physical determinations in laboratory and field studies.

-Conducts research on problems of toxicology and other chemical problems as necessary for industry, county and other governmental agencies.

-Maintains laboratory records and prepares reports on results of studies and projects.

-Interprets data and confers with engineers, various divisions of the Health Department, and industrial managers to solve chemical problems concerning industrial health and hazards to workers.

-Operates a variety of laboratory and field testing equipment.

Toxicologist

-Performs chemical analyses of water, soil, plant, animal, and other samples utilizing standard laboratory techniques such as spectrophotometry, chromatography and gravimetric and volumetric analysis.

-Follows accepted procedures and required quality control measures for conducting routine analyses such as determinations for pesticides and other organic/inorganic compounds.

-Writes reports on analyses outlining methods used and results.

-Contacts inspectors, law enforcement officers, and others to obtain information on cases as necessary.

-Assists the Senior Toxicologist in performing analysis of unknown substances.

-Prepares standard chemical solutions and reagents to specific requirements.

Toxicological Technologist

-Performs chemical analysis of environmental and biological samples using established procedures to determine the presence or absence of pesticides.

-Utilizes known instrumentation techniques such as gas and high pressure liquid chromatographies to determine the quality and quantity of pesticides present.

-Follows quality control guidelines on all chemical procedures and analyses performed.

-Prepares reference standards, chemical solutions, and reagents to specific requirements.

-Performs routine maintenance on laboratory equipment and apparatus including cleaning and calibration.

-Interprets charts and reading generated by various laboratory instruments used and submits interpretations to a toxicologist or senior toxicologist for review.

-Maintains register of all samples which includes detailed information on the methods used and findings.

-Assist in the development of new methods and procedures to improve the quality and reliability of test results.

-Follows experimental procedures under the guidance of a senior staff to test for new pesticides.

Laboratory Support Supervisor

-Plans work schedules and assignments of laboratory assistants.
-Evaluates the work of all laboratory assistants and counsels then on steps they may need to take to improve their performance and quality of work.
-Plans and maintains sufficient inventory of supplies and reagents needed for the day-to-day operations of the laboratory.

-Prepares samples for laboratory testing by performing written standard work-up procedures.

-Follows quality control guidelines on all chemical procedures and analyses performed.

-Calibrates and operates semi-and fully-automatic laboratory equipment such as pH meter and turbidity meter; records test results displayed by the equipment, and alerts supervisor before proceeding if test result or procedure outcome falls outside a specific range.

-Prepares reagents (including acids) and other solutions and compounds by mixing components to standard ratios using laboratory apparatus such as balances and volumetric and graduated cylinders; lifts and moves containers holding several gallons or other substantial quantity of constituent parts or compounds produced.

-Performs scheduled routine maintenance on miscellaneous devices such as platform shakers and centrifuges;

-Performs more difficult work-up procedures that requires more experience and higher level skills than laboratory assistants.

Laboratory Assistant

-Receives samples such as water, soil and hazardous wastes together with standard laboratory request form and/or chain of custody form following the laboratory's written standard operating procedure;

-Logs in samples received and other pertinent information to the laboratory's Logbook database.

-stores the samples received to appropriate holding areas such as the walking refrigerator and routes the accompanying documentation to the appropriate supervisor for subsequent analysis.

-Prepares samples for laboratory testing by performing written standard work-up procedures.

-Calibrates and operates semi-and fully-automatic laboratory equipment such as pH meter and turbidity meter; records test results displayed by the equipment, and alerts supervisor before proceeding if test result or procedure outcome falls outside a specific range.

-Prepares, following written procedures, specific quantities of media, reagents (including acids) and other solutions and compounds by mixing components to standard ratios using laboratory apparatus such as balances and volumetric and graduated cylinders; lifts and moves containers holding several gallons or other substantial quantity of constituent parts or compounds produced.

-Performs scheduled routine maintenance on miscellaneous devices such as microscopes and centrifuges;

-Performs general housekeeping duties such as cleanup of work areas, bench tops and refrigerators;

-Maintains inventory of supplies received and used.

-Wash laboratory glass wares using prescribed procedures such as acid washing and de-ionized rinsing.

-Stores laboratory supplies in appropriate storage areas.

-Performs chemical analysis of environmental and biological samples using established procedures to determine the presence or absence of pesticides.

-Utilizes known instrumentation techniques such as gas and high pressure liquid chromatographies to determine the quality and quantity of pesticides present.

-Follows quality control guidelines on all chemical procedures and analyses performed.

-Prepares reference standards, chemical solutions, and reagents to specific requirements.

-Performs routine maintenance on laboratory equipment and apparatus including cleaning and calibration.

-Interprets charts and reading generated by various laboratory instruments used and submits interpretations to a toxicologist or senior toxicologist for review.

-Maintains register of all samples which includes detailed information on the methods used and findings.

-Assist in the development of new methods and procedures to improve the quality and reliability of test results.

-Follows experimental procedures under the guidance of a senior staff to test for new pesticides.

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III. SAMPLING PROCEDURES

The laboratory follows EPA recommendations for sampling and preservation of samples. Tables 1, 2 and 3 in Appendix A: Tables were taken from EPA publications which summarize the required volume, container, preservative and holding times of samples according to matrix types and constituent to be tested.

Sample Bottles and Containers

Bottles and containers used by the laboratory are either pre-cleaned by the manufacturer with accompanying certificate of analysis or washed following standard procedures detailed in the SOP MI013. To monitor the cleanliness of bottles and containers used, a comprehensive analysis of all bottles used in the laboratory is performed once a month. Results of these analyses are kept on file under **Bottle/Container Background Check**.

Sampling Material

The sampling material for dust wipe of lead program must meet the requirement of ASTM E1792. Both plastic or glass sample containers are suitable for paint chip and soil.

Sample Preservation and Transport

Appropriate preservatives must be used, if needed. The preservative used should be indicated on the sample container together with any safety precautions for the sample collector. Material Safety Data Sheets are available upon request on the preservatives used.

Ice chests and blue ice are used to store the samples immediately after collection and during transportation from the field to the laboratory.

Sample Labeling and Identification

Immediately after collection, the sample must be sealed, labeled and the chain-of custody form filled out for each sample.

Sample labels are used for the specific identification of samples. Gummed paper labels affixed to the containers are adequate, but it should not be attached to the sample lid. The labels should be filled out at the time of collection and should include the following information:

Field Number	Name of Collector
Date and Time of Collection	Place of Collection

Evidence Sample Seals

Evidence sample seals are required for all samples submitted by the Los Angeles County Fire

Department Hazardous Materials Program. These are also required for all other samples related to projects which have the potential for criminal litigation. Evidence sample seals are used to detect unauthorized tampering of samples after collection, up to the time of analysis. The seals must be affixed to the sample container by the collector in a way that it has to be broken in order to open the sample container.

Chain-of-Custody

Chain-of-Custody is a documentation of the sample history from collection to data reporting. A sample is considered under a person's custody if: 1) it is in the person's physical possession; 2) in view of the person after he/she has taken possession; 3) secured by the person so that none can tamper with the sample; and/or 4) secured by the person in an area which is restricted to authorized personnel.

The chain-of-custody form records the history of sample possession from collection, to analysis, and finally, to sample disposal. It must accompany the sample upon delivery to the laboratory. Information on the chain-of-custody form should include at least the following:

Project Name
Submitting Agency
Contact Person including address and phone number
Name and Signature of Sample Collector
Date and Time of Sample Collection
Field ID Number, if any
Sampling Site Location
Analysis Requested
Date/Time/Signature when relinquishing sample custody

A copy of the laboratory's chain-of-custody form is attached as exhibit 1.

Sample Receiving/Rejection Criteria

SOP MI001.2 defines the laboratory's sample receiving protocol. This is a very critical part of the entire analytical process. It establishes the validity of the sample received and the subsequent analyses that follows. Strict adherence to the sample receiving protocol is required of all log-in personnel.

Developing, writing, and updating of the laboratory's standard operating procedures (SOP) for the receipt and log-in of samples are limited to the senior staff only which includes the Deputy Director, Chief, and Supervising Toxicologists. Training of log-in personnel are done or closely supervised the any one of the senior staff. The responsible senior staff will certify the training of a laboratory personnel to log-in samples with a formal letter to the Deputy Director (c. Chief).

Briefly, when a sample arrives, it is logged in immediately. The laboratory receiving personnel looks at the sample to verify that:

1. Proper container and preservative are used;
2. Container is properly filled;
3. Quantity submitted is sufficient for the test requested;
4. Evidence sample seal, if required, is intact; and
5. Chain-of-Custody form properly completed.

If any of the above item is in any manner deficient, the laboratory supervisor is notified immediately. The supervisor will then consult with the project manager of the submitting agency to formally notify the latter of the impact the deficiency will have on the analytical integrity of the sample. Thereafter, the sample will either be returned to the submitting agency or accepted for analysis with the deficiency noted in the chain-of-custody form and in the final analytical report.

All samples received must be logged in the **Laboratory Logbook**. This is an electronic database developed in-house which replaces the traditional hard-bound register. Entries to the laboratory logbook are printed on a weekly basis and kept as hard copy records.

A unique laboratory number must be assigned to each sample and entered in the logbook, the sample container, and the chain-of-custody form. The logbook entry for each sample must include the following information:

Date Received
Laboratory ID number
Submitting Agency/Sampling Location
Collector's ID Number
Sample Matrix Type
Laboratory Receiving Personnel
Collector's Name
Test Requested
Laboratory Result
Remarks
Release Date (of results)

Sample Storage

Once the sample has been logged in and the laboratory assumes responsibility for it, the sample must be stored in a secure location. Whether the location should be refrigerated or not depends on the type of sample or analysis requested. Refer to Tables 1, 2, or 3 in Appendix A: Tables for storage conditions. Typically, all samples for organic analyses must be stored in the refrigerator at ≤4°C. Samples for trace metal analysis may be stored at room temperature except those requiring Chromium VI analysis. The latter must be refrigerated.

Refrigerator/freezer used for sample storage must be different from those used for storing standards. In addition, samples for volatile analysis must be stored separately from non-volatiles. On each refrigerator/freezer, a chart is posted outside that includes the acceptable temperature range of the unit and the daily record of temperature readings, date, and name of person monitoring the temperature.

Sample Disposal

The laboratory guarantees holding the sample in appropriate storage for a maximum of thirty days from the date of the final report. Unless otherwise notified by the submitting agency in writing, the sample will be disposed of according to the procedures described in the laboratory's Safety Manual, Rev. 3.1, Part II, page 30.

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IV. STANDARD SOURCES AND REAGENT PREPARATION

All standards are obtained from reliable sources who can certify the purity of the materials. Table 4 (see Appendix A) is a list of suppliers provided by the California State Department of Health Services Environmental Laboratory Accreditation Program.

The laboratory's procedures for the receipt, storage and labeling of standards are detailed in SOPs MII006, MI007 and MI008.

A **Standards Log Book** is maintained by each division in the laboratory. All new standards, whether ordered from an outside source or prepared in the laboratory, are assigned a unique ID number which is entered in the log book. The minimum information on the standard required to be entered in the log book are:

Unique ID number
Date received or date prepared
Chemical name
Weight or volume used (for standard preparation)
Analyst (receiving or preparing standard)
Source ID number (required when preparing standard solutions)
Final Concentration (required when preparing standard solutions)
Supplier (for standards ordered from an outside source)
Lot number (for standards ordered from an outside source)
Expiration date

Preparation of Standards

Standards are prepared as outlined in SOPs MI009, MI010 and MI011. All information pertinent in the preparation of the standards are entered in the laboratory's Standard Preparation Book. Standard solution bottles are also labeled individually with, at least, the ID number, concentration, solvent used, date of preparation and initials of the preparer.

Storage of Standards

All degradable and volatile organic standards are stored in a freezer at below 0°C. This is true for any concentration, neat or in solution. Trace metal standards, except Chromium VI, are stored at room temperature (Chromium IV is refrigerated). All other standards are stored appropriately as called for by the specific methods used.

External Reference Standards

External reference standards, also known as standard reference material (SRM), are used regularly to verify the accuracy of the working standards. The frequency of their analyses for a particular parameter is specified in the method used. External reference standards are available from suppliers listed Table 4. A standard maybe used as an external reference if it's source is different from the one

used in calculation or as calibration standards. A different source is defined as different suppliers or the same supplier but different lot numbers.

Stock Reagents

When we received a stock reagent, we should enter the information into a Reagents Log Book. Enter the information of ID number, Date received, reagent name, concentration, expiration date, supplier, Lot number, and the analyst's initial. Also, put down on the label of container the information of ID number, date received, expiration date if there isn't any, and initial of the analyst.

Prepared Reagents

When a fresh reagent is prepared, enter into a Reagent Log Book, the information of ID number, date prepared, chemical name, source ID, source concentration, weight/volume used, final concentration, final volume, expiration date, and analyst's initial. Also, put down on the label of container the information of ID number, chemical name, concentration, expiration date, and the analyst's initial.

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V. INSTRUMENT PERFORMANCE CHECK AND CALIBRATION

Calibration of an instrument for a specific method used is required to establish the initial analytical response of an analyte relative to the amount of the analyte present in the sample or sample extract. The concentration range used in calibration is limited to the linear range of the specific instrument used. Each instrument will have a different linear range and this range can vary depending on the condition of the instrument. Because of this variability, a linear range verification of every instrument in use must be done annually. Basically, a linear range verification involves the instrument analysis of the lowest possible standard concentration of the analyte of interest to the level at which the instrument response to the analyte is no longer linear relative to the concentration.

Specific calibration procedures are included in the analytical method used and in the operator's manual of the particular instrument used. Calibration is performed at least once per day each time a test method is performed or when an equipment is used. Some EPA methods, particularly titrimetric methods, allow single point calibration while majority require multipoint calibration. The lowest and highest calibrated points define the calibration range. The samples analyzed must be diluted or concentrated so as to generate a response that falls within the calibration range. Table 5 (see Appendix A) summarizes the laboratory's calibration requirements for each parameter tested or method performed.

The analyst is responsible for calibration. All the calibration data are kept with specific data packages they are used in and with each instrument they are generated from, if applicable.

Detailed below are the calibration guidelines when using gas chromatographs (GC), high pressure liquid chromatographs (HPLC), and atomic absorption (AA) spectrophotometers. These guidelines are applicable regardless of the make or model of the instrument used.

GC/IC/HPLC Calibration Guidelines

MULTIPOINT CALIBRATION CURVE

Initially, before use, a multipoint calibration curve must be established for each analyte of interest. The concentration of the standards used must correspond to the expected range of concentration in real samples, or must define the linear working range of the detector used. One standard concentration that must be included should be near but above the method detection limit (check individual methods for MDL list of analytes detected).

A calibration curve is established by plotting the system response, as in peak height or peak area, versus the concentration of the standard injected or introduced to the system. See Figure 1.

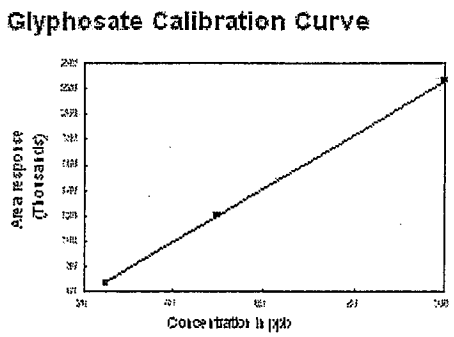

Figure 1: Typical calibration curve

An alternative to establishing a calibration curve is the definition of calibration factors (Cfs) for the analyte of interest at each standard concentration.

$$CF = \frac{\text{Total Peak Area/Height}}{\text{Mass Injected (ng)}}$$

The calibration factor is calculated for each concentration of analyte. The percent relative standard deviation (%RSD) of the CFs is determined. If the %RSD falls within the laboratory's acceptable limits, it can be assumed that the line defined by the average CFs is linear and that the CF can be used instead of a calibration curve for calculation of the concentration of the analyte in real samples. Check individual methods for acceptable %RSD limits. Typical acceptable %RSD values fall between 15-20%.

The laboratory has developed computerized quality control forms for the analyst to use. These forms include a **Calibration Curve Worksheet** (exhibit 2) that would automatically calculate the CFs, average CFs, and %RSD when the concentration and response values for each analyte is entered.

DAILY CALIBRATION CURVE VERIFICATION

If a calibration curve has been previously established, it must be verified on a daily basis. A mid-range calibration standard must be injected and analyzed under the same conditions as when the calibration curve was initially established. The response of the standard must fall within the laboratory's acceptable limit of ±20%[1] of the established calibration curve or calibration factor. The **Calibration Log** of individual instrument for records current CF values. If the daily response fall outside the acceptance limit, the cause of change must be determined and corrected, if possible. Verification of the calibration curve is repeated with a mid-range calibration standard. If the problem is one that is inherent in the system and cannot be corrected, then a new calibration curve must be established before any real sample can be analyzed.
The response of the calibration standard are monitored every 10 samples. The acceptance limit must be met with every injection of the standard before additional samples may be analyzed.

As with calibration curves, a computerized form of the **Daily Calibration Worksheet** (exhibit 3) is used by the analyst that would automatically calculate the current CF when the previous curve's average CF, mid-range standard's concentration and response are entered.

RETENTION TIME (RT) WINDOWS

Prior to any new analyte testing and each time a new GC column is installed, retention time windows must be defined initially for each analyte. To determine the RT windows, a minimum of three

[1] If the specific method used calls for a different acceptance limit, this value supersedes the given laboratory limit of ±20%.

injections of all single analyte standard mixture and multi-response analyte like chlordane are made over a 72 hour period with the operating conditions of the instrument held constant. The standard deviation of the absolute RTs of each analyte with every injection is calculated. For multi-response analyte, a major peak is chosen from the group of peaks and the standard deviation of its absolute RTs from every injection is calculated. The RT windows are defined as the $\pm 3\sigma$, where σ is the standard deviation of the absolute retention time for each analyte.

All RTs and windows are recorded and an example is shown in exhibit 4. From the injection of the daily mid-range calibration standard, determine the retention times for each analyte of interest and make certain they fall within the established windows.

AA Spectrophotometer Calibration Guidelines

A calibration curve must be prepared each day with a minimum of a reagent blank and three standards at different levels of concentrations. The absorbances of each blank and standards are determined. The absorbances versus the concentrations for each standards are plotted. This plot establishes the linear curve for the day of the atomic absorption spectrophotometer used. The manufacturer's instructions in preparing the calibration curve for the particular instrument used is followed.

At the beginning of every run, and once the calibration curve has been established or verified, the initial calibration blank must re-analyzed. The absolute value of metal concentration or absorbance obtained must not be more than 10% of the regulatory limit or minimum level of concern.

Continuing calibration and calibration blank verifications are performed every ten samples by analyzing the initial calibration blank and a mid-level standard. The results of the calibration verification should be within ±20% of the original curve for GFAA analyses or, ±10% for FAA analyses. The concentration or absorbency of the analyte of interest in the calibration blank must not be more than 10% of the regulatory limit or minimum level of concern. If either one of these conditions is not met, a new curve is generated. Exhibit 5 is used to record calibration data.

Independent calibration verification (ICV) - For each analysis, after the calibration curve has been established or verified, the calibration must be verified using a second standard prepared from a different source other than the ones used to generate or verify the calibration curve. Result obtained analyzing the ICV must be within ±10% of the known value.

VI. ANALYTICAL PROCEDURES

Methods Used

All the analytical methods used for regulatory samples such as drinking water and wastewater are approved by the California State Department of Health Services Environmental Laboratory Accreditation Program. The laboratory has also developed several in-house methods for informational use. Listed below are the references used by the laboratory for approved methods:

1. **Criteria for Identification of Hazardous and Extremely Hazardous Wastes**, California Code of Regulations, (CCR) Title 22.

2. **Leaking Underground Fuel Tank Field Manual**, October 1989 version, State of California, Leaking Underground Fuel Tank Task Force.

3. **Manual of the Analytical Methods for the Analysis of Pesticide Residues in Human and Environmental Samples**, prepared by Pesticides and Toxic Substances Effects Laboratory, National Environmental Research Center, revised in December 1974, U.S. Environmental Protection Agency.

4. **Manual of Chemical Methods for Pesticides and Devises**, 2nd ed., Office of Pesticide Programs, Analytical Chemistry Branch, US-EPA, Published and distributed by AOAC International.

5. **Methods for Chemical Analysis of Water and Wastewater**, EPA-600/4-79-020, 1984, U.S. Environmental Protection Agency.

6. **Methods for the Determination of Metals in Environmental Samples**, EPA/600/4-91/010, U.S. Environmental Protection Agency.

7. **Methods for the Determination of Organic Compounds in Drinking Water**, EPA/600/4-88/039, December 1988, U.S. Environmental Protection Agency.

8. **Methods for the Determination of Organic Compounds in Drinking Water, Supplement I**, EPA-600/4-90/020, July 1990, U.S. Environmental Protection Agency.

9. **Methods for the Determination of Organic Compounds in Drinking Water, Supplement II**, EPA-600/R-92/129, August 1992, U.S. Environmental Protection Agency.

10. **Methods for the Determination of Organic Compounds in Drinking Water, Supplement III**, EPA-600/R-95/131, August 1995, U.S. Environmental Protection Agency.

11. **Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater**, EPA-600/4-82-057, July 1982, U.S. Environmental Protection Agency.

12. **Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms**, 4th ed., EPA/600/4-90-027F, August 1993, U.S. Environmental Protection Agency.

13. **"Multiple Residue Pesticide Screen Method"**, State of California, Department of Food and Agriculture, Sacramento, January 27, 1988.

14. **NIOSH Manual of Analytical Methods**, U.S. Department of Health and Human Resources, for the following editions:
   a. .3rd ed., February 1984
   b. 4th ed., August 1994

15. **NIOSH Manual of Analytical Methods, First Supplement to the Fourth Edition**, U.S. Department of Health and Human Resources, May 1996.

16. **Official Methods of Analysis of AOAC International**, AOAC International, for the following editions:
   a. 12th ed., 1975
   b. 14th ed., 1984
   c. 16th ed., 1995

17. **Pesticide Analytical Manual**, 3rd ed., 1994, US-FDA.

18. **Recommended Methods of Analyses for the Organic Components Required for AB 1803**, 3rd ed., revised May 1985.

19. **Standard Methods for the Examination of Water and Wastewater**, APHA-AWWA-WPCF, Washington, DC, for the following editions:
   a. 15th ed., 1980
   b. 16th ed., 1985
   c. 17th ed., 1989
   d. 18th ed., 1992
   e. 19th ed., 1995

20. **Test Methods for Evaluating Solid Waste, Physical/Chemical Methods**, EPA SW-846, 3rd Edition, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, DC, November, 1986.

Working SOPs are written for methods used in the laboratory. These SOPs are written with reference to the above approved sources. Working SOPs are written by bench chemists who actually perform the initial demonstration of proficiency for a particular method. All SOPs are assigned a unique ETL[2] Method ID number. Prior to its use, an SOP must be reviewed and approved for use by the laboratory chief. If an analyst should have a need modify an existing SOP - such as the use of a different calibration standard set or a different extraction procedure - the entire SOP must be re-written and assigned a different ETL Method Number. As with new SOPs, revised SOPs must be reviewed and approved for use by the laboratory Chief.

[2]Environmental Toxicology Laboratory

All SOPs are reviewed every five years by the senior staff consisting of the laboratory chief and supervising toxicologists for accuracy and applicability.

Standard Operating Procedures (SOP) Manual

The laboratory maintains a **Standard Operating Procedures (SOP) Manual** for all activities performed. These manual contains the different working SOPs used by the staff. It includes detailed SOPs for such activities as log-in of samples, washing of glasswares, QA/QC procedures, analytical methods and standard preparation. Individual SOPs include, whenever applicable, the following:

Scope and Application
Detection Limits (instrument and method)
Precision and Bias
Working Range
Summary of Method
Sample Collection, Preservation and Holding Times
Comments:
  Interferences
  Helpful Hints
Safety Issues (specific to the method)
Instrumentation/Equipment:
  Operating Instructions
  Maintenance
Reagents and Standards
Procedures (detailed step-by-step):
  Sample Preparation
  Instrument Operating Conditions and Calibration
  Analysis
QA/QC Requirements:
  QC Samples
  Acceptance Criteria (precision and accuracy) and
Calculations

Reporting:
  Units
  Limits
  Significant figures and Values Below Detection Limit
References/Method Source
  Deviations from Source Method and Rationale

Adopting and revising analytical procedures:

(Adopting a procedure): When there is a need from the clients or from the laboratory to use a new analytical procedure and it is economical and practical for the laboratory to do it, the laboratory should adopt the new procedure. The steps include:

1. Initial demonstration of capability: Three replicates of the laboratory fortified blank at middle level of range of concentration of interest. The replicates are worked up through entire method procedure and analyzed. The mean analyte recovery must be 80 to 120% and the relative standard deviation of analyte recovery must be <20%.

2. Follow through Section VIII (method validation, data reduction and reporting) of this Quality Assurance Manual.

3. The data and report are reviewed and approved by the laboratory manager/director before the procedure is put use for sample testing.

(Revising an analytical procedure): A Procedure should be revised when:

1. It can be done in shorter time, but the procedures still do not deviate from the original procedure.

2. It can use small amount of reagents, but the amount is still enough to carry out the analysis.

3. The sample matrix is different from the original type of matrix.

When a procedure is revised, run a laboratory fortified blank with the revised procedure and runs a parallel test with the original (before revised) procedure. If the test results from two procedures agree within 20%, the revised procedure is acceptable. The revised procedure must be reviewed and approved by the manager/director before it is used for sample testing.

Generation and Control of Document

Generation of Document

1. All documents issued to laboratory personnel as part of quality system, such as QC Manuel, SOP and analytical methods, shall be reviewed and approved by authorized laboratory management prior to use.

2. Quality system documents generated by the laboratory shall be uniquely identified and include the date of issue, revision identification, page numbering, total number of pages or a mark identifying the end of the document and an authorizing signature.

3. Authorized documents shall be available where needed and periodically review. An invalid document shall be removed and marked obsolete.

4. Changes to document shall be reviewed and approved for use by authorized laboratory management. Computerized document must be controlled and monitored.

Control of Records

1. All laboratory records (results) shall be maintained for ten (10) years. Records shall be stored and retained in a secured room and are readily retrievable.

2. Computer records are satisfactory without hard copy file provided copies can be produced as needed and data edits are documented within the computer files. Computer file backup procedures are required. File access must be protected by password.

(END OF PAGE)

VII. METHOD VALIDATION, DATA REDUCTION AND REPORTING

Analyst/Method Validation

For any analyst using an analytical method for the first time, an initial method validation package must be prepared prior to the analyses of real samples (see attached copy of form, exhibit 6, to be completed). When using accepted EPA methods, completion of the Initial Demonstration of Proficiency, if specified in the method, is sufficient to meet this requirement. Otherwise, the following steps must be performed, if applicable:

1. Calibration Curve: a 5-point calibration curve must be established that includes a standard concentration at 2-5 times above the method detection limit. The concentration range of the standards must encompass the expected concentration of the analytes in the real samples to be analyzed or the linear working range of the instrument used.

2. Matrix Spike: a minimum of four replicate matrices spiked at the regulatory level or mid-range calibration standard concentration, whichever is lower, must be analyzed to determined initial average recovery and reproducibility of the method. For drinking water methods, the regulatory level is the maximum contaminant level (MCL) established by the CDHS Office of Environmental Health Hazard Assessment. The regulatory level for hazardous waste is defined in CCR Title 26, Section 22.66699.

3. Method Detection Limit (MDL): a minimum of seven replicate matrices spiked at or slightly above an estimate of the detection limit must be analyzed to determined the actual MDL of the laboratory. The PROCEDURE TO DETERMINE METHOD DETECTION LIMIT found in publication EPA-600/4-82-057, Appendix A is followed by the laboratory. A copy of the procedure is made part of this manual as Appendix C.

4. External Reference Sample: an external reference sample obtained from a source other than those used for #1, #2, and #3 above must be analyzed. Recovery obtained in this analysis must fall within the range established in #2 above.

Data Validation

All results generated by the laboratory must be validated through the simultaneous analyses of required quality control (QC) samples with the unknown sample. Section VIII, Analytical Quality Control Procedures, of this manual discusses this subject in detail. Quality control samples include, but are not limited to, calibration, analysis of method blanks, analysis of matrix spiked samples in duplicate, and analysis of external reference standards.

After completing the analyses of an analytical batch, QC results are recorded and plotted in the appropriate quality control chart (see exhibit 7). Precision and accuracy control charts are maintained to determine if the QC results of an analysis are within established control limits. Control limits are initially set after the initial demonstration of proficiency by the analyst (see Analyst/Method Validation above). They are then regularly updated to reflect results of the most recent twenty QC analyses.

Using this QA Manual as guide, the analyst is responsible in identifying all appropriate quality control operations to follow when performing a specific analyses. When results have been generated, the analyst must also verify that all QC results fall within established limits. If any of the required QC is out of control, the analyst must notify the supervisor so that the necessary corrective action may be initiated.

Detection Limits

The laboratory uses three types of detection limits: instrument detection limit (IDL), method detection limit (MDL), and detection limits for the purpose of reporting (DLR). An analyte is considered to be positive if the signal-to-noise (S/N) ratio is 5. This fact is taken into consideration by the staff when they are establishing an analyte's IDL or MDL.

Instrument detection limit (IDL) is the constituent concentration that produce a signal by the instrument greater than five times the signal/noise ratio of the instrument.

Method detection limit (MDL) is the lowest quantifiable level that can be reliably achieved during a routine laboratory analysis of an analyte in a given matrix. The laboratory's MDL is identical to the ***practical quantitation limit (PQL)*** defined in EPA methods. Again, the laboratory's requirement of S/N=5 is applied when establishing MDLs. MDL values are typically higher than the IDLs because it is matrix dependent. In determining MDLs, the laboratory begins by following the method given in the publication EPA-600/4-82-057, Appendix A. This process will generate a "calculated" MDL. Normally, "calculated" MDL values will not be used by the laboratory when reporting results. The actual MDL used will be 8-12 times the standard deviation resulting from the MDL procedure. MDLs for each regulated analyte or analyte of interest are verified annually.

Detection limit for reporting purposes (DLR) is the limit set by the California State Department of Health Service Office of Drinking Water. This limit specifies the lowest concentration to be reported by the laboratory on any drinking water analyses performed under Title 22 of the California Code of Regulations, Domestic Water Quality. The laboratory must detected all analytes at DLRs established by the State. If the laboratory should detected an analyte below the DLR, then the sample must still be reported as "Not Detected".

Data Reduction

Equations and calculation procedures are included in the laboratory's SOPs for specific methods. All calculations must be included with data package for the sample. Results **are not corrected** for background levels found in the analyses of method or reagent blanks. If background levels are detected, they are reported separately to alert the users of the data to this fact. Calculations by the instrument or integrator are acceptable. Equations for calculations typically used by the laboratory are given in Appendix B.

Significant Figures

The laboratory is a typical environmental laboratory that uses Class A glasswares for volume measurements. As such, final results are reported to **no more** than three significant figures. To

illustrate, consider the following examples of results generated by a calculator or computer and the final values actually reported:

	Calculated Results	Reported Value
Lead in paint chips	1,168.87773395 ppm	1,168ppm
Percent Recovery for phenols	99.213%	99.3%
Ammonium Ions in wastewater	4.3076 ppm	4.31 ppm
Cyanide in water	0.0982 ppm	0.098 ppm

Table 6 provides a list of Class A tolerances for glasswares routinely used in the laboratory.

Analysis's Significant Events

Analysts must document all significant events that occur in an analytical run. These events are grouped into two basic activities required in a complete analysis: sample work-up and instrument analysis.

Sample work-up includes, but is not limited to such tasks as the pretreatment of the sample, amounts of the sample used, sample work-up performed such as extraction and digestion, and dilution or concentration of the sample. The laboratory has created worksheets for each individual analysis performed where the analyst can conveniently document significant events related to the sample work-up.

Instrument analyses are tasks such as tuning, performance check, calibration, analysis of quality control samples, analysis of actual samples and verification of the calibration curve. These are significant events that occur in analyzing a sample. To document when these events occur, analysts are required to maintain a Run Logbook where they will need to record the sequence of when these events happen for each analytical run.

Calculation Records and Documentation

When the laboratory reports on constituents found in a sample, the report includes not only the identity but also the concentration of the constituent in a given sample as well as in the quality control samples analyzed. It is very important that the data package for a given sample include documentation on how calculations are performed to arrive at the reported value. This will facilitate any future verification or audit that may be conducted on the package.

Laboratory analysts perform calculations either manually, through computer programs, or a combination of both. All manual calculations must be made on worksheets that are included with the data package. For calculation performed by computer programs, the report generated by the programs must include the equations used in the program and the source of the variables used in the equation.

Data Review/Reports and Data Package Requirements

Analytical results are ready to be reported as soon as it is verified that all quality control data fall within the laboratory's established limits. All data generated, both for the actual sample and the quality control samples, must be entered in the appropriate worksheet, log book and QC books. All information related to the sample analysis such as weight, volume, and QC results must be recorded in the worksheets used.

Before the laboratory's results of analysis are reported, the data package for the sample must be complete. The requirement for a complete data package is detailed in SOP QA003. At the minimum, the data package must include the following documents:

1. Original Chain-of-Custody submitted with the sample.
2. Summary worksheet showing final result obtained in the analysis.
3. QC report that includes calibration curve, results of blank analysis, spike recoveries, accuracy and precision calculations.
4. Worksheet showing method used, sample weight or volume, dilutions, standard concentrations, description of instruments used, name of analyst and calculation, if applicable.
5. Raw data such as chromatogram and charts.

The laboratory supervisor will review the above documents for accuracy and completeness. The following key points will be verified:

1. The appropriate method was use.
2. The required holding time was observed.
3. All the required analytical control samples were analyzed and the results were within acceptable range.

4. All required information on the worksheets are provided.
5. Calculations are correctly performed.
6. Raw data such as chromatograms are properly labeled.

If the data package is acceptable, the supervisor will date and initial each of the above documents. Immediately thereafter, a written report for the client or submitting agency is prepared. The following information must be included in any analytical report released by the laboratory:

Laboratory name, address, and phone number
State DHS-ELAP accreditation number
For each sample analyzed:
  Name, address, and contact person of submitting agency
  Laboratory ID#
  Submitting agency's ID#
Date/Time of sample collection
Date of sample received by the laboratory
Sampling location
Name of analytical method used

Analytical values obtained including units
Detection limits-MDL or DLR
Date of report

Identification and estimation of uncertainty in test method

Identification of uncertainty: In an analytical chemistry laboratory the following describes the major sources of uncertainty.

1. Mass: Both analytical balances and weights used for verification of performances have uncertainties associated with them. The bias, based on the claims of manufactures is approximately 0.3 mg. If one assumes a typical sample weight of 1 gram, the estimated uncertainty associated with mass determinations is approximately 0.03%.

2. Volume: Volumetric measurements include the use of volumetric flask, pipets and burets. Conservative estimate of error with volume measurements is 0.05%

3. Temperature: The uncertainty associated with temperature is approximately 0.012%.

4. Calibration standards: Calibration standards frequently have published uncertainties. They are generally 0.5-1% for solution standards and much less for solid standards.

5. Atomic Weights: The uncertainty of published atomic weights can contribute to total, combine uncertainty in process in which atomic weights are used for calculations contributing to the generation of results. The largest uncertainty associated with this factor is estimated at 0.02%.

6. Standardization process: The standardization process for most instrumental analyses introduces uncertainty because of the inexact nature of the process. With and linear correlation coefficient of 0.999, the standard error of estimate is approximately 3%.

7. Instrumentation Sensors: Sensors have uncertainty because of lack of stability.

Estimation of Uncertainty

Since the combined error is generally addressed by the sum of the square of the standard deviations of the contributing factors, the effects of the uncertainty associated with mass, volume, temperature, and atomic weights are insignificant compared to uncertainty attributable to random error associated with the calibration and measurement process. Since random error associated with the calibration and measurement process is the most significant contribution to the uncertainty of most measurements, and this error can be assessed by a consideration of quality control data, we can use quality control data to estimate uncertainty.

1. Laboratory control samples (LCS) and laboratory control sample duplicates (LCSD) are used to estimate uncertainty.

2. A minimum of 50 quality control samples are used to estimate uncertainty. Preliminary indications of uncertainty can be assessed by fewer than 50 results.

3. The relative standard deviation is calculated for the quality control samples for the estimation on uncertainty.

4. The expanded uncertainty for an analytical process (specific method and specific matrix) is calculated as two times the relative standard deviation (Sr) of recovery data. The expanded uncertainty is used to define the uncertainty interval associated with a result. For example, if X is measured result obtained for a sample, the interval of uncertainty for this result can be represented as:

$$X(1\pm 2Sr)$$

(END OF PAGE)

VIII. ANALYTICAL QUALITY CONTROL PROCEDURES

Once the analyst has completed the method validation (see Section VII), actual samples maybe processed. On a daily basis, or each time a sample or batch of samples is analyzed, certain quality control samples must be ran. ***Quality control (QC) samples*** are sets of samples processed with each analytical batch to measure the accuracy and precision of the analytical method each time it is performed. An ***analytical batch*** is defined as a group of samples which behave similarly to the procedure being employed. They are processed together as a unit, and their analysis is completed within a 8-10 hour work shift.

The QC samples used by the laboratory may include calibration curve (see Section V), method blank, laboratory fortified blank, laboratory fortified blank duplicate, laboratory performance check standard, quality check sample, MDL check, laboratory fortified matrix, laboratory fortified matrix duplicate, replicate samples, external reference samples, and surrogate standards. Table 5 (see Appendix A) details the QC samples required per analysis or EPA method used and the frequency they are analyzed. Results obtained from the analysis of these QC samples are used to generate control charts which are then used to establish the accuracy and precision limits of a procedure.

The different quality control samples used by the laboratory are defined below:

Method Blank

Also known as ***reagent blank*** or ***laboratory blank***, ***method blank*** is a matrix similar to the actual samples being analyzed to which all reagents are added in the same volumes or proportions as used in the processing of the actual samples.

Ideally, a method blank should be free of contamination by the parameter being tested, otherwise, the following criteria must be met before a matrix may be used as a method blank: the concentration of analyte to be tested in the matrix will not cause the final extract to be positive for the analyte at concentrations equal to or higher than (1) the method detection limit, (2) 5%of the regulatory limit for that analyte, or (3) 5% of the measured concentration of the analyte in the sample, whichever is higher. Distilled, de-ionized water is an acceptable method blank for drinking water samples.

The method blank must be carried through the entire sample preparation and analytical procedure. It is used to document contamination resulting from the analytical process. Acceptable method blanks are:

- Distilled and de-ionized water for the analyses of drinking water samples or hazardous waste sample which is non-aqueous or solid and for which it is impossible to obtain a universal matrix blank.

- Plant tissue previously tested and found to have no detectable level of contamination by the analyte to be tested.

- Soil samples previously tested and found to have no detectable level of contamination by the analyte to be tested.

Laboratory Fortified Blank

Laboratory fortified blank **(LFB)** is mainly used in the analysis of drinking water, groundwater and surface water samples. It is reagent water spiked with a known concentration of the target analyte(s) at ten times the MDL or at the regulatory level whichever is less. The spiking is done prior to the sample work-up and analysis. The LFB is used primarily to monitor the accuracy of the method in relatively clean sample matrices.

Laboratory Fortified Blank Duplicates

Laboratory fortified blank duplicates are two LFBs analyzed simultaneously in an analytical batch. The level of spiking should be identical in both samples. LFB duplicates are used to measure the accuracy and precision of a given method in relatively clean sample matrices.

Laboratory Performance Check Standard

Certain EPA methods such as method number 507 requires the analysis of ***Laboratory performance check (LPC)*** standard. LPC is used to evaluate the performance of the instrument system being used in a specific method. Check individual methods for preparation and performance criteria. Inability to meet performance criteria for the LPC indicates the need to re-evaluate the instrument system.

Quality Check Sample

Required primarily by the EPA 8000 series methods, ***quality check samples*** are used by the laboratory to establish its ability to generate acceptable accuracy and precision. Standards used to prepare QC samples must be from a source other than the ones used for calibration or spiking (see external reference standard definition below). Refer to SW-846, Method 8000, Section 8.6.2 for instruction on its preparation and performance criteria.

MDL Check

At this time, ***MDL check*** is only required for EPA method 504, the analysis of EDB and DBCP on drinking water samples. MDL check is performed on a weekly basis or each time the method is used, whichever is less frequent. See the method for instructions on its preparation. The recovery of each analyte in the MDL check sample must fall within 60%-140%. If either analyte fails the tests, the test must be repeated for that analyte. Repeated failure, however, indicates a problem with the measurement system or standards. The source of the problem must be located, corrected and the test repeated.

Laboratory Fortified Matrix

A ***laboratory fortified matrix (LFM)***, also known as ***matrix spikes (MS)***, is used to document the accuracy of a method in a given sample matrix type. It is prepared by spiking an aliquot of a selected sample with a known concentration of the target analyte(s). The aliquot must be spiked before it goes

through the work-up and analytical process. The LFM is analyzed simultaneously with the actual samples of an analytical batch. The amount of standard for spiking must be at the regulatory level. Samples with analyte concentration greater than 0.1% do not require the analysis of a laboratory fortified matrix.

Laboratory Fortified Matrix Duplicates

The ***laboratory fortified matrix duplicates (LFMD)***, also known as ***matrix spike duplicates (MSD)***, are prepared by spiking split samples with identical concentrations of the target analyte(s). As with the LFM, the spiking occurs prior to sample preparation and analysis. LFM duplicates are used to document the precision and accuracy of a method in a given sample matrix type.

Duplicate Samples

Duplicate samples serve the purpose of monitoring the precision of the measurement system. As such, the analytical result must yield a measurable amount for the process to be meaningful. Duplicate samples are analyzed only when there is a strong likelihood that there will be a measurable amount of the analyte being tested in the sample. This is usually true for general mineral and general physical analyses.

Duplicate samples are prepared by dividing the selected sample into two and analyzing them separately. The relative percent difference for the results of the duplicate analyses must be within established precision limits. If not, an error has occurred and it must be determined and corrected. The batch must then be reanalyzed.

External Reference Samples

External reference samples serve two purposes: (1) to verify the accuracy of standards used in the method such as calibration standards and spiking solutions, and (2) to document the laboratory's performance. They are prepared similarly to LFB and LFM samples discussed above. The difference is that the source of spiking solution must be different than the one used for calibration and spiking the LFB or LFM. A different source means a different manufacturer or the same manufacturer but different lot number. See individual methods for more detailed instructions on its preparation.

Surrogate Standards

Surrogate standards are organic compounds which are similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples. Surrogate standards are added to all the samples in an analytical batch including quality control samples. Addition is done prior to the work-up and analysis. Surrogate standards document the accuracy of the laboratory's analyses of each sample.

Quality Control Reports

A report on the results of analysis of quality control samples is prepared for every analytical batch. A standard worksheet for this use has been developed (see exhibit 8). The analyst completes the

worksheet based on the analytical results obtained. The supervisor signs the completed worksheet to signify that the results are acceptable and meets the laboratory's established accept/reject criteria. The QC Worksheet is filed with the data package of an analytical batch.

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IX. ASSESSMENT OF ACCURACY AND PRECISION

Accuracy and precision control limits set the criteria for accepting or rejecting data generated by the laboratory. Limits are established for each target analyte, in a particular sample matrix, following a specific test procedure. These limits are initially set from the values obtained when a method is validated by an analyst (see Section VII). Afterwards, more data on accuracy and precision are produced by the laboratory as it continuously analyzes samples on a daily basis. These data are tabulated in a chart (see exhibit 7) with the twenty most recent data used to set the current control limits.

Accuracy

Accuracy is the nearness of a result or the average of a set of results to the true concentration value of the analyte added. It is represented by the percent recovery (%R) and calculated as follows:

$$\%R=\frac{a-b}{t}\times 100\%$$

Where:
- a = the calculated concentration of the analyte in the spiked matrix after analysis.
- b = the background concentration of the analyte in the matrix blank, if any.
- t = the known value of the analyte spiked in the matrix blank.

Upper and lower control limits for accuracy of an analyte, in a particular matrix, using a specific method are calculated using the average $\%R_{ave}$ values and their standard deviation (σ_R). The accuracy control limit as recommended by the EPA is defined as:

$$RLCL=\%R_{ave}-2\sigma_R$$
$$RUCL=\%R_{ave}+2\sigma_R$$

Where:
- RLCL = the accuracy lower control limit.
- RUCL = the accuracy upper control limit.

Precision

Precision is a measure of the laboratory's ability to generate the same result in repeated tests of the same sample without any prior information as to the true value. Precision is measured using duplicate sample analysis. It is assessed through the calculated relative percent difference (RPD) of duplicate analytical results. The calculation is as follows:

$$RPD = \frac{|Conc_1 - Conc_2|}{Conc_{ave}} \times 100\%$$

Where: $|Conc_1 - Conc_2|$ is the absolute value of the difference between the results of the duplicate analyses.

$Conc_{ave}$ is the average of $Conc_1$ and $Conc_2$.

As recommended by EPA, the laboratory's requires an RPD value of ±20% for the data to be deemed acceptable.

Control Charts

Precision and accuracy control charts are maintained for at least 10% of the analytes (minimum 3 and maximum 10) for a given method using exhibit 7. Control limits are initially set after ten data points. Thereafter, limits are periodically set using the twenty most recent data to reflect current performance.

(END OF PAGE)

X. CORRECTIVE ACTION

Corrective action is initiated in out-of-control situations. A situation is considered out-of-control if any of the laboratory's analytical quality control samples (see Section VIII) are outside established limits, i.e.:

1. Method blanks are coming out positive for the analyte of interest signifying that the analytical system is contaminated.

2. Results of duplicate samples are outside the 20% precision control limit.

3. Spike recoveries fall outside the established laboratory's accuracy control limits.

Once it is determined that an out-of-control situation exist, the supervising staff initiates proper documentation thorough the use of the laboratory's **"REDO Sheet"** (see exhibit 9). The out-of-control situation is defined, and the corrective actions taken are recorded in this form. The Redo Sheet is kept permanently on file with the analytical batch affected. It is the supervising staff's responsibility to decide the appropriate corrective action(s) to be taken. They can include, but are not limited to, the following:

- The analyst provides additional information or recalculations;
- Instrument calibration and operation are checked. Calibration standards are checked and new ones are prepared if necessary. Instrument malfunctions are corrected;
- New reagents are used, if needed;
- The analyst repeats the analysis of spiked samples using the same method;
- A different analyst repeats the analysis of spiked samples using the same method;
- The analyst repeats the analysis of spiked samples using a modified or new method, and finally;
- The analysis of the analytical batch will be repeated after the corrective action has been taken.
- If the accuracy of test results is affected by events resulting in corrective action. clients are notified in writing.

No laboratory results will be released until the problem is solved.

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XI. PERFORMANCE AND SYSTEM AUDITS

External Performance and System Audits

The laboratory holds an accredited status with the California State Department of Health Services-Environmental Laboratory Accreditation Program (CDHS-ELAP). As a requirement for continued accreditation, the laboratory undergoes external performance and system audits every two years by CDHS-ELAP environmental specialists. This is an exhaustive investigation of the laboratory's analytical procedures, facilities, personnel, and documentation/record keeping.

In addition to the biennial audits, the laboratory is required by the CDHS-ELAP to successfully participate in the performance evaluation (PE) studies conducted by EPA-approved vendors, CDFA, and CDHS. Performance evaluation samples consist of annual drinking water (WS or Water Supply Studies), wastewater (WP or Water Pollution Study), microbiology, hazardous wastes, and pesticides (in raw agricultural products) sets.

The laboratory is accredited by the American Industrial Hygiene Association (AIHA) to analyze lead in environmental samples. Towards this end, laboratory participates in the external proficiency testing program known as the Environmental Lead Proficiency Analytical Testing (ELPAT) Program which is a cooperative effort between the AIHA and the National Institute for Occupational Health and Safety under agreement with the EPA. This program requires the analysis of our sets of unknown samples including soil, paint chips, dust wipes and air for lead content.

Finally, the laboratory goes through audits conducted by the County of Los Angeles Department of Public Works (DPW). As a major client, DPW randomly sends blind split samples to monitor laboratory performance.

All PE samples, regardless of the source, are processed and analyzed by the laboratory in a manner similar to client samples.

Internal Performance and System Audits

SYSTEM AUDIT

Annual audits of the laboratory operation are conducted by the laboratory's designated QA officer at the 3rd quarter every year. QA (Quality Assurance) Checklist (see exhibit 10) is used when these inspections are conducted. The activities inspected include:

-consistent calibration of instruments are performed;
-proper documentation of equipment use;
-proper documentation of equipment operating conditions such as refrigerator temperatures;
-consistent performance and proper documentation of required quality assurance activities such as sterility checks of containers used for microbiology, timely disposal of used media, etc.
-acceptable documentation of standard preparation and labeling; and
-timely maintenance and calibration of equipment such as certified thermometer, analytical

balance, etc.

After each audit, a summary report is prepared and submitted to management. The report includes deficiencies found and required corrective actions. The supervisory staffs are provided with a copy of the summary report and time limitations on when the corrective actions

INTERNAL PROFICIENCY TESTING SAMPLES

The laboratory supervisors conducts an internal audit, at least twice per year, through the use of ***intra-laboratory check samples (ICS)*** for randomly selected testing procedure. The supervisors submits unknown concentrations of analytes or analyte mixes, prepared in-house or purchased through a vendor, to the staff for testing using approved methods. Every effort is made to make the identity and quantity of the analyte present unknown to the staff. A report is prepared by the QA Coordinator on the results of analysis of ICS. This report is made part of the laboratory's permanent record.

QUALITY ASSURANCE INSPECTIONS

Every quarter, the laboratory's designated QA Officer conducts an audit of randomly selected data packages of samples for general laboratory, lead and microbiological testings. The packages are audited for completeness in meeting required analytical quality controls of each analyses performed on the samples and proper documentation of every steps taken in processing the samples. Exhibit 21 is the checklist used by the QA Officer when conducting the audit. It lists the items inspected and provides appropriate areas for comments and observations.

At the conclusion of the quality assurance inspection, the QA Coordinator prepares a summary report which includes deficiencies found in quality assurance and quality control practices of the laboratory, and required corrective actions that must be performed including the staff responsible and the date when the corrective actions are expected to be completed.

Summary reports are made available to the staff and laboratory management, and made part of the laboratory's permanent record.

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XII. PREVENTIVE MAINTENANCE

All minor maintenance and repair needed on equipment and instruments are accomplished by the laboratory personnel. For major breakdowns, all primary equipment such as gas chromatographs and atomic absorption spectrophotometers are covered by manufacturer's service contracts to enable the laboratory to obtain service calls from qualified manufacturer's service engineers in short notice.

The laboratory maintains an ***Instrument Log Book*** for each equipment or instrument used in the laboratory. The analyst is required to use these logbooks to document all samples and standards analyzed in chronological order, and any repair or maintenance performed on the instrument.

pH METER

pH meters are calibrated daily when in use with 2 buffers in the pH range of interest. All calibrations are documented and maintained in a permanent **pH Logbook.**

ANALYTICAL BALANCE

All microbalance and platform balance are calibrated annually by qualified service engineers. The calibration of the balances are verified daily, when in use, with standard weights. A set of class "S1" weights are available for calibration. All calibration check records are maintained in a permanent **Balance Logbook.**

REFERENCE WEIGHTS

The reference standards used in calibrating analytical balances are certified annually by an outside agency. Calibration and certification reports are kept on permanent file under **Reference Standard Weights Certification**.

LABORATORY THERMOMETERS

All thermometers used in the laboratory are calibrated very six months against a certified thermometer. Records of calibration are documented and maintained **Thermometer Calibration Logbook**.

CERTIFIED THERMOMETER

The laboratory maintains a certified thermometer that is sent to an outside laboratory annually for calibration and certification. Results of calibration and certification are filed under **Certified Thermometer: Calibration and Certification**.

INSTRUMENT SERVICE

When required, instrument manufacturer's service engineers perform the necessary maintenance and repair of instruments such as gas chromatographs or atomic absorption spectrophotometers. The laboratory maintains a log book, **Instrument Maintenance By Outside Contractors,** on instrument maintenance reports for all major equipment used in the laboratory. It contains records on when an instrument is maintained and/or serviced, who provided the service, and what actions were taken.

REFRIGERATOR/FREEZER

The temperatures of refrigerators and freezers are monitored daily with a calibrated thermometer immersed in liquid. Records of the monitoring are posted outside each unit and includes the date, temperature, initial of responsible person and acceptable range of temperature. All temperature monitoring performed is kept in a permanent file, **Equipment Temperature Monitoring.**

PIPETTORS

All automatic pipettors used in the laboratory are calibrated and maintained by an outside contractor every six months. Reports on the calibrations are kept on file under, **Pipettor Calibration.**

SPECTROPHOTOMETER WAVELENGTH CHECK

The wavelength of spectrophotometers in use are verified every six months using a holmium oxide filter. Records of verification are maintained in the **Spectrophotometer Wavelength Check** log book.

(END OF PAGE)

XIII DOCUMENT CONTROL

Published documents such as analytical methods published by U.S. Environmental Protection Agency (EPA), American Public Health Association (APHA), American Water Works Association (AWWA) and Water Environment Federation (WEF) shall be kept by Chief, Environmental Toxicology Laboratory, and will be available for viewing by laboratory staff.

Approved standard operating procedures and instrument manuals are kept by laboratory supervisors and are available for viewing by laboratory staff. Instrument softwares are also kept by supervisors and are available when needed.

Laboratory safety manual and laboratory quality assurance manual are issued to all laboratory staff.

Document Approval and Issue

In principle, all the EPA Methods and Standard Methods by APHA and AWWA are approved to use in the laboratory. The standard operating procedures (SOP) must be approved by Chief, Environmental Toxicology Laboratory before issue for use. For more information, see Section VI, Analytical Procedures.

The followings are approved documents (master list):

Methods for the Determination of Organic Compounds in drinking water. EPA-600/4-88/039, December 1995.

Methods for Organic Chemical Analysis of Municipal and Industrial Waste water. EPA-600/4-82-057, July 1982.

Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods. EPA SW-846, 3rd Edition, November 1986.

NIOSA mannual of Analytical Methods, 4th Edition, U.S. Department of Health and Human Services, 1994.

Official Methods of Analysis, 15th Edition, 1990, AOAC

Standard Methods for the Examination of Water and Waste water , 20th Edition, APHA, AWWA, WEF

Quality Assurance Manual, Revision 5

Laboratory Safety Manual, Revision 3.1

Standard Operation Procedures (SOP):

1. Standard Operating Procedures for Inorganic Tests of Water Samples

SOP #	Test Name
IW001	Alkalinity (Titrimetric), September 1985
IW002	Ammonia (in water), September 1990
IW2.1	Ammonia in Waste Water, November 1997
IW2.2	Ammonia in Water, May 2002
IW2.3	Determination of Anions by IC, November 1997
IW5.3	Biochemical Oxygen Demand (BOD), May 2, 2002
IW6.1	Boron (Colorimetric, Curcumin), October 1997
IW007	Calcium and Magnesium (EDTA Titrimetric), November 1985
IW008	Chemical Oxygen Demand (Colorimetric, Manual), October 1997
IW10	Chlorine Residual, March 27, 1995
IW12.1	Chromium^{+6} (Colorimetric), October 1997
IW12.2	Dissolved Chromium(IV) in Water, March 6, 2001
IW13	Color (Colorimetric, Platinum/Cobalt), November 1985
IW14.2	Conductivity, May 20, 2004
IW15.1	Cyanide, Total (Revised 11/97), November 1997
IW15.2	Flame Atomic Absorption Spectrophotometry, November, 1997
IW18	Hardness, Total (as $CaCO_3$), September 1985
IW19.2	Total Kjeldahl Nitrogen, May 2002
IW23.1	Metals by EPA Method 200.8, April 25, 2002
IW24.1	Methylene Blue Active Substance (Revised 09/1997), May 2004
IW27	Odor (Threshold Odor), September 1985
IW28	Organic Nitrogen (Colorimetric), February 1991
IW29.1	pH , May 20, 2004
IW30	Total Phosphate (Revised 04/03/02), April 3, 2002
IW30.1	K^+ Flame Emission Method, November 1997
IW31.1	Phenolic, Total Recoverable (Revised 05/13/02), May 13, 2002
IW33.2	Residue, Total Filterable (TDS Dried at 180°C), June 2006
IW34.1	Na^+ Flame Emission Method, November 1997
IW34.2	Settleable Solids, November 1997
IW36	Suspended Solids and Volatile Suspended Solids, December 18, 2006
IW37	Silica, Dissolved, September 9, 1993
IW38	Sulfate (Turbidimetric), September 1985
IW39	Sulfides, October 1997
IW40	Sulfide(Methylene Blue Method), December 11, 1987
IW41.4	Total Organic Carbon, Rev. 4, May 1, 2006
IW42	Trace Metals by Graphite Furnace, May 2, 2002
IW43.2	Turbidity, May 6, 2002
IW44	Perchlorate (ClO_4), June 5, 2006
IW45	Dissolved Oxygen, December 3, 2003

2. Standard Operating Procedures for Organic Tests of Water Samples

SOP #	Test Names
OW1.2	EDB/DBCP by Microextraction/GC (Rev. 2), March 6, 1998
OW2.2	Analysis of Organohalides Pesticides and Commercial

	Polychlorinated Biphenyl Products in Water by Microextraction and Chromatography, May 2002
OW3.2	Nitrogen/PHosphorus Containing Pesticides by GC/NPD, January 12, 2002
OW4.3	For the Determination of Chlorinated Acids in Drinking Water by Liquid-Liquid Extraction, Derviatization and Gas Chromatography with ECD, January 10, 2003
OW5.1	Measurement of N-MethylCarbamoyloximes and N-MethylCarbamates in Water by Direct Aqueous Injection HPLC with Post Column Derivitization, April 15, 2002
OW6	Generation of Diazomethane (Using mini diazald apparatus), April 1995
OW7	Determination of Triazine Herbicide, September 1991
OW8.2	Determination of Glyphosate in Drinking Water by Direct Aqueous Injection HPLC, Post-Column Derivization, and Fluorescence Detection, April 29, 2002
OW9.2	Measurement of Purgeable Organic compounds in Water by Capillary Column Gas Chromatography/Mass Spectrometry, March 28, 2002
OW10.1	EPA Mehod 608, July 29, 2003
OW11.1	Measurement of Purgeable Organic Compounds in Waste Water by Capillary Column GC/MS (Method 624), April 1, 2002
OW12.1	SOP for Base/Neutrals and Acids (Method 625), April 8, 2002
OW13	Spinosad, April 30, 2003

3. Standard Operating Procedures for Microbiology Tests

SOP #	Test Names
MC1	Clark's Presence/Absence (P-A), August 1, 1995
MC2.1	Colilert Test (MMO-MUG), April 26, 2002
MC10.1	Total Coliform, Membrane Filter Procedure, September 11, 1995
MC11.1	Fecal Coliform Membrane Filter Procedure, September 11, 1995
MC 12.1	Fecal Streptococcus, Membrane Filter Procedure, September 11, 1995
MC13.1	Heterotrophic Plate Count, November 14, 1997
MC14.2	Inhibitory Test, April 29, 2002
MC15	Completed Test for Coliforms, September 11, 1995
MC18	Autoclave and Sterilization, May 3, 2002
MC19	Total and Fecal Coliform Test in Drinking Water, MTF Technique, September 20, 2002
MC20	Streptococcus and Enterococcus Group in Drinking Water, Multiple Tube Fermentation Technique, September 24, 2002
MC21	Total and Fecal Coliform Test in Waste Water, MTF Technique, September 25, 2002
MC22	Streptococcus and Enterococcus in Waste Water, Multiple Tube Fermentation Technique (MTF), September 24, 2002
MC 23	Heterotropic Plate Count (SimPlate Method), May 27, 2004

4. Standard Operating Procedures for Lead Program

SOP #	Test Names
IW15.3	Flame Atomic Absorption Spectrophotometry (FAA), September 2000
MI13	Washing of Glassware, March 22, 1995
IW23	Metals, February 10, 1989
IW42	Trace Metals by Graphite Furnace Atomic Absorption, May 6, 2002
IH3.2	Lead Digestion for Paint Chips, March 3, 1999
IH3.3	Lead Digestion for Soil, September 20, 2006
IH3.4	Lead Digestion of Dust Wipes, September 20, 2006
MT4	Lead in Food (Ashing), February 7, 1995
IH9	Leachable Lead Determination, September 20, 2006
IH10	Lead Leaching of Candy Wrappers, March 3, 1999
IH11	Lead Digestion for Paint Chips (Acid Digestion Method), December 9, 2002
IH12	Balance Check Procedure, September 1, 2006

Document Changes

The in-house documents such as Quality Assurance Manual, Standard Operation Procedures and Laboratory Safety Manual should be reviewed annually by Chief, Environmental Toxicology Laboratory, and document the reviewal. Changes to documents shall be reviewed and approved by Chief or Deputy Director of Environmental Toxicology Laboratory. Invalid or obsolete documents are promptly removed from all points of issue or use. Obsolete document retained are suitably marked.

Documents amended by hand pending reissue of the document before annual review by Chief, shall be clearly marked, initialed and dated. A revised document shall be formally re-issued as soon as practicable. Amended electronic documents shall be saved as a new file, and leave the previous file intact for the purpose of tracking. Original files that have been amended two or more times may be deleted, especially when there is a big change.

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IX CLIENT POLICY

Protection of confidentiality of client information

1. All client information, sample information, test results and reports are handled by authorized personnel only. If those information are in hard copy, they must be stored in a secured place. If those information are stored in a computer, they must be protected by a password to the computer. All personnel who handle those information must ensure the data accuracy and integrity.

2. All test results, sample, and client information are submitted to the client only unless it is authorized by the client.

3. All record of communications to and from the client should be kept in a safe place. In case of phone communication of brief description should be recorded.

Client Complaints

In case of client complaints in writing, a hard copy of the complaint should be kept in the file. Any investigation and corrective actions as the result of complaint should be recorded and file together with the complaint.
In case of client complaint by phone, a brief message should be recorded in a book. Any investigation and corrective actions as the results of complaint should be recorded together with the complaint.

(END OF PAGE)

Supplement I: Lead Analyses

This supplement to the manual is to be used in conjunction with the laboratory's most recent Quality Assurance Manual revision. It is written to address the particular activities associated with lead analysis that is not applicable to other laboratory operations. Unless specifically discussed in this supplement, the laboratory's Quality Assurance Manual describes the actual operating and quality control programs followed by laboratory personnel in lead testing.

SI.1. PERSONNEL

The key personnel in the laboratory's lead testing activities includes the technical manager, QA coordinator, and the analyst/technician. Existing staff that meets the minimum requirements specified below are assigned to these positions. At the present time, the laboratory's supervising toxicologist is assigned as the technical manager, the laboratory chief as the QA coordinator, and selected individuals from the laboratory's technical staff which includes the senior industrial hygiene chemist, senior toxicologist, industrial hygiene chemist, toxicologist, herbicide/pesticide technologist, toxicological technologist, laboratory support supervisor, laboratory assistant, and laboratory aides, are assigned as lead analyst/technician. Analyst/technician assignment is conditional upon successfully completing the laboratory's in-house certification process and meeting the requirement for continued certification every six months.

Minimum Personnel Qualification and Background

Technical Manager - shall have at least three (3) years of nonacademic analytical chemistry laboratory experience of which at least two (2) years shall be metals analysis experience. The technical manager must possess a knowledge of industrial hygiene chemistry with respect to lead in air principles and calculations.

Quality Assurance Coordinator - shall possess a bachelor's degree in a basic or applied science and have at lest one year of nonacademic analytical chemistry experience, or in lieu of a degree, 4 years of nonacademic analytical chemistry experience. In addition, documented training in statistics or quality control procedures is required.

Lead Analyst / Technician - shall possess current certification of successful completion of the laboratory's in-house training, defined under **Lead Analyst/Technician Certification** below on lead analysis, is required. In addition, analyst shall have a bachelor's degree in chemistry or related science.

Personnel Responsibilities

QA Coordinator

-Implements and oversees the laboratory's quality assurance program and quality control practices.

-Conducts periodic audits of the quality assurance program in place and maintains the record of laboratory and staff performance on internal and external audits.

-Implements corrections to the laboratory quality assurance program and practices found to be deficient through internal and/or external audits.

-Writes and maintains the laboratory's Quality Assurance Manual.

-Conducts periodic, thorough review of data packages to verify completeness and adherence to established quality control guidelines.

Technical Manager

-Addresses technical issues for laboratory staff and customers concerning NLLAP-related analyses.

-Ensures and documents that personnel with appropriate educational and/or technical background perform all NLLAP-related lead analysis.

-Ensures that adequate supervision is provided for all laboratory technical personnel.

-Plans and assigns work to appropriately trained laboratory personnel.

-Supervises and reviews of daily work of laboratory personnel.

-Provides technical direction to laboratory personnel in performing lead analyses of paint chips, soil, dust wipes, air and other environmental samples utilizing various analytical techniques such as flame and graphite atomic absorption spectrophotometry.

-Establishes and sets up special test procedures for detecting lead in unusual sample matrices the laboratory has little or no experience with.

-Implements minimum quality control guidelines defined by the Quality Assurance Program of the laboratory for all lead testing performed.

-Conducts and oversees training of laboratory personnel to perform lead testing.

-Provides oral and written consultation to the laboratory staff and clients on technical issues concerning lead analyses.

Lead Analyst/Technician

-Complete current in-house training requirements for Lead Analyst/Technician Certification.

-Receive samples submitted to the laboratory for lead analysis.

-Perform all required sample preparations such as grinding, milling and digestion using specified methods prior to analysis of lead following the laboratory's standard operating procedures.

-Analyze all prepared sample digestate for lead using existing laboratory instrumentation according to standard operating procedures of the laboratory.

-Analyze all required quality control samples with every analytical batch as specified by the laboratory's Quality Assurance Manual and this supplement.

-Complete all required analytical worksheets and documentation after the analysis of each analytical batch.

Lead Analyst/Technician Certification

Lead Analysts/Technicians are required to complete an internal training program for lead analysis prior to performing analyses on samples requiring NLLAP accreditation. The training is clearly defined in the Lead Analyst/Technician Certification Packet included in this supplement as Appendix B.

SI.2. ANALYTICAL PROCEDURES

Methods Used

All the analytical methods used for lead analyses are recommended and promulgated by the EPA, NIOSH, ASTM, AOAC, APHA, or AWWA. Listed below are the references available to and used by the laboratory for approved methods:

1. **Methods for Chemical Analysis of Water and Wastewater**, EPA-600/4-79-020, 1984, U.S. Environmental Protection Agency.

2. **Methods for the Determination of Metals in Environmental Samples**, EPA/600/4-91/010, U.S. Environmental Protection Agency.

3. **NIOSH Manual of Analytical Methods**, U.S. Department of Health and Human Resources, for the following editions:
   a. 3rd ed., February 1984
   b. 4th ed., August 1994

4. **NIOSH Manual of Analytical Methods, First Supplement to the Fourth Edition**, U.S. Department of Health and Human Resources, May 1996.

5. **Official Methods of Analysis of AOAC International**, AOAC International, for the following editions:
   a. 12th ed., 1975
   b. 14th ed., 1984
   c. 16th ed., 1995

6. **Standard Methods for the Examination of Water and Wastewater**, APHA-AWWA-WPCF, Washington, DC, for the following editions:
   a. 15th ed., 1980
   b. 16th ed., 1985
   c. 17th ed., 1989
   d. 18th ed., 1992
   e. 19th ed., 1995

7. **Test Methods for Evaluating Solid Waste, Physical/Chemical Methods**, EPA SW-846, 3rd Edition, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, DC, November, 1986.

8. **Methods and Guidance for Analysis of Water**, EPA 821-C-99-004, US-EPA, Office of Water, Washington, D.C., 20460, June 1999.

9. **General Guidance for Lead Analysis of Candy and Wrappers**, 1995 draft, Richard M. Jacobs, California Department of Health Services, Food and Drug Branch, May 13, 1995.

Standard Operating Procedures (SOP)

Using the above publications as references, the laboratory has several written standard operating procedures that details the steps followed when analyzing samples for lead content. These SOP's were developed and written by staffs who were experienced in performing the analyses themselves. Currently, the laboratory has the following SOPs for lead analyses and copies of them may be found in the laboratory's Standard Operating Procedures Manual:

IW015.3:	Flame Atomic Absorption Spectrophotometry
IW023:	Metals, Digestion of Aqueous Samples and Extracts
IW042.	Trace Metals by Graphite Furnace
IH009:	Leachable Lead Determination
IH003.2:	Lead Digestion for Paint Chips (Microwave)
IH003.3:	Lead Digestion for Soils
IH003.4:	Lead Digestion of Dust Wipes
MT004:	Lead in Food (Ashing)
IH010:	Lead Leaching of Candy Wrappers
IH11	Lead Digestion for Paint Chips(Acid Digestion Method)
IH12	Balance Check Procedure

SI.3. INSTRUMENT PERFORMANCE CHECK AND CALIBRATION

Performance Check Standard

The analysis of a performance check standard is important in establishing an instrument's suitability in performing a particular analysis. It is required in any lead analysis using atomic absorption spectrophotometry techniques. A performance check standard is analyzed immediately after the instrument is powered-up and tuned, but before the instrument is calibrated.

For flame AA analysis, use a 10 mg/L concentration of lead standard as the performance check standard. Analysis of the standard should yield an absorbency unit reading of 0.2.

For graphite furnace AA analysis, use a 20 µg/L of lead standard as the performance check standard. The acceptance criteria of the performance check is ±10% of true value.

Please see SOP IW015.3: Flame Atomic Absorption Spectrophotometry or SOP IW042.1: Trace Metal by Graphite Furnace for detailed instructions on analyzing the performance check standard.

AA Spectrophotometer Calibration Guidelines

A calibration curve must be prepared each day with a minimum of the initial calibration blank (ICB) and three lead standards at different levels of concentrations. The ICB is prepared the same way as any of the standards used except for the addition of lead concentrates. For example, if the standards are prepared in an acidic aqueous solution, the ICB must be an acidic aqueous solution.

The lowest level of the calibration standard used must be at or slightly above the method detection

limit.
The absorbencies of each ICB and standards are determined. The absorbencies versus the concentrations for each standard are plotted. This plot establishes the linear curve for the day of the atomic absorption spectrophotometer used. The manufacturer's instructions in preparing the calibration curve for the particular instrument used is followed.

The criterion for acceptability of the calibration curve is as follows: for each calibration standard analyzed, the concentration returned by the instrument must be within ±20% of the standard's true concentration.

The accuracy of the established curve must be verified by performing an ***independent calibration verification (ICV)***. An ICV is done by the analysis of a reference standard independently prepared from a source other than that of the calibration standards or a quality control check sample. Value determined for the ICV must be within 10% of the true value.

Immediately after the ICV has been determined, the ICB must be re-analyzed. The lead detected in the ICB must not be more than 10% of the regulatory limit or minimum level of concern. This value corresponds to 0.025 parts per million of lead.

A ***continuing calibration blank (CCB)*** and ***continuing calibration verification (CCV)*** must be performed after the analysis of every ten samples. Use the ICB as the CCB and the mid-level calibration standard for the CCV. The lead detected in the ICB must be <0.025 ppm and value obtained for the CCV must be with ±10% of the true value.

Report Limit Verification

The reporting Limit Verification at the minimum reporting limit level must be checked for every batch of sample. The established criteria was ±20% of reporting limit.

SI.4. INTERNAL QUALITY CONTROL PROCEDURES

Lead analysis has specific quality control procedures that override those given in the laboratory's current Quality Assurance Manual revision. They are defined in this section and must be followed every time samples requiring NLLAP certification are analyzed for lead.

Definitions

A ***matrix spike (Spike)*** is used to document the accuracy of a method in a given sample matrix type. It is prepared by spiking an aliquot or a portion of a selected sample with a known concentration of lead. The portion must be spiked before it goes through the work-up and analytical process. The ***Spike*** is analyzed simultaneously with the actual samples of an analytical batch.

A ***matrix spike duplicate (Spike Duplicate)*** is prepared by spiking split samples with identical concentrations of lead. As with the matrix spike, the spiking occurs before sample preparation and analysis. ***Spike duplicates*** are used to document the precision and accuracy of a method in a given

sample matrix type.
In case of wipe samples, ***spike*** and ***spike duplicate*** are prepared using two (2) portions of solid paint or dust to two (2) blank collection media spiked at the same level with known lead concentrations. The solid paint or dust must be Certified Reference Materials (CRM).The spiked samples are then processed and analyzed in the same manner as the actual wipe samples.

Duplicate samples serve the purpose of monitoring the precision of the measurement system. As such, the analytical result must yield a measurable amount for the process to be meaningful. Duplicate samples are analyzed only when there is a strong likelihood that there will be a measurable amount of lead in the sample. This is usually true for paint chip samples. Duplicate samples are prepared by dividing the selected sample into two and analyzing them separately.

Laboratory Control Sample (LCS) is a solid matrix material of known lead concentration or a solid spike of the appropriate matrix.

If a method requires sample pretreatment that is not applied to calibration standards, a ***method blank*** containing all reagents and subject to all preparation steps will be processed along with the samples.

Frequency of Analyses

QC Samples	Frequency	Acceptance Limit
LCS	1 per 20 samples or batch (5%)	within ±20% of true value
Matrix spike	1 per 20 samples or batch (5%)	within ±25% of true value
Duplicate sample or matrix spike duplicate	1 per 20 samples or batch (5%)	within ±25% of true value
Method blank	1 per 20 samples or batch (5%)	absolute value not more than 10% of the regulatory limit or minimum level of concern.

Acceptance Limits

Results obtained each time any of the above quality control samples are analyzed must fall within the acceptance limits listed. Acceptance limits are initially set using the levels defined in table 1 below. These limits are only used when the first twenty (20) quality control samples are analyzed. They are superseded by acceptance limits established based on the statistical evaluation of the data generated by the analysis of quality control samples. Acceptance limits are re-evaluated periodically using the most recent twenty (20) quality control results.

Contamination Control

Wipe samples are taken and analyzed from surfaces in the laboratory where lead analysis is

performed to determine any background levels of lead. This determination must be performed quarterly. At the present time, lead analyses is restricted to the Lead Room located on the first floor of the building. Areas to be sampled include:

analytical balance
areas around the analytical balance
all the work benches
inside of the fume hoods
inside of the microwave oven

The acceptable contamination level per wipe must be below the laboratory's method detection limit of 5µg/L in wipe samples.

Method Detection Limit

Method detection limits for each method and matrix will be verified annually using the procedures defined in EPA-600/4-82-057, Appendix A, PROCEDURE TO DETERMINE METHOD DETECTION LIMIT. The laboratory's method detection limits are below the action levels specified by the State of California and the EPA. These values are summarized in table 2 that follows.

Table 2: MDL and action levels

Material	Units	MDL	Action levels					
			LAC[1]	Cal-DHS	HUD	US-EPA	FDA	Cal-EPA
Paint chips	mg/kg	80	>600	≥5,000	≥5,000	≥5,000		
Paint	mg/kg	5	>600	≥5,000	≥5,000	≥5,000		
Soil	mg/kg	5		≥400[3]/ ≥1000[4]		400-5000[5] >5,000[6] 2000-5000[7] >5,000[8]		≥1,000

[3]interim or abatement in high child contact area
[4]abatement in all areas
[5]interim control in high child contact area
[6]abatement in high child contact area
[7]interim controls in low child contact area
[8]abatement in low child contact areas

Material	Units	MDL	Action levels					
			LAC[1]	Cal-DHS	HUD	US-EPA	FDA	Cal-EPA
Dust wipe	µg/ft²	6.25		≥50[9] ≥250[10]	≥100[11] ≥500[12] ≥800[13]			
Bottled Water	µg/L	5					5	
Water	µg/L	5				15		
Ceramic or potter glazes	mg/L	0.25					≥3[14] >2[15] ≥1[16] ≥0.5[17]	

Evaluation and List of Supplier

After careful evaluation for an extended period of time, the following suppliers of consumables, supplies and service have been documented to provide acceptable qualify of products and services:

VWR
Fisher Scientific
Perkin Elmer
NIST
SPEX
AccuStandard
Matheson Tri-Gas
Aransco
Supelco
Dionex
Restek

[9]dust, floor

[10]dust, horizontal window surfaces

[11]dust, floor (effective 9/15/2000: 40 µg/ft²)

[12]dust, interior window sills (effective 9/15/2000: 250 µg/ft²)

[13]dust, window troughs and exterior surfaces (effective 9/15/2000: no change)

[14]plates, saucers and other flatwares

[15]small hollow-ware such as cereal bowls

[16]large hollow-ware

[17]cups, mugs and pitchers

SI.5. PERFORMANCE AND SYSTEM AUDITS

External Performance and System Audits

The laboratory has been a participant in the external proficiency testing program known as the Environmental Lead Proficiency Analytical Testing (ELPAT) Program, a cooperative effort between the American Industrial Hygiene Association (AIHA) and the National Institute for Occupational Health and Safety under agreement with the EPA, since 1997.

Before the year 2000, the laboratory's participation in the ELPAT studies has been strictly voluntary. It was used as a means to assess the lead analyst/technician proficiency. With the writing of the current QA Manual revision, participation in ELPAT is mandatory since the laboratory is seeking the AIHA Environmental Lead Laboratory Accreditation. Continued and successful participation in ELPAT is a requirement for accreditation by the AIHA.

ELPAT Studies are conducted every quarter. They involve the analysis of four sets of unknown samples including soil, paint chips and dust wipes for lead content. The samples are processed and analyzed by the laboratory in a manner similar to client samples. The laboratory results are evaluated and pass/fail scores are accumulated over a calendar year.

Internal Performance and System Audit

SYSTEM AUDIT

When the annual inspections of the laboratory operation are conducted, the lead testing program is also audited. The QA Checklist (see exhibit 10) includes a section that details areas of the program audited. These include:

- consistent calibration of instruments are performed;
- proper documentation of equipment use;
- complete audit of a randomly chosen data package for determination of consistent analysis and proper documentation of required quality control samples.
- acceptable documentation of standard preparation and labeling; and
- timely maintenance and calibration of equipment such as certified thermometer, analytical balance, etc.
- sample retention and disposal
- hazardous waste disposal procedures.

When the QA coordinator prepares the report on the results of the annual inspection, a separate section is included which documents the findings specific to the lead testing program.

QUALITY ASSURANCE INSPECTIONS

Every quarter, the laboratory's designated QA Officer conducts an audit of randomly selected data packages of samples for lead testing. The packages are audited for completeness in meeting required

analytical quality controls of each analyses performed on the samples and proper documentation of every steps taken in processing the samples. Exhibit 21 is the checklist used by the QA Officer when conducting the audit. It includes a separate section that reports findings specific to the lead testing program.

At the conclusion of the quality assurance inspection, the QA Coordinator prepares a summary report which includes deficiencies found in quality assurance and quality control practices of the lead testing section, and required corrective actions that must be performed including the staff responsible and the date when the corrective actions are expected to be completed.

Summary reports are made available to the staff and laboratory management, and made part of the laboratory's permanent record.

ADDITIONAL AUDIT

Where the identification of non-conformities or departures casts doubts on the laboratory compliance with its own policies and procedures, or on its compliance with International Standard (ISO/IEC 17025:2005), an additional audit shall follow the implementation of the corrective actions to confirm their effectiveness, if a services issue or risk to the business is identified.

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Supplement II: Microbiology Testing

This supplement to the manual is to be used in conjunction with the laboratory's most recent Quality Assurance Manual revision. It is written to address the particular activities associated with microbiological testing that is not applicable to other laboratory operations. Unless specifically discussed in this supplement, the laboratory's Quality Assurance Manual describes the actual operating and quality control programs followed by laboratory personnel in microbiological testing.

SII.1 QA OBJECTIVES

1. Establish the laboratory's ability to perform qualitative and quantitative microbiology testing of drinking water and wastewater by:

-Identifying the qualifications and responsibilities of laboratory personnel (in previous QA Manual).

-Enumerating the existing laboratory instrumentation and equipment used in microbiology testing together with the procedures for their service and maintenance to assure proper operation.

-Providing sources of analytical methods accepted by regulatory agencies for use in the laboratory.

2. Provide guidelines pertaining to sampling protocols, chain-of-custody, and storage of samples to maintain sample integrity prior to analyses.

3. Define the laboratory's calibration procedures and frequency of calibration.

4. Identify all the necessary steps to validate the laboratory's results.

5. Define all the necessary quality control checks that must be followed prior to the analysis and/or in the course of analyzing samples.

6. Identify all laboratory records and information needed to document the quality of analyses performed in the laboratory.

SII.1. SAMPLING PROCEDURES

Containers

Approved container for bacteriological sampling are pre-sterilized Nasco Whirl-Pak bag or 4 oz. sterilized Nalgene or glass bottles. All samples containers must contain two drops of 10% sodium thiosulfate. One sample bottle from each batch of bottles prepared must be checked for sterility by adding Tryptic Soy-Broth for 48 hours and checking for growth.

Collection and Transport

Samples must be representative of the potable water distribution system. Water taps used for sampling are free of aerators, strainers, hose attachments, mixing type faucets and purification devices. Maintain a steady water flow for at least 2 minutes to clear the service line before sampling. Collect at least a 100 ml sample volume, allow at least ½ inch air space to facilitate mixing of sample by shaking. Do not rinse sample container.

Holding/travel time between sampling and analysis is not to exceed 30 hours for potable water samples. If laboratory is required by State regulation to analyze samples after 30 hours and up to 48 hours, the laboratory is to indicate that the data may be invalid because of excessive delay before

sample processing. No samples received after 48 hours are to be analyzed. Sample collectors who deliver samples directly to the laboratory should ice samples immediately after sample collection. All samples received in the laboratory are to be analyzed on the day of receipt.

Waste and surface water sample holding time is not to exceed 6 hours.

Labeling and Identification

Immediately after collection, the sample bottle must be labeled and the sample analysis request and report form filled out for each sample.

1. **Sample Labels** are used for the specific identification of samples collected. Gummed paper labels affixed to the containers are adequate, but it should not be affixed to the sample lids. The labels should be filled out at the time of collection and should include the following information: 1) sampling site; 2) name of collector; and 3) date and time of collection.

2. **Sample Analysis Request and Report Form** (Exhibit 11) accompanies the sample when it is delivered to the laboratory. The collector should complete the field portion of this form by providing information on sample site location, sample type, purpose of the sample, date and time of collection, free chlorine residual, collector's initial, and any remains.

Upon receipt of the sample the laboratory will log in the sample and at the minimum, the following information will be stored and maintained:

1. Date of collection, receipt, and analysis
2. Time of collection, receipt, and analysis
3. Receiving personnel initials
4. Client and/or system name
5. Sample site location and/or description
6. Purpose of the sample
7. Assigned individual laboratory identification number
8. Name of the analyst
9. Analysis requested
10. Results of analysis
11. Remarks on the sample (if any)

SII.3. EQUIPMENT TEMPERATURE AND USE RECORD

Incubator Temperature

The total coliform incubator are maintained at 35 ± 0.5°C and have a thermometer graduated in at least 0.5°C increments. A daily log of the temperatures read to 0.1°C are kept together with the date the entry was made and the initial of the person making the entry (Exhibit 12).

Water Bath Temperature (For Fecal Coliform)

Similarly, the fecal coliform water bath are maintained at 44.5 ± 0.2°C and have a thermometer

graduated in at least 0.2°C increments. A log of the temperatures when the water bath is in use read to 0.1°C are kept together with the date the entry is made and the initials of the person making the entry (Exhibit 13).

Sterilizing Oven Temperature

A thermometer immersed in a sand bath is kept inside the sterilizing over to monitor the temperature. Records of all items being sterilized, total sterilization time, and temperatures are kept (Exhibit 14).

Autoclave

An autoclave/sterilization log is maintained. The log includes: date, time in, time out, total elapsed time, sterilization time, items sterilized, sterility controls, maximum temperature reached and any maintenance performed (Exhibit 15).

Certified Thermometer

All thermometers used in laboratory are cross checked against a certified thermometer annually. Records of calibrations and corrections are maintained (Exhibit 16).

SII.4. LABORATORY WATER QUALITY MONITORING

Bottled water is purchased from an outside source with an accompanying certificate of suitability. This is the water used to prepare the media. the parameters in the certificate include:

PARAMETER	LIMITS	FREQUENCY
Conductivity	>0.5 megohms resistance or <2 micromhos/cm at 25°C	Monthly
Pb, Cd, Cr, Cu, Ni, and Zn	Not greater than 0.05 mg/l per contaminant. Collectively, no greater than 0.1 mg/l	Annually
Total Chlorine Residual	Nondetectable	Monthly
Heterotrophic	<500/ml	Monthly
Quality of Reagent	Ratio 0.8 - 3.0	Annually

Copies of the certificates of suitability are kept and maintained on file.

SII.V. MEDIA PREPARATION

A media preparation is completed for each batch of media prepared (Exhibit 17). The information included in the form are listed below. All completed media preparation forms are kept in a binder

for easy reference.

1. Data of preparation
2. Preparer's initial
3. Media prepared
4. Weight of dehydrated media taken
5. pH of autoclave media
6. Test of media with positive/negative cultures
7. Sterility check

SII.VI. ANALYTICAL PROCEDURES

Methods

The methods followed by the laboratory taken from Standard methods for the Examination of Water and Wastewater, 18th Edition, 1992 are:

Total Coliform by Multi-Tube Fermentation (MPN)	Method 9221B
Fecal Coliform by MPN	Method 9221E
Total Coliform by Membrane filter (MF)	Method 9222B
Fecal Coliform by MF	Method 9222D

The outline forms of the above methods may be found in the laboratory's Standard Operating Procedures Manual.

Quality Control

1. For each bottle of media positive, negative, and sterile checks will be performed and a log of the check results will be maintained (Exhibit 18).

2. Positive and sterile checks will be performed for every batch of prepared media and a log of the check results will be maintained (Exhibit 19).

3. Positive and negative controls are ran with each analytical batch for EC test.

4. For each analytical batch tested by membrane filtration technique, a sterile control is ran at the beginning and end of the sample run, and a positive control is ran after the last sample.

5. For each lot of membrane filters, sterile and positive checks are ran.

6. The completed test must be done every three months or every positive confirmed potable water sample, which ever applies. a log of all positive potable confirmed samples is maintained.

SII.VII. PERFORMANCE AND SYSTEM AUDITS

External Performance and System Audits

See discussion in QA Manual Section XI.

Internal Performance and System Audits

SYSTEM AUDIT

When the annual inspections of the laboratory operation are conducted, the microbiology testing program is also audited. A QA Checklist (see exhibit 10) includes a section that details areas of the program audited. These include:

-consistent calibration of instruments are performed;
-proper documentation of equipment use;
-proper documentation of equipment operating conditions such as refrigerator temperatures;
-consistent performance and proper documentation of required quality assurance activities such as sterility checks of containers used for microbiology, timely disposal of used media, etc.
-acceptable documentation of standard preparation and labeling; and
- timely maintenance and calibration of equipment such as certified thermometer, analytical balance, etc.
-consistent calibration of instruments are performed;
-proper documentation of equipment use;
-acceptable documentation of standard preparation and labeling; and
- timely maintenance and calibration of equipment such as certified thermometer, analytical balance, etc.
- sample retention and disposal
- hazardous waste disposal procedures.

When the QA coordinator prepares the report on the results of the annual inspection, a separate section is included which documents the findings specific to the microbiology testing program.

QUALITY ASSURANCE INSPECTIONS

Every quarter, the laboratory's designated QA Officer conducts an audit of randomly selected data packages of samples for microbiology testing. The packages are audited for completeness in meeting required analytical quality controls of each analyses performed on the samples and proper documentation of every steps taken in processing the samples. Exhibit 21 is the checklist used by the QA Officer when conducting the audit. It includes a separate section that reports findings specific to the microbiology testing program.

At the conclusion of the quality assurance inspection, the QA Coordinator prepares a summary report which includes deficiencies found in quality assurance and quality control practices of the

microbiology testing section, and required corrective actions that must be performed including the staff responsible and the date when the corrective actions are expected to be completed.

Summary reports are made available to the staff and laboratory management, and made part of the laboratory's permanent record.

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EXHIBIT A.2

To characterize the runoff quality in Los Angeles County, mass emission sites have been selected for monitoring. To evaluate the runoff quality of various subwatersheds, tributary sites were established in the Los Angeles River watershed.

2.1 MASS EMISSION SITE SELECTION

The LACDPW monitored at seven mass emission stations, Ballona Creek, Malibu Creek, Los Angeles River, Coyote Creek, San Gabriel River, Dominguez Channel, and Santa Clara River. Four of the mass emission monitoring stations installed under the original 1990 Permit were retained under the 1996 and the 2001 Municipal Storm Water Permit; specifically Ballona Creek, Malibu Creek, Los Angeles River, and San Gabriel River. The Coyote Creek monitoring station was monitored under the 1990, 1996, and 2001 Municipal Storm Water Permit, though monitoring was not required under the 1996 Municipal Storm Water Permit. Monitoring began at Dominguez Channel mass emission station during the 2001-2002 season. Sampling at the Santa Clara mass emission station began during the 2002-2003 season. The seven mass emission monitoring stations were used to collect water quality data from 2060 square miles.

2.2 MASS EMISSION MONITORING LOCATIONS AND DRAINAGE AREAS

Figure 2-1 is an overview of the study area with all mass emission monitoring sites shown. Table 2-1 also indicates the dominant land use associated with each monitoring site and the total drainage area.

Provided below is a description of the seven mass emission stations, Ballona Creek, Malibu Creek, Los Angeles River, San Gabriel River, Coyote Creek, Dominguez Channel, and Santa Clara River, required by the Municipal Storm Water Permit for the 2005-2006 monitoring period. Figures 2-2 through 2-8 show the location of each monitoring station along with a description of its land use.

Ballona Creek Monitoring Station (S01)

The Ballona Creek monitoring station is located at the existing stream gage station (Stream Gage No. F38C-R) between Sawtelle Boulevard and Sepulveda Boulevard in the City of Los Angeles. At this location, which was chosen to avoid tidal influences, the upstream tributary watershed of Ballona Creek is 88.8 square miles. The entire Ballona Creek Watershed is 127.1 square miles. At the gauging station, Ballona Creek is a concrete lined trapezoidal channel.

Malibu Creek Monitoring Station (S02)

The Malibu Creek monitoring station is located at the existing stream gage station (Stream Gage No. F130-9-R) near Malibu Canyon Road, south of Piuma Road. At this location, the tributary watershed to Malibu Creek is 104.9 square miles. The entire Malibu Creek Watershed is 109.9 square miles.

Los Angeles River Monitoring Station (S10)

The Los Angeles River Monitoring Station is located at the existing stream gage station (Stream Gage No. F319-R) between Willow Street and Wardlow Road in the City of Long Beach. At

this location, which was chosen to avoid tidal influences, the total upstream tributary drainage area for the Los Angeles River is 825 square miles. This river is the largest watershed outlet to the Pacific Ocean in Los Angeles County. At the site, the river is a concrete lined trapezoidal channel.

Coyote Creek Monitoring Station (S13)

The Coyote Creek Monitoring Station is located at the existing ACOE stream gage station (Stream Gage No. F354-R) below Spring Street in the lower San Gabriel River watershed. The site assists in determining mass loading for the San Gabriel River watershed. At this location, the upstream tributary area is 150 square miles (extending into Orange County). The sampling site was chosen to avoid backwater effects from the San Gabriel River. Coyote Creek, at the gauging station, is a concrete lined trapezoidal channel. The Coyote Creek sampling location has been an active stream gauging station since 1963.

San Gabriel River Monitoring Station (S14)

The San Gabriel River Monitoring Station is located at an historic stream gage station (Stream Gage No. F263C-R), below San Gabriel River Parkway in Pico Rivera. At this location the upstream tributary area is 450 square miles. The San Gabriel River, at the gauging station, is a grouted rock-concrete stabilizer along the western levee and a natural section on the eastern side. Flow measurement and water sampling are conducted in the grouted rock area along the western levee of the river. The length of the concrete stabilizer is nearly 70 feet. The San Gabriel River sampling location has been an active stream gauging station since 1968.

Dominguez Channel Monitoring Station (S28)

The Dominguez Channel Monitoring Station is located at Dominguez Channel and Artesia Boulevard in the City of Torrance. At this location, which was chosen to avoid tidal influence, the upstream tributary area is 33 square miles. The portion of the river where the monitoring site is located is a concrete-lined rectangular channel.

Santa Clara River Monitoring Station (S29)

The Santa Clara monitoring station is located at the Santa Clara River and The Old Road in Santa Clara. The Santa Clara River has a soft bottom for the most part, which makes flow monitoring extremely difficult. This location was chosen because flow monitoring was possible from the existing USGS 11108000 Santa Clara River near Saugus California stream gauging station. The upstream tributary area is 411 square miles.

2.3 TRIBUTARY SITE SELECTION

All six of the tributary monitoring stations, Centinela Creek, Sepulveda Channel, Benedict Canyon, Adams Drain, Fairfax Drain, and Cochran, were established in accord with the 2001 Municipal Storm Water Permit. Monitoring began during the 2004-2005 season. The six tributary monitoring stations were used to collect water quality data from subwatersheds in the Ballona Creek WMA.

2.4 TRIBUTARY MONITORING LOCATIONS AND DRAINAGE AREAS

Figure 2-9 is an overview of the study area showing all the tributary monitoring sites.

Provided below is a description of the six tributary monitoring stations required by the Municipal Storm Water Permit for the 2005-2006 monitoring period. From the furthest downstream to the furthest upstream, these stations were identified as Centinela Creek, Sepulveda Channel, Benedict Canyon, Adams Drain, Fairfax Drain, and Cochran. Figures 2-10 through 2-15 show the location of each monitoring station. Two of these monitoring sites (Centinela Creek and Sepulveda Channel) were located on tributaries downstream of the long-term Ballona Creek mass emission station.

Centinela Creek (TS07)
The Centinela Creek tributary monitoring site is located on Centinela Creek near the intersection of Centinela Boulevard. and Highway 90. The confluence with Ballona Creek is downstream of the mass emission station. The upstream tributary watershed area of Centinela Creek is approximately 9.83 square miles.

Sepulveda Channel (TS08)
The Sepulveda Channel tributary monitoring site is located on the Sepulveda Channel at Culver Boulevard. The confluence of Sepulveda Channel with Ballona Creek is downstream of the mass emission station. The upstream tributary watershed area of Sepulveda Channel is approximately 23.11 square miles.

Benedict Canyon (TS09)
The Benedict Canyon tributary monitoring site is located in Culver City where Duquesne Avenue crosses Ballona Creek. The tributary monitoring site is designed to monitor flow from Benedict Canyon channel. The upstream tributary watershed area of Benedict Canyon is approximately 11.59 square miles.

Adams Drain (TS10)
Adams Drain is located in the northern portions of Culver City near the intersection of La Cienega Boulevard and Ballona Creek. The upstream tributary watershed area of Adams Drain is approximately 2.11 square miles.

Fairfax Drain (TS11)
The Fairfax Drain tributary monitoring site is located in the City of Los Angeles where Fairfax Avenue crosses Ballona Creek. The upstream tributary watershed area of Fairfax Drain is approximately 1.20 square miles.

Cochran Drain(TS12)
The Cochran tributary monitoring site is located in the Mid-City Community of Los Angeles near the upstream extent of Ballona Creek at Cochran Avenue. The upstream tributary watershed area of Benedict Canyon is approximately 24.76 square miles.

APPENDIX B

Table B.1: Santa Clara River Reach 6 chlorpyrifos data (data obtained from LADPW)
(Corresponding metadata available on provided sheets)

SITE ID	DATE SAMPLED	WATERBODY	ANALYTE	SIGN*	VALUE	UNIT	DETECTION LIMIT	EPA test method
S29	10/10/02	Santa Clara River Reach 6	Chlorpyrifos	<	0.05	µg/L	0.05	507
S29	11/08/02	Santa Clara River Reach 6	Chlorpyrifos	<	0.05	µg/L	0.05	507
S29	12/16/02	Santa Clara River Reach 6	Chlorpyrifos	<	0.05	µg/L	0.05	507
S29	02/11/03	Santa Clara River Reach 6	Chlorpyrifos	<	0.05	µg/L	0.05	507
S29	03/15/03	Santa Clara River Reach 6	Chlorpyrifos	<	0.05	µg/L	0.05	507
S29	04/30/03	Santa Clara River Reach 6	Chlorpyrifos	<	0.05	µg/L	0.05	507
S29	10/28/03	Santa Clara River Reach 6	Chlorpyrifos	<	0.05	µg/L	0.05	507
S29	10/31/03	Santa Clara River Reach 6	Chlorpyrifos	<	0.05	µg/L	0.05	507
S29	12/25/03	Santa Clara River Reach 6	Chlorpyrifos	<	0.05	µg/L	0.05	507
S29	01/01/04	Santa Clara River Reach 6	Chlorpyrifos	<	0.05	µg/L	0.05	507
S29	01/13/04	Santa Clara River Reach 6	Chlorpyrifos	<	0.05	µg/L	0.05	507
S29	10/17/04	Santa Clara River Reach 6	Chlorpyrifos	<	0.05	µg/L	0.05	507
S29	10/26/04	Santa Clara River Reach 6	Chlorpyrifos	<	0.05	µg/L	0.05	507
S29	11/16/04	Santa Clara River Reach 6	Chlorpyrifos	<	0.05	µg/L	0.05	507
S29	01/17/05	Santa Clara River Reach 6	Chlorpyrifos	<	0.05	µg/L	0.05	507
S29	03/09/05	Santa Clara River Reach 6	Chlorpyrifos	<	0.05	µg/L	0.05	507
S29	10/17/05	Santa Clara River Reach 6	Chlorpyrifos	<	0.05	µg/L	0.05	507
S29	11/29/05	Santa Clara River Reach 6	Chlorpyrifos	<	0.05	µg/L	0.05	507
S29	12/31/05	Santa Clara River Reach 6	Chlorpyrifos	<	0.05	µg/L	0.05	507
S29	01/14/06	Santa Clara River Reach 6	Chlorpyrifos	<	0.05	µg/L	0.05	507
S29	02/17/06	Santa Clara River Reach 6	Chlorpyrifos	<	0.05	µg/L	0.05	507
S29	04/25/06	Santa Clara River Reach 6	Chlorpyrifos	<	0.05	µg/L	0.05	507

0 exceedances in 22 samples

Notes:

* "SIGN" reads "<" for non-detect values.

EXHIBIT B.1

WEATHER CONDITION					Wet				Dry	
STATION NO.					S29	S29	S29	S29	S29	S29
STATION NAME					Santa Clara River	Santa Clara River	Santa Clara River	Santa Clara River	Santa Clara River	Santa Clara River
EVENT NO.					0203-01	0203-02	0203-03	0203-05	0203-01	0203-02
DATE					11/08/2002	12/16/2002	02/11/2003	03/15/2003	10/10/2002	04/30/2003
	Sample Type	EPA Method	PQL	Units						
Conventional										
Oil and Grease	Grab	EPA413.1	1	mg/L	0	3.1	0	1.7	0	0
Total Phenols	Grab	EPA420.1	0.1	mg/L	0	0	0	0	0	0
Cyanide	Grab	EPA335.2	0.01	mg/L	[illegible]	0	[illegible]	0	0	0
pH	Comp	SM4500H B	0-14		7.51	7.18	7.86	6.74	[illegible]	8.24
Dissolved Oxygen	Grab	SM4500O G	1	mg/L	5.74	[illegible]	8.44	9.39	8.5	8.02
Indicator Bacteria										
Total Coliform	Grab	SM9230B	20	MPN/100ml	[illegible]	[illegible]	[illegible]	[illegible]	8000	500
Fecal Coliform	Grab	SM9230B	20	MPN/100ml	[illegible]	[illegible]	[illegible]	170000	[illegible]	170
Ratio Fecal Coliform/Total Coliform					[illegible]	[illegible]	0.038	[illegible]	[illegible]	0.34
Fecal Streptococcus	Grab	SM9230B	20	MPN/100ml	170000	240000	50000	170000	300	230
Fecal Enterococcus	Grab	SM9230B		MPN/100ml	[illegible]	[illegible]	[illegible]	[illegible]	0	[illegible]
General										
Chloride	Comp	EPA300.0	2	mg/L	33.8	13	39.8	2.58	[illegible]	[illegible]
Fluoride	Comp	EPA300.0	0.1	mg/L	0.21	0.13	0.26	0	0.46	0.5
Nitrate	Comp	EPA300.0	0.1	mg/L	4.91	2.73	4.85	2.31	5.7	5.6
Sulfate	Comp	EPA300.0	0.1	mg/L	50.3	26.9	51.6	2.89	208	153
Alkalinity	Comp	EPA310.1	4	mg/L	75	59	49.5	11	122	292
Hardness	Comp	EPA130.2	2	mg/L	122	99.2	131	15.2	330	410
COD	SI	EPA410.4	10	mg/L	71.6	28.5	45	20	62.6	60.3
TPH	Grab	EPA418.1	1	mg/L	0	1.3	0	1.2	0	0
Specific Conductance	Comp	EPA120.1	1	umhos/cm	410	255	427	47.6	1420	1388
Total Dissolved Solids	Comp	EPA160.1	2	mg/L	268	214	278	28	942	838
Turbidity	Comp	EPA180.1	0.1	NTU	32.9	107	[illegible]	39.4	0.23	1.38
Total Suspended Solids	Comp	EPA160.2	2	mg/L	712	53	588	80	8	11
Volatile Suspended Solids	Comp	EPA160.4	1	mg/L	76	3	4.1	1.3	3	7
MBAS	Comp	EPA425.1	0.05	mg/L	0.174	0	0	0	0	0
Total Organic Carbon	Comp	EPA415.1	1	mg/L	25.5	7.52	11.2	3.96	4.58	3.69
BOD	Comp	SM5210B	2	mg/L	55.56	6.3	21.1	5	2.91	27.1
Nutrients										
Dissolved Phosphorus	Comp	EPA365.3	0.05	mg/L	0.379	0.311	0.159	0.29	0.071	0.183
Total Phosphorus	Comp	EPA365.3	0.05	mg/L	0.438	0.351	0.359	0.29	0.097	0.208
NH3-N	Comp	EPA350.3	0.1	mg/L	1.09	0.338	0	0	0	0
Nitrate-N	Comp	SM4110B	0.5	mg/L	1.11	0.616	1.05	0.5216	1.29	1.26
Nitrite-N	Comp	SM4110B	0.03	mg/L	0.867	0	0.26	0	0	0
Kjeldahl-N	Comp	EPA351.4	0.1	mg/L	2.62	0.662	2.56	1.02	0.484	0.35
Metals										
Dissolved Aluminum	Comp	EPA200.8	100	ug/l	0	131	130	0	0	0
Total Aluminum	Comp	EPA200.8	100	ug/l	[illegible]	[illegible]	131	348	0	0
Dissolved Antimony	Comp	EPA200.8	5	ug/l	1.03	0.73	0.99	0.93	0	0
Total Antimony	Comp	EPA200.8	5	ug/l	2.01	0.76	0.99	1.11	0	0
Dissolved Arsenic	Comp	EPA200.8	5	ug/l	0	2.28	1.38	0	1.42	0
Total Arsenic	Comp	EPA200.8	5	ug/l	2.72	4.16	1.65	1.04	1.42	0
Dissolved Beryllium	Comp	EPA200.8	1	ug/l	0	0	0	0	0	0
Total Beryllium	Comp	EPA200.8	1	ug/l	0	0	0	0	0	0
Dissolved Cadmium	Comp	EPA200.8	1	ug/l	0	0	0	0	0	0
Total Cadmium	Comp	EPA200.8	1	ug/l	0.6	0.25	0	0	0	0
Dissolved Chromium	Comp	EPA200.8	5	ug/l	0.61	0.97	3.39	2.2	3.33	0
Total Chromium	Comp	EPA200.8	5	ug/l	9.35	12.8	3.45	9.32	11.6	1.97
Dissolved Chromium +6	Comp	EPA200.8	10	ug/l	0	0	0	0	0	0
Total Chromium +6	Comp	EPA200.8	10	ug/l	0	0	0	0	0	0
Dissolved Copper	Comp	EPA200.8	5	ug/l	6.39	3.75	6.31	[illegible]	3.5	2.55
Total Copper	Comp	EPA200.8	5	ug/l	[illegible]	9.58	9.43	[illegible]	6.96	7.38

WEATHER CONDITION					Wet				Dry	
STATION NO.					S29	S29	S29	S29	S29	S29
STATION NAME					Santa Clara River	Santa Clara River	Santa Clara River	Santa Clara River	Santa Clara River	Santa Clara River
EVENT NO.					0203-01	0203-02	0203-03	0203-05	0203-01	0203-02
DATE					11/08/2002	12/16/2002	02/11/2003	03/15/2003	10/10/2002	04/30/2003
	Sample Type	EPA Method	POL	Units						
Dissolved Iron	Comp	EPA200.8	100	ug/l	0	434	193	460	0	0
Total Iron	Comp	EPA200.8	100	ug/l	3010	1910	399	742	172	191
Dissolved Lead	Comp	EPA200.8	5	ug/l	0	2.3	0.99	0	0	0
Total Lead	Comp	EPA200.8	5	ug/l	[redacted]	4.12	1.14	2.8	0.6	0.53
Dissolved Mercury	Comp	EPA200.8	1	ug/l	0	0	0	0	0	0
Total Mercury	Comp	EPA200.8	1	ug/l	0	0	0	0	0	0
Dissolved Nickel	Comp	EPA200.8	5	ug/l	7.68	2.67	6.03	2.39	12.7	12.5
Total Nickel	Comp	EPA200.8	5	ug/l	13.2	16.1	7	5.26	[redacted]	13.8
Dissolved Selenium	Comp	EPA200.8	5	ug/l	1.14	0	0	0	2.43	0
Total Selenium	Comp	EPA200.8	5	ug/l	1.29	0	0	0	2.43	0
Dissolved Silver	Comp	EPA200.8	1	ug/l	0	0	0	0	0	0
Total Silver	Comp	EPA200.8	1	ug/l	0	0	0	0	0	0
Dissolved Thallium	Comp	EPA200.8	5	ug/l	0	0	0	0	0	0
Total Thallium	Comp	EPA200.8	5	ug/l	0	0	0	0	0	0
Dissolved Zinc	Comp	EPA200.8	50	ug/l	31.6	37	33	27	7.64	41
Total Zinc	Comp	EPA200.8	50	ug/l	[redacted]	45	42	61	7.64	72
Semi-Volatiles Organics (EPA 625)										
2- Chlorophenol	Comp	EPA625	2	ug/l	0	0	0	0	0	0
2,4-dichlorophenol	Comp	EPA625	2	ug/l	0	0	0	0	0	0
2,4-dimethylphenol	Comp	EPA625	2	ug/l	0	0	0	0	0	0
2,4-dinitrophenol	Comp	EPA625	3	ug/l	0	0	0	0	0	0
2-nitrophenol	Comp	EPA625	3	ug/l	3.7	0	0	0	0	0
4-nitrophenol	Comp	EPA625	3	ug/l	0	0	0	0	0	0
4-chloro_3_methylphenol	Comp	EPA625	3	ug/l	0	0	0	0	0	0
Pentachlorophenol	Comp	EPA625	2	ug/l	0	0	0	0	0	0
Phenol	Comp	EPA625	1	ug/l	0	0	0	0	0	0
2,4,6-trichlorophenol	Comp	EPA625	1	ug/l	0	0	0	0	0	0
Base/Neutral										
Acenaphthene	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
Acenaphthylene	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
Anthracene	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
Benzidine	Comp	EPA625	3	ug/l	0	0	0	0	0	0
1,2 Benzanthracene	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
Benzo(a)pyrene	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
Benzo(k)fluoranthene	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
Bis(2-Chloroethoxy) methane	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
Bis(2-Chloroisopropyl) ether	Comp	EPA625	1	ug/l	0	0	0	0	0	0
Bis(2-Chloroethyl) ether	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
Bis(2-Ethylhexl) phthalate	Comp	EPA625	1	ug/l	0	0	0	0	0	0
4-Bromophenyl phenyl ether	Comp	EPA625	1	ug/l	0	0	0	0	0	0
Butyl benzyl phthalate	Comp	EPA625	0.3	ug/l	13.4	0	0	0	0	0
2-Chloronaphthalene	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
4-Chlorophenyl phenyl ether	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
Chrysene	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
Dibenzo(a,h)anthracene	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
1,3-Dichlorobenzene	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
1,4-Dichlorobenzene	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
1,2-Dichlorobenzene	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
3,3-Dichlorobenzidine	Comp	EPA625	3	ug/l	0	0	0	0	0	0
Diethyl phthalate	Comp	EPA625	0.5	ug/l	3.1	0	0	0	0	0
Dimethyl phthalate	Comp	EPA625	0.5	ug/l	0	0	0	0	0	0
di-n-Butyl phthalate	Comp	EPA625	1	ug/l	17.6	0	0	0	0	0

WEATHER CONDITION					Wet				Dry	
STATION NO.					S20	S20	S29	S29	S20	S29
STATION NAME					Santa Clara River	Santa Clara River	Santa Clara River	Santa Clara River	Santa Clara River	Santa Clara River
EVENT NO.					0203-01	0203-02	0203-03	0203-05	0203-01	0203-02
DATE					11/08/2002	12/16/2002	02/11/2003	03/15/2003	10/10/2002	04/30/2003
	Sample Type	EPA Method	POL	Units						
2,4-Dinitrotoluene	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
2,6-Dinitrotoluene	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
4,6 Dinitro-2-methylphenol	Comp	EPA625	3	ug/l	0	0	0	0	0	0
1,2-Diphenylhydrazine	Comp	EPA625	3	ug/l	0	0	0	0	0	0
di-n-Octyl phthalate	Comp	EPA625	1	ug/l	0	0	0	0	0	0
Fluoranthene	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
Fluorene	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
Hexachlorobenzene	Comp	EPA625	0.5	ug/l	0	0	0	0	0	0
Hexachlorobutadiene	Comp	EPA625	1	ug/l	0	0	0	0	0	0
Hexachloro-cyclopentadiene	Comp	EPA625	3	ug/l	0	0	0	0	0	0
Hexachloroethane	Comp	EPA625	1	ug/l	0	0	0	0	0	0
Indeno(1,2,3-cd)pyrene	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
Isophorone	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
Naphthalene	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
Nitrobenzene	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
N-Nitroso-dimethyl amine	Comp	EPA625	0.3	ug/l	0	0	0	0	0	0
N-Nitroso-diphenyl amine	Comp	EPA625	0.3	ug/l	0	0	0	0	0	0
N-Nitroso-di-n-propyl amine	Comp	EPA625	0.3	ug/l	0	0	0	0	0	0
Phenanthrene	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
Pyrene	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
1,2,4-Trichlorobenzene	Comp	EPA625	0.5	ug/l	0	0	0	0	0	0
Chlorinated Pesticides										
Aldrin	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
alpha-BHC	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
beta-BHC	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
delta-BHC	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
gamma-BHC (lindane)	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
alpha-chlordane	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
gamma-chlordane	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
4,4'-DDD	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
4,4'-DDE	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
4,4'-DDT	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
Dieldrin	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
alpha-Endosulfan	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
beta-Endosulfan	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
Endosulfan sulfate	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
Endrin	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
Endrin aldehyde	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
Heptachlor	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
Heptachlor Epoxide	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
Toxaphene	Comp	EPA625	1	ug/l	0	0	0	0	0	0
Polychlorinated Biphenyls										
Aroclor-1016	Comp	EPA608	0.5	ug/l	0	0	0	0	0	0
Aroclor-1221	Comp	EPA608	0.5	ug/l	0	0	0	0	0	0
Aroclor-1232	Comp	EPA608	0.5	ug/l	0	0	0	0	0	0
Aroclor-1242	Comp	EPA608	0.5	ug/l	0	0	0	0	0	0
Aroclor-1248	Comp	EPA608	0.5	ug/l	0	0	0	0	0	0
Aroclor-1254	Comp	EPA608	0.5	ug/l	0	0	0	0	0	0
Aroclor-1260	Comp	EPA608	0.5	ug/l	0	0	0	0	0	0
Organophosphate Pesticides										
Chlorpyrifos	Comp	EPA507	0.05	ug/l	0	0	0	0	0	0
Diazinon	Comp	EPA507	0.01	ug/l	[illegible]	0	[illegible]	0.05	0	0.023

WEATHER CONDITION					Wet				Dry	
STATION NO.					S29	S29	S29	S29	S29	S29
STATION NAME					Santa Clara River	Santa Clara River	Santa Clara River	Santa Clara River	Santa Clara River	Santa Clara River
EVENT NO.					0203-01	0203-02	0203-03	0203-05	0203-01	0203-02
DATE					11/08/2002	12/16/2002	02/11/2003	03/15/2003	10/10/2002	04/30/2003
	Sample Type	EPA Method	PQL	Units						
Prometryn	Comp	EPA507	2	ug/l	0	0	0	0	0	0
Atrazine	Comp	EPA507	2	ug/l	0	0	0	0	0	0
Simazine	Comp	EPA507	2	ug/l	0	0	0	0	0	0
Cyanazine	Comp	EPA507	2	ug/l	0	0	0	0	0	0
Malathion	Comp	EPA507	2	ug/l	0	0	0	0	0	0
Herbicides										
Glyphosate	Comp	EPA547	25	ug/l	0	0	0	0	0	0
2,4-D	Comp	EPA515.3	10	ug/l	0	0	0	0	0	0
2,4,5-TP-SILVEX	Comp	EPA515.3	1	ug/l	0	0	0	0	0	0

Note:
1) blank cell indicates sample was not analyzed
2) 0 indicates concentration below minimum detection leve
3) PQL = minimum level
4) Highlighted cells show exceedances

WEATHER CONDITION					Wet				Dry	
STATION NO.					S29	S29	S29	S29	S29	S29
STATION NAME					Santa Clara River	Santa Clara River	Santa Clara River	Santa Clara River	Santa Clara River	Santa Clara River
EVENT NO.					0506-01	0506-02	0506-03	0506-03	0506-01	0506-02
DATE					10/17/2005	12/31/2005	01/14/2006	02/17/2006	11/29/2005	04/25/2006
	Sample Type	EPA Method	PQL	Units						
Base/Neutral										
Acenaphthene	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0
Acenaphthylene	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0
Anthracene	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0
Benzidine	Comp	EPA625	3.00	ug/L	0	0	0	0	0	0
1,2 Benzanthracene	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0
Benzo(a)pyrene	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0
Benzo(g,h,i)perylene	Comp	EPA625	1.00	ug/L	0	0	0	0	0	0
3,4 Benzofluoranthene	Comp	EPA625	2.00	ug/L	0	0	0	0	0	0
Benzo(k)fluoranthene	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0
Bis(2-Chloroethoxy)methane	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0
Bis(2-Chloroisopropyl)ether	Comp	EPA625	1.00	ug/L	0	0	0	0	0	0
Bis(2-Chloroethyl)ether	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0
Bis(2-Ethylhexl)phthalate	Comp	EPA625	1.00	ug/L	0	0	0	0	0	0
4-Bromophenyl phenyl ether	Comp	EPA625	1.00	ug/L	0	0	0	0	0	0
Butyl benzyl phthalate	Comp	EPA625	0.30	ug/L	0	0	0	0	0	0
2-Chloroethyl vinyl ether	Grab	EPA624	2.50	ug/L	0	0	0	0	0	0
2-Chloronaphthalene	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0
4-Chlorophenyl phenyl ether	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0
Chrysene	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0
Dibenzo(a,h)anthracene	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0
1,3-Dichlorobenzene	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0
1,4-Dichlorobenzene	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0
1,2-Dichlorobenzene	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0
3,3-Dichlorobenzidine	Comp	EPA625	3.00	ug/L	0	0	0	0	0	0
Diethyl phthalate	Comp	EPA625	0.50	ug/L	0	0	0	0	0	0
Dimethyl phthalate	Comp	EPA625	0.50	ug/L	0	0	0	0	0	0
di-n-Butyl phthalate	Comp	EPA625	1.00	ug/L	0	0	0	0	0	0
2,4-Dinitrotoluene	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0
2,6-Dinitrotoluene	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0
4,6 Dinitro-2-methylphenol	Comp	EPA625	3.00	ug/L	0	0	0	0	0	0
1,2-Diphenylhydrazine	Comp	EPA625	3.00	ug/L	0	0	0	0	0	0
di-n-Octyl phthalate	Comp	EPA625	1.00	ug/L	0	0	0	0	0	0
Fluoranthene	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0
Fluorene	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0
Hexachlorobenzene	Comp	EPA625	0.50	ug/L	0	0	0	0	0	0
Hexachlorobutadiene	Comp	EPA625	1.00	ug/L	0	0	0	0	0	0
Hexachloro-cyclopentadiene	Comp	EPA625	3.00	ug/L	0	0	0	0	0	0
Hexachloroethane	Comp	EPA625	1.00	ug/L	0	0	0	0	0	0
Indeno (1,2,3-cd)pyrene	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0
Isophorone	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0
Naphthalene	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0
Nitrobenzene	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0
N-Nitroso-dimethyl amine	Comp	EPA625	0.30	ug/L	0	0	0	0	0	0
N-Nitroso-diphenyl amine	Comp	EPA625	0.30	ug/L	0	0	0	0	0	0
N-Nitroso-di-n-propyl amine	Comp	EPA625	0.30	ug/L	0	0	0	0	0	0
Phenanthrene	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0
Pyrene	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0
1,2,4-Trichlorobenzene	Comp	EPA625	0.50	ug/L	0	0	0	0	0	0
Chlorinated Pesticides										
Aldrin	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0
alpha-BHC	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0
beta-BHC	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0
delta-BHC	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0
Gamma-BHC (Lindane)	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0
alpha-chlordane	Comp	EPA625	0.05	ug/L						
gamma-chlordane	Comp	EPA625	0.05	ug/L						
Chlordane	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0
4,4'-DDD	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0
4,4'-DDE	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0
4,4'-DDT	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0
Dieldrin	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0
Endosulfan I [alpha]	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0
Endosulfan II [beta]	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0
Endosulfan sulfate	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0
Endrin	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0
Endrin aldehyde	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0
Heptachlor	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0
Heptachlor Epoxide	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0
Toxaphene	Comp	EPA625	1.00	ug/L	0	0	0	0	0	0
Polychlorinated Biphenyls										
Aroclor-1016	Comp	EPA608	0.50	ug/L	0	0	0	0	0	0
Aroclor-1221	Comp	EPA608	0.50	ug/L	0	0	0	0	0	0
Aroclor-1232	Comp	EPA608	0.50	ug/L	0	0	0	0	0	0
Aroclor-1242	Comp	EPA608	0.50	ug/L	0	0	0	0	0	0
Aroclor-1248	Comp	EPA608	0.50	ug/L	0	0	0	0	0	0
Aroclor-1254	Comp	EPA608	0.50	ug/L	0	0	0	0	0	0
Aroclor-1260	Comp	EPA608	0.50	ug/L	0	0	0	0	0	0

WEATHER CONDITION					Wet				Dry	
STATION NO.					S29	S29	S29	S29	S29	S29
STATION NAME					Santa Clara River	Santa Clara River	Santa Clara River	Santa Clara River	Santa Clara River	Santa Clara River
EVENT NO.					0506-01	0506-02	0506-03	0506-03	0506-01	0506-02
DATE					10/17/2005	12/31/2005	01/14/2006	02/17/2006	11/29/2005	04/25/2006
	Sample Type	EPA Method	PQL	Units						
Organohosphate Pesticides										
Chlorpyrifos	Comp	EPA507	0.05	ug/L	0	0	0	0	0	0
Diazinon	Comp	EPA507	0.01	ug/L	0	0.01	[redacted]	0	0	0
Prometryn	Comp	EPA507	2.00	ug/L	0	0	0	0	0	0
Atrazine	Comp	EPA507	2.00	ug/L	0	0	0	0	0	0
Simazine	Comp	EPA507	2.00	ug/L	0	0	0	0	0	0
Cyanazine	Comp	EPA507	2.00	ug/L	0	0	0	0	0	0
Malathion	Comp	EPA507	2.00	ug/L	0	0	0	0	0	0
Herbicides										
Glyphosate	Comp	EPA547	25.00	ug/L	0	0	0	0	0	0
2,4-D	Comp	EPA515.3	10.00	ug/L	0	0	0	0	0	0
2,4,5-TP-SILVEX	Comp	EPA515.3	1.00	ug/L	0	0	0	0	0	0

Note:
1) blank cell indicates sample was not analyzed
2) 0 indicates concentration below minimum detection level
3) PQL = minimum level
4) Highlighted cells show exceedances

WEATHER CONDITION					Wet			Dry	
STATION NO.					S29	S29	S29	S29	S29
STATION NAME					Santa Clara River	Santa Clara River	Santa Clara River	Santa Clara River	Santa Clara River
EVENT NO.					0304-01	0304-02	0304-03	0304-01	0304-02
DATE					10/31/2003	12/25/2003	1/1/2004	10/28/2003	1/13/2004
	Sample Type	EPA Method	PQL	Units					
Conventional									
Oil and Grease	Grab	EPA413.1	1	mg/L	1.7	1.9	0	0	0
Total Phenols	Grab	EPA420.1	0.1	mg/L	0	0	0	0	0
Cyanide	Grab	EPA335.2	0.01	mg/L	[redacted]	0	0.007	0	0
pH	Comp	SM4500H B	0-14		7.25	7.83	6.93	[redacted]	8.19
Dissolved Oxygen	Grab	SM4500O G	1	mg/L	7.56	8.32	9.05	8	8.26
Indicator Bacteria									
Total Coliform	Grab	SM9230B	20	MPN/100ml	[redacted]	170000	[redacted]	50000	130
Fecal Coliform	Grab	SM9230B	20	MPN/100ml	[redacted]	[redacted]	[redacted]	[redacted]	20
Ratio Fecal Coliform/Total Coliform					0.27	0.294117647	0.294117647	0.01	0.153846154
Fecal Streptococcus	Grab	SM9230B	20	MPN/100ml	500000	34000	50000	1300	40
Fecal Enterococcus	Grab	SM9230B		MPN/100ml	[redacted]	[redacted]	[redacted]	[redacted]	40
General									
Chloride	Comp	EPA300.0	2	mg/L	70.6	51.6	35.5	[redacted]	140
Fluoride	Comp	EPA300.0	0.1	mg/L	0.31	0.65	0.17	0.34	0.33
Nitrate	Comp	EPA300.0	0.1	mg/L	3.06	0	8.21	7.02	5.46
Sulfate	Comp	EPA300.0	0.1	mg/L	101	82.4	82.6	222	222
Alkalinity	Comp	EPA310.1	4	mg/L	169	128	85	249	294
Hardness	Comp	EPA130.2	2	mg/L	200	170	140	400	450
COD	SI	EPA410.4	10	mg/L	127.3	41	31.7	27.7	35.2
TPH	Grab	EPA418.1	1	mg/L	1.9	0	0	0	0
Specific Conductance	Comp	EPA120.1	1	umhos/cm	612	537	443	1395	1413
Total Dissolved Solids	Comp	EPA160.1	2	mg/L	392	364	266	820	884
Turbidity	Comp	EPA180.1	0.1	NTU	93.5	24.6	[redacted]	139	0.84
Total Suspended Solids	Comp	EPA160.2	2	mg/L	2202	1616	542	1320	14
Volatile Suspended Solids	Comp	EPA160.4	1	mg/L	172	240	70	64	7
MBAS	Comp	EPA425.1	0.05	mg/L	0.193	0.051	0	0	0
Total Organic Carbon	Comp	EPA415.1	1	mg/L	34.5	5.85	7.79	4.02	4.06
BOD	Comp	SM5210B	2	mg/L	37.2	6.74	11.7	2	3.2
Nutrients									
Dissolved Phosphorus	Comp	EPA365.3	0.05	mg/L	0.427	0.453	0.241	0.208	0.222
Total Phosphorus	Comp	EPA365.3	0.05	mg/L	0.559	0.839	0.413	0.237	0.267
NH3-N	Comp	EPA350.3	0.1	mg/L	0	0.15	0	0	0
Nitrate-N	Comp	SM4110B	0.5	mg/L	0.691	0	1.85	1.585	1.23
Nitrite-N	Comp	SM4110B	0.03	mg/L	0.998	0.1826	0.152	0.414	0.6
Kjeldahl-N	Comp	EPA351.4	0.1	mg/L	8.7	2.04	3.2	0.514	0.918
Metals									
Dissolved Aluminum	Comp	EPA200.8	100	ug/l	0	0	1390	0	0
Total Aluminum	Comp	EPA200.8	100	ug/l	600	[redacted]	[redacted]	224	0
Dissolved Antimony	Comp	EPA200.8	5	ug/l	1.91	0.93	1.1	0	0
Total Antimony	Comp	EPA200.8	5	ug/l	1.98	2.33	1.38	0	0
Dissolved Arsenic	Comp	EPA200.8	5	ug/l	3.66	1.53	1.72	1.86	1.54
Total Arsenic	Comp	EPA200.8	5	ug/l	3.68	3.9	1.78	1.86	1.8
Dissolved Beryllium	Comp	EPA200.8	1	ug/l	0	0	0	0	0
Total Beryllium	Comp	EPA200.8	1	ug/l	0	0	0	0	0
Dissolved Cadmium	Comp	EPA200.8	1	ug/l	0	0	0	0	0
Total Cadmium	Comp	EPA200.8	1	ug/l	0.29	1.09	0.27	0	0
Dissolved Chromium	Comp	EPA200.8	5	ug/l	4.38	1.48	4.33	5.29	3.19
Total Chromium	Comp	EPA200.8	5	ug/l	6.59	17.6	7.63	11.4	4.04
Dissolved Chromium +6	Comp	EPA200.8	10	ug/l	0	0	0	0	0
Total Chromium +6	Comp	EPA200.8	10	ug/l	0	0	0	0	0
Dissolved Copper	Comp	EPA200.8	5	ug/l	10.6	4.88	7.36	3.55	3.54
Total Copper	Comp	EPA200.8	5	ug/l	[redacted]	53.3	10.2	13.5	5.96
Dissolved Iron	Comp	EPA200.8	100	ug/l	0	461	2210	0	0
Total Iron	Comp	EPA200.8	100	ug/l	1460	14480	2490	306	120
Dissolved Lead	Comp	EPA200.8	5	ug/l	0	1.24	3.32	0	0
Total Lead	Comp	EPA200.8	5	ug/l	5.41	[redacted]	3.44	1.19	0.65
Dissolved Mercury	Comp	EPA200.8	1	ug/l	0	0	0	0	0
Total Mercury	Comp	EPA200.8	1	ug/l	0	0	0	0	0.201
Dissolved Nickel	Comp	EPA200.8	5	ug/l	11.3	6.36	6.21	13.2	15.4
Total Nickel	Comp	EPA200.8	5	ug/l	13.6	20.2	8.21	13.6	17.2
Dissolved Selenium	Comp	EPA200.8	5	ug/l	1.88	0	0	2.67	2.43
Total Selenium	Comp	EPA200.8	5	ug/l	1.9	1.08	0	2.67	3
Dissolved Silver	Comp	EPA200.8	1	ug/l	0	0	0	0	0
Total Silver	Comp	EPA200.8	1	ug/l	0	0	0	0	0
Dissolved Thallium	Comp	EPA200.8	5	ug/l	0	0	0	0	0
Total Thallium	Comp	EPA200.8	5	ug/l	0	0	0	0	0
Dissolved Zinc	Comp	EPA200.8	50	ug/l	20.4	13	27	3.87	26
Total Zinc	Comp	EPA200.8	50	ug/l	59.6	[redacted]	54	8.13	48

WEATHER CONDITION					Wet			Dry	
STATION NO.					S29	S29	S29	S29	S29
STATION NAME					Santa Clara River	Santa Clara River	Santa Clara River	Santa Clara River	Santa Clara River
EVENT NO.					0304-01	0304-02	0304-03	0304-01	0304-02
DATE					10/31/2003	12/25/2003	1/1/2004	10/28/2003	1/13/2004
	Sample Type	EPA Method	PQL	Units					
Semi-Volatiles Organics (EPA 625)									
2- Chlorophenol	Comp	EPA625	2	ug/l	0	0	0	0	0
2,4-dichlorophenol	Comp	EPA625	2	ug/l	0	0	0	0	0
2,4-dimethylphenol	Comp	EPA625	2	ug/l	0	0	0	0	0
2,4-dinitrophenol	Comp	EPA625	3	ug/l	0	0	0	0	0
2-nitrophenol	Comp	EPA625	3	ug/l	0	0	0	0	0
4-nitrophenol	Comp	EPA625	3	ug/l	0	0	0	0	0
4-chloro_3_methylphenol	Comp	EPA625	3	ug/l	0	0	0	0	0
Pentachlorophenol	Comp	EPA625	2	ug/l	0	0	0	0	0
Phenol	Comp	EPA625	1	ug/l	0	0	0	0	0
2,4,6-trichlophenol	Comp	EPA625	1	ug/l	0	0	0	0	0
Base/Neutral									
Acenaphthene	Comp	EPA625	0.05	ug/l	0	0	0	0	0
Acenaphthylene	Comp	EPA625	0.05	ug/l	0	0	0	0	0
Anthracene	Comp	EPA625	0.05	ug/l	0	0	0	0	0
Benzidine	Comp	EPA625	3	ug/l	0	0	0	0	0
1,2 Benzanthracene	Comp	EPA625	0.1	ug/l	0	0	0	0	0
Benzo(a)pyrene	Comp	EPA625	0.1	ug/l	0	0	0	0	0
Benzo(k)fluoranthene	Comp	EPA625	0.1	ug/l	0	0	0	0	0
Bis(2-Chloroethoxy) methane	Comp	EPA625	0.1	ug/l	0	0	0	0	0
Bis(2-Chloroisopropyl) ether	Comp	EPA625	1	ug/l	0	0	0	0	0
Bis(2-Chloroethyl) ether	Comp	EPA625	0.1	ug/l	0	0	0	0	0
Bis(2-Ethylhexl) phthalate	Comp	EPA625	1	ug/l	60.4	21.4	20.2	32.2	15.8
4-Bromophenyl phenyl ether	Comp	EPA625	1	ug/l	0	0	0	0	0
Butyl benzyl phthalate	Comp	EPA625	0.3	ug/l	0	0	0	0	0
2-Chloronaphthalene	Comp	EPA625	0.1	ug/l	0	0	0	0	0
4-Chlorophenyl phenyl ether	Comp	EPA625	0.1	ug/l	0	0	0	0	0
Chrysene	Comp	EPA625	0.1	ug/l	0	0	0	0	0
Dibenzo(a,h)anthracene	Comp	EPA625	0.1	ug/l	0	0	0	0	0
1,3-Dichlorobenzene	Comp	EPA625	0.05	ug/l	0	0	0	0	0
1,4-Dichlorobenzene	Comp	EPA625	0.05	ug/l	0	0	0	0	0
1,2-Dichlorobenzene	Comp	EPA625	0.05	ug/l	0	0	0	0	0
3,3-Dichlorobenzidine	Comp	EPA625	3	ug/l	0	0	0	0	0
Diethyl phthalate	Comp	EPA625	0.5	ug/l	19.2	1.3	1.9	0	1.5
Dimethyl phthalate	Comp	EPA625	0.5	ug/l	0	0	0	0	0
di-n-Butyl phthalate	Comp	EPA625	1	ug/l	0	0	0	3.4	0
2,4-Dinitrotoluene	Comp	EPA625	0.05	ug/l	0	0	0	0	0
2,6-Dinitrotoluene	Comp	EPA625	0.05	ug/l	0	0	0	0	0
4,6 Dinitro-2-methylphenol	Comp	EPA625	3	ug/l	0	0	0	0	0
1,2-Diphenylhydrazine	Comp	EPA625	3	ug/l	0	0	0	0	0
di-n-Octyl phthalate	Comp	EPA625	1	ug/l	0	0	0	0	0
Fluoranthene	Comp	EPA625	0.1	ug/l	0	0.3	0	0	0
Fluorene	Comp	EPA625	0.1	ug/l	0	0	0	0	0
Hexachlorobenzene	Comp	EPA625	0.5	ug/l	0	0	0	0	0
Hexachlorobutadiene	Comp	EPA625	1	ug/l	0	0	0	0	0
Hexachloro-cyclopentadiene	Comp	EPA625	3	ug/l	0	0	0	0	0
Hexachloroethane	Comp	EPA625	1	ug/l	0	0	0	0	0
Indeno(1,2,3-cd)pyrene	Comp	EPA625	0.1	ug/l	0	0	0	0	0
Isophorone	Comp	EPA625	0.05	ug/l	0	0	0.5	0	0
Naphthalene	Comp	EPA625	0.05	ug/l	0	0	0	0	0
Nitrobenzene	Comp	EPA625	0.05	ug/l	0	0	0	0	0
N-Nitroso-dimethyl amine	Comp	EPA625	0.3	ug/l	0	0	0	0	0
N-Nitroso-diphenyl amine	Comp	EPA625	0.3	ug/l	0	0	0	0	0
N-Nitroso-di-n-propyl amine	Comp	EPA625	0.3	ug/l	0	0	0	0	0
Phenanthrene	Comp	EPA625	0.05	ug/l	0	0	0	0	0
Pyrene	Comp	EPA625	0.05	ug/l	0	0	0	0	0
1,2,4-Trichlorobenzene	Comp	EPA625	0.5	ug/l	0	0	0	0	0
Chlorinated Pesticides									
Aldrin	Comp	EPA625	0.05	ug/l	0	0	0	0	0
alpha-BHC	Comp	EPA625	0.05	ug/l	0	0	0	0	0
beta-BHC	Comp	EPA625	0.05	ug/l	0	0	0	0	0
delta-BHC	Comp	EPA625	0.05	ug/l	0	0	0	0	0
gamma-BHC (lindane)	Comp	EPA625	0.05	ug/l	0	0	0	0	0
alpha-chlordane	Comp	EPA625	0.05	ug/l	0	0	0	0	0
gamma-chlordane	Comp	EPA625	0.05	ug/l	0	0	0	0	0
4,4'-DDD	Comp	EPA625	0.1	ug/l	0	0	0	0	0
4,4'-DDE	Comp	EPA625	0.1	ug/l	0	0	0	0	0
4,4'-DDT	Comp	EPA625	0.1	ug/l	0	0	0	0	0
Dieldrin	Comp	EPA625	0.1	ug/l	0	0	0	0	0

WEATHER CONDITION					Wet			Dry	
STATION NO.					S29	S29	S29	S29	S29
STATION NAME					Santa Clara River	Santa Clara River	Santa Clara River	Santa Clara River	Santa Clara River
EVENT NO.					0304-01	0304-02	0304-03	0304-01	0304-02
DATE					10/31/2003	12/25/2003	1/1/2004	10/28/2003	1/13/2004
	Sample Type	EPA Method	PQL	Units					
alpha-Endosulfan	Comp	EPA625	0.1	ug/l	0	0	0	0	0
beta-Endosulfan	Comp	EPA625	0.1	ug/l	0	0	0	0	0
Endosulfan sulfate	Comp	EPA625	0.1	ug/l	0	0	0	0	0
Endrin	Comp	EPA625	0.1	ug/l	0	0	0	0	0
Endrin aldehyde	Comp	EPA625	0.1	ug/l	0	0	0	0	0
Heptachlor	Comp	EPA625	0.05	ug/l	0	0	0	0	0
Heptachlor Epoxide	Comp	EPA625	0.05	ug/l	0	0	0	0	0
Toxaphene	Comp	EPA625	1	ug/l	0	0	0	0	0
Polychlorinated Biphenyls									
Aroclor-1016	Comp	EPA608	0.5	ug/l	0	0	0	0	0
Aroclor-1221	Comp	EPA608	0.5	ug/l	0	0	0	0	0
Aroclor-1232	Comp	EPA608	0.5	ug/l	0	0	0	0	0
Aroclor-1242	Comp	EPA608	0.5	ug/l	0	0	0	0	0
Aroclor-1248	Comp	EPA608	0.5	ug/l	0	0	0	0	0
Aroclor-1254	Comp	EPA608	0.5	ug/l	0	0	0	0	0
Aroclor-1260	Comp	EPA608	0.5	ug/l	0	0	0	0	0
Organophosphate Pesticides									
Chlorpyrifos	Comp	EPA507	0.05	ug/l	0	0	0	0	0
Diazinon	Comp	EPA507	0.01	ug/l			0.026	0	0
Prometryn	Comp	EPA507	2	ug/l	0	0	0	0	0
Atrazine	Comp	EPA507	2	ug/l	0	0	0	0	0
Simazine	Comp	EPA507	2	ug/l	0	0	0	0	0
Cyanazine	Comp	EPA507	2	ug/l	0	0	0	0	0
Malathion	Comp	EPA507	2	ug/l	0	0	0	0	0
Herbicides									
Glyphosate	Comp	EPA547	25	ug/l	0	0	0	0	0
2,4-D	Comp	EPA515.3	10	ug/l	0	0	0	0	0
2,4,5-TP-SILVEX	Comp	EPA515.3	1	ug/l	0	0	0	0	0

Note:
1) blank cell indicates sample was not analyzed
2) 0 indicates concentration below minimum detection leve
3) PQL = minimum level
4) Highlighted cells show exceedances

Table C-7. Water Quality Results for Constituents Measured at the Santa Clara River Mass Emission Site for the 2004-2005 Monitoring Season.

			Water Quality Objectives				Wet Weather Monitoring[2]			Dry Weather Monitoring[2]	
CONSTITUENT	PQL	UNITS	Ocean Plan	Basin Plan	Freshwater CTR (CCC)[1]	Freshwater CTR (CMC)[1]	10/17/2004	10/26/2004	1/7/2005	11/16/2004	3/9/2005
General Chemistry											
Cyanide	0.01	mg/L	0.004				0.010	0.000	0.000	0.000	0.000
pH	mg/L			6.5<pH<8.5			7.36	7.07	7.58	7.72	8.17
TPH	1						0.00	1.00	0.00	0.00	0.00
Oil and Grease	1	mg/L	75				0.00	0.00	0.00	0.00	0.00
Total Phenols	0.1	mg/L					0.00	0.00	0.00	0.00	0.00
Dissolved Oxygen	1	mg/L		<5			6.78	10.29	10.40	8.80	10.76
Calcium	1	mg/L					112.00	24.00	28.10	136.00	100.20
Magnesium	1	mg/L					36.00	7.29	9.72	41.30	31.10
Potassium	1	mg/L					10.50	4.99	2.93	5.43	7.14
Sodium	1	mg/L					87.00	19.10	23.20	108.00	63.20
Bicarbonate	2	mg/L					228.00	67.10		369.00	0.00
Carbonate	2	mg/L					0.00	0.00	0.00	0.00	0.00
Chloride	2	mg/L		100			115.00	15.60	9.26	140.00	46.50
Fluoride	0.1	mg/L		2.4			0.40	0.16	0.20	0.44	0.52
Sulfate	0.1	mg/L		300			288.00	46.40	87.80	263.00	253.00
Alkalinity	0.1	mg/L					187.00	55.00	50.60	303.00	253.00
Hardness	2	mg/L					428.0	90.0	110.0	510.0	460.0
COD	10	mg/L					49.90	16.30	27.92	11.80	27.20
Specific Conductance	1	umhos/cm					1074	235	317	1560	999
Total Dissolved Solids	2	mg/L		1500			732	134	206	914	696
Turbidity	0.1	NTU	225				141.00	37.30	193.00	0.87	0.45
Total Suspended Solids	2	mg/L					870	6591	2662	8	600
Volatile Suspended Solids	1	mg/L					79	569	190	4	21
MBAS	0.05	mg/L					0.10	0.00	0.00	0.00	0.00
Total Organic Carbon	1	mg/L					20.37	11.20	3.49	4.22	3.39
BOD	2	mg/L					21.80	10.40	5.58	3.80	0.00
Nutrients											
Dissolved Phosphorus	0.05	mg/L					0.18	0.20	0.10	0.25	0.14
Total Phosphorus	0.05	mg/L					0.83	0.37	0.18	0.28	0.67
Ammonia	0.1	mg/L					0.00	0.20	0.37	0.00	0.98
NH3-N	0.1	mg/L					0.00	0.17	0.30	0.00	0.81
Nitrate	0.1	mg/L					4.23	5.04	3.38	4.84	7.20
Nitrate-N	0.5	mg/L		10			0.96	1.36	0.76	1.09	1.63
Nitrite-N	0.03	mg/L		1			0.43	0.00	0.00	0.00	0.00
Kjeldahl-N	0.1	mg/L					2.94	3.32	0.74	1.31	1.00
Indicator Bacteria											
Total Coliform	20	MPN/100ml		10,000			1600,000	300,000	300,000	5,000	2,800
Fecal Coliform	20	MPN/100ml		400			500,000	240,000	16,000	20	500
Fecal Streptococcus	20	MPN/100ml					300,000	90,000	220,000	300	1,300
Enterococcus	20	MPN/100ml		104			300,000	90,000	220,000	500	1,600
Metals											
Dissolved Aluminum	100	ug/l					0.00	0.00	3680.00	0.00	0.00
Total Aluminum	100	ug/l		1000			450	10,343	19,650	0	2,500
Dissolved Antimony	5	ug/l					1.07	0.51	0.00	0.00	0.00
Total Antimony	5	ug/l		6			1.15	0.70	0.67	0.00	0.00
Dissolved Arsenic	5	ug/l					1.75	1.13	1.58	1.55	2.65
Total Arsenic	5	ug/l	32	50			2.26	5.17	3.07	1.55	3.89
Dissolved Barium	10	ug/l					58.00	24.60	135.00	69.50	97.40
Total Barium	10	ug/l					75.90	263.00	152.00	75.30	197.00
Dissolved Beryllium	1	ug/l					0.00	0.00	0.00	0.00	0.00
Total Beryllium	1	ug/l					0.00	0.00	0.00	0.00	0.00
Dissolved Boron	100	ug/l					583	186	0	1,050	388
Total Boron	100	ug/l					634	399	375	1,860	413
Dissolved Cadmium	1	ug/l			2.2-7.8	3.8-24.9	0.00	0.00	0.74	0.00	0.00
Total Cadmium	1	ug/l			2.3-8.9	4.0-28.4	0.00	1.27	0.96	0.00	0.29

Table C-7. Water Quality Results for Constituents Measured at the Santa Clara River Mass Emission Site for the 2004-2005 Monitoring Season.

			Water Quality Objectives				Wet Weather Monitoring[2]			Dry Weather Monitoring[2]	
CONSTITUENT	POL	UNITS	Ocean Plan	Basin Plan	Freshwater CTR (CCC)[1]	Freshwater CTR (CMC)[1]	10/17/2004	10/26/2004	1/7/2005	11/16/2004	3/9/2005
Dissolved Chromium	5	ug/l			50.0-248.4	503.4-2083.8	1.68	1.16	1.56	0.60	7.21
Total Chromium	5	ug/l		50	189.5-786.0	1593.0-6594.4	3.40	22.70	12.80	0.60	9.60
Dissolved Chromium +6	10	ug/l					0.00	0.00	0.00	0.00	0.00
Total Chromium +6	10	ug/l					0.00	0.00	0.00	0.00	0.00
Dissolved Copper	5	ug/l			8.2-36.0	12.2-52.3	5.80	22.60	17.20	1.00	3.53
Total Copper	5	ug/l	12		8.5-37.5	12.7-54.9	15.70	28.00	19.50	14.40	18.50
Dissolved Iron	100	ug/l					0	0	3035	0	0
Total Iron	100	ug/l					988	34,856	27,400	128	15,160
Dissolved Lead	5	ug/l			2.2-14	57.6-359.7	0.00	0.00	12.50	0.00	0.00
Total Lead	5	ug/l	8		2.8-25.3	71.4-649.6	1.48	35.30	14.40	3.35	8.19
Dissolved Manganese	30	ug/l					0.00	0.00	512.00	0.00	0.00
Total Manganese	30	ug/l					53	407	594.00	131.00	485.00
Dissolved Mercury	1	ug/l					0.00	0.00	0.00	0.00	0.00
Total Mercury	1	ug/l	0.16	2			0.00	0.00	0.00	0.00	0.00
Dissolved Nickel	5	ug/l			47.6-206.6	428.3-1858.1	14.40	4.62	10.00	14.40	5.17
Total Nickel	5	ug/l	20	100	47.7-207.0	429.2-1861.8	15.70	19.50	15.00	15.10	12.70
Dissolved Selenium	5	ug/l					2.26	0.00	0.00	4.23	1.74
Total Selenium	5	ug/l	60	50			3.04	0.00	0.00	4.23	3.69
Dissolved Silver	1	ug/l				2.9-56.86	0.00	0.00	0.00	0.00	0.00
Total Silver	1	ug/l	80			3.4-66.9	0.00	0.26	0.00	0.00	0.00
Dissolved Thallium	5	ug/l					0.00	0.00	0.00	0.00	0.00
Total Thallium	5	ug/l					0.00	0.00	0.00	0.00	0.00
Dissolved Zinc	50	ug/l			107.2-466.0	107.2-466.0	10.20	12.00	29.70	0.00	2.27
Total Zinc	50	ug/l			109.6-476.5	109.6-476.5	11.10	68.80	60.80	27.40	52.20
					Semi-Volatiles						
Acenaphthylene	0.05	ug/l					0.00	0.00	0.00	0.00	0.00
Acetophenone	0.3	ug/l					0.00	0.00	0.00	0.00	0.00
Anthracene	3	ug/l					0.00	0.00	0.00	0.00	0.00
Antracene	0.05	ug/l					0.00	0.00	0.00	0.00	0.00
Aminobiphenyl	3	ug/l					0.00	0.00	0.00	0.00	0.00
Benzidine	3	ug/l					0.00	0.00	0.00	0.00	0.00
Benzo(a)anthracene	0.1	ug/l					0.00	0.00	0.00	0.00	0.00
Benzo(b)fluoranthene	0.1	ug/l					0.00	0.00	0.00	0.00	0.00
Benzo(k)fluoranthene	0.1	ug/l					0.00	0.00	0.00	0.00	0.00
Benzo(a)pyrene	0.1	ug/l		0.2			0.00	0.00	0.00	0.00	0.00
Butyl benzyl phthalate	0.3	ug/l					0.00	0.00	0.00	0.00	0.00
Bis(2-chloroethyl)ether	1	ug/l					0.00	0.00	0.00	0.00	0.00
Bis(2-Chloroethoxy) methane	0.1	ug/l					0.00	0.00	0.00	0.00	0.00
Bis(2-Ethylhexl) phthalate	1	ug/l					0.00	0.00	0.00	0.00	0.00
Bis(2-chloroisopropyl) ether	2	ug/l					0.00	0.00	0.00	0.00	0.00
4-Bromophenyl phenyl ether	1	ug/l					0.00	0.00	0.00	0.00	0.00
Chloroaniline	1	ug/l					0.00	0.00	0.00	0.00	0.00
1-Chloronaphthalene	0.1	ug/l					0.00	0.00	0.00	0.00	0.00
2-Chloronaphthalene	0.1	ug/l					0.00	0.00	0.00	0.00	0.00
4-Chlorophenyl phenyl ether	0.1	ug/l					0.00	0.00	0.00	0.00	0.00
Chrysene	0.1	ug/l					0.00	0.00	0.00	0.00	0.00
Dimethyl phthalate	0.5	ug/l					0.00	0.00	0.00	0.00	0.00
7,12-Dimethyl-benz(a)-anthracene	0.1	ug/l					0.00	0.00	0.00	0.00	0.00
alpha,alpha-Dimethylphenethylamine	3	ug/l					0.00	0.00	0.00	0.00	0.00
Dibenz(a,j)acridine	0.3	ug/l					0.00	0.00	0.00	0.00	0.00
Dibenzo(a,h)anthracene	0.1	ug/l					0.00	0.00	0.00	0.00	0.00
1,3-Dichlorobenzene	0.05	ug/l					0.00	0.00	0.00	0.00	0.00
1,2-Dichlorobenzene	0.05	ug/l					0.00	0.00	0.00	0.00	0.00
1,4-Dichlorobenzene	0.05	ug/l		5			0.00	0.00	0.00	0.00	0.00
3,3-Dichlorobenzidine	0.05	ug/l		600			0.00	0.00	0.00	0.00	0.00
Diethyl phthalate	0.5	ug/l					0.00	0.00	0.00	0.00	0.00
Dimethyl phthalate	0.5	ug/l					0.00	0.00	0.00	0.00	0.00
di-n-Butyl phthalate	1	ug/l					0.00	0.00	0.00	0.00	0.00

Table C-7. Water Quality Results for Constituents Measured at the Santa Clara River Mass Emission Site for the 2004-2005 Monitoring Season.

			Water Quality Objectives				Wet Weather Monitoring [2]			Dry Weather Monitoring [2]	
CONSTITUENT	PQL	UNITS	Ocean Plan	Basin Plan	Freshwater CTR (CCC)[1]	Freshwater CTR (CMC)[1]	10/17/2004	10/26/2004	1/7/2005	11/16/2004	3/9/2005
2,4-Dinitrotoluene	0.05	ug/l					0.00	0.00	0.00	0.00	0.00
2,6-Dinitrotoluene	0.05	ug/l					0.00	0.00	0.00	0.00	0.00
Diphenylamine	1	ug/l					0.00	0.00	0.00	0.00	0.00
1,2-Diphenylhydrazine	3	ug/l					0.00	0.00	0.00	0.00	0.00
di-n-Octyl phthalate	1	ug/l					0.00	0.00	0.00	0.00	0.00
Ethyl methanesulfonate	0.3	ug/l					0.00	0.00	0.00	0.00	0.00
Endrin ketone	1	ug/l					0.00	0.00	0.00	0.00	0.00
Fluoranthene	0.1	ug/l					0.00	0.00	0.00	0.00	0.00
Fluorene	0.1	ug/l					0.00	0.00	0.00	0.00	0.00
Hexachlorobenzene	0.5	ug/l		1			0.00	0.00	0.00	0.00	0.00
Hexachlorobutadiene	1	ug/l					0.00	0.00	0.00	0.00	0.00
Hexachloro-cyclopentadiene	3	ug/l		50			0.00	0.00	0.00	0.00	0.00
Hexachloroethane	1	ug/l					0.00	0.00	0.00	0.00	0.00
Indeno(1,2,3-cd)pyrene	0.1	ug/l					0.00	0.00	0.00	0.00	0.00
Isophorone	0.05	ug/l					0.00	0.00	0.00	0.00	0.00
Methylcholanthrene	0.3	ug/l					0.00	0.00	0.00	0.00	0.00
Methylmethanesulfonate	0.3	ug/l					0.00	0.00	0.00	0.00	0.00
Naphthalene	0.05	ug/l					0.00	0.00	0.00	0.00	0.00
1-Naphthylamine	3	ug/l					0.00	0.00	0.00	0.00	0.00
2-Naphthylamine	3	ug/l					0.00	0.00	0.00	0.00	0.00
2-Nitroaniline	3	ug/l					0.00	0.00	0.00	0.00	0.00
3-Nitroaniline	3	ug/l					0.00	0.00	0.00	0.00	0.00
4-Nitroaniline	3	ug/l					0.00	0.00	0.00	0.00	0.00
Nitrobenzene	0.05	ug/l					0.00	0.00	0.00	0.00	0.00
N-Nitroso-butyl amine	0.3	ug/l					0.00	0.00	0.00	0.00	0.00
N-Nitroso-dimethyl amine	0.3	ug/l					0.00	0.00	0.00	0.00	0.00
N-Nitroso-diphenyl amine	0.3	ug/l					0.00	0.00	0.00	0.00	0.00
N-Nitroso-di-n-propyl amine	0.3	ug/l					0.00	0.00	0.00	0.00	0.00
N-Nitrosopiperidine	1	ug/l					0.00	0.00	0.00	0.00	0.00
Pentachlorophenol	2	ug/l					0.00	0.00	0.00	0.00	0.00
Phenacetin	3	ug/l					0.00	0.00	0.00	0.00	0.00
Phenanthrene	0.05	ug/l					0.00	0.00	0.00	0.00	0.00
2-Picoline	3	ug/l					0.00	0.00	0.00	0.00	0.00
Pronamide	5	ug/l					0.00	0.00	0.00	0.00	0.00
Pyrene	0.05	ug/l					0.00	0.00	0.00	0.00	0.00
1,2,4,5-Tetra-chlorobenzene	1	ug/l					0.00	0.00	0.00	0.00	0.00
1,2,4-Trichlorobenzene	1	ug/l					0.00	0.00	0.00	0.00	0.00
Benzoic acid	5	ug/l					0.00	0.00	0.00	0.00	0.00
4-chloro-3-methylphenol	5	ug/l					0.00	0.00	0.00	0.00	0.00
4-chloro_3_methylphenol	3	ug/l					0.00	0.00	0.00	0.00	0.00
2- Chlorophenol	2	ug/l					0.00	0.00	0.00	0.00	0.00
2,4-dichlorophenol	2	ug/l					0.00	0.00	0.00	0.00	0.00
2,6-Dichlorophenol	2	ug/l					0.00	0.00	0.00	0.00	0.00
2,4-dimethylphenol	2	ug/l					0.00	0.00	0.00	0.00	0.00
2,4-dinitrophenol	3	ug/l					0.00	0.00	0.00	0.00	0.00
4,6 Dinitro-2-methylphenol	3	ug/l					0.00	0.00	0.00	0.00	0.00
2-Methylphenol	3	ug/l					0.00	0.00	0.00	0.00	0.00
4-Methylphenol	3	ug/l					0.00	0.00	0.00	0.00	0.00
2-nitrophenol	3	ug/l					0.00	0.00	0.00	0.00	0.00
4-nitrophenol	3	ug/l					0.00	0.00	0.00	0.00	0.00
Pentachlorophenol	2	ug/l					0.00	0.00	0.00	0.00	0.00
Phenol	1	ug/l					0.00	0.00	0.00	0.00	0.00
2,3,4,6-Tetrachlorophenol	1	ug/l					0.00	0.00	0.00	0.00	0.00
2,4,5-Trichlorophenol	1	ug/l					0.00	0.00	0.00	0.00	0.00
2,4,6-trichlophenol	1	ug/l					0.00	0.00	0.00	0.00	0.00

Table C-7. Water Quality Results for Constituents Measured at the Santa Clara River Mass Emission Site for the 2004-2005 Monitoring Season.

			Water Quality Objectives				Wet Weather Monitoring [2]			Dry Weather Monitoring [2]	
CONSTITUENT	PQL	UNITS	Ocean Plan	Basin Plan	Freshwater CTR (CCC)[1]	Freshwater CTR (CMC)[1]	10/17/2004	10/26/2004	1/7/2005	11/16/2004	3/9/2005
PCBs											
Aroclor-1016	0.5	ug/l					0.00	0.00	0.00	0.00	0.00
Aroclor-1221	0.5	ug/l					0.00	0.00	0.00	0.00	0.00
Aroclor-1232	0.5	ug/l					0.00	0.00	0.00	0.00	0.00
Aroclor-1242	0.5	ug/l		0.03	0.014		0.00	0.00	0.00	0.00	0.00
Aroclor-1248	0.5	ug/l					0.00	0.00	0.00	0.00	0.00
Aroclor-1254	0.5	ug/l					0.00	0.00	0.00	0.00	0.00
Aroclor-1260	0.5	ug/l					0.00	0.00	0.00	0.00	0.00
Pesticides											
Aldrin	0.05	ug/l				3	0.00	0.00	0.00	0.00	0.00
alpha-BHC	0.05	ug/l					0.00	0.00	0.00	0.00	0.00
beta-BHC	0.05	ug/l	0.008				0.00	0.00	0.00	0.00	0.00
delta-BHC	0.05	ug/l					0.00	0.00	0.00	0.00	0.00
gamma-BHC (lindane)	0.05	ug/l		0.2		0.95	0.00	0.00	0.00	0.00	0.00
Chlordane	0.05	ug/l			0.0043	2.4	0.00	0.00	0.00	0.00	0.00
4,4'-DDD	0.1	ug/l					0.00	0.00	0.00	0.00	0.00
4,4'-DDE	0.1	ug/l					0.00	0.00	0.00	0.00	0.00
4,4'-DDT	0.1	ug/l			0.001	1.1	0.00	0.00	0.00	0.00	0.00
Dieldrin	0.1	ug/l			0.056	0.24	0.00	0.00	0.00	0.00	0.00
Endosulfan 1	0.1	ug/l			0.056	0.22	0.00	0.00	0.00	0.00	0.00
Endosulfan 2	0.1	ug/l	0.018		0.056	0.22	0.00	0.00	0.00	0.00	0.00
Endosulfan sulfate	0.1	ug/l					0.00	0.00	0.00	0.00	0.00
Endrin	0.1	ug/l	0.004	2	0.036	0.086	0.00	0.00	0.00	0.00	0.00
Endrin aldehyde	0.1	ug/l					0.00	0.00	0.00	0.00	0.00
Heptachlor	0.05	ug/l		0.01	0.0038	0.52	0.00	0.00	0.00	0.00	0.00
Heptachlor Epoxide	0.05	ug/l		0.01	0.0038	0.52	0.00	0.00	0.00	0.00	0.00
Methoxychlor	0.5	ug/l					0.00	0.00	0.00	0.00	0.00
Toxephene	1	ug/l		3	0.0002	0.73	0.00	0.00	0.00	0.00	0.00
Diazinon	0.01	ug/l		0.08			0.430	0.030	0.00	0.00	0.00
Chlorpyrifos	0.05	ug/l		0.07			0.00	0.00	0.00	0.00	0.00
Diuron	1	ug/l					0.00	0.00	0.00	0.00	0.00
Malathion	2	ug/l					0.00	0.00	0.00	0.00	0.00
Prometryn	2	ug/l					0.00	0.00	0.00	0.00	0.00
Simazine	2	ug/l					0.00	0.00	0.00	0.00	0.00
Atrazine	2	ug/l		3			0.00	0.00	0.00	0.00	0.00
Cyanazine	2	ug/l					0.00	0.00	0.00	0.00	0.00
Molinate	2	ug/l					0.00	0.00	0.00	0.00	0.00
Thiobencarb	1	ug/l					0.00	0.00	0.00	0.00	0.00
Herbicides											
Carbofuran	5	ug/l					0.00	0.00	0.00	0.00	0.00
2,4,5-TP-Silvex	10	ug/l		70			0.00	0.00	0.00	0.00	0.00
2,4,5-TP	1	ug/l		50			0.00	0.00	0.00	0.00	0.00
Bentazon	2	ug/l					0.00	0.00	0.00	0.00	0.00
Glyphosate	25	ug/l		700			0.00	0.00	0.00	0.00	0.00

[1] CTR values for metals are hardness dependent; higher hardness gives higher WQO

[2] Values of 0 represent that the constituent was not detected above the PQL as defined in the Municipal Stormwater Permit. Results are presented in accordance with Method B of the permit.

APPENDIX C

Table C.1: Representative selenium measurements in San Jose Creek Reach 1 (data from Districts' and SCCWRP monitoring)

(orange shading is used to differentiate samples where the concentration > 5.0 ug/L)

SAMPLE DATE	JOB #	LOCATION	SIGN*	VALUE	UNIT	ANALYTE	SAMPLE COMMENTS
8/17/2004	SJ12673	RA	E	0.5	UG/L	SELENIUM	
9/7/2004	SJ13708	RA	E	0.3	UG/L	SELENIUM	
10/12/2004	SJ15508	RA	E	0.4	UG/L	SELENIUM	
11/16/2004	SJ17510	RA	E	0.4	UG/L	SELENIUM	
12/16/2004	SJ19248	RA	<	1	UG/L	SELENIUM	
1/18/2005	SJ20916	RA	E	0.5	UG/L	SELENIUM	
2/15/2005	SJ22630	RA	E	0.5	UG/L	SELENIUM	
3/15/2005	SJ24353	RA	E	0.6	UG/L	SELENIUM	
4/19/2005	SJ26780	RA	E	0.4	UG/L	SELENIUM	
5/17/2005	SJ28579	RA	E	0.4	UG/L	SELENIUM	
6/14/2005	SJ30507	RA	E	0.5	UG/L	SELENIUM	
7/19/2005	SJ33415	RA	E	0.4	UG/L	SELENIUM	
8/16/2005	SJ35428	RA	E	0.6	UG/L	SELENIUM	
9/27/2005	SJ38209	RA	E	0.5	UG/L	SELENIUM	
10/25/2005	SJ40110	RA	E	0.6	UG/L	SELENIUM	
11/15/2005	SJ41781	RA	E	0.6	UG/L	SELENIUM	
12/13/2005	SJ43484	RA	E	0.8	UG/L	SELENIUM	
1/17/2006	SJ50941	RA	E	0.5	UG/L	SELENIUM	
2/21/2006	SJ53780	RA	E	0.5	UG/L	SELENIUM	
3/23/2006	SJ56093	RA	E	0.6	UG/L	SELENIUM	
4/18/2006	SJ57816	RA	E	0.5	UG/L	SELENIUM	
5/30/2006	SJ60217	RA	E	0.4	UG/L	SELENIUM	
5/25/2005	SJ29267	R14		2.7	UG/L	SELENIUM	
5/25/2005	SJ29269	R14		3	UG/L	SELENIUM	
6/28/2005	SJ32008	R14		1.1	UG/L	SELENIUM	
7/18/2005	SJ33250	R14		1.8	UG/L	SELENIUM	
8/15/2005	SJ35322	R14	E	0.7	UG/L	SELENIUM	
9/19/2005	SJ37704	R14		1	UG/L	SELENIUM	
10/24/2005	SJ40049	R14		1.6	UG/L	SELENIUM	
11/21/2005	SJ42169	R14		1.6	UG/L	SELENIUM	
12/19/2005	SJ43843	R14	E	0.8	UG/L	SELENIUM	
1/23/2006	SJ51345	R14	E	0.7	UG/L	SELENIUM	
2/27/2006	SJ54250	R14	E	0.9	UG/L	SELENIUM	
4/25/2006	SJ58200	R14		1.9	UG/L	SELENIUM	
5/15/2006	SJ59380	R14		1.8	UG/L	SELENIUM	
6/19/2006	SJ61359	R14	E	0.6	UG/L	SELENIUM	
7/31/2006	SJ63755	R14	E	0.6	UG/L	SELENIUM	
8/21/2006	SJ64798	R14	<	1	UG/L	SELENIUM	
9/18/2006	SJ66431	R14		2.47	UG/L	SELENIUM	
10/30/2006	SJ68984	R14	<	1	UG/L	SELENIUM	
11/29/2006	SJ70525	R14		2.21	UG/L	SELENIUM	
8/17/2004	SJ12674	RC		1.5	UG/L	SELENIUM	
9/7/2004	SJ13709	RC	E	0.7	UG/L	SELENIUM	
10/12/2004	SJ15509	RC		1.6	UG/L	SELENIUM	
11/16/2004	SJ17511	RC	E	0.9	UG/L	SELENIUM	
12/16/2004	SJ19249	RC		1.1	UG/L	SELENIUM	
1/18/2005	SJ20917	RC		2.3	UG/L	SELENIUM	
2/15/2005	SJ22631	RC		1.3	UG/L	SELENIUM	
3/15/2005	SJ24354	RC		2	UG/L	SELENIUM	
4/19/2005	SJ26781	RC		2.8	UG/L	SELENIUM	
5/17/2005	SJ28580	RC		2.2	UG/L	SELENIUM	
6/14/2005	SJ30508	RC		2.6	UG/L	SELENIUM	
7/19/2005	SJ33416	RC		2	UG/L	SELENIUM	
8/16/2005	SJ35429	RC	E	0.8	UG/L	SELENIUM	
9/27/2005	SJ38210	RC	E	0.9	UG/L	SELENIUM	
10/25/2005	SJ40111	RC		1.2	UG/L	SELENIUM	
11/15/2005	SJ41782	RC		1.2	UG/L	SELENIUM	
12/13/2005	SJ43485	RC		1.2	UG/L	SELENIUM	

SAMPLE DATE	JOB #	LOCATION	SIGN*	VALUE	UNIT	ANALYTE	SAMPLE COMMENTS
1/17/2006	SJ50942	RC	E	0.8	UG/L	SELENIUM	
2/21/2006	SJ53781	RC		1.6	UG/L	SELENIUM	
3/23/2006	SJ56094	RC	E	0.9	UG/L	SELENIUM	
4/18/2006	SJ57817	RC		2.3	UG/L	SELENIUM	
5/30/2006	SJ60218	RC		1.8	UG/L	SELENIUM	
6/20/2006	SJ61421	RC	E	0.6	UG/L	SELENIUM	
7/18/2006	SJ62670	RC		2.4	UG/L	SELENIUM	
8/23/2006	SJ64950	RC	<	1	UG/L	SELENIUM	
9/27/2006	SJ67208	RC		2.27	UG/L	SELENIUM	
10/4/2006	SJ67597	RC	E	0.77	UG/L	SELENIUM	
11/1/2006	SJ69124	RC	E	0.68	UG/L	SELENIUM	
12/6/2006	SJ70946	RC	E	0.43	UG/L	SELENIUM	
5/25/2005	SJ29268	R15		6.7	UG/L	SELENIUM	
5/25/2005	SJ29270	R15		7.2	UG/L	SELENIUM	
6/28/2005	SJ32009	R15		4.7	UG/L	SELENIUM	
7/18/2005	SJ33251	R15		4.9	UG/L	SELENIUM	
8/15/2005	SJ35323	R15		1.5	UG/L	SELENIUM	
9/19/2005	SJ37705	R15		3.5	UG/L	SELENIUM	
10/24/2005	SJ40050	R15		4.8	UG/L	SELENIUM	
11/21/2005	SJ42170	R15		4.3	UG/L	SELENIUM	
12/19/2005	SJ43844	R15		1.6	UG/L	SELENIUM	
1/23/2006	SJ51346	R15		1.5	UG/L	SELENIUM	
2/27/2006	SJ54251	R15		1.7	UG/L	SELENIUM	
4/25/2006	SJ58201	R15		4.5	UG/L	SELENIUM	
5/15/2006	SJ59381	R15		5.3	UG/L	SELENIUM	
6/19/2006	SJ61360	R15	E	0.9	UG/L	SELENIUM	
7/31/2006	SJ63756	R15		1.1	UG/L	SELENIUM	
8/21/2006	SJ64799	R15		1.17	UG/L	SELENIUM	
9/18/2006	SJ66432	R15		5.21	UG/L	SELENIUM	
10/30/2006	SJ68985	R15		1.3	UG/L	SELENIUM	
11/29/2006	SJ70526	R15		5.26	UG/L	SELENIUM	
8/17/2004	SJ12675	RD		3.2	UG/L	SELENIUM	
9/7/2004	SJ13710	RD		3	UG/L	SELENIUM	
10/12/2004	SJ15510	RD		3.7	UG/L	SELENIUM	
11/16/2004	SJ17512	RD		1.3	UG/L	SELENIUM	
12/16/2004	SJ19250	RD		1.6	UG/L	SELENIUM	
1/18/2005	SJ20918	RD		5.9	UG/L	SELENIUM	
2/15/2005	SJ22632	RD		4.7	UG/L	SELENIUM	
3/15/2005	SJ24355	RD		5.9	UG/L	SELENIUM	
4/19/2005	SJ26782	RD		5.5	UG/L	SELENIUM	
5/17/2005	SJ28581	RD		5.6	UG/L	SELENIUM	
6/14/2005	SJ30509	RD		5.3	UG/L	SELENIUM	
7/19/2005	SJ33417	RD		5	UG/L	SELENIUM	
8/16/2005	SJ35430	RD		1.7	UG/L	SELENIUM	
9/27/2005	SJ38211	RD		3.3	UG/L	SELENIUM	
10/25/2005	SJ40112	RD		4.1	UG/L	SELENIUM	
11/15/2005	SJ41783	RD		4.4	UG/L	SELENIUM	
12/13/2005	SJ43486	RD		1.5	UG/L	SELENIUM	
1/17/2006	SJ50943	RD		1.9	UG/L	SELENIUM	
2/21/2006	SJ53782	RD		3.6	UG/L	SELENIUM	
3/23/2006	SJ56095	RD		3.9	UG/L	SELENIUM	
4/18/2006	SJ57818	RD		4.2	UG/L	SELENIUM	
5/30/2006	SJ60219	RD		3.8	UG/L	SELENIUM	
6/20/2006	SJ61422	RD		1.1	UG/L	SELENIUM	
7/18/2006	SJ62671	RD		4.7	UG/L	SELENIUM	
8/23/2006	SJ64951	RD		1.1	UG/L	SELENIUM	
9/27/2006	SJ67209	RD		4.37	UG/L	SELENIUM	
10/4/2006	SJ67598	RD		1.37	UG/L	SELENIUM	
11/1/2006	SJ69125	RD		1.37	UG/L	SELENIUM	
12/6/2006	SJ70947	RD	E	0.97	UG/L	SELENIUM	
7/12/2001	SJ48869	C1		5.6	UG/L	SELENIUM	
8/6/2001	SJ49790	C1		3.9	UG/L	SELENIUM	
9/14/2001	SJ51961	C1		4.2	UG/L	SELENIUM	

SAMPLE DATE	JOB #	LOCATION	SIGN*	VALUE	UNIT	ANALYTE	SAMPLE COMMENTS
10/3/2001	SJ52793	C1		4.1	UG/L	SELENIUM	
11/8/2001	SJ55859	C1		2	UG/L	SELENIUM	
12/4/2001	SJ58669	C1		1.9	UG/L	SELENIUM	
1/16/2002	SJ60603	C1		1.9	UG/L	SELENIUM	
2/5/2002	SJ61453	C1		3.7	UG/L	SELENIUM	
3/4/2002	SJ62555	C1		5.8	UG/L	SELENIUM	
4/8/2002	SJ64207	C1		4	UG/L	SELENIUM	
5/8/2002	SJ65944	C1		4.1	UG/L	SELENIUM	
6/11/2002	SJ67327	C1		3.4	UG/L	SELENIUM	
7/10/2002	SJ68493	C1		3.1	UG/L	SELENIUM	
8/14/2002	SJ70231	C1		4.1	UG/L	SELENIUM	
9/11/2002	SJ71592	C1		4.8	UG/L	SELENIUM	
10/2/2002	SJ72715	C1		3.2	UG/L	SELENIUM	
11/20/2002	SJ75051	C1		1.5	UG/L	SELENIUM	
12/26/2002	SJ76792	C1		1.5	UG/L	SELENIUM	
8/11/2004	SJ12334	C1		3.5	UG/L	SELENIUM	
9/15/2004	SJ14125	C1		3.1	UG/L	SELENIUM	
10/6/2004	SJ15239	C1		2.8	UG/L	SELENIUM	
11/17/2004	SJ17629	C1		1.2	UG/L	SELENIUM	
12/15/2004	SJ19160	C1	<	1	UG/L	SELENIUM	
1/19/2005	SJ20947	C1		5.3	UG/L	SELENIUM	
2/15/2005	SJ22636	C1		4.7	UG/L	SELENIUM	
3/16/2005	SJ24532	C1		6	UG/L	SELENIUM	
4/13/2005	SJ26373	C1		5.9	UG/L	SELENIUM	
5/11/2005	SJ28229	C1		4.8	UG/L	SELENIUM	
6/15/2005	SJ30807	C1		4.2	UG/L	SELENIUM	
7/13/2005	SJ32894	C1		4.7	UG/L	SELENIUM	
8/10/2005	SJ35094	C1		1.8	UG/L	SELENIUM	
9/14/2005	SJ37388	C1		3.5	UG/L	SELENIUM	
10/26/2005	SJ40280	C1		3.7	UG/L	SELENIUM	
11/16/2005	SJ41944	C1		4.7	UG/L	SELENIUM	
12/21/2005	SJ44026	C1		1.5	UG/L	SELENIUM	
1/11/2006	SJ50626	C1		2.2	UG/L	SELENIUM	
2/1/2006	SJ52119	C1		1.5	UG/L	SELENIUM	
3/15/2006	SJ55542	C1		3.8	UG/L	SELENIUM	
4/19/2006	SJ57896	C1		4.4	UG/L	SELENIUM	
5/17/2006	SJ59631	C1		2.1	UG/L	SELENIUM	
6/7/2006	SJ60703	C1		4.4	UG/L	SELENIUM	
7/12/2006	SJ62387	C1		1.3	UG/L	SELENIUM	
8/16/2006	SJ64621	C1		1.25	UG/L	SELENIUM	
9/13/2006	SJ66242	C1		4.18	UG/L	SELENIUM	
10/11/2006	SJ68030	C1		1.28	UG/L	SELENIUM	
11/8/2006	SJ69584	C1		4.41	UG/L	SELENIUM	
12/13/2006	SJ71334	C1		4.21	UG/L	SELENIUM	
8/11/2004	SJ12335	C2		1.4	UG/L	SELENIUM	
9/15/2004	SJ14126	C2	E	0.9	UG/L	SELENIUM	
10/6/2004	SJ15240	C2		1.5	UG/L	SELENIUM	
11/17/2004	SJ17630	C2		1.2	UG/L	SELENIUM	
12/15/2004	SJ19161	C2	<	1	UG/L	SELENIUM	
1/19/2005	SJ20948	C2		4.4	UG/L	SELENIUM	
2/15/2005	SJ22637	C2		2.1	UG/L	SELENIUM	
3/16/2005	SJ24533	C2		2.9	UG/L	SELENIUM	
4/13/2005	SJ26374	C2		5.7	UG/L	SELENIUM	
5/11/2005	SJ28228	C2		2.3	UG/L	SELENIUM	
6/15/2005	SJ30808	C2		1.7	UG/L	SELENIUM	
7/13/2005	SJ32895	C2		1.8	UG/L	SELENIUM	
8/10/2005	SJ35095	C2		1.2	UG/L	SELENIUM	
9/14/2005	SJ37389	C2		3.9	UG/L	SELENIUM	
10/26/2005	SJ40281	C2		2	UG/L	SELENIUM	
11/16/2005	SJ41945	C2		1.6	UG/L	SELENIUM	
12/21/2005	SJ44027	C2		1	UG/L	SELENIUM	
1/11/2006	SJ50627	C2		1.2	UG/L	SELENIUM	
2/1/2006	SJ52120	C2	E	0.9	UG/L	SELENIUM	

SAMPLE DATE	JOB #	LOCATION	SIGN*	VALUE	UNIT	ANALYTE	SAMPLE COMMENTS
3/15/2006	SJ55543	C2		1.3	UG/L	SELENIUM	
4/19/2006	SJ57897	C2		1.8	UG/L	SELENIUM	
5/17/2006	SJ59632	C2		1.5	UG/L	SELENIUM	
6/7/2006	SJ60704	C2	E	0.9	UG/L	SELENIUM	
7/12/2006	SJ62388	C2	E	0.8	UG/L	SELENIUM	
8/16/2006	SJ64622	C2	E	0.85	UG/L	SELENIUM	
9/13/2006	SJ66243	C2		1.51	UG/L	SELENIUM	
10/11/2006	SJ68031	C2	E	0.9	UG/L	SELENIUM	
11/8/2006	SJ69585	C2		1.85	UG/L	SELENIUM	
12/13/2006	SJ71335	C2		1.01	UG/L	SELENIUM	
9/30/2002		SCCWRP SJ-2		2.63	UG/L	SELENIUM	AVG OF SAMPLE ID SJ-2 (A,B&C)
9/15/2003		SCCWRP SJ-2		3.63	UG/L	SELENIUM	AVG OF SAMPLE ID SJ-2 (A,B&C)
9/15/2003		SCCWRP SJ-22		3.53	UG/L	SELENIUM	AVG OF SAMPLE ID SJ-22 (A,B&C)
9/30/2002		SCCWRP SJ-3		4.23	UG/L	SELENIUM	AVG OF SAMPLE ID SJ-3 (A,B&C)
9/15/2003		SCCWRP SJ-3		3.83	UG/L	SELENIUM	AVG OF SAMPLE ID SJ-3 (A,B&C)
9/15/2003		SCCWRP SJ-33		4.07	UG/L	SELENIUM	AVG OF SAMPLE ID SJ-33 (A,B&C)
9/30/2002		SCCWRP SJ-4		1.50	UG/L	SELENIUM	AVG OF SAMPLE ID SJ-4 (A,B&C)
9/15/2003		SCCWRP SJ-4		1.53	UG/L	SELENIUM	AVG OF SAMPLE ID SJ-4 (A,B&C)
9/15/2003		SCCWRP SJ-44		1.90	UG/L	SELENIUM	AVG OF SAMPLE ID SJ-44 (A,B&C)

16 exceedances out of 203 representative datapoints

Notes:

* "SIGN" indicates E for estimated values - when the detected amount is above the Method Detection Limit but below the Reporting Level (thus, it is an estimated value) or < for non-detect values.

Table C.2: Impairment analysis for selenium measurements in San Jose Creek Reach 1

Data description	Location(s)	Number of Samples
SCCWRP grab samples from 2002 & 2003 snapshot surveys	varied	9
Receiving water station monitoring from 2001 to 2006: RA, RC, RD, C1 & C2	RA, RC, RD, C1 & C2	156
Receiving water station monitoring from 2005 & 2006: R14 & R15	R14 & R15	38
Total Number of Representative Samples		203
Number of Exceedances from all samples		**16**
Is it impaired? (see analysis below)		**No**
TMDL analysis (data from RA, RC, RD, C1 & C2) FROM 2001 TO MID-2005	RA, RC, RD, C1 & C2	78

Impairment Analysis for selenium for San Jose Creek - Reach 1

From Table 3.1 (MINIMUM NUMBER OF MEASURED EXCEEDANCES NEEDED TO PLACE A WATER SEGMENT ON THE SECTION 303(D) LIST FOR TOXICANTS) of the State Listing Policy:

For sample sizes greater than 129, the minimum number of measured exceedances is established where α and $\beta < 0.2$ and where $|\alpha - \beta|$ is minimized.
α = Excel® Function BINOMDIST(n-k, n, 1 – 0.03, TRUE)
β = Excel® Function BINOMDIST(k-1, n, 0.18, TRUE)
where n = the number of samples,
k = minimum number of measured exceedances to place a water on the section 303(d) list,
0.03 = acceptable exceedance proportion, and
0.18 = unacceptable exceedance proportion.

α = Excel® Function BINOMDIST(n-k, n, 1 – 0.03, TRUE)	0.000468275
β = Excel® Function BINOMDIST(k-1, n, 0.18, TRUE)	1.19652E-05

Both functions are less than 0.2 and $|\alpha - \beta|$ is minimized (less than 0.0004)
thus, San Jose Creek Reach 1 is not impaired for selenium

Table C.3: Lat/longs for receiving water monitoring stations in San Jose Creek Reach 1

LONGITUDE	LATITUDE	Station
-118.0193	34.0346	C-1
-118.0217	34.0365	C-2
-117.7986	34.0536	R-A
-117.9990	34.0299	R-D
-117.8517	34.0122	R-C
-117.8307	34.0285	R-14
-117.9538	34.0122	R-15
-118.0177	34.0337	SCCWRP SJ-2
-117.9716	34.0207	SCCWRP SJ-22
-117.9264	34.0082	SCCWRP SJ-3
-117.8814	33.9997	SCCWRP SJ-33
-117.8397	34.0200	SCCWRP SJ-4
-117.8163	34.0498	SCCWRP SJ-44

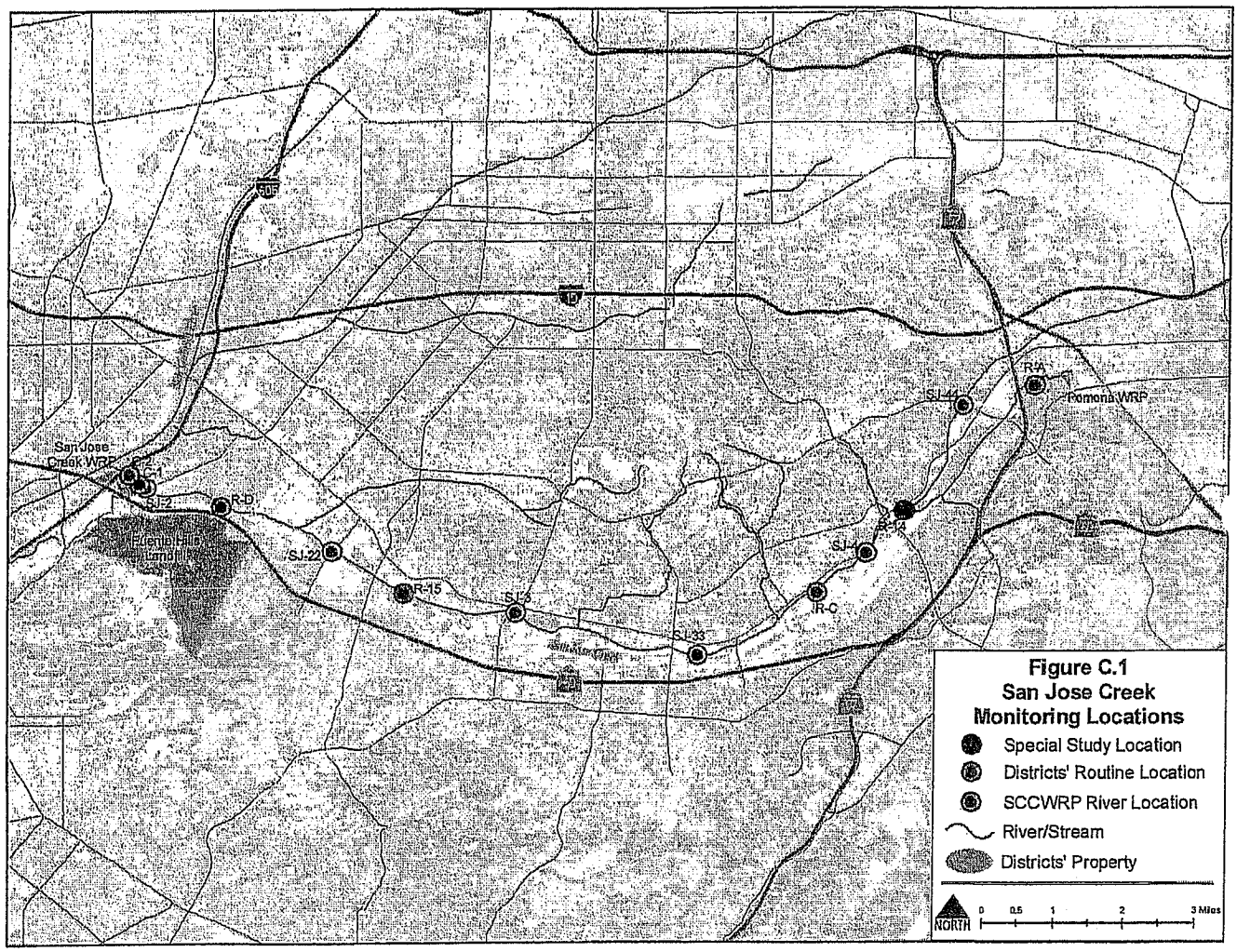
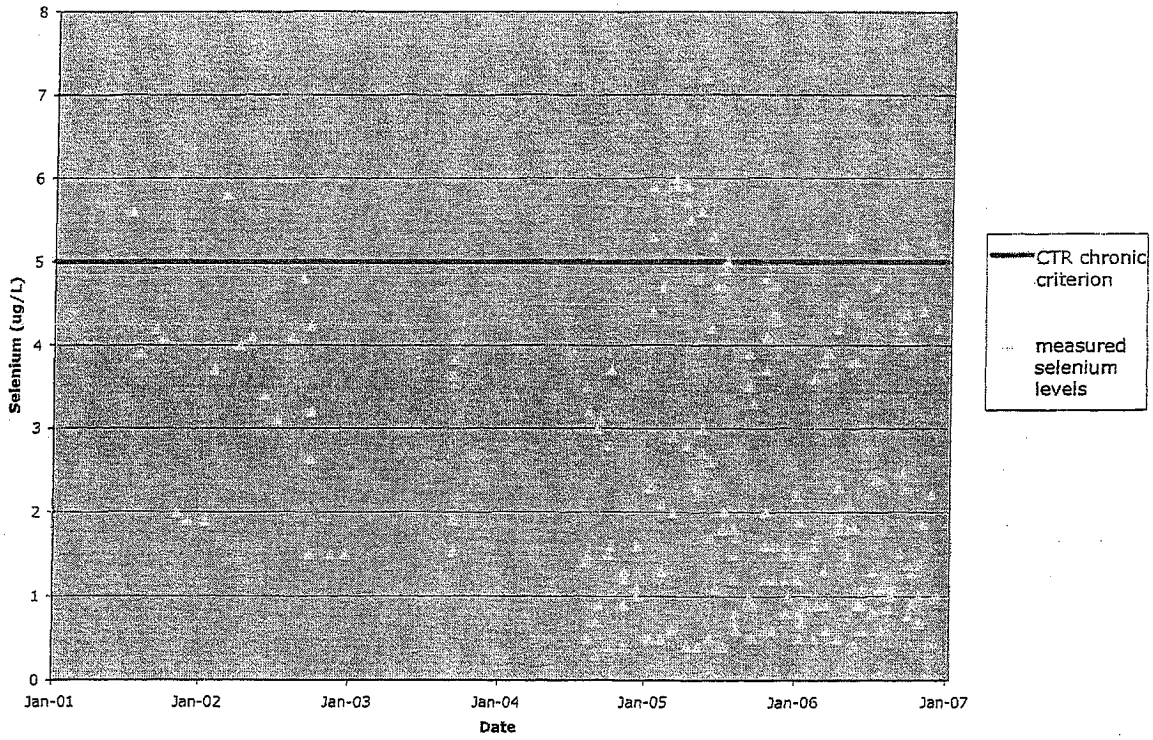


Figure C.1
San Jose Creek
Monitoring Locations
Special Study Location
Districts' Routine Location
SCCWRP River Location
River/Stream
Districts' Property
NORTH
0
0.5
1
2
3 Miles
San Jose Creek WRP
Pomona WRP
Puente Hills Landfill
SJ-1
SJ-2
SJ-3
SJ-4
SJ-22
SJ-33
R-A
R-B
R-C
R-D
R-15
605
10
57
71
60
210
91

Figure C.2: Selenium measured in San Jose Creek in comparison to CTR chronic criterion



ATTACHMENT C.1

Sanitation Districts of Los Angeles County

QUALITY ASSURANCE PROGRAM OF THE SANITATION DISTRICTS OF LOS ANGELES COUNTY LABORATORIES SECTION

January 2007

Revision 06.1.0

This Quality Assurance Program document has been reviewed by the Technical Services / Laboratories Section staff. The signatures below indicate that the plan is being accepted and that the contents shall be implemented in the Laboratories Section's daily activities.

Dwayne F. Fischer — 12/19/06

Dwayne F. Fischer, Manager of Laboratories — Date

12/19/06

Maria Y. Pang, Assistant Manager of Laboratories and Manager of Quality Assurance — Date

12/28/06

Jean Lee, Superintendent
Joint Water Pollution Control Plant Water Quality Laboratory — Date

1/4/07

Chris Wissman, Supervisor
Treatment Plant Laboratories — Date

12/21/06

Shawn Thompson, Supervisor
San Jose Creek Water Quality Laboratory
Biological Sciences — Date

12.22.06

Roger Lewis, Supervisor
San Jose Creek Water Quality Laboratory
Chemistry Research and Instrumentation — Date

TABLE OF CONTENTS

1. INTRODUCTION

The Sanitation Districts of Los Angeles County serve the water pollution control and solid waste management needs of approximately five million people in seventy-eight cities and unincorporated areas within Los Angeles County. The Districts operate eleven wastewater treatment plants and three active sanitary landfills, and the Laboratories Section provides the analytical support services relating to the operation of these facilities. The Laboratories Section also provides technical support to the Districts' Industrial Waste Section, the Wastewater Research Section, the Los Angeles County District Attorney's Environmental Crimes and OSHA Division, and the U.S. Department of Justice.

1.1 Quality Program Objective

This quality assurance (QA) program was prepared by the Sanitation Districts of Los Angeles County Laboratories Section with the ultimate goal of generating the quality of data necessary to meet the needs of the Districts' laboratories and the requirements of different regulatory agencies (California State Water Resources Control Board, California Department of Health Services, U.S. Environmental Protection Agency) for compliance purposes. Executing an effective QA program depends on the total commitment and attention of both management and staff at all levels to ensure the data produced by the laboratories is scientifically sound and legally defensible. This QA program encompasses all phases of the Districts laboratories' daily activities, starting from sample collection to data reporting, and provides means by which the integrity of data can be verified.

1.2 Capabilities

The Districts' laboratories perform analyses for wastewater and hazardous waste testing mandated by regulatory agencies in support of the Clean Water Act (CWA) and the Resource Conservation and Recovery Act (RCRA). Eight treatment plant laboratories have the capability to routinely analyze samples relating to the daily monitoring and control of wastewater treatment plant process parameters. Two larger laboratories and one of the treatment plant laboratories are capable of analyzing wastewater and hazardous waste samples involving more sophisticated analytical protocols and equipment and are able to perform analyses for a variety of both regulated and non-regulated parameters and contaminants. In addition, there are two research groups in the Laboratories Section that develop and validate new methodologies for the laboratories to keep abreast of current technology.

1.3 Facilities

The Laboratories Section of the Sanitation Districts of Los Angeles County is comprised of ten environmental laboratories. Each laboratory operates under one centralized quality assurance program and follows this Quality Assurance Program document. The ten laboratories are listed below:

LABORATORY	ADDRESS
1. San Jose Creek Water Quality Laboratory	1965 South Workman Mill Rd. Whittier, CA 90601
2. Joint Water Pollution Control Plant Water Quality Laboratory	24501 South Figueroa St. Carson, CA 90745
3. San Jose Creek Analytical Plant Laboratory	1965 South Workman Mill Rd. Whittier, CA 90601
4. Los Coyotes Treatment Plant Laboratory	16515 S. Piuma Avenue Cerritos, CA 90701
5. Long Beach Treatment Plant Laboratory	7400 Willow St. Long Beach, CA 90815
6. Whittier Narrows Treatment Plant Laboratory	301 N. Rosemead Blvd. El Monte, CA 91733
7. Saugus Treatment Plant Laboratory	26200 Springbrook Ave. Saugus, CA 91350
8. Pomona Treatment Plant Laboratory	295 Humane Way Pomona, CA 91766
9. Valencia Treatment Plant Laboratory	29185 The Old Road Valencia, CA 91355
10. Lancaster Treatment Plant Laboratory	1865 W. Avenue D Lancaster, CA 93534

At the San Jose Creek Water Quality Laboratory, separate areas are specifically designated for organics analyses, organics extractions, trace metals digestions, trace metals analyses, microbiological testing, research, and bioassays. Other locations are designated for sample receipt, log in, and storage. There is also a main stockroom where supplies and chemicals are dispensed.

The San Jose Creek Analytical Plant Laboratory and the Joint Water Pollution Control Plant Water Quality Laboratory have similar specified areas in their laboratory buildings dedicated to various aspects of laboratory functions.

Each treatment plant has a laboratory facility where process control samples collected by laboratory personnel can be analyzed promptly and independently.

Each facility has the necessary laboratory safety equipment including eyewash stations, emergency showers, fire blankets, spill kits, first aid materials, and fire extinguishers. Each

month, all of the safety related items are inspected, and each laboratory group is required to hold a meeting to discuss safety issues.

1.4 Laboratory Accreditation

For the analyses that are used for regulatory purposes, the California Department of Health Services Environmental Laboratory Accreditation Program (DHS-ELAP) accredits each of the Districts' laboratories. Each laboratory must successfully analyze proficiency-testing samples on an annual basis, and pass a biennial on-site inspection conducted by DHS-ELAP. The fields of testing for which the laboratories are accredited are found in Appendix A.

1.5 Equipment

Major instrumentation used by Districts' laboratories include:

- Inductively coupled plasma optical emission and mass spectrometers
- Gas chromatographs with various detectors such as thermal conductivity, electron capture, flame ionization, photoionization, chemiluminescence, and mass spectrometers
- High performance liquid chromatography instruments with UV/photodiode array, fluorescence, or mass spectrometer detectors
- Purge and trap concentrators
- Ion chromatograph
- Flow Injection Analyzers
- Total organic carbon analyzer
- Cold vapor mercury analyzers
- UV/VIS spectrophotometers

Other laboratory equipment includes:

- Specific ion meters and electrodes
- Dissolved oxygen meters
- Incubators / circulating baths
- Autoclaves
- Microscopes
- Colony counters
- Centrifuges
- Thermometer calibration baths
- Flashpoint analyzer
- Freezers / refrigerators
- Furnaces / ovens
- pH meters
- Spectrofluorometer
- Turbidimeters
- Conductivity meters
- Pure water systems
- Autotitrators
- Solvent-recovery apparatus
- Solid phase extraction apparatus
- Analytical and top-loading balances
- Composite and discrete samplers
- Microwave digesters
- Evaporators

2. ORGANIZATION OF THE SANITATION DISTRICTS OF LOS ANGELES COUNTY

2.1 Sanitation Districts Overview

2.1.1 The Sanitation Districts of Los Angeles County consists of eight major departments: Office Engineering, Solid Waste Management, Sewerage, Technical Services, Financial Planning, Facilities Management, Human Resources, and Administrative Services (Appendix B).

2.1.2 The eight departments are responsible for their activities to the Chief Engineer and General Manager as well as the Assistant Chief Engineer and Assistant General Manager.

2.1.3 The Chief Engineer and General Manager reports to the Board of Directors of the Sanitation Districts.

3. ORGANIZATION OF THE LABORATORIES SECTION AND QUALIFICATIONS OF PERSONNEL

3.1 Laboratories Section Overview

3.1.1 The Laboratories Section falls under the jurisdiction of the Technical Services Department and is under the direction of the Manager of Laboratories.

3.1.2 The Laboratories Section consists of five major subsections: Quality Assurance/Sample Receiving, San Jose Creek Water Quality Laboratory (SJCWQL), Joint Water Pollution Control Plant Water Quality Laboratory (JWPCPWQL), Treatment Plant Laboratories (TPLs), and Laboratory Services. Approximately 140 permanent employees currently work in managerial, supervisory, scientific, technical, and clerical laboratory positions. The Laboratories Section also has individuals employed on a part-time or temporary basis.

3.1.3 Each subsection has either a Laboratory Superintendent or Laboratory Supervisor who reports directly to the Manager of Laboratories. The Superintendent of JWPCPWQL, the Supervisor of the Treatment Plant Laboratories, the Supervisor of SJCWQL Biological Sciences, the Supervisor of SJCWQL Chemistry Research and Instrumentation, the Supervisor of Laboratory Services, and the Quality Assurance Manager are responsible for the over-all operation of the subsection(s) under their jurisdiction.

3.1.4 The Superintendent or Supervisors are assisted by group supervisors and supervising professionals who are responsible for and oversee the daily activities of their respective groups. The Laboratory Superintendent and Laboratory Supervisors have a bachelor's degree or an advanced degree in chemistry, biology, microbiology, or a closely related

science, from an accredited college or university in addition to experience in the environmental field.

3.1.5 Chemists, Microbiologists, and Biologists comprise the professional staff. The minimum entry-level requirement for these positions is a bachelor's degree in the respective science or a closely related field, or performing professional level analyses in the respective science for a specified number of years. A number of Section professionals also have advanced degrees and many have previous experience in water quality laboratories.

3.1.6 Laboratory Technicians work in the same three branches of science noted above. The minimum entry-level requirement is twelve college units in chemistry, biology, microbiology, or a closely related field. Most of the Districts' Laboratory Technicians have four-year college degrees in a science field.

3.2 San Jose Creek Water Quality Laboratory

The SJCWQL subsection includes separate groups involved in chemistry, microbiology, biology, and research. The supervisor of each group reports to the Manager and Assistant Manager of Laboratories.

3.2.1 The analytical chemistry work at SJCWQL is performed by the Instrumental Chemistry Group. The group conducts analyses for trace metals and organic compounds. The Instrumental Chemistry group is under the direction of the Supervisor of Chemistry Research and Instrumentation. The group has two Supervising Chemists, three Senior Chemists, four Chemists, one Senior Laboratory Technician, four Laboratory Technicians, three Laboratory Attendants, and one temporary Laboratory Technician. The group performs chemical analyses required for monthly National Pollutant Discharge Elimination System (NPDES) permit monitoring of the inland water reclamation plants. In addition, the personnel analyze industrial wastes, ocean sediment samples, groundwater, hazardous wastes, and other special samples requiring sophisticated methodologies.

3.2.2 The Microbiology Group at SJCWQL does some routine monitoring, but is primarily concerned with process laboratory research programs. In addition to all phases of coliform testing, research in the fields of parasitology, bacteriology, mycology, virology, and molecular biology are conducted. The Microbiology Group operates under the direction of the Supervisor of Biological Sciences and is comprised of a Laboratory Supervisor, one Senior Microbiologist, two Microbiologists, two Senior Laboratory Technicians, and four Laboratory Technicians.

3.2.3 The Biology Group, also under the direction of the Supervisor of Biological Sciences, is comprised of a Laboratory Supervisor, one Supervising Biologist, four Biologists, one Senior Laboratory Technician, five Laboratory Technicians, and seven temporary Laboratory Technicians. The major responsibility for the Biology Group is the performance of acute and chronic bioassays and toxicity reduction/identification evaluations on treatment plant effluents and receiving waters using standard toxicity test

procedures developed by the EPA. The Biology Group is also responsible for the monthly monitoring and sample collection of the San Gabriel and Rio Hondo Rivers, and Coyote Creek as required by the NPDES permits for the San Jose Creek, Whittier Narrows, Los Coyotes, and Long Beach Water Reclamation Plants (WRPs). In addition, to comply with the Districts' NPDES permit monitoring requirements, bioassessment surveys are conducted by the group. Bioassessment sampling involves the collection of benthic macroinvertebrates (BMIs), physical habitat observations, and flow measurements. The Biology Group also conducts bioassays for special areas of interest including experimental treatment plant processes, interpretation techniques for toxicity data, and developing methods for identifying toxic constituents in water samples.

3.2.4 The Research Group is under the direction of the Supervisor of Chemistry Research and Instrumentation. The group has a Laboratory Supervisor, two Research Chemists, two Senior Chemists, two Chemists, and one Laboratory Technician who conduct research in areas related to wastewater treatment and analysis. They adopt procedures from the literature, develop techniques based on in-house expertise, conduct specialized test procedures of a non-routine nature and publish papers and reports. The group provides technical expertise on wastewater and hazardous wastes issues within the Districts. Research Chemists also work closely with outside agencies and academic institutions on multiple research projects that are of benefit to the overall operational goals and objectives of the Districts. In addition, the group works closely with the County District Attorney's office and other law enforcement agencies involved with environmental crimes issues.

3.3 Joint Water Pollution Control Plant Water Quality Laboratory

The JWPCPWQL subsection includes separate groups involved in Process Control/Sample Receiving, Organic Chemistry/Air Toxics, Microbiology, and Research. The supervisor of each group reports to the Superintendent of the JWPCP Laboratory.

3.3.1 The Process Control/Wet Chemistry/Sample Receiving Group is under the direction of a Supervising Chemist and carries out the daily monitoring required for the Joint Water Pollution Control Plant (JWPCP) as well as specialized testing required for regulatory purposes. Process Control operates 365 days a year and is staffed with two Chemists, two Senior Laboratory Technicians, eight Laboratory Technicians, one Laboratory Attendant, and four temporary Laboratory Technicians. The major focus of Process Control is to monitor the treatment process of the JWPCP treatment plant, the largest of the Districts plants. The group also performs chemical analyses not required on a daily basis (e.g., cyanide, boron, fluoride). Special research projects in conjunction with process control modifications are also conducted in the laboratory.

3.3.2 The Organic Chemistry Group is under the direction of a Laboratory Supervisor and is responsible for the analysis of pesticides and PCBs in wastewater, receiving water, sediments, fish, sludge, and well waters. The group also carries out the Districts' monitoring for toxic organic components, sulfur compounds, and permanent gases in air and gas samples from sanitary landfills and wastewater treatment facilities. The group

has two Senior Chemists, three Chemists, five Laboratory Technicians, and one temporary Laboratory Technician.

3.3.3 The Microbiology Group is under the direction of a Laboratory Supervisor. The group is responsible for performing NPDES permit monitoring at the shoreline, near shore and outfall stations for total coliform, fecal coliform and enterococcus bacteria. Total chlorine residual, total coliform and enterococcus analyses are performed daily at the outfall. The group also monitors the JWPCP biosolids for fecal coliform and *Salmonellae*, supports Districts research projects, and participates in regional bight studies. The group performs emergency monitoring as needed. Two Microbiologists, one Senior Laboratory Technician, and four Laboratory Technicians make up the group.

3.3.4 The Research Group is under the direction of a Laboratory Supervisor. The group primarily carries out research and analytical methods development work related to the analysis of contaminants and environmental pollutants present in air/gas samples. This would include the analysis of volatile organic compounds (VOCs), sulfur gas compounds, volatile silicon compounds, volatile organometallic compounds, amines, carboxylic acids, hydrocarbons, oxygenates, and odorant compounds. In addition, it also carries out other troubleshooting and special project work related to environmental chemistry of aqueous systems. The Research Group has employed GC, GC-MS, solid phase microextraction (SPME), UV-Visible spectrometry, electrochemical, cryogenic/low temperature methods, olfactory detection, and ion chromatography (IC) techniques. It also provides scientific expertise and technical assistance for the Districts staff, as well as for outside entities. As part of the Districts odor-monitoring program, it operates a ten-person odor panel that is used to measure odor intensities for specified samples. The Research Group is staffed with one Research Chemist, two Senior Chemists, two Chemists, and a Laboratory Technician.

3.4 Treatment Plant Laboratories

The Treatment Plant Laboratories (TPLs) group consists of eight facilities: Los Coyotes, Long Beach, Whittier Narrows, Saugus, Pomona, Valencia, and Lancaster TPLs, and the APL, which is located at the San Jose Creek WRP.

3.4.1 The group is under the direction of a Laboratory Supervisor who is assisted by one Supervising Chemist, one Senior Chemist, and four Chemists. Each TPL has one or more Senior Laboratory Technicians and Laboratory Technicians. In addition, there are rotating Laboratory Technicians who are assigned to different TPLs as needed. The TPLs are staffed seven days a week.

3.4.2 The TPLs are primarily concerned with the daily process control of the water reclamation plants. Special research projects in conjunction with process control modifications are also conducted in the laboratories. Additional duties of the TPLs include daily, weekly, bi-weekly, monthly, and semi-annual monitoring pursuant to NPDES discharge permits. In addition to performing the routine process monitoring, the APL has additional capabilities to perform more complex types of analyses and to conduct research studies.

3.4.3 There are no laboratories at the La Cañada and Palmdale WRPs. Consequently, the APL also functions as the TPL for the La Cañada WRP, and the Lancaster TPL also functions as the TPL for the Palmdale WRP.

3.5 Quality Assurance / Sample Receiving

The Assistant Manager of Laboratories has the additional title as Manager of Quality Assurance. The Assistant Manager oversees both the Quality Assurance Group and the Sample Receiving Group. The two groups are comprised of one Supervising Chemist, one Senior Chemist, two Chemists, one Senior Laboratory Technician, six Laboratory Technicians, one Laboratory Attendant, and five temporary Laboratory Technicians. Quality Assurance personnel are responsible for improving and maintaining the validity and reliability of data produced in the Laboratories Section. The Sample Receiving personnel are responsible for collecting samples for NPDES monitoring and research projects, and receiving and handling all other samples submitted to the laboratories for analysis.

3.6 Laboratory Services

The Laboratory Services group is staffed with a Laboratory Supervisor, one Laboratory Storekeeper, one Stock Clerk, and one General Services Worker. The stockroom staff maintains the inventory of laboratory supplies, prepares the laboratory order requisition forms, receives deliveries, and coordinates payment of invoices for the items and services received. The group is also responsible for evaluating and authorizing the maintenance and repairs to the laboratory facilities, providing for the proper disposal of the laboratory hazardous waste, and maintaining the Material Safety Data Sheet files at the SJCWQL.

4. JOB DESCRIPTION AND RESPONSIBILITIES OF KEY STAFF

4.1 Manager of Laboratories

The Manager of Laboratories receives directions from the Technical Services Departmental Engineer. The Manager of Laboratories plans, organizes, and directs the overall activities of the Districts' water quality and process control laboratories. He exercises administrative direction and technical guidance over professional scientific, technical laboratory, and clerical employees.

Other duties and responsibilities involve managing and coordinating the activities of the Laboratories Section to provide chemical, bacteriological, biological, and physical testing of environmental samples related to the operation of Districts' water reclamation plants and landfills. The Manager directs the preparation of reports regarding the effect of Districts' operation on the environment and demonstrated compliance with Federal and State standards, initiates specialized testing and analyses, studies, and research projects, and analyzes laboratory data and reports. He also prepares the laboratory budget and authorizes expenditures; recommends and approves improvements in procedures, equipment and materials; represents the laboratories at meetings and conferences; recommends and consults regarding the design of the

laboratories; formulates and implements laboratory policies; oversees the Laboratories Section's safety program; recommends personnel actions; evaluates the work of subordinates; and performs related duties as required.

4.2 Assistant Manager of Laboratories / Quality Assurance Manager

The Assistant Manager of Laboratories receives directions from the Manager of Laboratories and assumes the duties of the Manager of Laboratories during periods of absence. The Assistant Manager participates in directing the chemical, microbiological, biological and physical testing of environmental samples that are performed by the Laboratories Section's staff. She analyzes regular and special laboratory correspondence and reports, coordinates work between laboratory supervisors and other section heads, reviews and makes recommendations on personnel actions. She also participates in formulating and implementing laboratory operation policies, standards and procedures, coordinates special projects with other institutions and agencies, and performs other duties as required. The Assistant Manager of Laboratories is also the Quality Assurance Manager of the Laboratories Section.

4.3 Superintendent of the Joint Water Pollution Control Plant Water Quality Laboratory

The Superintendent of the JWPCPWQL reports to the Manager of Laboratories. She insures the validity of, and approves data generated by the laboratory. The Superintendent is involved in the automation of laboratory tasks and computerization of all data handling, and developing the laboratory capabilities to include the most current analytical methodologies.

4.4 Supervisor of Chemistry Research and Instrumentation, SJCWQL
Supervisor of Biological Sciences, SJCWQL

Two Supervisors oversee the operation of the laboratories at the SJCWQL, and both report to the Manager of Laboratories. They direct, coordinate, and evaluate the work of subordinate laboratory supervisors, prepare and review laboratory reports and correspondence, and review laboratory data. They also participate in the planning of new projects with engineering and other technical staff, coordinate interdisciplinary scientific projects, implement laboratory policies, and recommend personnel actions.

4.5 Supervisor of Treatment Plant Laboratories

The Supervisor of Treatment Plant Laboratories oversees professional and technical laboratory personnel at the Districts' Treatment Plant laboratories. He evaluates data generated by the laboratories and provides technical assistance pertaining to laboratory and treatment plant issues. He reports to the Manager of Laboratories.

4.6 Supervisor of Quality Assurance and Sample Receiving

The Supervising Chemist of the Districts' Quality Assurance and Sample Receiving Groups at the San Jose Creek facility is responsible for monitoring the routine operational performance of the laboratory and ensuring that quality control measures described in this manual are being

followed. The Supervising Chemist also has direct oversight of the Sample Receiving Group to ensure that all samples are properly logged-in, stored, and distributed to the correct laboratory analytical groups or commercial laboratories. The collection of samples related to the discharge permits of the Districts' wastewater treatment plants is also under her supervision. She reports to the Assistant Manager of Laboratories.

4.7 Supervisor of Laboratory Services

The Supervisor of Laboratory Services provides technical assistance pertaining to the proper operation of the SJCWQL, ensuring that all aspects of the facility are fully functional. He evaluates any problems and authorizes the maintenance or repairs, whether by District personnel or outside contractors, to make certain that all needed utilities are available as needed for the laboratory. He also supervises the operation and personnel of the laboratory stockroom. He reports to the Manager of Laboratories.

4.8 Group Supervisors, SJCWQL

4.8.1 Two Supervising Chemists lead the Instrumentation Group at SJCWQL. The Supervising Chemist of the Organics Group oversees the sample preparation and analyses of volatile organic compounds and semi-volatile compounds (base/neutral/acid extractables) using gas and liquid chromatography techniques. The Supervising Chemist of the Metals Group directs the sample preparation and analyses of trace metals by inductively coupled plasma and cold vapor techniques. Both of these supervisors insure that proper sample handling and holding times are observed and appropriate methods are being used in performing the analyses. They also check that the prescribed QA/QC protocols are being followed, and confirm that all analysts have the necessary training to perform analytical tasks safely and accurately. Each is responsible for checking the validity and integrity of data generated by their respective groups and both report to the Supervisor of Chemistry Research and Instrumentation.

4.8.2 Under the direction of the Supervisor of Biological Sciences, the Supervisor of the Microbiology Group at SJCWQL is responsible for environmental research and program management, specifically in the public health aspects of water reclamation, water reuse, and waste solids recycling. She coordinates the activities of a scientific staff of microbiologists with engineering projects, and is responsible for managing the microbiology phase of research programs in public health aspects of water reclamation and reuse and sludge utilization. The group performs analyses and studies in areas of indicator and pathogenic bacteriology, parasitology, mycology, and virology.

4.8.3 The Supervisor of the Biology Group at SJCWQL, assisted by a Supervising Biologist, directs the work of Biologists and Laboratory Technicians in marine and freshwater biology. They supervise the collection of water samples for chemical and biological analyses and maintain a state-certified bioassay laboratory such that all State Water Resources Control Board requirements are met. They coordinate, perform, and/or supervise the various aspects of routine and research bioassay testing, and train, assign, and supervise biologists and laboratory technicians in the performance of chemical and

biological testing. They also consult with the Supervisor of Biological Sciences and engineering groups on investigative projects.

4.8.4 The Supervisor of the Research Group at SJCWQL oversees a group that is responsible for conducting research in areas related to wastewater treatment and testing, development and validation of new test protocols, and conducting non-routine specialized analyses on an as-requested basis. He also provides technical expertise and analytical support to different groups within the Districts and to the County District Attorney's Environmental Crimes and OSHA Division. He reports to the Supervisor of Chemistry Research and Instrumentation.

4.9 Group Supervisors, JWPCPWQL

4.9.1 The Supervisor of Organic Chemistry at JWPCPWQL is responsible for the activities and operations of the group which analyzes: air and gas samples for toxic organic components, sulfur compounds and permanent gases; wastewater, receiving water, well water, sludge and sediment samples for pesticides and PCBs; and fish samples for pesticides, PCBs, lipids, and moisture. He is responsible for insuring that all analysts in the group observe proper QA/QC practices to insure the quality and validity of results, and reports to the Superintendent of JWPCPWQL.

4.9.2 The Supervising Chemist of Process Control, Wet Chemistry, and Sample Receiving at JWPCPWQL, under the direction of the Laboratory Superintendent, verifies data used for daily plant process control testing at JWPCP, and is responsible for the wet chemistry data produced for NPDES permit monitoring requirements of JWPCP and other Districts facilities. He oversees the training of analysts in his group, and evaluates their performance. He is also responsible for the sampling, receipt, login and storage of most of the samples analyzed within the laboratory and maintenance of both the TDJ and LABDATA databases. An additional responsibility is the maintenance of the physical infrastructure of the laboratory buildings including HVAC and pure water systems.

4.9.3 The Supervisor of Microbiology at JWPCPWQL coordinates a staff responsible for bacteriological monitoring as required by the JWPCP NPDES and biosolids reuse permits. Another NPDES requirement includes the daily analysis of the Districts' outfall for total chlorine residual. Additional work may include method development and treatment plant process monitoring related to biological reactors and digesters. The supervisor is responsible for evaluating the laboratory performance including QA/QC practices and reporting verified data to the Superintendent of JWPCPWQL.

4.9.4 The Supervisor of Research at JWPCPWQL directs research and analytical methods development work related to environmental chemistry and pollution control. Most of this work has been concerned with the field of air pollution chemistry, and odorant characterization. However, some projects have involved water pollution and solid waste issues. He also coordinates the activities of his group with the other scientific and engineering groups in order to troubleshoot problems and develop better analytical

techniques. He evaluates the performance of the laboratory staff, acts as a technical consultant to the engineering staff, and writes technical reports and proposals.

5. THE QUALITY ASSURANCE GROUP

The Quality Assurance staff is charged with the responsibility of monitoring the validity and reliability of data generated by the Districts' laboratories to comply with the requisites of the California State Water Resources Control Board, California Department of Health Services and the U.S. Environmental Protection Agency. The group's main concern is to assure continuous improvement in the laboratories' performance by:

- Reviewing and updating the Quality Assurance Program document and making necessary changes in the program to continually improve the quality of data that the laboratories generate.
- Reviewing, updating, and providing training for the Laboratories Section Ethics and Data Integrity program.
- Managing and organizing the Laboratories Section's written standard operating procedures and ensuring that the latest revisions are available to the laboratory personnel.
- Establishing guidelines on intralaboratory quality assurance practices including, but not limited to, the use of sample and reagent blanks and daily calibration standards, laboratory control standards, duplicate and fortified samples to assess precision and accuracy.
- Maintaining an on-going interlaboratory quality control program by the preparation and distribution of QC reference standards, split samples and blind samples, where feasible.
- Organizing the Laboratories Section's participation in proficiency testing to comply with the California Environmental Laboratory Accreditation Program (ELAP) and the USEPA Discharge Monitoring Report-Quality Assurance (DMR-QA) requirements.
- Ensuring that samples are collected and analyzed according to the laboratory standard operating procedures and that all data are calculated and reported in units comparable and consistent with the regulatory agencies' requirements.
- Affirming that corrective action is performed and documented whenever the analysis of blanks, laboratory control standards, sample duplicates, spikes, or other required quality control measures are out of control.
- Requiring contract laboratories to provide a QA/QC data package for samples submitted for specific programs and projects to ensure that required quality criteria are met.
- Performing periodic audits of the laboratories to ensure that the Quality Assurance Program is effective and being followed.
- Ensuring that each Districts laboratory meets all of the requirements necessary to maintain their accreditation to perform analyses.

6. TECHNICAL STAFF

The Laboratories Section technical staff includes the personnel who are directly or indirectly involved in performing sample analyses. Each employee must meet certain minimum requirements for their position through education and experience. Before performing any analysis, each laboratory analyst must be thoroughly trained by an experienced staff member in all aspects of the analysis.

6.1 Technical Staff Training

New and rotated personnel are trained initially by the immediate supervisor or the principal analyst. The training begins with a review of the relevant SOPs, including safety and quality assurance practices. The new employee then works with an analyst experienced in the required tests and must perform and pass an initial demonstration of proficiency (see §15.1).

6.1.1 A training checklist is used to ensure that important points are not overlooked. At the completion of the training, the new analyst and the supervisor review and sign the checklist to confirm that all the items were explained and/or demonstrated adequately.

6.1.2 Blind reference samples, if available for the analysis, are issued by the QA group and must be successfully completed before a new analyst is allowed to run tests on routine samples.

6.1.3 The technical staff members are individually evaluated on an annual basis by their immediate supervisor. The evaluations are reviewed by the laboratory management.

6.2 On-Going Education and Training

6.2.1 The Districts has a policy to reimburse employees for tuition expenses for classes relating to Districts employment. The employee must receive a passing grade and receive course credit in order to be reimbursed.

6.2.2 Analysts are often sent to attend classes or seminars sponsored by the manufacturers of equipment and instruments used in the laboratories in order to learn of new advances and increase their knowledge of the use of the products.

6.2.3 To encourage communication on scientific matters, monthly reports are prepared by the senior personnel in each group. These reports are available to all laboratory personnel so they will be aware of the activities of other laboratory groups. Meetings are held within and among laboratory groups whenever subjects of common interest arise.

6.2.4 Reference books and journals relating to the analyses performed by a laboratory group are available in the specific laboratory or with the supervisor concerned with that area of analysis. In addition, a small technical library is maintained at each of the two water quality laboratories. The Districts also maintains a joint technical library at the Joint Administration Office with over 100 technical publications and several thousand

technical references.

6.2.5 Technical personnel are encouraged to join recognized professional societies and attend conventions and seminars of those societies. The Districts' has a reimbursement policy for this purpose for personnel with job classifications of 'Professional'. All analysts are also encouraged to attend local conferences and presentations.

7. ETHICS AND DATA INTEGRITY PROGRAM

The Districts' laboratories are committed to only report data, test results and conclusions that are accurate, precise and of the highest quality. The Laboratories Section has developed an Ethics and Data Integrity Policy that must be adhered to by all of the Districts' laboratory personnel.

7.1 Any employee that knowingly reports falsified or improperly manipulated data will be subject to disciplinary action. Staff members who are aware of misrepresentation of facts regarding analytical data, or the manipulation of data, are required to immediately inform their supervisor, who, in turn, must notify the Manager of Quality Assurance or other appropriate individuals.

7.2 Each employee is required to attend a training session on ethics and data integrity and sign an Ethics and Data Integrity Agreement affirming that they understand the policy. Employees are also required to attend annual refresher sessions.

7.3 The Laboratories Section Ethics and Data Integrity Policies and Procedures are found in Appendix C of this document.

8. SAMPLING PROCEDURES

8.1 General Sampling Procedures

8.1.1 Special instructions for sample collection, the correct types of sample bottles, methods of sample preservation if needed, and holding periods are provided to sample collection personnel and analysts.

8.1.2 Sample request forms, sample tags and labels, and other sample tracking documentation are included during sample submittal (Appendix D).

8.1.3 Sample containers and chemical preservatives are supplied by the Sample Receiving Center at the San Jose Creek facility.

8.1.4 Sample chain of custody employed varies from facility to facility within the Laboratories Section. At each facility, it is specifically tailored to produce efficient sample handling and to insure sample integrity.

8.2 Sampling at the Treatment Plants

8.2.1 Routine composite samples are collected in refrigerated automatic samplers.

8.2.2 There are multiple configurations for automated composite samplers: six-bucket flow-weighted compositors, one-bucket time-weighted compositors, and highly configurable commercial automated samplers.

8.2.3 For hard-plumbed sampler configurations, the sample lines are continuously pump-driven or gravity fed to assure representativeness of the sample source.

8.2.4 For the six-bucket flow-weighted and one-bucket time-weighted samplers, the flow is briefly diverted from the sample line into the sample bucket every fifteen minutes.

8.2.5 For the six-bucket samplers, six four-hour composites are manually flow-composited using flow proportioned aliquot volumes from each bucket each morning.

8.2.6 For the configurable commercial samplers, samples are either flow-weighted by sampling at time intervals proportional to the projected flow or from a signal from a flow meter. The samplers may also be configured for time-weighted composites, multiplexed sampling, and numerous other sampling configurations.

8.2.7 Depending on the analyses required, some of the bottles used for sampling are previously marked with permanent identification and are washed and reused everyday, while others are used once and discarded.

8.2.8 The chain of custody is simple for on-site monitoring: The technician removes the sample from the sampler, makes a flow composite, transfers the sample to a clearly marked sample bottle, carries the bottles to the laboratory, and performs the analyses.

8.2.9 The same chain-of-custody applies to grab samples for special on-site testing (pH, temperature, chlorine residual, etc.). The technician collects, transports, and analyzes the samples.

8.2.10 Samples collected for tests other than the daily process control monitoring have a formal chain-of-custody. This is generated by the group conducting the sampling and accompanies the samples to the SJC Sample Receiving Center.

8.2.11 The Biology Group has written guidelines for sampling effluent and receiving waters for bioassay testing. These guidelines are found in the "Sample Collection Methods for Acute and Chronic Bioassay Testing" document available in CyberDOCS.

8.3 Sampling at the Joint Water Pollution Control Plant

8.3.1 Midnight to midnight 24-hour composite samples are collected for daily, weekly, and monthly testing. Grab samples are also collected for daily testing.

8.3.2 Liquid samples are collected as flow-weighted composites by refrigerated automatic samplers. Sludge and cake composite samples are collected as discrete grab samples throughout the period by plant operators. These composited grab samples are placed in permanently marked containers and refrigerated.

8.3.3 At midnight, plant operators change sample containers and move the composites to refrigerated storage, either in the laboratory's walk-in cold room or in refrigerators located throughout the treatment plant. Since the buckets are permanently marked, and there is only one sample per day from each sampler, there can be no confusion regarding sample identity.

8.3.4 The JWPCPWQL has a designated sample receiving station staffed by one laboratory attendant and one temporary laboratory technician. They are responsible for introducing samples into the laboratory's sample control system and maintaining the sampling equipment.

8.3.5 In the morning, the Laboratory Attendant collects and transports to the laboratory the samples not delivered by the plant operators. Since the buckets are permanently marked, and there is only one sample per day from each sampler, there can be no confusion regarding sample identity.

8.3.6 Each routine plant sample is uniquely identified in the TDJ database. A permanent number is given to each sample, and it is also designated by location code, sub-location code, and sample type. The sample date is also part of the permanent data record, distinguishing one day's sample from that of another day.

8.3.7 Analyses of all routine samples are done the day the samples are brought into the laboratory, and most of the samples are discarded on the same day. Any samples that must be saved are poured into appropriate sample containers, labeled, and placed in the laboratory walk-in refrigerator for storage.

8.3.8 Composite samples that require more extensive testing (e.g., monthly NPDES permit monitoring) are logged into the Districts' LABDATA database. A unique log number beginning with "JW", followed by five digits, identifies each sample. An additional number identifies each discrete sample aliquot container.

8.3.9 Additional non-routine samples may be collected by engineering aides and others and are submitted to the laboratory for various analyses. Sample request sheets or memos indicating the analyses desired accompany the samples. These samples are also logged into the LABDATA database.

8.3.10 Some JWPCP samples are analyzed at other laboratories. The JWPCPWQL sample receiving station transfers control of these samples to the SJCWQL sample receiving station. The samples are then either analyzed at SJCWQL or at a contract laboratory.

9. SAN JOSE CREEK SAMPLE RECEIVING CENTER (SJCSRC)

The Sample Receiving Center located at the San Jose Creek facility is the main sample receiving point for the Laboratories Section. It is under the direction of a Supervising Chemist. The staff conducts field sampling and also accepts a wide variety of samples submitted to the laboratory by other collection personnel.

9.1 Sample Receiving Procedures

9.1.1 Treatment plant and receiving water samples for process control and NPDES permit monitoring are collected by sample receiving staff or TPL technicians. Depending on the test parameters, these samples are analyzed at the TPLs or at other laboratories. The samples designated for SJCWQL, APL, JWPCPWQL, or commercial laboratories are transported to the SJCSRC for login.

9.1.2 A variety of other samples may be submitted to SJCSRC by non-laboratory personnel from the Districts' other departments (Sewerage, Solid Waste, Industrial Waste, etc.) or from Hazardous Materials investigators.

9.1.3 Samples taken for possible legal action are subjected to specialized chain of custody procedures, and stored by evidence sample custodians in dedicated, locked refrigerators.

9.1.4 All samples submitted to the Sample Receiving Center use sample submission forms that are filled out by the sample collectors. Sample tags and labels are also included when samples are submitted to the SJCSRC.

9.1.5 Sample chain of custody employed varies from facility to facility within the Laboratories Section. At each facility, it is specifically tailored to produce efficient sample handling and to insure sample integrity.

9.1.6 The samples submitted to the Sample Receiving Center are checked for properly filled-out sample submission forms, proper labeling, preservation, lack of headspace in containers (if required), and the temperature of the samples at the time of receipt. Any deviations from the expected are noted on the Sample Receipt Form (Appendix D).

9.1.7 All acceptable samples submitted to the SJCSRC are assigned unique identification numbers and are electronically logged in. For samples submitted with multiple containers, each sample container can be traced to the identification number. A description of the Laboratories Section's LABDATA data system used for logging-in samples can be found in Appendix E of this document.

9.1.7.1 Bioassay testing requires more than one sample during the duration of the test; therefore the bioassay test itself is given an identification number instead of the actual samples.

9.1.8 All samples are properly stored while under the custody of the SJCSRC until released to the laboratories for analysis. All samples shipped to outlying or commercial laboratories are packed to maintain the proper storage temperature.

9.1.9 The approval of the samples' analytical requests by the Laboratory Manager or Superintendent is required before analysis commences. Samples that require immediate analyses are delivered to the appropriate analyst. The remaining samples are properly stored and delivered to the analysts on the next working day.

9.1.10 Work assignment sheets are issued to each analyst daily, showing all pertinent identification information and the required tests.

10. SAMPLE HANDLING: CONTAINERS, PRESERVATION, STORAGE AND HOLDING PERIODS

Guidelines are provided to sample collectors and analysts in the use of proper sampling containers, sample preservation, and the time limit as to when an analysis must be performed in order to maintain the integrity of the samples and the results. Table 1 of Appendix F lists the recommended containers, preservatives, and holding periods.

10.1 Sample Containers

10.1.1 Sample containers are chosen to minimize changes in the sample after it is taken. Characteristics that the containers must possess are: a) must resist attack by the sample or the preservative, b) must not absorb or adsorb constituents of interest nor allow them to escape, c) must not add contamination that will appear in an analysis.

10.1.2 Appropriate sample containers are purchased from reputable laboratory suppliers who are required to provide certification of the cleaning procedures the containers undergo. Before being issued to sample collectors, each new batch of sample containers received is lot tested in a Districts laboratory for contaminants that might compromise analytical results.

10.1.3 Suitable containers for sample collection include glass or polyethylene bottles and jars. Glass bottles or vials with TFE-lined caps are required for most samples collected for trace organic analyses.

10.2 Sample Preservation

Preservation techniques can be utilized for some samples to retard the chemical and biological changes that inevitably continue after the sample is removed from the source. Sample preservation methods are generally limited to pH control, chemical addition and refrigeration.

10.2.1 The acids used for preservation (hydrochloric acid, nitric acid, sulfuric acid, phosphoric acid) are lot tested for interfering contaminants prior to use. Certain containers are

purchased with the preservative included in the container. These containers are lot tested in a Districts laboratory for contaminants that might compromise analytical results.

10.2.2 Refrigeration is a very common means for sample preservation. The temperatures of all of the refrigerators used for storing samples are monitored and recorded each working day.

10.3 Sample Storage

10.3.1 Samples that require storage at sub-ambient temperatures are kept in locked refrigerators or freezers monitored by the Sample Receiving personnel. The laboratories may receive samples in containers for a specific analysis, or they may collect sub-samples from multiple tests containers. These sub-samples are usually stored in the laboratory's own refrigerators/freezers while awaiting analysis. Evidence samples are stored in secured refrigerators.

10.4 Sample Holding Times

10.4.1 The container type, preservation, and holding times listed in Table 1 of Appendix F must be adhered to for all samples. If any of the listed requirements are not met, the analyst must fill out and submit a 'Notification for Discharge Exceedance or Qualified Results' (Appendix G) to the Assistant Manager of Laboratories and the Supervising Chemist of the Sample Receiving Center. A decision will then be made on whether the sample is to be recollected and analyzed, or the initial results (if any) reported with a qualification to the requestor of the sample.

10.4.2 The holding time for a composited sample begins at the end of the composite collection. For other sample types, the holding time begins at the time of sample collection.

11. REAGENTS, STANDARDS, AND MEDIA

Chemicals, standards and other materials used in the laboratories are obtained from reputable manufacturers and suppliers. The purity specifications are based upon the requirements of the analysis, but, generally, Analytical Reagent Grade or better is obtained.

11.1 Common Laboratory Chemicals and Reagents

11.1.1 Commonly used chemicals and reagents are purchased through a single centralized stockroom overseen by the Laboratory Services Supervisor. Stockroom personnel utilize an inventory system for reagents and chemicals which are stored and issued on a "first in, first out" rotating basis. A record is kept of each reagent indicating chemical name, descriptive information, maximum stock level, and amount in stock. Inventory records are adjusted as goods are received or issued.

11.1.2 Material Safety Data Sheets for all chemicals are retained and are available to all laboratory personnel. All chemicals, reagents, or their waste products are to be disposed of in a proper manner.

11.1.3 Certain materials are routinely screened before use. New lots of organic solvents used for extraction and analysis are tested for interfering contaminants prior to use. New lots of acids used for certain trace metals analyses are also checked before use.

11.1.4 Some multi-component reagents are prepared in the laboratories from the stock chemicals and reagents available in the stockroom. The preparations and shelf lives of these reagents are detailed in each SOP. Each laboratory maintains records to allow the traceability of each component of the reagent.

11.1.5 New lots of bacterial strains are tested before use with at least one positive and one negative control culture.

11.2 Laboratory Standards

11.2.1 Standards used in analyses are prepared in each laboratory from neat chemicals or are purchased already prepared, either off the shelf or as custom made standards. Each purchased standard must be accompanied by documentation of the manufacturer, concentration(s), reagent traceability, lot number, storage information, and expiration date.

11.2.2 Each of the standards used in an analysis has a specified expiration time listed in the standard operating procedure. The beginning of the time or date is when the standard is prepared.

11.2.3 For standards that are purchased already prepared, the expiration date of an unopened container is supplied by the manufacturer. For most analyses, the maximum expiration date for a properly stored purchased standard is one year from first opening of the container, or the manufacturer's expiration date, whichever is less. The expiration date of an opened container may be significantly less depending on the nature of the chemical(s) or the manufacturer's recommendations.

11.2.4 Secondary standards prepared from dilutions of a purchased prepared standard will have expiration dates equal to or less than those stated in 11.2.3, or as specified in the standard operating procedure.

11.2.5 Each laboratory is required to maintain fully traceable records for each standard used for an analysis. The records should contain, at a minimum, the source and preparation information including dates (receipt, preparation, expiration, etc.), lot numbers, concentrations, name of preparer, and other information deemed necessary to fully document the standard or reagent.

11.3 Culture Media

11.3.1 Dehydrated media is stored in tightly closed bottles in a dark area of low humidity, at less than 30°C, or as specified by the manufacturer.

11.3.2 A complete record of each lot of media received is maintained.

11.3.3 Media that does not cake, is not discolored, or does not show other signs of deterioration may be used until the manufacturer's expiration date.

11.3.4 Prepared media is stored following the recommendations of the manufacturer or the test method.

12. TEST METHODS AND STANDARD OPERATING PROCEDURES

Each of the Districts laboratories has written Standard Operating Procedures (SOPs) available for all tests that are performed in the laboratory. The written procedures provide all of the information necessary to perform the analyses in a manner that will produce results that are scientifically valid, defensible, and of known quality.

When results are reported for regulatory purposes, the SOPs are based upon EPA or Standard Methods procedures that the laboratories are certified to perform by the California Department of Health Services Environmental Laboratory Accreditation Program. The laboratory SOPs provide additional information such as instrument operation or handling specific matrices that may not be covered in the EPA or Standard Methods procedures. The analyst may not change or deviate from the procedure without authorization from a Laboratory Supervisor or Manager. Any modification must be fully documented.

12.1 Laboratories Section's Standard Operating Procedures

12.1.1 Current versions of the Laboratories Section's SOPs are available to all Districts' laboratory personnel through a document management system, CyberDOCS®, accessed through the Districts' intranet. This allows immediate access to new or updated procedures to all authorized laboratory supervisors and analysts. The Quality Assurance group maintains the security and version control of the documents.

12.1.2 The SOPs that are used on a routine basis are reviewed and updated annually.

12.2 Laboratory Method References

12.2.1 The laboratories attempt to use the most current references that are permitted as the basis for the laboratory SOPs. The references include:

- Standard Methods for the Examination of Water and Wastewater, 18th Edition 1992, 19th Edition 1995, and 20th Edition 1998.

- Methods for Chemical Analyses of Water and Wastes, U.S. Environmental Protection Agency, Rev. 1983.
- Test Methods for Evaluating Solid Waste Physical/ Chemical Methods, U.S. Environmental Protection Agency, SW-846, 3rd edition, 1986 and later updates.
- Guidelines Establishing Test Procedures for the Analysis of Pollutants under the Clean Water Act, Federal Register 40 CFR Part 136, Oct. 26, 1984,
- Criteria for Identification of Hazardous and Extremely Hazardous Wastes, Title 22, Div. 4, Ch. 30, California Administrative Code, 1985.
- Methods for the Determination of Metals in Environmental Samples, EPA/600/4-91/010.
- 1976 Annual Book of ASTM Standards, Part 31.
- AOAC Manual, 14th edition, 1984.
- Static Acute Bioassay Procedures for Hazardous Waste Samples, Polisini and Miller, California Department of Fish and Game Water Pollution Control Laboratory, 1988.
- Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms, EPA/600/4-85/013.
- Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, EPA/821-R-02-012.
- Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, EPA/821-R-02-013.
- Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms, EPA/821-R-02-014.
- Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms, EPA/600/R-95/136.

12.2.2 Methods currently used in Districts laboratories are listed in Tables 2-A and 2-B of Appendix F.

13. INSTRUMENT/EQUIPMENT OPERATION AND MAINTENANCE

The Laboratories Section uses a variety of instruments and equipment for the collection and analysis of samples, some of which are listed in §1.4. Analysts are required to be trained on the proper use and maintenance of the instruments and equipment used for their analyses.

13.1 General Operation, Training, Maintenance and Repairs

13.1.1 A copy of the manufacturer's manual for each instrument is accessible to any user. The manual is always consulted when a new analyst is being trained to correlate the manufacturer's guidelines with hands-on training and the SOP. New analysts are

encouraged to review the manual to increase their understanding of the operation of the instrument. This manual is also consulted any time problems arise.

13.1.2 Specific instructions on instrument set-up, operation and maintenance are provided in the appropriate SOP.

13.1.3 Documentation of instrument/equipment calibration, inspection and routine maintenance is maintained in each laboratory. Repairs and other non-routine maintenance records must also be maintained. At a minimum, each record should contain the problem, the date the problem was first observed, the work performed to fix the problem, the date the work was performed, and the outcome.

13.1.4 Service contracts are often purchased for major instruments. Instruments included are gas and liquid chromatographs, mass spectrometers, inductively coupled plasma spectrophotometers, purge and trap concentrators, and other equipment where a lengthy downtime would have a detrimental effect on the timely reporting of results.

13.1.5 Spare parts for some instruments are kept on hand and stored in the laboratory using the instrument. Other parts and consumables are ordered and kept at the central stockroom.

13.2 Thermometers

13.2.1 The QA Group administers a thermometer calibration check program. Laboratory thermometers used for ovens, incubators, water baths, autoclaves, refrigerators, freezers, and any other equipment used for compliance purposes are compared annually to reference thermometers traceable to the National Institute of Standards and Technology (NIST). A record of all calibrated thermometers and their assignments or distribution is maintained.

13.2.2 The calibration of each thermometer is checked at the temperature(s) it will be used at whenever possible.

13.2.3 Each thermometer is labeled with an identification number, the correction factor(s), and the date recalibration is required.

13.3 Monitoring of Temperatures

13.3.1 Each workday, personnel monitor temperatures of ovens, incubators, refrigerators, freezers, and other ancillary equipment. For equipment not used on a daily basis, the temperatures may be monitored on each day of operation or as required by the analysis method. The corrected temperature readings and any temperature adjustments are recorded in a temperature log.

13.3.2 If a temperature is outside the acceptance limits, the device may need a temperature control adjustment or repair.

13.3.3 If a temperature control adjustment must be made to bring a unit back within the acceptance limits, an indication of the adjustment must be made on the temperature log. It is recommended that one or more readings be taken and recorded later in the day to show that the adjustment brought the unit back to the proper temperature.

13.3.4 Autoclave temperatures are either continuously recorded or are monitored by the use of maximum temperature holding thermometers. Demonstration of sterilization is verified by the periodic use of spore ampules or other approved methods.

13.4 Spectrophotometers

13.4.1 Spectrophotometers are tested for wavelength accuracy and absorbance linearity by the annual issuance of a testing solution (cobaltous ammonium sulfate) prepared by the QA Group.

13.5 Balances

13.8.1 Laboratory balances are serviced and calibrated on an annual basis by a balance specialty company. Balances are also inspected and calibrated whenever a problem is observed or suspected.

13.8.2 The calibration of each balance is checked and recorded on each day of use using reference weights that bracket the expected sample weights to be measured, or as specified in the analytical procedure.

14. CALIBRATION PROCEDURES

All testing that requires a calibration using one or more standards must follow the calibration requirements of the written procedure. The SOPs include specific information on the proper calibration procedure to follow, including the number of standards, appropriate concentrations, curve fit types, and the acceptance criteria for a successful calibration.

14.1 Calibration Requirements

14.1.1 Calibration standards are analyzed as required by each procedure. For some tests, especially those without time restraint limitations due to long analytical runs, multi-point calibrations are performed on each day of analysis. Other analysis methods may allow for an initial multi-point calibration with a daily verification standard to ensure that the initial calibration standard curve is still valid. These check solutions have a concentration at or near the mid-point of the calibration curve. If the results of the check standard do not meet the method specific criteria, a new initial calibration curve must be prepared.

14.1.2 If response factors or calibration factors are used, the calculated percent relative standard deviation (%RSD) for each analyte of interest must either be less than the

method-specified value or as required by the method. If linear regression is performed, use the minimum correlation coefficient (r) specified in the method. If the minimum correlation coefficient is not specified, then a minimum value of 0.995 is recommended. See Appendix G for common laboratory calculations.

14.1.3 For calibrations with two or more standards, the lowest and highest points on the curve establish the working range for the analysis. The lowest standard should be equivalent to the method reporting limit, after adjustment for method-specific parameters such as routine concentrations or dilutions. The lowest standard must also be above the method detection limit. The reporting of results below the working range is not allowed without a clear notation that these results are 'estimated' values. For a result that exceeds the highest calibration standard, the sample must be reanalyzed using a smaller sample size or a dilution of the sample. If this is not possible, the result must be reported with an appropriate data qualifier and explanation.

14.1.4 For analyses that do not require calibration curves (i.e., titrimetric or gravimetric) or those whose methods allow the use of a single standard due to the inherent linearity of the instrument (i.e., ICP), the reporting limits are determined and verified during the laboratory's initial method validation. Additional verifications are performed as required in the analytical method.

14.1.5 Method-specific ongoing calibration verification checks are described in the individual SOPs.

15. QUALITY CONTROL PROCEDURES

The Districts' laboratories utilize various quality measures to ensure that testing and analytical procedures are operating within reasonable control. To accomplish this, various aspects of the analyses are monitored. These include the analyst's technique, reagents, standards, apparatus and instrumentation, and the precision and accuracy of the results. Each SOP contains a section that details the minimum quality control measures that must be performed for that analysis. Some common QC practices are listed in this section.

15.1 Individual Initial Demonstration of Proficiency

15.1.1 When a new or rotated analyst is initially assigned to a bench, the analyst must demonstrate proficiency (sometimes referred to as 'Demonstration of Capability') for each analytical chemistry method prior to generating data for any samples. After initial training on safety, instrumentation and methodology, the analyst is required to analyze a method blank and four replicates of laboratory fortified blanks at a concentration between ten times the method detection limit and the midpoint of the calibration curve, or as specified in the method. The blank and replicate standards must be processed according to the SOP. The blank must be less than one half of the established reporting limit or as specified in the method, and each of the replicate results must be within 90-110% recovery and <10% RSD, or within the laboratory or method established

acceptable limits for the test before the analyst can perform the test and report the results from actual samples.

15.1.1.1 If one or more of the tested parameters exceed the acceptance criteria, the analyst must locate and correct the source of the problem and repeat the test for the parameters that failed.

15.1.2 When it is not possible to determine mean and standard deviation, use procedures documented in the corresponding SOP (e.g., presence/absence, logarithmic values).

15.1.3 The Districts' Biology Group uses a document entitled "Training Procedures For San Jose Creek Water Quality Laboratory Biology Section Employees" that contains guidelines for the initial proficiency testing of analysts in toxicity testing.

15.2 Method Detection Limit Determination

15.2.1 For analyses where a method detection limit (MDL) must be determined, the analyst follows the guidelines in the Code of Federal Regulations, 40 CFR 136, Appendix B. A copy of the procedure is contained in Appendix I of this document.

15.2.2 An MDL study must be conducted each time there is a significant change in the method, for the addition of new analytes, or if there is a significant change in the instrumentation. Certain procedures specify the frequency that MDL determinations must be made, and these additional requirements must be adhered to.

15.2.3 The MDL study shall incorporate all sample preparation procedures and shall be performed by analyte and matrix.

15.2.3.1 For SW-846 test procedures, the laboratory shall use reagent water for aqueous matrices and sand or sandy loam soil for solid matrices.

15.2.4 The calculated MDL must be less than the spike concentration (or sample background concentration) used for the determination.

15.2.5 The calculated MDL must be greater than 10% of the spike concentration. If this requirement cannot be met, it must be documented that the laboratory made an attempt to meet it by repeating the determination using a lower spike concentration (or a sample with a lower inherent analyte concentration).

15.2.5.1 For MDL determinations using an actual environmental sample matrix, if the inherent concentration of the analyte in the sample exceeds ten times the MDL in reagent water, then another sample of similar matrix with a lower concentration must be used. If it is not possible to locate a sample with an inherent concentration in the proper range, the laboratory will use the MDL obtained using reagent water or clean sand/soil as the sample matrix.

15.3 Blanks and Negative Controls

15.3.1 The method blank is used to assess the preparation batch for possible contamination during the preparation and processing steps. It should consist of a matrix that is similar to the associated samples and is known to be free of the analytes of interest. For aqueous samples, the method blank matrix consists of reagent water.

15.3.2 At least one method blank is to be included with each preparation batch. Each method blank is processed along with and under the same conditions as the associated samples in the batch.

15.3.2.1 For tests where there is no separate preparation procedure (e.g., volatile organics in water), the batch shall be defined as environmental samples that are analyzed together with the same method and personnel, using the same lots of reagents, not to exceed the analysis of either 20 environmental samples or the maximum number specified in the analytical method.

15.3.3 If a method blank is found to contain a detectable amount of a targeted analyte, the result must be evaluated to ascertain the effect on the analysis of each sample within the batch. If the concentration of the analyte(s) in the method blank exceeds the acceptance criteria specified in the analytical procedure, the samples in the batch shall be reprocessed and analyzed or resolved as allowed in the SOP.

15.3.4 If a method blank is found to contain a detectable amount of a targeted analyte and there are no specific acceptance guidelines in the analytical method or SOP, the samples in the batch must be reprocessed and analyzed. For samples that cannot be reanalyzed, if the concentration of the analyte in the blank is greater than the reporting limit, but less than 1/10 of the amount measured in any of the samples in the batch, the results may be reported with qualification.

15.3.4.1 For certain analyses with no or minimal sample preparation, it may be possible to analyze another method blank immediately. If the second blank result is acceptable, the analysis may continue. The original blank result must be retained and the second blank will be cited in the documented error resolution.

15.3.5 In all cases of method blank contamination, the source of the contamination must be investigated and the corrective action must be documented.

15.3.6 For microbiological testing, negative culture controls demonstrate that the medium does not support the growth of non-targeted organisms or does not demonstrate the typical positive reaction of the target organism(s).

15.3.7 A sterility blank shall be analyzed for each lot of pre-prepared, ready-to-use medium and for each batch of medium prepared in the laboratory. This shall be done prior to first use of the medium.

15.3.8 For microbiology analyses using membrane filtration, the laboratory shall conduct one beginning and one ending sterility check for each filtration used in a filtration series. The filtration series is considered ended when more than 30 minutes elapses between successive filtrations.

15.4 Positive Controls

15.4.1 A laboratory control sample (LCS), also referred to as a laboratory fortified blank (LFB), consists of analyte-fortified reagent water, analyte-fortified clean soil or sand, or standard reference materials. The LCS provides an indication of whether the analytical process was performed correctly and in control under matrix-free or limited matrix conditions.

15.4.1.1 The LCS is analyzed where feasible, one for each sample batch or as dictated in the analytical procedure. Exceptions would be where there is no spiking material available such as pH, suspended solids, and turbidity.

15.4.1.2 The source of the LCS spiking standard should be different from that used for standardization or calibration of the system. At a minimum, the LCS must be prepared independently or have a different manufacturer's lot number.

15.4.1.3 Each LCS should contain the analyte(s) to be determined for the samples in the batch, or a subset of the analytes as allowed by the analysis procedure. The concentration of the LCS is specified in most of the laboratory SOPs. If none is specified, a general guideline is to use a concentration between 10 times the MDL and the midpoint of the calibration curve, or at a concentration typically found in samples analyzed with the procedure.

15.4.1.4 The results of each LCS are compared to the acceptance criteria specified by the analysis method or statistically determined by the laboratory from previous LCS results. If the LCS is within the criteria, the analytical process for the samples in that batch is in control. Samples analyzed along with an LCS that is determined to be out of control shall be considered suspect. In this case, once the problem is resolved, the samples are reprocessed and re-analyzed. If this is not possible due to insufficient sample volumes or holding time violations, the affected sample results will not be reported and replacements samples must be collected. In certain cases, the data is reported with appropriate qualifiers pending the approval of the data requestor and laboratory management.

15.4.1.4.1 In all cases of LCS failures, the source of the problem must be investigated and the corrective action must be documented.

15.4.2 Certified reference materials, such as a natural or fortified soil sample, are utilized as an additional check on the performance of the analytical procedure for some analyses. The supplier of the reference material provides the certified concentrations and acceptance limits for each of the analytes.

15.4.3 For microbiological testing, positive culture controls demonstrate that the medium can support the growth of targeted organisms, and that the medium produces the specified or expected indications of the target organism(s).

15.4.4 Matrix Duplicates, Matrix Spikes, Matrix Spike Duplicates

15.4.4.1 Matrix-specific QC samples indicate the effect of the sample matrix on the precision and accuracy of the results generated using the selected method. The information from these controls is sample-specific and is not normally used to determine the validity of the entire batch.

15.4.4.2 For most analyses, duplicates and/or matrix spikes are performed with each sample batch of ten or less or as otherwise specified in the analytical procedure. For process control samples, the duplicates and matrix spikes are performed weekly or every twenty samples, whichever is more frequent. Each laboratory SOP has a section detailing the specific matrix QC requirements of the analysis.

15.4.4.3 For analyses where the analyte concentrations are usually above the reporting limits of the method, matrix duplicates and a single matrix spike are analyzed. Matrix spikes are sometimes referred to as laboratory fortified matrices (LFM).

15.4.4.3.1 Only duplicates are performed for methods where no spiking material is available such as pH, suspended solids, and turbidity.

15.4.4.3.2 For analyses where the entire sample container contents must be used and it is impractical to collect more than one additional sample, a single spike is performed if allowed in the method (i.e., oil and grease).

15.4.4.4 For analyses where the analyte concentrations are usually below reporting limits at natural concentrations, a single unspiked sample, a matrix spike and a duplicate matrix spike are analyzed.

15.4.4.5 The source of the matrix spiking standard is different from that used for standardization or calibration of the system. The standard used is the same one used for the LCS of the batch, and the concentration should approximate that found in the unspiked sample, or as specified in the laboratory SOP.

15.4.4.6 Relative percent differences (RPDs), derived from duplicate sample or duplicate matrix spike results, and percent recoveries, derived from matrix spike results, are used to evaluate the precision and accuracy of the analysis, respectively.

15.4.4.7 The results of the duplicates and spikes are compared to the acceptance criteria specified by the SOP or are statistically derived from previous QC results. If the results are within the criteria, the analytical process for the sample was in control. If the precision and/or accuracy of the matrix QC samples are determined to be out of

control, the matrix QC samples are reprocessed and re-analyzed. If the reanalyzed sample results are in control, that data is used for reporting. If the reanalyzed sample results are still not in control, matrix interference is confirmed and the original sample result is reported with appropriate qualification. The corrective action taken must be fully documented.

15.4.4.7.1 If a reanalysis is not possible due to insufficient sample volume or holding time violations, the original sample data is reported with appropriate qualification. The corrective action taken must be fully documented.

15.4.5 Surrogate Spikes

15.4.5.1 Surrogates, sometimes referred to as system monitoring compounds, are often used in organic chromatography test methods. They are added to samples, standards, and blanks prior to sample preparation/extraction and provide a measure of recovery for every sample matrix.

15.4.5.2 Surrogate compounds are chosen to represent the various chemistries of the target analytes, but are unlikely to be present as an environmental contaminant. The surrogate compounds are specified in the SOP.

15.4.5.3 The recovery of each surrogate compound should meet the acceptance criteria specified in the SOP or as statistically derived from historical data.

15.5 Additional Quality Control Measures

15.5.1 Microbiological QA/QC measures practiced by the Microbiology Groups are described in the Quality Assurance section of the Microbiology SOPs.

15.5.2 The Biology Group has written guidelines on intralaboratory QA/QC to assure validity of data generated in their laboratory. These are found in the Biology Quality Assurance Plan document available in CyberDOCS.

15.5.3 Each laboratory SOP may have quality control measures that are specific for an analysis that are in addition to the ones mentioned in this section. The acceptance criteria for these measures are provided in the SOP or in a document referenced in the SOP.

15.6 Assessment of Data Precision and Accuracy

15.6.1 Acceptance Limits and Control Charts

15.6.1.1 Initial QC acceptance limits for some parameters are established by the EPA and are listed in the specific methods in 40 CFR Part 136 and SW-846. Unless directed otherwise by a method, the laboratories establish new control limits once they have obtained sufficient historical data.

15.6.1.2 Many analyses have QC acceptance limits specific to matrices such as groundwater or industrial waste.

15.6.1.3 Control charts visually illustrate trends in QC sample results. The two types of control charts commonly used in laboratories are: precision charts to monitor the RPDs of duplicate analyses; and accuracy charts for monitoring the recoveries of LCSs, matrix spikes, and surrogates.

15.6.1.4 Shewhart precision control charts are derived from at least 20 duplicate determinations. The difference between duplicates, the average of the duplicates, and the RPD (mathematically expressed as the difference between duplicates multiplied by 100, then divided by the average of the duplicates) are calculated. From these data, the average RPD is used to establish the control limits using the following formula: The Control Limit (CL) = $D_4 \times RPD_{Avg}$ where D_4 is a statistically derived factor of 3.27. The Warning Limit (WL) is calculated using the formula $RPD_{Avg} + \frac{2}{3}[(D_4 \times RPD_{Avg}) - RPD_{Avg}]$.

The equivalent RPD limit calculations for duplicate samples or duplicate spiked samples are:

$$CL = RPD_{Avg} \times 3.27$$

$$WL = RPD_{Avg} + \frac{2}{3}(CL - RPD_{Avg})$$

15.6.1.5 Shewhart accuracy control charts are statistically derived from at least 20 spike recoveries. The mean ($\bar{X}$) and the standard deviation (s) of the recoveries are calculated, the warning limits are established at the mean recovery ±2 standard deviations, and the control limits are established at the mean recovery ±3 standard deviations, or as otherwise required by the SOP. The control limits approximate a 99% confidence interval around the mean, while the warning limits approximate a 95% confidence interval.

The calculation of the upper and lower accuracy limits are:

$$\begin{aligned} \text{Upper Control Limit} &= \bar{X} + 3s \\ \text{Upper Warning Limit} &= \bar{X} + 2s \\ \text{Lower Warning Limit} &= \bar{X} - 2s \\ \text{Lower Control Limit} &= \bar{X} - 3s \end{aligned}$$

15.6.1.6 For each analysis where duplicate and/or spike measurements are made, results are entered into control charts. The analyst, the supervisor, or supervising professional review the charts to determine if the analytical process is trending out of control so that preventative corrective actions can be taken.

15.6.1.6.1 If a trend in the results is observed, e.g., 7 consecutive data points consistently falling above or below the mean, or a consistent upward or downward trend, corrective action is initiated and documented.

15.6.1.6.2 It is recommended that new limits to be updated semi-annually, or for tests that are performed infrequently, when at least 20 new data points are available.

15.6.1.7 Other types of control charts are also used in the Districts' laboratories. For example, the Biology Group uses control charts to evaluate the percent minimum significant difference (pMSD) values, the LC50 values for acute bioassay endpoints, and the EC/IC25 values for chronic bioassay endpoints.

15.7 Interlaboratory Quality Control Samples

15.7.1 Blind Quality Control Samples

15.7.1.1 The Laboratories Section's Quality Assurance Group issues blind quality control samples to the ten Districts laboratories on a routine basis for all chemistry tests where a QC sample is available. The group also issues blind QC samples as part of the performance evaluation of any personnel being trained on a new procedure. The performance evaluation samples are issued when the relevant Laboratory Supervisor believes the analyst has been sufficiently trained.

15.7.1.2 The majority of the blind quality control samples issued by the QA group are purchased from commercial sources that specialize in QC samples. The QA group personnel may also prepare QC samples if they are commercially unavailable.

15.7.1.3 Most of the blind QC sample analytes have acceptance limits that range from ± 10 to 20%, depending on the test, of the true value. The acceptance limits for multi-analyte samples for organics and certain other tests are provided from the commercial vendor and are usually based upon 95% confidence intervals. Laboratory Supervisors are provided with the true values for the QC sample so that any necessary corrective action can begin immediately after data review.

15.7.1.4 Corrective action is required for any result that is outside the acceptance limits. Once a possible cause for the failure is determined and corrective action is implemented, another blind QC sample is issued to the analyst. If an analyst fails a second time the relevant supervisor or experienced analyst closely observes the individual's technique to identify the problem. The investigation is continued until acceptable QC results are obtained and the supervisor is satisfied with the resolution.

15.7.1.5 If suspect analytical results are reported by a commercial laboratory, double-blind samples may be issued to the laboratory by the QA Group.

15.7.2 Split QC Samples

15.7.2.1 The Districts laboratories that perform certain common chemical analyses are provided with a sample collected from a wastewater treatment plant that is divided into multiple portions or 'split' samples. Quarterly split samples are issued by the QA group for certain wet chemistry analyses including: biochemical oxygen demand,

chemical oxygen demand, ammonia, nitrate, nitrite, total Kjeldahl nitrogen, total suspended solids, and total dissolved solids. The analysis rotates between these listed determinations for each quarterly sample. The results of the split sample are analyzed statistically and the acceptance limits are established at ± 2 standard deviations from the mean result. Any result outside the limits is considered an outlier.

15.7.2.2 Precision and accuracy for total and fecal coliform determinations are evaluated monthly by the issuance of a split sample prepared by the SJCWQL Microbiology Group and distributed to all the relevant Districts laboratories for analysis by Membrane Filtration (MF). The results are statistically analyzed for outliers.

15.7.2.3 The SJC Microbiology group also prepares two sets of total and fecal coliform membrane filtration plates each month. Each set of plates is transported to four or five of the Districts laboratories as a multiple-analyst membrane filter colony count. The results of the intra-laboratory colony counts are statistically analyzed for outliers.

15.7.3 Proficiency Testing Samples

15.7.3.1 The Districts' laboratories participate annually in laboratory proficiency testing programs to maintain their accreditation for regulatory analyses. The testing programs require the analysis of blind samples from an approved vendor. The results are evaluated by the vendor for acceptability, and a report is sent to the laboratory and the appropriate regulatory agency.

15.7.3.2 The Districts' laboratories analyze proficiency testing samples for chemistry, microbiology, and aquatic bioassay parameters. Each laboratory participates in one or more of the following testing programs:

- Wastewater WP studies (chemistry, microbiology)
- Supply water WS studies (microbiology)
- Hazardous waste studies (chemistry)
- DMR-QA studies (chemistry, microbiology, biology)

15.7.3.3 Any of the testing parameters that are evaluated as 'not acceptable' require corrective action by the laboratory. The laboratory accrediting agency (DHS-ELAP) must be notified of the failure and corrective actions must be documented prior to the analysis of a subsequent proficiency testing sample. A second failure may result in the loss of the laboratory's accreditation for the parameter.

15.7.4 Quality Control Reports

15.7.4.1 The Quality Assurance Group prepares reports for the results of the blind QC samples and split samples. The reports are provided to laboratory management and supervision.

15.8 Corrective Actions

15.8.1 Corrective action is mandated when any of the following occurs:

- When any irregularity in the sample submitted to the Laboratories Section is discovered. This may include labeling errors, missing labels, improper sample containers, leaks, or damaged samples.
- Recommended sample preservation is not practiced and/or the holding times are exceeded.
- Instruments are not working according to specifications.
- Proper methodology is not followed.
- Results of blanks, laboratory control standards, duplicates, matrix spike and/or matrix spike duplicates, surrogates, or reference samples fall outside the range of acceptance.
- Results of analyses on quality control check samples issued by the QA Group are out of acceptance limits.

15.8.2 If a sample irregularity is noticed, the relevant supervisor informs the sample collector. If possible, the sample is recollected and resubmitted to the laboratory. In certain situations for non-regulatory samples, the sample requestor may decide to proceed with the analysis. In this case, a notation of the irregularity must be included on the benchsheet, in the Laboratory Information Management System(s) (LIMS), and in the final report.

15.8.3 When a problem with an analytical instrument occurs, in-house troubleshooting is initially attempted. Most of the major instruments are covered by service contracts, so if the problem persists, vendor service engineers are called. When an instrument is down and another instrument is not available to perform the analyses within the required sample holding time, the samples are sent to qualified commercial laboratories. Alternatively, the sample is collected again at a later date.

15.8.4 A sample must be reanalyzed if the proper analytical methodology was not followed. The reason for the irregularity must be documented on an Error Resolution form.

15.8.5 When results of LCS, duplicate, spike, or interlaboratory check sample analyses are questionable or are outside the acceptance range, the supervisor is notified and further analysis of samples is suspended until the following course of action is followed and appropriate corrective measures are made:

- Data entry and calculations are reviewed and examined for transcription errors.
- Reagents and standards are checked to see if they were prepared correctly and that they have not exceeded their expiration dates.
- The equipment is examined for proper performance. Calibration and maintenance records are reviewed.

- The methodology is reviewed to make sure that it was properly applied.
- Sampling and sample handling are checked to verify that the sample was collected properly, that there was no irregularity, and that recommended preservations and holding times were observed.

15.8.6 The analyst shall document all needs for corrective action on an Error Resolution form (Appendix G) detailing the problem, the investigative steps taken, and the outcome. The relevant supervisor and QA will approve the corrective actions, and a copy of the signed form will accompany the laboratory benchsheets or final reports.

16. DATA MANAGEMENT, VALIDATION, REPORTING AND RETENTION

16.1 Data Management

16.1.1 The Sanitation Districts of Los Angeles County utilizes two in-house developed laboratory information management systems that run on the Districts' mainframe. A detailed description of their capabilities can be found in Appendix E.

16.1.2 Most of the laboratory instruments and analyzers are equipped with built-in data collection and processing systems or utilize data processing programs on associated external workstations. Automation is used in the laboratories if it is shown to increase accuracy and improve efficiency.

16.1.3 Some groups utilize local laboratory information management systems specific to their area of analysis. These systems hold additional analysis and quality control information that is not currently retained in the mainframe applications.

16.1.4 The mainframe is the repository for the laboratory data associated with samples that are logged in via the LABDATA and TDJ systems. Most of the auxiliary data collection and processing systems used in the laboratories are capable of transferring the final results directly to the mainframe.

16.1.5 For samples that are logged in to the LABDATA system, work assignment sheets are generated each working day and distributed to the appropriate analytical bench. The assignment sheets convey which analyses are required for each sample.

16.1.6 Depending on the analysis, the raw results are handled in different ways. Whenever possible, raw data are transferred directly from an instrument to an electronic form or data system. This eliminates any human transcription errors. Where electronic transfers are not possible, the analyst enters the readings manually into an electronic form during the analysis, or writes the data onto test specific forms. At the completion of the analysis, the hand written results are entered into an electronic form for processing.

16.1.7 The method for the calculation of results, the units of analysis for reporting, and the required number of significant figures are included in the "Calculations" section of each SOP.

16.2 Data Validation

16.2.1 The analyst performing the test is responsible for the initial review of the results. This ensures that the results appear reasonable (compared to previous results of the same sample source, if available), the necessary QC samples were included in the analysis batch, and that QC results were within acceptance limits. The analyst must also verify that the dates, times, volumes, reporting limits, and units are correct.

16.2.2 The group supervisors or supervising professionals are responsible for verifying the completeness and correctness of the results generated by their groups. They will also initiate or ensure that the analyst is performing any necessary corrective actions.

16.2.3 In some sections, a peer analyst review of the results is performed prior to the supervisory verification. If any irregularities are found in the review, the data is returned to the primary analyst for explanation or corrective action.

16.2.4 Certain laboratory results must be compared to permit or regulatory limits. If a result is found to exceed a limit, the project manager for the sample must be notified promptly so that the proper course of action can be initiated. The Laboratories Section has a "Notification for Discharge Limit Exceedence or Qualified Results" form (Appendix G) that must be completed whenever a result exceeds a discharge or regulatory limit, or if any test results cannot be reported due to QC failures.

16.2.5 Once all the tests for a sample are complete and the results verified by the group supervisors, the Laboratory Superintendent or designated Laboratory Supervisor will review and approve the results of the sample in its entirety.

16.2.6 A relevant supervisor or senior analyst reviews the daily process control results. The results are then provided to the treatment plant operators via an electronic or hardcopy form.

16.3 Data Reporting

16.3.1 Sample completion notification reports are issued from the mainframe application for samples that have received final approval to the person(s) requesting the analyses. Each report contains sample identification information, requested analytes, sample results, units, laboratory ID(s), and any footnotes pertaining to each test. A short narrative may also be included.

16.3.2 A more complete report that includes relevant QC information can be generated through the TDQ application mentioned in Appendix E. The TDQ report includes the analyst's

name, sample preparation and analysis dates and methods, sample results, reporting limits, QC results, and QC acceptance criteria.

16.4 Data Retention and Storage

16.4.1 All relevant laboratory records, including benchsheets and error resolution forms are stored indefinitely. Routine and special reports are filed at each facility. Monthly Summaries of Operations for JWPCP and the inland plants are permanently filed in the Sewerage Department at the Joint Administration Office. In addition, a copy is retained at each of the relevant plants. The State Water Resource Control Board reports are permanently kept in the Monitoring Section at the Districts' Joint Administration Office.

16.4.2 In most of the laboratory groups, laboratory analysis records are retained in the laboratory for one to two years before being transferred to a secure data storage facility. The APL also electronically scans benchsheets and data system reports.

16.4.3 Each laboratory must be able to fully document the receipt and analysis of a sample. All pertinent records are accessible in a timely manner to comply with approved requests.

16.4.4 All charts, graphs, raw data and GC/LC/IC chromatograms associated with reportable data are archived electronically and can be retrieved when needed. Each laboratory group is responsible for making backup copies of their electronic data.

17. LABORATORY AUDITS

17.1 In addition to the biennial on-site inspections by DHS-ELAP, internal inspections of the Districts' laboratories are conducted periodically to ensure that they comply with both laboratory accreditation and QA requirements. The internal audits are conducted by the Quality Assurance Manager and/or quality assurance personnel, each of whom are independent of the activity to be audited.

17.2 If any of the audit findings cast doubt on the correctness or validity of test results, the laboratory shall take corrective actions to resolve the problem. Sample retesting or qualification of affected results may be required, and the data user may, subsequently, be notified.

17.3 Both laboratory management and the laboratory supervisors are provided with a report of the findings of the internal audits. Follow-up audits will verify the implementation and effectiveness of corrective actions.

18. QUALITY ASSURANCE REPORTS

18.1.1 Periodic reports are provided to management to summarize key QA activities. Significant observations, corrective actions, changes in certification/accreditation status, DHS-ELAP laboratory audit findings, and other QA-related items are summarized.

18.1.2 Management is provided with all proficiency testing results and any associated corrective actions.

18.1.3 The results of the monthly blind QC samples and QC split samples are also provided to Management.

19. REFERENCES

19.1 Test Methods for Evaluating Solid Waste, EPA SW-846, 3rd Edition, Nov., 1986 and later updates.

19.2 Standard Methods for the Examination of Water and Wastewater, 20th Edition 1998.

19.3 2003 NELAC Standard, Quality Systems, July 1, 2005.

19.4 Code of Federal Regulations, 40 CFR Part 136, July 1999.

19.5 California Health and Safety Code, Sections 100825-100920, Environmental Laboratory Accreditation Act.

19.6 California Code of Regulations, Title 22, Division 4, Chapter 19, Certification of Environmental Laboratories.

APPENDIX A

California Department of Health Services
Environmental Laboratory Accreditation Program
Accredited Fields of Testing

EXPECTED ACCREDITED FIELDS OF TESTING*

CALIFORNIA DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing

SAN JOSE CREEK WATER QUALITY LABORATORY **Lab Phone** (562) 699-7411
COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
1965 SOUTH WORKMAN MILL ROAD
WHITTIER, CA 90601

Certificate No: 1052 **Renew Date:** 11/30/2007

Field of Testing: 107 - Microbiology of Wastewater

107.010 001	Heterotrophic Bacteria	SM9215B
107.020 001	Total Coliform	SM9221B
107.040 001	Fecal Coliform	SM9221C,E (MTF/EC)
107.060 001	Total Coliform	SM9222B
107.080 001	Fecal Coliform	SM9222D
107.099 001	E. coli	SM9221F
107.099 002	E. coli	SM9222G
107.100 001	Fecal Streptococci	SM9230B
107.100 002	Enterococci	SM9230B
107.111 001	Fecal Streptococci	SM9230C (MF/m-Enterococcus)
107.111 002	Enterococci	SM9230C (MF/m-Enterococcus)

Field of Testing: 108 - Inorganic Chemistry of Wastewater

108.112 002	Calcium	EPA 200.7
108.112 003	Hardness (calc.)	EPA 200.7
108.112 004	Magnesium	EPA 200.7
108.112 005	Potassium	EPA 200.7
108.112 007	Sodium	EPA 200.7
108.420 001	Hardness (calc.)	SM2340B

Field of Testing: 109 – Toxic Chemical Elements of Wastewater

109.010 001	Aluminum	EPA 200.7
109.010 002	Antimony	EPA 200.7
109.010 003	Arsenic	EPA 200.7
109.010 004	Barium	EPA 200.7
109.010 005	Beryllium	EPA 200.7
109.010 007	Cadmium	EPA 200.7
109.010 009	Chromium	EPA 200.7
109.010 010	Cobalt	EPA 200.7
109.010 011	Copper	EPA 200.7
109.010 012	Iron	EPA 200.7
109.010 013	Lead	EPA 200.7
109.010 015	Manganese	EPA 200.7
109.010 016	Molybdenum	EPA 200.7
109.010 017	Nickel	EPA 200.7
109.010 019	Selenium	EPA 200.7
109.010 021	Silver	EPA 200.7
109.010 023	Thallium	EPA 200.7
109.010 024	Tin	EPA 200.7
109.010 026	Vanadium	EPA 200.7
109.010 027	Zinc	EPA 200.7
109.020 001	Aluminum	EPA 200.8
109.020 002	Antimony	EPA 200.8
109.020 003	Arsenic	EPA 200.8
109.020 004	Barium	EPA 200.8
109.020 005	Beryllium	EPA 200.8

As of 12/8/2006, this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

* ELAP reported no audit deficiencies; however, as of this printing, and due to an inadvertent error on the original certificate, the receipt of the official Fields of Accreditation certificate has been delayed.

A1

109.020	006	Cadmium	EPA 200.8
109.020	007	Chromium	EPA 200.8
109.020	008	Cobalt	EPA 200.8
109.020	009	Copper	EPA 200.8
109.020	010	Lead	EPA 200.8
109.020	011	Manganese	EPA 200.8
109.020	012	Molybdenum	EPA 200.8
109.020	013	Nickel	EPA 200.8
109.020	014	Selenium	EPA 200.8
109.020	015	Silver	EPA 200.8
109.020	016	Thallium	EPA 200.8
109.020	017	Vanadium	EPA 200.8
109.020	018	Zinc	EPA 200.8
109.190	001	Mercury	EPA 245.1

Field of Testing: 110 – Volatile Organic Chemistry of Wastewater

110.040	040	Halogenated Hydrocarbons	EPA 624
110.040	041	Aromatic Compounds	EPA 624
110.040	042	Oxygenates	EPA 624
110.040	043	Other Volatile Organics	EPA 624

Field of Testing: 111 – Semi-volatile Organic Chemistry of Wastewater

111.060	000	Polynuclear Aromatics	EPA 610
111.101	032	Polynuclear Aromatic Hydrocarbons	EPA 625
111.101	034	Phthalates	EPA 625
111.101	036	Other Extractables	EPA 625

Field of Testing: 113 – Whole Effluent Toxicity of Wastewater

113.021	001B	Fathead Minnow (P. promelas)	EPA 2000 (EPA-821-R-02-012), Static Renewal
113.025	009B	Silverside (Menidia spp.)	EPA 2006 (EPA-821-R-02-012), Static Renewal
113.027	012B	Mysid (M. bahia)	EPA 2007 (EPA-821-R-02-012), Static Renewal
113.028	008B	Topsmelt (A. affinis)	EPA-821-R-02-012, Static Renewal
113.041	001	Fathead Minnow (P. promelas)	EPA 1000 (EPA-821-R-02-013)
113.051	005	Daphnid (C. dubia)	EPA 1002 (EPA-821-R-02-013)
113.061	020	Green algae (S. capricornutum)	EPA 1003 (EPA-821-R-02-013)
113.081	009	Silverside (Menidia spp.)	EPA 1006 (EPA-821-R-02-014)
113.091	012	Mysid (M. bahia)	EPA 1007 (EPA-821-R-02-014)
113.120	008	Topsmelt (A. affinis)	EPA 600/R-95/136
113.120	017D	Purple sea urchin (S. purpuratus)	EPA 600/R-95/136, Fertilization Test
113.120	022	Giant kelp (M. pyrifera)	EPA 600/R-95/136
113.990	001	Chlorophyll	EPA 445.0

Field of Testing: 114 – Inorganic Chemistry of Hazardous Waste

114.010	001	Antimony	EPA 6010B
114.010	002	Arsenic	EPA 6010B
114.010	003	Barium	EPA 6010B
114.010	004	Beryllium	EPA 6010B
114.010	005	Cadmium	EPA 6010B
114.010	006	Chromium	EPA 6010B
114.010	007	Cobalt	EPA 6010B
114.010	008	Copper	EPA 6010B
114.010	009	Lead	EPA 6010B
114.010	010	Molybdenum	EPA 6010B
114.010	011	Nickel	EPA 6010B
114.010	012	Selenium	EPA 6010B
114.010	013	Silver	EPA 6010B
114.010	014	Thallium	EPA 6010B
114.010	015	Vanadium	EPA 6010B
114.010	016	Zinc	EPA 6010B

As of 12/8/2006, this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

114.020	001	Antimony	EPA 6020
114.020	002	Arsenic	EPA 6020
114.020	003	Barium	EPA 6020
114.020	004	Beryllium	EPA 6020
114.020	005	Cadmium	EPA 6020
114.020	006	Chromium	EPA 6020
114.020	007	Cobalt	EPA 6020
114.020	008	Copper	EPA 6020
114.020	009	Lead	EPA 6020
114.020	010	Molybdenum	EPA 6020
114.020	011	Nickel	EPA 6020
114.020	012	Selenium	EPA 6020
114.020	013	Silver	EPA 6020
114.020	014	Thallium	EPA 6020
114.020	015	Vanadium	EPA 6020
114.020	016	Zinc	EPA 6020
114.140	001	Mercury	EPA 7470A
114.141	001	Mercury	EPA 7471A
114.99	001	Aluminum	EPA 6010B
114.99	002	Tin	EPA 6010B
114.99	003	Manganese	EPA 6010B
114.99	004	Iron	EPA 6010B
114.99	005	Calcium	EPA 6010B
114.99	006	Magnesium	EPA 6010B
114.99	007	Sodium	EPA 6010B
114.99	008	Potassium	EPA 6010B
114.99	009	Hardness (calc.)	EPA 6010B
114.99	010	Aluminum	EPA 6020
114.99	011	Manganese	EPA 6020
114.99	012	Iron	EPA 6020
114.99	013	Tin	EPA 6020
114.99	014	Calcium	EPA 6020
114.99	015	Magnesium	EPA 6020
114.99	016	Sodium	EPA 6020
114.99	017	Potassium	EPA 6020
114.99	018	Hardness (calc.)	EPA 6020

Field of Testing: 116 – Volatile Organic Chemistry of Hazardous Waste

116.080	000	Volatile Organic Compounds	EPA 8260B
116.080	120	Oxygenates	EPA 8260B

Field of Testing: 117 – Semi-volatile Organic Chemistry of Hazardous Waste

117.110	000	Extractable Organics	EPA 8270C

Field of Testing: 119 – Toxicity Bioassay of Hazardous Waste

119.010	001	Fathead Minnow (P. promelas)	Polisini & Miller (CDFG 1988)

Field of Testing: 126 –Microbiology of Recreational Water

126.070	001	Enterococci	EPA 1600

As of 12/8/2006, this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

CALIFORNIA DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing

JOINT WATER POLLUTION CONTROL PLANT WATER QUALITY LABORATORY
COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
24501 SOUTH FIGUEROA STREET
CARSON, CA 90745

Lab Phone (310) 830-2400

Certificate No: 1034 **Renew Date: 10/31/2007**

Field of Testing: 107 - Microbiology of Wastewater

107.010	001	Heterotrophic Bacteria	SM9215B
107.020	001	Total Coliform	SM9221B
107.040	001	Fecal Coliform	SM9221C,E (MTF/EC)
107.060	001	Total Coliform	SM9222B
107.080	001	Fecal Coliform	SM9222D
107.110	002	Enterococci	SM9230B (MF/ME)

Field of Testing: 108 - Inorganic Chemistry of Wastewater

108.070	001	Residue, Non-filterable	EPA 160.2
108.090	001	Residue, Volatile	EPA 160.4
108.320	001	Chemical Oxygen Demand	EPA 410.1
108.390	001	Turbidity	SM2130B
108.410	001	Alkalinity	SM2320B
108.421	001	Hardness	SM2340C
108.430	001	Conductivity	SM2510B
108.440	001	Residue, Total	SM2540B
108.441	001	Residue, Filterable	SM2540C
108.442	001	Residue, Non-filterable	SM2540D
108.443	001	Residue, Settleable	SM2540F
108.461	001	Chlorine	SM4500-Cl C
108.470	001	Cyanide, Manual Distillation	SM4500-CN C
108.471	001	Cyanide, Total	SM4500-CN D
108.472	001	Cyanide, Total	SM4500-CN E
108.480	001	Fluoride	SM4500-F C
108.490	001	pH	SM4500-H+B
108.500	001	Ammonia	SM4500-NH3 C
108.501	001	Kjeldahl Nitrogen	SM4500-NH3 C
108.510	001	Nitrite	SM4500-NO2 B
108.520	001	Nitrate-nitrite, Total	SM4500-NO3 E
108.521	001	Nitrate calc.	SM4500-NO3 E
108.530	001	Dissolved Oxygen	SM4500-O C
108.531	001	Dissolved Oxygen	SM4500-O G
108.540	001	Phosphate, Ortho	SM4500-P E
108.541	001	Phosphorus, Total	SM4500-P E
108.580	001	Sulfide	SM4500-S= D
108.581	001	Sulfide	SM4500-S= E (18th)
108.590	001	Biochemical Oxygen Demand	SM5210B
108.591	001	Carbonaceous BOD	SM5210B
108.601	001	Chemical Oxygen Demand	SM5220C
108.903	001	Boron	SM4500-B B
108.99	001	Residue, Total	SM2540G

Field of Testing: 109 – Toxic Chemical Elements of Wastewater

109.811	001	Chromium (VI)	SM3500-Cr D

As of 12/26/06, this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

JOINT WATER POLLUTION CONTROL PLANT WATER QUALITY LABORATORY

Certificate No: 1034
Renew Date: 10/31/2007

Field of Testing:	111 – Semi-volatile Organic Chemistry of Wastewater		
111.170	030	Organochlorine Pesticides	EPA 608
111.170	031	PCBs	EPA 608
Field of Testing:	114 – Inorganic Chemistry of Hazardous Waste		
114.103	001	Chromium (VI)	EPA 7196A
114.222	001	Cyanide	EPA 9014
114.240	001	pH	EPA 9040
114.241	001	pH	EPA 9045
114.270	001	Fluoride	EPA 9214
Field of Testing:	114 – Semi-volatile Organic Chemistry of Hazardous Waste		
117.210	000	Organochlorine Pesticides	EPA 8081A
117.220	000	PCBs	EPA 8082
Field of Testing:	120 – Physical Properties of Hazardous Waste		
120.070	001	Corrosivity – pH Determination	EPA 9040B
120.080	001	Corrosivity – pH Determination	EPA 9045C
Field of Testing:	126 – Microbiology of Recreational Water		
126.010	001	Total Coliform (Enumeration)	SM9221A,B,C
126.020	001	Total Coliform (Enumeration)	SM9222A,B
126.030	001	Fecal Coliform (Enumeration)	SM9221E
126.040	001	Fecal Coliform (Enumeration)	SM9222D
126.070	001	Enterococci	EPA 1600

As of 12/26/2006, this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

CALIFORNIA DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing

SAN JOSE CREEK ANALYTICAL PLANT LABORATORY
COUNTY SANITATION DISTRICTS of LOS ANGELES COUNTY
1965 SOUTH WORKMAN MILL ROAD
WHITTIER, CA 90601

Lab Phone (562) 699-7411

Certificate No: 1032 **Renew Date: 10/31/2007**

Field of Testing: 107 - Microbiology of Wastewater

107.020	001	Total Coliform	SM9221B
107.040	001	Fecal Coliform	SM9221C,E (MTF/EC)
107.060	001	Total Coliform	SM9222B
107.080	001	Fecal Coliform	SM9222D
107.99	001	E. coli	SM9221F
107.99	001	E. coli	SM9222G

Field of Testing: 108 - Inorganic Chemistry of Wastewater

108.090	001	Residue, Volatile	EPA 160.4
108.120	001	Bromide	EPA 300.0
108.120	002	Chloride	EPA 300.0
108.120	004	Nitrate	EPA 300.0
108.120	005	Nitrite	EPA 300.0
108.120	006	Nitrate-nitrite, Total	EPA 300.0
108.120	008	Sulfate	EPA 300.0
108.183	001	Cyanide, Total	EPA 335.4
108.202	001	Ammonia	EPA 350.3
108.211	001	Kjeldahl Nitrogen	EPA 351.2
108.260	001	Phosphate, Ortho	EPA 365.1
108.261	001	Phosphate, Total	EPA 365.1
108.282	001	Sulfate	EPA 375.4
108.320	001	Chemical Oxygen Demand	EPA 410.1
108.360	001	Phenols, Total	EPA 420.1
108.380	001	Oil and Grease	EPA 1664
108.390	001	Turbidity	SM2130B
108.410	001	Alkalinity	SM2320B
108.421	001	Hardness	SM2340C
108.430	001	Conductivity	SM2510B
108.440	001	Residue, Total	SM2540B
108.441	001	Residue, Filterable	SM2540C
108.442	001	Residue, Non-filterable	SM2540D
108.443	001	Residue, Settleable	SM2540F
108.452	001	Chloride	SM4500-Cl- C
108.461	001	Chlorine	SM4500-Cl C
108.472	001	Cyanide, Total	SM4500-CN E
108.473	001	Cyanide, amenable	SM4500-CN G
108.490	001	pH	SM4500-H+B
108.500	001	Ammonia	SM4500-NH3 C
108.501	001	Kjeldahl Nitrogen	SM4500-NH3 C
108.508	001	Ammonia	SM4500-NH3 H
108.510	001	Nitrite	SM4500-NO2 B
108.521	001	Nitrate calc.	SM4500-NO3 E
108.522	001	Nitrate-nitrite, Total	SM4500-NO3 F
108.523	001	Nitrate calc.	SM4500-NO3 F
108.530	001	Dissolved Oxygen	SM4500-O C
108.531	001	Dissolved Oxygen	SM4500-O G
108.540	001	Phosphate, Ortho	SM4500-P E
108.541	001	Phosphorus, Total	SM4500-P E
108.580	001	Sulfide	SM4500-S= D

As of 12/19/2006, this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

108.590	001	Biochemical Oxygen Demand	SM5210B	
108.591	001	Carbonaceous BOD	SM5210B	
108.601	001	Chemical Oxygen Demand	SM5220C	
108.611	001	Total Organic Carbon	SM5310C	
108.640	001	Surfactants	SM5540C	
108.99	001	Non-ionic Surfactants as CTAS	SM5540D	

Field of Testing: 109 - Toxic Chemical Elements of Wastewater

109.811	001	Chromium (VI)	SM3500-Cr D	

Field of Testing: 114 - Inorganic Chemistry of Hazardous Waste

114.103	001	Chromium (VI)	EPA 7196A	
114.222	001	Cyanide	EPA 9014	
114.240	001	Corrosivity – pH Determination	EPA 9040B	
114.241	001	Corrosivity – pH Determination	EPA 9045C	
114.99	001	Total Organic Carbon	EPA 9060	Aqueous Only
114.99	002	Chloride	EPA 9056	Aqueous Only
114.99	003	Nitrate	EPA 9056	Aqueous Only
114.99	004	Nitrite	EPA 9056	Aqueous Only
114.99	005	Sulfate	EPA 9056	Aqueous Only
114.99	006	Bromide	EPA 9056	Aqueous Only

Field of Testing: 115 – Extraction of Hazardous Waste

115.020	001	Toxicity Characteristic Leaching Procedure (TCLP)	EPA 1311
115.030	001	Waste Extraction Test (WET)	CCR Chapter 11, Article 5, Appendix II

Field of Testing: 120 –Physical Properties of Hazardous Waste

120.010	001	Ignitability	EPA 1010
120.070	001	Corrosivity – pH Determination	EPA 9040B
120.080	001	Corrosivity – pH Determination	EPA 9045C

As of 12/19/2006, this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

CALIFORNIA DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing

LOS COYOTES TREATMENT PLANT LABORATORY
COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
16515 PIUMA AVENUE
CERRITOS, CA 90701

Lab Phone (562) 402-6995

Certificate No: 1031 **Renew Date: 10/31/2007**

Field of Testing: 107 - Microbiology of Wastewater

107.020 001	Total Coliform	SM9221B
107.040 001	Fecal Coliform	SM9221C,E (MTF/EC)
107.060 001	Total Coliform	SM9222B
107.080 001	Fecal Coliform	SM9222D

Field of Testing: 108 - Inorganic Chemistry of Wastewater

108.090 001	Residue, Volatile	EPA 160.4
108.183 001	Cyanide, Total	EPA 335.4
108.202 001	Ammonia	EPA 350.3
108.390 001	Turbidity	SM2130B
108.442 001	Residue, Non-filterable	SM2540D
108.443 001	Residue, Settleable	SM2540F
108.461 001	Chlorine	SM4500-Cl C
108.472 001	Cyanide, Total	SM4500-CN E
108.490 001	pH	SM4500-H+B
108.500 001	Ammonia	SM4500-NH3 C
108.501 001	Kjeldahl Nitrogen	SM4500-NH3 C
108.510 001	Nitrite	SM4500-NO2 B
108.520 001	Nitrate-nitrite, Total	SM4500-NO3 E
108.521 001	Nitrate calc.	SM4500-NO3 E
108.530 001	Dissolved Oxygen	SM4500-O C
108.531 001	Dissolved Oxygen	SM4500-O G
108.590 001	Biochemical Oxygen Demand	SM5210B
108.591 001	Carbonaceous BOD	SM5210B
108.602 001	Chemical Oxygen Demand	SM5220D

As of 03/20/2006, this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

CALIFORNIA DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing

LONG BEACH TREATMENT PLANT LABORATORY
COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
7400 WILLOW STREET
LONG BEACH, CA 90815

Lab Phone (562) 425-4014

Certificate No: 1033 **Renew Date: 10/31/2007**

Field of Testing: 107 - Microbiology of Wastewater

107.020	001	Total Coliform	SM9221B
107.040	001	Fecal Coliform	SM9221C,E (MTF/EC)
107.060	001	Total Coliform	SM9222B
107.080	001	Fecal Coliform	SM9222D

Field of Testing: 108 - Inorganic Chemistry of Wastewater

108.090	001	Residue, Volatile	EPA 160.4
108.183	001	Cyanide, Total	EPA 335.4
108.202	001	Ammonia	EPA 350.3
108.390	001	Turbidity	SM2130B
108.442	001	Residue, Non-filterable	SM2540D
108.443	001	Residue, Settleable	SM2540F
108.461	001	Chlorine	SM4500-Cl C
108.472	001	Cyanide, Total	SM4500-CN E
108.490	001	pH	SM4500-H+B
108.500	001	Ammonia	SM4500-NH3 C
108.501	001	Kjeldahl Nitrogen	SM4500-NH3 C
108.510	001	Nitrite	SM4500-NO2 B
108.520	001	Nitrate-nitrite, Total	SM4500-NO3 E
108.521	001	Nitrate calc.	SM4500-NO3 E
108.531	001	Dissolved Oxygen	SM4500-O G
108.590	001	Biochemical Oxygen Demand	SM5210B
108.591	001	Carbonaceous BOD	SM5210B
108.602	001	Chemical Oxygen Demand	SM5220D

As of 03/20/2006, this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

EXPECTED ACCREDITED FIELDS OF TESTING*

CALIFORNIA DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing

WHITTIER NARROWS TREATMENT PLANT LABORATORY **Lab Phone** (626) 433-2954
COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
301 NORTH ROSEMEAD BOULEVARD
EL MONTE, CA 91733

Certificate No: 1036 **Renew Date: 12/31/2007**

Field of Testing: 107 - Microbiology of Wastewater

107.020	001	Total Coliform	SM9221B
107.040	001	Fecal Coliform	SM9221C,E (MTF/EC)
107.060	001	Total Coliform	SM9222B
107.080	001	Fecal Coliform	SM9222D

Field of Testing: 108 - Inorganic Chemistry of Wastewater

108.090	001	Residue, Volatile	EPA 160.4
108.183	001	Cyanide	EPA 335.4
108.202	001	Ammonia	EPA 350.3
108.390	001	Turbidity	SM2130B
108.442	001	Residue, Non-filterable	SM2540D
108.443	001	Residue, Settleable	SM2540F
108.461	001	Chlorine	SM4500-Cl C
108.472	001	Cyanide, Total	SM4500-CN E
108.490	001	pH	SM4500-H+B
108.500	001	Ammonia	SM4500-NH3 C
108.501	001	Kjeldahl Nitrogen	SM4500-NH3 C
108.510	001	Nitrite	SM4500-NO2 B
108.520	001	Nitrate-nitrite, Total	SM4500-NO3 E
108.521	001	Nitrate calc.	SM4500-NO3 E
108.530	001	Dissolved Oxygen	SM4500-O C
108.531	001	Dissolved Oxygen	SM4500-O G
108.590	001	Biochemical Oxygen Demand	SM5210B
108.591	001	Carbonaceous BOD	SM5210B
108.602	001	Chemical Oxygen Demand	SM5220D

As of 11/27/2006, this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

* ELAP reported no audit deficiencies; however, as of this printing, the receipt of the official Fields of Accreditation certificate has been delayed.

CALIFORNIA DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing

SAUGUS TREATMENT PLANT LABORATORY **Lab Phone** (661) 259-6846
COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
26200 SPRINGBROOK AVENUE
SAUGUS, CA 91350

Certificate No: 1040 **Renew Date: 11/30/2007**

Field of Testing: 107 - Microbiology of Wastewater

107.010 001	Total Coliform	SM9221B
107.040 001	Fecal Coliform	SM9221C,E (MTF/EC)
107.060 001	Total Coliform	SM9222B
107.080 001	Fecal Coliform	SM9222D
107.099	E. coli	SM9222G
107.099	E. coli	SM9221F

Field of Testing: 108 - Inorganic Chemistry of Wastewater

108.090 001	Residue, Volatile	EPA 160.4
108.202 001	Ammonia	EPA 350.3
108.390 001	Turbidity	SM2130B
108.442 001	Residue, Non-filterable	SM2540D
108.443 001	Residue, Settleable	SM2540F
108.461 001	Chlorine	SM4500-Cl C
108.490 001	pH	SM4500-H+B
108.501 001	Kjeldahl Nitrogen	SM4500-NH3 C
108.502 001	Ammonia	SM4500-NH3 E
108.510 001	Nitrite	SM4500-NO2 B
108.520 001	Nitrate-nitrite, Total	SM4500-NO3 E
108.521 001	Nitrate calc.	SM4500-NO3 E
108.530 001	Dissolved Oxygen	SM4500-O C
108.531 001	Dissolved Oxygen	SM4500-O G
108.590 001	Biochemical Oxygen Demand	SM5210B
108.591 001	Carbonaceous BOD	SM5210B
108.602 001	Chemical Oxygen Demand	SM5220D

As of 05/31/2006, this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

CALIFORNIA DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing

POMONA TREATMENT PLANT LABORATORY
COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
295 HUMANE WAY
POMONA, CA 91766

Lab Phone (909) 623-6721

Certificate No: 1068 **Renew Date: 12/31/2007**

Field of Testing: 107 - Microbiology of Wastewater

107.020	001	Total Coliform	SM9221B
107.040	001	Fecal Coliform	SM9221C,E (MTF/EC)
107.060	001	Total Coliform	SM9222B
107.080	001	Fecal Coliform	SM9222D
107.099	001	E. coli	SM9221F
107.099	002	E. coli	SM9222G

Field of Testing: 108 - Inorganic Chemistry of Wastewater

108.090	001	Residue, Volatile	EPA 160.4
108.183	001	Cyanide	EPA 335.4
108.202	001	Ammonia	EPA 350.3
108.390	001	Turbidity	SM2130B
108.442	001	Residue, Non-filterable	SM2540D
108.443	001	Residue, Settleable	SM2540F
108.461	001	Chlorine	SM4500-Cl C
108.472	001	Cyanide, Total	SM4500-CN E
108.490	001	pH	SM4500-H+B
108.500	001	Ammonia	SM4500-NH3 C
108.501	001	Kjeldahl Nitrogen	SM4500-NH3 C
108.510	001	Nitrite	SM4500-NO2 B
108.520	001	Nitrate-nitrite, Total	SM4500-NO3 E
108.521	001	Nitrate calc.	SM4500-NO3 E
108.530	001	Dissolved Oxygen	SM4500-O C
108.531	001	Dissolved Oxygen	SM4500-O G
108.590	001	Biochemical Oxygen Demand	SM5210B
108.591	001	Carbonaceous BOD	SM5210B
108.602	001	Chemical Oxygen Demand	SM5220D

As of 11/27/2006, this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

CALIFORNIA DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing

VALENCIA TREATMENT PLANT LABORATORY Lab Phone (661) 257-2575
COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY
28185 THE OLD ROAD
VALENCIA, CA 91335

Certificate No: 1041 **Renew Date:** 11/30/2007

Field of Testing: 107 - Microbiology of Wastewater

107.020 001	Total Coliform	SM9221B
107.040 001	Fecal Coliform	SM9221C,E (MTF/EC)
107.060 001	Total Coliform	SM9222B
107.080 001	Fecal Coliform	SM9222D
107.099 001	E. coli	SM9221F
107.099 002	E. coli	SM9222G

Field of Testing: 108 - Inorganic Chemistry of Wastewater

108.090 001	Residue, Volatile	EPA 160.4
108.183 001	Cyanide	EPA 335.4
108.202 001	Ammonia	EPA 350.3
108.390 001	Turbidity	SM2130B
108.410 001	Alkalinity	SM2320B
108.442 001	Residue, Non-filterable	SM2540D
108.443 001	Residue, Settleable	SM2540F
108.461 001	Chlorine	SM4500-Cl C
108.472 001	Cyanide, Total	SM4500-CN E
108.490 001	pH	SM4500-H+B
108.500 001	Ammonia	SM4500-NH3 C
108.501 001	Kjeldahl Nitrogen	SM4500-NH3 C
108.510 001	Nitrite	SM4500-NO2 B
108.520 001	Nitrate-nitrite, Total	SM4500-NO3 E
108.521 001	Nitrate calc.	SM4500-NO3 E
108.530 001	Dissolved Oxygen	SM4500-O C
108.531 001	Dissolved Oxygen	SM4500-O G
108.590 001	Biochemical Oxygen Demand	SM5210B
108.591 001	Carbonaceous BOD	SM5210B
108.602 001	Chemical Oxygen Demand	SM5220D

As of 05/31/2006, this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

CALIFORNIA DEPARTMENT OF HEALTH SERVICES
ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM
Accredited Fields of Testing

LANCASTER TREATMENT PLANT LABORATORY
COUNTY SANITATION DISTRICTS of LOS ANGELES COUNTY
1865 WEST AVENUE D
LANCASTER, CA 93534

Lab Phone (805) 723-8537

Certificate No: 1051 **Renew Date: 12/31/2007**

Field of Testing: 107 - Microbiology of Wastewater

107.020	001	Total Coliform	SM9221B
107.040	001	Fecal Coliform	SM9221C,E (MTF/EC)
107.060	001	Total Coliform	SM9222B
107.080	001	Fecal Coliform	SM9222D
107.099	001	E. coli	SM9221F
107.099	001	E. coli	SM9222G

Field of Testing: 108 - Inorganic Chemistry of Wastewater

108.090	001	Residue, Volatile	EPA 160.4
108.099	001	Non-ionic Surfactants as CTAS	SM5540D
108.202	001	Ammonia	EPA 350.3
108.320	001	Chemical Oxygen Demand	EPA 410.1
108.390	001	Turbidity	SM2130B
108.410	001	Alkalinity	SM2320B
108.421	001	Hardness	SM2340C
108.430	001	Conductivity	SM2510B
108.440	001	Residue, Total	SM2540B
108.441	001	Residue, Filterable	SM2540C
108.442	001	Residue, Non-filterable	SM2540D
108.443	001	Residue, Settleable	SM2540F
108.461	001	Chlorine	SM4500-Cl C
108.490	001	pH	SM4500-H+B
108.500	001	Ammonia	SM4500-NH3 C
108.501	001	Kjeldahl Nitrogen	SM4500-NH3 C
108.510	001	Nitrite	SM4500-NO2 B
108.520	001	Nitrate-nitrite, Total	SM4500-NO3 E
108.521	001	Nitrate calc.	SM4500-NO3 E
108.530	001	Dissolved Oxygen	SM4500-O C
108.531	001	Dissolved Oxygen	SM4500-O G
108.590	001	Biochemical Oxygen Demand	SM5210B
108.591	001	Carbonaceous BOD	SM5210B
108.602	001	Chemical Oxygen Demand	SM5220D
108.640	001	Surfactants	SM5540C

Field of Testing: 109 - Toxic Chemical Elements of Wastewater

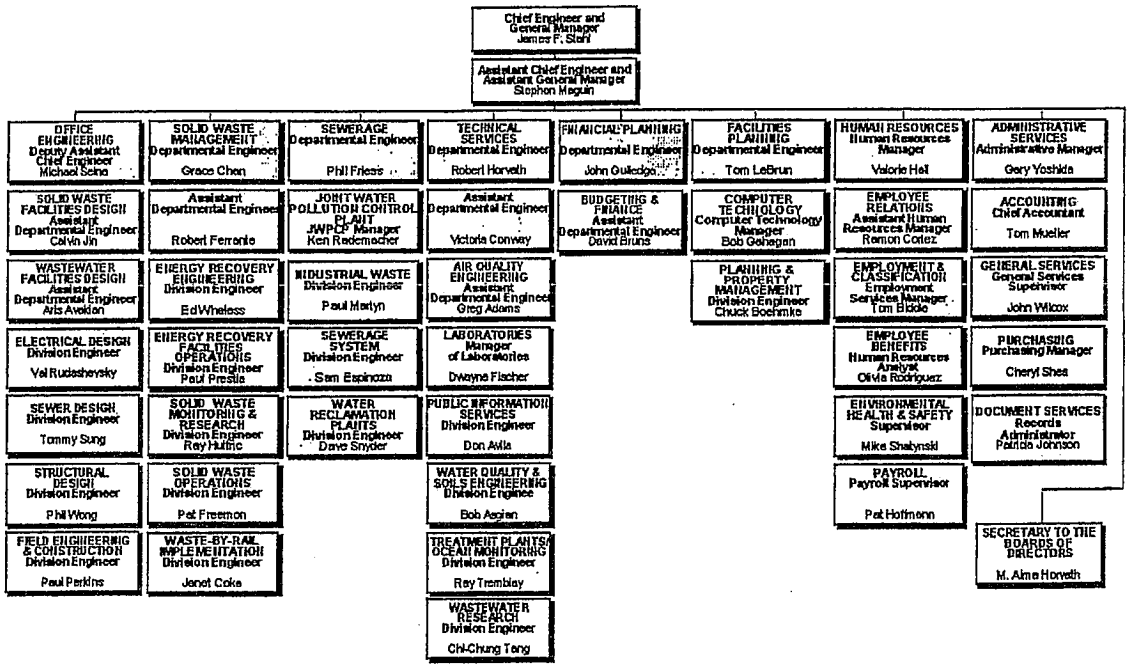
109.811	001	Chromium (VI)	SM3500-Cr D

As of 11/27/2006, this list supersedes all previous lists for this certificate number.
Customers: Please verify the current accreditation standing with the State.

APPENDIX B

Tables of Organization for the Sanitation Districts of Los Angeles County

Sanitation Districts of Los Angeles County Organization Chart



As of 11-06

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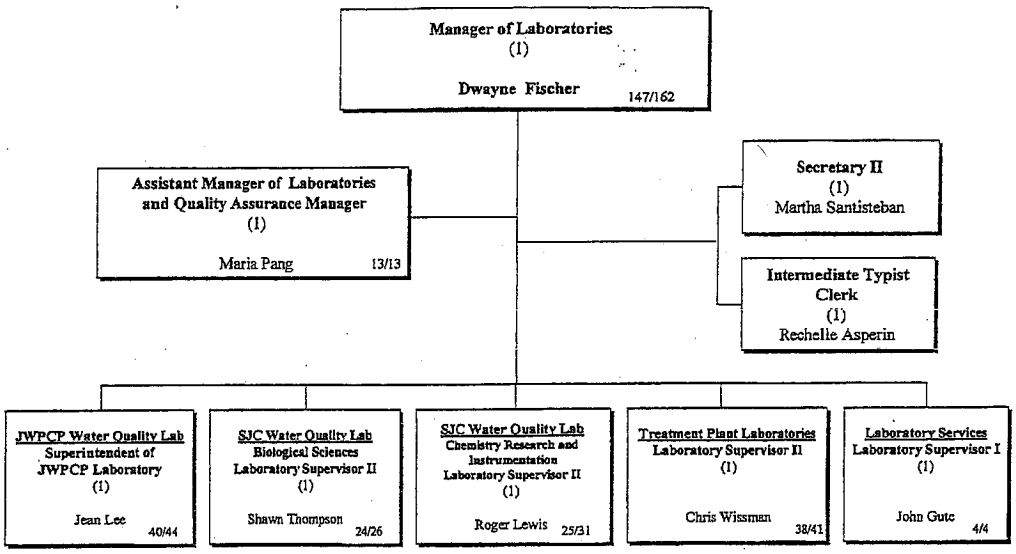
December 2006



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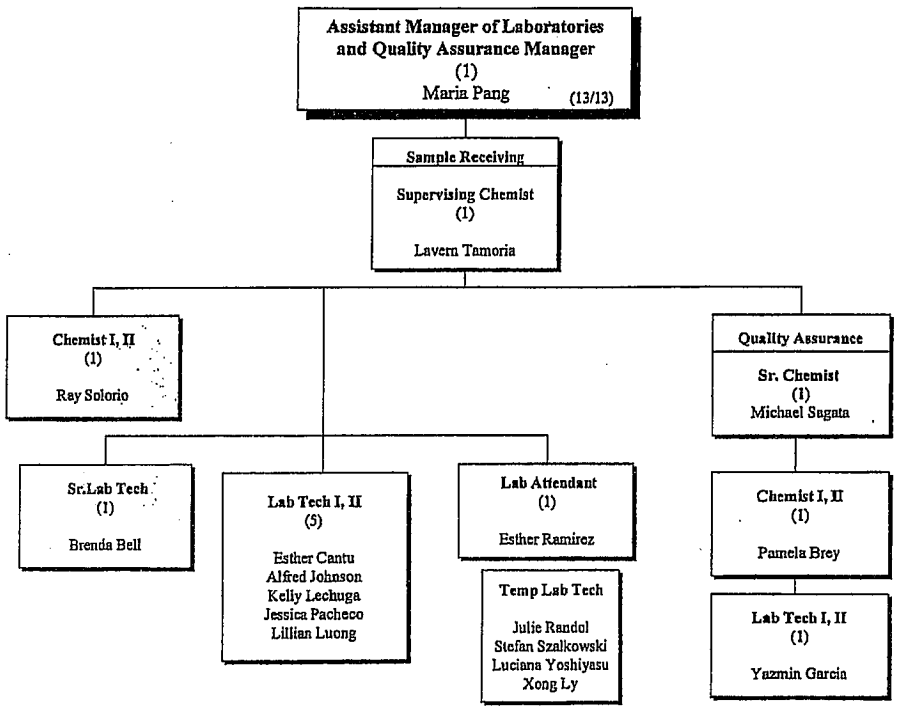

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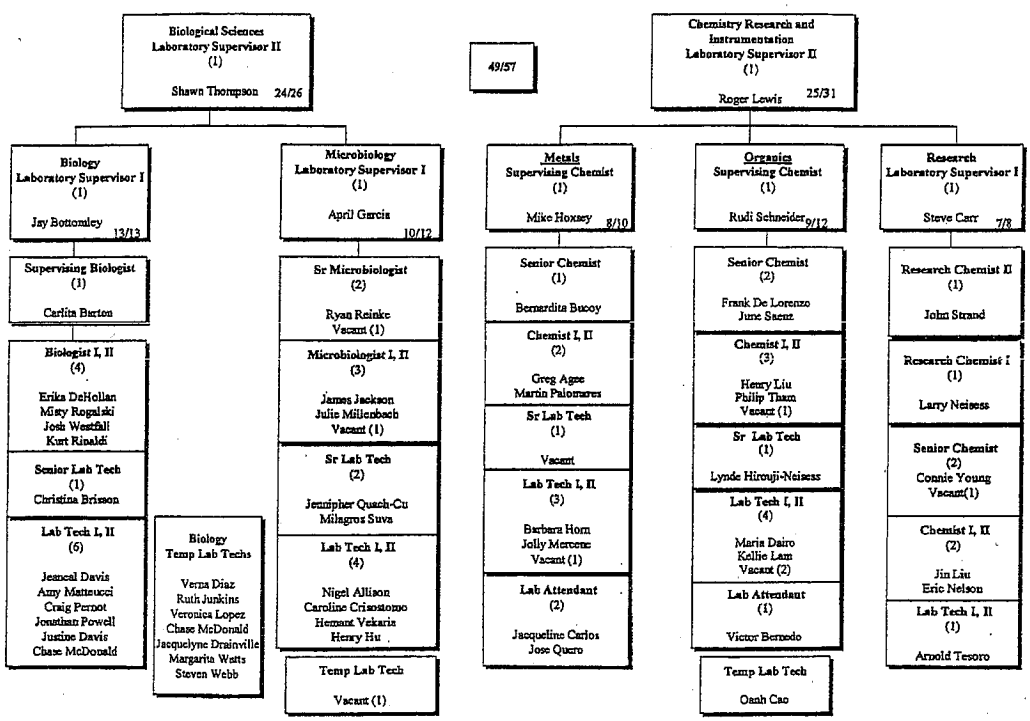

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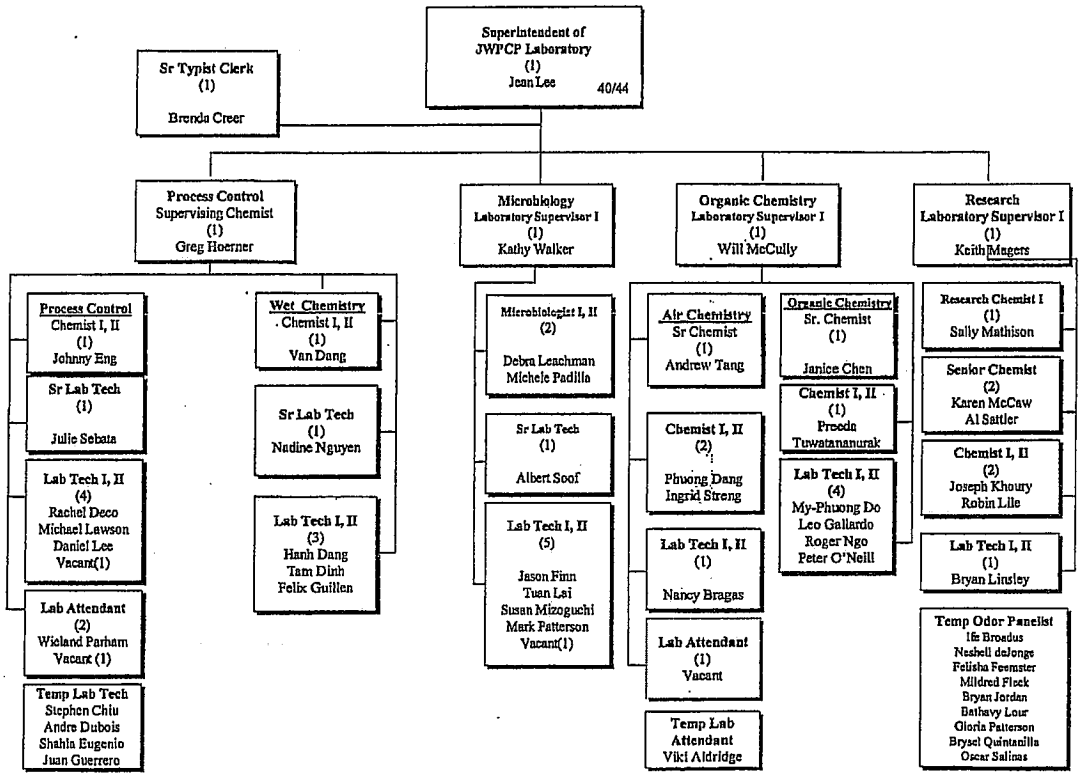

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TREATMENT PLANT LABORATORIES
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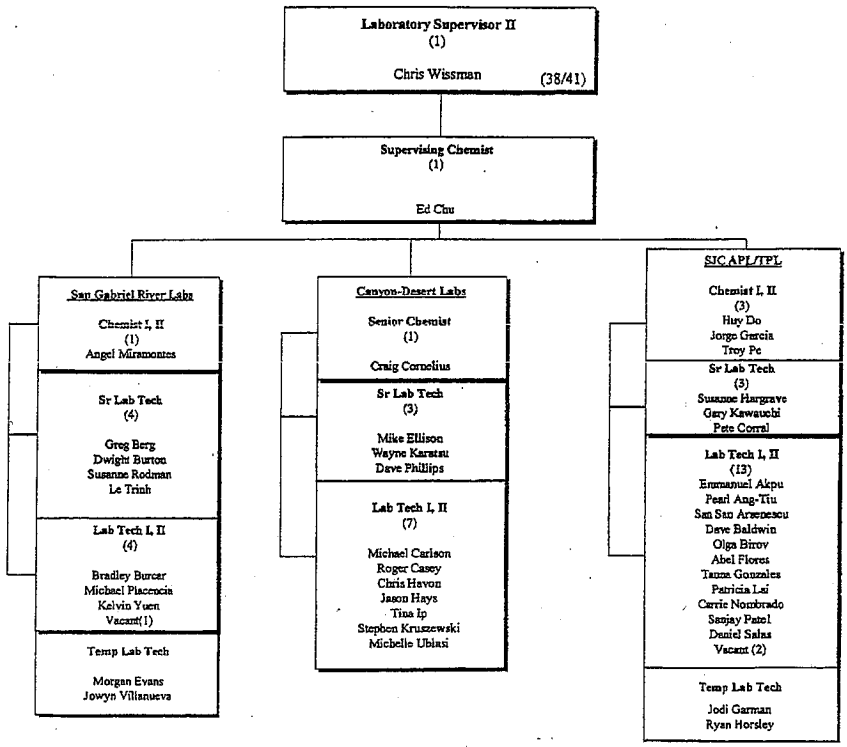

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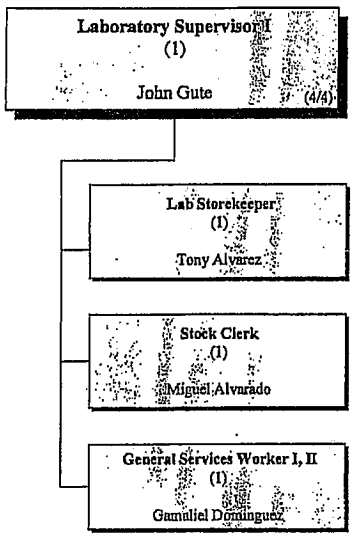
LABORATORY SERVICES
December 2006



APPENDIX C

Ethics and Data Integrity Policies and Procedures

Sanitation Districts of Los Angeles County

Laboratories Section

C0

Ethics and Data Integrity Policies and Procedures

Table of Contents

1. Introduction

This document outlines the ethics and data integrity policies and procedures implemented by the County Sanitation Districts of Los Angeles County through the Laboratories Section's Quality Assurance Program. It describes the framework by which the Laboratories Section establishes and maintains a documented ethics and data integrity system appropriate to the environmental activities it undertakes. In addition, this document outlines the Laboratories Section's policies and procedures as required by the Environmental Laboratory Accreditation Program (ELAP) according to the guidelines set by the National Environmental Laboratory Accreditation Conference (NELAC).

2. Ethics Policy

The Districts' Laboratories Section is committed to ensuring the integrity of our analytical data and to meeting the data quality needs of all regulatory agencies (California State Water Resources Control Board, California Department of Health Services, Department of Toxic Substances Control, U.S. Environmental Protection Agency). Key elements of our ethics policy are as follows:

- To produce results that are technically sound and legally defensible
- To provide employees with guidelines and an understanding of the ethical and quality standards required in a public agency through ethics and data integrity training
- To report any observation of suspicious, unethical, or illegal behavior
- To operate facilities in a manner that protects the environment and the health and safety of employees and the public, and
- To obey all pertinent federal, state, and local laws and regulations.

3. Data Integrity

Data integrity is the property that data have not been altered or destroyed in an unauthorized manner or by unauthorized users; it is a security principle that protects information from being modified or otherwise corrupted either maliciously or accidentally. Characteristics of data integrity include: data of known and documented quality, data whose authenticity can be relied upon, and data with positive controls that demonstrate the data's authenticity and accuracy. It is the goal of the Districts' Laboratories Section to set up systems, practices, and procedures to protect and assure the credibility, authenticity, and reliability of our analytical data.

4. Laboratory Fraud

Laboratory fraud is defined as the deliberate falsification of analytical and quality assurance results, where failed method and standard operating procedure requirements are made to appear acceptable; also, purposeful misrepresentation while knowingly and intentionally presenting information or data in a manner that is not scientifically valid.

Laboratory fraud includes but is not limited to:

- Making a false statement or representation
- Failure to analyze samples prior to reporting results (i.e., "dry-labbing")
- Failure to conduct required analytical steps, e.g., reporting previously conducted successful QC results instead of conducting required QC analyses
- Manipulation of the sample prior to analysis in order to produce a desired analytical result such as:
  - Fortification of a sample with additional analyte (known as "juicing")
  - Purposeful over-dilution of a sample to produce lower results or a biased lower recovery
  - Injection of an increased amount of continuing calibration verification solution when recoveries are low when injecting the proper volume
- Manipulation of results during analysis such as:
  - Peak shaving or peak enhancement in order to obtain acceptable QC data
  - Artificial manipulation of GC/MS tuning data to meet QC criteria
  - Falsifying the date or time of analysis in the data system or on the bench sheet in order to meet holding times (time traveling)
- Post analysis alteration of results such as:
  - Transposition of figures to produce a desired result
  - Removal of manual integration flags from data
  - Not documenting all data. Full documentation is required to support the rationale for choosing calibration points utilized and control sample performance. Rejected data points must be supported by the current standard operating procedures or approved by the responsible supervisor.

5. Inappropriate or Improper Practices That Can Lead To Suspicion of Fraud

- Practices which are not technically sound
- Practices used to bypass required quality control parameters
- Practices used to change quality control results so they pass the control criteria
- Practices in which results are modified for additional gain, over and above that which is normal for the analysis by the laboratory or individuals in the laboratory

6. Ethics and Data Integrity Responsibilities

- **Management Responsibilities**
  - Create a strong ethics and data integrity program
  - Provide training on ethics and data integrity
  - Promptly investigate allegations of unethical behavior
  - Maintain working conditions that encourage ethical behavior and proper data integrity
- **Supervisor Responsibilities**
  - Lead by example
  - Ensure that employees understand ethics and data integrity policies and attend ethics and data integrity training
  - Encourage open discussion of ethics and data integrity issues
  - Support and assist with ethics investigations
- **Employee Responsibilities**
  - Seek guidance when course of action is unclear
  - Be supportive and receptive to co-workers; communicate danger of unethical behavior and report suspected unethical behavior
  - Present concerns regarding unethical behavior in an honest manner

- Cooperate with investigations and maintain confidentiality while an investigation is in progress

Any employee who is aware of unethical conduct within the laboratory is required to report it. Failure to report unethical behavior will result in the employee being an accomplice to the unethical behavior.

7. Sources of Unethical Behavior

Generally, bad habits and unethical behavior are the result of workplace factors, management or supervisory factors, and/or personal factors.

- **Workplace Factors**
  - Ineffective oversight of laboratory data
  - Limited QA review of analytical laboratory data
  - "One-size-fits-all" approach to analytical requirements
  - Limited guidance and/or training on ethics and fraud
- **Management/Supervisory Factors**
  - Public humiliation and embarrassment
  - Uninvolved
  - Relying on ultimatums in a threatening, fearful, or arrogant manner
  - A punitive work environment where analysts are blamed for either routine failures or systematic problems
  - Inability to confront failure and unpleasant situations
- **Personal Factors**
  - Character flaws
  - Lack of personal integrity
  - Ignorance and insensitivity
  - Laziness and irresponsibility
  - Ambition without ethics or respect for the truth

8. Reporting Procedures and Confidentiality

When reporting ethics and/or data integrity concerns, follow the chain of command. First, report to your immediate supervisor. If the supervisor does not follow up, or is personally involved in the matter, then report your concerns to the Quality Assurance Manager. Alternatively, if you wish to remain anonymous, an "Ethics and Data Integrity Reporting Form", found on the Districts' Intranet website, should be completed and submitted via interoffice mail to the Quality Assurance Manager or the Manager of Laboratories.

No employee will be disciplined for raising ethics and/or data integrity concerns. The employee's identity will be kept confidential during the course of the investigation of allegations.

9. Ethics and Data Integrity Training

Within their first two weeks of employment, new employees (including temps) are required to read the "Ethics and Data Integrity Policies and Procedures" and subsequently sign an "Ethics and Data Integrity Agreement". Thereafter, on a yearly basis, ethics and data integrity refresher training will be required of all employees and each employee again will be required to sign the "Ethics and Data Integrity Agreement" thereby renewing their commitment to the Laboratories Section's ethics and data integrity policies.

10. Proactive Fraud Prevention and Detection

During the processes of data review, data verification, and data validation, implementing the following practices and asking the following questions are encouraged to prevent and detect fraud (also see Table 1. "Typical Laboratory Problems: Unacceptable/Acceptable Solutions"):

- Has routine instrument maintenance and servicing been fully documented? Schedule routine "down-time" to perform instrument maintenance and repairs to meet method quality control requirements.

- Routine spot-checking of manual integration utilized by the analysts. Are there repeated manual integrations, especially of QC data? A periodic audit of manual integration by supervisors/management is recommended.

- Peer reviewers should verify that reported dates in a data report are consistent. Does the date of analysis precede the date of extraction? This would raise the possibility of "time traveling".

- Are there overlapping analysis times for the same instrument? This suggests the possibility of "dry-labbing".

- Is there a pattern of high response factors for compounds where relatively low response factors are expected? This suggests the possibility of "juicing".

- Is there an indication that tuning or calibration dates may have been manipulated? For example, does the raw data indicate numerous computer operations associated with the tuning or calibration? Is there a possibility that an adjacent peak was "borrowed" in lieu of legitimate background subtraction procedures? If so, this raises questions about the analyst's performance and may suggest the use of improper practices.

- Are there erasures, whiteouts, and/or handwritten changes in the batch data or on the bench sheet? Are all changes properly documented and dated? Improperly documented changes may suggest improper manipulation of results.

- Is the QC data relevant and associated with the field sample data under review? The analyst may be attempting to hide out-of-control performance.

- Is there any indication that the analyst is selectively choosing desirable QC results while suppressing other data? If so, the analyst may be establishing improper calibration curves, or batch acceptance.

11. Response to Ethical and Data Integrity Issues

When an employee brings ethics and/or data integrity concerns to the attention of supervisors or management, the employee will be advised as to what action to take based on the situation. If the answer is not immediately known, the supervisor and/or management will investigate the concern and determine what advice to give at a future date.

12. Ethics Discipline

All factors must be weighed before determining discipline. The discipline may vary from a verbal or written warning to suspension or termination of employment. Knowingly falsifying data is grounds for immediate termination of employment.

Assessing Employee Responsibility

- Did the employee know the right action?

- Did the employee have adequate instructions?

- Did the action appear to be intentional?

- Was the employee instructed to take the wrong action?

- What was the severity of the violation?

- Was there any prior history of discipline involving the individual or the supervisor for ethics violations?

Assessing Management's Responsibility

- Did management direct or in any way condone the wrong action?
- Were there indicators of potential wrongdoing that were missed or ignored?
- Were there any conflicting practices or policies?

13. Conclusion

Ethics is a code of right and wrong behaviors that dictate personal and professional conduct. Ethical behavior is behavior that conforms to accepted professional standards of conduct; unethical behavior, therefore, is behavior not conforming to those standards. The Los Angeles County Sanitation Districts' Laboratories Section recognizes the importance of having employees that understand the difference between a mistake and improper behavior and are trained to make ethical decisions. Therefore, the Laboratories Section is committed to promoting and cultivating a culture of ethics and integrity while recognizing the critical role that every laboratory employee plays in public health and environmental management decisions.

14. References

Best Practices for the Detection and Deterrence of Laboratory Fraud, v.1.0, U. S. Environmental Protection Agency, Region 9, March 1997.

E.S. Babcock & Sons, Inc., Ethics and Data Integrity Manual, Appendix F, ESB Quality Assurance Manual, Rev. September 2003.

Guidance on Environmental Data Verification and Data Validation, U.S. Environmental Protection Agency, EPA/QA/G-8, 240/R-02/004, November 2002.

On-Line Ethics Training, New York Association of Approved Environmental Laboratories, www.nyaael.org.

Quality Systems, National Environmental Laboratory Accreditation Conference, 2003 NELAC Standard, Effective July 1, 2005.

Robertson, Peter D., Acting Deputy Administrator, Office of the Inspector General, U.S. Environmental Protection Agency, Memorandum, Laboratory Fraud: Deterrence and Detection, June 25, 1999.

Rosecrance, A.E., Ethics Standards for Environmental and Petroleum Testing Laboratories,

Proceedings of the U.S. EPA's 19th Annual Conference on Managing Environmental Quality Systems, Albuquerque, NM, April 2000.

U.S. Environmental Protection Agency, 16th Annual Waste Testing and Quality Assurance Symposium (WTQA 2000), August 2000.

ETHICS AND DATA INTEGRITY AGREEMENT

I, _____ (print name and employee number) understand that high standards of integrity are required of me with regard to the duties I perform and the data I report in connection with my employment by the Laboratories Section of the County Sanitation Districts of Los Angeles County, and:

1. All analytical results are to be presented as honestly and accurately as possible. I will not intentionally report data values that are not the actual values obtained;

2. Analytical difficulties are to be dealt with in a forthright manner. Any errors that effect an analysis must be brought to the attention of management as soon as discovered;

3. I will not intentionally report the dates, times, sample or Quality Control identifications that are not the actual dates, times, sample, or Quality Control identifications;

4. I will not intentionally report data values that do not meet established quality control criteria as set forth in the Method and/or Standard Operating Procedure;

5. I will not intentionally misrepresent another individual's work and if a supervisor or a member of management requests me to engage in or perform an activity that I feel is compromising data validity or quality, I will not comply with the request and will report this action immediately to a member of the upper management.

6. Any data corrections must be clearly documented, showing both the original data and the correction with the initials of the person making the correction, the date the correction was made, plus a notation of the reason for the correction whenever the reason is not readily apparent;

7. I agree to inform my Supervisor of any accidental reporting of non-authentic data by me in a timely manner. I agree to inform my Supervisor of any accidental or intentional reporting of non-authentic data by other employees.

8. I have read this Ethics Agreement and understand that failure to comply with the conditions stated above will result in disciplinary action.

_____ _____

Signature of Employee Date

_____ _____

Signature of Witness Date

Table 1. Typical Laboratory Problems: Unacceptable / Acceptable Solutions

Problem	Unacceptable Solution	Acceptable Solution
Holding time near or past	**Improper Clock Setting (Time Traveling) or Improper Data/Time Recording:** Resetting the internal clock on an instrument data system/computer to make it appear that a sample(s) was analyzed within a specified holding time when in fact it was not. Alternately, change the actual time or recording a false time to make it appear that holding times were met, or changing the times for sample collection, extractions or other steps to make it appear that they were performed at the correct time when in fact they were not.	The recorded date and time of collection, preparation or analysis must match the actual date and time that the action was performed. Documented dates and times must represent actual dates and times. Samples exceeding holding times must be reported as such; a case narrative is recommended.
DFTPP or BFB not meeting acceptance criteria	**Improper GC/MS Tuning:** Artificially manipulating GC/MS tuning data to produce an ion abundance result that appears to meet specific QC criteria when in fact the criteria were not met.	GC/MS tuning data must be generated and reported according to proper techniques without manipulation to the peak or mass spectrum. Preventive/corrective action must be taken on data not meeting required criteria.
Calibration or QC data not meeting acceptance criteria	**Improper Calibration/QC Analysis:** a. Performing multiple (more than two) calibrations or QC runs (including calibration verifications, LCSs, spikes, duplicates and blanks) until one analysis barely meets criteria, rather that taking needed preventive/corrective action after the second failed analysis, and not documenting or retaining data for the other unacceptable data. b. Using the incorrect (previous) initial calibration to make calibration verification data appear to be acceptable when in fact it was not acceptable when compared to the correct initial calibration. c. Discarding points in the initial calibration to force the calibration to meet acceptance criteria. Discarding points from an MDL study to force the calculated MDL to be higher or lower than the actual value.	a. All calibration and QC data associated with sample analyses must be documented. Preventive/corrective action must be taken and documented if calibration and/or other QC criteria are not met. b. Acceptance of calibration verification data must be based on the correct initial calibration. c. Calibration points can only be rejected for inclusion in the calibration curve if a known error was made or if a statistical evaluation indicates that a point can be discarded. When multiple target analytes are included in each calibration standard, it may be necessary to discard selected upper or lower points for individual target analytes. Points can be discarded at the upper end of the curve if the linear range of the detector has been exceeded. Data points for MDL studies can only be rejected for inclusion in the MDL calculation if a known error was made or if a statistical evaluation indicates that a point can be discarded.
QC samples or spikes not meeting acceptance criteria	**Misrepresentation of QC Samples and Spikes:** Misrepresenting QC samples or spikes as being digested or extracted when in fact they were not actually digested or extracted for example: a. Add surrogates after sample extraction rather than prior to sample extraction. b. Reporting post-digested spikes or duplicates as predigested spikes or duplicates. c. Not preparing or analyzing method blanks and LCSs the same way that samples are prepared or analyzed in order to make it appear that method blank or LCS results are acceptable when in fact they may not be.	QC samples and spikes must be prepared, analyzed and reported according to appropriate procedures. a. Surrogates must be added prior to sample extraction. b. Post-digested spikes and duplicates must be reported as post-digested and must not be misrepresented as pre-digestion spikes and duplicates. c. Method blanks and LCSs must be prepared and analyzed the same way that samples are prepared and analyzed. QC results outside of acceptance criteria must be reported as such; a case narrative is recommended.

Table 1. (Cont.) Typical Laboratory Problems: Unacceptable / Acceptable Solutions

Problem	Unacceptable Solution	Acceptable Solution
Calibration or QC data not meeting acceptance criteria	**File Substitution:** Substituting previously generated files (runs) for a noncompliant calibration or QC run to make it appear that an acceptable run was performed when in fact it was not.	All data must be generated and reported for actual analyses performed. Reported dates and times for all analyses must match actual dates and times. Substitution of files is not permitted.
Calibration or QC data not meeting acceptance criteria	**Unwarranted Manipulation of Computer Software:** Unwarranted manipulation of computer software to force calibration or QC data to meet criteria and removing computer operational codes, such as "M" flags.	Computer manipulation is allowed only for warranted reasons and any manipulation should be minimal and traceable. Removal of computer operational codes is not permitted.
Analytical conditions for standard do not work for sample	**Improper Alteration of Analytical Conditions:** Improperly altering analytical conditions, such as changing the instrument conditions for sample analyses from those used for standard analyses. Also using different procedures to process sample data than those used for standards.	All sample analyses must be performed under the same conditions as those used for standard analyses. Any alterations of analytical conditions must be allowable under the method requirements. All sample data must be processed by the same procedures as those used for processing standard data. Any discrepancies must be documented.
Sample not analyzed at appropriate level or not reported at correct detection limit	**Overdilution of Samples or Misrepresentation of Detection Limits:** Intentionally diluting a sample to such an extent that no analytes (target or non-target) are detected without justification as to why the high dilution was made. Reporting a detection limit that does not represent the sample analysis (e.g., not including dilution factor in sample detection limit).	Dilutions must be made on a reasonable basis, such as high concentrations of target or non-target analytes, matrix interferences, oily samples, and other components in the sample that could harm the instrument. Include details on the reason for the dilution in a case narrative. Sample detection or reporting limits must include dilution factors.
Non-Compliant Data	**Deletion of Non-Compliant Data:** Intentional deletion or non-recording of non-compliant data to conceal the fact that analyses were non-compliant.	All data associated with sample collection and analysis, including any out of control events or non-compliant data, must be documented and retained. Preventive corrective action must be taken and documented for any non-compliant data.
Undesirable situation with analysis or sample; knowledge of unethical conduct	**Concealment of a Known Problem:** Concealing a known analytical or sample problem from the laboratory supervisor or laboratory management. Concealing a known unethical behavior or action from the laboratory supervisor or laboratory management.	Any knowledge of analytical or sample problems must be communicated to the laboratory supervisor or laboratory management. Any knowledge of unethical behavior or actions must be fully communicated to the laboratory supervisor or laboratory management.

APPENDIX D

Sample Receiving Forms

SJCWQL SAMPLE REQUEST FORM

LAB JOB NOS.: 1) SJ 2) SJ 3) SJ 4) SJ

CHARGE NOS.: 1: _____ B ____ 2: _____ B ____ 3: _____ B____

REQUESTED BY: _____ SAMPLED BY: _____

REPORT TO: 1) _____ 2)_____ 3)_____

DATE AND TIME - GRAB SAMPLES: 1) / / : 2) / / :

3) / / : 4) / / :

COMPOSITE SAMPLES: 1) FROM: / / : / / :

2) FROM: / / : / / :

3) FROM: / / : / / :

4) FROM: / / : / / :

SAMPLE LOCATION: 1) - - TYPE: VOLUME LITER

2) - - TYPE: VOLUME LITER

3) - - TYPE: VOLUME LITER

4) - - TYPE: VOLUME LITER

DESCRIPTION: 1) _____

2) _____

3) _____

4) _____

PROJ. NO.: NO. OF SAMPLES: LOCATIONS: 1) 2) 3) 4)

PROJECT TITLE:

TESTS REQUIRED:

CODE: TEST NAME: CODE: TEST NAME:

1) _____ - _____
2) _____ - _____
3) _____ - _____
4) _____ - _____
5) _____ - _____
6) _____ - _____
7) _____ - _____
8) _____ - _____
9) _____ - _____
10) _____ - _____
11) _____ - _____
12) _____ - _____
13) _____ - _____
14) _____ - _____
15) _____ - _____
16) _____ - _____
17) _____ - _____
18) _____ - _____
19) _____ - _____
20) _____ - _____
21) _____ - _____
22) _____ - _____
23) _____ - _____
24) _____ - _____
25) _____ - _____
26) _____ - _____
27) _____ - _____
28) _____ - _____
29) _____ - _____
30) _____ - _____

NOTES TO ANALYST:

CUSTODY RECORD

Relinquished by: (Signature)	Date/Time / / AM/PM	Received by: (Signature)

Figure 1. SJCWQL Sample Request Form

SJ Number:

San Jose Creek
Sample Receipt Form

Sample Receiving Center
1965 Workman Mill Rd.
Whittier, CA 90601

Date and Time Stamp	Temperature at time of receipt
	°C *

Sample Inspection Section:

Chain of Custody?	Yes	No	N/A	NOTES:
Container labeled according to information on the login sheet?	Yes	No	N/A	
Proper containers used for analyses requested?	Yes	No	N/A	
Samples properly preserved?	Yes	No	N/A	
VOA vial(s) free of headspace?	Yes	No	N/A	
Samples received on ice?	Yes	No	N/A	if N/A, directly from:

Bottles Received:

Constituent	Container ID	Bottle Code	Vol (L)	Constituent	Container ID	Bottle Code	Vol (L)	Constituent	Container ID	Bottle Code	Vol (L)
Volatiles w/o acid		JA		Dioxin/ Furans		SA		Phosphate		OA	
Acrolein/ Acrylonitrile (pH4.5)		JQ		Flash Point		OA		Silver		FB	
				MBAS		CA NA		Sulfides		FD	
Volatiles w/ acid (pH<2)		JH ZR		Mercaptans		FA		TOC		IO	
				Mercury		UB		Total Hardness		CA NA	
AOK Nitrogen		CC NC				AB CB		TOX		MK	
As, Se, Sb		CB NB		Metals		NB		2,3,7,8-TCDD		SA	
Atrazine /Simazine		SA		MOD 8015		DH				AA CA	
BNAs		LA		NDMA		VA LA		Wet Chem		GA LA	
Boron/ Fluoride		FA		NIDS		CA NA				NA YA	
Chlorophyll a		SA		Oil and Grease		DH		Other:			
		CD ND		Ortho-Phosphate		OA		Other:			
Cyanide		AD		Perchlorate		FA		Other:			
Chromium VI		CA NA		Pesticides		SA		Other:			
Diazinon		SA		Phenols		VC		Other:			

Received By:				
Esther Cantu	Mark Estoque	R. Mariano		Signature:
Brenda E. Bell	Chris Huang	Lillian Luong	Other:	

Figure 2. Sample Receipt Form

SANITATION DISTRICTS OF LOS ANGELES COUNTY
SURVEILLANCE PROGRAM CUSTODY TAG

Sample Source: _____

This is #_____ of _____ Splits.

LOT NUMBER: PRESERVATIVE ADDED:	Time	Date	Sampled By: (Signature)
☐ ACID:	Time	Date	Relinquished By: (Signature)
☐ BASE:	Time	Date	Received By: (Signature)
☐ OTHER	Time	Date	Relinquished By: (Signature)
☐ AMOUNT: ml/g	Time	Date	Received By: (Signature)

LAB JOB NO. SJS

SANITATION DISTRICTS OF LOS ANGELES COUNTY
PRETREATMENT PROGRAM CUSTODY TAG

Sample Source: _____

This is #_____ of _____ Splits.

LOT NUMBER: PRESERVATIVE ADDED:	Time	Date	Sampled By: (Signature)
☐ ACID	Time	Date	Relinquished By: (Signature)
☐ BASE:	Time	Date	Received By: (Signature)
☐ OTHER:	Time	Date	Relinquished By: (Signature)
☐ AMOUNT: ml/g	Time	Date	Received By: (Signature)

LAB JOB NO. _____

Figure 3. Surveillance and Pretreatment Programs Custody Tags

SANITATION DISTRICTS OF LOS ANGELES COUNTY
EVIDENCE SAMPLE—CUSTODY TAG

Sample Source: _____

This is #_____ of _____ Splits. See over for preservative.

CONTAINER LOT NUMBER:	Time	Date	Sampled By: (Signature)
Relinquished By: (Signature)	Time	Date	Received: By: (Signature)
Relinquished By: (Signature)	Time	Date	Received: By: (Signature)
Relinquished By: (Signature)	Time	Date	Received: By: (Signature)
Relinquished By: (Signature)	Time	Date	Received: By: (Signature)

LAB JOB NO. SJE _____

FRACTION # _____ **OF** _____ **SPLITS**

Preservative Added:	Preserved By: (Signature)
	Stored By: (Signature)
☐ ACID: _____	Retrieved By: (Signature)
☐ BASE: _____	Stored By: (Signature)
☐ OTHER: _____	Retrieved By: (Signature)
☐ AMOUNT: ____ml/g	Stored By: (Signature)

Figure 4. Evidence Sample Custody Tag

LOGGED IN BY:_____ LABORATORY JOB NUMBER: SJE_____

CHARLES W. CARRY
Chief Engineer and General Manager

SANITATION DISTRICTS OF LOS ANGELES COUNTY
P.O. Box 4998 Whittier, California 90607

For additional information regarding this analysis call (310) 699-7411 x 2900

EVIDENCE SAMPLE - CHAIN OF CUSTODY RECORD

SAMPLE IDENTIFICATION | Surcharge Account Number: | I.W. Permit Number:

Sample Source or Company Name: _____

Address: _____

Reason For Sampling: ☐ Phase I ☐ Pretreatment ☐ Sewer System Problem ☐ Other: _____

Evidence Sampling Authorized By: *Marilyn* _____

Accounting Charges: ☐ For Routine Samples Taken By Inspectors: TS14905 BM ☐ For routine Samples Taken By - IWMC: TS14905 BM

☐ For All Special Investigation Samples: TS14905 B_____ ☐ Other _____

SAMPLE COLLECTION INFORMATION:

Sample Taken From:
- ☐ Sample Box
- ☐ Clarifier
- ☐ Clean-out
- ☐ Other_____

Sample Method:
- ☐ Grab
- ☐ Composite-Timed With _____ minute intervals
- ☐ Composite-Flow With _____ gallon intervals

Sample Grab or Composite Times:

A/or ☐ A.M. ☐ P.M.

From _____ HR MIN ☐ A.M. ☐ P.M. _____ MONTH DAY 19 YEAR

To _____ HR MIN ☐ A.M. ☐ P.M. _____ MONTH DAY 19 YEAR

Condition of Clarifier, Sample Box, Other Observations: _____

Company Contact: Name:_____ Title: _____

Sample By (Signature):_____ Container Lot Number: _____

Total Quantity of Sample Collected:_____ Total Quantity of Composite Prepared:_____ Total Quantity Submitted to Lab _____

Sample Preservation Used:_____ Sample Split With Company?: Y N Name: _____

Flow When Sampled:

_____ Hour Composite - Total Flow During Composite Period:_____ Grab Sample - Flow Rate At Time of Sample: _____

Obtained From: ☐ Visual Estimate, ☐ Effluent Flow Meter, ☐ Influent Water Meter, ☐ Impossible To Tell If Flow Existed When Sampled

FIELD TEST RESULTS

pH (005) _____ Flammability _____ Redox _____ Cyanide _____

Odor _____ Other _____

Sulfide_____ Other _____ Other _____

LABORATORY TESTS Check Tests Requested

	CONSTITUENT	CODE
	pH	101
	TOTAL CYANIDE, mg/l CN	206
	TOTAL ARSENIC, mg/l As	705
	TOTAL CADMIUM, mg/l Cd	708
	TOTAL CHROMIUM, mg/l Cr	709
	TOTAL COPPER, mg/l Cu	712
	TOTAL LEAD, mg/l Pb	714
	TOTAL MERCURY, mg/l Hg	717
	TOTAL NICKEL, mg/l Ni	718
	TOTAL SILVER, mg/l Ag	722
	TOTAL ZINC, mg/l Zn	724
	FLASH POINT °C	105
	TOTAL PHENOLS, mg/l C,H, OH	312

	CONSTITUENT	CODE

CUSTODY RECORD

Relinquished by: (Signature)	Time/Date	Received by: (Signature)
Relinquished by: (Signature)	Time/Date	Received by: (Signature)
Relinquished by: (Signature)	Time/Date	Received by: (Signature)
Relinquished by: (Signature)	Time/Date	Received by: (Signature)
Relinquished by: (Signature)	Time/Date	Received by: (Signature)

Figure 5. Evidence Sample Chain of Custody Tags

LOGGED IN BY:_____ LABORATORY JOB NUMBER: SJS_____

CHARLES W. CARRY
Chief Engineer and General Manager

SANITATION DISTRICTS OF LOS ANGELES COUNTY
P.O. Box 4998 Whittier, California 90607

For additional information regarding this analysis call (562) 699-7411 x 2900

SURVEILLANCE PROGRAM - CHAIN OF CUSTODY RECORD

SAMPLE IDENTIFICATION | Surcharge Account Number: | I.W. Permit Number:

Sample Source or Company Name: _____

Address: _____

Reason For Sampling: ☐ Phase 1 ☐ Pretreatment ☐ Sewer System Problem ☐ Other: _____

Evidence Sampling Authorized By: *Martyn Burch* _____

Accounting Charges: ☐ For Routine Samples Taken By IWMC: TS14905 BM

☐ For All Special Investigation Samples: TS14905 D_____ ☐ Other: _____

SAMPLE COLLECTION INFORMATION: Test aliquot Volume____/____mL Interval____/____min, Estimated Flow Rate_____cpm.

Sample Taken From:
- ☐ d/s Manhole
- ☐ u/s Manhole
- ☐ d/s Only Manhole
- ☐ Other:

* Sample Method:
- ☐ Composite - Single Container
- ☐ Individual Bottles _____ hr/bottle
- ☐ Individual Bottles - Composited
- ☐ Grab

* Sample Date:
- At/or
- From ____ (HR MIN) ☐ A.M. ☐ P.M. _____ 20____ (MONTH DAY YEAR)
- To ____ ☐ A.M. ☐ P.M. _____ 20____

Condition of Manhole, Other Observations: _____

Sampled By (Signature): _____

Total Quantity of Sample Collected: _____ Quantity submitted to lab _____ Sample Container(s) Used: ☐ C/o Other: _____

Sample Preservation Used: ☐ Ice ☐ No Cl_2 ☐ Sodium Thiosulfate ☐ NaOH ☐ HNO_3 Other: _____

Composite Sample Data: pH (905) _____ Color: _____ Other: _____

Individual Bottle Data: pH/Color/Vol.

1.		6.		11.		17.	23.
2.		7.		12.		18.	24.
3.		8.		13.		19.	25.
4.		9.		14.		20.	26.
5.		10.		15.		21.	27.
				16.		22.	28.

Bottle Nos. Composited: _____

Bottle Nos. Submitted to Lab: _____

LABORATORY TESTS NOTES TO ANALYSTS: _____

	pH	101		
	SUSPENDED SOLIDS, mg/l	151		
	COD, mg/l O	403		
	TOTAL CYANIDE, mg/l CN	206		
	CYANIDE AMENABLE TO Cl_2	210		
	TOTAL CADMIUM, mg/l Cd	708		
	TOTAL CHROMIUM, mg/l Cr	709		
	TOTAL COPPER, mg/l Cu	712		
	TOTAL LEAD, mg/l Pb	714		
	TOTAL NICKEL, mg/l Ni	718		
	TOTAL SILVER, mg/l Ag	722		
	TOTAL ZINC, mg/l Zn	724		

CUSTODY RECORD

Relinquished by:	Print Name	Time/Date	Received by:	Print Name
Relinquished by:	Print Name	Time/Date	Received by:	Print Name
Relinquished by:	Print Name	Time/Date	Received by:	Print Name
Relinquished by:	Print Name	Time/Date	Received by:	Print Name

Figure 6. Surveillance Program Chain of Custody Record

Received In Sample Room By: _____

Time Received In Laboratory: _____

LABORATORY JOB NUMBER: _____

PRIORITY:
☐ Routine (U) ☐ Expedite, (1 hr. DQ)
☐ Rush, 1 day (R) ☐ Urgent, 1 wk. (U)

PRIORITY AUTHORIZATION _____
Ext. _____

JAMES F. STAHL
Chief Engineer and General Manager

SANITATION DISTRICTS OF LOS ANGELES COUNTY
P.O. Box 4998 Whittier, California 90607

For additional information regarding this analysis call (562) 699-7411 x:2900

INDUSTRIAL WASTE MONITORING RESULTS

SAMPLE IDENTIFICATION | Surcharge Account Number: | I.W. Permit Number:

Sample Source or Company Name: _____

Address: _____

Reason For Sampling: ☐ Routine ☐ Phase 1 ☐ Treatment Plant Upset ☐ Sewer System Problem ☐ Other: _____

Monitoring Requested By: Manufacturer _____

Accounting Charges: ☐ For Routine Samples Taken By Inspectors: TS14905 BI ☐ For Routine Samples Taken By AMMC: TS14905 BM
☐ For All Special Investigation Samples: TS14905 R _____

SAMPLE COLLECTION INFORMATION:

* Sample Point		* Sample Method	* Sample Date:	
☐ Sample Box	☐ Clarifier	☐ Grab	After	☐ A.M.
☐ Manhole	☐ _____	☐ Composite-Timed With _____ minute intervals	From _____ (24 HR)	☐ P.M. _____ 20__ (MONTH DAY YEAR)
☐ Valve	☐ CN Sample Point	☐ Composite-Flow With _____ x _____ gallons.		☐ A.M.
☐ Clearwell	☐ _____	Test aliquot volume _____ / _____ ml	To _____	☐ P.M. _____ 20__
		Tot aliquot _____		

* Observations: _____

* Sampled By _____ * Submitted to Laboratory By: _____ * Contact Name _____ * Title _____

* Total Quantity of Sample Collected: _____ * Sample Container(s) Used: ☐ Cubitainer ☐ Other: _____

* Quantity Submitted to Lab _____

* Sample Preservation Used: ☐ Ice ☐ $HgCl_2$ ☐ Sodium Thiosulfate ☐ NaOH ☐ HNO_3 Other _____

Sample given to company: Y N (Refused)
Sample given to: ☐ Contact Other _____
Sample: ☐ Split ☐ Concurrent ☐ Consecutive

Flow When Sampled:

COMPOSITE SAMPLE		GRAB SAMPLE
Period of Composite _____ hours		Flow Rate at Time of Sample:
Totalizer Readings: Final: _____		
Initial: _____		(905)pH _____ in. _____ cfm
Difference: _____		
Multiplier: _____		(905)pH _____ dia. _____ gpm
Total Flow: _____ gallons		
* Obtained From: ☐ Visual Estimate ☐ Effluent Flow Meter ☐ Influent Water Meter ☐ Impossible To Tell If Flow Existed When Sampled		

FIELD TEST RESULTS

* pH (905) _____ * Color _____ * Temperature _____ * Cyanide _____

* Odor _____

* Total Sulfide _____ * Dissolved Sulfide _____ * Other _____

LABORATORY TESTS NOTES TO ANALYSTS: _____

	pH	101		OIL AND GREASE, mg/l	405		MBAS, mg/l LAS	315
	SUSPENDED SOLIDS, mg/l	161		OIL AND GREASE (NON-POLAR), mg/l	414		MO, mg/l	316
	SUSPENDED SOLIDS (@ pH7), mg/l	160						
	COD, mg/l O	409		TOTAL CYANIDE, mg/l CN	204		BENZENE, ug/l	520
	TOTAL DISS. SOLIDS (TDS), mg/l	156		CYANIDE AMENABLE TO Cl_2	210		TOLUENE, ug/l	521
	TOTAL DISS. SOLIDS (@ 550°C), mg/l	186		TOTAL CADMIUM, mg/l Cd	706		ETHYL BENZENE, ug/l	524
				TOTAL CHROMIUM, mg/l Cr	707		o-XYLENE, ug/l	523
	AMMONIA NITROGEN, mg/l N	201		TOTAL COPPER, mg/l Cu	712		m+p-XYLENE, ug/l	525
	SOLUBLE SULFIDE, mg/l S	252		TOTAL LEAD, mg/l Pb	714			
	THIOSULFATE SULFUR, mg/l S	253		TOTAL NICKEL, mg/l Ni	718			
	SULFITE SULFUR, mg/l S	254		TOTAL SILVER, mg/l Ag	722		PC	
	SULFATE, mg/l SO_4	257		TOTAL ZINC, mg/l Zn	724			
	TOTAL MERCAPTANS, mg/l S	258		TOTAL ARSENIC, mg/l As	706		EPA	
	TOTAL PHENOLS, mg/l C_6H_5OH	317		TOTAL MERCURY, mg/l Hg	717			

DISTRIBUTION: Return this sheet to Industrial Waste Section Head after log-in.
* All information to be filled in by Field Collection Personnel

Figure 7. Industrial Waste Monitoring Request Form

LOGGED IN BY: _____ LABORATORY JOB NUMBER: SJP _____

CHARLES W CARRY
Chief Engineer and General Manager

SANITATION DISTRICTS OF LOS ANGELES COUNTY
P.O. Box 4998 Whittier, California 90607

For additional information regarding this analysis call (310) 699-7411 x 2900

PRETREAMENT PROGRAM - CHAIN OF CUSTODY RECORD

SAMPLE IDENTIFICATION | Surcharge Account Number: | I.W. Permit Number:

Sample Source or Company Name: _____

Address _____

Reason For Sampling ☐ Phase I ☐ Pretreatment ☐ Sewer System Problem ☐ Other. _____

Monitoring Requested By: *Marilyn/Burch* _____

Accounting Charges: ☐ For Routine Samples Taken By IWMC: TS14905 BM

☐ For All Special Investigation Samples: TS14905 B _____ ☐ Other: _____

SAMPLE COLLECTION INFORMATION:

* Sample Point:
- Sample Box ☐ Clarifier
- Manhole _____
- Valve ☐ CN Sample Point
- Clean-out _____

* Sample Method:
- ☐ Grab
- ☐ Composite-Timed With ____ minute intervals
- ☐ Composite-Flow With ____ x ____ gallons
- Test aliquot volume ____ ml.
- Tot aliquot _____

* Sample Date:
- After ☐ A.M
- From _____ (HR MIN) ☐ P.M (MONTH DAY) 19 (YEAR)
- ☐ A.M
- To _____ ☐ P.M _____ 19__

* Observations. _____

* Sampled By: _____ * Submitted to Laboratory By: _____ * Contact Name: _____ * Title: _____

* Total Quantity of Sample Collected: _____ * Sample Container(s) Used: ☐ C/c _____ Other: _____ * Split with Company? Y N

* Quantity Submitted to Lab. _____ * Split given to. ☐ Contract

* Sample Preservation Used. ☐ Ice ☐ $No Cl_2$ ☐ Sodium Thiosulfate ☐ NaOH ☐ HNO_3 Other: _____

FIELD TEST RESULTS

pH (905) _____ Sulfide _____

Color _____ Flammability _____

Cyanide _____ Odor _____

Redox _____ Other _____

FLOW METER INFORMATION

Totalizer Readings: _____

Final. _____

Initial: _____

Difference: _____

Multiplier: _____

Total Flow: _____ gal.

Flow Rate at Time of Sample:

(905)ph_____ s/u_____gpm

(905)ph_____ s/u_____gpm

☐ Visual Estimate

☐ Effluent Flow Meter

☐ Influent Water Meter

☐ Estimate Impossible

LABORATORY TESTS NOTES TO ANALYSTS: _____

CONSTITUENT	CODE
pH	101
SUSPENDED SOLIDS, mg/l	151
COD, mg/l O	403
TOTAL DISS. SOLIDS (TDS), mg/l	155
AMMONIA NITROGEN, mg/l N	201
TOTAL PHOSPHATE, mg/l PO_4	310
TOTAL FLUORIDE, mg/l F	313
TOTAL PHENOLS, mg/l C_6H_5OH	312
OIL AND GREASE, mg/l	406
OIL AND GREASE (NON-POLAR), mg/l	414

CONSTITUENT	CODE
TOTAL CYANIDE mg/l CN	206
CYANIDE AMENABLE TO C12	210
TOTAL CADMIUM, mg/l Cd	708
TOTAL CHROMIUM, mg/l Cr	709
TOTAL COPPER, mg/l Cu	712
TOTAL LEAD, mg/l Pb	714
TOTAL NICKEL, mg/l Ni	718
TOTAL SILVER, mg/l Ag	722
TOTAL ZINC, mg/l Zn	724
TOTAL ARSENIC, mg/l As	705
TOTAL MAGANESE, mg/l Mn	716
TOTAL ANTIMONY, mg/l Sb	725

CONSTITUENT	CODE
PROJECT CODE 831	T06
ACROLEIN	654
ARCYLONITRILE	665
PROJECT CODE:	
EPA	
TOTAL GOLD, mg/l Au	730
TOTAL PLATINUM, mg/l Pt	M01
TOTAL PALLADIUM, mg/l Pd	M02

CUSTODY RECORD

Relinquished by	Print Name	Time/Date	Received by:	Print Name
Relinquished by.	Print Name	Time/Date	Received by.	Print Name
Relinquished by	Print Name	Time/Date	Received by:	Print Name
Relinquished by:	Print Name	Time/Date	Received by.	Print Name
Relinquished by	Print Name	Time/Date	Received by:	Print Name

Figure 8. Pretreatment Program Chain of Custody Record

APPENDIX E

Overview of the Laboratory Data Information Systems

SANITATION DISTRICTS OF LOS ANGELES COUNTY
LABORATORY DATA INFORMATION SYSTEM

The Sanitation Districts laboratory data information system is an in-house designed database system that runs on the Districts' mainframe computer. The system is known as LABDATA, and access to the system is via a network of personal computers. The laboratory superintendents of the SJCWQL and the JWPCPWQL are each the system manager for the half of LABDATA which links their respective groups to the database. Several layers of protection govern this mirror-image system.

LABDATA runs in an environment where user access is restricted to operation from fixed, standardized programs. Data entry is accepted only in standardized format from authorized users (those with correct passwords). Most of the laboratory results are transferred to LABDATA directly from computer calculated and formatted results. This minimizes the potential for transcription errors of manually entered results. The database is backed up daily to protect against catastrophic loss. The data has a three-year residence time on-line. Older data may be accessed via the archived backups on an as-needed basis.

Every sample that arrives at the sample receiving station is assigned a unique identification number during the log-in process. This number and all of the location and sample collection information and required tests are added to the LABDATA database. (Location, collection, and tests carry Districts specified codes so that the sample record may be retrieved by either its log number or by code information such as location, sample type, date, and/or test). It is from this permanent information entered at log-in that analysts receive their daily work assignments and enter analytical data.

The log-in process is performed using a Districts designed program called TDQ. TDQ provides a more familiar and flexible Windows® environment for entering the sample information to the mainframe database. TDQ is also used to create analysis reports for the samples that have specific data requirements and report formats required by some regulatory agencies. Access to TDQ is restricted to authorized personnel.

Data reporting in the form of a final standardized laboratory reporting format is accomplished from the LABDATA database after the results are verified by the group supervisor, which is followed by approval by the laboratory superintendent or authorized laboratory supervisor. A preliminary data hardcopy may be generated via a "screen dump" command, but no statistical or test manipulation of on-line data is possible for reporting. Laboratory users may perform statistical analysis and generate customized reports and graphics from a parallel database, which is updated daily from LABDATA, but these processes can not alter the LABDATA information. Once the group supervisor verifies a result, any changes will require another verification. Once a sample is approved by the laboratory superintendent or authorized supervisor, further changes can only be performed by the laboratory superintendent or authorized laboratory supervisor. An amended report will then be generated and the requestor(s) of the tests will be notified.

SANITATION DISTRICTS OF LOS ANGELES COUNTY
JOINT WATER POLLUTION CONTROL PLANT
TDJ TECHNICAL DATABASE SYSTEM

The Joint Water Pollution Control Plant TDJ technical database system is an in-house customized system that runs on the District's mainframe computer. The system is known as "TDJ", and is utilized for both laboratory and operational data entry and manipulation. The system is accessed through a network of personal computers. The Superintendent of the JWPCP Laboratory and the JWPCPWQL Process Control/Sample Receiving Group Supervisor act as system managers for the laboratory data portion of the TDJ system.

TDJ runs in an environment where user access is restricted to operation from fixed, standardized programs. Data entry is accepted only in standardized format from authorized users (those with correct passwords). Data is backed up daily to protect against catastrophic loss. Data may be viewed on-line by laboratory staff and other District's personnel at any time, except when on-line customized reports are being run (this closes the files temporarily).

Each sample is uniquely identified in the TDJ system by a permanent three-digit sample number, location code, sub-location code, sample type code, and a designation of composite or grab sample. For each sample, a list of tests is generated. Only the system managers can add or change the sample numbers, location codes, etc., and only the system managers can add test codes and designate the tests for each sample number.

The sample date is a permanent part of the sample record and it is the sample date (rather than a unique log number) that distinguishes one day's samples from any other day's samples. The location codes, sub-location codes, sample types, and test codes are the same as those used in the LABDATA system, so that users can browse freely through either system without confusion. However, in the TDJ system, once a default unit has been assigned to a test code, that unit cannot be changed. (For example, in TDJ all Total Solids are reported as % Total Solids, and they cannot be reported as mg/L.)

Data verification is done by generation of a special four-page report each day that contains all data entered into the database during that day. The Process Control/Sample Receiving Supervisor reviews this report and checks any unusual data entries. When the Supervisor has verified the data, Operations is called and told that they can run their program that uses the new data to generate a multi-page report that is used for making plant changes and for operational control.

The monthly data is reviewed and verified by the Process Control/Wet Chemistry, Organics, and Microbiology supervisors. Summary reports of the results are created and forwarded to the Superintendent of the JWPCP Laboratory for final approval.

APPENDIX F

Referenced Tables

Table 1. REQUIRED CONTAINERS, PRESERVATION TECHNIQUES AND HOLDING TIMES

Parameter/Test	Container[1]	Preservation	Max. Storage Regulatory[2]
Aquatic Toxicity Tests			
Acute and chronic	P, FP, G	$deCl_2$ with Na_2SO_3, Cool, 4°C	36 h initial use, 72 h for sample renewal[4]
Algal biomass tests	G(a)	None	36 h
Bacterial Tests			
Coliform: total, fecal, and E. coli	P, G	0.008% $Na_2S_2O_3$. Cool, <10°C	6 h[3]
Fecal Streptococci	P, G	0.008% $Na_2S_2O_3$. Cool, <10°C	6 h[3]
Enterococci	P, G	0.008% $Na_2S_2O_3$. Cool, <10°C	6 h[3]
Chemistry Tests			
Alkalinity	P, FP, G	Cool, ≤ 6°C	14 d
BOD, cBOD	P, FP, G	Cool, ≤6°C	48 h
Boron	P, FP	HNO_3 to pH <2, Cool, ≤6°C	6 mos.
Bromide	P, FP, G	Cool, ≤6°C	28 d
Carbon, total organic	G(A)(a); PTFE-lined cap	Analyze immeditately or add H_3PO_4 to pH <2; Cool, ≤6°C	28 d
COD	P, FP, G	Analyze ASAP, or add H_2SO_4 to pH <2; Cool, ≤6°C	28 d
Chloride	P, FP, G	Cool, ≤6°C	28 d
Chlorine, residual	P, G	Analyze immediately	Stat
Color	P, FP, G	Cool, ≤ 6°C	48 h
Conductivity	P, FP, G	Cool, ≤ 6°C	28 d

F1

Table 1. REQUIRED CONTAINERS, PRESERVATION TECHNIQUES AND HOLDING TIMES - cont'd

Parameter/Test	Container[1]	Preservation	Max.Storage Regulatory[2]
Cyanide			
Total	P, FP, G	Analyze immediately - within 15 min; add $Na_2S_2O_3$ when ox. agents present.	Stat
		NaOH to pH>12; add $Na_2S_2O_3$ when ox. agents present. Cool, ≤6°C	14 d; 24 h if $S^=$ present
Amenable to Chlorination	P, FP, G	NaOH to pH >12; Add 100 mg $Na_2S_2O_3$/L Cool, ≤6°C	14 d; 24 h if $S^=$ present
Fluoride	P	Cool, ≤6°C	28 d
Hardness	P, FP, G	Add HNO_3 to pH <2	6 mos.
Metals			
General, total	P(A), G(A)	Add HNO_3 to pH <2[5]. Cool, ≤6°C	6 mos.
General, soluble	P(A), G(A)	Filter in field or as soon as possible. Add HNO_3 to pH<2[5]. Cool, ≤6°C	6 mos.
Chromium VI (colorimetric)	P(A), G(A)	Add $(NH_4)_2SO_4$-NH_4OH buffer[3,6], dropwise to pH 9.3-9.7; Cool, ≤6°C	28 d[6]
Chromium VI (IC)	P(A), G(A)	Filter in field or ASAP; follow above[3,6].	28 d[6] 28 d
Mercury	P(A), G(A)	Add HNO_3 to pH <2, Cool, ≤6°C	

Table 1. REQUIRED CONTAINERS, PRESERVATION TECHNIQUES AND HOLDING TIMES - cont'd

Parameter/Test	Container[1]	Preservation	Max. Storage Regulatory[2]
Nitrogen			
Ammonia	P, FP, G	$deCl_2$ with Na_2SO_3 if necessary, analyze ASAP or add H_2SO_4 to pH <2; Cool, ≤6°C	28 d
Nitrate	P, FP, G	Analyze ASAP or Cool, ≤6°C	48 h
$NO_3 + NO_2$	P, FP, G	H_2SO_4 to pH <2, Cool, ≤6°C	28 d
Nitrite	P, FP, G	Analyze ASAP or Cool, ≤6°C	48 h
Org., Kjeld.	P, FP, G	Analyze ASAP or add H_2SO_4 to pH <2, Cool, ≤6°C	28 d
Oil and Grease	G, wide-mouthed	1:1 HCl to pH <2, Cool, ≤6°C	28 d
Organic Compounds			
Dioxins/Furans	G, PTFE-lined cap	$Na_2S_2O_3$; Cool, ≤6°C	7 d until extr. 40 d after extr.[7]
PAHs	G(A)(a), PTFE-lined cap	$Na_2S_2O_3$; Cool, ≤6°C	7 d until extr. 40 d after extr.[3]
Pesticides & PCBs	G, PTFE-lined cap	Na_2SO_3, Cool, ≤6°C	7 d until extr. 40 d after extr.
Semi-volatile organics	G(a), PTFE-lined cap	$Na_2S_2O_3$; Cool, ≤6°C	7 d until extr. 40 d after extr.

Table 1. REQUIRED CONTAINERS, PRESERVATION TECHNIQUES AND HOLDING TIMES - cont'd

Parameter/Test	Container[1]	Preservation	Max. Storage Regulatory[2]
Organic Compounds cont'd.			
Total Organic Halides (TOX)	G(A)(a), PTFE-lined cap	Add H_2SO_4 to pH <2, Cool, ≤6°C	28 d[7]
Total Petroleum Hydrocarbons	G(A), PTFE-lined cap	Add HCl to pH <2, Cool, ≤6°C	28 d
Volatile Organics	G, PTFE-lined cap	Add HCl to pH <2, Cool, ≤6°C	14 d
Acrolein and Acrylonitrile	G, PTFE-lined cap	Cool, ≤6°C	14 d
Oxygen, dissolved			
Electrode	G(a), BOD bottle	Analyze immediately	Stat
Winkler		Titration may be delayed after acidification	8 h
Hydrogen Ion (pH)	P, FP, G	Analyze ASAP	Stat
Phenols	G	Add $FeSO_4$ to remove oxidizing agents if needed. Add H_2SO_4 to pH <2; Cool, ≤6°C	28 d
Phosphate, Ortho-	P, FP, G	For sol. PO_4, filter immeditately Cool, ≤6°C	48 h
Phosphorus (Total)	P, FP, G	Add H_2SO_4 to pH <2; Cool, ≤ 6°C	28 d

Table 1. REQUIRED CONTAINERS, PRESERVATION TECHNIQUES AND HOLDING TIMES - cont'd

Parameter/Test	Container[1]	Preservation	Max. Storage Regulatory[2]
Residue			
Total	P, FP, G	Cool, ≤6°C	7 d[3]
Filterable (TDS)	P, FP, G	Cool, ≤6°C	7 d
Non-filterable (TSS)	P, FP, G	Cool, ≤6°C	7 d
Settleable	P, FP, G	Cool, ≤6°C	48 h[3]
Volatile	P, FP, G	Cool, ≤6°C	7 d
Sulfate	P, FP, G	Cool, ≤6°C	28 d
Sulfide	P, FP, G	Add 4 drops 2N ZnAc/100 mL; NaOH to pH >9 Cool, ≤6°C	7 d
Sulfite	P, FP, G	None required	Stat
Surfactants			
MBAS	P, FP, G	Cool, ≤6°C	48 h
NID	P, FP, G	Cool, ≤6°C	48 h
Temperature	P, FP, G	Analyze immeditately	Stat
Turbidity	P, FP, G	Analyze same day; store in dark up to 24 h; Cool, ≤6°C	48 h

Table 1. REQUIRED CONTAINERS, PRESERVATION TECHNIQUES AND HOLDING TIMES - cont'd

Parameter/Test	Container[1]	Preservation	Max. Storage Regulatory[2]
Radiological Tests			
Gross beta	P, FP, G	HNO_3 to pH <2	6 mos.[8]
Gross alpha	P, FP, G	HNO_3 to pH <2	6 mos.[3]
Radium (226+228)	P, FP, G	HNO_3 to pH <2	6 mos.[7]

NOTES:

[1] P = Polyethylene; FP = Fluoropolymer (PTFE; Teflon®); G = Glass; (A) = Rinsed with 1+1 nitric acid; (a) = Use amber container or protect from light. Appropriate-sized containers are purchased with the suppliers' certification that the products were tested and meet or exceed the analyte specifications of OSWER Directive 9240.0-05A (EPA 540/R-93/051) "Specifications and Guidance for Contaminant-Free Sample Containers 12/92". Each new lot of containers is also checked for contaminants in-house before the lot is made available to sample collectors.

[2] Standard Methods for the Examination of Water and Wastewater, 18th Edition 1992, 19th Edition 1995, 20th Edition 1998.

[3] EPA - 40 Code of Federal Regulations (CFR) Part 136. Guidelines Establishing Test Procedures for the Analysis of Pollutants, Table II.

[4] EPA - 40 Code of Federal Regulations (CFR) Part 136. Whole Effluent Toxicity: Guidelines Establishing Test Procedures for the Analysis of Pollutants, Technical Corrections (Federal Register; Vol. 64, Number 21).

[5] Per [3], above, an aqueous sample may be collected and shipped without acid preservation. However, acid must be added at least 24 hours before analysis to dissolve any metals that adsorb to the container walls ().

[6] EPA – SW-846. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Chapter Two, Revision 3, December 1996.

[7] As required in NPDES permits for the County Sanitation Districts of Los Angeles County.

[8] 48 hour limit in certain Districts permits.

Stat - no storage allowed, analyze immediately

TABLE 2-A. TESTS/PARAMETERS AND METHODS FOR WASTEWATER USED BY THE SANITATION DISTRICTS LABORATORIES

TEST/PARAMETER	METHOD USED		
	EPA	STANDARD METHODS, 20th Edition	OTHERS
Microbiology			
Heterotrophic Plate Count		9215B	
Total Coliform in Wastewater by MTF		9221B	
Fecal Coliform in Wastewater by MTF		9221E	
Escherichia coli by MTF		9221F	
Total Coliform in Wastewater by MF		9222B	
Fecal Coliform in Wastewater by MF		9222D	
Escherichia coli by MTF		9221F	
Escherichia coli by MF		9222G	
Fecal Streptococci or Enterococci by MTF		9230B	
Fecal Streptococci or Enterococci by MF		9230C	
Salmonella in Biosolids	1682		
Enterococci in Recreational Water by MF	1600		
Aquatic Toxicity Bioassays			
Acute testing with juvenile fathead minnow (*Pimephales promelas*), Method 2000.0	821-R-02-012		
Acute testing with juvenile inland silverside (*Menidia beryllina*), Method 2006.0	821-R-02-012		
Acute testing with larval fathead minnow (*Pimephales promelas*), Method 2000.0	821-R-02-012		
Acute testing with larval inland silverside (*Menidia beryllina*), Method 2006.0	821-R-02-012		
Acute testing with larval topsmelt (*Atherinops affinis*)	821-R-02-012		
Marine chronic testing with giant kelp (*Macrocystis pyrifera*)	600/R-95/136		
Freshwater chronic testing with larval fathead minnow (*Pimephales promelas*); Method 1000.0	821-R-02-013		
Freshwater chronic testing with water fleas (*Ceriodaphnia dubia*) Method 1002.0	821-R-02-013		
Freshwater chronic testing with green algae (*Selenastrum capricornutum*); Method 1003.0	821-R-02-013		
Marine chronic testing with inland silverside (*Menidia beryllina*), Method 1006.0	821-R-02-014		
Marine chronic testing with Atlantic *mysid (Mysidposis bahia*); Method 1007.0	821-R-02-014		
Marine chronic testing with larval topsmelt (*Atherinops affinis*)	600/R-95/136		
Marine chronic testing with echinoderms (*Strongylocentrotus purpuratus* fertilization)	600/R-95/136		
Marine chronic larval development using red abalone (*Haliotis rufescens*)	600/R-95/136		
Acute static bioassay using juvenile fathead minnow (*Pimephales promelas*)	600/4-85/013		

TABLE 2-A. TESTS/PARAMETERS AND METHODS FOR WASTEWATER USED BY THE SANITATION DISTRICTS LABORATORIES - cont'd

TEST/PARAMETER	METHOD USED		
	EPA	STANDARD METHODS, 20th Edition	OTHERS
Wastewater Inorganic Chemistry, Nutrients, and Demand			
Acidity		2310B	
Algal Biomass as Chlorophyll a	445.0		
Alkalinity		2320B	
Ammonia	350.3	4500-NH_3 C,D,F,H	
Biochemical Oxygen Demand		5210B	
Boron		4500-B B	
Bromide	300.0		
Calcium	200.7		
Carbonaceous BOD		5210B	
Chemical Oxygen Demand	410.1	5220 C,D	
Chloride	300.0	4500-Cl^- B,E	
Chlorine Residual, Total		4500-Cl C	
Cyanide	335.4	4500-CN C,D,E	
Cyanide Amenable to Chlorination		4500-CN C,G,E	
Fluoride		4500-F C	
Hardness	200.7	2340C	
Magnesium	200.7		
Kjeldahl-N	351.2	4500-N_{org} 4500-NH_3 B,D	
Nitrate	300.0	4500-NO_3 E,F	
Nitrite	300.0	4500-NO_2 B	
Oil & Grease	1664A	5520B	
Organic Carbon		5310C	
Organic Nitrogen		4500-N_{org} B, 4500-NH_3 B,E	
Oxygen, Dissolved		4500-O C, G	
pH		4500-H^+ B	
Phenols	420.1		
Phosphate, ortho	365.1	4500-P E	
Phosphorus, Total	365.1	4500-P B, E	
Potassium	200.7		
Residue, Total		2540B	
Residue, Filterable (Total Dissolved Solids)		2540C	
Residue, Nonfilterable (Total Suspended Solids)		2540 D	
Residue, Settleable		2540 F	
Residue, Volatile	160.4	2540 E	
Silica	200.7		
Sodium	200.7	3111 B	
Specific Conductance		2510 B	
Sulfate	300.0, 375.4		
Sulfide (includes total & soluble)		4500-$S^=$ D	
Sulfite		4500-$SO_3^=$ B	
Surfactants (MBAS)		5540 C	
Surfactants (NID)		5540 D	
Turbidity		2130 B	

TABLE 2-A. TESTS/PARAMETERS AND METHODS FOR WASTEWATER USED BY THE SANITATION DISTRICTS LABORATORIES - cont'd

TEST/PARAMETER	METHOD USED		
	EPA	STANDARD METHODS, 20th Edition	OTHERS
Toxic Chemical Elements in Wastewater			
Aluminum	200.7, 200.8		
Antimony	200.8, 200.8		
Arsenic	200.7, 200.8		
Barium	200.7, 200.8		
Beryllium	200.7, 200.8		
Cadmium	200.7, 200.8		
Chromium VI		3500-Cr D	
Chromium, Total	200.7, 200.8		
Cobalt	200.7, 200.8		
Copper	200.7, 200.8		
Iron	200.7		
Lead	200.7, 200.8		
Manganese	200.7, 200.8		
Mercury	245.1		
Molybdenum	200.7, 200.8		
Nickel	200.7, 200.8		
Selenium	200.7, 200.8		
Silver	200.7, 200.8		
Thallium	200.7, 200.8		
Tin	200.7		
Vanadium	200.7, 200.8		
Zinc	200.7, 200.8		
Organic Chemistry of Wastewater (measurements by GC/MS combination)			
Acid and Base/Neutral Compounds	Method 625		
Volatile Organic Compounds	Method 624		
Organic Chemistry of Wastewater (excluding measurements by GC/MS combination)			
Organochlorine Pesticides and PCBs	Method 608		
Polynuclear Aromatic Hydrocarbons	Method 610		

TABLE 2-B. TESTS/PARAMETERS AND METHODS FOR HAZARDOUS WASTES USED BY THE SANITATION DISTRICTS LABORATORIES

TEST/PARAMETER	METHOD USED		
	EPA	STANDARD METHODS, 20th Edition.	OTHERS
Physical Properties Testing of Hazardous Waste			
Ignitability by Flashpoint Determination	SW-846 1010		
Corrosivity - pH Determination	SW-846 9040B, 9045C		
Inorganic Chemistry and Toxic Chemical Elements of Hazardous Waste			
Aluminum	SW-846 6010B, 6020		
Antimony	SW-846 6020		
Arsenic	SW-846 6010B, 6020		
Barium	SW-846 6010B, 6020		
Beryllium	SW-846 6010B, 6020		
Cadmium	SW-846 6010B, 6020		
Chromium, total	SW-846 6010B, 6020		
Chromium (VI)	SW-846 7196A		
Cobalt	SW-846 6010B, 6020		
Copper	SW-846 6010B, 6020		
Lead	SW-846 6010B, 6020		
Mercury	SW-846 7470A, 7471A		
Molybdenum	SW-846 6010B, 6020		
Nickel	SW-846 6010B, 6020		
Selenium	SW-846 6010B, 6020		
Silver	SW-846 6010B, 6020		
Thallium	SW-846 6010B, 6020		
Tin	SW-846 6010B, 6020		
Vanadium	SW-846 6010B, 6020		
Zinc	SW-846 6010B, 6020		
Cyanide	SW-846 9010B		
Fluoride	SW-846 9214		
Br^-, Cl^-, NO_3^-, NO_2^-, $SO_4^=$	SW-846 9056		

TABLE 2-B. TESTS/PARAMETERS AND METHODS FOR HAZARDOUS WASTES USED BY THE SANITATION DISTRICTS LABORATORIES - cont'd.

TEST/PARAMETER	METHOD USED		
	EPA	STANDARD METHODS, 20th Edition.	OTHERS
Extraction Tests of Hazardous Waste			
California Waste Extraction Test			CCR, Chapter 11, Article 5, Appendix II
Toxicity Characteristic Leaching Procedure	SW-846 1311		
Organic Chemistry of Hazardous Waste (measurements by GC/MS)			
Semi-Volatile Organics	SW-846 8270C		
Volatile Organics	SW-846 8260B		
Organic Chemistry of Hazardous Waste (excluding measurements by GC/MS combination)			
Organochlorine Pesticides/PCBs	SW-846 8081A, 8082		
Aquatic Toxicity Bioassays			
Hazardous waste bioassay using fathead minnow (*Pimephales promelas*)			Title 22, CCR 66261.24

APPENDIX G

Error Resolution and Qualified Result Forms

SANITATION DISTRICTS OF LOS ANGELES COUNTY

QUALITY ASSURANCE

ERROR RESOLUTION

TREATMENT PLANT LABORATORY

Error Resolution for:

_____ Blank

_____ LCS

_____ Matrix Duplicates

_____ Matrix Spikes

_____ QA Check Samples

The QA data is out of control, check the following:

1. ____ Check data entry
2. ____ Check calculation
3. ____ Check data transcription
4. ____ Check reagents
5. ____ Check standards
6. ____ Check instrument
7. ____ Check procedure
8. ____ Check sample matrix
9. ____ Check sample handling

Test Code and Constituent Name: _____

Spiked Sample or Duplicated Sample No.: _____ Date Analyzed: _____

QA Check Sample No.: _____ Date Analyzed: _____

QA Check Sample Error Resolution SJ No.: _____ Date Analyzed: _____

Other Samples in Set: _____

Description of Problem: _____

_____

_____

_____

Corrective Action Taken: _____

_____

_____

_____

Analyst Name (Print): _____ Date: _____

Analyst's Signature: _____ Date: _____

Supervisor's Signature: _____ Date: _____

QA Rep's Signature: _____ Date: _____

Example of a Quality Assurance Error Resolution Form

Notification for Discharge Limit Exceedance or Qualified Results

Sample Number(s) : _____

Location : _____

Test Code & Name : _____

Laboratory : _____

Check One :

____ Discharge Limit Exceedance (for Final Effluent Samples Only)

Analytical Result: _____ Discharge Limit: _____

____ Data Qualified but Reportable

____ Data Qualified and Not Reportable

Data Qualified but Reportable

____ Result Does Not Agree With Historical Data Trend
____ Field Duplicate Results Not Comparable
____ Filtered Sample Result Greater Than Non-Filtered
____ Blank Contamination
____ Other

Data Qualified and Not Reportable

____ Sample Lost
____ Sample Not Analyzed
____ Sample Out of Holding Time
____ Insufficient Sample Volume
____ QC Failed
____ Other

Explanation/Actions:

Reported by : _____ Date : _____

Revision 3 Nov 2005

Example of a Qualified Result Notification Form

APPENDIX H

Common Laboratory Quality Control Calculations

a. Laboratory Control Sample (Laboratory Fortified Blank)

$$\%\,\text{Recovery} = \frac{\text{Measured Value}}{\text{True Value}} \times 100\%$$

b. Matrix Spike (Laboratory Fortified Matrix)

$$\%\,\text{Recovery} = \frac{\text{Matrix Spike Result - Sample Result}}{\text{Spike Added Concentration}} \times 100\%$$

c. Duplicate Sample (as relative percent difference)

$$\text{RPD} = \frac{|\,\text{Sample Result - Duplicate Result}\,|}{(\text{Sample Result} + \text{Duplicate Result})/2} \times 100\%$$

d. Standard Deviation

$$s = \sqrt{\sum_{i=1}^{n} \frac{(x_i - \bar{x})^2}{(n-1)}}$$

where:

s = standard deviation
n = total number of values
x_i = each individual value
$\bar{x}$ = mean of n values

e. Relative Standard Deviation (as percent)

$$\%\text{RSD} = \frac{s}{\bar{x}} \times 100\%$$

where:

s = standard deviation
$\bar{x}$ = mean of n values

f. Calibration Factor

$$CF = \frac{\text{Peak Area (or height) of standard}}{\text{Mass Injected}}$$

g. Response Factor

$$RF(x) = \frac{A_x}{C_x}$$

where:
A = peak area or height
C = concentration
x = analyte of interest

h. Relative Response Factor

$$RRF(x) = \frac{A_x}{A_{is}} \times \frac{C_{is}}{C_x}$$

where:
A = peak area or height
C = concentration
x = analyte of interest
is = internal standard

i. Coefficient of Linear Correlation

$$r = \frac{\sum (x - \bar{x})(y - \bar{y})}{(n-1)s_x s_y}$$

where:
x = variable 1
y = variable 2
n = number of data pairs
s_x = standard deviation of x
s_y = standard deviation of y

APPENDIX I

40 CFR PART 136
PROCEDURE FOR THE DETERMINATION OF THE METHOD DETECTION LIMIT

USEPA DEFINITION AND METHOD FOR MDL
From: 40 CFR (7–1–95 Edition) Part 136, Appendix B

APPENDIX B TO PART 136 — DEFINITION AND PROCEDURE FOR THE DETERMINATION OF THE METHOD DETECTION LIMIT — REVISION 1.11

Definition

The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte.

Scope and Application

This procedure is designed for applicability to a wide variety of sample types ranging from reagent (blank) water containing analyte to wastewater containing analyte. The MDL for an analytical procedure may vary as a function of sample type. The procedure requires a complete, specific, and well defined analytical method. It is essential that all sample processing steps of the analytical method be included in the determination of the method detection limit. The MDL obtained by this procedure is used to judge the significance of a single measurement of a future sample. The MDL procedure was designed for applicability to a broad variety of physical and chemical methods. To accomplish this, the procedure was made device- or instrument-independent.

Procedure

1. Make an estimate of the detection limit using one of the following:

(a) The concentration value that corresponds to an instrument signal/noise in the range of 2.5 to 5.
(b) The concentration equivalent of three times the standard deviation of replicate instrumental measurements of the analyte in reagent water.
(c) That region of the standard curve where there is a significant change in sensitivity, i.e., a break in the slope of the standard curve.
(d) Instrumental limitations. It is recognized that the experience of the analyst is important to this process. However, the analyst must include the above considerations in the initial estimate of the detection limit.

2. Prepare reagent (blank) water that is as free of analyte as possible. Reagent or interference free water is defined as a water sample in which analyte and interferent concentrations are not detected at the method detection limit of each analyte of interest. Interferences are defined as systematic errors in the measured analytical signal of an established procedure caused by the presence of interfering species (interferent). The interferent concentration is presupposed to be normally distributed in representative samples of a given matrix.

3. (a) If the MDL is to be determined in reagent (blank) water, prepare a laboratory standard (analyte in reagent water) at a concentration which is at least equal to or in the same concentration range as the estimated method detection limit. (Recommend between 1 and 5 times the estimated method detection limit.) Proceed to Step 4.

   (b) If the MDL is to be determined in another sample matrix, analyze the sample. If the measured level of the analyte is in the recommended range of one to five times the estimated detection limit, proceed to Step 4. If the measured level of analyte is less than the estimated detection limit, add a known amount of analyte to bring the level of analyte between one and five times the estimated detection limit. If the measured level of analyte is greater than five times the estimated detection limit, there are two options.

   (1) Obtain another sample with a lower level of analyte in the same matrix if possible.

   (2) The sample may be used as is for determining the method detection limit if the analyte level does not exceed 10 times the MDL of the analyte in reagent water. The variance of the analytical method changes as the analyte concentration increases from the MDL, hence the MDL determined under these circumstances may not truly reflect method variance at lower analyte concentrations.

4. (a) Take a minimum of seven aliquots of the sample to be used to calculate the method detection limit and process each through the entire analytical method. Make all computations according to the defined method with final results in the method reporting units. If a blank measurement is required to calculate the measured level of analyte, obtain a separate blank measurement for each sample aliquot analyzed. The average blank measurement is subtracted from the respective sample measurements.

   (b) It may be economically and technically desirable to evaluate the estimated method detection limit before proceeding with 4a. This will: (1) Prevent repeating this entire procedure when the costs of analyses are high and (2) insure that the procedure is being conducted at the correct concentration. It is quite possible that an inflated MDL will be calculated from data obtained at many times the real MDL even though the level of analyte is less than five times the calculated method detection limit. To insure that the estimate of the method detection limit is a good estimate, it is necessary to determine that a lower concentration of analyte will not result in a significantly lower method detection limit. Take two aliquots of the sample to be used to calculate the method detection limit and process each through the entire method, including blank measurements as described above in 4a. Evaluate these data:

   (1) If these measurements indicate the sample is in desirable range for determination of the MDL, take five additional aliquots and proceed. Use all seven measurements for calculation of the MDL.

   (2) If these measurements indicate the sample is not in correct range, reestimate the MDL, obtain new sample as in 3 and repeat either 4a or 4b.

5. Calculate the variance (S^2) and standard deviation (S) of the replicate measurements, as follows:

$$S^2 = \frac{1}{n-1}\left[\sum_{i=1}^{n} X_i^2 - \frac{\left(\sum_{i=1}^{n} X_i\right)^2}{n}\right]$$

$$S = \left(S^2\right)^{\frac{1}{2}}$$

where:

X_i; i = 1 to n, are the analytical results in the final method reporting units obtained from the n sample aliquots and Σ refers to the sum of the X values from i = 1 to n.

6. (a) Compute the MDL as follows:

$$MDL = t_{(n-1,\ 1-\alpha=0.99)}\ (S)$$

where:

MDL = the method detection limit

$t_{(n-1,\ 1-\alpha=.99)}$ = the students' t value appropriate for a 99% confidence level and alpha standard deviation estimate with n-1 degrees of freedom. See Table.

S = standard deviation of the replicate analyses.

(b) The 95% confidence interval estimates for the MDL derived in 6a are computed according to the following equations derived from percentiles of the chi square over degrees of freedom distribution (χ^2/df).

LCL = 0.64 MDL
UCL = 2.20 MDL

where:

LCL and UCL are the lower and upper 95% confidence limits respectively based on seven aliquots.

7. Optional iterative procedure to verify the reasonableness of the estimate of the MDL and subsequent MDL determinations.

(a) If this is the initial attempt to compute MDL based on the estimate of MDL formulated in Step 1, take the MDL as calculated in Step 6, spike the matrix at this calculated MDL and proceed through the procedure starting with Step 4.

(b) If this is the second or later iteration of the MDL calculation, use S^2 from the current MDL calculation and S^2 from the previous MDL calculation to compute the F-ratio. The F-ratio is calculated by substituting the larger S^2 into the numerator S^2_A and the other into the denominator S^2_B. The computed F-ratio is then compared with the F-ratio found in the table

which is 3.05 as follows: if $S^2_A / S^2_B < 3.05$, then compute the pooled standard deviation by the following equation:

$$S_{pooled} = \left[\frac{6S_A^2 + 6S_B^2}{12}\right]^{\frac{1}{2}}$$

If $S^2_A / S^2_B > 3.05$, respike at the most recent calculated MDL and process the samples through the procedure starting with Step 4. If the most recent calculated MDL does not permit qualitative identification when samples are spiked at that level, report the MDL as a concentration between the current and previous MDL which permits qualitative identification.

(c) Use the S_{pooled} as calculated in 7b to compute the final MDL according to the following equation:

$$MDL = 2.681\ (S_{pooled})$$

where:

2.681 is equal to $t_{(12,\ 1-\alpha=.99)}$.

(d) The 95% confidence limits for MDL derived in 7c are computed according to the following equations derived from percentiles of the chi squared over degrees of freedom distribution.

$$LCL = 0.72\ MDL$$
$$UCL = 1.65\ MDL$$

where:

LCL and UCL are the lower and upper 95% confidence limits respectively based on 14 aliquots.

TABLES OF STUDENTS' t VALUES AT THE 99 PERCENT CONFIDENCE LEVEL

Number of replicates	Degrees of freedom (n-1)	$t_{(n-1,\ .99)}$
7	6	3.143
8	7	2.998
9	8	2.896
10	9	2.821
11	10	2.764
16	15	2.602
21	20	2.528
26	25	2.485
31	30	2.457
61	60	2.390
∞	∞	2.326

Reporting

The analytical method used must be specifically identified by number or title and the MDL for each analyte expressed in the appropriate method reporting units. If the analytical method permits options which affect the method detection limit, these conditions must be specified with the MDL value. The sample matrix used to determine the MDL must also be identified with MDL value. Report the mean analyte level with the MDL and indicate if the MDL procedure was iterated. If a laboratory standard or a sample that contained a known amount analyte was used for this determination, also report the mean recovery. If the level of analyte in the sample was below the determined MDL or exceeds 10 times the MDL of the analyte in reagent water, do not report a value for the MDL.

[49 FR 43430, Oct. 26, 1984; 50 FR 694, 696, Jan. 4, 1985, as amended at 51 FR 23703, June 30, 1986]

APPENDIX J

Glossary Of Laboratory Quality Assurance Terms

GLOSSARY OF LABORATORY QUALITY ASSURANCE TERMS

Accuracy	The closeness of a measurement to the true value.
Batch	A group of samples, including quality control samples, which are processed together with the same method, the same lot of reagents, and with manipulations common to each sample within the same time period, or in continuous sequential time periods.
Bias	The constant deviation of measured values from the true value caused by systematic errors in a procedure.
Blank	A general term for a clean sample used to measure artifacts in the measurement (sampling and/or analysis) process. See method blank, reagent blank, equipment blank, field blank, and trip blank.
Blind sample	A sample submitted for analysis with the concentration known to the submitter but unknown to the analyst. The analyst is aware that the sample is a special sample, such as a QC sample, and the result is used to test the analyst's or laboratory's proficiency in the execution of the measurement process.
Calibrate	To determine, by measurement or comparison with a standard, the correct response of an instrument.
Calibration check	A standard or set of standards used for the verification of an instruments ability to provide a correct response within the limits of the analytical method used. Calibration check solutions are typically made from stock solutions different from the stock used to prepare the calibration standard.
Chain-of-custody	An unbroken trail of accountability that insures the physical security of samples, data and records.
Check standard	A substance or reference material obtained from a source independent from the source of the calibration standard.
Control chart	Test or analytical data are displayed in a form that graphically compares the variability of the test results with the average or expected variability of small groups of data.
Control limit	A specified boundary on a control chart that, if exceeded, indicates a process that is out of statistical control.

Corrective action	The process of taking step to eliminate the causes of an existing nonconformance, deficiency, or other undesirable situation in order to prevent recurrence.
Coefficient of determination (r^2)	The correlation coefficient squared, sometimes designated as R^2, represents the proportion of common variation in the two variables, i.e. how well or tightly the data fit the estimated model.
Coefficient of variation	A measure of dispersion of a probability distribution defined as the ratio of the standard deviation to the mean. The absolute value of the coefficient of variation expressed as a percentage is often referred to as the relative standard deviation.
Correlation coefficient (r)	A statistic that represents the degree of linear relationship between two variables. It can vary from -1 (perfect negative correlation) through 0 (no correlation) to +1 (perfect positive correlation).
DMR-QA	Discharge Monitoring Report – Quality Assurance; - a proficiency testing study for the laboratories utilized by an NPDES permit holder.
DNQ	Detected, but Not Quantified - This is the concentration that results from the detection of a substance by the analytical method that is greater than or equal to the laboratory's MDL but less than the ML. The result is considered to be an 'estimate' because the concentration is below the lowest calibration point.
Double-blind sample	A sample submitted for analysis with the concentration and identity known to the submitter but unknown to the analyst. The analyst is not aware that the sample is a special sample, such as a QC sample. This type of sample is used to eliminate any possible bias in the result from knowing the source or composition of the sample.
ELAP	The Environmental Laboratory Accreditation Program, established within the California Department of Health Services, provides accreditation to environmental laboratories producing analytical data for California regulatory agencies.
Environmental sample	A representative collection of any material (aqueous, non-aqueous, or multimedia) collected from any source, for which

	the determination of composition or contamination is requested or required.
Equipment blank	A clean sample (e.g., reagent water) that is opened in the field and the contents are poured appropriately over or through the sample collection device, collected, then returned to the laboratory as a sample. An equipment blank is a check on the cleanliness of the sampling device.
F-Test	A statistical method used to evaluate the difference in the variances between two sets of data.
Field blank	A clean sample (e.g., reagent water), carried to the sampling site, exposed to sampling conditions and returned to the laboratory and treated as an environmental sample. Field blanks are used to check for analytical artifacts and/or background contamination by sampling and analytical procedures.
IDL	The Instrument Detection Limit is considered the minimum detection concentration for the instrument only, and unlike the MDL, it ignores sample preparation effects.
Interference	A positive or negative effect on a measurement caused by a variable other than the one being investigated.
Interlaboratory calibration	The process, procedures, and activities for standardizing a given measurement system to ensure that laboratories participating in the same program can produce comparable data.
Internal standard	A pure compound added to a sample prior to instrumental analysis to permit correction for inefficiencies.
Laboratory control standard	An uncontaminated sample matrix (usually reagent water) spiked with known amounts of analytes from a source independent from the calibration standards. It is generally used to establish intralaboratory or analyst specific precision and bias or to assess the performance of all or a portion of the measurement system.
Matrix	A specific type of medium (e.g. wastewater, surface water, sediment) in which the analyte of interest may be contained.
Matrix spike/duplicate	In matrix spike/duplicate analyses, samples are split into duplicates and spiked with predetermined quantities of stock

	solutions of certain analytes prior to sample extraction/digestion and analysis.
Maximum holding time	The length of time a sample can be kept under specified conditions without undergoing significant degradation of the analytes(s) or property of interest.
Medium	A substance (e.g. air, water, soil) which serves as a carrier of the analytes of interest.
Method blank	A method blank is used to assess the preparation batch for possible contamination during the preparation and processing steps. For aqueous samples, the method blank matrix consists of reagent water and is processed and analyzed in the same manner as the other samples in the batch. See reagent blank.
MCL	The Maximum Contaminant Level is the maximum concentration of a chemical that is allowed in public drinking water systems. The MCL is established by the U.S. Environmental Protection Agency (EPA).
MDL	The Method Detection Limit is a statistically derived value representing the minimum concentration of a substance, in a given matrix, that can be measured and reported with 99% confidence that the analyte concentration is greater than zero.
ML	The Minimum Level represents the lowest concentration at which an analyte can be measured with a known level of confidence. For analysis procedures that utilize a calibration curve, the ML represents the lowest standard concentration in the calibration curve for a specific analytical technique after the application of appropriate method-specific factors.
Outlier	An observed value that does not appear to fall within the expected distribution for a particular data set.
PQL	The Practical Quantitation Limit is the lowest level that can be reliably measured by routine laboratory operating conditions within specified limits of precision and accuracy. It is sometimes defined as a value 3 to 10 times the MDL.
Precision	The closeness of agreement between repeated measurements.
Proficiency testing	A systematic program in which one or more standardized samples is analyzed by laboratories to determine the capability of each participant.

Quality assurance	A definitive plan for laboratory operation that specifies the measures used to produce data of known precision and bias.
Quality control	Set of measures within a sample analysis methodology to assure that the process is in control.
Range	The difference between the highest and lowest values.
Reagent blank	A sample consisting of the reagents used for an analysis, usually including reagent water to match the reagent dilution that occurs during sample preparation, and introduced into the analytical procedure at the appropriate point to determine the contribution of the reagents to the observed values of the samples. See method blank.
Reagent water	Water with no detectable concentration of the compound or element to be analyzed at the detection limit of the analytical method. Reagent water should be free of substances that interfere with analytical methods.
Reference material	A material or substance, one or more properties of which are sufficiently well established to be used for the calibration of an apparatus, the assessment of a measurement method, or assigning values to materials.
Relative Percent Difference	For duplicate measurements, RPD, expressed in percent, is equal to the positive difference of the two measurements multiplied by 100, then divided by the average of the two measurements. $RPD = \frac{\lvert x_1 - x_2 \rvert \times 100}{(x_1 + x_2)/2}$
Relative Standard Deviation	A measure of precision, usually expressed in percent and calculated by: $RSD = 100 \times s / \lvert \bar{x} \rvert$
Replicate sample	Two or more samples representing the same population characteristic, time, and place, which are independently carried through all steps of the sampling and measurement process in an identical manner. It also can be defined as a sample that is prepared by dividing it into two or more separate aliquots. Duplicate samples are considered to be two replicates.
RL	The Reporting Limit represents the lowest level, adjusted for sample dilution or concentration, that can be reliably achieved

	within limits of precision and accuracy during routine laboratory operating conditions.
Ruggedness	The stability of the result produced when departures are made from the specified analytical or environmental conditions.
Sensitivity	Capability of a method or instrument to discriminate between measurement responses representing different levels of a variable of interest.
Standard curve	A plot of the concentration of known analyte standard versus the measured response to the analyte.
Standard deviation	A measure of the dispersion of observed values. It is defined as the positive square root of the variance.
SOP	The Standard Operating Procedure is a written document detailing the method of an operation, analysis or action and is accepted as the method for performing certain routine or repetitive tasks.
Surrogate analyte	A pure substance with properties similar to the analytes(s) of interest. It is unlikely to be found in environmental samples and is added to blanks, standards, samples, and matrix spiked samples prior to analysis for quality control purposes.
t-Test	A statistical method used to evaluate the difference in the means between two sets of data.
Target compounds	In chromatography, these are compounds that have been demonstrated to be applicable to the analysis method and are used to calibrate the system for retention time and detector response.
Tentatively identified compounds	In chromatography, TICs are non-target compounds that have been subjected to mass spectral library searches for tentative identifications. Concentration estimates for TICs are determined by the internal standard method.
Traceability	An unbroken trail of accountability for verifying or validating the chain-of-custody, data, the documentation of a procedure, or the values of a standard.
Trip blank	A clean sample (e.g., reagent water) that is carried to the sampling site and transported to the laboratory with the

	collected samples for analysis without having been exposed (opened) to sampling procedures.
Type I (alpha) error	The probability of deciding a constituent is present when it actually is absent; a false positive decision.
Type II (beta) error	The probability of not detecting a constituent when it actually is present; a false negative decision.
Variance	A measure of the dispersion of a set of values. Variance (s^2) is calculated as $s^2 = \Sigma (x - \bar{x})^2 / (n - 1)$
Warning limit	A specified boundary on a control chart that indicates a process may be going out of statistical control.

APPENDIX D

Table D.1: Raw Coyote Creek data for lead (data obtained from LADPW)

(Corresponding metadata available on provided sheets)

site ID	date sampled	hardness MG/L	dissolved lead UG/L	total lead UG/L	Detection limit UG/L	EPA test method
S13	06/14/95	490	0	0	5	A239.2
S13	11/07/95	470	0	0	5	A239.2
S13	12/12/95	110	0	11	5	A239.2
S13	12/23/95	135	0	0	5	A239.2
S13	01/09/96	315	0	0	5	A239.2
S13	01/21/96	141	0	0	5	A239.2
S13	01/31/96	90	0	27	5	A239.2
S13	02/03/96	200	0	0.011	5	A239.2
S13	02/19/96	40	0	16	5	A239.2
S13	03/05/96	162	0	31	5	A239.2
S13	03/19/96	400	0	0	5	A239.2
S13	05/14/96	359	0	0	5	A239.2
S13	07/09/96	400	0	0	1	A239.2
S13	10/30/96	110	0	38	1	A239.2
S13	11/21/96	60	0	0	1	A239.2
S13	12/09/96	76.4	2	33	1	A239.2
S13	01/23/97	52	0	3.7	1	A239.2
S13	11/10/97	270	0	0	5	A239.2
S13	11/13/97	156	0	0	5	A239.2
S13	11/26/97	150	61.5	94.5	5	A239.2
S13	11/30/97	50	20.2	29	5	A239.2
S13	12/05/97	70	11	14.5	5	A239.2
S13	12/18/97	50	17.6	20.4	5	A239.2
S13	01/02/98	150	0	0	5	A239.2
S13	01/04/98	110	0	0	5	A239.2
S13	01/09/98	50	14.4	27.3	5	A239.2
S13	10/14/98	420	0	0	5	A239.2
S13	11/08/98	102	0	0	5	A239.2
S13	11/28/98	140	5	24.7	5	A239.2
S13	12/01/98	82	0	0	5	A239.2
S13	12/06/98	196	0	0	5	A239.2
S13	01/12/99	440	0	0	5	A239.2
S13	01/21/99	176	0	0	5	A239.2
S13	01/25/99	90	0	0	5	A239.2
S13	01/31/99	78	0	0	5	A239.2
S13	02/06/99	140	0	0	5	A239.2
S13	02/09/99	210	0	5.8	5	A239.2
S13	03/20/99	210	0	0	5	A239.2
S13	03/25/99	400	0	0	5	A239.2
S13	04/07/99	92	0	0	5	A239.2
S13	04/08/99	210	0	0	5	A239.2
S13	04/11/99	51.2	0	0	5	A239.2
S13	11/08/99	nd	0	0	5	A239.2
S13	12/31/99	175	0	5.3	5	A239.2
S13	01/25/00	90	0	7.3	5	A239.2
S13	01/30/00	105	0	0	5	A239.2
S13	02/10/00	112	0	0	5	A239.2
S13	02/12/00	84	0	0	5	A239.2

site ID	date sampled	hardness MG/L	dissolved lead UG/L	total lead UG/L	Detection limit UG/L	EPA test method
S13	02/16/00	70	0	0	5	A239.2
S13	02/20/00	56.8	0	0	5	A239.2
S13	02/23/00	104	0	0	5	A239.2
S13	02/27/00	114	0	0	5	A239.2
S13	03/05/00	70	0	0	5	A239.2
S13	03/08/00	80	0	0	0.5	200.8
S13	10/12/00	230	0	0	0.5	200.8
S13	10/28/00	130	0	0	0.5	200.8
S13	10/30/00	51.2	0	0	0.5	200.8
S13	01/11/01	60	0	0	0.5	200.8
S13	01/25/01	87.5	0	0	0.5	200.8
S13	02/01/01	60	0	0	0.5	200.8
S13	02/14/01	110	0	0	0.5	200.8
S13	02/20/01	60	0	0	0.5	200.8
S13	02/28/01	65	0	0	0.5	200.8
S13	03/06/01	275	0	0	0.5	200.8
S13	11/12/01	150	0.86	1.62	0.5	200.8
S13	11/24/01	105	1.95	2.67	0.5	200.8
S13	11/29/01	140	0.74	3.09	0.5	200.8
S13	12/03/01	95	0.7	1.6	0.5	200.8
S13	01/28/02	83.2	0	0	0.5	200.8
S13	10/10/02	195	0	1.25	0.5	200.8
S13	11/08/02	130	0	20.9	0.5	200.8
S13	12/16/02	60	0.62	1.44	0.5	200.8
S13	02/11/03	180	0.58	1.27	0.5	200.8
S13	03/15/03	45.6	0	2.05	0.5	200.8
S13	04/30/03	340	0	0.54	0.5	200.8
S13	10/28/03	325	0	0.81	0.5	200.8
S13	10/31/03	225	0	73.1	0.5	200.8
S13	12/25/03	92.8	0.96	1.85	0.5	200.8
S13	01/01/04	112	1.5	2.25	0.5	200.8
S13	01/13/04	395	0	0.82	0.5	200.8
S13	10/17/04	200	0	3.24	0.5	200.8
S13	10/26/04	50	0	7.31	0.5	200.8
S13	11/16/04	410	0	2.15	0.5	200.8
S13	12/05/04	110	0	14.7	0.5	200.8
S13	01/07/05	64	1.67	13.5	0.5	200.8
S13	03/09/05	520	0	1.48	0.5	200.8
S13	10/17/05	210	0.64	63.2	0.5	200.8
S13	12/31/05	180	0	7.52	0.5	200.8
S13	01/14/06	170	0	13.7	0.5	200.8
S13	01/24/06	420	0.5	9.13	0.5	200.8
S13	02/17/06	380	0	16.7	0.5	200.8
S13	03/03/06	88	0.77	56.9	0.5	200.8
S13	04/25/06	370	0	18.8	0.5	200.8
	total	93 data points				

Table D.2: Averaged Coyote Creek data in comparison to CTR chronic criterion for lead

(Averaged data are shown in red font. The earlier date was used to report the averaged data; thus, for the data reported 1/31/1996 and 2/3/1996, averages of the hardness and lead values were reported on 1/31/1996.)

site ID	date sampled	hardness MG/L	dissolved lead UG/L	total lead UG/L	Detection limit UG/L	EPA test method	Lead acute CTR UG/L	Exceed acute CTR?	Lead chronic CTR UG/L	Exceed chronic CTR?	Is CTR (or measurement) above DL?
S13	06/14/95	490	0	0	5	A239.2	281		10.9		OK to use
S13	11/07/95	470	0	0	5	A239.2	281		10.9		OK to use
S13	12/12/95	110	0	11	5	A239.2	72		2.8		OK to use
S13	12/23/95	135	0	0	5	A239.2	89		3.5		don't use
S13	01/09/96	315	0	0	5	A239.2	219		8.6		OK to use
S13	01/21/96	141	0	0	5	A239.2	94		3.7		don't use
S13	01/31/96	145	0	13.5	5	A239.2	97		3.8		OK to use
S13	02/03/96				5	A239.2					
S13	02/19/96	40	0	16	5	A239.2	24		0.9		OK to use
S13	03/05/96	162	0	31	5	A239.2	109		4.2		OK to use
S13	03/19/96	400	0	0	5	A239.2	281		10.9		OK to use
S13	05/14/96	359	0	0	5	A239.2	251		9.8		OK to use
S13	07/09/96	400	0	0	1	A239.2	281		10.9		OK to use
S13	10/30/96	110	0	38	1	A239.2	72		2.8		OK to use
S13	11/21/96	60	0	0	1	A239.2	37		1.4		OK to use
S13	12/09/96	76.4	2	33	1	A239.2	48		1.9	Yes	OK to use
S13	01/23/97	52	0	3.7	1	A239.2	31		1.2		OK to use
S13	11/10/97	213	0	0	5	A239.2	146		5.7		OK to use
S13	11/13/97				5	A239.2					
S13	11/26/97	100	40.85	61.75	5	A239.2	65		2.5	Yes	OK to use
S13	11/30/97				5	A239.2					
S13	12/05/97	70	11	14.5	5	A239.2	44		1.7	Yes	OK to use
S13	12/18/97	50	17.6	20.4	5	A239.2	30		1.2	Yes	OK to use
S13	01/02/98	130	0	0	5	A239.2	86		3.3		don't use
S13	01/04/98				5	A239.2					
S13	01/09/98	50	14.4	27.3	5	A239.2	30		1.2	Yes	OK to use
S13	10/14/98	420	0	0	5	A239.2	281		10.9		OK to use
S13	11/08/98	102	0	0	5	A239.2	66		2.6		don't use
S13	11/28/98	111	2.5	12.35	5	A239.2	72		2.8		OK to use
S13	12/01/98				5	A239.2					
S13	12/06/98	196	0	0	5	A239.2	133		5.2		OK to use
S13	01/12/99	440	0	0	5	A239.2	281		10.9		OK to use
S13	01/21/99	133	0	0	5	A239.2	88		3.4		don't use
S13	01/25/99				5	A239.2					
S13	01/31/99	78	0	0	5	A239.2	49		1.9		don't use
S13	02/06/99	175	0	2.9	5	A239.2	118		4.6		don't use
S13	02/09/99				5	A239.2					
S13	03/20/99	210	0	0	5	A239.2	143		5.6		OK to use
S13	03/25/99	400	0	0	5	A239.2	281		10.9		OK to use
S13	04/07/99	151	0	0	5	A239.2	101		3.9		don't use
S13	04/08/99	130.6	0	0	5	A239.2	86		3.4		don't use
S13	04/11/99				5	A239.2					
S13	11/08/99		0	0	5	A239.2					
S13	12/31/99	175	0	5.3	5	A239.2	118		4.6		OK to use
S13	01/25/00	90	0	7.3	5	A239.2	58		2.2		OK to use
S13	01/30/00	105	0	0	5	A239.2	68		2.7		don't use
S13	02/10/00	96	0	0	5	A239.2	63		2.5		don't use
S13	02/12/00	77	0	0	5	A239.2	49		1.9		don't use
S13	02/16/00	63.4	0	0	5	A239.2	39		1.5		don't use
S13	02/20/00	80.4	0	0	5	A239.2	51		2.0		don't use
S13	02/23/00	109	0	0	5	A239.2	71		2.8		don't use

site ID	date sampled	hardness MG/L	dissolved lead UG/L	total lead UG/L	Detection limit UG/L	EPA test method	Lead acute CTR UG/L	Exceed acute CTR?	Lead chronic CTR UG/L	Exceed chronic CTR?	Is CTR (or measurement) above DL?
S13	02/27/00				5	A239.2					
S13	03/05/00	75	0	0	5	A239.2	47		1.8		don't use
S13	03/00/00				0.5	200.8					
S13	10/12/00	230	0	0	0.5	200.8	158		6.2		OK to use
S13	10/26/00	90.6	0	0	0.5	200.8	58		2.3		OK to use
S13	10/30/00				0.5	200.8					
S13	01/11/01	60	0	0	0.5	200.8	37		1.4		OK to use
S13	01/25/01	87.5	0	0	0.5	200.8	56		2.2		OK to use
S13	02/01/01	60	0	0	0.5	200.8	37		1.4		OK to use
S13	02/14/01	110	0	0	0.5	200.8	72		2.8		OK to use
S13	02/20/01	60	0	0	0.5	200.8	37		1.4		OK to use
S13	02/28/01	65	0	0	0.5	200.8	40		1.6		OK to use
S13	03/08/01	275	0	0	0.5	200.8	190		7.4		OK to use
S13	11/12/01	150	0.66	1.62	0.5	200.8	100		3.8		OK to use
S13	11/24/01	105	1.05	2.67	0.5	200.8	68		2.7		OK to use
S13	11/29/01	117.5	0.72	2.34	0.5	200.8	77		3.0		OK to use
S13	12/03/01				0.5	200.8					
S13	01/28/02	83.2	0	0	0.5	200.8	53		2.1		OK to use
S13	10/10/02	195	0	1.25	0.5	200.8	133		5.2		OK to use
S13	11/08/02	130	0	20.8	0.5	200.8	86		3.3		OK to use
S13	12/16/02	60	0.62	1.44	0.5	200.8	37		1.4		OK to use
S13	02/11/03	180	0.58	1.27	0.5	200.8	122		4.7		OK to use
S13	03/15/03	45.6	0	2.05	0.5	200.8	27		1.1		OK to use
S13	04/30/03	340	0	0.54	0.5	200.8	236		9.3		OK to use
S13	10/28/03	275	0	38.96	0.5	200.8	190		7.4		OK to use
S13	10/31/03				0.5	200.8					
S13	12/25/03	92.8	0.96	1.85	0.5	200.8	60		2.3		OK to use
S13	01/01/04	112	1.5	2.25	0.5	200.8	73		2.8		OK to use
S13	01/13/04	395	0	0.82	0.5	200.8	277		10.8		OK to use
S13	10/17/04	200	0	3.24	0.5	200.8	136		5.3		OK to use
S13	10/28/04	50	0	7.31	0.5	200.8	30		1.2		OK to use
S13	11/16/04	410	0	2.15	0.5	200.8	281		10.9		OK to use
S13	12/05/04	110	0	14.7	0.5	200.8	72		2.8		OK to use
S13	01/07/05	64	1.67	13.5	0.5	200.8	40		1.5	Yes	OK to use
S13	03/09/05	520	0	1.48	0.5	200.8	281		10.9		OK to use
S13	10/17/05	210	0.64	63.2	0.5	200.8	143		5.6		OK to use
S13	12/31/05	180	0	7.52	0.5	200.8	122		4.7		OK to use
S13	01/14/06	170	0	13.7	0.5	200.8	114		4.5		OK to use
S13	01/24/06	420	0.5	9.13	0.5	200.8	281		10.9		OK to use
S13	02/17/06	380	0	16.7	0.5	200.8	266		10.4		OK to use
S13	03/03/06	88	0.77	56.9	0.5	200.8	56		2.2		OK to use
S13	04/25/06	370	0	16.8	0.5	200.8	259		10.1		OK to use

6 exceedances out of 63 useable datapoints

Notes:

Per the State Listing Policy, the data should be averaged over the period of time relative to the standard. Since the chronic CTR standard is based on a four-day period, data falling within a single 4-day period was averaged. See Section 6.1.5.6 of the Listing Policy.

Section 6.1.5.5 of the Listing Policy states: "When the sample value is less than the quantitation limit and the quantitation limit is greater than the water quality standard, objective, criterion, or evaluation guideline, the result shall not be used in the analysis."

Table D.3: Districts' Representative Lead data measured in Coyote Creek in comparison to CTR criteria

(Corresponding metadata available on 'raw data' sheet)

SAMPLE DATE	LOCATION	LEAD UG/L	TOTAL HARDNESS MG/L	Lead acute CTR UG/L	Exceed acute CTR?	Lead chronic CTR UG/L	Exceed chronic CTR?
07/12/01	RA1	3.92	325	227		8.8	
08/08/01	RA1	4.11	419	281		10.9	
09/10/01	RA1	2.00	442	281		10.9	
10/02/01	RA1	3.00	419	281		10.9	
11/07/01	RA1	1.90	424	281		10.9	
12/06/01	RA1	4.00	486	281		10.9	
01/17/02	RA1	2.00	408	281		10.9	
02/20/02	RA1	2.00	400	281		10.9	
03/06/02	RA1	2.00	396	278		10.8	
04/04/02	RA1	3.00	372	261		10.2	
05/13/02	RA1	1.70	249	172		6.7	
06/11/02	RA1	3.00	312	217		8.5	
07/08/02	RA1	3.00	311	217		8.4	
08/13/02	RA1	3.00	388	272		10.6	
10/09/02	RA	1.50	298	207		8.1	
10/09/02	RA1	1.73	313	218		8.5	
10/21/02	R9E	38.00	260	180		7.0	Yes
11/20/02	RA1	1.00	473	281		10.9	
12/23/02	RA1	1.90	487	281		10.9	
01/21/03	R9E	1.00	332	232		9.0	
04/01/03	R9E	3.00	351	245		9.6	
07/08/03	R9E	3.00	351	245		9.6	
07/14/03	RA	3.00	222	152		5.9	
07/14/03	RA1	6.00	433	281		10.9	
08/13/03	RA1	2.00	420	281		10.9	
10/07/03	R9E	1.00	258	178		6.9	
01/06/04	R9E	1.00	310	216		8.4	
02/10/04	RA	1.00	195	133		5.2	
02/10/04	RA1	3.70	453	281		10.9	
03/09/04	RA	1.00	265	183		7.1	
03/09/04	RA1	2.00	429	281		10.9	
04/06/04	R9E	1.60	288	200		7.8	
04/06/04	RA	1.70	274	190		7.4	
04/06/04	RA1	1.00	383	269		10.5	
05/11/04	RA	2.00	278	193		7.5	
05/11/04	RA1	4.00	382	268		10.4	
06/08/04	RA	2.00	391	274		10.7	
06/08/04	RA1	2.00	435	281		10.9	
07/06/04	R9E	3.00	588	281		10.9	
07/13/04	RA	5.00	285	198		7.7	
07/13/04	RA1	1.80	382	268		10.4	
08/10/04	RA	1.50	302	210		8.2	
08/10/04	RA1	1.90	388	272		10.6	
09/14/04	RA	1.00	342	239		9.3	
09/14/04	RA1	1.60	214	146		5.7	
10/04/04	R9E	1.00	204.5	139		5.4	
10/04/04	RA	1.00	202	138		5.4	
10/04/04	RA1	1.90	352	246		9.6	
11/15/04	RA	0.50	302	210		8.2	
11/15/04	RA1	1.00	410.5	281		10.9	
12/07/04	RA	0.30	223.5	153		6.0	
12/07/04	RA1	0.50	365	256		10.0	
01/25/05	R9E	0.76	393.5	276		10.8	
01/25/05	RA	0.54	356	249		9.7	
01/25/05	RA1	2.00	624	281		10.9	
02/14/05	RA	0.39	362.5	254		9.9	

SAMPLE DATE	LOCATION	LEAD	TOTAL HARDNESS	Lead acute CTR	Exceed acute CTR?	Lead chronic CTR	Exceed chronic CTR?
		UG/L	MG/L	UG/L		UG/L	
02/14/05	RA1	0.45	513.5	281		10.9	
03/22/05	RA	0.33	391	274		10.7	
03/22/05	RA1	0.26	574	281		10.9	
04/12/05	R9E	0.60	371	260		10.1	
04/12/05	RA	0.14	405	281		10.9	
04/12/05	RA1	0.25	531	281		10.9	
05/17/05	RA	0.37	296	206		8.0	
05/17/05	RA1	0.76	491	281		10.9	
06/21/05	RA	1.20	315	219		8.6	
06/21/05	RA1	1.00	380	266		10.4	
06/23/05	RA	0.53	491	281		10.9	
07/19/05	R9E	3.50	294	204		8.0	
07/19/05	RA	3.00	260	180		7.0	
07/19/05	RA1	3.60	436	281		10.9	
08/09/05	RA	3.40	291	202		7.9	
08/09/05	RA1	3.40	432	281		10.9	
09/06/05	RA	0.39	250	172		6.7	
09/06/05	RA1	0.84	441	281		10.9	
10/11/05	R9E	0.25	235	161		6.3	
10/11/05	RA	0.25	294	204		8.0	
10/11/05	RA1	0.29	482	281		10.9	
11/15/05	RA	0.25	292	203		7.9	
11/15/05	RA1	0.59	516	281		10.9	
12/13/05	RA	2.50	275	190		7.4	
12/13/05	RA1	2.50	505	281		10.9	
01/10/06	R9E	2.50	326	227		8.9	
01/10/06	RA	0.25	295	205		8.0	
01/10/06	RA1	0.39	545	281		10.9	
02/07/06	RA	0.25	263	182		7.1	
02/07/06	RA1	1.24	460	281		10.9	
03/09/06	RA	0.25	232	159		6.2	
03/09/06	RA1	0.31	477	281		10.9	
04/17/06	R9E	2.50	380	266		10.4	
04/17/06	RA	0.25	278	193		7.5	
04/17/06	RA1	0.25	492	281		10.9	
05/16/06	RA	0.25	250	172		6.7	
05/16/06	RA1	0.25	388	272		10.6	
06/20/06	RA	0.34	216	148		5.8	
06/20/06	RA1	0.62	421	281		10.9	
06/26/06	RA	0.25	269.5	186		7.3	
07/20/06	R9E	0.70	334	233		9.1	
07/20/06	RA	0.47	282	196		7.6	
07/20/06	RA1	0.81	311	217		8.4	
08/22/06	RA	0.36	413	281		10.9	
08/22/06	RA1	0.36	403	281		10.9	
09/19/06	RA	0.42	288	200		7.8	
09/19/06	RA1	0.87	391	274		10.7	
10/24/06	RA	0.35	252	174		6.8	
10/24/06	RA1	0.60	391	274		10.7	
11/21/06	RA	1.61	234	161		6.3	
11/21/06	RA1	2.64	415	281		10.9	
12/14/06	RA	0.29	250	172		6.7	
12/14/06	RA1	0.73	486	281		10.9	
01/09/07	RA	0.30	186	126		4.9	
01/09/07	RA1	0.47	486	281		10.9	

1 exceedance in 111 samples

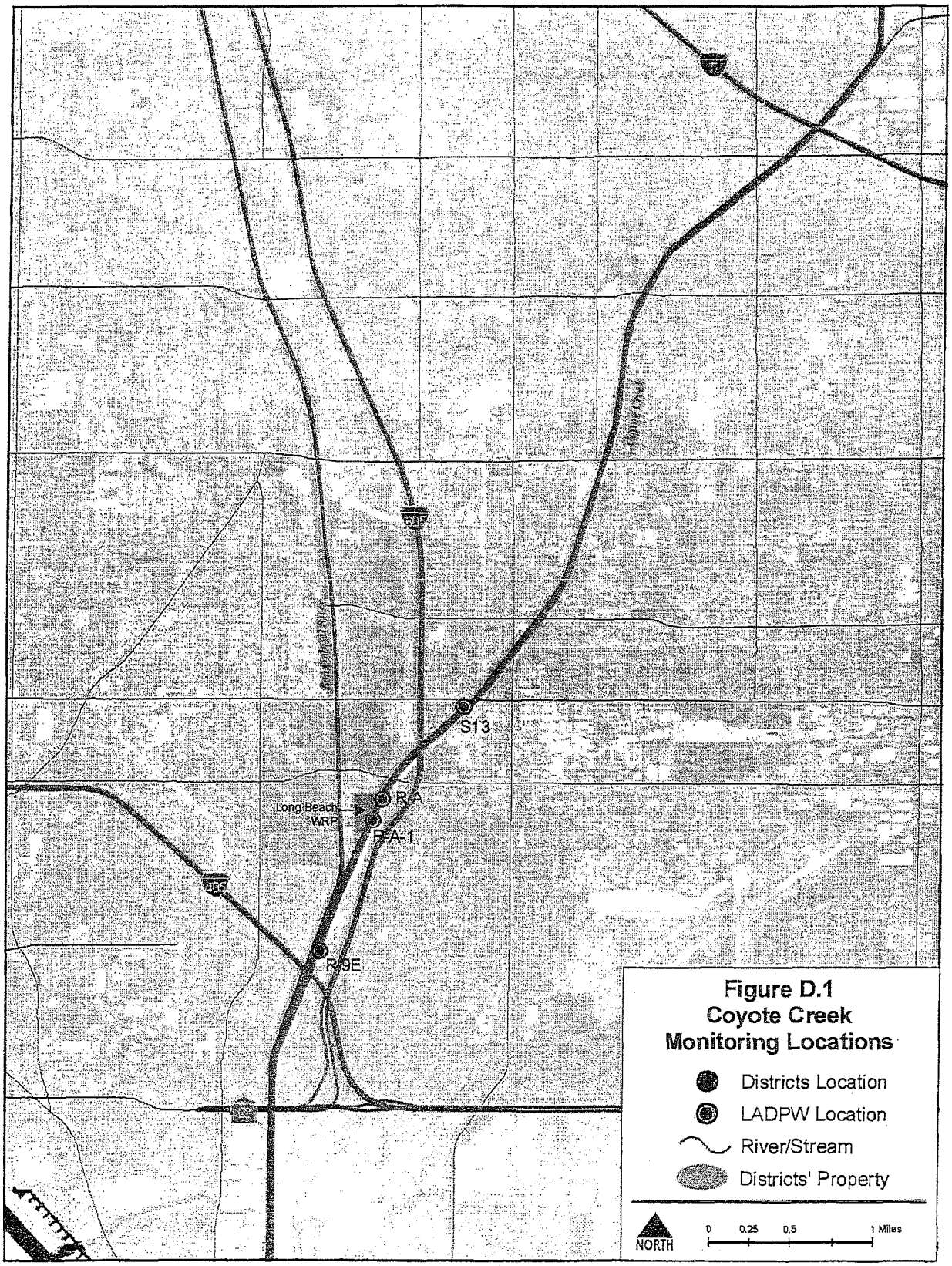

S13
R-A
Long Beach WRP
R-A-1
R-9E
Figure D.1
Coyote Creek
Monitoring Locations
Districts Location
LADPW Location
River/Stream
Districts' Property
NORTH
0
0.25
0.5
1 Miles

Figure D.2: Lead measured in Coyote Creek in comparison to CTR criteria

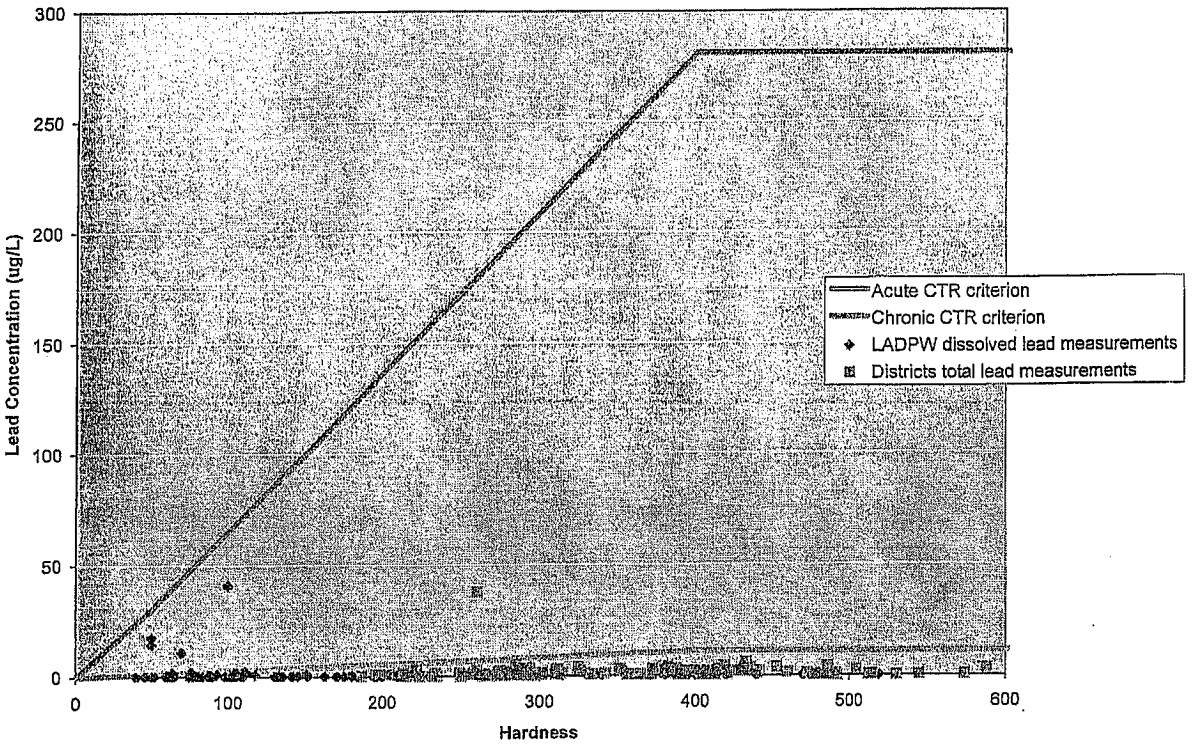


Figure D.3: Lead measured in Coyote Creek in comparison to CTR chronic criterion

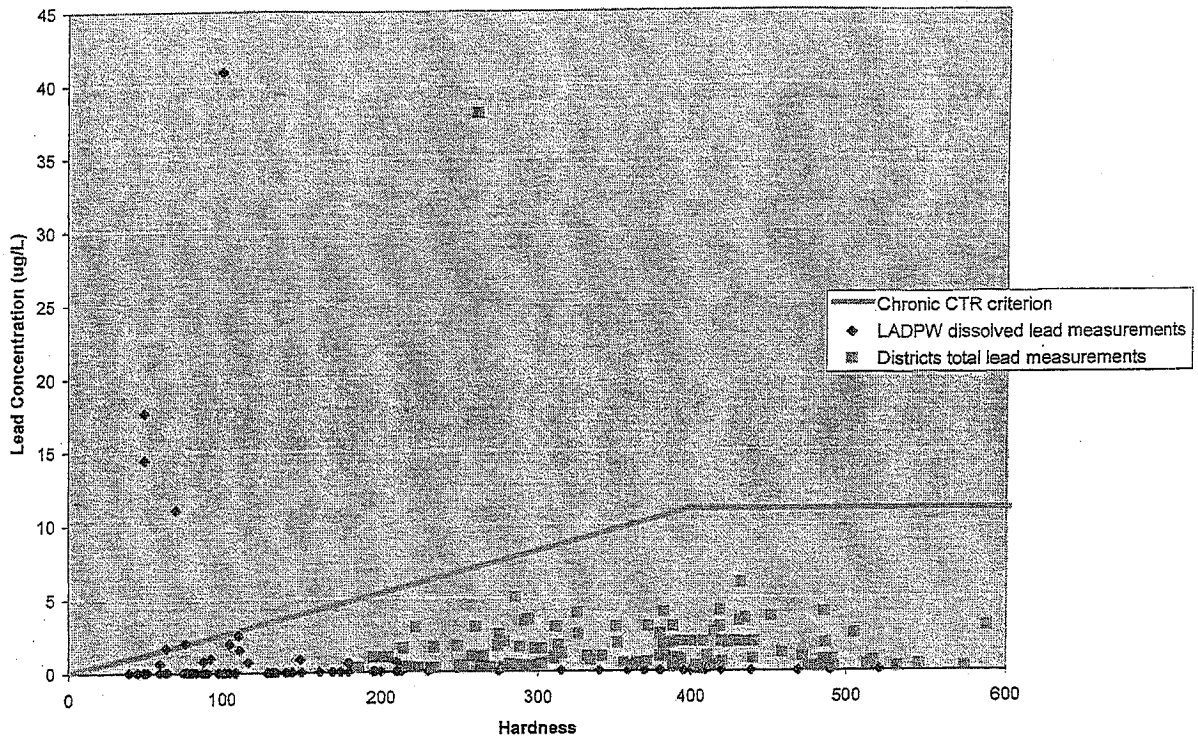


EXHIBIT D.1

Table C-6. Summary of Results for 1998-1999 Routine Monitoring at Coyote Creek

STATION NO.					S13	S13	S13	S13	S13	S13	S13	S13	S13	S13	S13
STATION NAME					Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek
STORM NO.						9899-01	9899-02	9899-03	9899-04		9899-05	9899-06	9899-07	9899-08	9899-09
DATE SAMPLED					10/14/98	11/8/98	11/28/98	12/1/98	12/6/98	1/12/99	1/21/99	1/25/99	1/31/99	2/6/99	2/9/99
DATE DELIVERED					10/14/98	11/9/98	11/30/98	12/3/98	12/8/98	1/13/99	1/21/99	1/27/99	2/2/99	2/7/99	2/10/99
	EPA Method	DL	Units	Sample Type	Dry					Dry					
Conventional															
Cyanide	A335.2	0.01	mg/l	Grab											
TPH	A418.1	1.0	mg/l	Grab											
Oil and Grease	A413.1	1.0	mg/l	Grab											
Total Phenols	A420.1	0.1	mg/l	Grab											
Glyphosate	547	25.0	ug/l	Comp.	0	0	0	0	0	0	0	0	0	0	0
Indicator Bacteria															
Total Coliform	C9221B	20.0	MPN/100ml	Grab											
Fecal Coliform	C9221C	20.0	MPN/100ml	Grab											
Fecal Streptococcus	C9230B	20.0	MPN/100ml	Grab											
Fecal Enterococcus	C9230B	20.0	MPN/100ml	Grab											
General															
Ammonia	A350.3	0.1	mg/l	Comp.	0.104	0.691	0.679	0.643	2.46	5.54	3.29	1.28	0	0	
Calcium	A215.2	1.0	mg/l	Comp.	80.2	32.1	40.1	24	44.1	92.2	52.1	26.5	22.4	40.1	56.1
Magnesium	C3500MgD	1.0	mg/l	Comp.	53.5	5.35	9.72	5.35	20.9	51.1	11.2	5.83	5.35	9.72	17
Potassium	A258.1	1.0	mg/l	Comp.	6.4	4.29	4.14	4.24	4.67	6.25	5.16	2.95	2.34	4.05	4.01
Sodium	A273.1	1.0	mg/l	Comp.	322	24.4	39.2	25.4	67.8	252	42.3	30.1	20.6	65.2	78
Bicarbonate	A310.1	2.0	mg/l	Comp.	230	66.8	53	53	113	225	111	61.5	43.5	78.4	127
Carbonate	A310.1	2.0	mg/l	Comp.	0	0	0	0	0	19.1	0	0	0	0	0
Chloride	B429	2.0	mg/l	Comp.	219	22.5	40.5	26	73.2	209	53.1	16	16.7	47.3	73
Fluoride	B429	0.1	mg/l	Comp.	0.751	0.171	0.257	0.196	0.351	0.749	0.368	0.126	0	0.309	0.395
Nitrate	B429	0.1	mg/l	Comp.	0	6.5	6.51	4.44	29.8	22.5	1.76	2.97	2.77	7.99	8.63
Sulfate	B429	0.1	mg/l	Comp.	500	41.2	76	37.3	177	437	102	27.7	30.3	110	138
Alkalinity	A310.1	4.0	mg/l	Comp.	230	66.8	53	53	113	244	111	61.5	43.5	78.4	127
Hardness	A130.2	2.0	mg/l	Comp.	420	102	140	82	196	440	176	90	78	140	210
Dissolved Phosphorus	A365.2	0.05	mg/l	Comp.	0.07	0.2	0.19	0.24	0.27	0	0.42	0.19	0.16	0.14	
Total Phosphorus	A365.2	0.05	mg/l	Comp.	0.08	0.25	0.24	0.26	0.28	0.05	0.49	0.24	0.19	0.17	
COD	A410.4	5.0	mg/l	Comp.	20.9	72.2	53	70.7	76	211	110	53.9	25.4	40.7	74.8
pH	A150.1	14.0		Comp.	8.64	7.56	7.39	7.43	8.09	8.71	7.6	7.45	7.44	7.56	8.2
NH3-N	A350.3	0.1	mg/l	Comp.	0	0.571	0.561	0.531	2.03	4.58	2.72	1.06	0	0	
Nitrate-N	C4110B	0.1	mg/l	Comp.	0	1.47	1.47	1	6.73	5.08	0.398	0.671	0.625	1.8	1.95
Nitrite-N	C4110B	0.1	mg/l	Comp.	0	0.191	0.186	0.12	0.094	0.459	0.651	0.05	0.052	0.128	0.135
Kjeldahl-N	A351.4	0.1	mg/l	Comp.	1.68	5.22	4.98	4.18	8.12	5.96	3.56	4.34	1.4	2.24	1.98
Specific Conductance	A120.1	1.0	umhos/cm	Comp.	2280	350	474	296	837	2255	577	314	238	561	
Total Dissolved Solids	A160.1	2.0	mg/l	Comp.	1414	224	302	186	492	1348	374	194	150	360	
Turbidity	A180.1	0.1	NTU	Comp.	9.21	164	180	80.7	138	4.93	110	102	62.7	67.4	51.6
Suspended Solids	A160.2	2.0	mg/l	Comp.	35	269	387	228	219	10	256	259	94	82	63
Vol.Sus.Solids	160.4	1.0	mg/l	Comp.	19	49	66	50	38	2	62	54	28	14	10
MBAS	A425.1	0.05	mg/l	Comp.	0.066	0.262	0.231	0.17	0.065	0	0.226	0.098	0.123	0.066	
Total Organic Carbon	A415.1	1.0	mg/l	Comp.	8.555	14.67	17.25	21.4	3.95	3.7	18.23	7	5.8		
BOD	A405.1	2.0	mg/l	Comp.	43	26	25	16	27	40	57	27	15.27		
Metals															
Dissolved Aluminum	A202.2	1000	ug/l	Comp	0	0	687	165	153	0	0	0	122	0	0
Total Aluminum	A202.2	1000	ug/l	Comp	244	551	4340	440	424	106	296	300	363	186	1040
Dissolved Antimony	A204.2	5.0	ug/l	Comp	0	0	0	0	0	0	0	0	0	0	0
Total Antimony	A204.2	5.0	ug/l	Comp	0	0	0	0	0	0	0	0	0	0	0
Dissolved Arsenic	A206.2	5.0	ug/l	Comp	5.9	0	0	0	0	0	0	0	0	0	0
Total Arsenic	A206.2	5.0	ug/l	Comp	7.3	0	0	0	0	0	0	0	0	0	0
Dissolved Barium	A208.2	10.0	ug/l	Comp	67	27	55.9	51.3	0	69.7	26.8	41.6	29.1	35	53.5
Total Barium	A208.2	10.0	ug/l	Comp	67	39	156	51.6	0	71.6	26.8	42.3	51.7	59.4	53.5
Dissolved Beryllium	A210.2	1.0	ug/l	Comp	0	0	0	0	0	0	0	0	0	0	0
Total Beryllium	A210.2	1.0	ug/l	Comp	0	0	0	0	0	0	0	0	0	0	0
Dissolved Boron	A212.3	100.0	ug/l	Comp	555	319	156	153	174	449	208	117	241	386	193
Total Boron	A212.3	100.0	ug/l	Comp	773	391	213	177	224	509	286	154	311	465	291
Dissolved Cadmium	A213.2	1.0	ug/l	Comp	0	0	0	0	0	0	0	0	0	0	0
Total Cadmium	A213.2	1.0	ug/l	Comp	0	0	0	0	0	0	0	0	0	1	0
Dissolved Chromium	A218.2	5.0	ug/l	Comp	0	0	0	0	0	0	0	0	0	0	0
Metals (cont.)															

Table C-6. Summary of Results for 1998-1999 Routine Monitoring at Coyote Creek

STATION NO.					S13	S13	S13	S13	S13	S13	S13	S13	S13	S13	S13
STATION NAME					Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek
STORM NO.						9899-01	9899-02	9899-03	9899-04		9899-05	9899-06	9899-07	9899-08	9899-09
DATE SAMPLED					10/14/98	11/8/98	11/28/98	12/1/98	12/6/98	1/12/99	1/21/99	1/25/99	1/31/99	2/6/99	2/9/99
DATE DELIVERED					10/14/98	11/9/98	11/30/98	12/3/98	12/8/98	1/13/99	1/21/99	1/27/99	2/2/99	2/7/99	2/10/99
	EPA Method	DL	Units	Sample Type	Dry					Dry					
Total Chromium	A218.2	5.0	ug/l	Comp	0	0	14.9	5.1	0	0	0	0	0	0	0
Dissolved Chromium +6		10.0	ug/l	Comp	0	0	0	0	0	0	0	0	0	0	0
Total Chromium +6		10.0	ug/l	Comp	0	0	0	0	0	0	0	0	0	0	0
Dissolved Copper	A220.1	5.0	ug/l	Comp	0	6.2	7	7.5	0	7.4	0	5	0	6.7	0
Total Copper	A220.1	5.0	ug/l	Comp	7.5	12.3	44.1	13.7	10.9	11.7	16.2	9.3	9.9	15.4	14.1
Dissolved Iron	A236.1	100.0	ug/l	Comp	0	240	726	387	216	0	0	0	168	101	223
Total Iron	A236.1	100.0	ug/l	Comp	201	800	4900	498	760	122	423	212	678	262	1530
Dissolved Lead	A239.2	5.0	ug/l	Comp	0	0	0	0	0	0	0	0	0	0	0
Total Lead	A239.2	5.0	ug/l	Comp	0	0	24.7	0	0	0	0	0	0	0	5.8
Dissolved Manganese	A243.1	100.0	ug/l	Comp	0	0	0	0	0	0	0	0	0	0	0
Total Manganese	A243.1	100.0	ug/l	Comp	0	117	266	0	0	0	155	0	0	0	117
Dissolved Mercury	A245.1	1.0	ug/l	Comp	0	0	0	0	0	0	0	0	0	0	0
Total Mercury	A245.1	1.0	ug/l	Comp	0	0	0	0	0	0	0	0	0	0	0
Dissolved Nickel	A249.2	5.0	ug/l	Comp	0	0	0	0	0	0	0	0	0	0	0
Nickel	A249.2	5.0	ug/l	Comp	0	0	16	7.8	0	0	9.9	0	5.1	0	8.3
Dissolved Selenium	A270.2	5.0	ug/l	Comp	0	0	0	0	0	0	0	0	0	0	0
Total Selenium	A270.2	5.0	ug/l	Comp	0	0	8	14.9	7.2	0	0	0	0	12.3	0
Dissolved Silver	A272.2	1.0	ug/l	Comp	0	0	0	0	0	0	0	0	0	0	0
Total Silver	A272.2	1.0	ug/l	Comp	0	0	0	0	0	0	0	0	0	0	0
Dissolved Thallium	A279.2	5.0	ug/l	Comp	0	0	0	0	0	0	0	0	0	0	0
Total Thallium	A279.2	5.0	ug/l	Comp	0	0	0	0	0	0	0	0	0	0	0
Dissolved Zinc	A289.1	50.0	ug/l	Comp	0	90	0	54	0	0	0	0	0	56	0
Total Zinc	A289.1	50.0	ug/l	Comp	0	90	237	69	70	0	59	0	0	88	79
Semi-Volatiles Organics															
Bis(2-ethylhexyl)phthalate	625	3.0	ug/l	Comp	43.6	0	0	4.7	3.5						
4-Chloro-3-methylphenol	625	3.0	ug/l	Comp	0	0	0	0	0						
2-Chlorophenol	625	2.0	ug/l	Comp	0	0	0	0	0						
All other SVOCs	625	0.5-5.0	ug/l	Comp	0	0	0	0	0						
Pesticides															
Organochlorine Pesticides & PCBs	D608	0.05-1.0	ug/l	Comp	0	0	0	0							
Diazinon	8141 SOP	0.01	ug/l	Comp	0	0	0.175	0	0	0	0		0	0	
Thiobencarb	507	1.0	ug/l	Comp	0	0	1.08	1.6	0	0	0		0	0	
Chlorpyrifos	8141 SOP	0.05	ug/l	Comp	0	0	0	0	0	0	0		0	0	
Pesticides	507	1.0-2.0	ug/l	Comp	0	0	0	0	0	0	0		0	0	

Note:
1). blank cell indicates sample was not analyzed
2). 0 indicated level below detection limit

Table C-6. Summary of Results for 1998-1999 Routine Monitoring at Coyote Creek

STATION NO.					S13	S13	S13	S13	S13
STATION NAME					Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek
STORM NO.					9899-12	9899-13	9899-14	9899-15	9899-16
DATE SAMPLED					3/20/99	3/25/99	4/7/99	4/8/99	4/11/99
DATE DELIVERED					3/22/99	3/26/99	4/8/99	4/9/99	4/12/99
	EPA Method	DL	Units	Sample Type					
Conventional									
Cyanide	A335.2	0.01	mg/l	Grab					
TPH	A418.1	1.0	mg/l	Grab					
Oil and Grease	A413.1	1.0	mg/l	Grab					
Total Phenols	A420.1	0.1	mg/l	Grab					
Glyphosate	547	25.0	ug/l	Comp.	0	0	0	0	0
Indicator Bacteria									
Total Coliform	C9221B	20.0	MPN/100ml	Grab					
Fecal Coliform	C9221C	20.0	MPN/100ml	Grab					
Fecal Streptococcus	C9230B	20.0	MPN/100ml	Grab					
Fecal Enterococcus	C9230B	20.0	MPN/100ml	Grab					
General									
Ammonia	A350.3	0.1	mg/l	Comp.	0.26	0.215	0	0	0
Calcium	A215.2	1.0	mg/l	Comp.	52.1	72.1	17	52.1	14.4
Magnesium	C3500MgD	1.0	mg/l	Comp.	19.4	53.6	5.35	19.4	3.7
Potassium	A258.1	1.0	mg/l	Comp.	4.4	5.5	2.69	4.49	2.05
Sodium	A273.1	1.0	mg/l	Comp.	52.6	296	18.2	59	19
Bicarbonate	A310.1	2.0	mg/l	Comp.	136	213	53	113	30.7
Carbonate	A310.1	2.0	mg/l	Comp.	0	0	0	0	0
Chloride	B429	2.0	mg/l	Comp.	79.2	216	16.2	66.7	9.62
Fluoride	B429	0.1	mg/l	Comp.	0.38	0.81	0.12	0.32	0
Nitrate	B429	0.1	mg/l	Comp.	10	15.3	4.29	8.1	1.65
Sulfate	B429	0.1	mg/l	Comp.	148	499	25.1	127	16.5
Alkalinity	A310.1	4.0	mg/l	Comp.	136	213	53	113	30.7
Hardness	A130.2	2.0	mg/l	Comp.	210	400	92	210	51.2
Dissolved Phosphorus	A365.2	0.05	mg/l	Comp.	0.12	0.06	0.154	0	0.166
Total Phosphorus	A365.2	0.05	mg/l	Comp.	0.14	0.06	0.167	0.121	0.177
COD	A410.4	5.0	mg/l	Comp.	182	60.4	30.2	54.5	25.7
pH	A150.1	14.0		Comp.	7.91	6.29	7.36	7.95	6.95
NH3-N	A350.3	0.1	mg/l	Comp.	0.215	0.178	0	0	0
Nitrate-N	C4110B	0.1	mg/l	Comp.	2.25	3.45	0.969	1.83	0.373
Nitrite-N	C4110B	0.1	mg/l	Comp.	0.185	0.51	0	0.097	0
Kjeldahl-N	A351.4	0.1	mg/l	Comp.	2.6	1.03	1.97	2.38	1.06
Specific Conductance	A120.1	1.0	umhos/cm	Comp.	772	2550	237	671	176
Total Dissolved Solids	A160.1	2.0	mg/l	Comp.	514	1506	150	466	102
Turbidity	A180.1	0.1	NTU	Comp.	12.8	3.59	53.3	27.1	31.4
Suspended Solids	A160.2	2.0	mg/l	Comp.	11	13	111	22	46
Vol.Sus.Solids	160.4	1.0	mg/l	Comp.	7	8	20	10	11
MBAS	A425.1	0.05	mg/l	Comp.	0.086	0	0	0.054	0.07
Total Organic Carbon	A415.1	1.0	mg/l	Comp.	14.35	6.5	7.56	9	4.3
BOD	A405.1	2.0	mg/l	Comp.	17.04	29.88	12.31	18.12	6.75
Metals									
Dissolved Aluminum	A202.2	1000	ug/l	Comp	0	0	0	0	0
Total Aluminum	A202.2	1000	ug/l	Comp	155	171	181	235	129
Dissolved Antimony	A204.2	5.0	ug/l	Comp	0	0	0	0	0
Total Antimony	A204.2	5.0	ug/l	Comp	0	0	0	0	0
Dissolved Arsenic	A206.2	5.0	ug/l	Comp	0	7.09	0	0	0
Total Arsenic	A206.2	5.0	ug/l	Comp	0	7.2	0	0	0
Dissolved Barium	A208.2	10.0	ug/l	Comp	59.8	88.7	35.2	54.7	18.6
Total Barium	A208.2	10.0	ug/l	Comp	65.3	90.6	44.7	54.7	24.7
Dissolved Beryllium	A210.2	1.0	ug/l	Comp	0	0	0	0	0
Total Beryllium	A210.2	1.0	ug/l	Comp	0	0	0	0	0
Dissolved Boron	A212.3	100.0	ug/l	Comp	135	438	158	185	139
Total Boron	A212.3	100.0	ug/l	Comp	166	514	166	228	167
Dissolved Cadmium	A213.2	1.0	ug/l	Comp	0	0	0	0	0
Total Cadmium	A213.2	1.0	ug/l	Comp	0	0	0	0	1.1
Dissolved Chromium	A218.2	5.0	ug/l	Comp	0	0	0	0	0
Metals (cont.)									

Table C-6. Summary of Results for 1998-1999 Routine Monitoring at Coyote Creek

STATION NO.					S13	S13	S13	S13	S13
STATION NAME					Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek
STORM NO.					9899-12	9899-13	9899-14	9899-15	9899-16
DATE SAMPLED					3/20/99	3/25/99	4/7/99	4/8/99	4/11/99
DATE DELIVERED					3/22/99	3/26/99	4/8/99	4/9/99	4/12/99
	EPA Method	DL	Units	Sample Type					
Total Chromium	A218.2	5.0	ug/l	Comp	0	5.5	0	0	0
Dissolved Chromium +6		10.0	ug/l	Comp	0	0	0	0	0
Total Chromium +6		10.0	ug/l	Comp	0	0	0	0	0
Dissolved Copper	A220.1	5.0	ug/l	Comp	9.5	7	0	8.8	0
Total Copper	A220.1	5.0	ug/l	Comp	14.4	11.6	8	8.8	10.4
Dissolved Iron	A236.1	100.0	ug/l	Comp	0	0	0	0	0
Total Iron	A236.1	100.0	ug/l	Comp	184	143	256	205	121
Dissolved Lead	A239.2	5.0	ug/l	Comp	0	0	0	0	0
Total Lead	A239.2	5.0	ug/l	Comp	0	0	0	0	0
Dissolved Manganese	A243.1	100.0	ug/l	Comp	0	0	0	0	0
Total Manganese	A243.1	100.0	ug/l	Comp	0	0	0	0	0
Dissolved Mercury	A245.1	1.0	ug/l	Comp	0	0	0	0	0
Total Mercury	A245.1	1.0	ug/l	Comp	0	0	0	0	0
Dissolved Nickel	A249.2	5.0	ug/l	Comp	0	0	0	0	0
Nickel	A249.2	5.0	ug/l	Comp	0	5.19	0	0	9.96
Dissloved Selenium	A270.2	5.0	ug/l	Comp	0	0	0	0	0
Total Selenium	A270.2	5.0	ug/l	Comp	0	0	0	0	0
Dissolved Silver	A272.2	1.0	ug/l	Comp	0	0	0	0	0
Total Silver	A272.2	1.0	ug/l	Comp	0	0	0	0	0
Dissolved Thallium	A279.2	5.0	ug/l	Comp	0	0	0	0	0
Total Thallium	A279.2	5.0	ug/l	Comp	0	0	0	0	0
Dissolved Zinc	A289.1	50.0	ug/l	Comp	0	0	0	0	0
Total Zinc	A289.1	50.0	ug/l	Comp	0	0	52	0	65
Semi-Volatiles Organics									
Bis(2-ethylhexyl)phthalate	625	3.0	ug/l	Comp					
4-Chloro-3-methylphenol	625	3.0	ug/l	Comp					
2-Chlorophenol	625	2.0	ug/l	Comp					
All other SVOCs	625	0.5-5.0	ug/l	Comp					
Pesticides									
Organochlorine Pesticides & PCBs	D608	0.05-1.0	ug/l	Comp					
Diazinon	8141 SOP	0.01	ug/l	Comp	0.69	0	0	0	0
Thiobencarb	507	1.0	ug/l	Comp	0	0	0	0	0
Chlorpyrifos	8141 SOP	0.05	ug/l	Comp	0	0	0	0	0
Pesticides	507	1.0-2.0	ug/l	Comp	0	0	0	0	0

Note:
1). blank cell indicates sample was not analyzed
2). 0 indicated level below detection limit

Table B-4. Summary of Results for the 1999-2000 Routine Monitoring at Coyote Creek

STATION NO.					S13	S13	S13	S13	S13	S13	S13	S13	S13	S13	S13	S13
STATION NAME					Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek
STORM NO.					9900-01	9900-02	9900-03	9900-04	9900-05	9900-06	9900-07	9900-08	9900-09	9900-10	9900-11	9900-12
DATE					11/8/99	12/31/99	1/25/00	1/30/00	2/10/00	2/12/00	2/16/00	2/20/00	2/23/00	2/27/00	3/5/00	3/8/00
	Sample Type	EPA Method	DL	Units												
Conventional																
Cyanide	Grab	A335.2	0.01	mg/l												
TPH as Diesel	Grab	A418.1	1	mg/l												
TPH as Gas	Grab	A418.1	1	mg/l												
Oil and Grease	Grab	A413.1	1	mg/l												
Total Phenols	Grab	A420.1	0.1	mg/l												
Indicator Bacteria																
Total Coliform	Grab		20	MPN/100ml												
Fecal Coliform	Grab		20	MPN/100ml												
Fecal Streptococcus	Grab		20	MPN/100ml												
General																
Ammonia	Comp	A350.3	0.1	mg/l		4.19	1.15	0.72	0.561	0	0.392	0	0	0	0.171	0.183
Calcium	Comp	A215.2	1	mg/l		48.1	28.1	26.1	32.1	24	20	16	27.9	30.5	8.82	20.8
Magnesium	Comp	C3500MgD	1	mg/l		13.37	4.86	5.72	7.78	5.83	4.86	4.08	8.36	9.34	11.7	6.81
Potassium	Comp	A258.1	1	mg/l		9.02	5.27	4.5	4.22	2.67	2.65	2.55	2.97	3.19	1.63	2.15
Sodium	Comp	A273.1	1	mg/l		58	23.1	42.4	46.2	28	30.7	24.1	37.8	48.8	5.5	24.1
Bicarbonate	Comp	A310.1	2	mg/l		172	107	87.9	90.5	71.1	62.1	50.4	71.1	81.5	31	56.2
Carbonate	Comp	A310.1	2	mg/l		0	0	0	0	0	0	0	0	0	0	0
Chloride	Comp	B429	2	mg/l		44.7	19	38.5	33.7	18.1	25	22.9	38.8	35.2	5.77	32.8
Fluoride	Comp	B429	0.1	mg/l		0.39	0.41	0.31	0.29	0.16	0.14	0.13	0.17	0.2	0	0.13
Nitrate	Comp	B429	0.1	mg/l		0	7.8	6.8	5.32	3.4	4.34	2.75	6.59	8.96	1.76	3.63
Sulfate	Comp	B429	0.1	mg/l		73.6	31.5	48	50.1	32.8	34.9	29.5	46.7	69.1	13.2	45.2
Alkalinity	Comp	A310.1	4	mg/l		141	88	72.1	74.2	58.3	50.9	41.3	58.3	66.8	25.4	47.7
Hardness	Comp	A130.2	2	mg/l		175	90	105	112	84	70	56.8	104	114	70	80
Dissolved Phosphorus	Comp	A365.2	0.05	mg/l		0.75	0.49	0.3	0.23	0.26	0	0.205	0.143	0.159	0.31	0.167
Total Phosphorus	Comp	A365.2	0.05	mg/l		1.42	0.53	0.31	0.32	0.28	0.295	0.303	0.159	0.199	0.347	0.168
COD	Comp	A410.4	5	mg/l		145.4	55	32.9	73	46.5	33.2	15.3	38.8	86.3	0	13.26
pH	Comp	A150.1	na			7.1	7.26	7.16	7.34	7.19	7.16	6.87	7.12	7.17	6.61	6.93
NH3-N	Comp	A350.3	0.1	mg/l		3.46	0.952	0.595	0.464	0	0.324	0	0	0	0.142	0.152
Nitrate-N	Comp	C4110B	0.1	mg/l		0	1.76	1.54	1.2	0.768	0.98	0.621	1.49	2.02	0.397	0.82
Nitrite-N	Comp	C4110B	0.1	mg/l		2.1	0.14	0.219	0.332	0.049	0.1	0.061	0.11	0.097	0.03	0.076
Kjeldahl-N	Comp	A351.4	0.1	mg/l		5.7	3.16	2.14	1.952	1.13	1.202	0.994	1.04	1.64	0.578	1.57
Specific Conductance	Comp	A120.1	1	umhos/cm		617	304	434	413	305	279	239	387	462	109.8	312
Total Dissolved Solids	Comp	A160.1	2	mg/l		406	182	264	242	184	158	142	222	255	70	174
Turbidity	Comp	A180.1	0.1	NTU		32.4	206	28.5	108	61.1	55.6	60	33.6	61.8	55.9	42.2
Suspended Solids	Comp	A160.2	2	mg/l		1393	570	67	382	128	146	136	86	168	140	104
Volatile Suspended Solids	Comp	160.4	1	mg/l		260	105	35	105	47	41	23	18	24	8	21
MBAS	Comp	A425.1	0.05	mg/l		0.232	0.126	0.167	0.097	0	0.097	0.067	0.076	0.096	0	0.067
Total Organic Carbon	Comp	A415.1	1	mg/l		41.3	13.55	16.4	14.2	7.8	5.7	7.9	9.2	11.3	4.5	9.5
BOD	Comp	A405.1	2	mg/l		55.31	23.18	21 22	14.5	7.3	7	6	8	6	3	7
Metals																
Dissolved Aluminum	Comp	A202 2	1000	ug/l	0	0	0	336	0	0	0	190	0	0	315	0
Total Aluminum	Comp	A202.2	1000	ug/l	431	229	653	359	146	245	0	204	119	413	436	0
Dissolved Antimony	Comp	A204.2	5	ug/l	0	0	0	0	0	0	0	0	0	0	0	0
Total Antimony	Comp	A204.2	5	ug/l	0	0	0	0	0	0	0	0	0	0	0	0
Dissolved Arsenic	Comp	A206.2	5	ug/l	0	0	0	0	0	0	0	0	0	0	0	0
Total Arsenic	Comp	A206.2	5	ug/l	0	0	0	0	0	0	0	0	0	0	0	0
Dissolved Barium	Comp	A208.2	10	ug/l	151	75.9	36.6	34.1	42.5	31.5	20.2	14	40.5	42	12	15.1
Total Barium	Comp	A208.2	10	ug/l	173.2	130	54.1	43.3	47.3	33.3	28.3	19.7	40.5	42	31.2	15.1
Dissolved Beryllium	Comp	A210.2	1	ug/l	0	0	0	0	0	0	0	0	0	0	0	0
Total Beryllium	Comp	A210.2	1	ug/l	0	0	0	0	0	0	0	0	0	0	0	0
Dissolved Boron	Comp	A212.3	100	ug/l	430	132	110	142	0	103	132	105	0	0	0	0
Total Boron	Comp	A212.3	100	ug/l	448	146	129	170	101	118	225	106	0	0	0	0
Dissolved Cadmium	Comp	A213.2	1	ug/l	0	0	0	0	0	0	0	0	0	0	0	0
Total Cadmium	Comp	A213.2	1	ug/l	0	0	0	0	0	0	0	0	0	0	0	0
Dissolved Chromium	Comp	A218.2	5	ug/l	9.5	0	0	0	0	0	0	0	0	0	0	0
Total Chromium	Comp	A218.2	5	ug/l	9.5	0	0	0	0	0	0	0	0	0	0	0

Table B-4. Summary of Results for the 1999-2000 Routine Monitoring at Coyote Creek

STATION NO.					S13	S13	S13	S13	S13	S13	S13	S13	S13	S13	S13	S13
STATION NAME					Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek
STORM NO.					9900-01	9900-02	9900-03	9900-04	9900-05	9900-06	9900-07	9900-08	9900-09	9900-10	9900-11	9900-12
DATE					11/8/99	12/31/99	1/25/00	1/30/00	2/10/00	2/12/00	2/16/00	2/20/00	2/23/00	2/27/00	3/5/00	3/8/00
	Sample Type	EPA Method	DL	Units												
Metals (cont.)																
Dissolved Chromium +6	Comp		10	ug/l	0	0	0	0	0	0	0	0	0	0	0	0
Total Chromium +6	Comp		10	ug/l	0	0	0	0	0	0	0	0	0	0	0	0
Dissolved Copper	Comp	A220.1	5	ug/l	5.45	16.4	10.4	12.2	5.1	0	0	0	0	5.4	0	0
Total Copper	Comp	A220.1	5	ug/l	5.45	19.1	14.5	16	14.5	6.6	5.9	9.3	9.3	12.9	0	8.1
Dissolved Iron	Comp	A236.1	100	ug/l	160	430	210	0	0	0	0	200	0	440	190	0
Total Iron	Comp	A236.1	100	ug/l	460	820	930	450	100	230	0	390	0	830	250	200
Dissolved Lead	Comp	A239.2	5	ug/l	0	0	0	0	0	0	0	0	0	0	0	0
Total Lead	Comp	A239.2	5	ug/l	0	5.3	7.3	0	0	0	0	0	0	0	0	0
Dissolved Manganese	Comp	A243.1	100	ug/l	0	0	0	0	0	0	0	0	0	0	0	0
Total Manganese	Comp	A243.1	100	ug/l	0	260	0	0	0	0	0	0	0	0	0	0
Dissolved Mercury	Comp	A245.1	1	ug/l	0	0	0	0	0	0	0	0	0	0	0	0
Total Mercury	Comp	A245.1	1	ug/l	0	0	0	0	0	0	0	0	0	0	0	0
Dissolved Nickel	Comp	A249.2	5	ug/l	0	8.76	5.3	0	0	0	0	0	0	0	0	0
Total Nickel	Comp	A249.2	5	ug/l	0	12.7	7.8	0	8.4	0	0	0	0	5.78	0	0
Dissolved Selenium	Comp	A270.2	5	ug/l	0	0	0	0	0	0	0	0	0	0	0	0
Total Selenium	Comp	A270.2	5	ug/l	0	0	0	0	0	0	0	0	0	0	0	0
Dissolved Silver	Comp	A272.2	1	ug/l	0	0	0	0	0	0	0	0	0	0	0	0
Total Silver	Comp	A272.2	1	ug/l	0	0	0	0	0	0	0	0	0	0	0	0
Dissolved Thallium	Comp	A279.2	5	ug/l	0	0	0	0	0	0	0	0	0	0	0	0
Total Thallium	Comp	A279.2	5	ug/l	0	0	0	0	0	0	0	0	0	0	0	0
Dissolved Zinc	Comp	A289.1	50	ug/l	0	0	0	0	0	0	0	0	0	0	0	0
Total Zinc	Comp	A289.1	50	ug/l	0	73	69	68	0	0	0	0	0	0	0	0
Semi-Volatiles Organics																
Bis(2-ethylhexyl)phthalate	Comp	625M	3	ug/l	0											
All other SVOCs	Comp	625M	0.5 - 5.0	ug/l	0											
Pesticides																
Diazinon	Comp	8141SOP	0.01	ug/l	0	0	0.15	0	0	0	0.07	0	0.05	0	0	0.18
Chlorpyrifos	Comp	8141SOP	0.05	ug/l	0	0	0	0	0	0	0	0	0	0	0	0
Carbofuran	Comp	531.1	5	ug/l	0	0	0	0	0	0	0	0	0	0	0	0
2,4-D	Comp	515.1	10	ug/l												
2,4,5-TP	Comp	515.1	1	ug/l												
Bentazon	Comp	515.1	2	ug/l												
Glyphosate	Comp	547	25	ug/l	150	0	0	0	0	0	0	0	0	0	0	0

Note:
1). blank cell indicates sample was not analyzed
2). 0 indicated level below detection limit

Table B-4, Summary of Results for the 2000-2001 Routine Monitoring at Coyote Creek

STATION NO.					S13	S13	S13	S13	S13	S13	S13	S13	S13	S13
STATION NAME					Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek
STORM NO.					0001-01	0001-02	0001-03	0001-05	0001-06	0001-07	0001-08	0001-09	0001-10	0001-11
DATE					10/12/00	10/28/00	10/30/00	1/11/01	1/25/01	2/1/01	2/14/01	2/20/01	2/28/01	3/6/01
	Sample Type	EPA Method	DL	Units										
Conventional														
Cyanide	Grab	A335.2	0.01	mg/L										
TPH	Grab													
Oil and Grease	Grab	A413.1	1	mg/L										
Total Phenols	Grab	A420.1	0.1	mg/L										
Indicator Bacteria														
Total Coliform	Grab	C9221B	20	MPN/100ml						900000	300000		500000	28000
Fecal Coliform	Grab	C9221C	20	MPN/100ml						220000	300000		110000	900
Fecal Streptococcus	Grab	C9230B	20	MPN/100ml						28000	17000		110000	800
Fecal Enterococcus	Grab	C9230B	20	MPN/100ml						28000	13000		50000	800
General														
Ammonia	Comp	A350.3	0.1	mg/L	5.13	0.209	0	0.116	0.413	0.421	0.65	0.105	0	0
Calcium	Comp	A215.2	1	mg/L	64.1	40.1	14.4	19.2	26.1	17	28.05	16	20.04	64.1
Magnesium	Comp	C3500MgC	1	mg/L	17	7.29	3.7	2.91	5.47	4.25	9.72	4.86	3.65	28
Potassium	Comp	A258.1	1	mg/L	15.9	5.66	2.02	2.55	2.94	2.38	2.87	1.63	2.01	4.9
Sodium	Comp	A273.1	1	mg/L	66.2	18.1	6.3	14.9	33.8	18.8	21.1	16.4	22.4	163
Bicarbonate	Comp	A310.1	2	mg/L	179	122	44.8	53	58.2	51.7	51.72	45.26	51.72	226.31
Carbonate	Comp	A310.1	2	mg/L	0	0	0	0	0	0	0	0	0	0
Chloride	Comp	B429	2	mg/L	63.1	22.9	16.6	12.1	21.4	15.3	24.4	14.9	21.9	113
Flouride	Comp	B429	0.1	mg/L	0.54	0.18	0.12	0.12	0.14	0.1	0.12	0.1	0.1	0.5
Nitrate	Comp	B429	0.1	mg/L	0	0	3.2	3.9	2.45	3.4	2.41	2.49	3.81	12.9
Sulfate	Comp	B429	0.1	mg/L	125	23.4	19.2	15.3	39.7	24.6	28.4	21.4	29.5	212
Alakalinity	Comp	A310.1	4	mg/L	147	99.8	36.8	43.5	47.7	42.4	42.4	37.1	42.4	185.5
Hardness	Comp	A130.2	2	mg/L	230	130	51.2	60	87.5	60	110	60	65	275
Dissolved Phosphorus	Comp	A365.2	0.05	mg/L	0.532	0.671	0.269	0.2	0.17	0.14	0.205	0.115	0.087	0.133
Total Phosphorus	Comp	A365.2	0.05	mg/L	0.71	0.692	0.465	0.24	0.2	0.17	0.232	0.141	0.176	0.152
COD	Comp	A410.4	5	mg/L	199	126	42.8	63.2	62.2	0	27.4	47.7	16.7	223.6
pH	Comp	A150.1	na		7.26	7.16	6.97	6.37	6.56	7.02	6.91	7.29	7.27	7.95
NH3-N	Comp	A350.3	0.1	mg/L	4.24	0.173	0	0	0.341	0.348	0.536	0	0	0
Nitrate-N	Comp	C4110B	0.1	mg/L	0	0	0.722	0.881	0.553	0.768	0.544	0.582	0.86	2.91
Nitrite-N	Comp	C4110B	0.1	mg/L	0	0.094	0.079	0	0.186	0.119	0.161	0.082	0.07	0.411
Kjeldahl-N	Comp	A351.4	0.1	mg/L	6.72	2.72	1.104	2.36	3.36	1.72	3.24	0.813	1.168	1.336
Specific Conductance	Comp	A120.1	1	umhos/cm	910	351	167	190	299	204	255	162.9	243	1095
Total Dissolved Solids	Comp	A160.1	2	mg/L	596	210	98	110	168	115	142	92	154	692
Turbidity	Comp	A180.1	0.1	NTU	194	305	50.1	64.3	67.9	58.6	31	61.9	24.3	16.2
Suspended Solids	Comp	A160.2	2	mg/L	843	954	109	211	262	199	175	112	123	79
Volatile Suspended Solids	Comp	160.4	1	mg/L	138	167	18	59	59	50	33	18	51	20
MBAS	Comp	A425.1	0.05	mg/L	0.099	0.106	0.095	0.109	0.084	0.092	0.169	0.056	0.09	0.07
Total Organic Carbon	Comp	A415.1	1	mg/L	66.9	21.5	10.5	8.04	9.8	9.3	9.62	7.3	6.4	6.4
BOD	Comp	A405.1	2	mg/L	7.1	5	4	9	0	8.9	20	7.5	26.5	6.8
Metals														
Dissolved Aluminum	Comp	A202.2	1000	ug/l	0	0	0	147	0	0	0	0	0	0
Total Aluminum	Comp	A202.2	1000	ug/l	199	122	247	147	399	249	0	113.6	168	0
Dissolved Antimony	Comp	A204.2	5	ug/l	0	0	0	0	0	0	0	0	0	0
Total Antimony	Comp	A204.2	5	ug/l	0	0	0	0	0	0	0	0	0	0
Dissolved Arsenic	Comp	A206.2	5	ug/l	0	0	0	0	0	0	0	0	0	0
Total Arsenic	Comp	A206.2	5	ug/l	0	0	0	0	0	0	0	0	0	0
Dissolved Barium	Comp	A208.2	10	ug/l	52.5	30.7	12.6	24.7	22.2	16.2	28.8	19.1	18.2	57.1
Total Barium	Comp	A208.2	10	ug/l	52.8	36.5	15.7	24.7	28.7	20.9	31.1	21.5	21.1	69.5
Dissolved Berylium	Comp	A210.2	1	ug/l	0	0	0	0	0	0	0	0	0	0
Total Berylium	Comp	A210.2	1	ug/l	0	0	0	0	0	0	0	0	0	0

Table B-4. Summary of Results for the 2000-2001 Routine Monitoring at Coyote Creek

STATION NO.					S13	S13	S13	S13	S13	S13	S13	S13	S13	S13
STATION NAME					Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek
STORM NO.					0001-01	0001-02	0001-03	0001-05	0001-06	0001-07	0001-08	0001-09	0001-10	0001-11
DATE					10/12/00	10/28/00	10/30/00	1/11/01	1/25/01	2/1/01	2/14/01	2/20/01	2/28/01	3/6/01
	Sample Type	EPA Method	DL	Units										
Metals (cont.)														
Dissolved Boron	Comp	A212.3	100	ug/l	201	140	112	0	116	0	0	0	0	322
Total Boron	Comp	A212.3	100	ug/l	340	160	126	0	123	200	0	123	104	322
Dissolved Cadmium	Comp	A213.2	1	ug/l	0	0	0	0	0	0	0	0	0	0
Total Cadmium	Comp	A213.2	1	ug/l	0	0	0	0	0	0	0	0	0	0
Dissolved Chromium	Comp	A218.2	5	ug/l	0	0	0	0	0	0	0	0	0	0
Total Chromium	Comp	A218.2	5	ug/l	0	0	0	0	0	0	0	0	0	0
Dissolved Chromium +6	Comp		10	ug/l	0	0	0	0	0	0	0	0	0	0
Total Chromium +6	Comp		10	ug/l	0	0	0	0	0	0	0	0	0	0
Dissolved Copper	Comp	A220.1	5	ug/l	6.2	0	7.43	6.27	7.72	0	0	5.07	0	0
Total Copper	Comp	A220.1	5	ug/l	8.3	11.9	10.7	8.93	13	8.45	5.73	9.76	8.18	6.53
Dissolved Iron	Comp	A236.1	100	ug/l	160	0	0	260	0	180	0	0	0	0
Total Iron	Comp	A236.1	100	ug/l	500	160	180	280	630	430	290	0	330	210
Dissolved Lead	Comp	A239.2	5	ug/l	0	0	0	0	0	0	0	0	0	0
Total Lead	Comp	A239.2	5	ug/l	0	0	0	0	0	0	0	0	0	0
Dissolved Manganese	Comp	A243.1	100	ug/l	260	0	0	0	0	0	0	0	0	0
Total Manganese	Comp	A243.1	100	ug/l	303	123	0	0	0	0	0	0	0	0
Dissolved Mercury	Comp	A245.1	1	ug/l	0	0	0	0	0	0	0	0	0	0
Total Mercury	Comp	A245.1	1	ug/l	0	0	0	0	0	0	0	0	0	0
Dissolved Nickel	Comp	A249.1	5	ug/l	13.5	5.65	0	0	0	0	0	0	0	0
Total Nickel	Comp	A249.1	5	ug/l	13.6	5.97	0	0	5.89	0	0	0	0	0
Dissolved Selenium	Comp	A270.2	5	ug/l	0	0	0	0	0	0	0	0	0	0
Total Selenium	Comp	A270.2	5	ug/l	0	0	0	0	0	0	0	0	0	0
Dissolved Silver	Comp	A272.2	1	ug/l	0	0	0	0	0	0	0	0	0	0
Total Silver	Comp	A272.2	1	ug/l	0	0	0	0	0	0	0	0	0	0
Dissolved Thallium	Comp	A279.2	5	ug/l	0	0	0	0	0	0	0	0	0	0
Total Thallium	Comp	A279.2	5	ug/l	0	0	0	0	0	0	0	0	0	0
Dissolved Zinc	Comp	A289.1	50	ug/l	0	0	0	0	68.6	0	0	0	0	0
Total Zinc	Comp	A289.1	50	ug/l	0	0	0	0	80.7	51.1	0	0	52.2	0
Semi-Volatiles Organics														
Bis(2-ethylhexyl)phthalate	Comp	625M	3	ug/l										
All other SVOCs	Comp	625M	0.5-5.0	ug/l										
Pesticides														
Diazinon	Comp	8141SOP	0.01	ug/l	0	0	0	0	0	0	0	0	0	0
Carbofuran	Comp	531.1	5	ug/l	0	0	0	0	0	0	0	0	0	0
2,4-D	Comp	515	10	ug/l										
2,4,5-TP	Comp	515	1	ug/l										
Bentazon	Comp	515	2	ug/l										
Glyphosate	Comp	547	25	ug/l	0	0	0	0	0	0	0	0	0	0
All other pesticides	Comp	D608	various	ug/l	0	0	0	0	0	0	0	0	0	0

Note:
1) blank cell indicates sample was not analyzed
2) 0 indicated level below detection limit

Appendix B. 2001-2002 Sampling Results for Coyote Creek

STATION NO.					S13	S13	S13	S13	S13	S13
STATION NAME					Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek
STORM NO.					0102-01	0102-02	0102-03	0102-04	0102-05	0102-06
DATE					11/12/2001	11/24/2001	11/29/2001	12/03/2001	12/20/2001	01/28/2002
	Sample Type	EPA Method	ML	Units						
Conventional										
Cyanide	Grab	A335.2	0.01	mg/L		0	0.006			0
TPH	Grab	A418.1	5.00	mg/L		1.5	2.6			0
Oil and Grease	Grab	A413.1	5.00	mg/L		0	1.7			4.8
Total Phenols	Grab	A420.1	0.10	mg/L		0	0			0
Indicator Bacteria										
Total Coliform	Grab	C9221B	20.00	MPN/100ml		5000000	5000000			500000
Fecal Coliform	Grab	C9221C	20.00	MPN/100ml		1700000	3000000			30000
Ratio Fecal Coliform/Total Coliform						0.34	0.6			0.06
Fecal Streptococcus	Grab	C9230B	20.00	MPN/100ml		1600000	700000			110000
Fecal Enterococcus	Grab	C9230B		MPN/100ml		900000	700000			70000
General										
Ammonia	Comp	A350.3	0.10	mg/L	1.124	0.736	0.538	0.126		0.47
Calcium	Comp	A215.2	1.00	mg/L	40.1	24	36.1	24		25.3
Magnesium	Comp	C3500MgD	1.00	mg/L	12.2	10.9	12.2	8.51		4.86
Potassium	Comp	A258.1	1.00	mg/L	5.25	4.25	5	4.11		4.34
Sodium	Comp	A273.1	1.00	mg/L	37.5	17.5	56.4	27.8		20.5
Bicarbonate	Comp	A310.1	2.00	mg/L	142.3	64.7	97	63.4		53.7
Carbonate	Comp	A310.1	2.00	mg/L	0	0	0	0		0
Chloride	Comp	B429	2.00	mg/L	32.58	13.05	43.03	26 28		12.3
Fluoride	Comp	B429	0.10	mg/L	0.31	0.13	0.3	0.14		0.17
Nitrate	Comp	B429	0.10	mg/L	0	1.09	7.03	7.7		1.62
Sulfate	Comp	B429	0.10	mg/L	41.65	14.55	86.96	34.02		23.6
Alkalinity	Comp	A310.1	2.00	mg/L	116.6	53	79.5	51.9		68.6
Hardness	Comp	A130.2	2.00	mg/L	150	105	140	95		83.2
COD	Comp	A410.4	20-900	mg/L	460.7	122.2	243	288		48.5
pH	Comp	A150.1	0-14		7.56	7.17	7.6	7.59		7.35
Specific Conductance	Comp	A120.1	1.00	umhos/cm	460	244	522	290		284
Total Dissolved Solids	Comp	A160.1	2.00	mg/L	320	170	350	200		184
Turbidity	Comp	A180.1	0.10	NTU	162	209	45.8	34.5		54.7
Total Suspended Solids	Comp	A160.2	2.00	mg/L	1104	191	91	63		212
Volatile Suspended Solids	Comp	160.4	2.00	mg/L	234	44	44	21		54
MBAS	Comp	A425.1	0.50	mg/L	0.33	0.107	0.167	0.216		0
Total Organic Carbon	Comp	A415.1	1.00	mg/L	37.7	15.5	17.6	14.9		22.3
BOD	Comp	A405.1	2.00	mg/L	9.1	24.1	19.9	12.7		12.7
Nutrients										
Dissolved Phosphorus	Comp	A365.2	0.05	mg/L	0.682	0.294	0.27	0.385		0.186
Total Phosphorus	Comp	A365.2	0.05	mg/L	0.818	0.408	0.284	0.424		0.246
NH3-N	Comp	A350.3	0.10	mg/L	0.929	0.608	0.445	0.104		0.388
Nitrate-N	Comp	C4110B	0.10	mg/L	0	0.246	1.59	1.74		0.366
Nitrite-N	Comp	C4110B	0.10	mg/L	0	0.122	0.271	0.164		0 167
Kjeldahl-N	Comp	A351.4	0.10	mg/L	5.18	6.12	2.94	2.66		3.82
Metals										
Dissolved Aluminum	Comp	EPA200.8	100.00	ug/l	0	118	0	0		0
Total Aluminum	Comp	EPA200.8	100.00	ug/l	216	119	0	0		0
Dissolved Antimony	Comp	EPA200.8	0.50	ug/l	1.73	1.02	1.96	1.6		1.41
Total Antimony	Comp	EPA200.8	0.50	ug/l	1.73	1.03	1.96	1.6		1.45
Dissolved Arsenic	Comp	EPA200.8	1.00	ug/l	2.26	1.87	1.9	0		3.78
Total Arsenic	Comp	EPA200.8	1.00	ug/l	2.26	1.87	1.9	1.6		3.78
Dissolved Barium	Comp	EPA200 8	10.00	ug/l	74	29.1	35.1	23.7		32.4
Total Barium	Comp	EPA200.8	10.00	ug/l	76.2	31.7	35.1	25.4		40.4

Appendix B. 2001-2002 Sampling Results for Coyote Creek

STATION NO.					S13	S13	S13	S13	S13	S13
STATION NAME					Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek
STORM NO					0102-01	0102-02	0102-03	0102-04	0102-05	0102-06
DATE					11/12/2001	11/24/2001	11/29/2001	12/03/2001	12/20/2001	01/28/2002
	Sample Type	EPA Method	ML	Units						
Dissolved Beryllium	Comp			ug/l	0	0	0	0		0
Total Beryllium	Comp	EPA200.8	0.50	ug/l	0	0	0	0		0
Metals (cont.)		EPA200.8	0.50							
Dissolved Boron	Comp	EPA200.8	100.00	ug/l	187	189	145	220		103.9
Total Boron	Comp	EPA200.8	100.00	ug/l	293	203	179	290		136.4
Dissolved Cadmium	Comp	EPA200.8	0.25	ug/l	0	0	0	0		0
Total Cadmium	Comp	EPA200.8	0.25	ug/l	0	0	0	0		0
Dissolved Chromium	Comp	EPA200.8	0.50	ug/l	3.13	1.17	2.42	1.6		1.06
Total Chromium	Comp	EPA200.8	0.50	ug/l	3.13	4.58	3.02	2.7		1.36
Dissolved Chromium +6	Comp	EPA200.8	5.00	ug/l	0	0	0	0		0
Dissolved Chromium +6	Comp	EPA200.8	5.00	ug/l	0	0	0	0		0
Dissolved Copper	Comp	EPA200.8	0.50	ug/l	3.62	8.42	15.6	15.1		4.87
Total Copper	Comp	EPA200.8	0.50	ug/l	6.79	14.7	22.3	24.1		14.6
Dissolved Iron	Comp	EPA200.8	100.00	ug/l	510	329	0	0		226
Total Iron	Comp	EPA200.8	100.00	ug/l	726	762	244	315		319
Dissolved Lead	Comp	EPA200.8	0.50	ug/l	0.86	1.95	0.74	0.7		0
Total Lead	Comp	EPA200.8	0.50	ug/l	1.62	2.67	3.09	1.6		0
Dissolved Manganese	Comp	EPA200.8	100.00	ug/l	474	32.9	0	0		169
Total Manganese	Comp	EPA200.8	100.00	ug/l	846	374	0	0		169
Dissolved Mercury	Comp	EPA200.8	0.50	ug/l	0	0	0	0		0
Total Mercury	Comp	EPA200.8	0.50	ug/l	0	0	0	0		0
Dissolved Nickel	Comp	EPA200.8	1.00	ug/l	12.8	5.67	9.09	6.8		4.58
Total Nickel	Comp	EPA200.8	1.00	ug/l	14	5.67	11.1	6.9		5.37
Dissolved Selenium	Comp	EPA200.8	1.00	ug/l	0	0	0	0		0
Total Selenium	Comp	EPA200.8	1.00	ug/l	0	0	0	0		0
Dissolved Silver	Comp	EPA200.8	0.25	ug/l	0	0	0	0		0
Total Silver	Comp	EPA200.8	0.25	ug/l	0	0	0	0		0
Dissolved Thallium	Comp	EPA200.8	1.00	ug/l	0	0	0	0		0
Total Thallium	Comp	EPA200.8	1.00	ug/l	0	0	0	0		0
Dissolved Zinc	Comp	EPA200.8	1.00	ug/l	13.3	31.3	60.6	67.1		24.7
Total Zinc	Comp	EPA200.8	1.00	ug/l	20.9	31.3	69.5	67.1		29.6
Semi-Volatiles Organics										
Bis(2-ethylhexyl)phthalate	Comp	625M	5.00	ug/l						
PAHs										
Acenaphthene	Comp			ug/l						
Acenaphthylene	Comp			ug/l						
Anthracene	Comp			ug/l						
Benzo(a)anthracene	Comp			ug/l						
Benzo(a)pyrene	Comp			ug/l						
Benzo(b)fluoranthene	Comp			ug/l						
Benzo(k)fluoranthene	Comp			ug/l						
Chrysene	Comp			ug/l						
Dibenz(a,h)anthracene	Comp			ug/l						
Fluoranthene	Comp			ug/l						
Fluorene	Comp			ug/l						
Indeno (1,2,3-cd)pyrene	Comp			ug/l						
Naphthalene	Comp			ug/l						
Phenanthrene	Comp			ug/l						
Pyrene	Comp			ug/l						
All other SVOCs	Comp	625M	.05-5	ug/l						
Pesticides										

Appendix B. 2001-2002 Sampling Results for Coyote Creek

STATION NO.					S13	S13	S13	S13	S13	S13
STATION NAME					Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek
STORM NO.					0102-01	0102-02	0102-03	0102-04	0102-05	0102-06
DATE					11/12/2001	11/24/2001	11/29/2001	12/03/2001	12/20/2001	01/28/2002
	Sample Type	EPA Method	ML	Units						
Organochlorine Pesticides & PCBs		0608	0.005-0.5	ug/l						
Carbofuran	Comp	531.1	5.00	ug/l						
Glyphosate	Comp	547	5.00	ug/l						
Organo-Phosphate Pesticides										
Diazinon	Comp	8141SOP	0.01	ug/l	0.117	0	0			0.49
Chlorpyrifos	Comp	507	0.05	ug/l	0	0	0			0
N- and P- Containing Pesticides										
Thiobencarb	Comp			ug/l	0	0	0			0
All other N- and P- Pesticides	Comp	507	1.0-2.0	ug/l						
Phenoxyacetic Acid Herbicides										
2,4-D	Comp	515.1	0.02	ug/l						
2,4,5-TP	Comp	515.1	0.20	ug/l						
Bentazon	Comp	515.1	2.00	ug/l						

Note:
1) blank cell indicates sample was not analyzed
2) 0 indicates level below minimum level
3) ML indicates minimum level

WEATHER CONDITION					Wet				Dry	
STATION NO.					S13	S13	S13	S13	S13	S13
STATION NAME					Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek
EVENT NO.					0203-01	0203-02	0203-03	0203-05	0203-01	0203-02
DATE					11/08/2002	12/16/2002	02/11/2003	03/15/2003	10/10/2002	04/30/2003
	Sample Type	EPA Method	POL	Units						
Conventional										
Oil and Grease	Grab	EPA413.1	1	mg/L	2.6	0	1	0	0	0
Total Phenols	Grab	EPA420.1	0.1	mg/L	0	0	0	0	0	0
Cyanide	Grab	EPA335.2	0.01	mg/L	0.126	0	0.018	0	0	0.019
pH	Comp	SM4500H B	0-14		7.82	7.06	8.03	7.02	7.75	8.65
Dissolved Oxygen	Grab	SM4500O G	1	mg/L	5.5	8.2	9.58	9.38	9.18	9.81
Indicator Bacteria										
Total Coliform	Grab	SM9230B	20	MPN/100ml	300000	500000	500000	500000	8000	3500
Fecal Coliform	Grab	SM9230B	20	MPN/100ml	300000	500000	90000	300000	1700	70
Ratio Fecal Coliform/Total Coliform					1.0	1.0	0.011	0.6	0.21	0.02
Fecal Streptococcus	Grab	SM9230B	20	MPN/100ml	800000	110000	170000	130000	800	800
Fecal Enterococcus	Grab	SM9230B		MPN/100ml	800000	50000	170000	300000	800	1600
General										
Chloride	Comp	EPA300.0	2	mg/L	29.5	9.13	78	14.8	88	87
Fluoride	Comp	EPA300.0	0.1	mg/L	0.36	0.14	0.54	0.1	0.46	1
Nitrate	Comp	EPA300.0	0.1	mg/L	7.32	1.61	8.31	2.89	2.26	8.9
Sulfate	Comp	EPA300.0	0.1	mg/L	44.5	10.4	114	22.1	125	129
Alkalinity	Comp	EPA310.1	4	mg/L	69	43	137.5	27.5	155	220
Hardness	Comp	EPA130.2	2	mg/L	130	60	180	45.6	195	340
COD	BI	EPA410.4	10	mg/L	96.1	24.4	148	24	20	87.6
TPH	Grab	EPA418.1	1	mg/L	1.4	1	2.8	0	0	0
Specific Conductance	Comp	EPA120.1	1	umhos/cm	522	160.8	792	171.1	831	2020
Total Dissolved Solids	Comp	EPA160.1	2	mg/L	370	114	522	112	518	1250
Turbidity	Comp	EPA180.1	0.1	NTU	48	54.5	45.1	97.4	0.73	1.98
Total Suspended Solids	Comp	EPA160.2	2	mg/L	648	351	204	181	63	12
Volatile Suspended Solids	Comp	EPA160.4	1	mg/L	123	68	14.8	2.4	15	9
MBAS	Comp	EPA425.1	0.05	mg/L	0.27	0.053	0.151	0	0	0.062
Total Organic Carbon	Comp	EPA415.1	1	mg/L	28.3	7.81	17.9	4.27	5.35	10.1
BOD	Comp	SM5210B	2	mg/L	52.1	9.4	12.1	6.03	6.62	42.4
Nutrients										
Dissolved Phosphorus	Comp	EPA365.3	0.05	mg/L	0.442	0.095	0.441	0.242	0	0
Total Phosphorus	Comp	EPA365.3	0.05	mg/L	0.46	0.155	0.524	0.259	0	0
NH3-N	Comp	EPA350.3	0.1	mg/L	2.51	0.158	2.11	0	0	0.298
Nitrate-N	Comp	SM4110B	0.5	mg/L	1.65	0.364	1.87	0.6525	0.515	2.01
Nitrite-N	Comp	SM4110B	0.03	mg/L	1.01	0.198	1.42	0	0	0.365
Kjeldahl-N	Comp	EPA351.4	0.1	mg/L	3.36	0.558	6.84	1.16	0.82	1.87
Metals										
Dissolved Aluminum	Comp	EPA200.8	100	ug/l	0	0	0	0	0	0
Total Aluminum	Comp	EPA200.8	100	ug/l	1115	0	0	134	0	0
Dissolved Antimony	Comp	EPA200.8	5	ug/l	2.99	0.83	1.22	0	0.64	0.68
Total Antimony	Comp	EPA200.8	5	ug/l	3.56	0.87	1.27	0	0.64	0.7
Dissolved Arsenic	Comp	EPA200.8	5	ug/l	2.48	0	2.28	0	6.19	2.27
Total Arsenic	Comp	EPA200.8	5	ug/l	3.01	1.42	2.43	1.19	6.19	3.46
Dissolved Beryllium	Comp	EPA200.8	1	ug/l	0	0	0	0	0	0
Total Beryllium	Comp	EPA200.8	1	ug/l	0	0	0	0	0	0
Dissolved Cadmium	Comp	EPA200.8	1	ug/l	0	0	0	0	0	0
Total Cadmium	Comp	EPA200.8	1	ug/l	0.97	0	0	0	0	0
Dissolved Chromium	Comp	EPA200.8	5	ug/l	3.15	1.16	4.11	3.37	2.06	1.02
Total Chromium	Comp	EPA200.8	5	ug/l	8.49	11.7	4.55	9.25	12.5	2.6
Dissolved Chromium +6	Comp	EPA200.8	10	ug/l	0	0	0	0	0	0
Total Chromium +6	Comp	EPA200.8	10	ug/l	0	0	0	0	0	0
Dissolved Copper	Comp	EPA200.8	5	ug/l	117	4.21	4.83	4.76	3.98	6.9
Total Copper	Comp	EPA200.8	5	ug/l	145.9	9.91	17.9	12.1	9.94	10.1

WEATHER CONDITION					Wet				Dry	
STATION NO.					S13	S13	S13	S13	S13	S13
STATION NAME					Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek
EVENT NO.					0203-01	0203-02	0203-03	0203-05	0203-01	0203-02
DATE					11/08/2002	12/16/2002	02/11/2003	03/15/2003	10/10/2002	04/30/2003
	Sample Type	EPA Method	PQL	Units						
Dissolved Iron	Comp	EPA200.8	100	ug/l	0	109	163	213	0	0
Total Iron	Comp	EPA200.8	100	ug/l	1420	225	209	581	203	145
Dissolved Lead	Comp	EPA200.8	5	ug/l	0	0.62	0.58	0	0	0
Total Lead	Comp	EPA200.8	5	ug/l	20.9	1.44	1.27	2.05	1.25	0.54
Dissolved Mercury	Comp	EPA200.8	1	ug/l	0	0	0	0	0	0
Total Mercury	Comp	EPA200.8	1	ug/l	0	0	0	0	0	0
Dissolved Nickel	Comp	EPA200.8	5	ug/l	14.2	2.25	7.65	2.68	2.29	3.37
Total Nickel	Comp	EPA200.8	5	ug/l	17	15.5	9.57	6.01	18.9	4.3
Dissolved Selenium	Comp	EPA200.8	5	ug/l	2.37	0	0	0	1.92	0
Total Selenium	Comp	EPA200.8	5	ug/l	2.37	0	0	0	1.92	0
Dissolved Silver	Comp	EPA200.8	1	ug/l	0	0	0	0	0	0
Total Silver	Comp	EPA200.8	1	ug/l	0	0	0	0	0	0
Dissolved Thallium	Comp	EPA200.8	5	ug/l	0	0	0	0	0	0
Total Thallium	Comp	EPA200.8	5	ug/l	0	0	0	0	0	0
Dissolved Zinc	Comp	EPA200.8	50	ug/l	84.5	32	52	6	9.32	53
Total Zinc	Comp	EPA200.8	50	ug/l	219	52	61	41	11.6	64
Semi-Volatiles Organics (EPA 625)										
2- Chlorophenol	Comp	EPA625	2	ug/l	0	0	0	0	0	0
2,4-dichlorophenol	Comp	EPA625	2	ug/l	0	0	0	0	0	0
2,4-dimethylphenol	Comp	EPA625	2	ug/l	0	0	0	0	0	0
2,4-dinitrophenol	Comp	EPA625	3	ug/l	0	0	0	0	0	0
2-nitrophenol	Comp	EPA625	3	ug/l	0	0	0	0	0	0
4-nitrophenol	Comp	EPA625	3	ug/l	0	0	0	0	0	0
4-chloro_3_methylphenol	Comp	EPA625	3	ug/l	0	0	0	0	0	0
Pentachlorophenol	Comp	EPA625	2	ug/l	0	0	0	0	0	0
Phenol	Comp	EPA625	1	ug/l	0	0	0	0	0	0
2,4,6-trichlorophenol	Comp	EPA625	1	ug/l	0	0	0	0	0	0
Base/Neutral										
Acenaphthene	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
Acenaphthylene	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
Anthracene	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
Benzidine	Comp	EPA625	3	ug/l	0	0	0	0	0	0
1,2 Benzanthracene	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
Benzo(a)pyrene	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
Benzo(k)fluoranthene	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
Bis(2-Chloroethoxy) methane	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
Bis(2-Chloroisopropyl) ether	Comp	EPA625	1	ug/l	0	0	0	0	0	0
Bis(2-Chloroethyl) ether	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
Bis(2-Ethylhexl) phthalate	Comp	EPA625	1	ug/l	0	0	0	0	0	0
4-Bromophenyl phenyl ether	Comp	EPA625	1	ug/l	0	0	0	0	0	0
Butyl benzyl phthalate	Comp	EPA625	0.3	ug/l	0	0	0	0	0	0
2-Chloronaphthalene	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
4-Chlorophenyl phenyl ether	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
Chrysene	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
Dibenzo(a,h)anthracene	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
1,3-Dichlorobenzene	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
1,4-Dichlorobenzene	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
1,2-Dichlorobenzene	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
3,3-Dichlorobenzidine	Comp	EPA625	3	ug/l	0	0	0	0	0	0
Diethyl phthalate	Comp	EPA625	0.5	ug/l	0	0	0	0	0	0
Dimethyl phthalate	Comp	EPA625	0.5	ug/l	0	0	0	0	0	0
di-n-Butyl phthalate	Comp	EPA625	1	ug/l	0	0	0	0	0	0

WEATHER CONDITION					Wet				Dry	
STATION NO.					S13	S13	S13	S13	S13	S13
STATION NAME					Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek
EVENT NO.					0203-01	0203-02	0203-03	0203-05	0203-01	0203-02
DATE					11/30/2002	12/18/2002	02/11/2003	03/15/2003	10/10/2002	04/30/2003
	Sample Type	EPA Method	PQL	Units						
2,4-Dinitrotoluene	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
2,6-Dinitrotoluene	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
4,6 Dinitro-2-methylphenol	Comp	EPA625	3	ug/l	0	0	0	0	0	0
1,2-Diphenylhydrazine	Comp	EPA625	3	ug/l	0	0	0	0	0	0
di-n-Octyl phthalate	Comp	EPA625	1	ug/l	0	0	0	0	0	0
Fluoranthene	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
Fluorene	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
Hexachlorobenzene	Comp	EPA625	0.5	ug/l	0	0	0	0	0	0
Hexachlorobutadiene	Comp	EPA625	1	ug/l	0	0	0	0	0	0
Hexachloro-cyclopentadiene	Comp	EPA625	3	ug/l	0	0	0	0	0	0
Hexachloroethane	Comp	EPA625	1	ug/l	0	0	0	0	0	0
Indeno(1,2,3-cd)pyrene	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
Isophorone	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
Naphthalene	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
Nitrobenzene	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
N-Nitroso-dimethyl amine	Comp	EPA625	0.3	ug/l	0	0	0	0	0	0
N-Nitroso-diphenyl amine	Comp	EPA625	0.3	ug/l	0	0	0	0	0	0
N-Nitroso-di-n-propyl amine	Comp	EPA625	0.3	ug/l	0	0	0	0	0	0
Phenanthrene	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
Pyrene	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
1,2,4-Trichlorobenzene	Comp	EPA625	0.5	ug/l	0	0	0	0	0	0
Chlorinated Pesticides										
Aldrin	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
alpha-BHC	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
beta-BHC	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
delta-BHC	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
gamma-BHC (lindane)	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
alpha-chlordane	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
gamma-chlordane	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
4,4'-DDD	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
4,4'-DDE	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
4,4'-DDT	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
Dieldrin	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
alpha-Endosulfan	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
beta-Endosulfan	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
Endosulfan sulfate	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
Endrin	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
Endrin aldehyde	Comp	EPA625	0.1	ug/l	0	0	0	0	0	0
Heptachlor	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
Heptachlor Epoxide	Comp	EPA625	0.05	ug/l	0	0	0	0	0	0
Toxaphene	Comp	EPA625	1	ug/l	0	0	0	0	0	0
Polychlorinated Biphenyls										
Aroclor-1016	Comp	EPA608	0.5	ug/l	0	0	0	0	0	0
Aroclor-1221	Comp	EPA608	0.5	ug/l	0	0	0	0	0	0
Aroclor-1232	Comp	EPA608	0.5	ug/l	0	0	0	0	0	0
Aroclor-1242	Comp	EPA608	0.5	ug/l	0	0	0	0	0	0
Aroclor-1248	Comp	EPA608	0.5	ug/l	0	0	0	0	0	0
Aroclor-1254	Comp	EPA608	0.5	ug/l	0	0	0	0	0	0
Aroclor-1260	Comp	EPA608	0.5	ug/l	0	0	0	0	0	0
Organophosphate Pesticides										
Chlorpyrifos	Comp	EPA507	0.05	ug/l	0	0	0	0	0	0
Diazinon	Comp	EPA507	0.01	ug/l	0.31	0	0.085	0.07	0	0.038

WEATHER CONDITION					Wet				Dry	
STATION NO.					S13	S13	S13	S13	S13	S13
STATION NAME					Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek
EVENT NO.					0203-01	0203-02	0203-03	0203-05	0203-01	0203-02
DATE					11/08/2002	12/16/2002	02/11/2003	03/15/2003	10/10/2002	04/30/2003
	Sample Type	EPA Method	POL	Units						
Prometryn	Comp	EPA507	2	ug/l	0	0	0	0	0	0
Atrazine	Comp	EPA507	2	ug/l	0	0	0	0	0	0
Simazine	Comp	EPA507	2	ug/l	0	0	0	0	0	0
Cyanazine	Comp	EPA507	2	ug/l	0	0	0	0	0	0
Malathion	Comp	EPA507	2	ug/l	0	0	0	0	0	0
Herbicides										
Glyphosate	Comp	EPA547	25	ug/l	0	0	0	0	0	0
2,4-D	Comp	EPA515.3	10	ug/l	0	0	0	0	0	0
2,4,5-TP-SILVEX	Comp	EPA515.3	1	ug/l	0	0	0	0	0	0

Note:
1) blank cell indicates sample was not analyzed
2) 0 indicates concentration below minimum detection leve
3) POL = minimum level
4) Highlighted cells show exceedances

WEATHER CONDITION					Wet			Dry	
STATION NO.					S13	S13	S13	S13	S13
STATION NAME					Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek
EVENT NO.					0304-01	0304-02	0304-03	0304-01	0304-02
DATE					10/31/2003	12/25/2003	1/1/2004	10/28/2003	1/13/2004
	Sample Type	EPA Method	PQL	Units					
Conventional									
Oil and Grease	Grab	EPA413.1	1	mg/L	0	0	0	0	0
Total Phenols	Grab	EPA420.1	0.1	mg/L	0	0	0	0	0
Cyanide	Grab	EPA335.2	0.01	mg/L	0.02	0	0.017	0.007	0.01
pH	Comp	SM4500H B	0-14		7.5	6.89	6.89	7.39	8.16
Dissolved Oxygen	Grab	SM4500O G	1	mg/L	5.02	8.12	11.28	6.6	17.1
Indicator Bacteria									
Total Coliform	Grab	SM9230B	20	MPN/100ml	50000	170000	24000	50000	2400
Fecal Coliform	Grab	SM9230B	20	MPN/100ml	9000	110000	5000	1700	2400
Ratio Fecal Coliform/Total Coliform					0.06	0.65	0.13	0.02	1.00
Fecal Streptococcus	Grab	SM9230B	20	MPN/100ml	24000	110000	17000	1100	900
Fecal Enterococcus	Grab	SM9230B		MPN/100ml	2400	90000	9000	1100	260
General									
Chloride	Comp	EPA300.0	2	mg/L	64.3	15.1	32.4	219	103
Fluoride	Comp	EPA300.0	0.1	mg/L	0.29	0.16	0.15	0.63	0.54
Nitrate	Comp	EPA300.0	0.1	mg/L	0	6.63	12.3	0.96	17.5
Sulfate	Comp	EPA300.0	0.1	mg/L	78.8	24	53	317	158
Alkalinity	Comp	EPA310.1	4	mg/L	157.3	77	78	217	237
Hardness	Comp	EPA130.2	2	mg/L	225	92.8	112	325	395
COD	Si	EPA410.4	10	mg/L	279.1	30	38.6	70.8	125
TPH	Grab	EPA418.1	1	mg/L	0	0	0	0	0
Specific Conductance	Comp	EPA120.1	1	umhos/cm	649	277	374	1735	1767
Total Dissolved Solids	Comp	EPA160.1	2	mg/L	408	192	250	1000	1100
Turbidity	Comp	EPA180.1	0.1	NTU	16.3	60	1.02	1.15	0.7
Total Suspended Solids	Comp	EPA160.2	2	mg/L	2061	336	102	445	9
Volatile Suspended Solids	Comp	EPA160.4	1	mg/L	394	88	25	77	7
MBAS	Comp	EPA425.1	0.05	mg/L	0.466	0.113	0.181	0.058	0
Total Organic Carbon	Comp	EPA415.1	1	mg/L	69.5	10	10.1	10.9	6.63
BOD	Comp	SM5210B	2	mg/L	119	20.3	17.3	4.31	14.4
Nutrients									
Dissolved Phosphorus	Comp	EPA365.3	0.05	mg/L	0.763	0.32	0.26	0.10	0.00
Total Phosphorus	Comp	EPA365.3	0.05	mg/L	0.844	0.36	0.30	0.13	0.00
NH3-N	Comp	EPA350.3	0.1	mg/L	4.84	0.00	0.00	0.14	0.19
Nitrate-N	Comp	SM4110B	0.5	mg/L	0	1.50	2.78	0.22	3.95
Nitrite-N	Comp	SM4110B	0.03	mg/L	0.18	0.07	0.13	0.69	1.11
Kjeldahl-N	Comp	EPA351.4	0.1	mg/L	7	1.73	2.28	2.34	1.16
Metals									
Dissolved Aluminum	Comp	EPA200.8	100	ug/l	0	0	0	0	0
Total Aluminum	Comp	EPA200.8	100	ug/l	6656	112	130	0	0
Dissolved Antimony	Comp	EPA200.8	5	ug/l	2.63	1.58	1.88	1.39	0.65
Total Antimony	Comp	EPA200.8	5	ug/l	4.75	1.63	2.02	1.39	0.65
Dissolved Arsenic	Comp	EPA200.8	5	ug/l	3.44	1.91	1.78	3.94	2.85
Total Arsenic	Comp	EPA200.8	5	ug/l	7.17	1.96	1.78	3.94	3.71
Dissolved Beryllium	Comp	EPA200.8	1	ug/l	0	0	0	0	0
Total Beryllium	Comp	EPA200.8	1	ug/l	0	0	0	0	0
Dissolved Cadmium	Comp	EPA200.8	1	ug/l	0	0	0	0	0
Total Cadmium	Comp	EPA200.8	1	ug/l	2.46	0	0	0	0
Dissolved Chromium	Comp	EPA200.8	5	ug/l	5.96	1.52	3.1	7.7	4.78
Total Chromium	Comp	EPA200.8	5	ug/l	19	5.78	6.26	19.2	6.66
Dissolved Chromium +6	Comp	EPA200.8	10	ug/l	0	0	0	0	0
Total Chromium +6	Comp	EPA200.8	10	ug/l	0	0	0	0	0
Dissolved Copper	Comp	EPA200.8	5	ug/l	5.56	7.4	13	8.56	6.35
Total Copper	Comp	EPA200.8	5	ug/l	97.5	21.6	17.9	18.1	8.58
Dissolved Iron	Comp	EPA200.8	100	ug/l	316	0	0	0	0
Total Iron	Comp	EPA200.8	100	ug/l	20100	294	318	157	0
Dissolved Lead	Comp	EPA200.8	5	ug/l	0	0.96	1.5	0	0
Total Lead	Comp	EPA200.8	5	ug/l	33.1	1.85	2.25	0.81	0.82
Dissolved Mercury	Comp	EPA200.8	1	ug/l	0	0	0	0	0
Total Mercury	Comp	EPA200.8	1	ug/l	0.236	0	0	0	0
Dissolved Nickel	Comp	EPA200.8	5	ug/l	15.1	3.94	4.53	6.62	5.3
Total Nickel	Comp	EPA200.8	5	ug/l	38	6.12	6.47	6.62	7.26
Dissolved Selenium	Comp	EPA200.8	5	ug/l	2.36	0	0	4.6	4.55
Total Selenium	Comp	EPA200.8	5	ug/l	2.85	0	0	4.6	5.64
Dissolved Silver	Comp	EPA200.8	1	ug/l	0	0	0	0	0
Total Silver	Comp	EPA200.8	1	ug/l	1.2	0	0	0	0
Dissolved Thallium	Comp	EPA200.8	5	ug/l	0	0	0	0	0
Total Thallium	Comp	EPA200.8	5	ug/l	0	0	0	0	0

WEATHER CONDITION STATION NO. STATION NAME EVENT NO. DATE	Sample Type	EPA Method	PQL	Units	Wet S13 Coyote Creek 0304-01 10/31/2003	Wet S13 Coyote Creek 0304-02 12/25/2003	Wet S13 Coyote Creek 0304-03 1/1/2004	Dry S13 Coyote Creek 0304-01 10/28/2003	Dry S13 Coyote Creek 0304-02 1/13/2004
Dissolved Zinc	Comp	EPA200.8	50	ug/l	8.9	40	65	17.1	13
Total Zinc	Comp	EPA200.8	50	ug/l	530	52	90	17.1	50
Semi-Volatiles Organics (EPA 625)									
2- Chlorophenol	Comp	EPA625	2	ug/l	0	0	0	0	0
2,4-dichlorophenol	Comp	EPA625	2	ug/l	0	0	0	0	0
2,4-dimethylphenol	Comp	EPA625	2	ug/l	0	0	0	0	0
2,4-dinitrophenol	Comp	EPA625	3	ug/l	0	0	0	0	0
2-nitrophenol	Comp	EPA625	3	ug/l	0	0	0	0	0
4-nitrophenol	Comp	EPA625	3	ug/l	0	0	0	0	0
4-chloro_3_methylphenol	Comp	EPA625	3	ug/l	0	0	0	0	0
Pentachlorophenol	Comp	EPA625	2	ug/l	0	0	0	0	0
Phenol	Comp	EPA625	1	ug/l	0	0	0	0	0
2,4,6-trichlophenol	Comp	EPA625	1	ug/l	0	0	0	0	0
Base/Neutral									
Acenaphthene	Comp	EPA625	0.05	ug/l	0	0	0	0	0
Acenaphthylene	Comp	EPA625	0.05	ug/l	0	0	0	0	0
Anthracene	Comp	EPA625	0.05	ug/l	0	0	0	0	0
Benzidine	Comp	EPA625	3	ug/l	0	0	0	0	0
1,2 Benzanthracene	Comp	EPA625	0.1	ug/l	0	0	0	0	0
Benzo(a)pyrene	Comp	EPA625	0.1	ug/l	0	0	0	0	0
Benzo(k)fluoranthene	Comp	EPA625	0.1	ug/l	0	0	0	0	0
Bis(2-Chloroethoxy) methane	Comp	EPA625	0.1	ug/l	0	0	0	0	0
Bis(2-Chloroisopropyl) ether	Comp	EPA625	1	ug/l	0	0	0	0	0
Bis(2-Chloroethyl) ether	Comp	EPA625	0.1	ug/l	0	0	0	0	0
Bis(2-Ethylhexl) phthalate	Comp	EPA625	1	ug/l	48.4	0	40.7	31.5	5.2
4-Bromophenyl phenyl ether	Comp	EPA625	1	ug/l	0	0	0	0	0
Butyl benzyl phthalate	Comp	EPA625	0.3	ug/l	0	0	0	0	0
2-Chloronaphthalene	Comp	EPA625	0.1	ug/l	0	0	0	0	0
4-Chlorophenyl phenyl ether	Comp	EPA625	0.1	ug/l	0	0	0	0	0
Chrysene	Comp	EPA625	0.1	ug/l	0	0	0	0	0
Dibenzo(a,h)anthracene	Comp	EPA625	0.1	ug/l	0	0	0	0	0
1,3-Dichlorobenzene	Comp	EPA625	0.05	ug/l	0	0	0	0	0
1,4-Dichlorobenzene	Comp	EPA625	0.05	ug/l	0	0	0	0	0
1,2-Dichlorobenzene	Comp	EPA625	0.05	ug/l	0	0	0	0	0
3,3-Dichlorobenzidine	Comp	EPA625	3	ug/l	0	0	0	0	0
Diethyl phthalate	Comp	EPA625	0.5	ug/l	0	0	0.7	0	0
Dimethyl phthalate	Comp	EPA625	0.5	ug/l	0	0	0	0	0
di-n-Butyl phthalate	Comp	EPA625	1	ug/l	0	0	0	6.4	0
2,4-Dinitrotoluene	Comp	EPA625	0.05	ug/l	0	0	0	0	0
2,6-Dinitrotoluene	Comp	EPA625	0.05	ug/l	0	0	0	0	0
4,6 Dinitro-2-methylphenol	Comp	EPA625	3	ug/l	0	0	6.6	0	0
1,2-Diphenylhydrazine	Comp	EPA625	3	ug/l	0	0	0	0	0
di-n-Octyl phthalate	Comp	EPA625	1	ug/l	0	0	0	0	0
Fluoranthene	Comp	EPA625	0.1	ug/l	0	0	0	0	0
Fluorene	Comp	EPA625	0.1	ug/l	0	0	0	0	0
Hexachlorobenzene	Comp	EPA625	0.5	ug/l	0	0	0	0	0
Hexachlorobutadiene	Comp	EPA625	1	ug/l	0	0	0	0	0
Hexachloro-cyclopentadiene	Comp	EPA625	3	ug/l	0	0	0	0	0
Hexachloroethane	Comp	EPA625	1	ug/l	0	0	0	0	0
Indeno(1,2,3-cd)pyrene	Comp	EPA625	0.1	ug/l	0	0	0	0	0
Isophorone	Comp	EPA625	0.05	ug/l	0	0	0	0	0
Naphthalene	Comp	EPA625	0.05	ug/l	0	0	0	0	0
Nitrobenzene	Comp	EPA625	0.05	ug/l	0	0	0	0	0
N-Nitroso-dimethyl amine	Comp	EPA625	0.3	ug/l	0	0	0	0	0
N-Nitroso-diphenyl amine	Comp	EPA625	0.3	ug/l	0	0	0	0	0
N-Nitroso-di-n-propyl amine	Comp	EPA625	0.3	ug/l	0	0	0	0	0
Phenanthrene	Comp	EPA625	0.05	ug/l	0	0	0	0	0
Pyrene	Comp	EPA625	0.05	ug/l	0	0	0	0	0
1,2,4-Trichlorobenzene	Comp	EPA625	0.5	ug/l	0	0	0	0	0
Chlorinated Pesticides									
Aldrin	Comp	EPA625	0.05	ug/l	0	0	0	0	0
alpha-BHC	Comp	EPA625	0.05	ug/l	0	0	0	0	0
beta-BHC	Comp	EPA625	0.05	ug/l	0	0	0	0	0
delta-BHC	Comp	EPA625	0.05	ug/l	0	0	0	0	0
gamma-BHC (lindane)	Comp	EPA625	0.05	ug/l	0	0	0	0	0
alpha-chlordane	Comp	EPA625	0.05	ug/l	0	0	0	0	0
gamma-chlordane	Comp	EPA625	0.05	ug/l	0	0	0	0	0

WEATHER CONDITION					Wet			Dry	
STATION NO.					S13	S13	S13	S13	S13
STATION NAME					Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek
EVENT NO.					0304-01	0304-02	0304-03	0304-01	0304-02
DATE					10/31/2003	12/25/2003	1/1/2004	10/28/2003	1/13/2004
	Sample Type	EPA Method	PQL	Units					
4,4'-DDD	Comp	EPA625	0.1	ug/l	0	0	0	0	0
4,4'-DDE	Comp	EPA625	0.1	ug/l	0	0	0	0	0
4,4'-DDT	Comp	EPA625	0.1	ug/l	0	0	0	0	0
Dieldrin	Comp	EPA625	0.1	ug/l	0	0	0	0	0
alpha-Endosulfan	Comp	EPA625	0.1	ug/l	0	0	0	0	0
beta-Endosulfan	Comp	EPA625	0.1	ug/l	0	0	0	0	0
Endosulfan sulfate	Comp	EPA625	0.1	ug/l	0	0	0	0	0
Endrin	Comp	EPA625	0.1	ug/l	0	0	0	0	0
Endrin aldehyde	Comp	EPA625	0.1	ug/l	0	0	0	0	0
Heptachlor	Comp	EPA625	0.05	ug/l	0	0	0	0	0
Heptachlor Epoxide	Comp	EPA625	0.05	ug/l	0	0	0	0	0
Toxaphene	Comp	EPA625	1	ug/l	0	0	0	0	0
Polychlorinated Biphenyls									
Aroclor-1016	Comp	EPA608	0.5	ug/l	0	0	0	0	0
Aroclor-1221	Comp	EPA608	0.5	ug/l	0	0	0	0	0
Aroclor-1232	Comp	EPA608	0.5	ug/l	0	0	0	0	0
Aroclor-1242	Comp	EPA608	0.5	ug/l	0	0	0	0	0
Aroclor-1248	Comp	EPA608	0.5	ug/l	0	0	0	0	0
Aroclor-1254	Comp	EPA608	0.5	ug/l	0	0	0	0	0
Aroclor-1260	Comp	EPA608	0.5	ug/l	0	0	0	0	0
Organophosphate Pesticides									
Chlorpyrifos	Comp	EPA507	0.05	ug/l	0	0	0	0	0
Diazinon	Comp	EPA507	0.01	ug/l	0	0	0.104	0.181	0
Prometryn	Comp	EPA507	2	ug/l	0	0	0	0	0
Atrazine	Comp	EPA507	2	ug/l	0	0	0	0	0
Simazine	Comp	EPA507	2	ug/l	0	0	0	0	0
Cyanazine	Comp	EPA507	2	ug/l	0	0	0	0	0
Malathion	Comp	EPA507	2	ug/l	0	0	0	0	0
Herbicides									
Glyphosate	Comp	EPA547	25	ug/l	0	0	0	0	0
2,4-D	Comp	EPA515.3	10	ug/l	0	0	0	0	0
2,4,5-TP-SILVEX	Comp	EPA515.3	1	ug/l	0	0	0	0	0

Note:
1) blank cell indicates sample was not analyzed
2) 0 indicates concentration below minimum detection leve
3) PQL = minimum level
4) Highlighted cells show exceedances

Table C-2. Water Quality Results for Constituents Measured at the Coyote Creek Mass Emission Site for the 2004-2005 Monitoring Season.

			Water Quality Objectives				Wet Weather Monitoring[2]				Dry Weather Monitoring[2]	
CONSTITUENT	POL	UNITS	Ocean Plan	Basin Plan	Freshwater CTR (CCC)[1]	Freshwater CTR (CMC)[1]	10/17/2004	10/26/2004	12/5/2004	1/7/2005	11/16/2004	3/9/2005
General Chemistry												
Cyanide	0.01	mg/L	0.004				0.005	1.300	0.007	0.000	0.015	0.009
pH	mg/L			6.5<pH<8.5			7.18	6.61	6.79	6.94	6.18	6.30
TPH	1						0.00	0.00	0.00	0.00	0.00	0.00
Oil and Grease	1	mg/L	75				0.00	0.00	0.00	0.00	0.00	0.00
Total Phenols	0.1	mg/L					0.00	9.66	0.00	0.00	0.00	0.00
Dissolved Oxygen	1	mg/L		<5			6.83		9.30	9.20	10.10	10.90
Calcium	1	mg/L					56.10	12.00	29.70	12.60	98.20	120.00
Magnesium	1	mg/L					14.80	4.86	8.75	7.78	41.30	53.50
Potassium	1	mg/L					7.47	2.69	3.67	2.07	7.47	11.40
Sodium	1	mg/L					55.20	16.50	28.10	20.90	156.00	265.00
Bicarbonate	2	mg/L					195.00	40.30	84.50		326.00	0.00
Carbonate	2	mg/L					0.00	0.00	0.00	0.00	0.00	0.00
Chloride	2	mg/L		150			55.70	14.50	28.70	17.10	175.00	228.00
Fluoride	0.1	mg/L		2.2			0.37	0.11	0.16	0.00	0.69	0.80
Sulfate	0.1	mg/L		350			96.30	16.80	44.70	23.70	293.00	492.00
Alkalinity	0.1	mg/L					160.00	33.00	69.30	40.70	267.00	283.00
Hardness	2	mg/L					200	50	110	64	410	520
COD	10	mg/L					117.90	11.30	79.70	18.72	27.40	88.40
Specific Conductance	1	umhos/cm					607	149	349	199	1545	1,923
Total Dissolved Solids	2	mg/L		1500			384	94	192	122	966	1,354
Turbidity	0.1	NTU	225				64.60	8.43	1.38	8.67	0.81	1.24
Total Suspended Solids	2	mg/L					1312	198	105	80	74	33
Volatile Suspended Solids	1	mg/L					233	59	36	3	20	9
MBAS	0.05	mg/L					0.29	0.13	0.07	0.00	0.00	0.00
Total Organic Carbon	1	mg/L					38.20	10.07	8.70	7.45	7.22	5.59
BOD	2	mg/L					59.80	12.80	14.40	5.18	32.00	8.85
Nutrients												
Dissolved Phosphorus	0.05	mg/L					0.11	0.19	0.17	0.12	0.09	0.00
Total Phosphorus	0.05	mg/L					0.38	0.26	0.29	0.25	0.13	0.00
Ammonia	0.1	mg/L					2.83	0.00	0.64	0.16	0.76	0.14
NH3-N	0.1	mg/L					2.34	0.00	0.53	0.13	0.63	0.11
Nitrate	0.1	mg/L					1.96	4.28	4.28	4.67	13.10	23.05
Nitrate-N	0.5	mg/L		10			0.44	0.97	0.97	0.15	2.96	5.21
Nitrite-N	0.03	mg/L		1			0.68	0.00	0.17	0.07	0.36	0.17
Kjeldahl-N	0.1	mg/L					12.20	2.24	2.24	1.31	1.29	0.99
Indicator Bacteria												
Total Coliform	20	MPN/100ml		10,000			900,000	1,600,000	500,000	500,000	30,000	9,000
Fecal Coliform	20	MPN/100ml		400			110,000	30,000	300,000	14,000	11,000	800
Fecal Streptococcus	20	MPN/100ml					900,000	900,000	170,000	50,000	1,700	130
Enterococcus	20	MPN/100ml		104			900,000	300,000	170,000	22,000	1,700	130
Metals												
Dissolved Aluminum	100	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Total Aluminum	100	ug/l		1000			170	1,061	1,560	1,360	0	148
Dissolved Antimony	5	ug/l					2.47	0.64	1.64	0.80	0.00	0.00
Total Antimony	5	ug/l		6			2.57	1.25	2.38	1.24	0.00	0.00
Dissolved Arsenic	5	ug/l					2.74	1.37	1.66	1.13	1.70	3.56
Total Arsenic	5	ug/l	32	50			2.87	1.39	3.16	1.48	1.70	4.02
Dissolved Barium	10	ug/l					44.00	19.40	20.00	17.70	40.10	71.10
Total Barium	10	ug/l					62.90	32.90	53.10	40.90	40.10	72.20
Dissolved Beryllium	1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Total Beryllium	1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Dissolved Boron	100	ug/l					330	0	0	0	447	508
Total Boron	100	ug/l					680	966	0	0	1,450	962
Dissolved Cadmium	1	ug/l			1.4-6.6	2.0-19.6	0.00	0.00	0.00	0.00	0.00	0.00
Total Cadmium	1	ug/l			1.4-7.6	2.1-22.2	0.00	0.00	0.38	0.28	0.00	0.00
Dissolved Chromium	5	ug/l			37.1-207.7	311.0-1742.6	1.30	0.69	1.48	0.73	0.84	0.98
Total Chromium	5	ug/l		50	117.3-657.4	984.3-5515.0	1.92	3.46	5.35	3.97	0.84	2.69

Table C-2. Water Quality Results for Constituents Measured at the Coyote Creek Mass Emission Site for the 2004-2005 Monitoring Season.

			Water Quality Objectives				Wet Weather Monitoring[2]				Dry Weather Monitoring[2]	
CONSTITUENT	POL	UNITS	Ocean Plan	Basin Plan	Freshwater CTR (CCC)[1]	Freshwater CTR (CMC)[1]	10/17/2004	10/26/2004	12/5/2004	1/7/2005	11/10/2004	3/8/2005
Dissolved Chromium +6	10	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Total Chromium +6	10	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Dissolved Copper	5	ug/l			5.0-29.9	7.0-60.7	7.30	7.02	5.94	6.36	4.30	5.40
Total Copper	5	ug/l	12		5.2-31.2	7.3-62.8	23.30	16.80	44.60	22.50	11.20	11.70
Dissolved Iron	100	ug/l					150	0	0	138	0	0
Total Iron	100	ug/l					698	1,874	2,050	1,355	0	103
Dissolved Lead	5	ug/l			1.2-11	30.1-268.1	0.00	0.00	0.00	1.67	0.00	0.00
Total Lead	5	ug/l	8		1.3-19.2	33.8-492.0	3.24	7.31	14.70	13.50	2.15	1.48
Dissolved Manganese	30	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Total Manganese	30	ug/l					395.0	40.3	64.2	57.60	0.00	0.00
Dissolved Mercury	1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Total Mercury	1	ug/l	0.16	2			0.00	0.00	0.00	0.00	0.00	0.00
Dissolved Nickel	5	ug/l			29.0-171.8	260.5-1544.5	10.00	3.26	3.07	2.16	3.82	4.22
Total Nickel	5	ug/l	20	100	29.0-172.1	261.0-1547.9	12.20	4.44	8.04	5.35	3.82	4.28
Dissolved Selenium	5	ug/l					1.99	0.00	0.00	0.00	2.94	7.78
Total Selenium	5	ug/l	60	50			1.76	0.00	0.00	0.00	2.94	9.29
Dissolved Silver	1	ug/l				1.1-39.1	0.00	0.00	0.00	0.00	0.00	0.00
Total Silver	1	ug/l	80			1.2-46.0	0.00	0.00	0.00	0.00	0.00	0.00
Dissolved Thallium	5	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Total Thallium	5	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Dissolved Zinc	20	ug/l			65.1-387.3	65.1-387.3	26.70	38.10	36.60	31.80	11.40	7.60
Total Zinc	20	ug/l			66.0-390.0	66.0-396.0	47.00	65.60	103.00	70.30	24.50	27.60
Semi-Volatiles												
Acenaphthylene	0.05	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Acetophenone	0.3	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Anthracene	3	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Aniline	0.05	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Aminobiphenyl	3	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Benzidine	3	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Benzo(a)anthracene	0.1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Benzo(b)fluoranthene	0.1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Benzo(k)fluoranthene	0.1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Benzo(a)pyrene	0.1	ug/l		0.2			0.00	0.00	0.00	0.00	0.00	0.00
Butyl benzyl phthalate	0.5	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Bis(2-chloroethyl)ether	1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Bis(2-Chloroethoxy) methane	0.1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Bis(2-Ethylhexl) phthalate	1	ug/l					0.00	0.00	0.00	0.00	0.00	14.20
Bis(2-chloroisopropyl) ether	2	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
4-Bromophenyl phenyl ether	1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Chloroaniline	1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
1-Chloronaphthalene	0.1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
2-Chloronaphthalene	0.1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
4-Chlorophenyl phenyl ether	0.1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Chrysene	0.1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Dimethyl phthalate	0.5	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
7,12-Dimethyl-benz(a)-anthracene	0.1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
alpha,alpha-Dimethylphenethylamine	3	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Dibenz(a,j)acridine	0.3	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Dibenz(a,h)anthracene	0.1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
1,3-Dichlorobenzene	0.05	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
1,2-Dichlorobenzene	0.05	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
1,4-Dichlorobenzene	0.05	ug/l		5			0.00	0.00	0.00	0.00	0.00	0.00
3,3-Dichlorobenzidine	0.05	ug/l		600			0.00	0.00	0.00	0.00	0.00	0.00
Diethyl phthalate	0.5	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Dimethyl phthalate	0.5	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
di-n-Butyl phthalate	1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
2,4-Dinitrotoluene	0.05	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
2,6-Dinitrotoluene	0.05	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Diphenylamine	1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
1,2-Diphenylhydrazine	3	ug/l					0.00	0.00	0.00	0.00	0.00	0.00

Table C-2. Water Quality Results for Constituents Measured at the Coyote Creek Mass Emission Site for the 2004-2005 Monitoring Season.

			Water Quality Objectives				Wet Weather Monitoring[2]				Dry Weather Monitoring[2]	
CONSTITUENT	POL	UNITS	Ocean Plan	Basin Plan	Freshwater CTR (CCC)[1]	Freshwater CTR (CMC)[1]	10/17/2004	10/26/2004	12/5/2004	1/7/2005	11/16/2004	3/9/2005
di-n-Octyl phthalate	1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Ethyl methanesulfonate	0.3	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Enonn ketone	1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Fluoranthene	0.1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Fluorene	0.1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Hexachlorobenzene	0.5	ug/l		1			0.00	0.00	0.00	0.00	0.00	0.00
Hexachlorobutadiene	1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Hexachloro-cyclopentadiene	3	ug/l		50			0.00	0.00	0.00	0.00	0.00	0.00
Hexachloroethane	1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Indeno(1,2,3-cd)pyrene	0.1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Isophorone	0.05	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Methylchloranthrene	0.3	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Methylmethanesulfonate	0.3	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Naphthalene	0.05	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
1-Naphthylamine	3	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
2-Naphthylamine	3	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
2-Nitroaniline	3	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
3-Nitroaniline	3	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
4-Nitroanilne	3	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Nitrobenzene	0.05	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
N-Nitroso-butyl amine	0.3	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
N-Nitroso-dimethyl amine	0.3	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
N-Nitroso-diethenyl amine	0.3	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
N-Nitroso-di-n-propyl amine	0.3	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
N-Nitrosopiperidine	1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Pentachlorophenol	2	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Phenacetin	3	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Phenanthrene	0.05	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
2-Picoline	3	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Pronamide	5	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Pyrene	0.05	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
1,2,4,5-Tetra-chlorobenzene	1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
1,2,4-Trichlorobenzene	1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Benzoic acid	5	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
4-chloro-3-methylphenol	5	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
4-chloro 3 methylphenol	3	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
2- Chlorophenol	2	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
2,4-dichlorophenol	2	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
2,6-Dichlorophenol	2	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
2,4-dimethylphenol	2	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
2,4-dinitrophenol	3	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
4,6 Dinitro-2-methylphenol	3	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
2-Methylphenol	3	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
4-Methylphenol	3	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
2-nitrophenol	3	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
4-nitrophenol	3	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Pentachlorophenol	2	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Phenol	1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
2,3,4,6-Tetrachlorophenol	1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
2,4,5-Trichlorophenol	1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
2,4,6-trichlophenol	1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00

Table C-2. Water Quality Results for Constituents Measured at the Coyote Creek Mass Emission Site for the 2004-2005 Monitoring Season.

			Water Quality Objectives				Wet Weather Monitoring[2]				Dry Weather Monitoring[2]	
CONSTITUENT	PQL	UNITS	Ocean Plan	Basin Plan	Freshwater CTR (CCC)[1]	Freshwater CTR (CMC)[1]	10/17/2004	10/26/2004	12/5/2004	1/7/2005	11/10/2004	3/9/2005
PCBs												
Aroclor-1016	0.5	ug/l		0.03	0.014		0.00	0.00	0.00	0.00	0.00	0.00
Aroclor-1221	0.5	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Aroclor-1232	0.5	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Aroclor-1242	0.5	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Aroclor-1248	0.5	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Aroclor-1254	0.5	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Aroclor-1260	0.5	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Pesticides												
Aldrin	0.05	ug/l				3	0.00	0.00	0.00	0.00	0.00	0.00
alpha-BHC	0.05	ug/l	0.008				0.00	0.00	0.00	0.00	0.00	0.00
beta-BHC	0.05	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
delta-BHC	0.05	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
gamma-BHC (lindane)	0.05	ug/l		0.2		0.95	0.00	0.00	0.00	0.00	0.00	0.00
Chlordane	0.05	ug/l			0.0043	2.4	0.00	0.00	0.00	0.00	0.00	0.00
4,4'-DDD	0.1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
4,4'-DDE	0.1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
4,4'-DDT	0.1	ug/l			0.001	1.1	0.00	0.00	0.00	0.00	0.00	0.00
Dieldrin	0.1	ug/l			0.056	0.24	0.00	0.00	0.00	0.00	0.00	0.00
Endosulfan 1	0.1	ug/l	0.018		0.056	0.22	0.00	0.00	0.00	0.00	0.00	0.00
Endosulfan 2	0.1	ug/l			0.056	0.22	0.00	0.00	0.00	0.00	0.00	0.00
Endosulfan sulfate	0.1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Endrin	0.1	ug/l	0.004	2	0.036	0.086	0.00	0.00	0.00	0.00	0.00	0.00
Endrin aldehyde	0.1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Heptachlor	0.05	ug/l		0.01	0.0038	0.52	0.00	0.00	0.00	0.00	0.00	0.00
Heptachlor Epoxide	0.05	ug/l		0.01	0.0038	0.52	0.00	0.00	0.00	0.00	0.00	0.00
Methoxychlor	0.5	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Toxaphene	1	ug/l		3	0.0002	0.73	0.00	0.00	0.00	0.00	0.00	0.00
Diazinon	0.01	ug/l		0.08			0.065	0.060	0.079	0.00	0.00	0.00
Chlorpyrifos	0.05	ug/l		0.07			0.00	0.00	0.00	0.00	0.00	0.00
Diuron	1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Malathion	2	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Prometryn	2	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Simazine	2	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Atrazine	2	ug/l		3			0.00	0.00	0.00	0.00	0.00	0.00
Cyanazine	2	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Molinate	2	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Thiobencarb	1	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Herbicides												
Carbofuran	5	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
2,4,5-TP-Silvex	10	ug/l		70			0.00	0.00	0.00	0.00	0.00	0.00
2,4,5-TP	1	ug/l		50			0.00	0.00	0.00	0.00	0.00	0.00
Bentazon	2	ug/l					0.00	0.00	0.00	0.00	0.00	0.00
Glyphosate	25	ug/l		700			0.00	0.00	0.00	0.00	0.00	0.00

[1] CTR values for metals are hardness dependent; higher hardness gives higher WQO

[2] Values of 0 represent that the constituent was not detected above the PQL as defined in the Municipal Stormwater Permit. Results are presented in accordance with Method B of the permit

WEATHER CONDITION					Wet					Dry	
STATION NO.					S13	S13	S13	S13	S13	S13	S13
STATION NAME					Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek
EVENT NO.					0506-01	0506-02	0506-03	0506-03	0506-04	0506-01	0506-02
DATE					10/17/2005	12/31/2005	01/14/2006	02/17/2006	03/03/2006	01/24/2006	04/25/2006
	Sample Type	EPA Method	PQL	Units							
Conventional											
Oil and Grease	Grab	EPA413 1	1	mg/L	1.10	0	0	0	0	0	0
Total Phenols	Grab	EPA420 1	0.10	mg/L	0	0	0	0	0	0	0
Cyanide	Grab	EPA335.2	0.01	mg/L	0	0	0.01	0.014	0.01	0.016	0.016
pH	Comp	SM4500H B	0-14		7.72	7.63	7.71	8.07	7 20	8 10	8.22
Dissolved Oxygen	Grab	SM4500O G	1.00	mg/L	8.05	8.16	8.57	12.26	10.97	13.00	14.38
Indicator Bacteria											
Total Coliform	Grab	SM9230B	20 00	MPN/100ml	50,000,000	900,000	1,000,000	22,000	160,000	22,000	17,000
Fecal Coliform	Grab	SM9230B	20.00	MPN/100ml	16,000,000	300,000	32,000	2,400	50,000	5,000	800
Ratio Fecal Coliform/Total Coliform					0.32	0.33	0.01	0.11	0.31	0.24	0.05
Streptococcus	Grab	SM9230B	20.00	MPN/100ml	300,000	90,000	90,000	170	17,000	3,000	130
Enterococcus	Grab	SM9230B		MPN/100ml	300,000	90,000	90,000	170	8,000	3,000	130
General											
Chloride	Comp	EPA300.0	2.00	mg/L	70.30	75 20	53.80	210 00	13 70	202.00	106 00
Fluoride	Comp	EPA300.0	0.10	mg/L	0.4	0.34	0.29	0.67	0	0 7	0 75
Nitrate	Comp	EPA300.0	0.10	mg/L	15.5	7.74	9.41	17.5	2.21	17.7	9.57
Sulfate	Comp	EPA300.0	0.10	mg/L	135.40	137.00	95.80	309 00	25.00	367.00	350.00
Alkalinity	Comp	EPA310 1	4.00	mg/L	150.7	104.5	104 5	201	41.6	247 5	220
Hardness	Comp	EPA130.2	2.00	mg/L	210	180	170	380	86	420	370
COD	Comp	EPA410.4	10.00	mg/L	148	70 547	75 64	72	0	65.2	145.3
Total Petroleum Hydrocarbons	Grab	EPA418.1	1.00	mg/L	1.0	0	0	0	0	0	0
Specific Conductance	Comp	EPA120.1	1.00	umhos/cm	858	712	588	2020	208	1569	2050
Total Dissolved Solids	Comp	EPA160.1	2.00	mg/L	575.00	434.00	350.00	1112.00	118.00	1040.00	1340.00
Turbidity	Comp	EPA180.1	0 10	NTU	2.10	2.51	2.23	0.70	8.94	1.47	0 84
Total Suspended Solids	Comp	EPA160.2	2 00	mg/L	987	302	259	3	368	11	5
Volatile Suspended Solids	Comp	EPA160.4	1.00	mg/L	130	63	80	1	72	5	1
MBAS	Comp	EPA425.1	0.05	mg/L	0.6322	0.126	0.261	0.05	0.154	0.066	0.087
Total Organic Carbon	Comp	EPA415.1	1.00	mg/L	36.6	9.21	17.2	6.28	4.12	4.5	7.63
BOD	Comp	SM5210B	2.00	mg/L	26.1	13 4	28.1	9.86	10 4	8.95	8.81
Methyl Tertiary Butyl Ether (MTBE)	Grab	EPA624	1 00	ug/L	0	0	0	0	0	0	0
Nutrients											
Dissolved Phosphorus	Comp	EPA365.3	0 05	mg/L	0.0552	0.118	0.112	0	0.122	0	0
Total Phosphorus	Comp	EPA365.3	0 05	mg/L	0.1307	0 201	0.398	0	0.73	0	0
NH3-N	Comp	EPA350.3	0 10	mg/L	1.22	0.21162	0.524	0.11	0.33	0	0 15
Nitrate - N	Comp	SM4110B	0 50	mg/L	3.50	1.75	2.125	3.952	0 499	3 997	2.16
Nitrite - N	Comp	SM4110B	0.03	mg/L	0.00	0.155	0.268	0	0.0396	0.00	0.4534
Kjeldahl-N	Comp	EPA351.4	0.10	mg/L	10.9	1.208	2.425	1 48	4.24	0.625	0.92
Metals											
Dissolved Aluminum	Comp	EPA200.8	100.00	ug/L	0	0	0	0	0	0	0
Total Aluminum	Comp	EPA200.8	100 00	ug/L	2,420	615	214	0	10,000	0	104
Dissolved Antimony	Comp	EPA200.8	5.00	ug/L	2.56	0.5	1.65	0.51	0.82	0	0.78
Total Antimony	Comp	EPA200.8	5 00	ug/L	3.69	1.11	2.23	0.63	2.05	0 70	0.77
Dissolved Arsenic	Comp	EPA200.8	5.00	ug/L	3.15	0	1 63	2.66	1.14	1.74	3.19
Total Arsenic	Comp	EPA200.8	5.00	ug/L	4.92	1.91	2.19	3.3	3.87	3.77	4.42
Dissolved Barium	Comp	EPA200 8	10.00	ug/L	48.60	15.60	26.80	36.00	20.60	28.50	41.50
Total Barium	Comp	EPA200.8	10.00	ug/L	152.00	29.70	31.80	36 40	155.00	46.40	44 90
Dissolved Beryllium	Comp	EPA200.8	1.00	ug/L	0	0	0	0	0	0	0
Total Beryllium	Comp	EPA200.8	1.00	ug/L	0	0	0	0	0	0	0
Dissolved Cadmium	Comp	EPA200.8	1.00	ug/L	0	0	0	0	0	0	0
Total Cadmium	Comp	EPA200.8	1.00	ug/L	0.80	0.00	0	0	1.29	0	0
Dissolved Chromium	Comp	EPA200.8	5.00	ug/L	0.72	0.71	2.83	3 63	1 34	1.42	6.79
Total Chromium	Comp	EPA200.8	5.00	ug/L	5.37	2.84	2.86	4.1	19.5	6.41	7.31
Dissolved Chromium +6	Comp	EPA200.8	10.00	ug/L	0	0	0	0	0	0	0
Total Chromium +6	Comp	EPA200 8	10.00	ug/L	0	0	0	0	0	0	0
Dissolved Copper	Comp	EPA200.8	5.00	ug/L	10.70	6.29	12 60	5 31	4.25	6.09	5.72
Total Copper	Comp	EPA200.8	5 00	ug/L	63.20	7.52	13.70	16.7	56.9	9.13	15.8
Dissolved Iron	Comp	EPA200.8	100.00	ug/L	339	0	0	0	0	0	0
Total Iron	Comp	EPA200.8	100.00	ug/L	4540	123	331	0	12980	0	172
Dissolved Lead	Comp	EPA200.8	5.00	ug/L	0.64	0	0	0	0.77	0 5	0
Total Lead	Comp	EPA200.8	5.00	ug/L	23.90	0.95	1.87	0.77	54	0.52	0.78
Dissolved Mercury	Comp	EPA200.8	1.00	ug/L	0	0	0	0	0	0	0
Total Mercury	Comp	EPA200.8	1.00	ug/L	0	0	0	0	0	0	0
Dissolved Nickel	Comp	EPA200.8	5.00	ug/L	10.00	1.64	4.37	3.58	2.64	2 09	4 91
Total Nickel	Comp	EPA200.8	5.00	ug/L	20.30	4 11	5.77	3 73	21.6	3.63	22.1
Dissolved Selenium	Comp	EPA200.8	5.00	ug/L	2 40	0	1 84	4.38	0	3.5	5 4
Total Selenium	Comp	EPA200.8	5.00	ug/L	2.83	1.98	2.15	5.99	0	6.50	7 57
Dissolved Silver	Comp	EPA200.8	1.00	ug/L	0	0	0	0	0	0	0
Total Silver	Comp	EPA200.8	1.00	ug/L	0.28	0	0	0	0 28	0	0
Dissolved Thallium	Comp	EPA200.8	5.00	ug/L	0	0	0	0	0	0	0
Total Thallium	Comp	EPA200.8	5.00	ug/L	0	0	0	0	0	0	0
Dissolved Zinc	Comp	EPA200.8	50.00	ug/L	35.00	11.60	46.00	17.5	17.6	20.10	9 09
Total Zinc	Comp	EPA200.8	50.00	ug/L	242.00	35.60	75.00	17.9	242	48 90	18.0
Semi-Volatiles Organics (EPA 625)											
2-Chlorophenol	Comp	EPA625	2.00	ug/L	0	0	0	0	0	0	0
2,4-dichlorophenol	Comp	EPA625	2 00	ug/L	0	0	0	0	0	0	0
2,4-dimethylphenol	Comp	EPA625	2.00	ug/L	0	0	0	0	0	0	0
2,4-dinitrophenol	Comp	EPA625	3.00	ug/L	0	0	0	0	0	0	0
2-nitrophenol	Comp	EPA625	3.00	ug/L	0	0	0	0	0	0	0
4-nitrophenol	Comp	EPA625	3.00	ug/L	0	0	0	0	0	0	0
4-chloro-3-methylphenol	Comp	EPA625	3.00	ug/L	0	0	0	0	0	0	0
Pentachlorophenol	Comp	EPA625	2.00	ug/L	0	0	0	0	0	0	0
Phenol	Comp	EPA625	1.00	ug/L	0	0	0	0	0	0	0
2,4,6-trichlorophenol	Comp	EPA625	1.00	ug/L	0	0	0	0	0	0	0

WEATHER CONDITION					Wet					Dry	
STATION NO.					S13	S13	S13	S13	S13	S13	S13
STATION NAME					Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek
EVENT NO.					0506-01	0506-02	0506-03	0506-03	0506-04	0506-01	0506-02
DATE					10/17/2005	12/31/2005	01/14/2006	02/17/2006	03/03/2006	01/24/2006	04/25/2006
	Sample Type	EPA Method	PQL	Units							
Base/Neutral											
Acenaphthene	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0	0
Acenaphthylene	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0	0
Anthracene	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0	0
Benzidine	Comp	EPA625	3.00	ug/L	0	0	0	0	0	0	0
1,2 Benzanthracene	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0	0
Benzo(a)pyrene	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0	0
Benzo(g,h,i)perylene	Comp	EPA625	1.00	ug/L	0	0	0	0	0	0	0
3,4 Benzofluoranthene	Comp	EPA625	2.00	ug/L	0	0	0	0	0	0	0
Benzo(k)fluoranthene	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0	0
Bis(2-Chloroethoxy)methane	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0	0
Bis(2-Chloroisopropyl)ether	Comp	EPA625	1.00	ug/L	0	0	0	0	0	0	0
Bis(2-Chloroethyl)ether	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0	0
Bis(2-Ethylhexyl)phthalate	Comp	EPA625	1.00	ug/L	0	0	0	0	0	0	0
4-Bromophenyl phenyl ether	Comp	EPA625	1.00	ug/L	0	0	0	0	0	0	0
Butyl benzyl phthalate	Comp	EPA625	0.30	ug/L	0	0	0	0	0	0	0
2-Chloroethyl vinyl ether	Grab	EPA624	2.50	ug/L	0	0	0	0	0	0	0
2-Chloronaphthalene	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0	0
4-Chlorophenyl phenyl ether	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0	0
Chrysene	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0	0
Dibenzo(a,h)anthracene	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0	0
1,3-Dichlorobenzene	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0	0
1,4-Dichlorobenzene	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0	0
1,2-Dichlorobenzene	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0	0
3,3-Dichlorobenzidine	Comp	EPA625	3.00	ug/L	0	0	0	0	0	0	0
Diethyl phthalate	Comp	EPA625	0.50	ug/L	0	0	0	0	0	0	0
Dimethyl phthalate	Comp	EPA625	0.50	ug/L	0	0	0	0	0	0	0
di-n-Butyl phthalate	Comp	EPA625	1.00	ug/L	0	0	0	0	0	0	0
2,4-Dinitrotoluene	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0	0
2,6-Dinitrotoluene	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0	0
4,6 Dinitro-2-methylphenol	Comp	EPA625	3.00	ug/L	0	0	0	0	0	0	0
1,2-Diphenylhydrazine	Comp	EPA625	3.00	ug/L	0	0	0	0	0	0	0
di-n-Octyl phthalate	Comp	EPA625	1.00	ug/L	0	0	0	0	0	0	0
Fluoranthene	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0	0
Fluorene	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0	0
Hexachlorobenzene	Comp	EPA625	0.50	ug/L	0	0	0	0	0	0	0
Hexachlorobutadiene	Comp	EPA625	1.00	ug/L	0	0	0	0	0	0	0
Hexachloro-cyclopentadiene	Comp	EPA625	3.00	ug/L	0	0	0	0	0	0	0
Hexachloroethane	Comp	EPA625	1.00	ug/L	0	0	0	0	0	0	0
Indeno (1,2,3-cd)pyrene	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0	0
Isophorone	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0	0.38
Naphthalene	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0	0
Nitrobenzene	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0	0
N-Nitroso-dimethyl amine	Comp	EPA625	0.30	ug/L	0	0	0	0	0	0	0
N-Nitroso-diphenyl amine	Comp	EPA625	0.30	ug/L	0	0	0	0	0	0	0
N-Nitroso-di-n-propyl amine	Comp	EPA625	0.30	ug/L	0	0	0	0	0	0	0
Phenanthrene	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0	0
Pyrene	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0	0
1,2,4-Trichlorobenzene	Comp	EPA625	0.50	ug/L	0	0	0	0	0	0	0
Chlorinated Pesticides											
Aldrin	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0	0
alpha-BHC	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0	0
beta-BHC	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0	0
delta-BHC	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0	0
Gamma-BHC (Lindane)	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0	0
alpha-chlordane	Comp	EPA625	0.05	ug/L							
gamma-chlordane	Comp	EPA625	0.05	ug/L							
Chlordane	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0	0
4,4-DDD	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0	0
4,4-DDE	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0	0
4,4-DDT	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0	0
Dieldrin	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0	0
Endosulfan I (alpha)	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0	0
Endosulfan II (beta)	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0	0
Endosulfan sulfate	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0	0
Endrin	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0	0
Endrin aldehyde	Comp	EPA625	0.10	ug/L	0	0	0	0	0	0	0
Heptachlor	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0	0
Heptachlor Epoxide	Comp	EPA625	0.05	ug/L	0	0	0	0	0	0	0
Toxaphene	Comp	EPA625	1.00	ug/L	0	0	0	0	0	0	0
Polychlorinated Biphenyls											
Aroclor-1016	Comp	EPA608	0.50	ug/L	0	0	0	0	0	0	0
Aroclor-1221	Comp	EPA608	0.50	ug/L	0	0	0	0	0	0	0
Aroclor-1232	Comp	EPA608	0.50	ug/L	0	0	0	0	0	0	0
Aroclor-1242	Comp	EPA608	0.50	ug/L	0	0	0	0	0	0	0
Aroclor-1248	Comp	EPA608	0.50	ug/L	0	0	0	0	0	0	0
Aroclor-1254	Comp	EPA608	0.50	ug/L	0	0	0	0	0	0	0
Aroclor-1260	Comp	EPA608	0.50	ug/L	0	0	0	0	0	0	0

WEATHER CONDITION					Wet					Dry	
STATION NO.					S13	S13	S13	S13	S13	S13	S13
STATION NAME					Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek	Coyote Creek
EVENT NO.					0506-01	0506-02	0506-03	0506-03	0506-04	0506-01	0506-02
DATE					10/17/2005	12/31/2005	01/14/2006	02/17/2006	03/03/2006	01/24/2006	04/25/2006
	Sample Type	EPA Method	PQL	Units							
Organophosphate Pesticides											
Chlorpyrifos	Comp	EPA507	0.05	ug/L	0	0	0	0	0	0	0
Diazinon	Comp	EPA507	0.01	ug/L	0	0	0	0	0	0	0
Prometryn	Comp	EPA507	2.00	ug/L	0	0	0	0	0	0	0
Atrazine	Comp	EPA507	2.00	ug/L	0	0	0	0	0	0	0
Simazine	Comp	EPA507	2.00	ug/L	0	0	0	0	0	0	0
Cyanazine	Comp	EPA507	2.00	ug/L	0	0	0	0	0	0	0
Malathion	Comp	EPA507	2.00	ug/L	0	0	0	0	0	0	0
Herbicides											
Glyphosate	Comp	EPA547	25.00	ug/L	0	0	0	0	0	0	0
2,4-D	Comp	EPA515.3	10.00	ug/L	0	0	0	0	0	0	0
2,4,5-TP-SILVEX	Comp	EPA515.3	1.00	ug/L	0	0	0	0	0	0	0

Note:
1) blank cell indicates sample was not analyzed
2) 0 indicates concentration below minimum detection level
3) PQL = minimum level
4) Highlighted cells show exceedances

APPENDIX E

Table E.1: Raw LADPW Zinc data measured in Coyote Creek

(Corresponding metadata available on provided sheets)

SAMPLE DATE	LOCATION	TOTAL HARDNESS MG/L	DISSOLVED ZINC UG/L	TOTAL ZINC UG/L
06/14/95	S13	490	0	0
11/07/95	S13	470	0	0
12/12/95	S13	110	60	110
12/23/95	S13	135	60	90
01/09/96	S13	315	0	0
01/21/96	S13	141	0	0
01/31/96	S13	90	0	167
02/03/96	S13	200	0	73
02/19/96	S13	40	0	130
03/05/96	S13	162	178	231
03/19/96	S13	400	0	0
05/14/96	S13	359	0	0
07/09/96	S13	400	0	0
10/30/96	S13	110	0	210
11/21/96	S13	60	0	60
12/09/96	S13	76.4	0	65
01/23/97	S13	52	0	37
11/10/97	S13	270	50	380
11/13/97	S13	156	580	580
11/26/97	S13	150	595	595
11/30/97	S13	50	180	261
12/05/97	S13	70	123	182
12/18/97	S13	50	167	185
01/02/98	S13	150	50	335
01/04/98	S13	110	50	112
01/09/98	S13	50	50	213
10/14/98	S13	420	50	50
11/08/98	S13	102	90	90
11/28/98	S13	140	50	237
12/01/98	S13	82	54	69
12/06/98	S13	196	50	70
01/12/99	S13	440	50	50
01/21/99	S13	176	50	59
01/25/99	S13	90	50	50
01/31/99	S13	78	50	50
02/06/99	S13	140	56	88
02/09/99	S13	210	50	79
03/20/99	S13	210	50	50
03/25/99	S13	400	50	50
04/07/99	S13	92	50	52
04/08/99	S13	210	50	50
04/11/99	S13	51.2	50	65
12/31/99	S13	175	0	73

SAMPLE DATE	LOCATION	TOTAL HARDNESS MG/L	DISSOLVED ZINC UG/L	TOTAL ZINC UG/L
02/16/00	S13	70	0	0
02/20/00	S13	56.8	0	0
02/23/00	S13	104	0	0
02/27/00	S13	114	0	0
03/05/00	S13	70	0	0
03/08/00	S13	80	0	0
10/12/00	S13	230	0	0
10/28/00	S13	130	0	0
10/30/00	S13	51.2	0	0
01/11/01	S13	60	0	0
01/25/01	S13	87.5	68.6	80.7
02/01/01	S13	60	0	51.1
02/14/01	S13	110	0	0
02/20/01	S13	60	0	0
02/28/01	S13	65	0	52.2
03/06/01	S13	275	0	0
11/12/01	S13	150	13.3	26.9
11/24/01	S13	105	31.3	31.3
11/29/01	S13	140	60.6	69.5
12/03/01	S13	95	67.1	67.1
01/28/02	S13	83.2	24.7	29.6
10/10/02	S13	195	9.32	11.6
11/08/02	S13	130	84.5	219
12/16/02	S13	60	32	52
02/11/03	S13	180	52	61
03/15/03	S13	45.6	6	41
04/30/03	S13	340	53	84
10/28/03	S13	325	17.1	17.1
10/31/03	S13	225	6.9	530
12/25/03	S13	92.8	40	52
01/01/04	S13	112	65	90
01/13/04	S13	395	13	50
10/17/04	S13	200	24.7	47
10/26/04	S13	50	36.1	65.8
12/05/04	S13	110	36.6	153
01/07/05	S13	64	31	79.3
11/16/04	S13	410	11.4	24.5
03/09/05	S13	520	7.6	27.6
10/17/05	S13	210	35	342
12/31/05	S13	180	11.9	35.6
01/14/06	S13	170	46	75
02/17/06	S13	380	17.5	17.9
03/03/06	S13	88	17.6	242
01/24/06	S13	420	26.1	48.9
04/25/06	S13	370	9.09	18.8

92 data points

Table E.2: LADPW Zinc data measured in Coyote Creek in comparison to CTR criteria
(Averaged data are shown in red font. The earlier date was used to report the averaged data; thus, for the data reported 1/31/1996 and 2/3/1996, averages of the hardness and lead values were reported on 1/31/1996.)

SAMPLE DATE	LOCATION	TOTAL HARDNESS MG/L	Dissolved Zinc UG/L	Total Zinc UG/L	zinc CTR (acute and chronic are equal) UG/L	Exceed CTR?
06/14/95	S13	490	0	0	388	
11/07/95	S13	470	0	0	388	
12/12/95	S13	110	60	110	130	
12/23/95	S13	135	60	90	155	
01/09/96	S13	315	0	0	317	
01/21/96	S13	141	0	0	160	
01/31/96	S13	145	0	120	164	
02/03/96	S13					
02/19/96	S13	40	0	130	55	
03/05/96	S13	162	178	231	180	
03/19/96	S13	400	0	0	388	
05/14/96	S13	359	0	0	354	
07/09/96	S13	400	0	0	388	
10/30/96	S13	110	0	210	130	
11/21/96	S13	60	0	60	78	
12/09/96	S13	76.4	0	65	95	
01/23/97	S13	52	0	37	69	
11/10/97	S13	213	315	480	227	yes
11/13/97	S13					
11/26/97	S13	100	388	428	120	yes
11/30/97	S13					
12/05/97	S13	70	123	182	89	yes
12/18/97	S13	50	167	185	67	yes
01/02/98	S13	130	50	223.5	150	
01/04/98	S13					
01/09/98	S13	50	50	213	67	
10/14/98	S13	420	50	50	388	
11/08/98	S13	102	90	90	122	
11/28/98	S13	111	52	153	131	
12/01/98	S13					
12/06/98	S13	196	50	70	212	
01/12/99	S13	440	50	50	388	
01/21/99	S13	133	50	54.5	153	
01/25/99	S13					
01/31/99	S13	78	50	50	97	
02/06/99	S13	175	53	83.5	193	
02/09/99	S13					
03/20/99	S13	210	50	50	225	
03/25/99	S13	400	50	50	388	
04/07/99	S13	151	50	51	170	
04/08/99	S13	130.6	50	57.5	150	
04/11/99	S13					
12/31/99	S13	175	0	73	193	
01/25/00	S13	90	0	69	110	
01/30/00	S13	105	0	68	125	
02/10/00	S13	98	0	0	118	

SAMPLE DATE	LOCATION	TOTAL HARDNESS MG/L	Dissolved Zinc UG/L	Total Zinc UG/L	zinc CTR (acute and chronic are equal) UG/L	Exceed CTR?
02/27/00	S13					
03/05/00	S13	'75	0	0	94	
03/08/00	S13					
10/12/00	S13	230	0	0	243	
10/28/00	S13	90.6	0	0	110	
10/30/00	S13					
01/11/01	S13	60	0	0	78	
01/25/01	S13	87.5	68.6	80.7	107	
02/01/01	S13	60	0	51.1	78	
02/14/01	S13	110	0	0	130	
02/20/01	S13	60	0	0	78	
02/28/01	S13	65	0	52.2	83	
03/06/01	S13	275	0	0	282	
11/12/01	S13	150	13.3	26.9	169	
11/24/01	S13	105	31.3	31.3	125	
11/29/01	S13	117.5	63.9	68.3	137	
12/03/01	S13					
01/28/02	S13	83.2	24.7	29.6	103	
10/10/02	S13	195	9.32	11.6	211	
11/08/02	S13	130	84.5	219	150	
12/16/02	S13	60	32	52	78	
02/11/03	S13	180	52	61	197	
03/15/03	S13	45.6	6	41	62	
04/30/03	S13	340	53	84	338	
10/28/03	S13	275	12	273.6	282	
10/31/03	S13					
12/25/03	S13	92.8	40	52	112	
01/01/04	S13	112	65	90	132	
01/13/04	S13	395	13	50	384	
10/17/04	S13	200	24.7	47	216	
10/26/04	S13	50	36.1	65.8	67	
11/16/04	S13	410	11.4	24.5	388	
12/05/04	S13	110	36.6	153	130	
01/07/05	S13	64	31	79.3	82	
03/09/05	S13	520	7.6	27.6	388	
10/17/05	S13	210	35	342	225	
12/31/05	S13	180	11.9	35.6	197	
01/14/06	S13	170	46	75	188	
01/24/06	S13	420	26.1	48.9	388	
02/17/06	S13	380	17.5	17.9	371	
03/03/06	S13	88	17.6	242	108	
04/25/06	S13	370	9.09	18.8	363	

4 EXCEEDANCES OUT OF 79 SAMPLES

Notes:

Per the State Listing Policy, the data should be averaged over the period of time relative to the standard. Since the chronic CTR standard is based on a four-day period, data falling within a single 4-day period was averaged. See Section 6.1.5.6 of the Listing Policy.

Table E.3: Districts' representative zinc data measured in Coyote Creek in comparison to CTR criteria

(Corresponding metadata available on 'raw data' sheet)

SAMPLE DATE	LOCATION	ZINC UG/L	TOTAL HARDNESS MG/L	zinc CTR (acute and chronic are equal) UG/L	Exceed CTR?
08/05/96	R9E	40	414	388	
08/05/98	R9E	20	235	247	
07/12/01	RA1	20	325	325	
08/08/01	RA1	40	419	388	
09/10/01	RA1	20	442	388	
10/02/01	RA1	30	419	388	
11/07/01	RA1	40	424	388	
12/06/01	RA1	30	486	388	
01/17/02	RA1	30	408	388	
02/20/02	RA1	20	400	388	
03/06/02	RA1	20	396	385	
04/04/02	RA1	40	372	365	
05/13/02	RA1	20	249	260	
06/11/02	RA1	30	312	314	
07/08/02	RA1	30	311	313	
08/13/02	RA1	20	388	378	
10/09/02	RA	40	298	302	
10/09/02	RA1	30	313	315	
10/21/02	R9E	300	260	269	yes
11/20/02	RA1	20	473	388	
12/23/02	RA1	60	487	388	
01/21/03	R9E	90	332	331	
04/01/03	R9E	98	351	347	
07/08/03	R9E	73	351	347	
07/14/03	RA	85	222	235	
07/14/03	RA1	76	433	388	
08/13/03	RA1	67	420	388	
10/07/03	R9E	39	258	267	
01/06/04	R9E	55	310	312	
02/10/04	RA	97	195	211	
02/10/04	RA1	69	453	388	
03/09/04	RA	60	265	274	
03/09/04	RA1	30	429	388	
04/06/04	R9E	93	288	294	
04/06/04	RA	84	274	281	
04/06/04	RA1	60	383	374	
05/11/04	RA	96	278	285	
05/11/04	RA1	82	382	373	
06/08/04	RA	31	391	380	
06/08/04	RA1	23	435	388	
07/06/04	R9E	132	588	388	
07/13/04	RA	66	285	291	
07/13/04	RA1	51	382	373	
08/10/04	RA	43	302	306	

SAMPLE DATE	LOCATION	ZINC UG/L	TOTAL HARDNESS MG/L	zinc CTR (acute and chronic are equal) UG/L	Exceed CTR?
08/10/04	RA1	28	388	378	
09/14/04	RA	32	342	340	
09/14/04	RA1	28	214	228	
10/04/04	R9E	55	204.5	220	
10/04/04	RA	47	202	217	
10/04/04	RA1	30	352	348	
11/15/04	RA	31	302	306	
11/15/04	RA1	23	410.5	388	
12/07/04	RA	81	223.5	237	
12/07/04	RA1	68	365	359	
01/25/05	R9E	23	393.5	382	
01/25/05	RA	23	356	351	
01/25/05	RA1	13	624	388	
02/14/05	RA	36	362.5	357	
02/14/05	RA1	10	513.5	388	
03/22/05	RA	23	391	380	
03/22/05	RA1	7	574	388	
04/12/05	R9E	18	371	364	
04/12/05	RA	13	405	388	
04/12/05	RA1	4	531	388	
05/17/05	RA	30	296	300	
05/17/05	RA1	11	491	388	
06/21/05	RA	18	315	317	
06/21/05	RA1	17	380	371	
06/23/05	RA	9.55	491	388	
07/19/05	R9E	53	294	299	
07/19/05	RA	49	260	269	
07/19/05	RA1	42	436	388	
08/09/05	RA	43	291	296	
08/09/05	RA1	33	432	388	
09/06/05	RA	16	250	260	
09/06/05	RA1	11	441	388	
10/11/05	R9E	28	235	247	
10/11/05	RA	25	294	299	
10/11/05	RA1	13	482	388	
11/15/05	RA	25	292	297	
11/15/05	RA1	15	516	388	
12/13/05	RA	20	275	282	
12/13/05	RA1	20	505	388	
01/10/06	R9E	28.2	326	326	
01/10/06	RA	24.7	295	300	
01/10/06	RA1	7.48	545	388	
02/07/06	RA	25.6	263	272	
02/07/06	RA1	10	460	388	
03/09/06	RA	37.3	232	244	
03/09/06	RA1	15.1	477	388	
04/17/06	R9E	23.3	380	371	
04/17/06	RA	36.7	278	285	

SAMPLE DATE	LOCATION	ZINC UG/L	TOTAL HARDNESS MG/L	zinc CTR (acute and chronic are equal) UG/L	Exceed CTR?
04/17/06	RA1	19.5	492	388	
05/16/06	RA	30.5	250	260	
05/16/06	RA1	12.4	388	378	
06/20/06	RA	37.4	216	230	
06/20/06	RA1	14.9	421	388	
06/26/06	RA	34.625	269.5	278	
07/20/06	R9E	26	334	333	
07/20/06	RA	40.9	282	288	
07/20/06	RA1	30.8	311	313	
08/22/06	RA	16.8	413	388	
08/22/06	RA1	16.9	403	388	
09/19/06	RA	24.4	288	294	
09/19/06	RA1	19	391	380	
10/24/06	RA	34.9	252	262	
10/24/06	RA1	11.1	391	380	
11/21/06	RA	48.7	234	246	
11/21/06	RA1	34.4	415	388	
12/14/06	RA	48.4	250	260	
12/14/06	RA1	18	486	388	
01/09/07	RA	69.1	186	203	
01/09/07	RA1	32.1	486	388	

1 EXCEEDANCE OUT OF 113 SAMPLES

Figure E.1: Zinc Measured in Coyote Creek in comparison to CTR criteria