

**Water Quality and Streamflow Monitoring  
of San Francisquito and Los Trancos  
Creeks at Piers Lane, and Bear Creek at  
Sand Hill Road, Water Year 2007,  
Long-term Monitoring and Assessment  
Program San Mateo and Santa Clara  
Counties, California**

Report prepared for:

Stanford University, Utilities Division  
Jasper Ridge Biological Preserve

Prepared by:

Jonathan Owens

Chris White

John Gartner

Zan Rubin

Barry Hecht

Balance Hydrologics, Inc.

August 2008

A report prepared for:

**Stanford University**  
**Utilities Division**  
327 Bonair Siding, 2nd Floor  
Stanford, California 94305-7270  
Attention: Marty Laporte  
(650) 725-7864

**Jasper Ridge Biological Preserve**  
**Stanford University**  
Gilbert 109  
Stanford, California 94305-5020  
Attention: Philippe Cohen  
(650) 723-1589

**Water Quality and Streamflow Monitoring of San Francisquito and Los Trancos Creeks at Piers Lane, and Bear Creek at Sand Hill Road, Water Year 2007, Long-term Monitoring and Assessment Program, San Mateo and Santa Clara Counties, California**

Balance Project Assignments 202018 & 202094



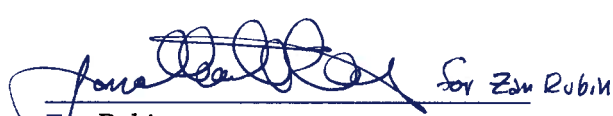
Jonathan Owens  
Senior Hydrologist



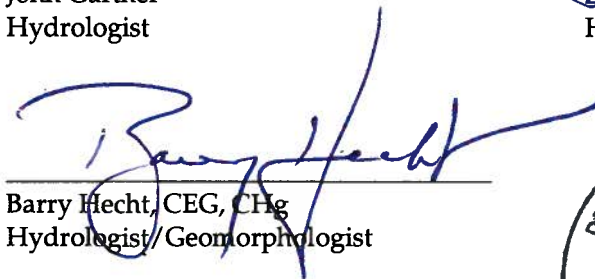
Chris White  
Senior Water Quality Specialist



John Gartner  
Hydrologist

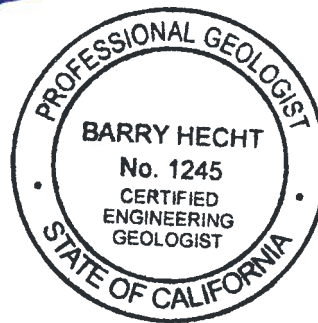


Zan Rubin  
Hydrologist



Barry Hecht, CEG, CHg  
Hydrologist/Geomorphologist

© 2008 Balance Hydrologics, Inc.  
800 Bancroft Avenue  
Berkeley, California 94710  
510-704-1000  
[office@balancehydro.com](mailto:office@balancehydro.com)



August 7, 2008

## TABLE OF CONTENTS

<b>SUMMARY AND CONCLUSIONS .....</b>	<b>1</b>
<b>1. INTRODUCTION .....</b>	<b>4</b>
<b>2. BACKGROUND.....</b>	<b>6</b>
2.1 LOCAL INFLUENCES ON WATER QUALITY .....	6
2.2 RELATED WATER QUALITY STUDIES IN THE WATERSHED.....	7
<b>3. STATION LOCATIONS .....</b>	<b>9</b>
3.1 BEAR CREEK SUB-WATERSHED STATION.....	9
3.2 PIERS LANE STATIONS .....	10
3.3 OTHER STATIONS IN THE WATERSHED.....	11
3.3.1 <i>Los Trancos Creek at Arastradero Road</i> .....	11
3.3.2 <i>Searsville sub-watershed stations</i> .....	11
3.3.3 <i>U.S. Geological Survey station on San Francisquito Creek</i> .....	11
<b>4. HYDROLOGIC SUMMARY, WATER YEAR 2007.....</b>	<b>12</b>
4.1 NARRATIVE SUMMARY .....	12
4.2 PRECIPITATION .....	13
4.3 RETURN PERIOD OF PEAK FLOWS .....	13
4.4 UNEXPLAINED FLOW SURGES.....	14
4.5 CREATING A RECORD OF STREAMFLOW .....	14
4.5.1 <i>Developing a record of water levels</i> .....	14
4.5.2 <i>Computing flows</i> .....	15
<b>5. WATER QUALITY SAMPLING APPROACH.....</b>	<b>16</b>
5.1 TIMING OF SAMPLING VISITS .....	16
5.2 FIELD MEASUREMENTS AND LABORATORY ANALYSES .....	16
5.3 EXCEPTIONS AND DEVIATIONS FROM PROPOSED METHODS .....	17
<b>6. RESULTS AND DISCUSSION OF WATER QUALITY SAMPLING.....</b>	<b>19</b>
6.1 WATER QUALITY OBJECTIVES .....	19
6.1.1 <i>Composite sampling effects on interpretation of acute-toxicity levels</i> .....	20
6.1.2 <i>Composite sampling results compared to mid-storm grab samples</i> .....	21
6.2 SPECIFIC CONDUCTANCE .....	21
6.3 NITROGEN.....	22
6.3.1 <i>Ammonia-nitrogen</i> .....	23
6.3.2 <i>Nitrate-nitrogen</i> .....	23
6.4 ORGANOPHOSPHATE PESTICIDES .....	24
6.5 METALS .....	25
6.5.1 <i>Metals not detected</i> .....	26
6.5.2 <i>Dissolved vs. Total Metals</i> .....	26
6.5.3 <i>Hardness-dependent toxicity</i> .....	26
6.5.4 <i>Aluminum</i> .....	27
6.5.5 <i>Copper</i> .....	28
6.5.6 <i>Lead</i> .....	29
6.5.7 <i>Mercury</i> .....	30
6.5.8 <i>Nickel</i> .....	31
6.5.9 <i>Selenium</i> .....	32
6.5.10 <i>Silver</i> .....	33
6.5.11 <i>Zinc</i> .....	33
6.6 WATER TEMPERATURE .....	34
6.6.1 <i>Water temperature affects fish</i> .....	34

6.6.2 *Temperature monitoring probes* ..... 34

6.6.3 *Temperature differences between creeks* ..... 34

6.7 PH ..... 35

6.8 DISSOLVED OXYGEN ..... 35

6.9 SEDIMENT ..... 36

6.9.1 *Suspended sediment* ..... 37

6.9.2 *Bedload sediment* ..... 38

6.9.3 *Sediment discussion* ..... 39

6.9.4 *Assessed bias of automated suspended-sediment sampling (excerpted from the WY2004 monitoring report)* 40

**7. FUTURE MONITORING AND RECOMMENDATIONS ..... 43**

**8. LIMITATIONS ..... 44**

**9. ACKNOWLEDGEMENTS ..... 45**

**10. REFERENCES ..... 46**

## LIST OF FORMS

- Form 1. Annual hydrologic record for Bear Creek at Sand Hill Road, water year 2007
- Form 2. Annual hydrologic record for Los Trancos Creek at Piers Lane, water year 2007
- Form 3. Annual hydrologic record for San Francisquito Creek at Piers Lane, water year 2007
- Form 4. Sediment-discharge record for Bear Creek at Sand Hill Road, water year 2007
- Form 5. Sediment-discharge record for Los Trancos Creek at Piers Lane, water year 2007
- Form 6. Sediment-discharge record for San Francisquito Creek at Piers Lane, water year 2007

## LIST OF TABLES

- Table 1. Station observer log for Bear Creek at Sand Hill Road, water year 2007
- Table 2. Station observer log for San Francisquito Creek at Piers Lane, water year 2007
- Table 3. Station observer log for Los Trancos Creek at Piers Lane, water year 2007
- Table 4. Hydrologic summary for the period of record, Bear Creek, Los Trancos Creek and San Francisquito Creek
- Table 5. Placeholder included in this year's report because no water quality sampling occurred at Bear Creek in water year 2007: Summary of water quality for Bear Creek, Sand Hill Road*
- Table 6. Summary of water quality for San Francisquito Creek and Los Trancos Creek at Piers Lane, water year 2007
- Table 7. Water quality objectives for dissolved trace-metals concentrations at hardnesses typically observed in the San Francisquito Creek watershed
- Table 8. Measurements and calculations of sediment transport, Bear Creek at Sand Hill Road, water year 2007
- Table 9. Sediment-discharge measurements and calculations, San Francisquito Creek and Los Trancos Creek at Piers Lane, water year 2007

## LIST OF FIGURES

- Figure 1. Site location and watershed map
- Figure 2. Daily flow hydrographs for San Francisquito, Los Trancos and Bear Creeks, water year 2007
- Figure 3. Daily flow hydrograph for Bear Creek at Sand Hill Road, water year 2007
- Figure 4. Daily flow hydrograph for San Francisquito Creek at Piers Lane, water year 2007
- Figure 5. Daily flow hydrograph for Los Trancos Creek at Piers Lane, water year 2007
- Figure 6. Unit flow hydrographs for San Francisquito, Los Trancos and Bear Creeks, water year 2007
- Figure 7. Cumulative 15-minute precipitation record at Bear Creek at Sand Hill Road, and San Francisquito Creek at Piers Lane, water year 2007
- Figure 8. Specific conductance measurements, Los Trancos Creek at Piers Lane, water years 2002 to 2007
- Figure 9. Specific conductance measurements, Bear Creek at Sand Hill Road, water year 2007
- Figure 10. Specific conductance measurements, San Francisquito Creek at Piers Lane, water years 2002 to 2007
- Figure 11. Daily water temperature record for San Francisquito Creek at Piers Lane, water year 2007
- Figure 12. Daily water temperature record for Los Trancos Creek at Piers Lane, water year 2007
- Figure 13. Daily water temperature record for Bear Creek at Sand Hill Road, water year 2007
- Figure 14. pH measurements in San Francisquito, Los Trancos and Bear Creeks, water year 2007
- Figure 15. Dissolved oxygen concentrations in Bear Creek at Sand Hill Road, water year 2007
- Figure 16. Dissolved oxygen concentrations in Los Trancos Creek at Piers Lane, water year 2007
- Figure 17. Dissolved oxygen concentrations in San Francisquito Creek at Piers Lane, water year 2007

## LIST OF FIGURES (CONTINUED)

- Figure 18. Sediment measurements and rating curves for the Piers Lane stations, water year 2007
- Figure 19. Sediment measurements and rating curves for Bear Creek at Sand Hill Road, water years 1998 to 2007

## APPENDICES

- Appendix A. Laboratory results and chain of custody forms (Piers Lane stations)
- Appendix B. Placeholder included in this year's report because no water quality sampling occurred at Bear Creek in water year 2007:* Laboratory results and chain of custody forms (Bear Creek)
- Appendix C. Detailed hydrographs of periods when water quality samples were collected
- Appendix D. Specific conductance anomalies at Bear Creek at Sand Hill Road

## SUMMARY AND CONCLUSIONS

San Francisquito Creek is currently listed by the California State Water Resources Control Board as being impaired by sediment and by the organophosphate pesticide, diazinon. Water quality in the creek is of particular concern because the creek is habitat for steelhead trout, a federally-listed threatened species. This study reports results of water year 2007 stream gaging and water quality sampling conducted as part of the Long-Term Monitoring and Assessment Program (LTMAP), a water-quality sampling program sponsored by Stanford University and the City of Palo Alto. Water year 2007 was the sixth year of monitoring at the Los Trancos Creek and San Francisquito Creek stations at Piers Lane, and the fourth year of monitoring at the Bear Creek at Sand Hill Road station. However, due to budget constraints, only flow and sediment monitoring were performed at Bear Creek in water year 2007. Measurements and observations at all three stations will continue during water year 2008, though on a limited scale.

Since fall 2001, Balance Hydrologics, Inc. has operated for LTMAP two automated water-quality sampling stations on San Francisquito Creek and Los Trancos Creek at Piers Lane, just above their confluence. In fall 2003, Kinnetic Labs (Santa Cruz) installed another automated sampling station, located on Bear Creek at Sand Hill Road, along the northern border of the Jasper Ridge Biological Preserve. The station, which is now also operated by Balance Hydrologics, is configured similarly to the other stations with a datalogger, several probes, and a programmable pumping unit. As in previous years, the electronic records were combined with manual measurements to create flow records for each stream. Measurements of temperature, specific conductance, dissolved oxygen and pH were made manually.

Five sets of comprehensive, composite water-quality samples were collected at each of the Piers Lane stations during the water year using time-paced sampling. A sixth set of samples was collected during the dry-season as grab samples. The same storms were sampled at both stations. Samples for particular constituents requiring special preservation methods (i.e., ammonia and mercury) were collected as grab samples during the composite sampling intervals. Suspended-sediment samples were collected during and between storms and used to estimate annual suspended-sediment yields. Results were compared to water quality objectives established by the San Francisco Bay office (Region 2) of the California Regional Water Quality Control Board ("Regional Board" or "RWQCB"). Our conclusions are presented below, together with citations to the relevant text subsections, tables and figures:



1. Rainfall and streamflow totals for water year 2007 were below average. Rainfall was approximately 62 percent of the long-term average at the Bear Creek and Piers Lane stations. The peak flow of the water year was also small. Based on USGS provisional streamflow data for San Francisquito Creek, the peak flow for the year corresponds to about a 1.3-year recurrence-interval flood, equivalent to a 76 percent chance of being exceeded in any year. (*Sections 4.1 to 4.3; Table 4; Figures 2 to 5*)
2. Specific conductance values (*Section 6.2; Tables 1 to 3; Figures 8 to 10*) and pH values (*Section 6.7; Tables 1 to 3; Figure 14*) in all three streams were within the range of previous sampling results during water year 2007. Dissolved oxygen concentrations (*Section 6.8; Tables 1 to 3; Figures 15 to 17*) were occasionally low – particularly in San Francisquito Creek in late summer or fall – a condition which may prove limiting for certain biota.
3. Dry-season water temperatures remained below lethal levels and below temperatures recorded in 2006 and other years, despite low baseflows and discontinuous pools in some upstream reaches. Low baseflows have a higher potential for high stream temperatures and, therefore, a greater impact on steelhead and other aquatic biota, especially if pools become discontinuous. (*Sections 4.4 and 6.6; Tables 1 to 3; Figures 11 to 13*).
4. As in prior years, organophosphate pesticide concentrations were below the detection limits in the streams sampled at Piers Lane on all dates sampled in water year 2007 (*Section 6.4; Table 6*). Given the small number of total samplings to-date, relative to the sample set required for consideration of de-listing, further sampling should be performed before concluding when or if these pesticides are present or absent in the three streams.
5. Ammonia-nitrogen was not detected at any station during water year 2007. Nitrate-nitrogen was detected at moderate concentrations in almost all samples from the streams sampled at Piers Lane. Levels of nitrate-nitrogen were within the range of previous sampling results and typical of those observed in other streams in the Santa Cruz Mountains where urban and agricultural land uses occur (*Section 6.3; Table 6*).
6. Total mercury concentrations were high in wet-season grab samples collected at the Piers Lane stations in water year 2007 and often exceeded the chronic toxicity objective. Dissolved mercury concentrations in all samples were well below the regulatory standard (*Section 6.5.7; Table 6*).
7. Dissolved copper concentrations in composite and grab samples collected at the Piers Lane stations in water year 2007 were slightly lower than prior years and below the regulatory objectives. Concentrations in grab samples collected mid-storm from Los Trancos Creek (but not San Francisquito Creek) were equal to or higher (up to about double) concentrations in the composite samples. (*Section 6.5.5; Table 6*).

8. Fluctuations in flow and specific conductance during baseflow periods were most noticeable at the Bear Creek station, but also propagated downstream to San Francisquito Creek at Piers Lane. In addition, our records show multiple and various types of flow alterations in Los Trancos Creek. Upstream diversions and other flow alterations may significantly and quickly affect summer baseflows and, therefore, aquatic habitat. Besides the volumetric changes to flow, water quality may also be altered by the apparent additions to creek flow (*Sections 4.4; Figures 3, 6, and 11 to 13; Appendix D*).
9. Because water year 2007 was dry, stream flows were lower and much less sediment than usual was discharged. For each of the stations, the computed sediment yields were about 1 to 2 percent of the totals from water year 2006. (*Section 6.9.3; Table 4; Figures 18 and 19*)

## 1. INTRODUCTION

This report presents the results of surface-water monitoring in the San Francisquito Creek watershed by Balance Hydrologics, Inc. (“Balance”), on behalf of the Stanford University Utilities Division, Jasper Ridge Biological Preserve, Stanford Management Company, Stanford Linear Accelerator Center (all, “Stanford”) and the City of Palo Alto. Stanford is a participant in the San Francisquito Watershed Council, which is managing the Long-Term Monitoring and Assessment Program (LTMAP). The LTMAP was originally created by a subcommittee of the San Francisquito Creek Coordinated Resource Management and Planning (CRMP) Steering Committee, the group now known as the San Francisquito Watershed Council. The LTMAP was established primarily to monitor and assess current (i.e., baseline) conditions, analyze trends, and evaluate watershed management. Three LTMAP monitoring stations in the lower San Francisquito Creek watershed have been monitored since fall 2001 (water year 2002<sup>1</sup>); monitoring at a fourth station higher in the watershed began in fall 2003.

The San Francisquito Creek watershed is located on the San Francisco Peninsula, and includes the northwestern portion of Santa Clara County and the southeastern portion of San Mateo County (Figure 1). Los Trancos Creek and (below their confluence) San Francisquito Creek form the boundary between the two counties. The watershed encompasses approximately 45 square miles, of which about 37 square miles lie upstream from the two Piers Lane stations, and includes a wide diversity of urbanized, rural and natural habitats. The 11.7-square mile Bear Creek sub-watershed encompasses the northwestern headwaters of San Francisquito Creek, covering approximately 25 percent of its watershed. Los Trancos Creek has a sub-watershed area of 7.8 square miles.

The first three LTMAP automated sampling stations were installed in fall 2001. The City of Palo Alto Regional Water Quality Control Plant staff are operating the lowermost station on San Francisquito Creek at Newell Road, a short distance upstream of Highway 101 and near the head of tidewater. Balance staff are operating the other two stations, on San Francisquito Creek and Los Trancos Creek at Piers Lane, a short distance downstream (north) of Interstate 280 and immediately upstream of the confluence of the two creeks. A fourth LTMAP station was

---

<sup>1</sup> Most hydrologic and geomorphic monitoring occurs for a period defined as a water year, which begins on October 1 and ends on September 30 of the named year. For example, water year 2007 (WY2007) began on Oct. 1, 2006 and concluded on September 30, 2007.

installed on Bear Creek at Sand Hill Road in fall 2003, reoccupying a site previously gaged by Balance staff. This station, which is also operated by Balance, is about 2.5 miles upstream from Piers Lane.

Data and findings from the initial two years of monitoring the Piers Lane stations are presented in the prior annual monitoring reports (Owens and others, 2003; Owens and others, 2004). To better integrate findings from the three stations currently monitored by Balance staff, results were summarized in a single report beginning with water year 2004, the third year of monitoring the two Piers Lane stations and the initial year of monitoring the Bear Creek at Sand Hill Road station (Owens and others, 2005) and continuing in water year 2005 (Owens and others, 2006) and water year 2006 (Owens and others, 2007). This report similarly presents results of water year 2007 monitoring at all three stations. Measurement and observations will continue during water year 2008 (WY2008), though on a limited scale at all three stations.

## 2. BACKGROUND

Surface-water monitoring for this project is being implemented to assess known and potential pollutant concentrations as part of the Long-Term Monitoring and Assessment Program (LTMAP). The LTMAP was originally created by a subcommittee of the San Francisquito Creek Coordinated Resource Management and Planning (CRMP) Steering Committee, the group now known as the San Francisquito Watershed Council. The goals of the LTMAP are to provide a comprehensive framework for organizing and coordinating monitoring and assessment activities in the San Francisquito Creek watershed.

As part of the LTMAP, surface water data are being collected for use in describing constituents which might adversely affect water quality in the watershed, under storm runoff and low-flow conditions, in major part as they affect the full range of steelhead life stages. To assist the LTMAP in one of its objectives, Balance was asked to:

1. Identify which contaminants or sets of contaminants are present in San Francisquito Creek, Los Trancos Creek and Bear Creek, and to prioritize analyses for more detailed study in future years;
2. Assess if a relationship exists between the presence, absence or concentration of contaminants and streamflow; and
3. Evaluate the amount of suspended sediment and bedload being transported by the three streams and compare them to results from other locations in the watershed also monitored during this water year for other projects.

### 2.1 Local Influences on Water Quality

Restoration of habitat for steelhead -- a federally-listed threatened species greatly valued by the watershed community at large -- in the San Francisquito Creek drainage has been the focus of substantial efforts over the past ten years. Technical professionals and knowledgeable residents with experience in these streams suspect that water quality may be a significant constraint to the size and robustness of the steelhead population in San Francisquito Creek and its tributaries. Steelhead are anadromous<sup>2</sup> salmonids which spawn and rear throughout the free-flowing headwaters of the San Francisquito Creek watershed. Water-quality impairment may likely affect other sensitive local species or possibly other beneficial uses as well.

---

<sup>2</sup> Migrates downstream to the ocean as a juvenile and returns upstream to fresh water to spawn.

The principal sources of potential concern include:

- horses and perhaps other livestock, particularly those boarded on land adjacent to the stream channels of San Francisquito Creek and its tributaries and/or using the stream or riparian buffer areas;
- septic systems, or other on-site wastewater-treatment units;
- urban runoff, including road and highway surface runoff, which may contribute nutrients and other constituents, such as heavy metals;
- pulses of water which have been repeatedly observed and documented in the streams at low flow, that may originate from human-managed sources, perhaps from flushing of swimming pools and other chlorinated ponds; and
- common garden, orchard and lawn or turf chemicals (i.e., fertilizers, pesticides).

Urban runoff and animal wastes from horses and other domesticated species, when washed into the creeks of the watershed, may be acutely toxic to steelhead and other fish or aquatic species. Chronic toxicity and/or indirect effects of these loadings may also counteract sustained regional efforts to improve and restore populations of steelhead. Each of the other sources listed above can also have chronic or acute toxicity.

The quantity of baseflow is also an important factor in maintaining habitat quality. Too little water in the creeks during the spring and summer can impede out-migration of year-old fish and affect summer survival of newly hatched “young-of-the-year” as well as year-old juveniles. Insufficient baseflow also magnifies the effects of introduced pollutants by reducing the amount of dilution available to decrease pollutant concentrations and at very low flows can lead to impaired conditions such as local increases in temperature or decreases in dissolved oxygen.

## **2.2 Related Water Quality Studies in the Watershed**

We know of only one recent sub-watershed-scale investigation of water quality. As part of a grant from the Packard Foundation, the San Francisquito Watershed Council asked Balance to conduct a three-year water quality study in the Bear Creek portion of the larger watershed during water years 2000 through 2002. Balance has reported the results of the first two years of monitoring (Owens and others, 2001; 2002). Both published and unpublished data from the Bear Creek study are used in this report as a basis for comparison. The Bear Creek watershed encompasses the northwestern headwaters of San Francisquito Creek, as shown in Figure 1.

Thus, water-quality problems in the Bear Creek watershed can directly affect nearly all other spawning and rearing areas in the San Francisquito Creek watershed. Conversely, measures which control causes of toxicity to fish in the Bear Creek system will benefit nearly the entire local steelhead population, as well as other species in the San Francisquito Creek watershed. Knowledge of natural and anthropogenic factors affecting water quality in Bear Creek can help in planning and assessing water quality elsewhere in the watershed.

### 3. STATION LOCATIONS

#### 3.1 Bear Creek Sub-watershed Station

The Bear Creek at Sand Hill Road station (designated as BCSH) is located on the northern border of the Jasper Ridge Biological Preserve (Figure 1), approximately 2.5 miles upstream of the San Francisquito Creek at Piers Lane station. Balance has periodically monitored streamflow and water-quality constituents at this site, which receives flows from almost one-half of the San Francisquito Creek watershed above Piers Lane, since the spring of 1997. Prior to the current study, the most complete sets of data were compiled during water years 2000 to 2002, when this station was one of eight stations in the watershed regularly monitored on behalf of the San Francisquito Watershed Council (see Section 2.2 above). Balance continued to operate the gaging station during water year 2003 but only minimal water quality measurements were made that year.

Through the combined efforts of Stanford Management Co., Stanford Linear Accelerator Center, and the Jasper Ridge Biological Preserve, this location became the fourth station in the LTMAP monitoring network. In fall 2003 (WY2004), Kinnetic Laboratories, Inc. (Santa Cruz) installed new monitoring equipment on the left bank of Bear Creek, about 200 feet downstream from Sand Hill Road and only a short distance from the previous gaging location. The instream portion of this installation was severely damaged by the storm that began on Dec. 31, 2005. Temporary probes were installed one week later and permanent replacement of the instream components occurred in May 2006, with the assistance of Kinnetic Laboratories, Inc.

The station is equipped with a tipping-bucket rain gauge, a streamside staff plate, a datalogger and automated sampler pumping unit housed within an enclosure, and several water-quality probes. Water level, water temperature, specific conductance (an index of salinity), dissolved oxygen, and pH are continuously monitored. Water levels are measured using pressure transducers. Manual measurements of water levels at a staff plate, streamflow and water quality parameters are made at regular intervals to calibrate the electronic record. The station is connected to a land-line telephone so that real-time data can be monitored over the Internet. The automated sampler is designed to collect aliquots over a specified period into a composite sample bottle kept chilled in an ice bath. Following sampling events, sub-samples of the mixed composite sample are poured into prepared sample bottles for laboratory analysis of individual constituents.



### 3.2 Piers Lane Stations

The other two LTMAP stations discussed in this report<sup>3</sup> are located on Los Trancos Creek and San Francisquito Creek, just upstream from their confluence, where Piers Lane crosses both creeks (Figure 1). The stations are within 100 yards of each other and only a short distance downstream (north) of Interstate 280. The stations were installed in fall 2001 by staff of Kinnetic Laboratories, Inc. and Larry Walker Associates (Davis) under contract to the City of Palo Alto. The station on San Francisquito Creek is equipped with a tipping-bucket rain gauge. From installation through fall 2005, water levels at both stations were measured by an ultrasonic sonar transponder mounted on the bridge above the creek at each site. Following failure of the transponder at the San Francisquito Creek station in November 2005, Balance installed a set of temporary probes and worked with City of Palo Alto Regional Water Quality Control Plant and Stanford staff to develop a repair plan that would also address maintenance problems at both Piers Lane stations, as detailed in previous monitoring reports. To improve reliability, a datalogger and pressure transducers were installed at the San Francisquito Creek station in February 2006, and the specific conductance probe was replaced with one of a different brand. Both stations remain powered by batteries, but solar panels were installed at each site to reduce or eliminate intermittent problems with battery failure that have resulted in occasional loss of monitoring data. The cable to the rain gauge was sheathed in conduit and buried to reduce chances of rodent damage. Sampling tubes at both stations were replaced and a second conduit was installed between the enclosures and the streams to carry the probe cables and reduce constriction in the original conduits. Otherwise, each station is equipped with the same instrumentation described above for the Bear Creek station and is monitored using the same protocols. Cell phone telemetry was attempted in the past but found to drain the batteries too quickly to make the data available in real-time.<sup>4</sup>

Balance initiated operation of the newly-installed Piers Lane stations, designated as San Francisquito Creek at Piers Lane (SFPL) and Los Trancos Creek at Piers Lane (LTPL), at the start of water year 2002. For a number of reasons detailed in the first-year (WY2002) monitoring report (Owens and others, 2003), only a limited number of samples were collected during the

---

<sup>3</sup> The fourth LTMAP station, on San Francisquito Creek at Newell Road, a short distance upstream of Highway 101, has been operated by staff of the City of Palo Alto Regional Water Quality Control Plant since it was installed in fall 2001. Monitoring at this site is coordinated with activities at the upstream stations but results are interpreted by City staff and reported under separate cover.

<sup>4</sup> Connection to a land-line telephone would decrease obstacles to real-time data availability but is reportedly not feasible at this time.

first year of operation. Monitoring during water years 2003 to 2007 more closely followed the envisioned sampling sequence.

### **3.3 Other Stations in the Watershed**

As part of a series of cooperating projects, Balance also monitored a number of locations in the San Francisquito Creek watershed upstream of Piers Lane during water year 2007 (Figure 1). The main focus was on monitoring streamflow and sediment discharge. Data from some of these other stations are used in this report for comparison to the data collected at the Piers Lane stations. Comparison of flow records among stations helps to verify the gaging data and describe and document differences in hydrologic responses to rainfall. These differences are proving larger than expected, such as very low baseflows on West Union Creek, or flashy storm peaks on Dry Creek, and may prove in and of themselves to be of significance to stream management, including steelhead restoration. Selected stations are described below.

#### **3.3.1 Los Trancos Creek at Arastradero Road**

Balance operates another station on Los Trancos Creek (LTAA) about 1.8 miles upstream of Piers Lane on behalf of Stanford University Utilities Division. This upstream station has been in operation since November 1994. Suspended-sediment and bedload discharge are also collected at this site. The watershed area upstream of this station is 5.3 square miles.

#### **3.3.2 Searsville sub-watershed stations**

Balance operated gages at Searsville Dam and upstream from Searsville Lake on Corte Madera Creek at Westridge Drive during water year 2007. Data collection from the Searsville sub-watershed stations focuses on sediment transport. Searsville and Corte Madera Creek flow data were considered during data analysis and in this report where such comparisons were useful.

#### **3.3.3 U.S. Geological Survey station on San Francisquito Creek**

USGS stream gage #1164500 (San Francisquito Creek at Stanford University) is located approximately 0.5 miles downstream from Piers Lane. This station was originally established in 1931 and has maintained a continuous record of flow since 1954. USGS staff regularly collected suspended-sediment (but not bedload sediment) data at this station from the mid-1960s to early 1970s (Brown and Jackson, 1973).

## 4. HYDROLOGIC SUMMARY, WATER YEAR 2007

Observations and measurements from our water year 2007 site visits are documented in Table 1 (Bear Creek), Table 2 (Los Trancos Creek) and Table 3 (San Francisquito Creek). Annual hydrologic summaries for each of the three creeks are presented in Forms 1 to 3. Table 4 is a hydrologic summary for all three creeks over the period of record. For Bear Creek, the summary includes gaging results from the earlier three-year water quality study (water years 2000 to 2002).

Daily flow hydrographs for the three creeks are plotted on the same graph in Figure 2, and for individual creeks in Figures 3 to 5. Figure 6 shows the unit flow hydrograph for each creek. "Unit flow", calculated by dividing the mean daily flow by the watershed area, allows comparison of the response to rainfall among different watersheds. In general, the magnitude of streamflow is governed by the size of the watershed, so that a larger watershed produces higher flows. However, differences among streams in wet- and dry-season baseflows also reflect variations in the geology, topography and management of diversions within their watersheds.

### 4.1 Narrative Summary

In general, water year 2007 was a dry year in terms of total rainfall (Figure 7), total flow, and peak flow (Figure 2). The water year began with baseflows slightly above normal in early October, due to the carry-over from the very wet previous year. Light rains fell during October and November. This year, as in previous years, many of the early rainfall events were small and similarly-sized making it difficult to define a distinct "first-flush"<sup>5</sup> in water year 2007. Occasional moderate rains occurred from mid- to late-December 2006. January was unusually dry, and baseflows were well below average. Several moderate rains occurred during February 2007; with peak flows occurring at most stations near midnight February 26-27. On Bear Creek (Figure 3), the peak flow rate was 200 cubic feet per second (cfs) on February 26, 2007 at 23:30.

---

<sup>5</sup> "First-flush" refers to a storm event that is strong enough to produce runoff and which occurs after a period of weeks or months of dry weather. This informal term is typically applied to the first major storm event of the wet-season but it may also be used to describe any significant storm occurring after a prolonged dry period. Since first-flush storms mobilize accumulated sediment, litter, nutrients and other pollutants, the resultant runoff often contains higher concentrations of these constituents than are observed in runoff from subsequent storms. Note that the first flush from impermeable surfaces, such as roads and roofs, often occurs earlier in the season than the first flush from open space lands, which must first become saturated.

On San Francisquito Creek (Figure 4), the highest peak flow rate was 436 cfs on February 27, 2007 at 0:45. On Los Trancos Creek at Piers Lane (Figure 5), the highest peak flow rate was 44 cfs on December 12, 2006 at 9:15.

Recessional flows during the spring were earlier than usual with only occasional light rain during March, April and May. Summer baseflows in all three streams were lower than in previous years.

## **4.2 Precipitation**

Water year 2007 rainfall recorded at the Piers Lane tipping-bucket rain gauge totaled 10.92 inches, or 59 percent of the long-term mean annual precipitation of 18.5 inches (Rantz, 1971). Higher in the watershed, the tipping-bucket rain gauge at the Bear Creek at Sand Hill Road station recorded 16.67 inches of rain in water year 2007, or 64 percent of the long-term mean annual precipitation of about 26 inches for the station location (Rantz, 1971).

We obtained the rainfall records for two index precipitation stations in the region, Mount Hamilton and the San Francisco Airport, from the California Data Exchange Center (CDEC). Water year 2007 precipitation at Mount Hamilton was also below normal at 83 percent of the long-term average values, while rainfall at the San Francisco Airport was 73 percent of the long-term average. The rainfall totals agree with our flow totals, which indicate that water year 2007 was much drier than water year 2006, and significantly drier than average.

## **4.3 Return Period of Peak Flows**

Even though we do not have a sufficient period of record to calculate the return period of water year 2007 peak flows at the stations that we monitor for this project, we can characterize the peak flows at the USGS gaging station on San Francisquito Creek (USGS number 11164500). The estimated peak flow for this station for water year 2007 as reported by the USGS is 483 cfs, which corresponds to a 1.32-year return period (76 percent chance of being exceeded in any year), based on the annual-peak series. This is significantly lower than the median peak flow of 1,560 cfs, which can be taken to approximate the 2-year return period (50 percent chance of being exceeded in any year).

#### 4.4 Unexplained Flow Surges

In fall 2006, we noted regular flow spikes in Bear Creek on weekend days, mainly during October and November (Appendix D), with flow increasing by about 0.3 cfs, or 135 gallons per minute. Specific conductance decreased by about 100 to 150 microsiemens ( $\mu\text{s}$ ) during the spikes, consistent with additions of water to the creek that were less saline than the background level of approximately 800 to 900  $\mu\text{s}$ . The temperature record was not discernibly affected by these spikes (Figure 13). The spikes may have increased dissolved oxygen levels slightly due to increased turbulence as the higher flows passed over riffles.

During June 2007, we recorded several brief sharp increases in flow for the Los Trancos Creek at Piers Lane station (Figures 5 and 6). The water temperature did not appear to be greatly affected. These spikes were also recorded at Balance's upstream Los Trancos Creek station at Arastradero Road.

In addition to the flow surges mentioned above, we continued to note significant abrupt changes in flow (mainly *dips* in flow) at the Bear Creek station that could be due to diversions. These changes are qualitatively consistent with operation of upstream diversions by California Water Service Company;<sup>6</sup> other diversions are known from the watershed, either directly from the channel or through replenishment of pumped ground water.

We have previously noted spikes of either high temperature, high salinity or both at all three of the monitoring stations.

#### 4.5 Creating a Record of Streamflow

We develop a record of streamflow in two steps. First, a record of water levels is compiled from the recorded electronic data and calibrated with field observations. Flow rates are then computed from the water levels using empirical equations developed specifically for each site from field measurements.

##### 4.5.1 Developing a record of water levels

The monitoring equipment at the Bear Creek at Sand Hill Road station and the San Francisquito Creek at Piers Lane station includes two pressure transducers, which measure water levels in

---

<sup>6</sup> Personal communication from Darin Duncan, California Water Service Co. to Marty Laporte, Stanford University, Utilities Division, May 26, 2006.

the creek at 15-minute intervals, and a Campbell Scientific CR10X datalogger to record the water-level data. The Los Trancos Creek at Piers Lane station is equipped with an ultrasonic sonar transponder connected to an American Sigma 950 flow meter and datalogger. Field measurements and observations at each station are used to calibrate the electronic record. Observations during site visits include: water level (or gage height) at the staff plate, high water marks, the presence of twig and leaf dams which may temporarily raise or lower water levels, signs of sedimentation or scour, and the specific conductance and temperature of the water (Tables 1 to 3).

During this year, as is typically done, we applied multiple stage shifts to the electronic water-level record to account for intermittent sedimentation, leaf dams and algae growth that affect the water-level elevation at the monitoring locations. We found that observed high-water marks corresponded well (usually within 0.2 to 0.3 feet) with the recorded water-level peaks, providing additional confidence in the stage record.

#### 4.5.2 Computing flows

Based on our periodic site visits, staff plate readings, and flow measurements (Tables 1 to 3), we create an empirical stage-to-discharge relationship (“stage-discharge rating curve”) for each gage. This rating curve is then applied to the electronic record of water levels measured by the pressure transducers (at BCSH and SFPL) and the sonar transponder (at LTPL).

At low flows, the sonar transponder values have a large amount of variation, up to about 0.3 feet per day. We consider most of this variation to be “noise” in the instrument reading that does not reflect actual changes in water levels, although a lower-amplitude (0.02-foot) diurnal pattern of water-level change is typically observed during low-flow periods. The flow record becomes particularly “noisy” at the 15-minute level of detail, which is why we present the data in daily form. Mean daily stream flow values appear to be fairly accurate because daily averaging removes most of the noise.

As with all other gaging of natural streams, some uncertainty remains (especially at high and low flows) in spite of efforts to be as precise as possible. Due to safety concerns and site limitations, we do not have manual stream flow measurements at the peak flow levels. The high end of the stage-discharge rating curves are defined by peak-flow estimates from water year 2006 (based on standard indirect peak-flow measurements made by cross-sectional and longitudinal surveys of high-water marks) (Owens and others, 2007).

## 5. WATER QUALITY SAMPLING APPROACH

Larry Walker Associates developed the water-quality monitoring plan for the two LTMAP stations at Piers Lane while under contract to the City of Palo Alto (LWA, 2001). Their Draft Surface Water Quality Monitoring Plan 2001/02, available from the City of Palo Alto, provides a complete description of the methods and protocols used in this study. Because the Bear Creek at Sand Hill Road stream gage is also part of the LTMAP study, the same protocols were used there as at the Piers Lane stations and results can be compared. Interested readers are referred to the water-quality monitoring plan for additional detail.

### 5.1 Timing of Sampling Visits

The hydrologic conditions during which a sample is taken are an important factor influencing the analyzed or observed values. For example, sampling baseflow in late August can be expected to provide very different results from sampling a first-flush event in October, or a mid-winter storm. The LTMAP monitoring program is designed to measure field parameters on each sampling visit and collect samples for ammonia, nitrate, phosphate, mercury, total and dissolved metals, and organophosphate pesticides four to five times annually. Sediment sampling occurs from fall through spring, when flows are sufficiently elevated to transport sediment, but not in summer.

### 5.2 Field Measurements and Laboratory Analyses

The focus of the study is on characterizing water quality in the two streams during both baseflow and storm periods, particularly with regard to those constituents potentially affecting fisheries and aquatic habitat conditions. Thus, the sampling plan includes a broad range of chemical constituents, and both total and dissolved constituent analyses:

#### Field Measurements

- streamflow (cubic feet per second, or cfs)
- specific conductance (microsiemens, or  $\mu\text{s}$  @ 25°C)
- water temperature (°C)
- dissolved oxygen (mg/L)
- pH
- qualitative remarks, for example, odors, color, clarity, (if noticeable), and anomalies

### Laboratory Analyses

- metals (aluminum, copper, lead, mercury, nickel, selenium, silver and zinc)
- organophosphate pesticides (diazinon and chlorpyrifos)
- nitrate-nitrogen and ammonia-nitrogen
- total phosphorus
- total hardness (needed to interpret metal toxicity)
- total suspended solids
- bedload sediment

### **5.3 Exceptions and Deviations from Proposed Methods**

Deviations almost inevitably occur in hydrologic studies, usually at very high or low flows, such as the responses necessary when a tree falls or other changes in the channel at the sampling location are encountered. Only the deviations for the Piers Lane stations are listed because no water-quality sampling was performed at the Bear Creek station in water year 2007.

During the sixth year of monitoring Los Trancos Creek and San Francisquito Creek at Piers Lane, we were unable to complete the following items as they were initially outlined in the project proposal:

- All five sets of composite water-quality samples were programmed as time-paced samples, rather than flow-paced samples. For the February 26 to 27 sampling date, the SFPL sampler was not properly programmed, so it did not collect a composite sample; we collected grab samples at the end of the sampling period for the analyses that would have been composite samples (Figure C6, Appendix C). We also collected an extra set of spring-storm samples on April 21 to 22 because the first spring storm that we sampled on April 11 to 12 was smaller than was forecast. As was done the previous water year, the dry-season samples collected in July 2007 were grab samples, rather than longer-duration composite samples. As befits summer conditions, this sample analysis was for a more limited set of constituents (ammonia- and nitrate-nitrogen; total phosphate; total hardness; dissolved metals).
- Prior reports noted that the original pH, dissolved oxygen and specific conductance probes at both stations worked intermittently or not at all due to the need for frequent cleaning, and that probe calibration was impeded due to constriction of the cables in the conduit leading from the enclosures to the stream. The latter problem was mostly alleviated by the February 2006 repairs, largely funded by the City of



Palo Alto Regional Water Quality Control Plant. The sampling tubes in the existing conduits were replaced and the probe cables were transferred to a second conduit reducing constrictions. Maintenance of the original pH and dissolved oxygen probes at both Piers Lane stations remains problematic, so these probes continue to perform poorly and the only available data on these parameters are from hand-held meters. The original specific conductance probe at the Los Trancos Creek station remains erratic but an additional probe installed in March 2007 worked well (Figure 8). The specific conductance (and temperature) probe installed at the San Francisquito Creek station performed well from October 2006 (when the sensor was lowered) until May of 2007 (Figure 10); performance since then has been intermittently erratic.

Recommendations for improving the monitoring program during water year 2008 and subsequent years are presented briefly in Chapter 7 below.

## 6. RESULTS AND DISCUSSION OF WATER QUALITY SAMPLING

This chapter includes a discussion of findings by individual constituent or constituent group. Results of manual measurements of specific conductance, temperature, pH, and dissolved oxygen are included in Tables 1 to 3. The specific dates when composite and/or grab water-quality samples were collected from San Francisquito Creek and Los Trancos Creek, the laboratory reporting limits<sup>7</sup>, and the analytical results are presented in Table 6. Results of suspended-sediment sampling during and between storms, used to estimate annual suspended-sediment yields, are presented in Table 8 (Bear Creek) and Table 9 (San Francisquito Creek and Los Trancos Creek). All laboratory reports are collected in Appendix A (Piers Lane stations). Detailed hydrographs showing the timing of sample collection at each station for various constituents during each of the water-quality sampling visits are graphically presented in Appendix C. Two periods of anomalous flow spikes are presented in Appendix D.

During the sixth year of operating the two Piers Lane stations, we collected time-paced composite water-quality samples on five occasions at the LTPL station and on four occasions at the SFPL station. Wet-season samples were collected on: December 26 to 27, 2006; February 8 to 10, 2007; and February 26 to 28, 2007. Spring-storm samples were collected on April 11 to 12, 2007 and April 21 to 22, 2007 to assess the effects of warming conditions and landscape fertilizer and pesticide applications on water quality. This year's dry-season baseflow sample was collected as a grab sample on July 11, 2007 and submitted to the laboratory for a more limited (focused) set of analyses. This baseflow samples were taken earlier in the season than in previous years because summer stream flows were lower, and we wanted the creeks to be flowing at the time the sampling occurred.

### 6.1 Water Quality Objectives

The San Francisco Bay office (Region 2) of the Regional Board regulates water quality in the Bay area in accordance with the Water Quality Control Plan or 'Basin Plan' (RWQCB, 1995). The Basin Plan includes both numeric and narrative water-quality objectives against which the LTMAP monitoring results in Table 6 are evaluated. The water-quality objectives for trace metals in the 1995 Basin Plan, for the South Bay below the Dumbarton Bridge and tributary streams which discharge into this portion of the Bay, were previously written as total

---

<sup>7</sup> Laboratory reporting limits varied due to the methods used and the amount of sample dilution required.

recoverable concentrations, rather than the more bioavailable dissolved concentrations of the metals, because they were established in 1986 preceding the U.S. EPA directive on aquatic life criteria for metals. Furthermore, the U.S. EPA ambient water-quality criteria for many metals have been updated since 1986 to incorporate more recent toxicity data and/or revisions to how the criteria were calculated.

To address these inconsistencies, the U.S. EPA criteria promulgated by the California Toxics Rule (CTR) included changes to the water-quality objectives for arsenic, cadmium, chromium, copper (fresh water only), lead, nickel, silver and zinc. The updated water-quality objectives were adopted by the Regional Board in 2004, approved by the U.S. EPA (Region 9) on January 5, 2005<sup>8</sup>, and are now included in the Basin Plan. Beginning with the water year 2005 report, tables presenting the water-quality monitoring results were modified to incorporate the new water-quality objectives for dissolved trace metal constituents into the Basin Plan objectives rather than showing them on separate lines.

We note that on August 9, 2006, the Regional Board adopted a new water-quality objective of 0.2 milligrams mercury per kilogram of fish tissue, replacing the acute (1-hour average) toxicity objective of 2.4 µg/L for total mercury and the chronic toxicity (4-day average) of 0.025 µg/L.

#### 6.1.1 Composite sampling effects on interpretation of acute-toxicity levels

When assessing the sample concentrations reported in this study, it is important to keep in mind that the composite samples are typically collected over periods of 12 to 36 hours, while the acute toxicity objective is a 1-hour average and the chronic toxicity objective is a 4-day or 96-hour average.

Particularly as regards the *acute* toxicity objective, concentrations in composite samples are likely to be significantly *lower* than the highest, short-term concentrations experienced by stream biota during the sampling period. One reason is simply that a high concentration in one aliquot is diluted by other aliquots of lower concentration, especially when the composite sampling interval includes a substantial period of baseflow prior to or following the storm (see Appendix C: sampling hydrographs). Additionally, exploratory sampling on Dry Creek during

---

<sup>8</sup> The Basin Plan amendment was previously approved by the State Water Resources Control Board on July 22, 2004, and by the California Office of Administrative Law on October 4, 2004.

the previous Bear Creek study (Owens and others, 2001) indicated that concentrations of many constituents (including copper) increase as flows rise and decrease as flows decline, such that concentrations of dissolved metals could vary by at least a factor of two over the course of a storm event. Finally, the effect of metals toxicity would be magnified by changes in hardness, which typically decreases with increased stream flow. As a result, when metals concentrations are highest, the hardness values would be lowest (and much lower than reported from the composite sample), increasing the effective toxicity at a given metals concentration.

Thus, a composite sample concentration equal to one-half the acute toxicity objective (1-hour period), such as occasionally occurred with dissolved copper in water year 2005 (see Owens and others, 2006), *may* indicate that the peak concentration actually exceeded that limit. For these constituents, synoptic grab sampling (multiple grab samples over the course of a single storm) and/or grab samples collected at the peak of multiple storms over a season, would be useful to better define the relationship between composite sample concentrations and acute water quality objectives.

#### **6.1.2 Composite sampling results compared to mid-storm grab samples**

As proposed above, during water year 2007 we collected mid-storm grab samples for dissolved metals analysis to compare with the results of composite samples collected during the same storms. The results, shown on page 2 of Table 6, are generally inconclusive except for dissolved copper concentrations, (one of the consistently high constituents in this watershed), which do show a pattern. For San Francisquito Creek, mid-storm copper concentrations were similar to or lower than concentrations in the composite samples. For Los Trancos Creek, mid-storm copper concentrations were equal to or higher than concentrations in composite samples on all five dates. We did not note a consistent pattern for dissolved nickel, selenium or zinc concentrations. Concentrations of dissolved lead and silver were below detection limits in both grab and composite samples on all sampling dates.

### **6.2 Specific Conductance**

Specific conductance values during water year 2007 were within the range of previous sampling results and are generally within the expected range for the San Francisquito watershed.

Occasional spikes and dips in specific conductance (along with changes in flow) are indicators of water additions of unknown origin (see section 4.4 and Appendix D).

Specific conductance, a widely used index for salinity or total dissolved solids (TDS), was measured in the field and recorded at field temperatures, then later converted to an equivalent value at 25°C according to the accepted relationship between specific conductance and temperature. The expected range of specific conductance in the San Francisquito Creek watershed is from about 100 to 2000  $\mu\text{s}$  (all values are normalized to 25°C). The lowest levels occur during storms, when flows are diluted with rain and fresh runoff. The highest levels are typically observed in early fall, when flows are lowest, prior to the onset of seasonal rains.

During water year 2007, specific conductance ranged from about 100 to 1,000  $\mu\text{s}$  (values from Figure 9) in Bear Creek (Table 1; Figure 9) and from about 200 to 1,400  $\mu\text{s}$  (values from Figure 10) in San Francisquito Creek (Table 3; Figure 10). Based solely on manual measurements, observed specific conductance ranged from about 180 to 2,000  $\mu\text{s}$  in Los Trancos Creek (Table 2, Figure 8). As was observed in previous water years, specific conductance was again typically lowest in Bear Creek and highest in Los Trancos Creek. Specific conductance levels in all three streams were at the higher end of the range in spring and summer of 2007, as would be expected during a relatively-low rainfall year.

Because we installed an additional specific conductance probe in Los Trancos Creek in March 2007, we were able to record some regular, sharp dips in the record during late August and early September (Figure 8). While the drops in specific conductance were not associated with any changes in streamflow, suggesting possible probe malfunction, the probe has otherwise performed normally.

### **6.3 Nitrogen**

As noted above, nitrogen has been identified as one of the potential pollutants affecting steelhead fisheries habitat in the San Francisquito Creek watershed, with possible sources including horse stables, fertilizers, yard waste, and failing residential septic systems. The most readily accessible forms of nitrogen in stream systems are typically nitrate ( $\text{NO}_3^-$ ) and ammonia ( $\text{NH}_3$ ), although relatively large amounts of nitrogen can be stored in both living and dead biomass (i.e., leaf litter). Ammonia is the form produced during decomposition of organic matter and is also common in fertilizers. When mixed with water, the majority of ammonia

quickly reacts to form the relatively harmless ammonium ion ( $\text{NH}_4^+$ ) which, due to its positive charge, is rapidly taken up by plants or microbially converted to nitrate. However, a small amount remains as un-ionized ammonia, which can be toxic to fish and aquatic invertebrates. The concentration of un-ionized ammonia increases with increased pH and water temperature above certain thresholds. Nitrate, in contrast, persists much longer in the environment and is more mobile in soil.

### 6.3.1 Ammonia-nitrogen

Ammonia-nitrogen was not detected on any of the six sampling dates during water year 2007.

In previous years, total ammonia concentrations have occasionally exceeded the detection limit of 0.2 mg/L, with 13 of 15 detections occurring during wet season sampling. While the Regional Board has not established a specific acute toxicity objective for ammonia, the calculated un-ionized ammonia fraction of the total ammonia concentration has typically remained below 10 percent of the 0.025 mg/L threshold for chronic (annual median) exposure to un-ionized ammonia cited in the Basin Plan (RWQCB, 1995), and the highest level attained was about 50 percent of the threshold.

### 6.3.2 Nitrate-nitrogen

Nitrate-nitrogen concentrations were at the low end of the range of previous sampling results during water year 2007 and also within the expected range for streams draining developed areas of the Santa Cruz Mountains.<sup>9</sup>

Nitrification is the process whereby ammonia-nitrogen ( $\text{NH}_3$ ) is microbially converted to nitrite ( $\text{NO}_2^-$ ), and then nitrate ( $\text{NO}_3^-$ ). The intermediate step occurs rapidly, so nitrite-nitrogen concentrations are usually very low or undetectable. Samples collected for nitrate analysis are usually preserved on ice and must be analyzed within 48 hours. However, timely delivery and processing of nitrate samples collected late in the work week and over weekends can be problematic because most laboratories are closed on weekends. To address this constraint, in recent years we often collect these samples in acidified bottles, extending the hold time to 28 days, and submit them to the laboratory for "nitrite plus nitrate" analysis. While we have listed

---

<sup>9</sup> For comparison, the Pajaro River Watershed Water Quality Management Plan (Applied Science and Engineering, 1999) reported that nitrate-nitrogen concentrations of 0.05 to 2.0 mg/L would be expected in "uncompromised" streams draining *undeveloped* (open-space) portions of the Santa Cruz Mountains.

this analysis separately in the water quality results tables, for practical purposes, we assume that virtually all of the nitrogen under the “nitrite plus nitrate” column is nitrate-nitrogen. In water year 2007, all samples for nitrate analysis were collected in unpreserved bottles and submitted to the lab within the required holding time.

Nitrate-nitrogen concentrations were detected in all three creeks on all dates sampled in water year 2007 at concentrations similar to or lower than values observed in previous years. Wet-season nitrate concentrations (as nitrogen) ranged from 0.05 to 1.7 mg/L in Los Trancos Creek, and from 0.31 to 0.63 mg/L in San Francisquito Creek. Dry-season nitrate concentrations were 3.2 mg/L in Los Trancos Creek and 1.1 mg/L in San Francisquito Creek. As observed in previous years, nitrate-nitrogen concentrations were higher in Los Trancos Creek on every sampling date except the April 11 to 12 sampling, where the value was anomalously low (0.05 mg/L).

Wet-season nitrate-nitrogen concentrations are generally expected to be highest during first-flush events early in the season, when sufficient runoff is present to flush accumulated nitrate into the stream but flows are below the threshold where nitrate concentrations become highly diluted by fresh runoff.

In past years, nitrate concentrations in Los Trancos Creek and San Francisquito Creek have tended to be highest during the first-flush and dry-season sampling events and much lower during larger mid-winter and spring storms. No obvious patterns were observed this year, perhaps because it was a dry year and all storms were small.

#### **6.4 Organophosphate Pesticides**

Diazinon and chlorpyrifos were not detected in any sample during water year 2007.

San Francisquito Creek is listed by the State Water Quality Control Board as being impaired by the common organophosphate pesticide, diazinon. As of December 31, 2004, the U.S. EPA banned sales of diazinon-containing outdoor, non-agricultural products in the United States in order to eliminate all residential uses of the insecticide. In the Bay Area, the Regional Board recently proposed a total maximum daily load (TMDL) that addresses diazinon (Johnson, 2004) in an effort to reduce pesticide-related toxicity in urban creeks. The TMDL process calls for

development of numeric targets that translate the current Basin Plan's narrative toxicity objective.<sup>10</sup> The Regional Board has proposed diazinon concentration targets of 0.05 µg/L (four-day average) and 0.08 µg/L (one-hour average), not to be exceeded more than once every three years.<sup>11</sup> These objectives were originally identified by the California Department of Fish and Game and are consistent with the federal antidegradation policy promulgated in the Code of Federal Regulations (Title 40, §131.12).

Concentrations of diazinon, and another common organophosphate pesticide, chlorpyrifos, were below the detection limit in both streams on all dates sampled in water year 2007 (Table 6). Neither pesticide was detected in samples from Los Trancos Creek and San Francisquito Creek in water years 2002 to 2006<sup>12</sup> nor from Bear Creek during water years 2004 to 2006. For comparison, during the Bear Creek water-quality study, diazinon was detected only once in three years, at 15.3 µg/L in October 2000, and chlorpyrifos was never detected in any sample.

## 6.5 Metals

Composite water quality samples collected from the three streams during the water year 2007 wet-season were analyzed for total and dissolved concentrations of eight metals commonly associated in part with urban and suburban development in the San Francisquito Creek watershed: aluminum, copper, lead, mercury, nickel, selenium, silver, and zinc. In addition, we collected grab samples for analysis of dissolved metals concentrations to better assess acute-toxicity levels (see Sections 6.1.1 and 6.1.2). The water year 2007 dry-season samples were collected as grab samples and submitted for analysis of a more limited suite of constituents (ammonia- and nitrate-nitrogen; dissolved metals; total phosphate and total hardness).

---

<sup>10</sup> Waters should remain free of toxics at concentrations lethal to or adversely impacting aquatic organisms (RWQCB, 1995).

<sup>11</sup> The proposed numerical standard is intended to apply only to the Clean Water Act Section 303(d) listing process methodology and does not revise water quality objectives. As described in the Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) list (California State Water Resources Control Board, 2004), the process by which a water segment is placed on or removed from the 303(d) list involves consideration of single or multiple lines of evidence and statistical evaluation of numeric water quality data. For example, a water segment can be listed if there are two or more exceedances in a set of up to 24 samples (for toxicants), or five or more exceedances in a set of up to 30 samples (for conventional pollutants). To be *delisted*, a water segment must have less than or equal to two exceedances in a set of 28 to 36 samples (for toxicants), or four or less exceedances in a set of 26 to 30 samples (for conventional pollutants).

<sup>12</sup> Samples collected for the Bear Creek water-quality study, and for the LTMAP study during water year 2002 and most of water year 2003, were analyzed for organophosphate pesticide content using a methodology with a detection limit of 0.5 µg/L. The LTMAP study began using a more sensitive methodology, with a detection limit of 0.05 µg/L, starting with the June 26, 2003 sampling.



### 6.5.1 Metals not detected

As in past years, almost all metals were detected in either the dissolved or solid form in all three streams on every sampling date (Table 6). The sole exception in water year 2007 was silver, which was not detected in either form in any of the three streams on any sampling date this year. In water years 2005 and 2006, silver was similarly not detected in Los Trancos Creek or San Francisquito Creek on any occasion; however, silver *was* detected in three samples from Bear Creek during water year 2005. This year (water year 2007), as in water year 2006, concentrations of dissolved lead, silver and zinc were all below the detection limit in the dry-season samples collected on July 11, 2007.

### 6.5.2 Dissolved vs. Total Metals

“Speciation” is the term that describes partitioning of the total load of a specific metal between the dissolved and particulate forms. Metals in the dissolved form are considered more readily available to aquatic organisms and therefore potentially more deleterious (see below). The fraction of the metal present in the dissolved form depends upon the pH of the water, the chemical properties of the metal, and the nature of the suspended solids that are present (Sansalone and Buchberger, 1997a, 1997b):

- At typical San Francisquito watershed baseflow pH levels of 7.5 to 8.5 (Tables 1 to 3), metals are generally more likely to adsorb onto particles, while lower pH levels during storm events favor the dissolved form (Paulson and Amy, 1993).
- Copper and lead are more likely to form complexes with sediments in the system and thus have a greater particulate fraction, whereas the majority of the total zinc is often in the dissolved phase (Characklis and Wiesner, 1997; Flores-Rodriguez and others, 1994).
- Higher suspended sediment or turbidity concentrations will increase the particulate metal fraction due to the greater number of sites available for adsorption. It is important to note that many metals have been shown to be associated with the smallest of the suspended particles (Dempsey and others, 1993; Sansalone and Buchberger, 1997a).

### 6.5.3 Hardness-dependent toxicity

As noted above, metals have been found to be less toxic to aquatic organisms when ambient hardness levels are higher. As a result, the U.S. EPA recently developed specific criteria for the dissolved form of selected trace metals. These criteria are hardness-dependent, since calcium

and magnesium (the primary components of hardness<sup>13</sup>) act to buffer metal toxicity. The criteria were adopted in California through the California Toxics Rule (CTR) and have been incorporated into Basin Plan documents by the nine Regional Boards.

Total hardness in Los Trancos Creek and San Francisquito Creek during water year 2007 was similar to values observed in previous years. In general, hardness is slightly higher in Los Trancos Creek than in San Francisquito Creek (Table 6). Hardness generally decreased as streamflow increased, reflecting reduced contributions of ground water relative to surface runoff during storms. Thus, hardness levels in water year 2007 were lowest during the late-winter (Feb. 26 to 27, 2007) storm samplings and highest during the mid-summer, dry-season sampling.

The CTR states that "For purposes of calculating freshwater aquatic life criteria for metals . . . [f]or waters with a hardness of over 400 mg/l as calcium carbonate, a hardness of 400 mg/l as calcium carbonate shall be used . . ." Thus, the range of regulatory values shown in Table 6 for the five hardness-dependent trace metals sampled as part of the LTMAP program are calculated for the range of 100 to 400 mg/L as CaCO<sub>3</sub>. These water quality objectives are presented separately in Table 7 for hardnesses of 100 to 400 mg/L. At the hardness levels typically observed in the three creeks during the dry season (>250 mg/L as CaCO<sub>3</sub>), the potential toxicity of trace metal ions is low.

#### 6.5.4 Aluminum

Aluminum concentrations were on the low end of previous sampling results during water year 2007. The Regional Board has not established acute or toxicity objectives for this constituent but concentrations of aluminum in both forms were similar to published values for aluminum concentrations in surface waters in natural streams of the United States (Hem, 1985), which include contributions from urban sources.

In both creeks, *total aluminum* concentrations were high in samples collected during the storm events on Dec. 26 to 27, 2006 and Feb. 26 to 27, 2007 (Table 6). This is not unexpected since aluminum is a major naturally-occurring component of the silts and clays that largely comprise

---

<sup>13</sup> The convention is to express total hardness in terms of an equivalent concentration of calcium carbonate (CaCO<sub>3</sub>).

suspended sediment<sup>14</sup>, and suspended sediment concentrations were as high on these dates (Table 9). Total aluminum was not analyzed in the water year 2007 dry-season samples.

*Dissolved aluminum* concentrations were low or non-detectable during the wet season, similar to values observed in previous years. Dry-season samples were not analyzed for aluminum content in water years 2006 or 2007. However, in previous years, dissolved aluminum concentrations in dry-season samples from all three streams have typically been below the detection limit of 10 µg/L.

### 6.5.5 Copper

Dissolved copper concentrations were high in water year 2007 wet-season *composite* samples. This finding suggests that at some point during the storm event, dissolved copper concentrations in the stream may actually have exceeded aquatic acute toxicity levels established by the Regional Board. Mid-storm grab samples collected from both Los Trancos Creek and San Francisquito Creek were analyzed for dissolved metals concentrations in an attempt to answer this question. For Los Trancos Creek, but not San Francisquito Creek, results showed that mid-storm copper concentrations were equal to or higher than concentrations in composite samples on all five dates.

Sources of copper in the San Francisquito Creek watershed include dust from vehicle brake pads, automotive fluids, wash waters, architectural building materials, and geologic sources. During the water year 2007 wet season, *total copper* concentrations in both streams ranged from 2.7 to 29 µg/L (Table 6), similar to or lower than values measured in previous years. The highest concentration in each stream occurred on different dates. Total copper concentrations in both streams were lowest in samples from the April 11 to 12, 2007 sampling event, which was the smallest wet-season flow that we sampled. Total copper concentrations were not analyzed in dry-season samples.

Concentrations of *dissolved copper* in wet-season samples from both streams ranged from 2.3 to 7.0 µg/L during water year 2007 (Table 6). Concentrations were similar to those previously measured at all three stations for the LTMAP program, and at the Sand Hill Road station during the earlier Bear Creek study (1.8 µg/L to 9.9 µg/L). In Los Trancos Creek, the highest values

---

<sup>14</sup> The acid digestion performed for total metal analysis also typically releases a much larger amount of the mineral than is naturally present in the stream.

were consistently measured in samples collected as grab samples rather than composite samples. In San Francisquito Creek, the highest values were measured during the Dec. 26 to 27, 2006 and Feb. 26 to 27, 2007 storm events. Wet-season dissolved copper concentrations were lowest in both streams during the small event sampled on April 11 to 12, 2007. Dry-season samples from all three streams had much lower dissolved copper concentrations and values were similar to those observed in previous years.

More than most streams draining to San Francisco Bay, geologic sources of copper may be contributing to the levels observed in the San Francisquito channels. Copper tends to be present at higher-than-usual concentrations in basic volcanic rocks (such as the Mindego or Franciscan volcanics which occur in the Los Trancos and San Francisquito sub-watersheds) or in sediments derived from them (such as the Purisima, and to a lesser extent, the Butano and Santa Clara formations found in all three sub-watersheds). Isolated exceedances have been reported in wells and streams drawing from most of these formations in other watersheds<sup>15</sup>.

We note that while wet-season dissolved copper concentrations were below the acute and chronic toxicity objectives in all of the water year 2007 composite *and* mid-storm grab samples, during wet years, peak dissolved copper concentrations in the streams might exceed the acute toxicity threshold during some portion of the sampling interval for the reasons discussed above in Section 6.1.1. As discussed in Section 6.1.2, mid-storm grab concentrations of dissolved copper in Los Trancos Creek (but not San Francisquito Creek) were generally higher than the values for composite samples. Given these mixed results, additional sampling would be helpful to further explore this line of reasoning and sources of dissolved copper.

#### 6.5.6 Lead

Lead concentrations were within the range of previous sampling results during water year 2007 and, when detected, dissolved lead concentrations were well below the aquatic acute and chronic toxicity thresholds established by the Regional Board.

*Total lead* concentrations in water year 2007 samples ranged from non-detectable to 4 µg/L (Table 6). Concentrations in samples from Los Trancos Creek and San Francisquito Creek were similar to or lower than those observed in wet-season samples during previous years. The

---

<sup>15</sup> For more detail on geologic sources of trace metals in the San Francisquito watershed, see Appendix C of the WY2003 LTMAP monitoring report (Owens and others, 2004).

highest concentration observed this year (4 µg/L) was in a composite sample collected from Los Trancos Creek during the Dec. 26 to 27, 2006 event. For comparison, the highest total lead concentration over the period of record is 30 µg/L measured in Los Trancos Creek during a much larger storm on Dec. 13 to 15, 2002 (water year 2003). Total lead concentrations were not analyzed in dry-season samples in water years 2006 or 2007 but in previous years levels were generally below the detection limit in dry-season samples from all three streams.

*Dissolved lead* was not detected in any sample from either stream during water year 2007. For comparison, in the earlier Bear Creek study, wet season concentrations of dissolved lead ranged from 2.6 to 8.4 µg/L in grab samples from stations in the Dry Creek watershed, which receives runoff from Highway 280.

The predominant source of lead in the watershed is probably residues from leaded gasoline, bound to organic matter or soil near roads and highways, and transported in urban runoff. Lead concentrations were non-detectable in samples from stations in other watersheds monitored during the same study. Lead is rarely reported from streams or wells in the region where human influences are minimal, and does not seem to have a significant or discernible geologic source in the San Francisquito watershed, although likely present in trace quantities.

#### 6.5.7 Mercury

All mercury data are from grab samples. As was also observed in water years 2005 and 2006, total mercury concentrations in water year 2007 samples regularly approached or exceeded the recently-superseded Regional Board chronic (4-day average) standard of 0.025 µg/L. Total and dissolved mercury concentrations in samples collected through the LTMAP program have never approached the former aquatic acute (1-hour average) standard of 2.4 µg/L.

Mercury is of increasing concern locally, as studies document remobilization of mercury from natural ore bodies, notably near New Almaden, plus adjoining areas. Mercury levels are also elevated in sediments deposited in San Francisco Bay during the hydraulic gold-mining era. The element is characterized by bioconcentration in fish and waterfowl once inorganic mercury is biomethylated by microbes. Methylmercury, an organic compound produced by microbial transformation of elemental mercury under anoxic conditions, generally increases (bioaccumulates or biomagnifies) with each step up the food chain. Because methylmercury is a potent neurotoxin that impairs the nervous system, the state of California has issued fish

consumption advisories for mercury in about 20 water bodies and the San Francisco Bay-Delta region. In addition, on August 9, 2006, the Water Board adopted a Basin Plan amendment including a revised TMDL for mercury in San Francisco Bay, two new water quality objectives (based on fish tissue concentrations), and an implementation plan to achieve the TMDL. Approval by the State Water Resources Control Board is pending.

*Total mercury* concentrations in water year 2007 samples ranged from 0.0017 to 0.13 µg/L in San Francisquito Creek, and from 0.0019 to 0.035 µg/L in Los Trancos Creek (Table 6). Wet-season concentrations in both streams were similar to or lower than values observed in previous seasons. Total mercury concentrations in both streams approached or exceeded the former Regional Board chronic (4-day average) standard of 0.025 µg/L in samples collected during the storm events of December 26 to 27, 2006, and February 8 to 10 and April 21 to 22, 2007. Total mercury concentrations were not analyzed in dry-season samples in water years 2006 or 2007 but in previous years, concentrations in dry-season samples have been well below all toxicity standards.

*Dissolved mercury* concentrations in samples from both streams ranged from 0.0006 to 0.0030 µg/L during water year 2007, similar to or lower than values measured in previous years, and well below the regulatory standard. The highest concentrations in all three streams were measured in samples collected during the February 26 to 27, 2007 storm event. Dissolved mercury concentrations were not analyzed in dry-season samples in water years 2006 or 2007. However, the lowest wet-season dissolved mercury concentrations, in samples from the April 10, 2007 event, were similar to levels in dry-season samples collected from these streams in water years 2003 to 2005.

#### 6.5.8 Nickel

Nickel concentrations were within the range of previous sampling results during water year 2007 and dissolved nickel concentrations were well below the aquatic acute and chronic toxicity thresholds established by the Regional Board.

*Total nickel* concentrations in wet-season samples from Los Trancos Creek and San Francisquito Creek ranged from 2.9 to 18 µg/L in water year 2007 (Table 6), similar to or lower than values measured in previous years. Total nickel concentrations in these two streams were high during the Dec. 26 to 27, 2006 and the Feb. 26 to 27, 2007 storms, and lower in samples when

streamflows were lower. Total nickel concentrations were not analyzed in dry-season samples in water years 2006 or 2007 but concentrations of this constituent have been low in dry-season samples from all three streams in previous years.

*Dissolved nickel* concentrations ranged from 2.3 to 14.0 µg/L in Los Trancos Creek during water year 2007, and from 2.6 to 3.8 µg/L in San Francisquito Creek. The value of 14 µg/L in the composite sample collected from Los Trancos Creek during the storm of February 8 to 10, 2007 is the highest concentration found during the period of record. The highest dissolved nickel concentration sampled from San Francisquito Creek this year was measured during the Dec. 26 to 27, 2006 event. Dissolved nickel concentrations in the water year 2007 dry-season samples from San Francisquito Creek and Los Trancos Creek were lower than those measured during previous dry-season sampling. All values were far below acute and chronic toxicity objectives for dissolved nickel established by the Regional Board.

#### 6.5.9 Selenium

Selenium concentrations were within the range of previous sampling results during water year 2007 and total and dissolved selenium concentrations were well below the aquatic acute and chronic toxicity thresholds established by the U.S EPA.

For all water year 2007 wet-season sampling events, *total selenium* concentrations ranged from non-detectable to 0.2 µg/L in Los Trancos Creek, and from 0.2 to 0.4 µg/L in San Francisquito Creek (Table 6). Concentrations in both streams were similar to or lower than those measured in previous years. Total selenium concentrations were not analyzed in dry-season samples in water years 2006 or 2007 but in previous years, levels have generally been in the lower half of the range. All concentrations were far below the U.S. EPA (National Toxic Rule) aquatic acute toxicity objective of 20 µg/L and the chronic toxicity objective of 5 µg/L.

*Dissolved selenium* concentrations in both streams ranged from non-detectable to 0.4 µg/L in water year 2007, following no identifiable trend but similar to values measured in previous years. All values were far below acute and chronic toxicity objectives for dissolved selenium established by the U.S. EPA. Selenium concentrations were not analyzed in the Bear Creek study but these concentrations are within the background range expected for this element, which is present in trace concentrations within rocks throughout the watershed.

#### 6.5.10 Silver

Silver, in either the total or dissolved form, was not reported above the detection limit in any sample during water year 2007.

In previous years, *dissolved* silver was detected on three occasions in Bear Creek in water year 2005, once in Los Trancos Creek in water year 2004, and once each in Los Trancos Creek and San Francisquito Creek in water year 2003. The highest concentration observed (0.3 µg/L) was only slightly higher than the detection limit of 0.2 µg/L. The Regional Board has not established acute or chronic toxicity standards for silver. However, the Regional Board has established an aquatic instantaneous maximum value for dissolved silver.

#### 6.5.11 Zinc

Zinc concentrations were within the range of previous sampling results during water year 2007 and dissolved zinc concentrations were well below the aquatic acute and chronic toxicity thresholds established by the Regional Board.

Zinc tends to be substantially more abundant and more soluble than other trace metals. In general, as with other metals, one would expect higher *total zinc* concentrations at high flows, when streams are transporting elevated loads of suspended sediment, and this is the pattern which has been observed on Los Trancos Creek and San Francisquito Creek in previous years. In water year 2007, total zinc concentrations in wet-season samples varied from non-detectable to 30 µg/L on San Francisquito Creek, and from non-detectable to 37 µg/L on Los Trancos Creek (Table 6), with values generally similar to or lower than concentrations observed during past years. This year, the highest concentrations observed in San Francisquito Creek occurred in samples from the Dec. 26 to 27, 2006 storm, while the highest concentrations in Los Trancos Creek were in samples collected during the Feb. 26 to 27, 2007 event. Dry-season samples were not analyzed for total zinc concentrations in water years 2006 or 2007 but in previous years, concentrations in most samples have generally been less than 10 µg/L.

During water year 2007, wet-season *dissolved zinc* concentrations in both streams ranged from non-detectable to 28 µg/L (Table 6), similar to or lower than levels measured in previous years. Dissolved zinc concentrations did not show a trend of higher concentrations with increasing streamflows, as was observed during water years 2003 and 2004. Dissolved zinc concentrations in dry-season samples from both streams were below the detection limit, as in water years 2006



and 2004. Dissolved zinc concentrations in all samples were well below the acute and chronic toxicity objectives for dissolved zinc established by the Regional Board. Both local geologic formations<sup>16</sup> and anthropogenic sources, such as road runoff and galvanized architectural materials (e.g., roofs, fencing, gutters), likely contribute to observed dissolved zinc levels.

## **6.6 Water Temperature**

Water temperatures during water year 2007 were within the range of previous measurements.

### **6.6.1 Water temperature affects fish**

Water temperature strongly affects steelhead habitat. Although steelhead can withstand high water temperatures of 29°C for a short period of time, and 25°C for longer periods, they have progressively-increasing difficulty extracting dissolved oxygen from water at temperatures above 21°C (Lang and others, 1998) and require a larger food source to sustain their elevated metabolism (Smith, pers. comm.). Therefore, water temperatures of 21°C and below are considered to provide adequate summer habitat, and values chronically above 25°C are likely not viable for the local steelhead population.

### **6.6.2 Temperature monitoring probes**

Each of the three stations includes one or two in-stream probes that continuously record water temperatures. Manual temperature measurements during water year 2007 site visits followed the same seasonal pattern and values recorded by the in-stream probes (Figures 11 to 13). Water temperatures were within the reported acceptable range for steelhead habitat during the water year 2007 season, despite the below-average flows which could have increased the potential for high stream temperatures.

### **6.6.3 Temperature differences between creeks**

As observed in the five previous years (WY2002 to WY2006), water temperatures in San Francisquito Creek (Figure 11) appeared to be slightly warmer than in Los Trancos Creek

---

<sup>16</sup> Elsewhere in the Santa Cruz Mountains, zinc and cadmium are reported in elevated concentrations in both waters and sediment emanating from portions of the Monterey formation and the lower Purisima formation (c.f., Ricker and others, 2001; also, see Majmundar, 1980). Both units outcrop in portions of the San Francisquito and Los Trancos sub-watersheds (Balance Hydrologics, 1996). Both formations are also known geologic sources of phosphate.

during the dry season (Figure 12). Dry-season temperatures in Bear Creek (Figure 13) were similar to Los Trancos Creek and cooler than in San Francisquito Creek.

## 6.7 pH

pH values during water year 2007 were within the range of previous measurements. This parameter is not considered to be a management concern.

As stated above in Section 5.3, the pH probes at the two Piers Lane stations were essentially non-functional in water year 2007, so this parameter was measured regularly using hand-held meters. A continuous record of pH at the Bear Creek station during water year 2007 is available, supplemented by manual measurements. pH varied from 7.4 to 8.4 in Bear Creek (Table 1, Figure 14), from 7.2 to 8.6 in Los Trancos Creek (Table 2, Figure 14), and from 7.6 to 8.6 in San Francisquito Creek (Table 3, Figure 14). pH values were similar to measurements from previous years and, once again, pH was typically slightly higher in Los Trancos Creek than in the other two streams on both dry- and wet-season sampling dates.

We note that fisheries biologists familiar with the northern Santa Cruz Mountains and San Francisco Peninsula streams have found that pH is very rarely a limiting factor in regards to steelhead habitat, so long as there is flow moving from pool to pool.

## 6.8 Dissolved Oxygen

Dissolved oxygen concentrations were occasionally low during late summer and fall, which may be limiting for biota.

As stated above in Section 5.3, the dissolved oxygen probes at the Los Trancos Creek and San Francisquito Creek stations were essentially non-functional in water year 2007 and the dissolved oxygen probe at the Bear Creek station also performed poorly. Dissolved oxygen concentrations in Bear Creek (Table 1, Figure 15) varied between 67 and 94 percent of saturation. Based solely on manual measurements, water year 2007 dissolved oxygen concentrations varied between 76 and 100 percent of saturation in Los Trancos Creek (Table 2, Figure 16) and between 26 and 94 percent of saturation in San Francisquito Creek (Table 3, Figure 17). As reported in previous years, dissolved oxygen concentrations were typically highest in Los Trancos Creek, and higher in Bear Creek than in San Francisquito Creek.

Concentrations decreased during summer months in all three streams, when water temperatures were high, streamflow was low, and there was little turbulence. Concentrations in Bear Creek and to an even greater extent in San Francisquito Creek, dropped even lower during the early fall months of 2006 and 2007, when dead leaves blown into the creek had begun to rot but were not yet flushed downstream by high flows from winter storms.

As noted in our WY2003 report (Owens and others, 2004), manual measurements of dissolved oxygen can vary considerably depending upon where in the creek the probe is placed, with values ranging from about 15 to 60 percent saturation at locations as little as one foot apart. This situation is particularly common in the fall, when the streams are full of dead leaves. Based on our monitoring data to date, we expect dissolved oxygen concentrations in all three creeks to range from 10 to 14 mg/L (90 to 100 percent saturation) during the winter and especially at high flows, when turbulence and cold ambient water temperatures promote oxygen saturation. Dissolved oxygen concentrations become more limiting for fish as streamflows decrease and temperatures rise in spring and summer, with the lowest concentrations occurring in the fall, at the start of the next water year but before rains raise water levels and flush leaves from the creeks.

## **6.9 Sediment**

Sediment totals for water year 2007 were low compared to totals from previous years, and especially low (1 to 2 percent) compared to water year 2006. This was due to the low total flow and the lack of any large peak flows. Sediment concentrations during water year 2007 were within the range of previous sampling results.

San Francisquito Creek is listed by the State Water Resources Control Board as impaired due to sediment loading. All creeks carry some sediment; problems can arise when creeks carry too much sediment. Biologically, too much fine sediment can reduce oxygen circulation to buried eggs, abrade fish gills, fill hiding and resting niches and impede post-storm feeding. Too much coarse sediment affects bed conditions in a number of ways that can constrain steelhead habitat, including filling pools and undercut banks, creating 'soft' beds that are prone to scour, and forming mid-channel bars that divert flows into the banks, inducing bank erosion. Excess coarse sediment can also settle out at low-gradient locations, reducing pool depths and decreasing the flood capacity of the channel.

Monitoring sediment concentrations and rates of sediment transport is important as a way of evaluating the amount of sediment being carried by the creek, to assess the mobility of spawning gravels and document changes that may signal improving or worsening conditions. Previous Balance reports have documented rates of sediment transported in various watersheds upstream from Piers Lane (c.f., Balance Hydrologics, 1996; Owens and others, 2001; Owens and Hecht, 2002), as well as the role of Searsville Lake in trapping sediment and the contributions from different geologic formations. Staff of the U.S. Geological Survey previously made measurements of suspended sediment at the long-term gage at the golf course (Brown and Jackson, 1973). In this watershed, we have observed a number of sources, both natural (e.g., bank failure, landslides) and human-caused or human-exacerbated (e.g., failure of culvert outfalls, construction erosion control measures, bank protection). Detailing these sources, however, is beyond the scope of this report.

Following convention, we distinguish two types of sediment in transport, each of which is measured during storms using specific types of samplers and sampling methods. Suspended sediment is supported by the turbulence of the water and is transported at a velocity approaching the mean velocity of flow. In the San Francisquito Creek watershed, as elsewhere in the Santa Cruz Mountains, suspended sediment consists primarily of fine sands, silts, and clays. Bedload sediment is supported by the bed of the stream; it rolls and saltates along the bed, commonly within the lowermost 3 inches of the water column. Movement can be either continuous or intermittent, but is generally much slower than the mean velocity of the stream. At the Piers Lane stations and in the Bear Creek watershed, bedload consists primarily of coarse sands and gravels, but will also include cobbles at extreme high flows. Total sediment discharge is the sum of bedload-sediment and suspended-sediment discharges.

### 6.9.1 Suspended sediment

Suspended-sediment samples were collected from all three stations throughout the water year at various dates and levels of flow (Table 4) using standard methods and equipment adopted by the Federal Interagency Sedimentation Program (FISP: see Hecht, 1983). All grab samples were analyzed by Soil Control Laboratories of Watsonville, California, a state-certified laboratory. Composite samples were analyzed at the Regional Water Quality Control Plant in Palo Alto and these results are also shown in Table 6 under the heading "Total Suspended Solids". No suspended-sediment samples were collected when stream waters were visibly clear. From past experience, we have found that samples collected when the streams are clear produce no useful information because they test below the analytical reporting limit.

By multiplying the reported suspended-sediment concentrations by the streamflow at the time the sample was taken, concentrations (mg/L) were converted into an instantaneous suspended-sediment “load” (tons/day), as shown in Tables 8 and 9. We then plotted sediment load as a function of streamflow to create suspended-sediment rating curves describing the general trend of the data points for each creek (Figures 18 and 19). We also applied the suspended-sediment rating curves to the records of streamflow (at 15-minute intervals) to calculate a total annual suspended-sediment load for each creek (Forms 4 to 6). Interpretation of suspended-sediment rates and total loads is discussed in Section 6.9.3 below.

### 6.9.2 Bedload sediment

The *Draft Surface Water Quality Monitoring Plan 2001/02* (LWA, 2001) does not include consideration or protocols for measurements of bedload-sediment transport. At all three LTMAP gaging stations discussed in this report, the threshold for significant bedload transport occurs at flow depths and velocities that border on being too deep to sample safely by wading. However, through the close of water year 2007, we have occasionally been successful in measuring bedload transport at the Bear Creek station and at the Los Trancos Creek station at Piers Lane. A greater emphasis on collecting bedload sediment transport data may develop as the LTMAP matures, as bed conditions tend to be an important constraint to anadromous fish populations in the Santa Cruz Mountains, and bedload monitoring is one effective way of characterizing them (Hecht and Enkeboll, 1980; Roques and Angelo, 2004; Hecht and Owens, 2006).

Although we have only a limited number of bedload-sediment measurements on Bear Creek and on Los Trancos Creek at Piers Lane (as compared to the number of suspended-sediment samples), we have constructed bedload rating curves for those stations (Figures 18 and 19). Bedload samples are converted to a discharge rate (in units of tons per day) and then plotted as a function of flow. As expected, sediment discharge increases as flow increases. We also applied the bedload rating curve to the record of streamflow (at 15-minute intervals) to calculate annual bedload totals for Bear Creek (Form 4 and Table 4) and Los Trancos Creek (Form 5 and Table 4). Interpretation of bedload-sediment rates and total loads for these two stations is discussed in Section 6.9.3 below.

### 6.9.3 Sediment discussion

Suspended-sediment rating curves for both San Francisquito and Los Trancos Creeks were similar to those produced for the previous year, while at Bear Creek, the suspended-sediment rating curve was the same as last year.

Comparison of the suspended-sediment rating curves for the Los Trancos Creek and San Francisquito Creek at Piers Lane stations (Figure 18) with the rating curve for the Bear Creek station (Figure 19) shows that Los Trancos Creek generally carries higher suspended-sediment loads at a given flow than San Francisquito Creek or Bear Creek. Higher rates of transport in *tributary* streams at a given flow is a typical condition and nearly universal throughout the Bay Area (c.f., Hecht, 1983), since tributary watersheds tend to be steeper and more subject to erosion due to higher flow velocities. In addition, suspended-sediment concentrations in San Francisquito Creek are diluted by outflows from Searsville Lake, which traps a large proportion of the sediment load from tributary streams higher in the watershed. We compared the sediment rating curve for Bear Creek to rating curves of other creeks that we monitor in the watershed, and found that sediment-discharge rates (as a function of flow) for Bear Creek are lower than rates for Corte Madera or Los Trancos Creeks.

It is important to note that storm flow in San Francisquito Creek is typically at twice the rate as flow in Bear Creek<sup>17</sup>, and usually three to five times greater than flow in Los Trancos Creek (Figure 2), so San Francisquito Creek still transports more sediment load. This is evident in the annual sediment summaries (Forms 4 to 6), which show that the calculated total suspended-sediment load in San Francisquito Creek was about 670 tons in water year 2007, compared to about 130 tons in Bear Creek and 37 tons in Los Trancos Creek. The suspended-sediment total for San Francisquito Creek seems to us to be a little high: we calculated the suspended-sediment total flowing out of Searsville Lake to be approximately 80 tons, and the San Francisquito total should be a little larger than the summation of the Searsville and Bear Creek totals.

---

<sup>17</sup> The relationship between flow at the Bear Creek at Sand Hill Road station and flow at San Francisquito Creek at Piers Lane varies seasonally with the amount of outflow from Searsville Lake. Typically, differences in flow between the two sites are smaller at the start of the wet season, when the water level in the lake is below the spillway. Later in the wet season, differences are greater once the lake begins to spill freely.

Sediment discharge rates at each of the stations show a strong dependence on flow at the time of the measurement; when flow is higher, the creeks carry more sediment. Therefore, sediment totals for each stream also vary from year to year depending on the amount of rainfall and the size of the largest flood peak (Table 4). This concept of “episodicity” is useful for interpreting the sediment measurements within the context of the inter-annual variability in climate conditions. Rather than trying to calculate an average sediment discharge per year, we acknowledge that there will be large year-to-year variability in sediment discharge.

#### 6.9.4 Assessed bias of automated suspended-sediment sampling (excerpted from the WY2004 monitoring report)

[**Note to Readers:** the subsection below from the WY2004 report is included herein because the test and the results may inform readers who seek to interpret the suspended sediment data presented in this report.]

The standard method for sampling suspended sediment is to use an isokinetic sampler to collect a depth- and width-integrated sample (Porterfield, 1972; Edwards and Glysson, 1999). Depth integration is important because the concentration of suspended sediment increases from the stream surface downwards to the bed. We typically use a DH-48 hand-held sampler to collect equal-transit-rate<sup>18</sup> sub-samples at multiple verticals across the width of the creek. We wanted to assess the degree of bias associated with using an automated sampler to collect suspended sediment samples, because the automated sampler does not have an isokinetic intake, instead, it draws the sample from a fixed point, and creates a composite sample from which a sub-sample is decanted and analyzed. However, by subsampling from the stream at regular intervals (time-paced sampling) or from pre-set volumes of flow (flow-paced sampling), the automated sampler can theoretically produce a more accurate representation of suspended sediment transport during the entire course of a particular storm event than is possible from one or two manually-collected grab samples.

The initial tests<sup>19</sup> reported below were conducted in the early afternoon of February 18, 2004. Streamflow in Bear Creek, which had peaked at about 499 cfs at about 5 AM that morning, had

---

<sup>18</sup> Equal-transit-rate (ETR) means that the sampler is lowered and raised at a constant rate at a particular vertical point on a transect across the width of the creek, then moved to the next point where the process is repeated.

<sup>19</sup> We still intend to conduct at least two more tests of a similar nature when conditions are appropriate before drawing any firm conclusions.

decreased to approximately 185 cfs in early afternoon and was falling slowly while we collected the set of samples for this test. The four types of samples used in this analysis are:

- “composite” - We pumped about 8 liters of creek water into a bucket using the ISCO or Sigma sampler; the sample was then swirled and mixed and a sub-sample was decanted into a bottle.
- “direct pump” – We used the ISCO or Sigma sampler to pump water directly from the creek into a bottle.
- “at intake” – We plunged a DH-48 hand-held sampler from the surface to the approximate location of the sampler intake near the streambed and held it there for about 15 seconds, then quickly raised it out of the water and poured the sample into a bottle.
- “depth-integrated” – We used the DH-48 to collect depth-integrated sub-samples at three verticals across about half the width of the creek; the sample was then poured from the DH-48 into a bottle.

The samples were collected in the order listed above, and all within a time span of ten minutes. The sample bottles used were identical 500-milliliter polyethylene bottles. All samples were sent to the same analytical laboratory (Soil Control Lab) and analyzed using identical methods. The results, detailed in Table 9 of the WY2004 report and discussed below, are consistent with our understanding of the limitations of different methods for sampling suspended sediment. For each type of sample, we present the suspended sediment concentration reported by the laboratory and the resulting suspended-sediment load for a 24-hour period:

- “composite” = 276 mg/l = 135 tons/day – This is the lowest value and probably reflects settling-out of the heaviest particles during the interval (a few seconds) between completion of mixing and decanting the sub-sample from the composite vessel into the sample bottle.
- “direct pump” = 350 mg/l = 171 tons/day – This is the highest value and probably reflects the high sediment concentrations near the bottom of the water column, where the intake is located. The shape of the intake port and the resulting intake velocities could also be influencing the results.
- “at intake” = 331 mg/l = 161 tons/day – This value is relatively high but slightly lower than the value from the “direct pump” test, perhaps due to an influx of water as the DH-48 sampler was being lowered and raised through the water column above the intake location.



- “depth-integrated” = 308 mg/l = 150 tons/day – Because this sample was manually collected using standard methods, it is the standard for comparison of the other types of samples collected.

Based on the results of this initial test, the sub-sample from the composite bottle under-represented suspended-sediment concentrations in the creek by about 9 percent, as compared to the depth-integrated sample, even though the sample collected through the automated sampler over-represented suspended-sediment concentrations by about 14 percent. While it appears that the two effects partially offset each other in this first test, additional test results will give us more confidence in our interpretation. Furthermore, we expect the results of the sampling techniques to differ depending on the flow level at which the test is conducted, since the relative fractions of the different sediment size classes mobilized will differ with stream flow.

## 7. FUTURE MONITORING AND RECOMMENDATIONS

The following recommendations are offered for consideration by the LTMAP working group based on our experience and observations since inception of monitoring:

1. We plan to monitor flow and sediment during water year 2008, but will not sample water quality at any of the three sites. Our focus will continue to be on monitoring first-flush storms in late fall and early winter, larger less-frequent mid-winter storms, a spring storm, and one non-storm (baseflow) sampling in late summer. Due to budget constraints, no water quality sampling other than occasionally collecting sediment grab samples will occur at the Bear Creek at Sand Hill Road station next year. However, the gaging program at this site will be maintained at a minimal (baseline) level that will still provide valuable data on streamflows.
2. Balance has been and is working with Stanford University and Regional Water Quality Control Board staff to develop useful metrics to evaluate sediment conditions in the creeks of the San Francisquito watershed. This effort could potentially enhance the current LTMAP monitoring program through application of new tools and a wider range of monitoring methods focused on sediment conditions as they relate to stream biota and habitat.

## 8. LIMITATIONS

Analyses and information included in this report are intended for use at the watershed scale and for the planning and long-term monitoring purposes described above. Analyses of channels and other water bodies, rocks, earth properties, topography and/or environmental processes are generalized to be useful at the scale of a watershed, both spatially and temporally. Information and interpretations presented in this report should not be applied to specific projects or sites without the expressed written permission of the authors, nor should they be used beyond the particular area to which we have applied them. Balance Hydrologics, Inc. should be consulted prior to applying the contents of this report to evaluating water supply or any out-of-stream uses not specifically cited in this report.

Readers who have additional pertinent information, who observed changed conditions, or who may note material errors should contact us with their findings at the earliest possible date, so that timely changes may be made.

## 9. ACKNOWLEDGEMENTS

We believe that this is an important study and would like to thank those individuals and groups whose contributions to the planning and implementation of the LTMAP project and this multi-component study have been invaluable, including: Marty Laporte, Philippe Cohen, Tom Zigterman, Susan Witebsky, and Annette Walton (Stanford University), Geoff Brosseau (BASMAA), and Phil Bobel (City of Palo Alto Regional Water Quality Control Plant).

We are also grateful to Armand Ruby (formerly of Larry Walker Associates), Brad Eggleston and Margaret Zittle (City of Palo Alto Regional Water Quality Control Plant), and the many other individuals who have contributed ideas or have assisted us in other ways to make this study feasible, safe and useful.

Key funding for monitoring equipment installation and/or monitoring, without which this study could not have proceeded, has been provided by: the City of Palo Alto Regional Water Quality Control Plant; Stanford University, Utility Division; Stanford Real Estate Office; Stanford Linear Accelerator Center (SLAC); and the Jasper Ridge Biological Preserve.

## 10. REFERENCES

- Applied Science and Engineering, Inc., 1999, Pajaro River Watershed Water Quality Management Plan: Report to the Association of Monterey Bay Area Governments (AMBAG), multipaged
- Balance Hydrologics, Inc., 1996, Sedimentation and channel dynamics of the Searsville Lake watershed and Jasper Ridge Biological Preserve, San Mateo County, California: Consulting report prepared for Jasper Ridge Biologic Preserve, 73 p. + appendices
- Brown, W. M., III, and Jackson, L.E., Jr., 1973, Erosional and depositional provinces and sediment transport in the south and central part of the San Francisco Bay region, California: U.S. Geological Survey Open-File Report MF-515. 21 p.
- California Regional Water Quality Control Board (RWQCB), San Francisco Bay, Region 2, 1995, Water Quality Control Plan (Basin Plan), June 1995.
- Characklis, G.W. and Wiesner, M.R., 1997, Particles, metals, and water quality in runoff from a large urban watershed: *Journal of Environmental Engineering*, V. 123, p. 753-759.
- Dempsey, B.A., Tai, Y.L., and Harrison, S.G., 1993, Mobilization and removal of contaminants associated with urban dust and dirt: *Water Science and Technology*, v. 28, p. 225-230.
- Edwards, T.K., and Glysson, D.G., 1999, Field methods for measurement of fluvial sediment, Chapter C2: Applications of hydraulics, Book 3. *Techniques of Water-Resources Investigations of the U.S. Geological Survey*.
- Flores-Rodriguez, J., Bussy, A.L., and Thevenot, D.R., 1994, Toxic metals in urban runoff – physio-chemical mobility assessment using speciation schemes: *Water Science and Technology*, v. 29, p. 83-93.
- Goldman, C., and Horne, A., 1983, *Limnology*, McGraw Hill Book Co., 464 p.
- Hecht, B. and Owens, J., 2006, Sediment discharge in unregulated streams tributary to San Francisco and Suisun Bays And adjoining areas: 2006, Bay Delta conference, abs.
- Hecht, B., 1983, Substrate enhancement/sediment management study: Lagunitas Creek, Marin County. Sediment transport and bed conditions, 1979-1982: HEA report prepared for the Marin Municipal Water District, 173 p.

## 10. REFERENCES (CONTINUED)

- Hem, J., 1985, Study and interpretation of the chemical characteristics of natural water, U.S. Geological Survey Water-Supply Paper 2254, 253 p.
- Johnson, B., 2004, Diazinon and pesticide-related toxicity in Bay Area urban creeks – water quality attainment strategy and total maximum daily load (TMDL) – final project report: California Regional Water Quality Control Board, San Francisco Bay Region, March 2004, 110 p.
- Lang, J., Oppenheim, B., and Knight, R., 1998, Southern steelhead (*Oncorhynchus mykiss*) habitat suitability survey of the Santa Margarita River, San Mateo, and San Onofre Creeks on Marine Corps Base Camp Pendleton, California: Report prepared by the U.S. Fish and Wildlife Service Coastal California Fish and Wildlife Office, Arcata, California for the Assistant Chief of Staff, Environmental Security, Environmental and Natural Resource Office, Marine Corps Base Camp Pendleton
- Larry Walker Associates, 2001, Draft surface water quality monitoring plan 2001/02, San Francisquito Creek watershed, Consulting report prepared for the City of Palo Alto, 27 p. + appendices.
- Majmundar, H.H., 1980, Distribution of heavy elements hazardous to health, Salinas Valley region, California: California Division of Mines and Geology Special Report 138.
- Owens, J., and Hecht, B., 2002, Annual hydrologic record and preliminary sediment budget for Los Trancos Creek above Stanford's Felt Lake diversion, Santa Clara and San Mateo Counties, California, Data report for water year 2002: Consulting report prepared by Balance Hydrologics for the Utilities Division, Stanford University, 13 p.
- Owens, J., Mallory, B., Shaw, D., White, C., and Hecht, B., 2001, Water quality and streamflow monitoring of the Bear Creek watershed, Woodside, San Mateo County, California: first year data report, water year 2000: Consulting report prepared by Balance Hydrologics for San Francisquito Watershed Council, 49 p. + appendices
- Owens, J., Mallory, B., White, C., and Hecht, B., 2004, Water quality and streamflow monitoring of the Bear Creek watershed, Woodside, San Mateo County, California: second year data report, water year 2001: Consulting report prepared by Balance Hydrologics for San Francisquito Watershed Council, 35 p. + appendices
- Owens, J., White, C., Gartner, J. and B. Hecht, 2006, Water quality and streamflow monitoring of San Francisquito and Los Trancos Creeks at Piers Lane, and Bear Creek at Sand Hill Road, water year 2005, long-term monitoring and assessment program, San Mateo and Santa Clara Counties: consulting report prepared by Balance Hydrologics for Stanford University Utilities Division, 87 p. + appendices

## 10. REFERENCES (CONTINUED)

- Owens, J., White, C., Gartner, J., Rubin, Z., and B. Hecht, 2007. Water quality and streamflow monitoring of San Francisquito and Los Trancos Creeks at Piers Lane, and Bear Creek at Sand Hill Road, water year 2006, long-term monitoring and assessment program, San Mateo and Santa Clara Counties: consulting report prepared by Balance Hydrologics for Stanford University Utilities Division, 50 p. + appendices
- Owens, J., White, C., Mallory, B. and Hecht, B., 2003, Water quality and streamflow monitoring of San Francisquito and Los Trancos Creeks at Piers Lane, water year 2002, long-term monitoring and assessment program, San Mateo and Santa Clara Counties: Consulting report prepared by Balance Hydrologics for Stanford University Utilities Division, 49 p. + appendices
- Owens, J., White, C., Mallory, B. and Hecht, B., 2004 Water quality and streamflow monitoring of San Francisquito and Los Trancos Creeks at Piers Lane, water year 2003 long-term monitoring and assessment program, San Mateo and Santa Clara Counties: Consulting report prepared by Balance Hydrologics for Stanford University Utilities Division, 57 p. + appendices
- Owens, J., White, C., Mallory, B. Hecht, B., and Gartner, J., 2005 Water quality and streamflow monitoring of San Francisquito and Los Trancos Creeks at Piers Lane, and Bear Creek at Sand Hill Road, water year 2004, long-term monitoring and assessment program, San Mateo and Santa Clara Counties: Consulting report prepared by Balance Hydrologics for Stanford University Utilities Division, 80 p. + appendices
- Paulson, C. and Amy, G., 1993, Regulating metal toxicity in stormwater: Water Environment and Technology, July, p. 44-49.
- Porterfield, G., 1972, Computation of fluvial-sediment discharge, Chapter C3; Applications of hydraulics, Book 3. Techniques of Water-Resources Investigations of the U.S. Geological Survey.
- Rantz, S.E., 1971. Precipitation depth-duration-frequency relations in the San Francisco Bay Region, California with isohyetal map showing mean annual precipitation: U.S. Geological Survey Basic Data Contribution 25.
- Ricker, J., Petersen, S., and Golling, R., 2001, Evaluation of urban water quality, Task 4 report, San Lorenzo River watershed management plan update, County of Santa Cruz, Water Resources Program, Environmental Health Services, Health Services Agency, 69 p.
- Roques, D., and Angelo, M., 2004, Regional sediment assessment – project report for phase I, module 4: Regional Water Quality Control Board, Central Coast Region, 24 p.

## 10. REFERENCES (CONTINUED)

Sansalone, J.J. and Buchberger, S.G., 1997(a), Characterization of solid and metal element distributions in urban highway stormwater: *Water Science and Technology*, v. 35, p. 155-160.

Sansalone, J.J. and Buchberger, S.G., 1997(b), Partitioning and first flush of metals in urban roadway storm water: *Journal of Environmental Engineering*, v. 123, p. 134-143.

U.S. EPA, 2000, Ambient water quality criteria recommendations for rivers and streams in nutrient ecoregion III, Office of Water report EPA 822-B-00-016, 33 p. + appendices



## **FORMS**

**Water Year:** 2007  
**Stream:** Bear Creek  
**Station:** at Sand Hill Road **BCSH**  
**County:** San Mateo County, CA

## Form 1. Annual Hydrologic Record

### Station Location / Watershed Descriptors

Latitude: 37 24' 40", Longitude: 122 14' 28" Jasper Ridge Biological Preserve, Stanford, CA.  
 Gage is installed on left bank, about 200 feet downstream from Sand Hill Rd. Staff-plate pool is eroded into hard sandstone; underflow is thought to be minimal. Land use includes forested open space, and suburban uses in valleys. Drainage area above gage is 11.7 sq. miles.

### Mean annual flow (MAF)

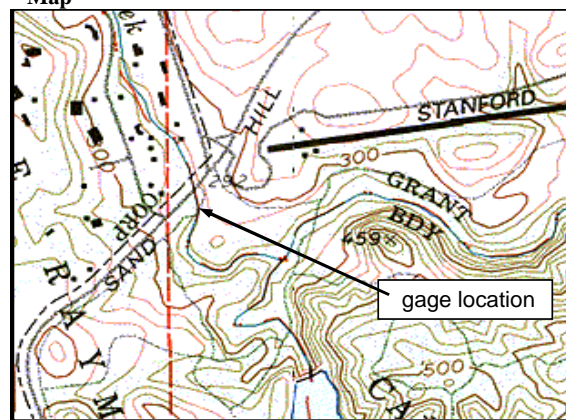
MAF for WY2007 is 1.75 cfs. MAF for 2006 was 18.33 cfs. MAF for 2005 was 11.21 cfs. 2004 was 5.87 cfs. 2002 was 5.12 cfs. 2001 was 3.71 cfs. 2000 was 10.65 cfs.

### Peak Flows

Date	Time (24-hr)	Gage Ht. (feet)	Discharge (cfs)	Date	Time (24-hr)	Gage Ht. (feet)	Discharge (cfs)
12/9/06	21:00	2.42	36	2/11/07	0:30	3.67	151
12/12/06	8:45	2.88	71	2/22/07	7:15	2.48	35
12/26/06	20:15	2.63	46	<b>2/26/07</b>	<b>23:30</b>	<b>4.02</b>	<b>197</b>
				4/22/07	4:00	2.50	37

The peak for the period of record (Oct. 1999 to Sept. 2007) was 3,800 cfs on Dec. 31, 2005

### Map



### Period of Record

Station operated May to Nov. 1997, and October 1999 to present.  
 Flow, sediment transport, water quality, and specific conductance measured periodically. Gaging sponsored by Jasper Ridge Biological Preserve and Stanford Linear Accelerator Center

### WY 2007 Daily Mean Flow (cubic feet per second)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT
1	0.46	0.50	0.59	0.80	0.80	11.00	1.20	0.82	0.65	0.23	0.08	0.01
2	0.47	0.73	0.59	0.81	0.85	7.27	1.18	0.87	0.67	0.21	0.62	0.01
3	0.42	0.84	0.59	0.88	0.82	5.60	1.20	0.81	0.64	0.19	0.07	0.01
4	0.49	0.46	0.59	1.05	0.81	4.65	1.19	0.92	0.59	0.21	0.03	0.01
5	0.63	0.33	0.68	0.83	0.97	3.96	1.19	0.87	0.61	0.32	0.02	0.01
6	0.41	0.39	0.62	0.80	1.03	3.45	1.17	0.82	0.61	0.30	0.04	0.01
7	0.35	0.40	0.58	0.81	1.03	3.19	1.12	0.78	0.61	0.35	0.08	0.01
8	0.34	0.51	0.66	0.82	1.32	2.45	1.12	0.65	0.60	0.37	0.06	0.01
9	0.34	0.49	6.56	0.82	5.02	1.76	1.07	0.69	0.65	0.36	0.05	0.01
10	0.29	0.31	5.04	0.81	41.75	1.64	0.97	0.68	0.63	0.34	0.06	0.01
11	0.26	0.39	1.37	0.79	60.61	1.69	1.09	0.69	0.59	0.34	0.06	0.03
12	0.28	0.30	14.10	0.80	8.83	1.72	1.04	0.69	0.62	0.34	0.05	0.02
13	0.31	0.58	1.67	0.83	5.14	1.65	1.03	0.71	0.54	0.29	0.07	0.02
14	0.41	2.32	0.97	0.85	3.64	1.60	1.15	0.71	0.43	0.14	0.09	0.02
15	0.58	0.64	0.95	0.91	2.83	1.60	1.06	0.68	0.44	0.16	0.04	0.02
16	0.38	0.53	0.86	0.89	2.45	1.60	1.00	0.67	0.47	0.14	0.04	0.02
17	0.37	0.50	0.82	0.89	2.21	1.55	0.99	0.68	0.49	0.12	0.03	0.05
18	0.36	0.49	0.75	0.92	2.02	1.52	1.13	0.71	0.44	0.12	0.03	0.06
19	0.33	0.48	0.73	0.88	1.89	1.52	1.19	0.59	0.42	0.15	0.04	0.04
20	0.36	0.49	0.70	0.87	1.75	1.75	1.49	0.55	0.42	0.16	0.07	0.02
21	0.37	0.48	1.60	0.85	1.72	1.71	1.25	0.57	0.41	0.12	0.09	0.02
22	0.41	0.46	1.42	0.82	13.54	1.67	5.66	0.53	0.41	0.13	0.06	0.06
23	0.49	0.47	0.92	0.81	6.90	1.59	1.14	0.56	0.40	0.16	0.04	0.18
24	0.51	0.46	0.88	0.85	3.87	1.56	0.83	0.57	0.35	0.12	0.03	0.14
25	0.53	0.45	0.78	0.86	17.18	1.55	0.75	0.57	0.44	0.11	0.02	0.08
26	0.43	1.19	5.80	0.91	71.30	2.07	0.73	0.58	0.39	0.12	0.02	0.09
27	0.41	1.02	6.82	0.99	72.18	1.75	0.76	0.59	0.40	0.11	0.03	0.07
28	0.45	0.72	1.77	1.28	27.37	1.26	0.74	0.59	0.35	0.11	0.05	0.07
29	0.42	0.61	1.09	1.11		1.36	0.75	0.59	0.35	0.09	0.05	0.05
30	0.47	0.59	0.86	0.90		1.22	0.73	0.65	0.27	0.11	0.04	0.05
31	0.52		0.88	0.75		1.20		0.63		0.12	0.01	
MEAN	0.41	0.61	2.01	0.88	12.85	2.52	1.20	0.68	0.50	0.20	0.07	0.04
MAX. DAY	0.63	2.32	14.10	1.28	72.18	11.00	5.66	0.92	0.67	0.37	0.62	0.18
MIN. DAY	0.26	0.30	0.58	0.75	0.80	1.20	0.73	0.53	0.27	0.09	0.01	0.01
cfs days	12.8	18.2	62.2	27.2	359.8	78.1	35.9	21.0	14.9	6.1	2.0	1.2
ac-ft	25.5	36.0	123.4	53.9	713.7	154.9	71.2	41.7	29.5	12.2	4.1	2.5

### Monitor's Comments

- We collected a continuous stage record for the entire water year.
- Diversions upstream of the gaging location affect flow in the creek. Numerous flow alterations were recorded (see Appendix D). Also, some small flow alterations originate where water intermittently flows into the creek from a ditch on the northwest side of Sand Hill Road (upstream of the gaging station).
- Multiple stage shifts were applied to the rating equation. Stage shifts adjust for local scour and fill in addition to water-level changes due to algal growth or dams caused by accumulation of fallen leaves and branches
- Daily values with more than 2 to 3 significant figures result from electronic calculations, no additional precision is implied

Water Year 2007 Totals:	
Mean annual flow	1.75 (cfs)
Max. daily flow	72 (cfs)
Min. daily flow	0.01 (cfs)
Annual total	640 (cfs-days)
Annual total	1,269 (ac-ft)

**Water Year:** 2007  
**Stream:** Los Trancos Creek  
**Station:** Piers Lane  
**County:** San Mateo County, CA

**LTPL**

## Form 2. Annual Hydrologic Record

### Station Location / Watershed Descriptors

Latitude: 37° 24' 48" N, Longitude: 122° 11' 29" W, in San Mateo County, CA. The gaging station is located under Piers Lane bridge at Los Trancos Creek. Land use includes open space, sports fields, small commercial areas, and low-density residential. There is a water diversion about 1.8 miles upstream. Los Trancos Creek watershed area above gaging station = 7.8 square miles.

### Mean Annual Flow

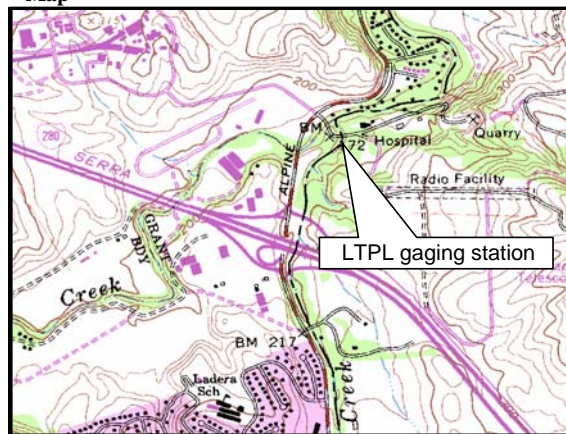
Mean annual flow (MAF) for WY 2007 is 0.75 cubic feet per second (cfs).  
 MAF for WY2006 was 7.09; WY2005 was 3.56; WY2004 was 2.70 cfs; and WY2003 was 2.63 cfs.

### Peak Flows

Date	Time <sup>2</sup> (24-hr)	Gage Ht. (feet)	Discharge (cfs)	Date	Time (24-hr)	Gage Ht. (feet)	Discharge (cfs)
12/9/06	20:45	1.88	20	2/10/07	9:00	1.73	17
<b>12/12/06</b>	<b>9:15</b>	<b>2.32</b>	<b>44</b>	2/11/07	1:45	2.14	35
12/26/06	22:15	1.72	15	2/22/07	8:30	1.81	19
				2/26/07	23:30	2.14	35
				4/22/07	4:30	1.62	15

The peaks (for the period of record Oct. 2002 to Sept. 2007) was 640 cfs on Dec. 16, '02 and Dec. 31, '06.

### Map



### Period of Record

Equipment installed October 2001. Periodic site visits to measure flow, make observations, and collect water quality samples have been made since February 2002. Gaging sponsored by Stanford University Utilities Division.

### WY 2007 Daily Mean Flow (cubic feet per second)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT
1	0.32	0.26	0.64	0.90	0.48	5.59	0.76	0.48	0.24	0.11	0.02	0.01
2	0.29	0.52	0.59	0.90	0.45	3.93	0.76	0.69	0.24	0.11	0.02	0.01
3	0.27	0.46	0.55	0.92	0.36	3.24	0.69	0.56	0.25	0.09	0.02	0.01
4	0.53	0.28	0.59	1.31	0.36	2.64	0.76	0.75	0.25	0.10	0.02	0.01
5	1.49	0.27	0.61	1.15	0.38	2.14	0.75	0.80	0.28	0.09	0.02	0.01
6	0.83	0.26	0.56	0.83	0.40	1.74	0.73	0.63	0.27	0.08	0.02	0.01
7	0.34	0.26	0.54	0.79	0.51	1.65	0.77	0.53	0.29	0.08	0.02	0.01
8	0.26	0.24	0.74	0.76	0.75	1.48	0.73	0.41	0.22	0.08	0.02	0.01
9	0.21	0.23	5.57	0.82	2.06	1.52	0.72	0.38	0.21	0.07	0.01	0.01
10	0.21	0.22	4.46	0.86	9.64	1.36	0.65	0.34	0.21	0.07	0.02	0.01
11	0.21	0.38	0.96	0.85	11.29	1.20	0.97	0.39	0.21	0.07	0.01	0.01
12	0.22	0.28	8.23	0.79	2.06	1.16	0.80	0.41	0.21	0.06	0.01	0.01
13	0.21	0.74	1.68	0.76	3.45	1.06	0.65	0.37	0.21	0.06	0.01	0.01
14	0.27	2.01	1.05	0.95	1.70	0.96	0.96	0.35	0.18	0.05	0.01	0.01
15	0.30	0.53	1.61	0.78	1.12	0.96	0.86	0.32	0.16	0.05	0.01	0.01
16	0.30	0.48	0.96	0.80	0.88	0.88	0.68	0.36	0.17	0.05	0.01	0.01
17	0.25	0.44	0.86	0.83	0.56	0.91	0.57	0.31	0.17	0.05	0.01	0.01
18	0.20	0.35	0.69	0.72	0.57	0.95	0.60	0.33	0.14	0.05	0.01	0.01
19	0.20	0.36	0.73	0.75	0.62	0.99	0.74	0.32	0.14	0.05	0.01	0.01
20	0.18	0.39	0.70	0.73	0.64	1.26	1.13	0.39	0.13	0.04	0.01	0.01
21	0.18	0.40	1.63	0.82	0.67	1.09	0.74	0.36	0.14	0.04	0.01	0.01
22	0.17	0.33	1.54	0.67	4.31	0.91	4.56	0.33	0.14	0.04	0.01	0.03
23	0.18	0.31	0.79	0.72	0.90	0.90	1.10	0.31	0.14	0.03	0.01	0.03
24	0.19	0.28	0.74	0.66	0.74	0.85	0.75	0.43	0.12	0.03	0.01	0.02
25	0.20	0.32	0.71	0.60	3.62	0.95	0.65	0.24	0.12	0.03	0.01	0.02
26	0.18	1.09	2.99	0.70	10.86	1.56	0.58	0.25	0.11	0.03	0.01	0.02
27	0.17	1.17	6.39	1.29	10.74	1.54	0.50	0.27	0.12	0.03	0.01	0.02
28	0.17	0.82	1.89	2.32	6.03	1.04	0.48	0.25	0.12	0.03	0.01	0.02
29	0.19	0.61	1.13	0.67	0.92	0.92	0.45	0.23	0.11	0.02	0.01	0.02
30	0.20	0.61	1.02	0.53	0.85	0.85	0.48	0.24	0.10	0.02	0.01	0.02
31	0.22		1.04	0.53		0.82		0.25		0.02	0.01	
MEAN	0.29	0.50	1.68	0.86	2.72	1.52	0.85	0.40	0.18	0.06	0.01	0.02
MAX. DAY	1.49	2.01	8.23	2.32	11.29	5.59	4.56	0.80	0.29	0.11	0.02	0.03
MIN. DAY	0.17	0.22	0.54	0.53	0.36	0.82	0.45	0.23	0.10	0.02	0.01	0.01
cfs days	9.1	14.9	52.2	26.7	76.2	47.0	25.6	12.3	5.4	1.7	0.5	0.5
ac-ft	18.1	29.5	103.5	53.0	151.0	93.3	50.7	24.3	10.7	3.4	0.9	0.9

### Monitor's Comments

1. We collected a continuous record for the entire water year.
2. Multiple stage shifts were applied to the rating equation; stage shifts adjust for local scour or fill and leaf debris build-up.
3. The upper portion of the rating curve is based on several high-flow estimates. (Calculated using the "slope-area" method.)
4. Daily values with more than 2 to 3 significant figures result from electronic calculations; no additional precision is implied.
5. There is a surface-water diversion and fish ladder, about 1.8 miles upstream of this station, which may divert water out of Los Trancos Creek during the period from December 1 to May 1.

### Water Year 2007 Totals:

Mean annual flow	0.75	(cfs)
Max. daily flow	11	(cfs)
Min. daily flow	0.01	(cfs)
Annual total	272	(cfs-days)
Annual total	540	(ac-ft)

**Water Year:** 2007  
**Stream:** San Francisquito Creek  
**Station:** Piers Lane **SFPL**  
**County:** San Mateo County, CA

### Form 3. Annual Hydrologic Record

#### Station Location / Watershed Descriptors

Latitude: 37° 24' 48" N, Longitude: 122° 11' 29" W in San Mateo County, CA. The gaging station is located directly under Piers Lane bridge at San Francisquito Creek, immediately upstream of its confluence with Los Trancos Creek. Land use includes open space, low-density residential, and some commercial uses. The watershed area above gaging station = 29.9 square miles.

#### Mean Annual Flow

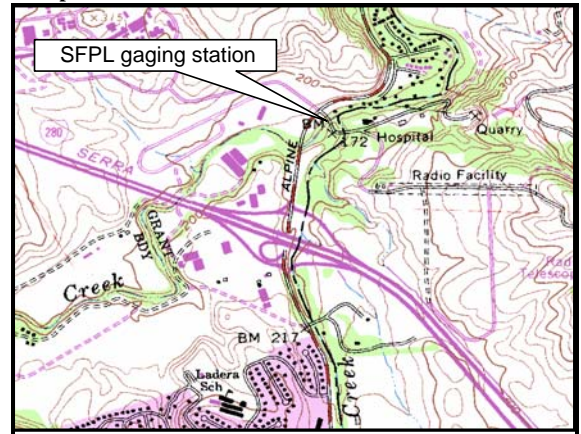
Mean annual flow (MAF) for WY 2007 is 4.88 cubic feet per second (cfs).  
 MAF for WY06 was 40.09; WY 2005 was 24.35; WY2004 was 11.02 cfs; and WY2003 was 15.40 cfs

#### Peak Flows

Date	Time <sup>2</sup> (24-hr)	Gage Ht. (feet)	Discharge (cfs)	Date	Time (24-hr)	Gage Ht. (feet)	Discharge (cfs)
12/9/06	22:30	4.77	54	2/22/07	12:15	4.92	66
12/12/06	11:30	5.38	127	2/25/07	2:15	4.90	64
12/26/06	22:15	4.99	75	<b>2/27/07</b>	<b>0:45</b>	<b>6.46</b>	<b>436</b>
2/11/07	2:45	6.16	318	4/22/07	6:15	4.79	55

The peak for the period of record (October 2002 to Sept. 2007) was 4,300 cfs on Dec. 31, 2005

#### Map



#### Period of Record

Equipment installed October 2001. Periodic site visits to measure flow, make observations, and collect water quality samples have been made since February 2002. Gaging sponsored by Stanford University Utilities Division.

#### WY 2007 Daily Mean Flow (cubic feet per second)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT
1	0.69	0.7	0.97	3.22	1.22	42.06	3.05	0.90	0.58	0.25	0.08	0.02
2	0.71	1.2	1.00	2.97	1.10	28.61	3.09	1.08	0.60	0.18	0.22	0.01
3	0.57	2.4	1.03	2.28	1.03	22.00	2.89	1.02	0.62	0.15	0.33	0.01
4	0.67	2.4	0.98	3.41	0.87	18.08	2.74	1.05	0.59	0.15	0.17	0.01
5	2.25	1.49	1.30	4.39	0.89	15.45	2.79	1.14	0.52	0.14	0.08	0.01
6	1.19	1.36	1.27	2.83	1.03	12.65	2.74	1.07	0.52	0.18	0.08	0.01
7	0.80	0.9	1.15	2.36	0.95	11.61	2.72	1.04	0.50	0.24	0.10	0.01
8	0.77	0.9	1.14	2.15	1.50	9.41	2.62	0.95	0.47	0.28	0.09	0.01
9	0.82	1.1	14.44	2.01	6.67	7.29	2.41	0.87	0.49	0.35	0.09	0.01
10	0.95	1.1	24.17	1.91	68.75	6.75	2.19	0.87	0.51	0.35	0.08	0.02
11	0.83	1.09	8.24	1.86	172.49	6.59	2.44	0.87	0.48	0.34	0.07	0.01
12	0.56	1.30	46.89	1.85	35.30	6.31	2.69	0.85	0.43	0.33	0.07	0.01
13	0.55	1.50	19.29	2.03	24.87	5.91	2.29	0.85	0.49	0.34	0.08	0.02
14	0.59	5.14	8.27	2.06	13.70	5.40	2.47	0.84	0.42	0.31	0.08	0.02
15	1.1	1.29	6.30	1.93	8.66	5.21	2.78	0.83	0.35	0.24	0.08	0.02
16	0.8	0.90	5.10	1.92	6.52	5.03	2.36	0.78	0.35	0.17	0.07	0.02
17	0.62	0.86	4.42	1.79	5.66	4.90	2.29	0.76	0.39	0.12	0.05	0.02
18	0.60	0.98	3.84	1.71	4.80	4.75	2.14	0.77	0.39	0.13	0.05	0.01
19	0.59	1.02	3.26	1.71	4.13	4.73	2.19	0.84	0.37	0.14	0.07	0.01
20	0.59	1.04	2.88	1.65	3.44	4.99	3.31	0.65	0.32	0.12	0.09	0.02
21	0.62	1.06	5.09	1.60	3.41	5.42	2.61	0.63	0.34	0.11	0.10	0.02
22	0.65	1.01	9.58	1.51	38.17	4.84	19.85	0.61	0.32	0.10	0.10	0.19
23	0.69	1.10	5.51	1.45	33.23	4.52	6.77	0.57	0.32	0.10	0.08	0.11
24	0.55	1.40	4.01	1.43	14.71	4.27	3.54	0.59	0.29	0.08	0.09	0.09
25	0.60	1.20	3.56	1.35	47.29	4.03	1.88	0.58	0.29	0.08	0.10	0.05
26	0.6	2.25	11.49	1.47	153.29	4.57	1.24	0.59	0.30	0.09	0.09	0.04
27	0.6	4.35	36.00	1.95	213.20	6.48	1.10	0.57	0.31	0.07	0.10	0.02
28	0.5	1.76	13.62	4.19	104.37	4.36	0.99	0.56	0.30	0.09	0.08	0.02
29	0.6	1.28	6.82	2.96	3.97	3.97	0.93	0.52	0.30	0.06	0.06	0.03
30	0.6	1.06	4.42	1.67	3.67	3.67	0.94	0.55	0.31	0.06	0.04	0.02
31	0.6		3.76	1.34	3.40	3.40		0.58		0.07	0.02	
MEAN	0.74	1.50	8.38	2.16	34.69	8.94	3.07	0.79	0.42	0.18	0.09	0.03
MAX. DAY	2.25	5.14	46.89	4.39	213.20	42.06	19.85	1.14	0.62	0.35	0.33	0.19
MIN. DAY	0.54	0.69	0.97	1.34	0.87	3.40	0.93	0.52	0.29	0.06	0.02	0.01
cfs days	23	45	260	67	971	277	92	24	12	5	3	1
ac-ft	45	89	515	133	1927	550	183	48	25	11	6	2

#### Monitor's Comments

1. We collected a continuous record for the entire water year.
2. Multiple stage shifts were applied to the rating equation; stage shifts adjust for local scour or fill.
3. Daily values with more than 2 to 3 significant figures result from electronic calculations; no additional precision is implied.
4. Flow is regulated by multiple diversions and an upstream reservoir (Searsville Lake), plus possible return flows from applied imported water.

Water Year 2007 Totals:		
Mean annual flow	4.88	(cfs)
Max. daily flow	213	(cfs)
Min. daily flow	0.01	(cfs)
Annual tota	1,781	(cfs-days)
Annual tota	3,533	(ac-ft)

### Form 4. Annual sediment-discharge record, Bear Creek at Sand Hill Road, water year 2007

Water Year: **2007**  
 Stream: Bear Creek  
 Station: at Sand Hill Road      **BCSH**  
 County: San Mateo County, CA

**Total annual sediment discharge  
 (suspended- plus bedload-sediment discharge)**  
**WY 2007:      138      tons**

**WY 2007 Daily Suspended-Sediment Discharge (tons)**

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	
1	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	
2	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	
3	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	
4	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
5	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
6	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
7	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
9	0.0	0.0	0.6	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	0.0	0.0	0.2	0.0	16.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
11	0.0	0.0	0.0	0.0	27.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
12	0.0	0.0	2.6	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
13	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
22	0.0	0.0	0.0	0.0	1.4	0.0	0.5	0.0	0.0	0.0	0.0	0.0	
23	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
24	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
25	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
26	0.0	0.0	0.8	0.0	42.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
27	0.0	0.0	0.3	0.0	30.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
28	0.0	0.0	0.0	0.0	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
29	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
30	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
31	0.0		0.0	0.0		0.0		0.0		0.0			<b>Qss Annual</b>
TOTAL	0	0	5	0	125	2	1	0	0	0	0	0	<b>133</b>
Max.day	0	0	3	0	43	1	0	0	0	0	0	0	<b>43</b>

**WY 2007 Daily Bedload-Sediment Discharge (tons)**

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
11	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
12	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
22	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
25	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
26	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
27	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
28	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
29	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
30	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	
31	0.0		0.0	0.0		0.0		0.0		0.0			<b>Qbed Annual</b>
TOTAL	0	0	0	0	5	0	0	0	0	0	0	0	<b>5</b>
Max.day	0	0	0	0	2	0	0	0	0	0	0	0	<b>2</b>

Daily values are based on calculations of sediment discharge at 15-minute intervals.  
 Multiple sediment-discharge rating curves were used for different periods of the year and ranges of flow.  
 Daily values with more than 2 significant figures result from electronic calculations. No additional precision is implied.

Balance Hydrologics, Inc. 800 Bancroft Way, Suite 101, Berkeley, CA 94710 (510) 704-1000; fax: (510) 704-1001

## Form 5. Annual sediment-discharge record, Los Trancos Creek at Piers Lane, water year 2007

Water Year: <b>2007</b>	
Stream: Los Trancos	
Station: at Piers Lane	<b>LTPL</b>
County: San Mateo County, CA	

<b>Total annual sediment discharge</b>		
<b>(suspended- plus bedload-sediment discharge)</b>		
<b>WY 2007:</b>	<b>41</b>	<b>tons</b>

### Daily Suspended-Sediment Discharge(tons)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	
1	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	
2	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	
3	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	
4	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	
5	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
6	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
7	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
8	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
9	0.0	0.0	1.5	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
10	0.0	0.0	0.6	0.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
11	0.0	0.0	0.0	0.0	6.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
12	0.0	0.0	4.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
13	0.0	0.0	0.1	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	0.0	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
15	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
20	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	
21	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
22	0.0	0.0	0.1	0.0	1.2	0.0	0.9	0.0	0.0	0.0	0.0	0.0	
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
25	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
26	0.0	0.1	0.6	0.0	5.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
27	0.0	0.0	1.2	0.1	3.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
28	0.0	0.0	0.1	0.2	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
TOTAL	0.1	0.4	8.8	0.7	22.8	2.7	1.3	0.1	0.0	0.0	0.0	0.0	<b>37</b>
Max.day	0.1	0.2	4.0	0.2	6.8	0.8	0.9	0.0	0.0	0.0	0.0	0.0	<b>7</b>

### Daily Bedload-Sediment Discharge(tons)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
9	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
10	0.0	0.0	0.1	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
11	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
12	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
21	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	
22	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
26	0.0	0.0	0.1	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
27	0.0	0.0	0.1	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
28	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
29	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
TOTAL	0.0	0.0	0.9	0.1	2.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	<b>4</b>
Max.day	0.0	0.0	0.4	0.0	0.7	0.0	0.1	0.0	0.0	0.0	0.0	0.0	<b>1</b>

Daily values are based on calculations of sediment discharge at 15-minute intervals.

Daily values with more than 2 significant figures result from electronic calculations. No additional precision is implied.

Balance Hydrologics, Inc. 800 Bancroft Way, Suite 101, Berkeley, CA 94710 (510) 704-1000; fax: (510) 704-1001

## Form 6. Annual sediment-discharge record, San Francisquito Creek at Piers Lane, water year 2007

Water Year: <b>2007</b>
Stream: San Francisquito Creek
Station: at Piers Lane
County: San Mateo County, CA

**SFPL**

### Daily Suspended-Sediment Discharge(tons)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	
1	0.0	0.0	0.0	0.0	0.0	7.2	0.0	0.0	0.0	0.0	0.0	0.0	
2	0.0	0.0	0.0	0.0	0.0	3.3	0.0	0.0	0.0	0.0	0.0	0.0	
3	0.0	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	
4	0.0	0.0	0.0	0.1	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	
5	0.0	0.0	0.0	0.1	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	
6	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	
7	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	
8	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	
9	0.0	0.0	1.5	0.0	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	
10	0.0	0.0	2.5	0.0	31	0.2	0.0	0.0	0.0	0.0	0.0	0.0	
11	0.0	0.0	0.3	0.0	149	0.2	0.0	0.0	0.0	0.0	0.0	0.0	
12	0.0	0.0	13.3	0.0	5.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	
13	0.0	0.0	1.6	0.0	2.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
14	0.0	0.2	0.3	0.0	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
15	0.0	0.0	0.2	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
16	0.0	0.0	0.1	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
17	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
18	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
19	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
20	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
21	0.0	0.0	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
22	0.0	0.0	0.4	0.0	8.0	0.1	2.1	0.0	0.0	0.0	0.0	0.0	
23	0.0	0.0	0.1	0.0	4.7	0.1	0.2	0.0	0.0	0.0	0.0	0.0	
24	0.0	0.0	0.1	0.0	0.9	0.1	0.1	0.0	0.0	0.0	0.0	0.0	
25	0.0	0.0	0.1	0.0	9.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
26	0.0	0.0	1.8	0.0	149	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
27	0.0	0.1	5.5	0.0	211	0.2	0.0	0.0	0.0	0.0	0.0	0.0	
28	0.0	0.0	0.8	0.1	50	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
29	0.0	0.0	0.2	0.0		0.1	0.0	0.0	0.0	0.0	0.0	0.0	
30	0.0	0.0	0.1	0.0		0.1	0.0	0.0	0.0	0.0	0.0	0.0	
31	0.0		0.1	0.0		0.0		0.0		0.0			
TOTAL	0.1	0	29	1	621	19	3	0	0.0	0.0	0.0	0.0	<b>Qss Annual 674</b>
Max.day	0.0	0.2	13	0	211	7	2	0	0.0	0.0	0.0	0.0	<b>211</b>

### Daily Bedload-Sediment Discharge(tons)

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	
1													
2													
3													
4													
5	Daily Bedload Discharge was not calculated because of the lack of bedload measurements												
6													
7													
8													
9													
10	Daily Bedload Discharge was not calculated because of the lack of bedload measurements												
11													
12													
13													
14													
15	Daily Bedload Discharge was not calculated because of the lack of bedload measurements												
16													
17													
18													
19													
20	Daily Bedload Discharge was not calculated because of the lack of bedload measurements												
21													
22													
23													
24													
25	Daily Bedload Discharge was not calculated because of the lack of bedload measurements												
26													
27													
28													
29													
30													
31	Daily Bedload Discharge was not calculated because of the lack of bedload measurements												
TOTAL	...	...	...	...	...	...	...	...	...	...	...	...	<b>Qbed Annual ...</b>
Max.day	...	...	...	...	...	...	...	...	...	...	...	...	<b>...</b>

Daily values are based on calculations of sediment discharge at 15-minute intervals.

Daily values with more than 2 significant figures result from electronic calculations. No additional precision is implied.

Balance Hydrologics, Inc. 800 Bancroft Way, Suite 101, Berkeley, CA 94710 (510) 704-1000; fax: (510) 704-1001

## **TABLES**



**Table 1. Station Observer Log: Bear Creek at Sand Hill Road, water year 2007**

Site Conditions			Streamflow					Water Quality Observations						High-Water Marks		Remarks	
Date/Time	Observer	Stage	Hydrograph	Measured Discharge	Estimated Discharge	Instrument Used	Estimated Accuracy	Water Temperature	Field Specific Conductance	Adjusted Specific Conductance	pH	Dissolved Oxygen	Dissolved Oxygen	Additional sampling?	Estimated stage at staff plate	Inferred dates?	Remarks
(mm/dd/yr)		(feet)	(R/F/S/B)	(cfs)	(cfs)	(AA/PY)	(e/g/f/p)	(oC)	(µmhos/cm)	(at 25 oC)	(pH)	(mg/L)	(% sat.)	(Qbed, etc.)	(feet)	(mm/dd/yr)	
8/9/06 11:15	zr, jo	1.425	B	0.46	...	PY	g	17.9	449	519	7.7	8.2	86%	WQ grabs	...	...	water clear, low, many fish in pool with gage
10/5/06 15:30	jg	1.445	B	0.44	...	PY	f	...	...	613	7.6	...	...	...	...	...	water clear, but grayish turbid area near left bank at stilling well
11/10/06 11:47	jg, he	1.395	B	0.36	...	PY	g	10.8	405	559	...	...	...	...	1.49-1.6	last storm	water clear, added new high water staff plate, cleaned oxygen probe
12/19/06 16:00	zr, rb	1.49	B	...	1.15	visual	p	...	...	...	...	...	...	...	3.2-3.6	...	water clear, dark green, cold, frost last night
1/23/07 16:15	zr, tb	1.5	B	0.81	...	PY	g	5.7	451	710	...	10.3	86%	...	...	...	cleaned water-quality probes
2/10/07 12:15	jo	2.26	F	...	25	visual	p	...	...	...	...	...	...	Qss	2.65	10-Feb	water light brown, no bedload transport
2/11/07 12:30	zr, gp	2.72	F	...	30	visual	p	...	...	...	...	...	...	Qss	3.1	11-Feb	water turbid
3/6/07 15:45	zr, he	1.72	B	...	3.5	visual	p	...	...	...	...	...	...	...	2.9	27-Feb	water clear, fallen tree down at staff plate,
3/22/07 11:30	zr	1.58	B	1.72	...	PY	g	10.4	412	560	...	10.8	94%	...	...	...	water clear, algae growing on bed
4/9/07 16:00	zr	1.5	B	...	0.72	visual	p	14.5	578	722	8.4	6.9	67%	...	...	...	bed covered with algae, several 1" fish in pool
5/11/07 17:15	zr	1.48	B	0.70	...	PY	g	15.6	493	603	7.9	9.2	92%	...	...	...	water clear, gate now closed, several 1" fish in gage pool
6/13/07 15:45	zr	1.45	B	0.46	...	PY	g	18.9	457	516	...	...	...	...	...	...	water clear, dozens of fish in gage pool
7/11/07 11:35	zr	1.46	B	...	0.2	visual	p	17.7	405	470	8.0	8.0	84%	...	...	...	water clear, bed covered with brown algae, dozens of 1-2" fish in gage pool
8/8/07 16:45	jo	1.36	B	0.05	...	PY	f	16.7	271	324	...	...	...	...	...	...	water turbid, low conductance, ~5gpm coming into channel from right bank upstream of Sandhill Rd
9/24/07 17:35	jg	1.45	B	0.16	...	PY	g	15.9	584	706	...	...	...	...	...	...	grass in creek on gravel bars, frogs chirping
10/26/07 16:30	jo, cg	1.42	B	0.13	...	PY	f	12.4	438	575	8.0	9.4	88%	...	2.0	10/12	water clear, algae on bed, small fish in pool, small leaf dam at road crossing

Notes:

Obs Key: jo is Jonathan Owens, jg is John Gartner, zr is Zan Rubin, he is Hilary Ewing, tb is Travis Baggett, rb is Rachel Boitano, gp is Gustavo Porras, cg is Carla Grandy

Stage: Water level observed at outside staff plate

Hydrograph: Describes stream stage as rising (R), falling (F), steady (S), baseflow (B), or diversion underway (D)

Instrument: If measured, typically made using a standard (AA) or pygmy (PY) bucket-wheel ("Price-type") current meter. If estimated, visual estimate (visual), or float test (float).

Estimated measurement accuracy: Excellent (E) = +/- 2%; Good (G) = +/- 5%; Fair (F) = +/- 9%; Poor (P) estimated percent accuracy given

High-water mark (HWM): Measured or estimated at location of the staff plate

Specific conductance: Measured in micromhos/cm in field; then adjusted to 25degC by equation  $(1.8813774452 - [0.050433063928 * \text{field temp}] + [0.00058561144042 * \text{field temp}^2]) * \text{Field specific conductance}$

Additional Sampling: Qbed = Bedload, Qss = Suspended sediment, WQ = water quality suite; other symbols as appropriate

**Table 2. Station observer log: Los Trancos Creek at Piers Lane, water year 2007**

Site Conditions				Streamflow				Water Quality Observations							High-Water Marks		Remarks
Date/Time	Observer(s)	Stage (staff plate)	Hydrograph	Measured Discharge	Estimated Discharge	Instrument Used	Estimated Accuracy	Water Temperature	Specific Conductance at field temp.	Specific Conductance at 25°C	pH	Dissolved Oxygen	Dissolved Oxygen	Additional sampling?	Estimated stage at staff plate	Inferred dates?	
(mm/dd/yr)		(feet)	(R/F/S/B/P)	(cfs)	(cfs)	(AA/PY)	(e/g/f/p)	(°C)	(µmhos/cm)	(at 25 °C)	(pH)	(mg/L)	(% sat.)	(Qbed, etc.)	(feet)	(mm/dd/yr)	
8/9/06 12:20	jo, zr	0.76	B	0.2	...	PY	g, f	18.4	1232	1419	7.9	8.3	89%	WQ grabs	...	...	water clear, many 1-3 inch fish in creek
10/5/06 9:30	ig	1.00	B, F	1.0	...	PY	g	...	...	956	8.1	...	...	...	1.2	10/5/06	water brown, white foam, first rain of new water year in early AM
10/11/06 15:00	ig, bkh	0.78	B	...	...	...	...	15.4	1150	1408	8.2	9.5	96%	...	1.1	10/5/06	water clear, sediment removed from around staff plate
11/10/06 16:36	ig, he	0.78	B	0.23	...	PY	e	12.1	957	1270	8.3	...	...	...	1.07	10/5/06	more leaves than last visit, water clear
11/26/06 13:16	ig, nn	0.87	B	...	0.3	visual	p	10.5	899	1242	8.4	8.5	76%	...	...	...	set up sampler
12/19/06 9:10	zr, rb	0.96	B	0.82	...	PY	g	5.5	591	941	8.1	9.8	78%	...	2.4	12/12/06	water clear, no algae on bed, small leaf dam, few leaves in channel
12/25/06 19:38	jo	0.95	B	...	...	...	...	...	...	...	...	...	...	...	...	...	set up sampler
12/26/06 15:55	jo	0.97	B/R	...	...	...	...	12.1	858	1140	8.1	8.9	82%	WQ grabs	...	...	water clear at 15:55, WQ grab samples collected at 22:00 on rising hydrograph, foam on water surface at 22:00
12/27/06 11:50	zr, ds	1.33	F	...	1.5	visual	p	10.2	463	646	8	10.1	91%	WQ	3.4	...	power line down on South side of creek, collected/partitioned composite sample
1/23/07 9:00	zr, tb	0.97	B	0.69	...	PY	g	5.2	728	1171	8.2	9.7	78%	...	...	...	water clear and cold, no algae on bed, several days of cold air temperatures
2/7/07 5:50	zr	0.84	B	...	0.5	visual	p	11.5	697	940	8.2	10.3	95%	...	...	...	set up sampler
2/8/07 15:25	jo	0.85	B	...	...	...	...	...	...	...	...	...	...	...	...	...	water clear
2/10/07 10:32	jo, bjm	1.64	R	...	...	...	...	...	...	...	...	...	...	WQ grabs Qss Qbed	...	...	collected WQ grab samples
2/11/07 10:30	zr, gp	1.32	F	...	...	...	...	...	...	...	...	...	...	WQ Qss	2.4	12/12/07	collected and partitioned composite sample, water is turbid
2/21/07 18:07	ig	0.90	B	...	0.2	visual	p	12.2	809	1076	7.2	9.5	89%	...	...	...	set up sampler, water clear, no leaf dams
2/22/07 8:44	bkh	1.78	R	...	...	...	...	9.9	362	509	8.2	10.8	95%	WQ grabs Qss	...	...	collected WQ grab samples
2/26/07 12:01	ig, tb	1.43	R	...	4.6	floats	p	11.1	396.5	540	8.2	10.6	97%	WQ grabs Qss	...	...	no leaf dams, collected WQ grab samples
2/27/07 16:05	zr, tb	1.34	F	...	7	visual	p	9.7	456	643	8.0	10.9	97%	Qss	...	...	no bedload transport, turbid water ~ .2' visibility
3/6/07 12:10	zr, he	1.03	B	1.74	...	PY	e	11.5	443.6	598	8.6	10.1	93%	...	...	...	installed new CR10X datalogger, water is clear
3/10/07 15:29	jo	0.97	B	...	1	visual	p	...	...	...	...	...	...	...	...	...	water is clear, algae on sediment in channel
4/6/07 13:30	zr	0.88	B	...	...	...	...	...	...	...	...	...	...	...	...	...	no leaf dams near gage
4/9/07 10:49	zr	0.86	B	0.67	...	PY	e	12.6	869	1163	8.4	10.0	95%	...	...	...	observations from short channel walk: several fish 1" fish in pool, no significant changes to channel for 150' upstream of gage this winter
4/11/07 7:15	jo	0.85	B	...	0.5	visual	p	13.3	851	1118	8.2	10.1	96%	WQ grabs	...	...	set up sampler, small spring storm, water clear, some foam and bubbles
4/12/07 15:00	zr, tb	0.86	B	...	0.7	visual	p	12.3	844	1115	7.7	9.6	90%	WQ	...	...	water clear, algae growing on bed, collected/partitioned composite sample
4/21/07 14:45	zr	0.85	B	...	0.85	visual	p	11.3	744	1011	8.1	10.6	97%	...	...	...	set up sampler spring storm, water clear
4/22/07 6:40	ds, ac	1.36	F	...	4	visual	p	10.8	468	643	7.6	10.5	95%	WQ grabs	1.53	4/22/07	water turbid and suddy
4/23/07 16:30	zr, ef	0.89	B	...	0.65	visual	p	13.7	809	1027	7.7	10.4	100%	WQ	...	...	water clear, algae growing on bed, collected/partitioned composite sample
5/11/07 14:00	zr	0.78	B	0.38	...	PY	g	15.4	1028	1259	8.3	9.8	99%	...	...	...	water clear, brown algae covering bed, no leaf dams
6/13/07 10:30	zr	0.75	B	0.17	...	PY	f	16.0	1183	1448	...	...	...	...	...	...	water clear with brown tint, with algae and leaves covering bed
7/11/07 15:42	zr	0.64	B	0.06	...	PY	f	19.5	1504	1685	8.4	7.6	84%	WQ grabs	...	...	very low flow, small leaf dams elevate stage
8/9/07 14:15	zr	0.63	B	0.01	...	PY	f	19.2	1618	1827	8.6	8.2	88%	...	...	...	several fish in pool, brown-black algae and decaying leaves on bed
9/24/07 11:56	ig	0.61	B	0.02	...	PY	p	14.7	1587	2010	...	7.9	80%	...	...	...	water clear with brown tint, minor leaf dam

Observer Key: jo= Jonathan Owens; bjm= Bonnie Mallory; ig = John Gartner, zr = Zan Rubin, he = Hillary Ewing, nn = Nathan Neufeld; ds = Dave Shaw; bkh = Brian Hastings, tb = Travis Baggett, rb = Rachel Boitano  
ac = Annette Cayot, ef = Eric Forno

Stage: Water level observed at outside staff plate

Hydrograph: Describes stream stage as rising (R), falling (F), steady (S), baseflow (B), uncertain (U), or peak (P).

Instrument: If measured, typically made using a standard (AA) or pygmy (PY) bucket-wheel ("Price-type") current meter. If estimated, from rating curve (R) or visual estimate (visual) or float test (float).

Estimated measurement accuracy: Excellent (E) = +/- 2%; Good (G) = +/- 5%; Fair (F) = +/- 9%; Poor (P) = +/- > 9%

High-water mark (HWM): Measured or estimated at location of the staff plate

Additional Sampling: Qbed = Bedload, Qss = Suspended sediment, WQ = composite water quality sampling, WQgrab = grab samples (typically ammonia or mercury).

**Table 3. Station observer log: San Francisquito Creek at Piers Lane, water year 2007**

Site Conditions			Streamflow					Water Quality Observations							High-Water Marks		Remarks
Date/Time	Observer(s)	Stage (staff plate)	Hydrograph	Measured Discharge	Estimated Discharge	Instrument Used	Estimated Accuracy	Water Temperature	Specific Conductance at field temp.	Specific Conductance at 25°C	pH	Dissolved Oxygen	Dissolved Oxygen	Additional sampling?	Estimated stage at staff plate	Inferred dates?	Remarks
(mm/dd/yr)	(feet)	(R/F/S/B)	(cfs)	(cfs)	(AA/PY)	(e/g/f/p)	(°C)	(µmhos/cm)	(µs@25°C)	(pH)	(mg/L)	(% sat.)	(Qbed, etc.)	(feet)	(mm/dd/yr)		
8/9/06 13:15	jo, zr	3.38	B	0.49	...	PY	f	19.6	1015	1135	7.7	7.7	85%	WQ grabs	...	...	water clear, algae on rocks, crayfish in pool and riffle
10/5/06 11:00	jo	3.46	B	0.87	...	PY	f	...	...	759	8.1	...	...	5.55	10/5/06	10/5/06	water brown, white foam, first precipitation of new water year in early am
10/11/06 14:40	jo, bkh	3.36	B	...	...	...	...	16.3	897	1090	8.2	6.3	63%	...	4.23	10/5/06	water clear
11/10/06 17:00	jo, he	3.47	B	0.88	...	...	e	11.6	668	900	8.3	...	...	...	...	...	water clear, cleaned sediment from stilling well
11/22/06 23:00	zr	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	cleaned rain gage, too dark to see stream conditions
11/26/06 14:35	jo, nn	3.49	B	...	0.6	visual	p	9.3	609	870	7.7	5.9	52%	...	...	...	set up sampler
12/19/06 10:15	zr, rb	3.66	B	3.3	...	PY	e	4.6	472	773	8.2	10.7	84%	...	4.6	12/12/06	frost on ground, water clear
12/25/06 19:38	jo	3.67	B	...	...	...	...	...	...	...	...	...	...	...	...	...	set up sampler, water clear, some bubbles on surface
12/26/06 16:03	jo	3.71	B/R	...	...	...	...	10	557	776	7.7	10.2	90%	WQ grabs	...	...	light to moderate rain, collected WQ samples at 21:30 on rising hydrograph, water light brown and smells like fresh dirt
12/27/06 12:48	zr, ds	4.47	F	...	25	visual	p	9.6	467	661	8.2	9.8	85%	WQ	...	...	collected composite sample
1/23/07 9:40	zr, tb	3.55	B	1.35	...	PY	f	3.7	522	879	8.1	10.8	81%	...	...	...	water clear, some algae on bed, several days of cold air temperatures
2/7/07 10:30	zr	3.47	B	...	0.65	visual	p	9.9	650	913	8.4	10.1	89%	...	...	...	set up sampler, algae growing on bed, precipitation beginning
2/8/07 15:10	jo	3.57	R	...	...	...	...	...	...	...	...	...	...	...	...	...	reset sampler, water still fairly clear
2/10/07 10:13	jo, bjm	4.90	R	...	35	visual	p	...	...	...	...	...	...	...	...	...	water is turbid but not opaque, water is rising with debris floating
2/11/07 10:43	zr, gp	5.67	F	...	...	...	...	...	...	...	...	...	...	Qss, WQ	6.7	2/10/07	water is turbid, no bedload transport
2/21/07 18:17	jo	...	R	...	...	...	...	10.8	555	766	7.9	8.2	75%	...	...	...	set up sampler, dark and difficult to see water conditions
2/22/07 9:22	bkh	4.83	F	...	...	...	...	10.1	605	862	8.4	8.5	78%	WQ	5.12	2/22/07	water turbid, light brown
2/26/07 12:10	jo, tb	5.35	R	...	200	visual	p	10.5	329	456	8.0	10.3	92%	WQ	...	...	set up sampler
2/27/07 16:25	zr, tb	5.37	F	...	...	...	...	9.4	289	412	8.1	10.3	90%	Qss, WQ	6.00	2/27/07	collected/partitioned composite sample
3/6/07 12:45	zr, he	3.95	B	12.58	...	PY	e	12.0	463	616	8.6	9.9	92%	...	...	...	water is light green, visibility ~ 3 ft, buckeye, willow, alder all have leaves, no fish observed
4/6/07 13:45	zr	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	download, poison oak thriving
4/9/07 12:00	zr	3.61	B	2.5	...	PY	g	13.8	665	862	8.3	9.0	87%	...	...	...	water clear, many leaves in water from wind in recent days
4/11/07 9:30	jo	3.58	R	...	2.5	visual	p	14.0	720	929	7.9	9.3	92%	WQ grabs	...	...	set up sampler, small spring storm, water clear, some foam and bubbles in water
4/12/07 15:10	zr, tb	3.61	B	...	4	visual	p	13.2	642	828	8.0	10.1	94%	WQ	...	...	collected composite sample, sample water clear, little flow response to rain
4/21/07 15:30	zr	3.62	B	...	2.5	visual	p	11.4	564	762	7.6	7.5	69%	...	...	...	set up sampler, rain just beginning
4/22/07 7:54	ds, ac	4.48	F	...	44	visual	p	11.5	494	665	7.8	9.3	86%	WQ grabs	5.13	4/22/07	water slightly turbid, no odor, less suds than LTPL
4/23/07 17:20	zr, ef	3.79	B	...	3	visual	p	14.6	612	764	7.7	7.1	71%	WQ	...	...	smell of dead animal, but didn't see one, water is light brown and foamy but not turbid, collected/partitioned composite sample
5/11/07 15:00	zr	3.44	B	0.84	...	PY	f	17.6	769	895	8.2	7.4	78%	...	...	...	water is clear, more than 50 1-inch fish in gage pool
6/13/07 11:45	zr	3.38	B	0.43	...	PY	g	17.2	742	874	...	...	...	...	...	...	water is cloudy, algae on bed, several 1-2 inch fish in gage pool
7/11/07 16:45	zr	3.33	B	0.28	...	PY	g	21.3	1006	1081	8.3	6.8	78%	WQ	...	...	poison oak leaves turning red, dozens of small fish in gage pool, water is clear
8/9/07 15:00	zr	3.22	B	0.05	...	PY	g	19.4	1188	1331	8.6	6.6	72%	...	...	...	water is dark brown and turbid in pool, brown algae and fine sediment covering bed, buckeye trees have lost their leaves, several 4 inch fish
9/24/07 13:13	jo	3.23	B	0.08	...	PY	p	14.7	1132	1411	...	2.7	26%	...	...	...	water clear and brown in color, algae on the bed

Observer Key: jo= Jonathan Owens; bjm= Bonnie Mallory; jo = John Gartner, zr = Zan Rubin, he = Hillary Ewing, nn = Nathan Neufeld; ds = Dave Shaw; bkh = Brian Hastings, tb = Travis Baggett, rb = Rachel Boitano  
ac = Annette Cayot, ef = Eric Forno

Stage: Water level observed at outside staff plate

Hydrograph: Describes stream stage as rising (R), falling (F), steady (S), baseflow (B), or uncertain (U).

Instrument: If measured, typically made using a standard (AA) or pygmy (PY) bucket-wheel ("Price-type") current meter. If estimated, from rating curve (R) or visual estimate (visual) or float test (float.)

Estimated measurement accuracy: Excellent (E) = +/- 2%; Good (G) = +/- 5%; Fair (F) = +/- 9%; Poor (P) = +/- > 9%

High-water mark (HWM): Measured or estimated at location of the staff plate

Additional Sampling: Qbed = Bedload, Qss = Suspended sediment, WQ = composite water quality sampling, WQgrab = grab samples (typically ammonia or mercury.)

**Table 4. Hydrologic summary for the period of record, Bear Creek at Sand Hill Road, Los Trancos and San Francisquito Creeks at Piers Lane**

Water Year <sup>1</sup>	Annual Flow <sup>4</sup>				Sediment Discharge <sup>4</sup>				Peak Flow		
	Mean Annual Flow	Maximum Daily Mean Flow	Minimum Daily Mean Flow	Total Flow Volume	Suspended Sediment	% suspended	Bedload Sediment	% bedload	Peak Flow	Peak Stage <sup>5</sup>	Date Time
	(cfs)	(cfs)	(cfs)	(ac-ft)	(tons)		(tons)		(cfs)	(ft)	(24-hr)
<b>Bear Creek at Sand Hill Road <sup>2, 6</sup></b>											
2000	10.65	684	0.01	7,728	24,426	93%	1,778	7%	2,050	8.81	2/13/00 20:45
2001	3.71	113	0.01	2,689	681	87%	98	13%	353	4.26	1/25/01 16:45
2002	5.12	189	0.01	3,704	1,681	91%	171	9%	733	5.78	12/2/01 7:45
2003	6.86	434	0.01	4,965	11,258	94%	762	6%	2,231	9.29	12/16/02 5:45
2004	5.87	282	0.01	4,260	5,624	91%	555	9%	1,186	7.28	1/1/04 12:15
2005	10.77	257	0.01	8,113	2,460	96%	98	4%	487	5.35	12/30/04 21:30
2006	18.33	849	0.01	13,269	11,693	96%	468	4%	3,800	10.70	12/31/05 7:00
2007	1.75	72	0.01	1,269	133	96%	5	4%	197	4.02	2/26/07 23:30
<b>Los Trancos Creek at Piers Lane <sup>3</sup></b>											
2003	2.67	123	0.01	1,934	2,494	...	...	...	649	7.58	12/16/02 6:30
2004	2.70	136	0.02	1,461	2,991	...	...	...	582	5.47	2/25/04 11:00
2005	3.56	67	0.02	2,575	1,424	94%	85	6%	357	4.33	2/18/05 6:00
2006	7.09	190	0.13	5,137	4,328	91%	433	9%	640	7.80	12/31/05 8:15
2007	0.75	11	0.01	540	37	90%	4	10%	44	2.32	12/12/06 9:15
<b>San Francisquito Creek at Piers Lane <sup>3</sup></b>											
2003	15.40	782	0.09	11,146	10,097	...	...	...	2,706	12.46	12/16/02 6:30
2004	11.02	453	0.12	8,002	6,910	...	...	...	1,474	9.67	1/1/04 13:15
2005	24.35	509	0.05	17,627	9,463	...	...	...	749	7.77	2/15/05 21:00
2006	40.09	1,704	0.39	29,027	34,217	...	...	...	4,300	12.98	12/31/05 8:15
2007	4.88	213	0.01	3,533	674	...	...	...	436	6.46	2/27/07 0:45

**Notes:**

General: Values displaying more than 2 or 3 significant figures are the result of electronic calculations; no additional precision is implied.

- Hydrologic monitoring is conducted by "water years", rather than calendar years, to encompass whole rainfall seasons. Water year 2007 (WY2007) extends from October 1, 2006 through September 30, 2007 and corresponds to the water year used by most federal agencies.
- The period of record for the Bear Creek at Sand Hill Road station is October 12, 1999 to September 30, 2007.
- The period of record for the Piers Lane stations is October 2002 to September 2007; the partial record from the initial season (WY2002) of monitoring is not shown.
- Daily flow values were computed from instantaneous flow calculated at 15-minute intervals. Sediment discharge values were totalled from calculations at 15-minute intervals. "Maximum daily mean flow" is the highest mean daily flow of the year.
- Stage is the staff plate reading; the staff plate is set at an arbitrary datum and does not represent the absolute depth of water in the creek.
- In water year 2006, Bear Creek peak flow (12/31/2005) was estimated from surveyed high-water marks. Because the gaging equipment was destroyed in the high flows, daily mean flow on that day was calculated from the 15-minute flow record synthesized by correlation with other creeks. Peak flow at the two Piers Lane stations (12/31/2005) were calculated using the slope-area method and surveyed high-water marks. (The equipment at Piers Lane was not damaged)

**Table 5 Place Holder. Summary of water quality for Bear Creek at Sand Hill Road  
(no water quality measurements were collected from Bear Creek during water year 2007, so this table is inserted a placeholder)**

<i>Field observations</i> <sup>1</sup>							<i>Nutrients</i> <sup>2</sup>				<i>Pesticides</i>		<i>Others</i> <sup>3</sup>		
Date and Time	Observer	Gage Height	Hydrograph	Discharge	Water Temperature	Specific conductance	Ammonia-N	Nitrate-N	Nitrate-N + Nitrite-N	Phosphate-P	Chlorpyrifos	Diazinon	Total Suspended Solids	Hardness	
		(feet)	(R,F,B,U)	(cfs)	(°C)	(µmhos/cm @ 25°C)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(ug/L)	(ug/L)	(mg/L)	(mg/L)	
<b>Analytical detection limits</b> <sup>5</sup>															
<b>Bear Creek at Sand Hill Road</b>															
Minimum over period of record							0.20	0.08	0.10	0.15	ND	ND	1.8	94	
Maximum over period of record							0.44	0.95	1.40	2.73	ND	ND	420	272	
SF Bay RWQCB (1995)--Aquatic acute toxicity: 1-hour average							--- <sup>6</sup>	--- <sup>7</sup>	--- <sup>7</sup>	--- <sup>7</sup>	--- <sup>8</sup>	--- <sup>8</sup>	--- <sup>9</sup>	None	
SF Bay RWQCB (1995)--Aquatic chronic toxicity: 4-day average							--- <sup>6</sup>	--- <sup>7</sup>	--- <sup>7</sup>	--- <sup>7</sup>	--- <sup>8</sup>	--- <sup>8</sup>	--- <sup>9</sup>	None	

**Table 6. Summary of water quality at San Francisquito and Los Trancos Creeks at Piers Lane, water year 2007.**

Field observations <sup>1</sup>							Nutrients <sup>2</sup>				Pesticides		Others <sup>3</sup>		
Date and Time	Observer	Gage Height (feet)	Hydrograph (R,P,F, B,U)	Discharge (cfs)	Water Temperature (°C)	Specific conductance (µmhos/cm @ 25°C)	Ammonia-N (mg/L)	Nitrate-N (mg/L)	Nitrate + Nitrite-N (mg/L)	Phosphate-P (mg/L)	Chlorpyrifos (ug/L)	Diazinon (ug/L)	Total Suspended Solids (mg/L)	Hardness (mg/L)	
Analytical detection limits: <sup>5</sup>							12/26-27/2006	0.2	0.1	...	0.02	0.05	0.05	0.5	1.0
							2/8-10/2007	0.2	0.1	...	0.02	0.05	0.05	0.5	1.0
							2/26-27/2007	0.2	0.1	...	0.02	0.05	0.05	0.5	1.0
							4/11-12/2007	0.2	0.1	...	0.02	0.05	0.05	0.5	1.0
							4/21-22/2007	0.2	0.1	...	0.02	0.05	0.05	0.5	1.0
							7/11/07	0.2	0.1	...	0.02	...	...	...	1.0
<b>San Francisquito Creek at Piers Lane</b>															
12/26-27/2006	JO,ZR,DS	comp.	...	35.8				0.37	...	0.55	ND	ND	64	241	
12/26/2006 21:45	JO	3.71	R	12.8	10.0	776	ND (ND)								
2/8-10/2007	JG,ZR,GP	comp.	...	11.5				0.40	...	0.34	ND	ND	34	289	
2/10/2007 10:55	JO, BJM	4.90	F	74.9	11.9	626	ND								
2/26/2007 12:30	JG,TB	5.35	R	117	10.5	456	ND								
2/27/2007 17:30	JG,ZR,TB	5.37	R	138	9.4	412		0.38	...	0.40	ND	ND	57	161	
4/11-12/2007	JO,ZR,TB	comp.	...	2.8				0.63	...	0.09	ND	ND	2	349	
4/11/2007 13:45	JO	3.58	R	2.5	14.0	908	ND								
4/21-22/2007	ZR, EF	comp.	...	17.9				0.31	...	0.40			58	262	
4/22/2007 7:50	DS, AC	4.48	F	38.9	11.5	665	ND				...	...			
7/11/2007 18:00	ZR	3.33	B	0.35	21.3	1081	ND	1.1	...	0.18	...	....	...	455	
Minimum over period of record							ND	0.31	0.38	0.09	ND	ND	2	101	
Maximum over period of record							1.2	5.5	3.3	3.98	ND	ND	377	643	
<b>Los Trancos Creek at Piers Lane</b>															
12/26-27/2006	JO,ZR,DS	comp.	...	8.4				1.1	...	0.90	ND	ND	48	281	
12/26/2006 21:45	JO	0.97	P	13.9	12.1	1140	ND								
2/8-10/2007	JG,ZR,GP	comp.	...	3.1				1.2	...	0.34	ND	ND	27	392	
2/10/2007 10:30	JO, BJM	1.64	P	14.4	12.4	...	ND								
2/26-27/2007	JG,ZR,TB	comp.	...	12.9				1.4	...	0.83 (0.89)	ND	ND	150 (150)	222 (223)	
2/26/2007 13:00	JG,TB	1.43	R	5.3	11.1	540	ND								
4/11-12/2007	JO,ZR,TB	comp.	...	1.1				0.05	...	0.25	ND	ND	1	469	
4/11/2007 13:30	JO	0.85	R	0.7	13.3	1098	ND								
4/21-22/2007	ZR, EF	comp.	...	5.0				1.7	...	0.58	ND	ND	46	343	
4/22/2007 7:00	DS, AC	1.36	F	8.1	10.8	643	ND								
7/11/2007 17:30	ZR	0.64	B	0.04	19.5	1685	ND	3.2	...	0.34	....	...	...	805	
Minimum over period of record							ND	0.05	0.91	0.15	ND	ND	1	184	
Maximum over period of record							0.79	5.7	5.2	7.05	ND	ND	527	830	
SF Bay RWQCB (1995)--Aquatic acute toxicity: 1-hour average							---	---	---	---	---	---	---	---	None
SF Bay RWQCB (1995)--Aquatic chronic toxicity: 4-day average							---	---	---	---	---	---	---	---	None

Table 6. Summary of water quality at San Francisquito and Los Trancos Creeks at Piers Lane, water year 2007.

Field observations <sup>1</sup>		Trace Metals <sup>4</sup>															
Date and Time	Discharge	Aluminum (total)		Copper (total)		Lead (total)		Mercury (total)		Nickel (total)		Selenium (total)		Silver (total)		Zinc (total)	
		(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
	(cfs)																
Analytical detection limits: <sup>5</sup>	12/26-27/2006	200	10	0.6	0.6	0.4	0.4	0.0010	0.0005	0.6	0.6	0.1	0.1	0.2	0.2	5.0	5.0
	2/8-10/2007	100	10	0.6	0.6	0.4	0.4	0.0005	0.0005	0.6	0.6	0.1	0.1	0.2	0.2	5.0	5.0
	2/26-27/2007	200, 500	10	0.6	0.6	0.4	0.4	0.0005	0.0005	0.6	0.6	0.1	0.1	0.2	0.2	5.0	5.0
	4/11-12/2007	10	10	0.6	0.6	0.4	0.4	0.0005	0.0005	0.6	0.6	0.1	0.1	0.2	0.2	5.0	5.0
	4/21-22/2007	100	10	0.6	0.6	0.4	0.4	0.0005	0.0005	0.6	0.6	0.1	0.1	0.2	0.2	5.0	5.0
	7/11/2007	...	...	...	0.6	...	0.4	...	...	...	...	0.6	...	0.1	...	0.2	...
<b>San Francisquito Creek at Piers Lane</b>																	
12/26-27/2006	35.8	1,900	11	28.0	4.6 (5.3)	3.3	ND (ND)			11.0	3.1 (3.6)	0.3	0.2 (0.2)	ND	ND (ND)	30	ND (ND)
12/26/2006 21:45	12.8				5.3 (4.7)		ND (ND)	0.0400	0.0016		3.8 (3.2)		0.2 (0.2)	ND	ND (ND)		8 (ND)
2/8-10/2007	11.5	690	2	13.7	4.3	1.5	ND			6.0	3.0	0.2	0.1	ns	ns	16	28
2/10/2007 10:55	75				3.0		ND	0.13	ns		3.1		0.1				18
2/26/2007 12:30	117				5.3		ND	0.020	0.0024		3.0		0.1				12
2/27/2007 17:30	138	1,600	36	18.0	3.7	2.5	ND			7.0	2.6	0.2	0.2	ns	ns	18	10
4/11-12/2007	2.5	30	10	2.7	2.3	ND	ND			3.4	3.2	0.4	0.4	ND	ND	ND	13
4/10/2007 13:45	17.9				2.3		ND	0.0017	0.0006		3.1		0.3	ND	ND		11
4/21-22/2007	17.9	810	6	29.0	4.8	3.1	ND			7.0	2.9	0.3	0.3	ND	ND	26	17
4/22/2007 7:50	38.9				3.0		ND	0.010	0.001		2.7		0.2	ND	ND		16
7/11/2007 18:00	0.4				1.6		ND	...	...		3.0		0.3	...	ND		ND
Minimum over period of record		ND	ND	1.5	1.3	ND	ND	0.0009	ND	3.4	2.6	0.2	0.1	ND	ND	ND	ND
Maximum over period of record		12,000	190	74.0	17.0	17.0	1.10	0.13	0.042	38.0	9.0	1.3	0.4	ND	0.3	110	47
<b>Los Trancos Creek at Piers Lane</b>																	
12/26-27/2006	8.40	1300	10	13.6	3.4	1.8	ND			9.0	2.4	0.2	0.2	ND	ND	30	ND
12/26/2006 21:45	13.9				7.0		ND	0.035	0.0017		3.4		0.1	ND	ND		20
2/8-10/2007	3.10	630	ND	4.5	2.9	1.0	ND			4.6	14.0	ND	ND	ns	ns	10	ND
2/10/2007 10:30	14.4				4.4		ND	0.024	ns		2.3		0.1				13
2/26-27/2007	12.9	4,600	24	13.8 (14.1)	4.4 (4.5)	4.0 (4.0)	ND (ND)			18.0 (18.0)	3.1 (2.5)	0.2 (0.2)	ND (ND)	ns	ns	30 (37)	14 (10)
2/26/2007 13:00	5.3				4.4		ND	0.0100	0.0030		2.3		ND				10
4/11-12/2007	1.1	25	ND	2.8	2.5	ND	ND			2.9	2.7	0.1	0.2	ND	ND	ND	10
4/10/2007 13:30	0.7				4.2		ND	0.0019	0.0011		3.6		0.2	ND	ND		6
4/21-22/2007	5.0	680	6	7.4	3.7	1.7	ND			7.0	2.8	0.2	0.1	ND	ND	19	28
4/22/2007 7:00	8.1				5.9		ND	0.034	0.0029		3.2		0.2	ND	ND		27
7/11/2007 17:30	0.0				2.2		ND	...	...		3.3		0.4	...	ND		ND
Minimum over period of record		ND	ND	ND	1.4	ND	ND	0.0010	ND	2.9	2.3	ND	ND	ND	ND	ND	ND
Maximum over period of record		33,000	110	82.0	10.9	30.0	1.2	0.27	0.0080	117	14.0	2.1	0.4	0.3	ND	180	50
SF Bay RWQCB (1995)--Aquatic acute toxicity: 1-hour average <sup>10</sup>		None		None	13.4 - 49.6	None	64.6 - 288	... <sup>11</sup>	... <sup>11</sup>	None	468 - 1,186	20	20	None	3.4 - 37.4	None	118 - 382
SF Bay RWQCB (1995)-- Aquatic chronic toxicity: 4-day average <sup>10</sup>		None		None	9.0 - 29.3	None	2.5 - 10.9	... <sup>11</sup>	... <sup>11</sup>	None	52 - 132	5	5	(instantaneous maximum; no acute or chronic toxicity)		None	117 - 379

**Table 6. Summary of water quality at San Francisquito and Los Trancos Creeks at Piers Lane, water year 2007.**

- Notes:** ND = not detected, ns = not sampled, na = not analyzed
- 1) Observer Key: TB is Travis Baggett; AC is Annette Cayot; EF is Eric Forno; JG is John Gartner; BJM is Bonnie Mallory; JO is Jonathan Owens; GP is Gustavo Porras; ZR is Zan Rubin  
 Hydrograph: R=Rising; P=Peak; F=Falling; B=Baseflow; U=Uncertain **Bold** flow values indicate average flow during the period of composite sampling  
 All specific conductance and temperature measurements were made in the field. Values reported in parentheses are replicate subsamples.
- 2) Ammonia and phosphate samples were preserved upon collection with sulfuric acid (H2SO4) to pH<2.  
 Nitrate samples were iced but not preserved because analysis occurred within 48 hours of sample collection.
- 3) All total suspended sediment (TSS) analyses of *composite* samples were performed by the RWQCP lab (City of Palo Alto) with a detection limit of 0.5 mg/L.  
 Results of TSS *grab* samples, analyzed by Soil Control Lab (Watsonville, CA) with a detection limit of 5.0 mg/L, are presented elsewhere in this report.
- 4) Total recoverable metals samples were preserved (unfiltered) upon collection with nitric acid (HNO3). Dissolved metals samples were filtered in the laboratory, then preserved with nitric acid.
- 5) Reporting Limits vary with analytical method, laboratory, quality control measures, and sample concentration, due to the dilution needed to bring the sample into analytical range.  
 Thus, the reporting limit may vary slightly among samples collected at different sites on the same day.  
 Aluminum, nitrate, organophosphate pesticide (diazinon, chlorpyrifos) and mercury analyses performed by Caltest (Napa).  
 Laboratory analyses for all other metals, ammonia, phosphate, hardness and suspended sediment (composite samples only) performed by the City of Palo Alto RWQCP.
- 6) Un-ionized ammonia concentrations chronically in excess of 0.025 mg/L (annual median value) can be toxic (RWQCB, 1995).  
 The proportion of total ammonia that is in the toxic, un-ionized form increases with increases in pH and temperature.  
 Mean daily temperatures varied from about 2.3 to 20.0°C in San Francisquito Creek and from about 4.4 to 19.8°C in Los Trancos Creek during water year 2007.  
 pH measurements ranged from 7.6 to 8.6 in San Francisquito Creek and from 7.2 to 8.6 in Los Trancos Creek during water year 2007.
- 7) Biostimulatory constituents should not be present in amounts that stimulate excessive aquatic growth (RWQCB, 1995).
- 8) Waters should remain free of toxics at concentrations lethal to or adversely impacting aquatic organisms (RWQCB, 1995).
- 9) Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses (RWQCB, 1995).
- 10) The California Toxics Rule, adopted statewide by the Regional Boards in 2004, then approved by the U.S. EPA and incorporated into the Basin Plans establishes aquatic acute and chronic toxicity objectives for dissolved concentrations of hardness-dependent trace metals. The range shown is for hardness of 100 to 400 mg/L as CaCO3, because the CTR states that "For purposes of calculating freshwater aquatic life criteria for metals . . . [f]or waters with a hardness of over 400 mg/l as calcium carbonate, a hardness of 400 mg/l as calcium carbonate shall be used . . ."

The objectives are calculated based on the following equations:

Dissolved Copper, 1-hour average =  $(e^{(0.9422 [\ln(\text{hardness})] - 1.700)}) \times (0.960)$   
 Dissolved Copper, 4-day average =  $(e^{(0.8545 [\ln(\text{hardness})] - 1.702)}) \times (0.960)$   
 Dissolved Lead, 1-hour average =  $(e^{(1.273[\ln(\text{hardness})] - 1.460)}) \times (1.46203 - \{[\ln(\text{hardness})] \times [0.145712]\})$   
 Dissolved Lead, 4-day average =  $(e^{(1.273[\ln(\text{hardness})] - 4.705)}) \times (1.46203 - \{[\ln(\text{hardness})] \times [0.145712]\})$   
 Dissolved Nickel, 1-hour average =  $(e^{(0.8460 [\ln(\text{hardness})] + 2.255)}) \times (0.998)$   
 Dissolved Nickel, 4-day average =  $(e^{(0.8460 [\ln(\text{hardness})] + 0.0584)}) \times (0.997)$   
 Dissolved Silver, instantaneous maximum =  $(e^{(1.72 [\ln(\text{hardness})] - 6.52)}) \times (0.85)$   
 Dissolved Zinc, 1-hour average =  $(e^{(0.8473 [\ln(\text{hardness})] + 0.884)}) \times (0.978)$   
 Dissolved Zinc, 4-day average =  $(e^{(0.8473 [\ln(\text{hardness})] + 0.884)}) \times (0.986)$

- 11) On August 9, 2006, the Regional Board adopted a new water-quality objective of 0.2 milligrams mercury per kilogram of fish tissue, replacing the acute (1-hour average) toxicity objective of 2.4 ug/L and the chronic (4-day average) toxicity objective of 0.025 ug/L.

**San Francisquito Creek at Piers Lane**

**12/26-27/2006 composite** programmed sampler to start on 12/26/06 at 16:00 and collect 36, 400-ml samples at 30-minute intervals; sample collection was stopped 12/27/06 at 9:30.  
**2/8-10/2007 composite** programmed sampler to start 2/8/07 at 15:30 and collect 45, 300-ml samples at 1-hour intervals; sample collection ended 2/10/07 at 11:30.  
**2/26-27/2007 GRAB** collected a grab sample on 2/26/2007 at 17:30  
**4/11-12/2007 composite** programmed sampler to start 4/11/07 at 9:30 and collect 32, 500-ml samples at 30-minute intervals; sample collection ended 4/12/07 at 13:00.  
**4/21-22/2007 composite** programmed sampler to start 4/21/07 at 18:00 and collect 36, 450-ml samples at 30-minute intervals; sample collection ended 4/22/07 at 11:30.  
**7/11/2007 grab** grab samples 7/11/07 at 18:00

**Los Trancos Creek at Piers Lane**

**12/26-27/2006 composite** programmed sampler to start on 12/26/06 at 16:00 and collect 36, 400-ml samples at 30-minute intervals; sample collection was stopped 12/27/06 at 9:30.  
**2/8-10/2007 composite** programmed sampler to start 2/8/07 at 15:30 and collect 45, 300-ml samples at 1-hour intervals; sample collection ended 2/10/07 at 11:30.  
**2/26-27/2007 composite** programmed sampler to start 2/26/06 at 12:30 and collect 57, 250-ml samples at 30 minute intervals; sample collection ended 2/27/06 at 16:30.  
**4/11-12/2007 composite** programmed sampler to start 4/11/07 at 9:30 and collect 32, 500-ml samples at 30-minute intervals; sample collection ended 4/12/07 at 13:00.  
**4/21-22/2007 composite** programmed sampler to start 4/21/07 at 18:00 and collect 36, 450-ml samples at 30-minute intervals; sample collection ended 4/22/07 at 11:30.  
**7/11/2007 grab** grab samples 7/11/07 at 17:30



**Table 7. Water quality objectives for dissolved trace metals concentrations at hardness levels typically observed in the San Francisquito Creek watershed.**

Trace Metal	Water Quality Objectives <sup>1</sup>	Ambient Total Hardness Levels <sup>2</sup>			
		100	200	300	400
		(mg/L as CaCO <sub>3</sub> )			
Copper	CMC (1-hour average)	13.4	25.8	37.8	49.6
Copper	CCC (4-day average)	9.0	16.2	22.9	29.3
Lead	CMC (1-hour average)	64.6	136.1	208.6	280.8
Lead	CCC (4-day average)	2.5	5.3	8.1	10.9
Nickel	CMC (1-hour average)	468	842	1186	1513
Nickel	CCC (4-day average)	52	94	132	168
Silver	Instantaneous Maximum	3.4	11.4	22.8	37.4
Zinc	CMC (1-hour average)	118	213	300	382
Zinc	CCC (4-day average)	117	211	297	379

**Notes:**

1. The California Toxics Rule (CTR), which includes water quality objectives for hardness-dependent trace metals, was adopted by the Regional Water Quality Control Board, Region 2 (San Francisco Bay), then approved by the State Water Resources Control Board on July 22, 2004 and by the California Office of Administrative Law on October 4, 2004. The criteria maximum concentration (CMC) is equivalent to the prior aquatic "acute" toxicity objective, while the criteria continuous concentration (CCC) is equivalent to the prior aquatic "chronic" toxicity objective.
2. Since calcium and magnesium are the primary components of hardness, the convention is to express total hardness in terms of an equivalent concentration of calcium carbonate (CaCO<sub>3</sub>). The range shown is for hardness of 100 to 400 mg/L as CaCO<sub>3</sub>. The CTR states that "For purposes of calculating freshwater aquatic life criteria for metals . . . [f]or waters with a hardness of over 400 mg/l as calcium carbonate, a hardness of 400 mg/l as calcium carbonate shall be used . . ."

**Table 8. Measurements and calculations of sediment transport, Bear Creek at Sand Hill Road, water year**

Field Observations <sup>1</sup>						Bedload Sampling Details					Sediment Transport			
Sample Date:Time	Observer(s)	Stage	Stream Condition	Streamflow Discharge	Streamflow Value Source	Active Bed Width	Sampler Width	No. of Verts.	Time/Vert.	Total Time	Sample Dry Weight	Bedload Discharge	Bedload Discharge	Suspended
		(ft)	R,F,B,U	(cfs)	M,R,E	(ft)	(ft)		(sec)	(sec)	(gm)	(lb/sec)	(tons/day)	(t)
<b>Bear Creek at Sand Hill Road</b>														
2/10/07 12:15	jo	2.26	F	21.0	R	tested for bedload, found none					...	0.01	...	
2/11/07 12:25	zr, gp	2.72	F	51.1	R	...	...	...	...	...	...	...	...	...

**Notes and explanations**

- Observer Key: jo = Jonathan Owens; zr = Zan Rubin; gp = Gustavo Porras  
 Stream Condition: R = rising, F = falling, B = baseflow, U = uncertain  
 Streamflow discharge is the measured or estimated instantaneous flow at the time that sediment was sampled. The value is usually taken from the datalogger record and typically differs from the mean flow for the day.  
 Streamflow Value Source: M = measured; R = rating curve; E = estimated; Streamflow for composite samples is mean flow for the sampling period.
- Active Bed Width is estimated by the field observer as the width through which significant amounts of bedload are being transported.  
 Sampler Width and Type: 0.25 = 3-inch Helley Smith; 0.50 = 6-inch Helley Smith
- Values for sediment discharge showing more than two to three digits are the result of calculations; increased precision is not implied.  
 Bedload Discharge (lbs/sec) = [active bed width (ft) \* sample dry weight (gm) \* 0.002205 (lbs)] / [sampler width (ft) \* sampling time (sec)]  
 Bedload Discharge (tons/day) = [active bed width (ft) \* sample dry weight (gm) \* 86,400 (sec)] / [sampler width (ft) \* sampling time (sec) \* 907,200 (gm)]  
 If the creek is visibly clear, then suspended sediment samples are not collected because concentrations would likely be below the detection limit.

**Table 9. Sediment-discharge measurements and calculations:  
San Francisquito and Los Trancos Creeks at Piers Lane, water year 2007**

Field observations					Bedload Sampling Details					Bedload Discharge		Suspended sediment			
Date and Time	Observer	Stage (feet)	Stream Condition (R, F, B)	Discharge (cfs)	Active Bed Width (ft)	Sampler Width (ft)	No. of Verts.	Time/Vert. (sec)	Total Time (sec)	Sample Dry Weight (gm)	Bedload- Sediment Discharge Rate (lb/sec)	Bedload- Sediment Discharge Rate (tons/day)	Total Suspended Solids (mg/L)	Suspended Sediment discharge (tons/day)	Turbidity (NTU)
<b>San Francisquito Creek at Piers Lane</b>															
12/26/2006 21:45	jo	4.21	F	22	...	...	...	...	...	...	...	...	203.7	12	140
<b>12/26-27/2006 composite</b>				<b>35.8</b>									<b>64.0</b>	<b>6.2</b>	...
2/10/2007 10:55	jo, bjm	5.04	R/F	75	...	...	...	...	...	...	...	...	170.9	35	...
<b>2/8-10/2007 composite</b>				<b>11.5</b>									<b>34.0</b>	<b>1.1</b>	...
2/11/2007 10:45	zr, gp	5.67	F	178	...	...	...	...	...	...	...	...	104.7	50	...
2/26/2007 12:30	ig, tb	5.23	R	117	...	...	...	...	...	...	...	...	103.6	33	91
2/27/2007 16:23	zr, tb	5.38	R/F	127	...	...	...	...	...	...	...	...	56.6	19	61
4/11/2007 13:45	jo	3.6	R	2.4	...	...	...	...	...	...	...	...	7.5	0.05	2.3
<b>4/11-12/2007 composite</b>				<b>2.8</b>									<b>2.0</b>	<b>0.02</b>	...
4/22/2007 7:50	ds, ac	4.52	F	38	...	...	...	...	...	...	...	...	84.0	8.6	54
<b>4/21-22/2007 composite</b>				<b>17.9</b>									<b>58.0</b>	<b>2.8</b>	...
<b>Los Trancos Creek at Piers Lane</b>															
12/26/2006 22:00	jo	1.70	R	14.2	...	...	...	...	...	...	...	...	123.8	4.7	120
<b>12/26-27/2006 composite</b>				<b>8.4</b>									<b>48</b>	<b>1.1</b>	...
2/10/2007 10:30	jo, bjm	1.64	F	14.4	7	0.25	3	40	120	48	0.025	1.04	141.2	5.5	...
<b>2/8-10/2007 composite</b>				<b>3.1</b>									<b>27</b>	<b>0.23</b>	...
2/11/2007 10:43	zr, gp	1.32	F	5.7	...	...	...	...	...	...	...	...	78.0	1.2	...
2/26/2007 13:00	ig, tb	1.33	F	6.0	...	...	...	...	...	...	...	...	47.9	0.8	37
<b>2/26-27/2007 composite</b>				<b>12.9</b>									<b>150</b>	<b>5.2</b>	...
<b>2/26-27/2007 composite</b>				<b>12.9</b>									<b>150</b>	<b>5.2</b>	...
2/27/2007 16:10	zr, tb	1.00	R	1.5	...	...	...	...	...	...	...	...	56.4	0.23	59
<b>4/11-12/2007 composite</b>				<b>1.1</b>									<b>1</b>	<b>0.003</b>	...
4/22/2007 7:50	ds, ac	1.38	F	7.6	...	...	...	...	...	...	...	...	84.9	1.7	76
<b>4/21-22/2007 composite</b>				<b>5.0</b>									<b>46</b>	<b>0.6</b>	...

Notes:

Observer Key: jo= Jonathan Owens; bjm= Bonnie Mallory; jg = John Gartner; ds = Dave Shaw; zr = Zan Rubin; bkh = Brian Hastings; tb = Travis Baggett; ac = Annette Cayot

Streamflow discharge is the measured or estimated instantaneous flow when sediment was sampled, usually from the datalogger record, and usually differs from the mean flow for the day.

Stream Condition: R = rising, F = falling, B = baseflow, U = uncertain

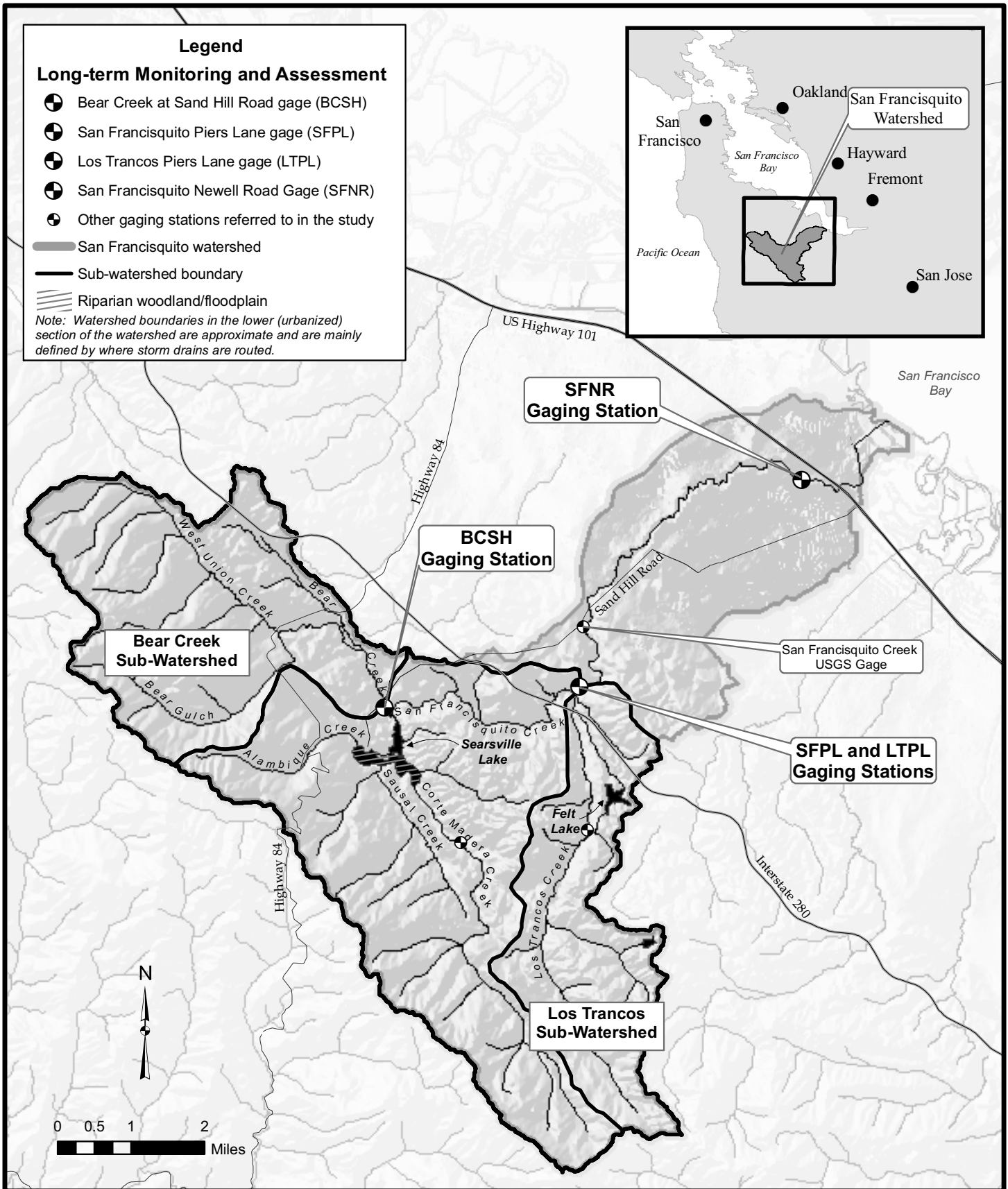
Values for sediment discharge having more than two to three digits displayed are the result of calculations; increased precision is not implied.

If the creek is visibly clear, then suspended sediment samples are not collected because concentrations would likely be below the detection limit.

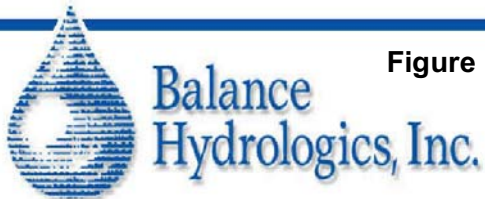
Bedload Discharge (lbs/sec) = [active bed width (ft) \* sample dry weight (gm) \* 0.002205 (lbs)] / [sampler width (ft) \* sampling time (sec)]

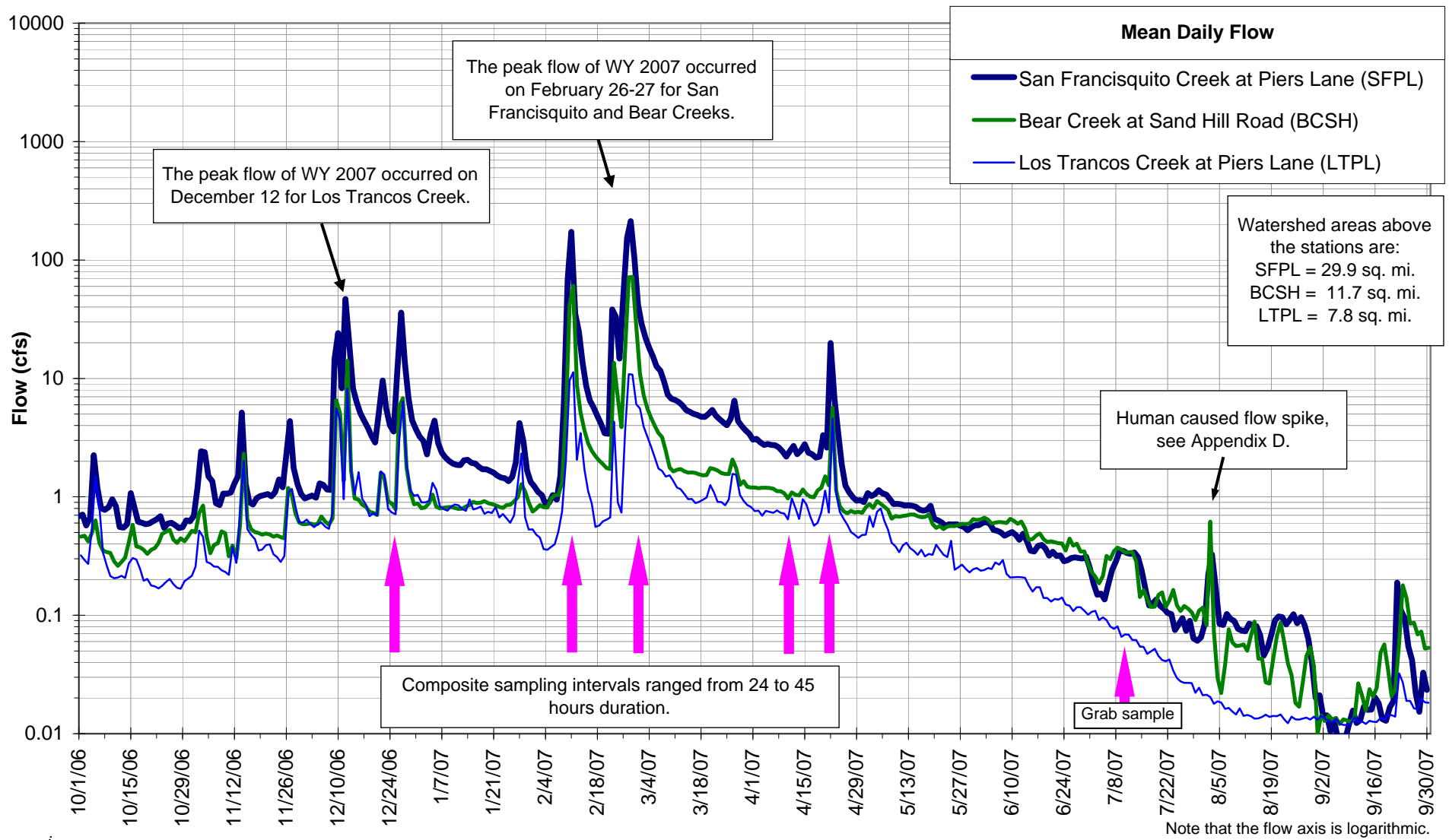
Bedload Discharge (tons/day) = [active bed width (ft) \* sample dry weight (gm) \* 86,400 (sec)] / [sampler width (ft) \* sampling time (sec) \* 907,200 (gm)]

## FIGURES



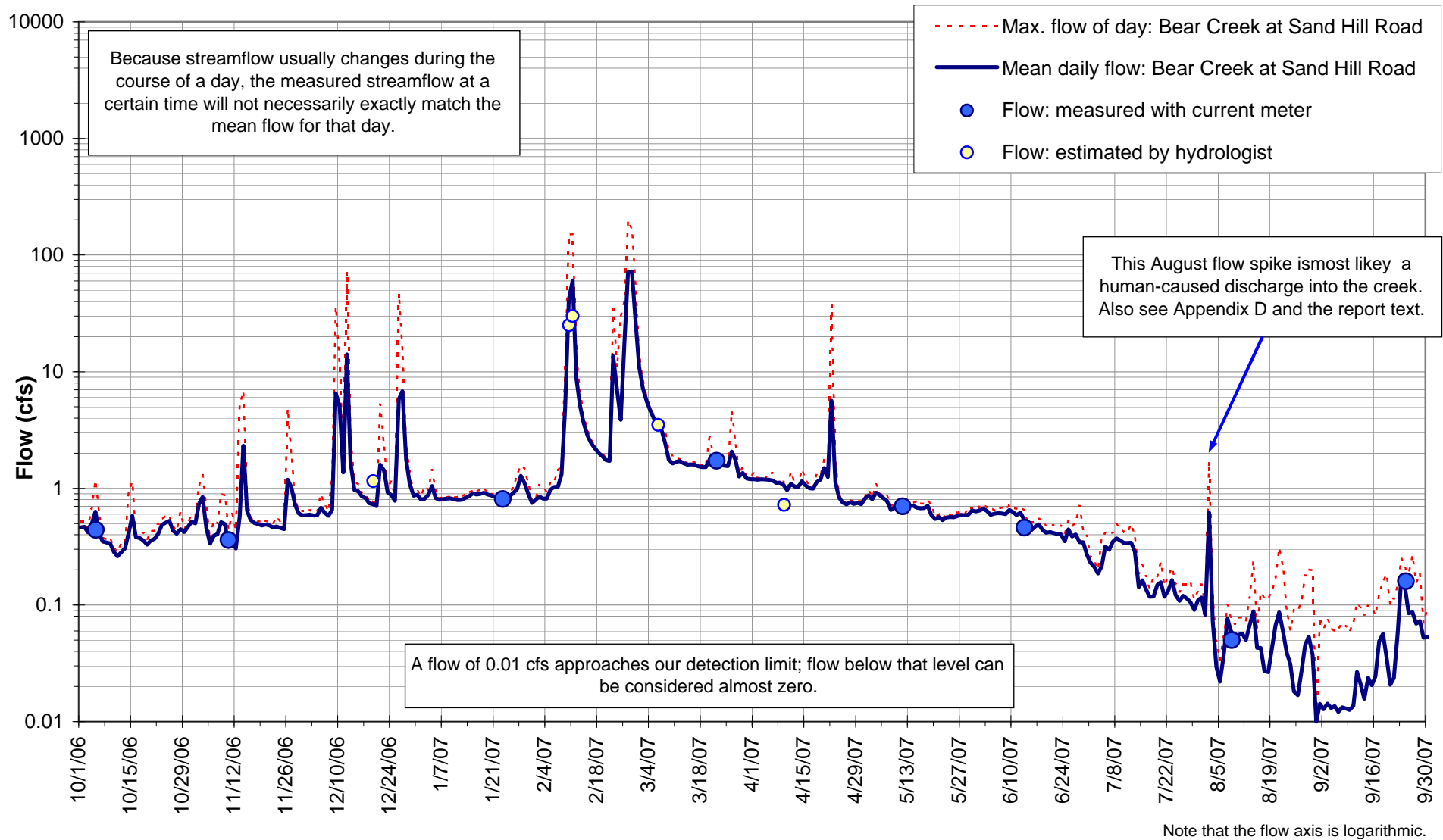
**Figure 1. Stream monitoring location in the San Francisquito watershed**  
 The Piers Lane stations are located just above the confluence of San Francisquito and Los Trancos Creeks. The Bear Creek station is located downstream of Sand Hill Road.



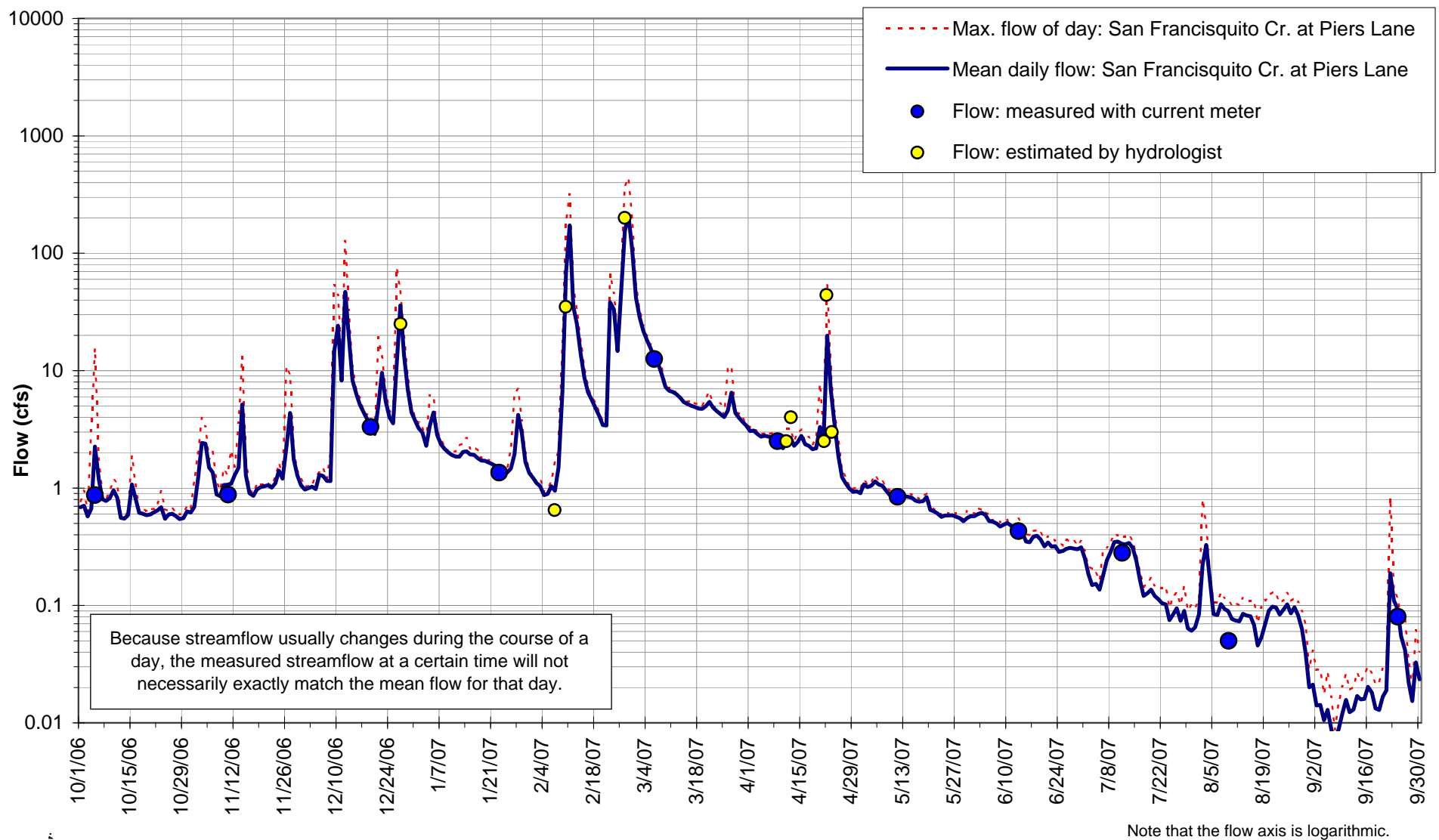


**Balance  
Hydrologics, Inc.**

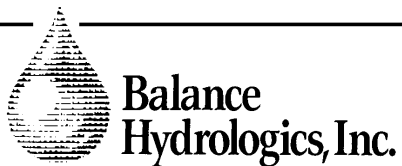
**Figure 2. Daily flow hydrographs for San Francisquito, Los Trancos and Bear Creeks, water year 2007.** Flow in San Francisquito Creek is generally greater than flow in Bear Creek or Los Trancos Creek, as would be expected from its larger drainage area. The sampling dates were chosen to measure water quality during: the first flush, winter storms, spring storms, and summer base flow.



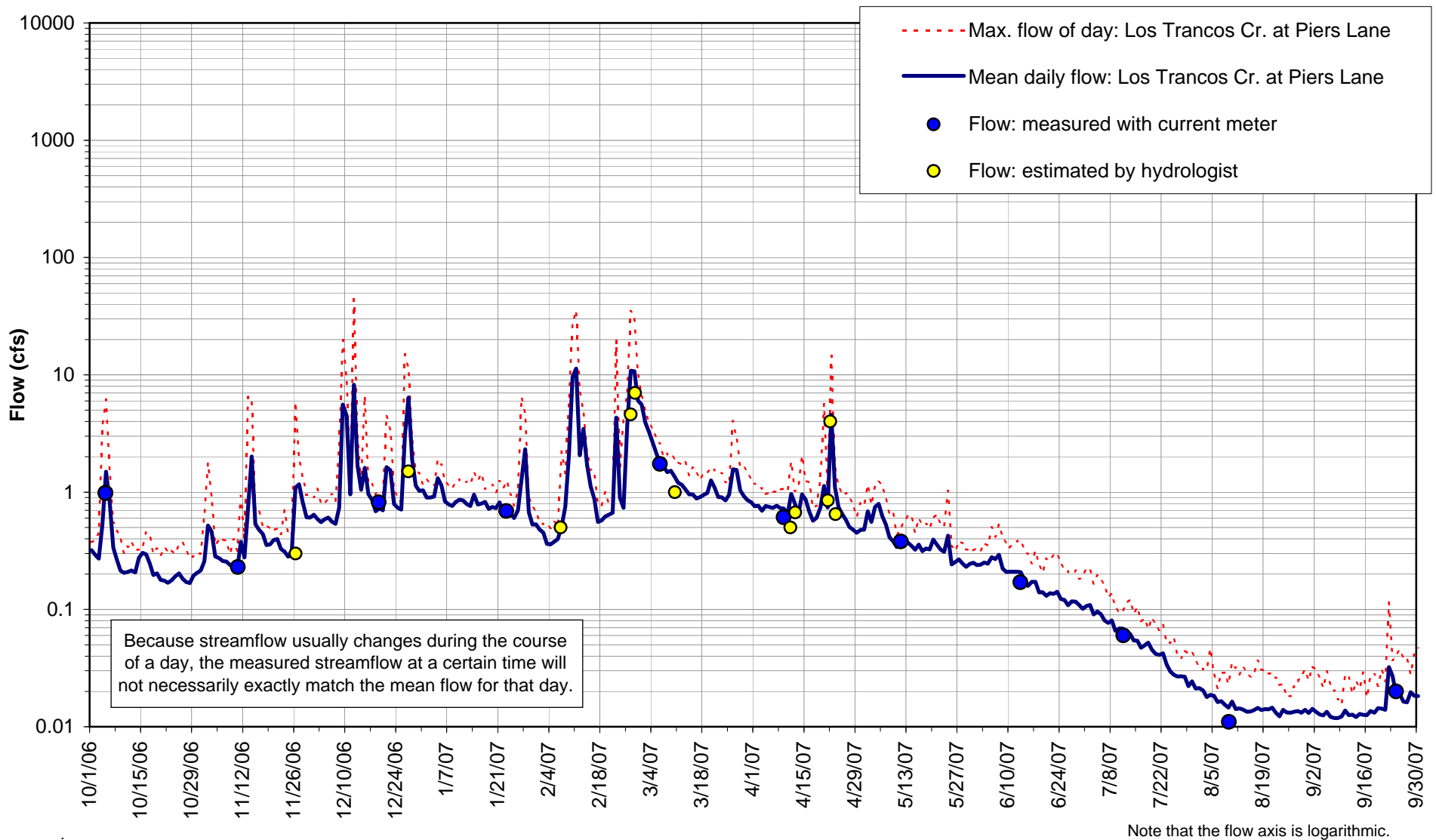
**Figure 3. Daily flow hydrograph for Bear Creek at Sand Hill Road, water year 2007.** Some flow regulation occurs upstream of this station. The peak flow of the water year was approximately 197 cfs on February 26, 2007 at about 11:30 PM.



**Figure 4. Daily flow hydrograph for San Francisquito Creek at Piers Lane, water year 2007.** The peak flow of the water year was approximately 436 cfs on February 27 at 12:45 am. This is an unusually small annual peak flow for this station.

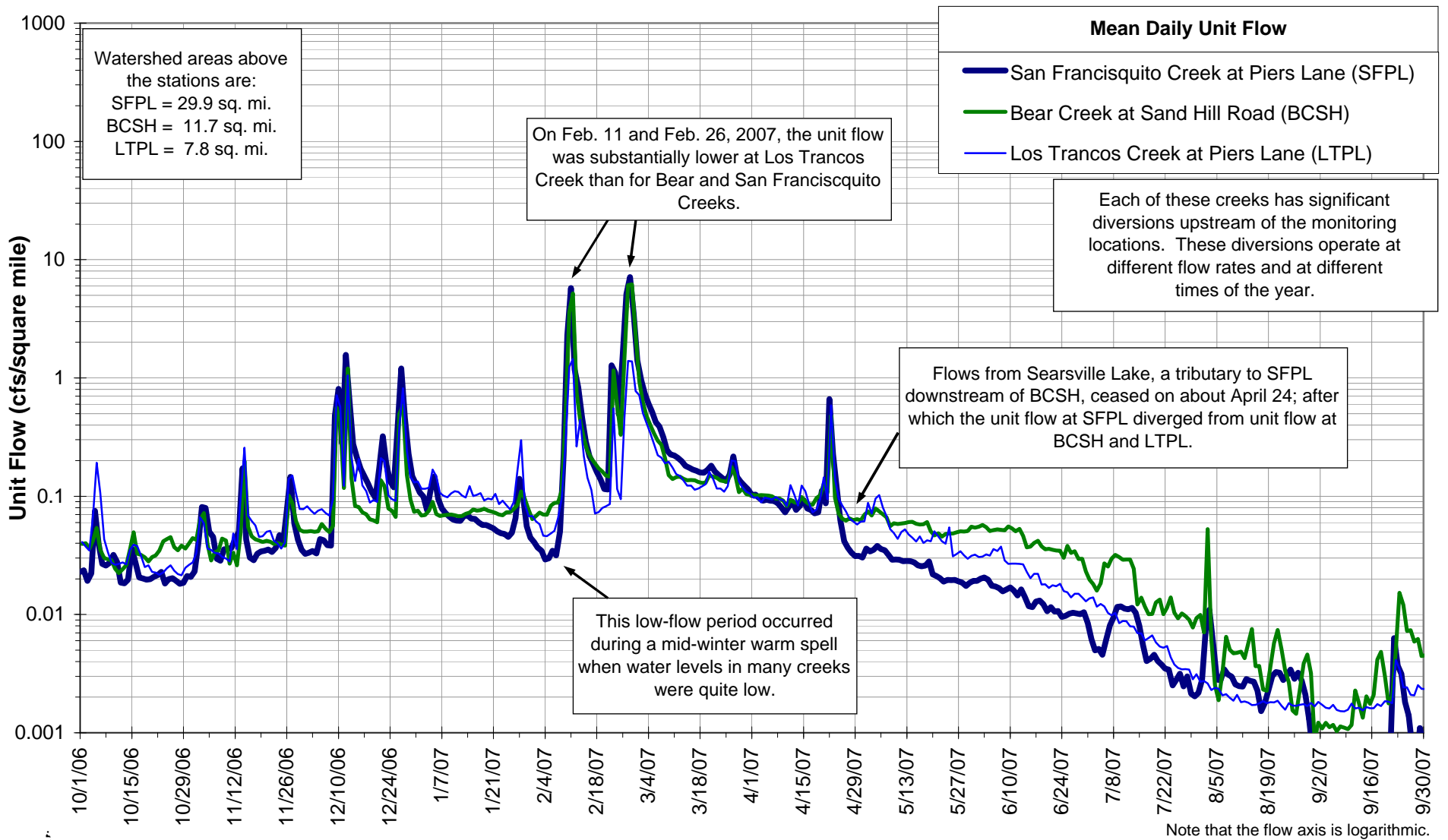






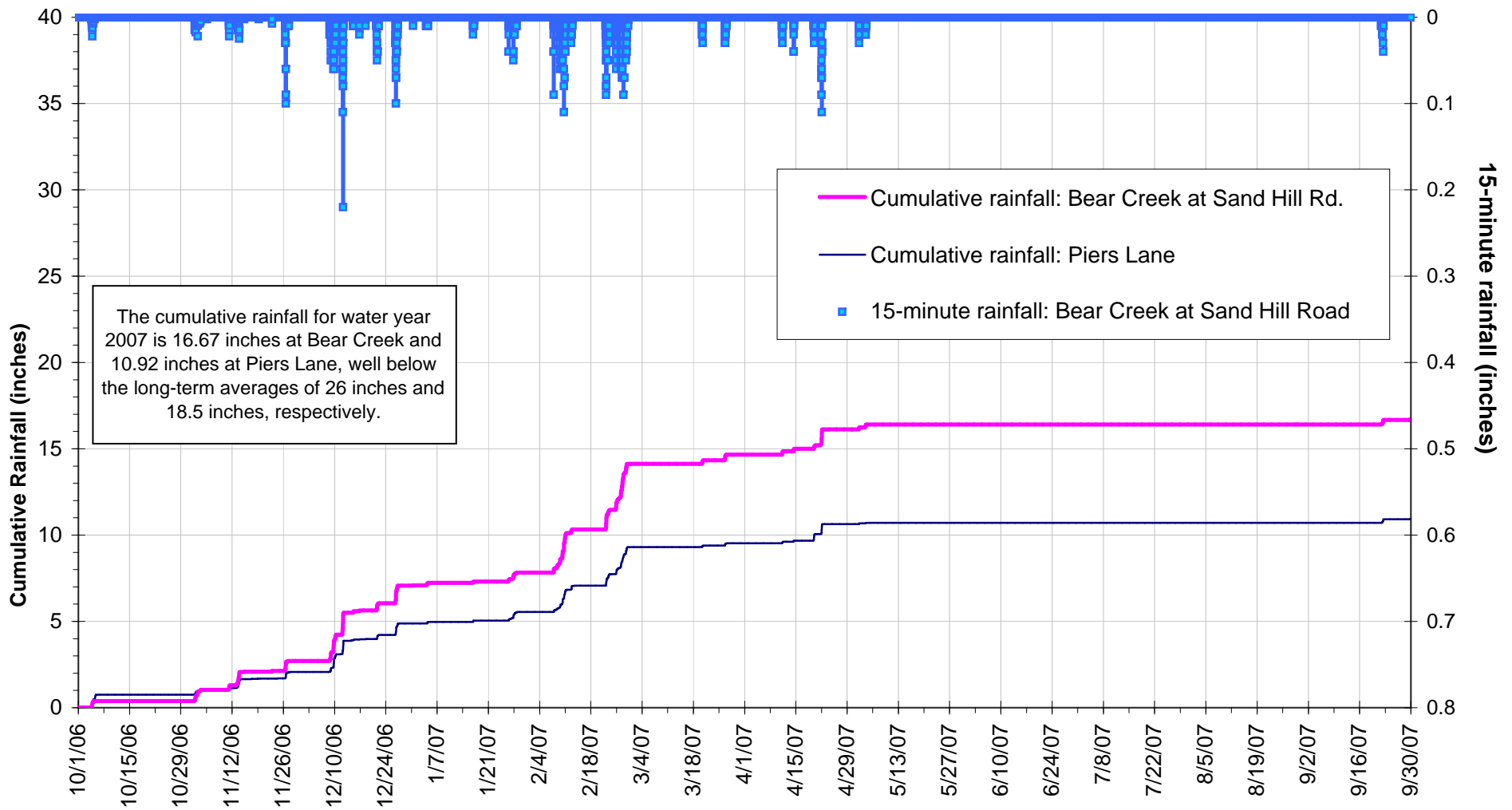
**Balance  
Hydrologics, Inc.**

**Figure 5. Daily flow hydrograph for Los Trancos Creek at Piers Lane, water year 2007.** The peak flow of the water year was approximately 44 cfs on December 12, 2007 at 9:15 am. Baseflow ended the water year significantly lower than the beginning of the water year. This is yet another indicator of how a low-rainfall year effects streamflow.



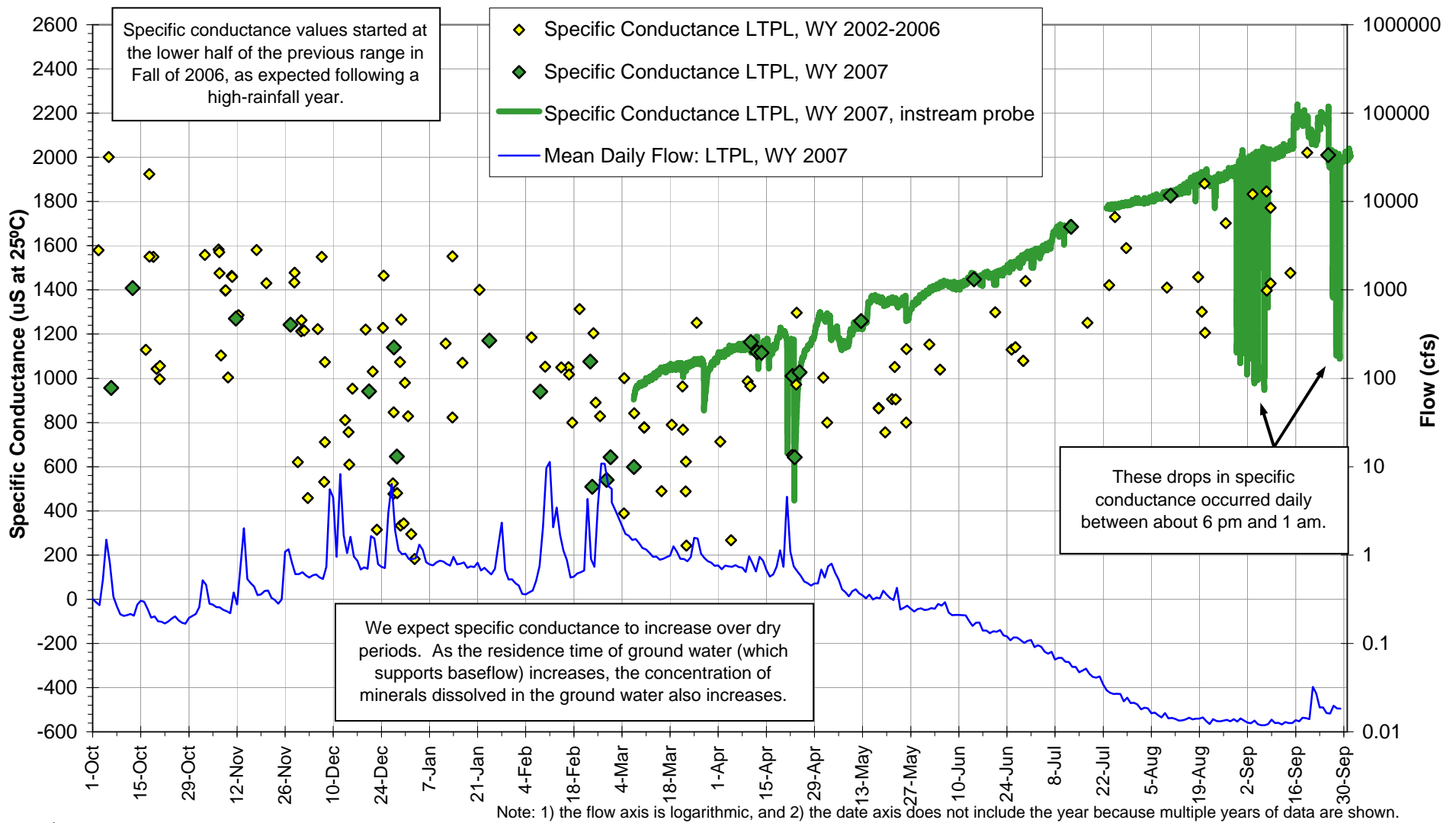
**Balance  
Hydrologics, Inc.**

**Figure 6. Unit flow hydrographs for San Francisquito, Los Trancos and Bear Creeks, water year 2007.** Unit flow is calculated by normalizing flow by watershed area. In many cases, lower flows in one creek as compared to the other creeks may be due to diversions, but flows can also be influenced by geology, topography and weather patterns. Baseflow was high at the beginning of the water year due to high rainfall in water year 2006, but was much lower at the end of this year due to *below*-average rainfall.

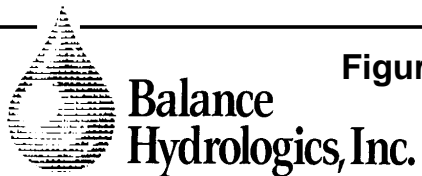


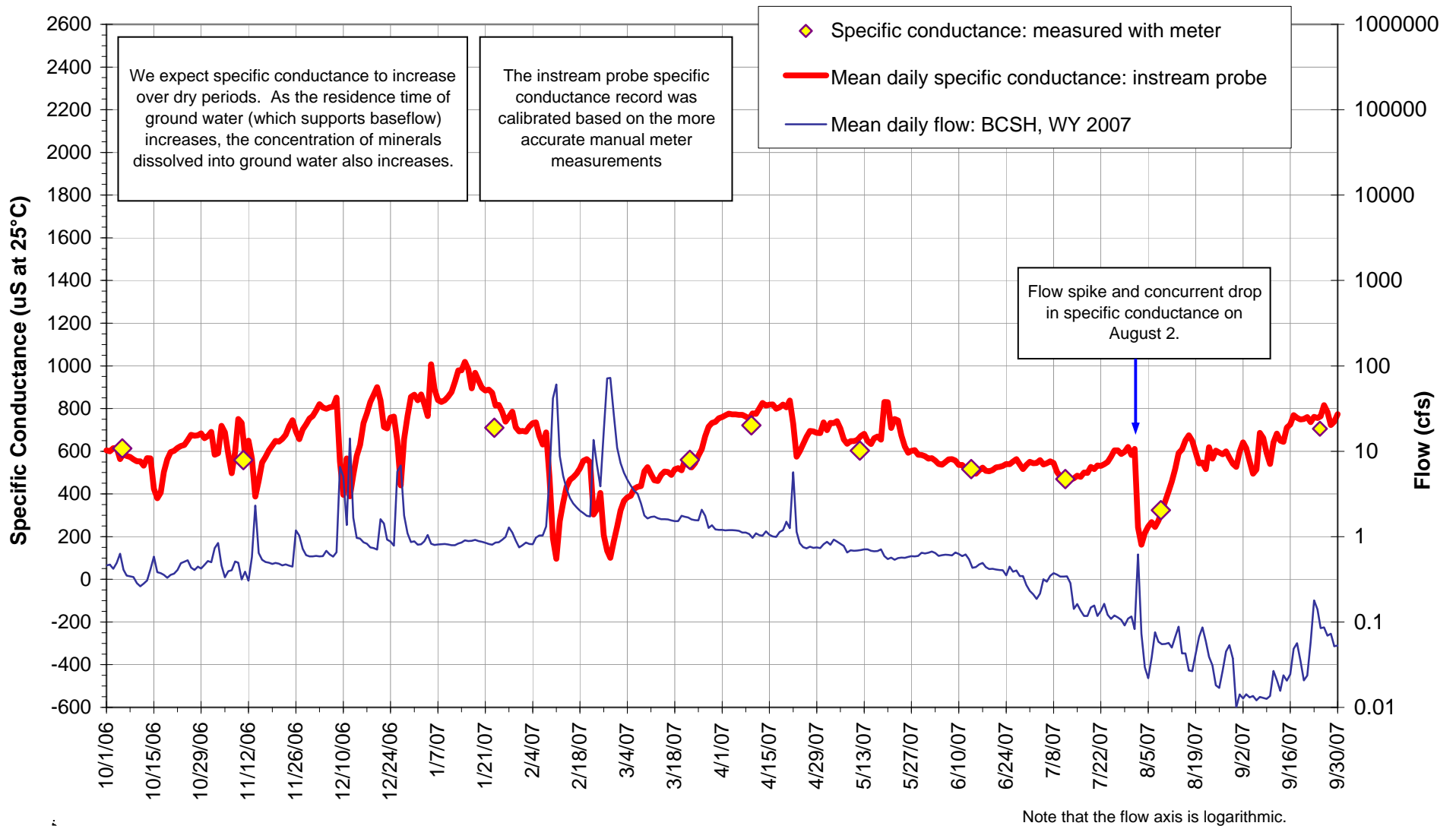
**Balance  
Hydrologics, Inc.**

**Figure 7. Cumulative 15-minute precipitation record at Bear Creek at Sand Hill Road, and San Francisquito Creek at Piers Lane, water year 2007.** Total rainfall this year is about 65 percent of average. The different totals between the two stations illustrate the typical annual gradient within the watershed, linked to distance from the top of the Santa Cruz Mountains.



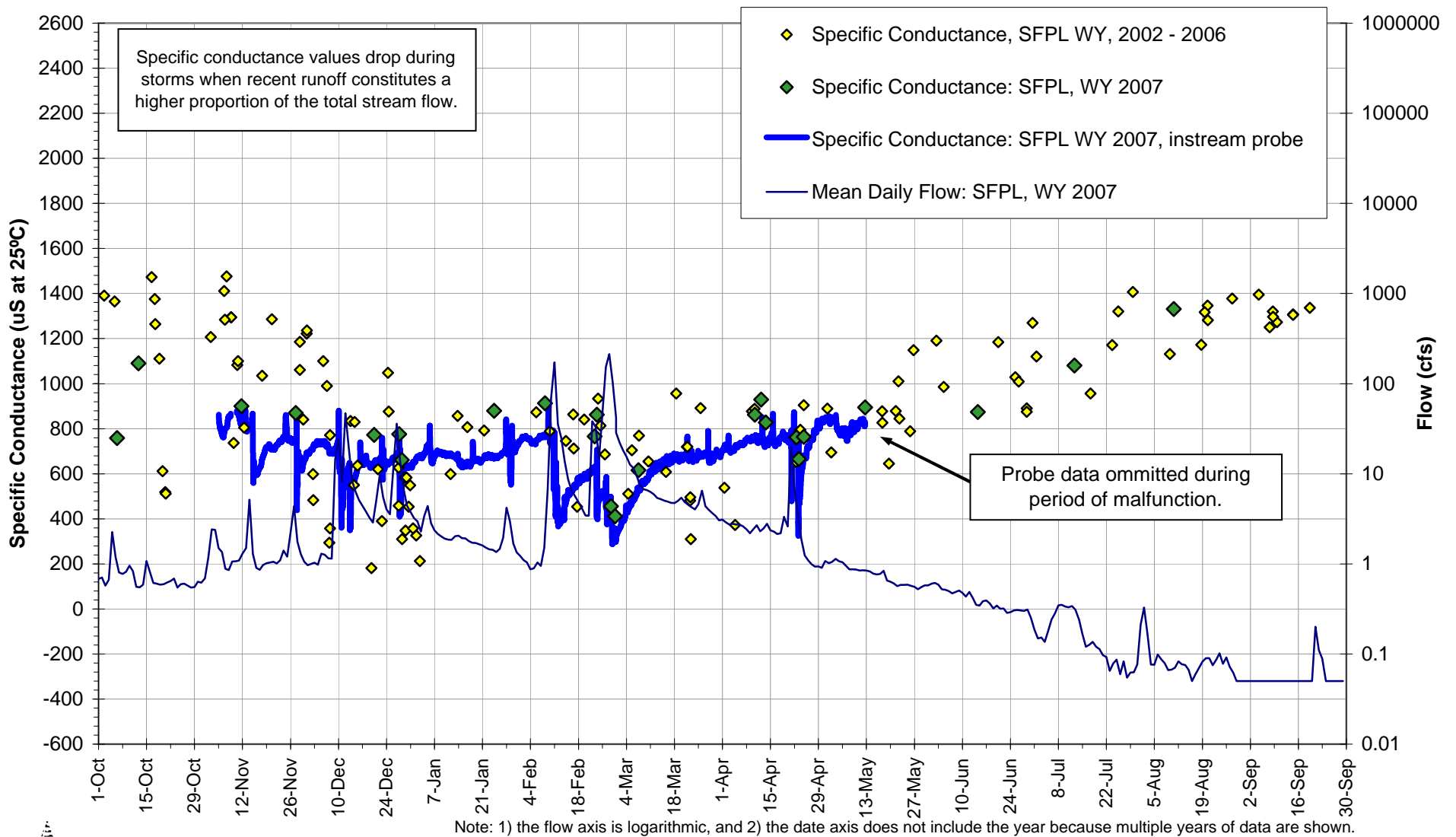
**Figure 8. Specific conductance measurements, Los Trancos Creek at Piers Lane, water years 2002 to 2007.** Specific conductance measurements are higher in Los Trancos Creek than in San Francisquito Creek or Bear Creek (see Figures 9 and 10). This difference between creeks may be due to geologic influences, or secondarily, human causes. The flow record is plotted for reference.





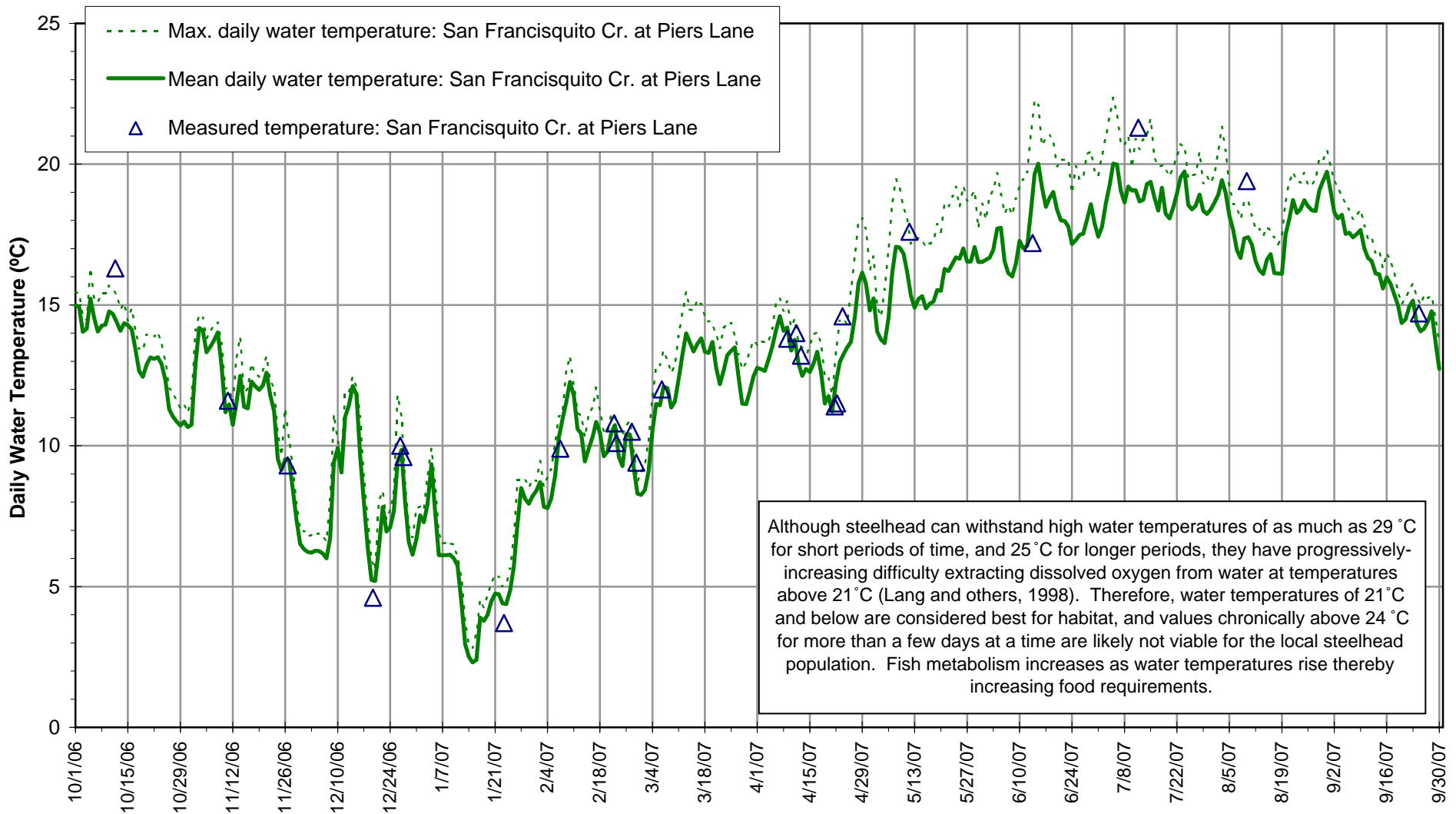
**Balance  
Hydrologics, Inc.**

**Figure 9. Specific conductance measurements, Bear Creek at Sand Hill Road, water year 2007.** Non-natural flow spikes and dips are often accompanied by concurrent changes in specific conductance and temperature (Figures D1 and D2). Specific conductance in Bear Creek is typically lower than in Los Trancos Creek or San Francisco Creek. This difference may be due to geologic influences, or secondarily, human causes. The flow record is plotted for reference.



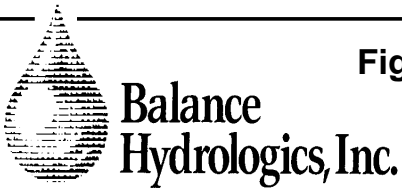
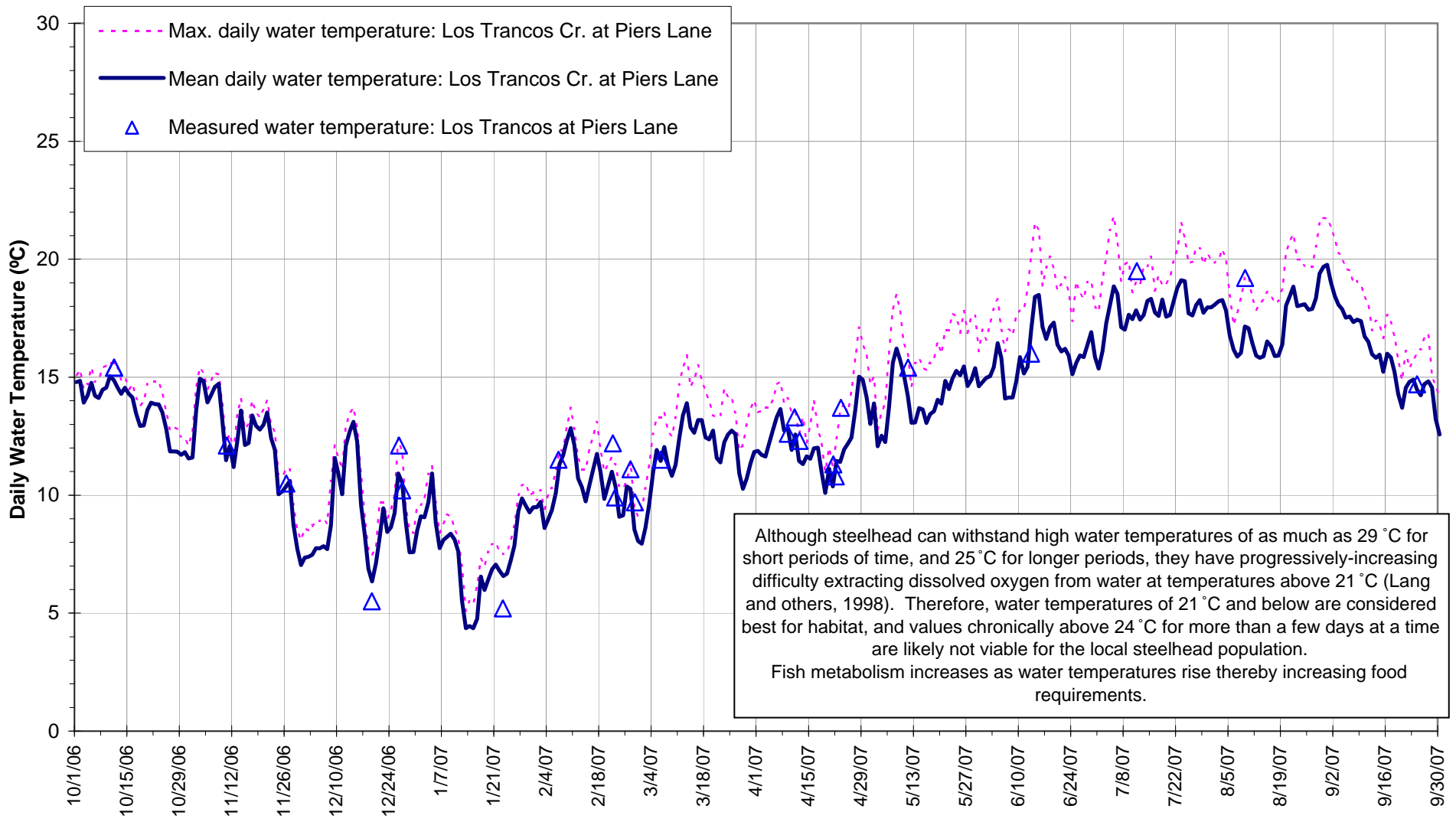
**Balance  
Hydrologics, Inc.**

**Figure 10. Specific conductance measurements, San Francisquito Creek at Piers Lane, water years 2002 to 2007.** Specific conductance measurements are generally similar for all years, with lower values during storms. This year, values started at the low end of the range during the fall (following wet water year 2006) and values are in the mid-to-high range during the winter and spring of 2007, as expected during a relatively low rainfall year. The flow record is plotted for reference.



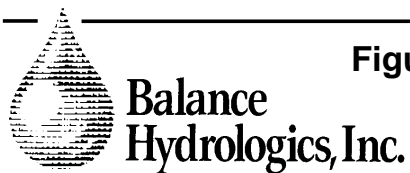
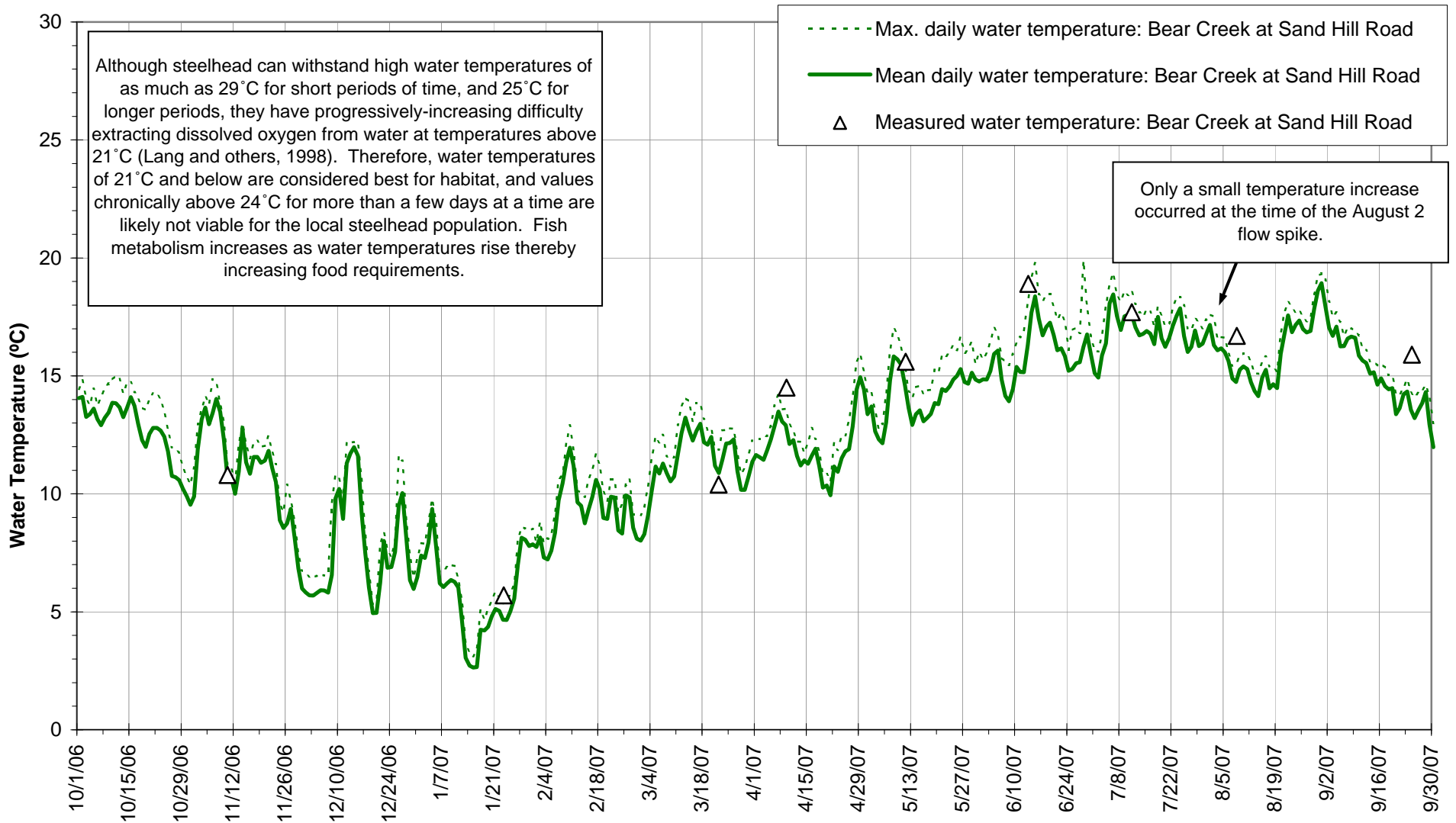
**Balance  
Hydrologics, Inc.**

**Figure 11. Daily water temperature record for San Francisquito Creek at Piers Lane, water year 2007.** Temperature patterns are similar at the San Francisquito Creek, Los Trancos Creek and Bear Creek stations. Water temperature generally seems to be slightly cooler in San Francisquito Creek than in Los Trancos Creek during the winter and warmer during the summer.



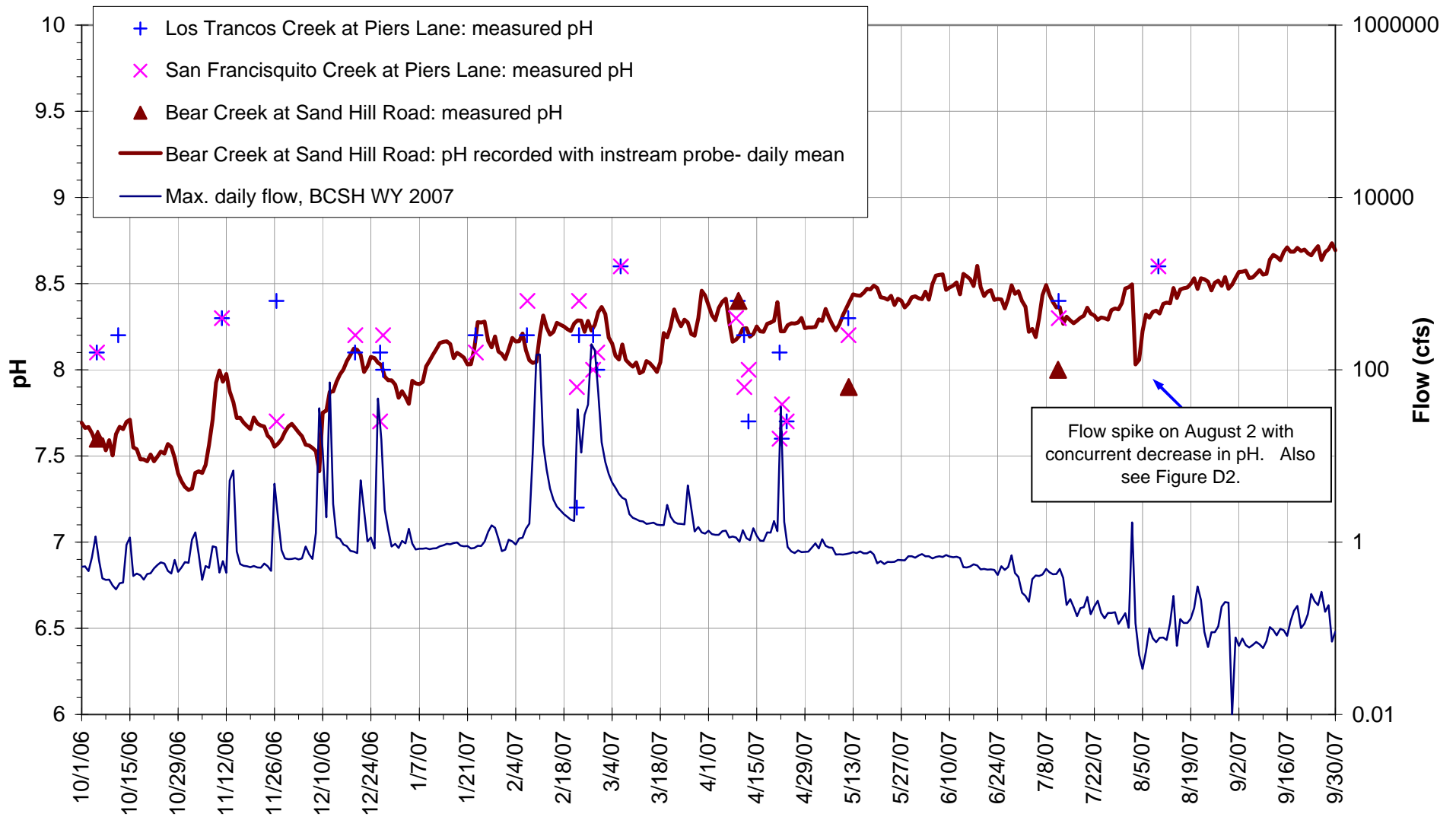
**Figure 12. Daily water temperature record for Los Trancos Creek at Piers Lane, water year 2007.** Temperature patterns are similar at the San Francisquito Creek, Los Trancos Creek and Bear Creek stations. Water temperature generally seems to be slightly warmer in Los Trancos Creek than in San Francisquito Creek during the winter and cooler during the summer.





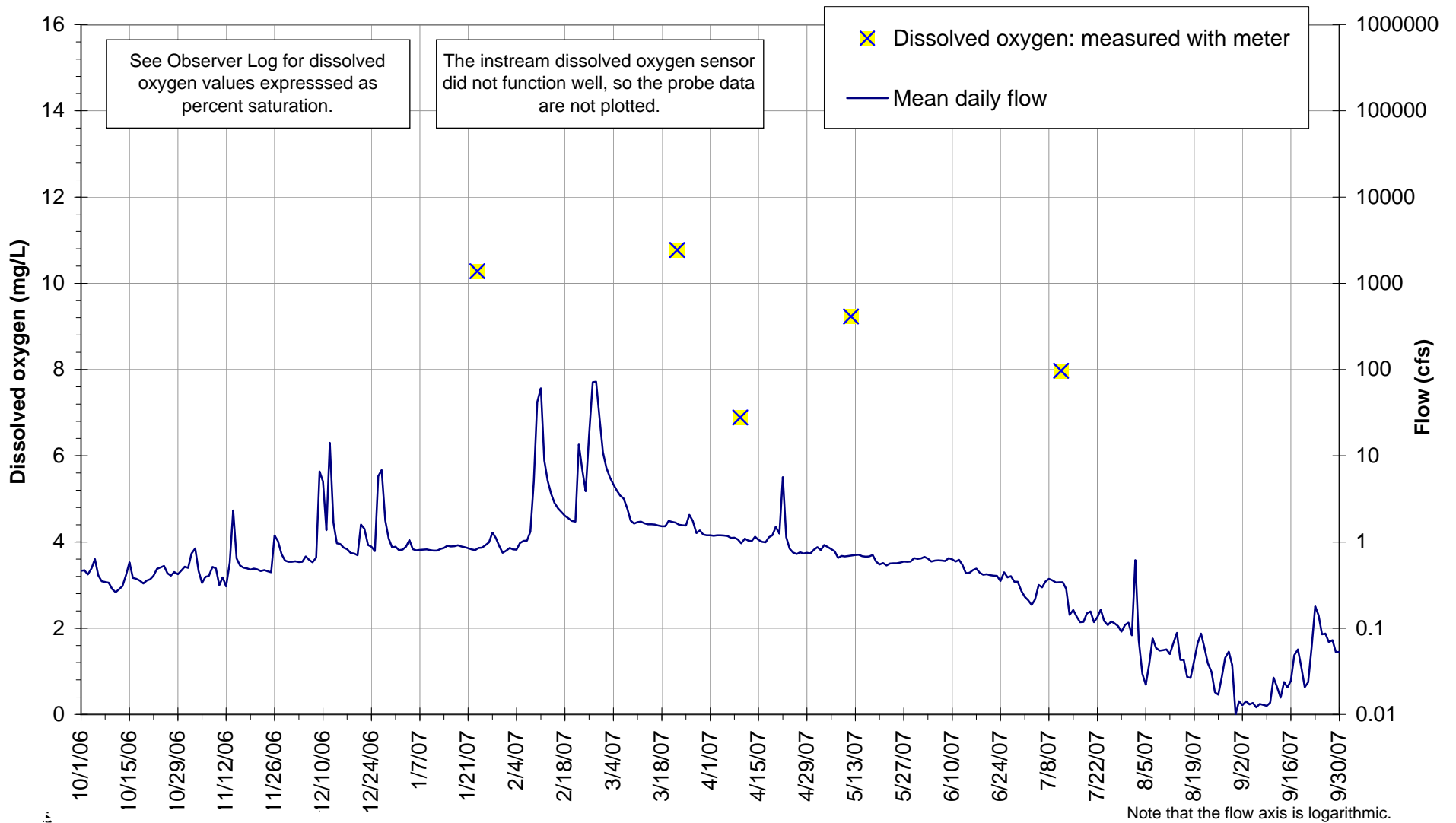
**Figure 13. Daily water temperature record for Bear Creek at Sand Hill Road, water year 2007.**

Temperature patterns at this station were similar to the downstream station, San Francisquito Creek at Piers Lane. Summer temperatures are lower at Bear Creek than either of the Piers Lane Stations.



**Balance  
Hydrologics, Inc.**

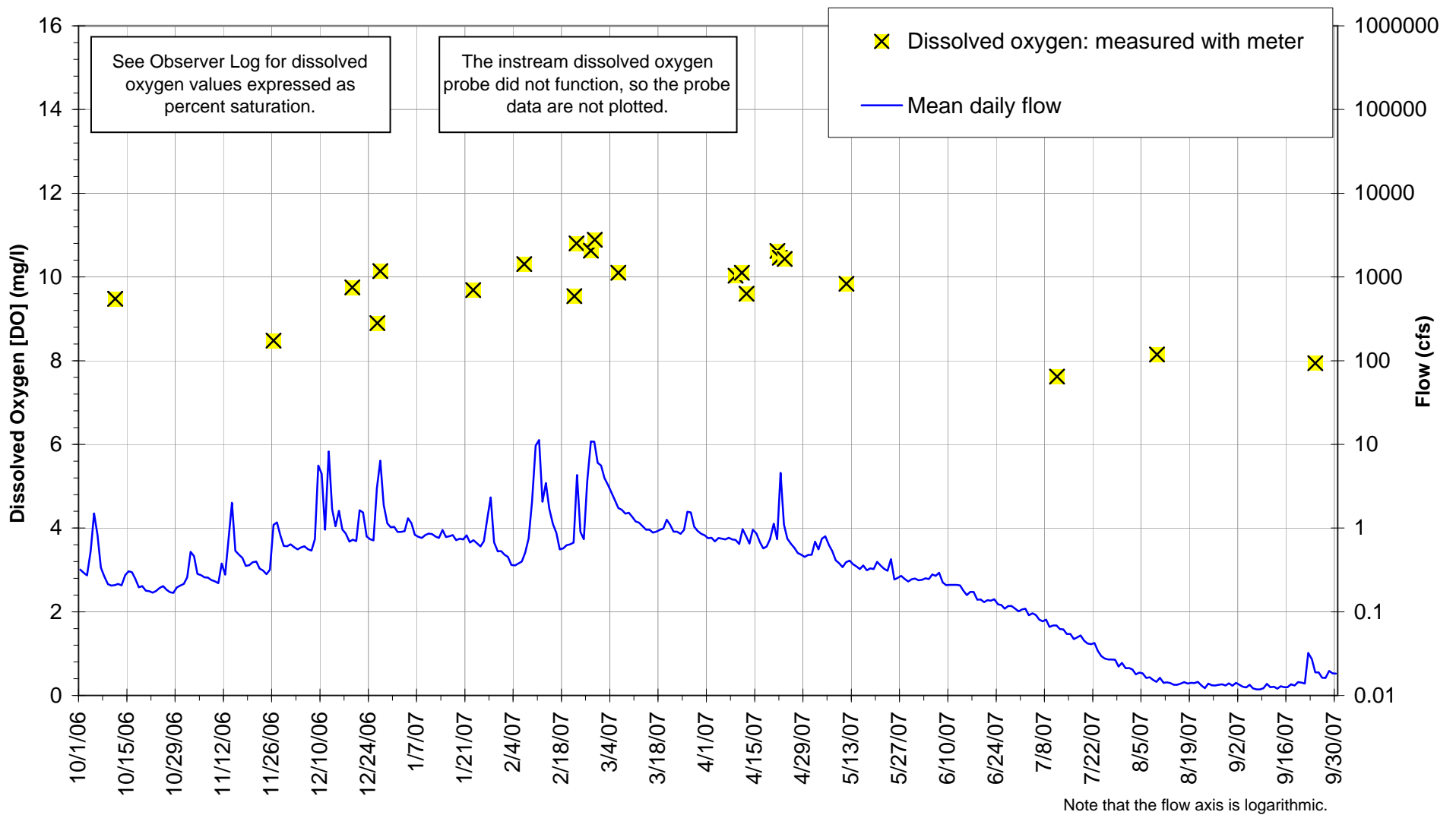
**Figure 14. pH measurements in San Francisquito Creek, Los Trancos Creek and Bear Creek, water year 2007.** Field measurements were made with hand-held pH meters. The in-stream pH probe functioned at Bear Creek, though the probes did not work properly at the two Piers Lane stations. The Bear Creek flow record is plotted for reference.



**Balance  
Hydrologics, Inc.**

**Figure 15. Dissolved oxygen concentrations at Bear Creek at Sand Hill Road, water year 2007.**

Dissolved oxygen concentrations are typically lower during late summer and fall low flows when water temperatures are higher, stream turbulence is lower, and pockets of decomposing leaves often create localized oxygen demand. The flow record is plotted for reference.

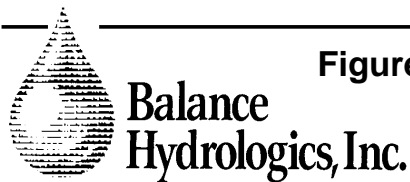
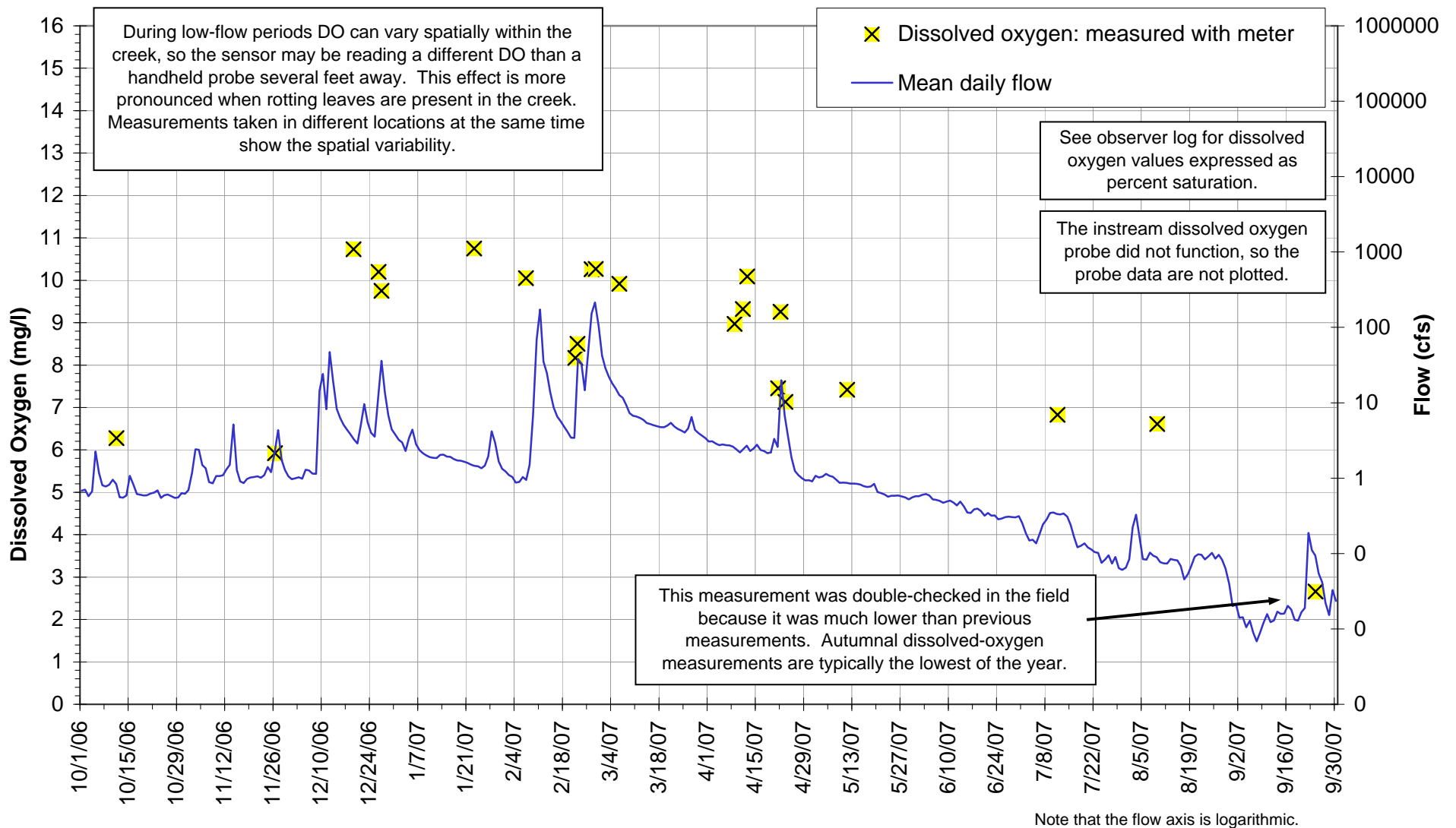


**Figure 16. Dissolved oxygen concentrations in Los Trancos Creek at Piers Lane, water year**

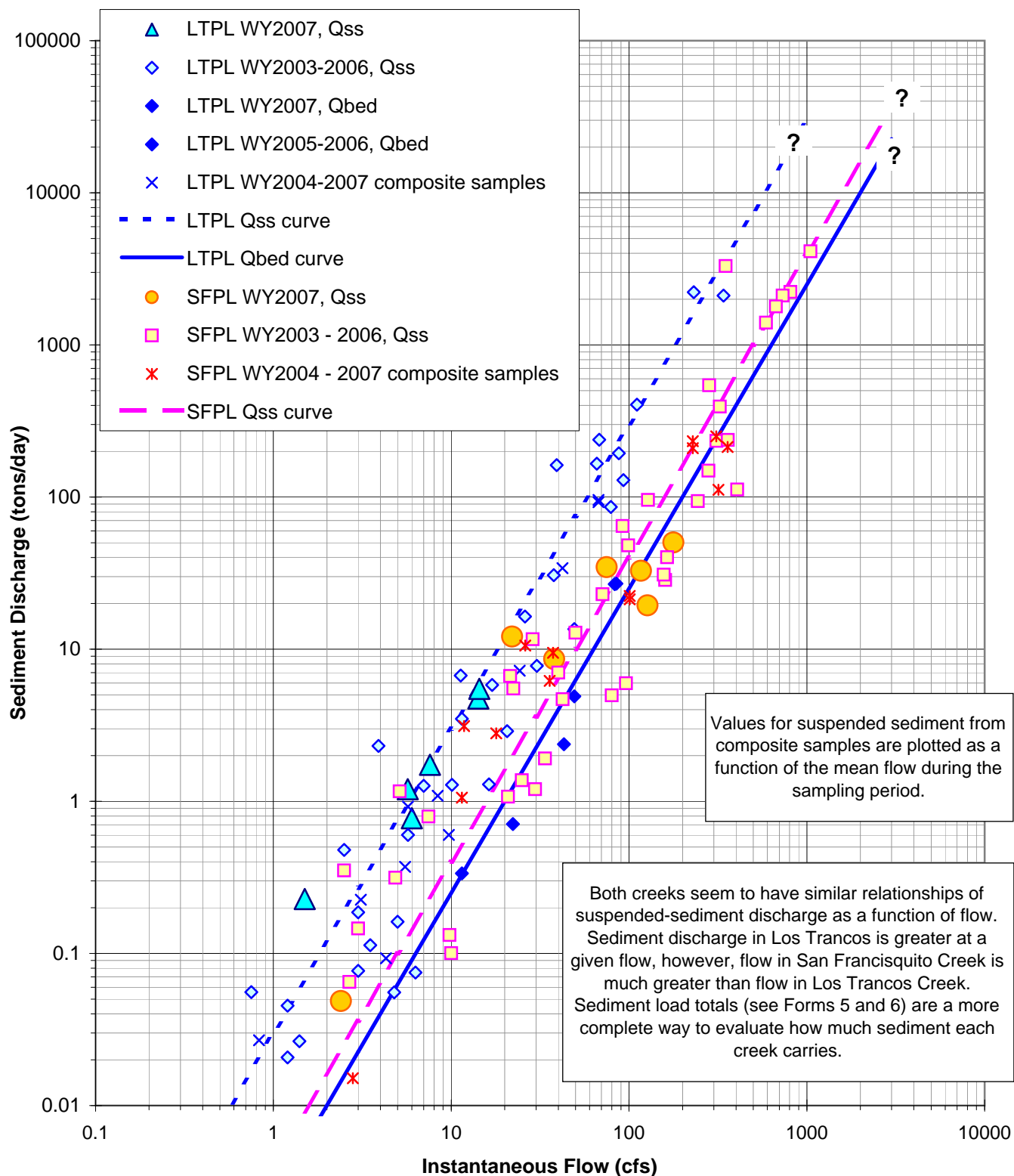
**2007.** Dissolved oxygen levels in Los Trancos Creek are almost always close to 100% saturation. Field measurements by Balance staff indicate that dissolved oxygen concentrations are lower during late summer and fall low flows when water temperatures are higher, stream turbulence is lower, and products of decomposing leaves often create localized oxygen demand. The flow record is plotted for reference.



**Balance  
Hydrologics, Inc.**

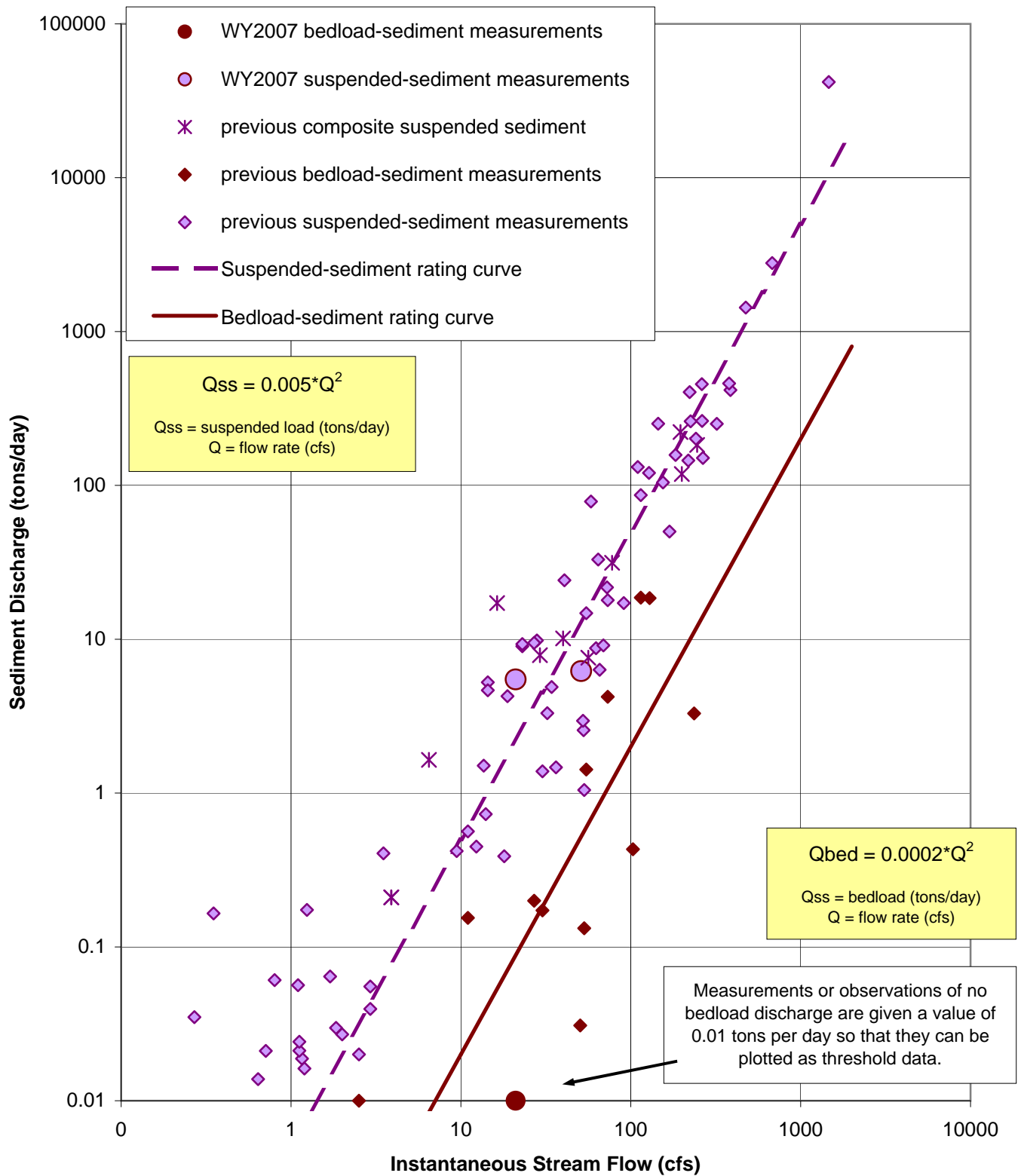


**Figure 17. Dissolved oxygen concentrations in San Francisquito Creek at Piers Lane, water year 2007.** Field measurements by Balance staff indicate that dissolved oxygen concentrations are lower during late summer and fall low flows when water temperatures are higher, stream turbulence is lower, and products of decomposing leaves often create localized oxygen demand.



**Balance  
Hydrologics, Inc.**

**Figure 18. Sediment measurements and rating curves for the Piers Lane stations.** The samples collected this year show a similar relationship as in previous years, therefore we used the same sediment rating curves for water year 2007 as we did for the previous year.



**Balance Hydrologics, Inc.**

**Figure 19. Sediment measurements and rating curves for Bear Creek at Sand hill Road, water years 1998-2007.**

Suspended sediment as a function of flow seems unchanged in water year 2007 from the previous year. Due to the lack of high flows, no bedload discharge was measured.

## **APPENDICES**



## **APPENDIX A**

### **Laboratory Results and Chain of Custody Forms (Piers Lane Stations)**

# SOIL CONTROL LAB

42 HANGAR WAY  
WATSONVILLE  
CALIFORNIA  
95076  
USA

Account Number:  
7010148-19-4205

Balance Hydrologics  
841 Folger Ave.  
Berkeley, CA 94710  
Attn: Jonathan Owens

Reporting Date:  
January 25, 2007

Date Received: Water samples received January 9, 2007  
Project #/Name: Various  
Laboratory #: 7010148-1/19 through 19/19

Sample Identification	Turbidity (NTU)	Particles Larger Than 63 Micron	Suspended Solids Smaller Than 63 Micron	Total Suspended Solids (mg/L)
<del>LTPL 061226:2145</del>	<del>120</del>	<del>21.8</del>	<del>102.0</del>	<del>123.8</del>
LTPL 061226:2145	120	21.8	102.0	123.8
BH 061214:1700	6.7	0.0	8.3	8.3
UPB 061129:1320	5.1	3.0	7.1	10.0
BH 061129:1050	12	4.4	17.5	22.0
MCSR 060412:1850	190	392.5	311.3	703.8
HCSR 060607:1141	44	13.5	55.6	69.1
K4 061227:1600	23	6.7	16.4	23.1
HCSR-A4 060412:1805	6900	1900.4	8609.2	10509.6
HCSR-A4 060412:1720	6500	3040.6	13435.3	16475.9
K4 060412:0930	190	169.7	171.1	340.8
BC 061214:1135	7.0	7.5	20.5	28.0
UPP 061214:1430	12	29.2	21.6	50.8
BCFB 061214:1325	3.0	9.3	10.5	19.8
Lidd.Sp (B) 060817:1445	2.6	7.7	4.9	12.6
Lidd.Sp 060817:1430	2.3	8.0	5.6	13.6
HCSR-A4 060805:0827	74	12.8	68.8	81.5
K4 060412:0820	200	68.3	172.5	240.8
LMWR 061005:1415	14	18.2	21.1	39.3

ANALYTICAL CHEMISTS  
and  
BACTERIOLOGISTS  
Approved by State of California

TEL: 831-724-5422  
FAX: 831-724-3188

# SOIL CONTROL LAB

42 HANGAR WAY  
WATSONVILLE  
CALIFORNIA  
95076  
USA

#202018 lab reports  
WY2007

Account Number:  
7020556-46-4205

Balance Hydrologics  
841 Folger Ave.  
Berkeley, CA 94710  
Attn: Jonathan Owens

Reporting Date:  
July 11, 2007

Date Received: Water samples received February 23, 2007  
Project #/Name: Various / Various  
Laboratory #: 7020556-26/46 through 46/46

<u>Sample Identification</u>	<u>Particles Larger Than 63 Micron</u>	<u>Suspended Solids Smaller Than 63 Micron</u>	<u>Total Suspended Solids (mg/L)</u>
BCSH 070211:1225	4.0	41.1	45.0
ECDM 070210:1415	12.0	45.4	57.4
ECDM 070209:0912	0.0	10.3	10.3
CMWR 070210:1145	41.1	201.4	242.5
CMWR 070211:1140	23.4	162.6	186.0
BCSH 070210:1215	6.7	90.0	96.7
PP10 Outfall 070210:0827	7.0	39.1	46.0
ECDM 070209:1009	0.4	8.7	9.1
ECDM 070210:1430	5.2	37.4	42.6
LTAA 061105:1308	9.1	30.8	39.9
LTAA 070211:1115	9.1	85.4	94.6
LTPL 070211:1045	12.5	92.1	104.7
LTPL 070211:1030	6.7	71.3	78.0
LTPL 070210:1030	13.7	127.6	141.2
LTPL 070210:1055	62.5	103.4	165.9
K4 070210:1023	81.5	81.0	162.5
K4 070216:1355	8.5	12.0	20.5
K4 070210:1133	80.3	86.7	167.0
K4 070209:0930	34.7	47.5	82.2
UWC 050407:1530	8.2	10.0	18.2
MWC 050407:1505	8.5	11.0	19.5

Mike Galloway

202018  
lab results  
WY2007

# SOIL CONTROL LAB

Account Number:  
7060311-27-4205

Balance Hydrologics  
841 Folger Ave.  
Berkeley, CA 94710  
Attn: Jonathan Owens

Reporting Date:  
July 5, 2007

Date Received: Water samples received June 12, 2007  
Project #/Name: Various / Various  
Laboratory #: 7060311-1/27 through 27/27

Sample Identification	Turbidity (NTU)	Particles Larger Than 63 Micron	Suspended Solids Smaller Than 63 Micron	Total Suspended Solids (mg/L)
<del>SPPL 070226:1280</del>	<del>91</del>	<del>12.8</del>	<del>88.8</del>	<del>103.6</del>
LTPL 070226:1300	37	8.7	39.2	47.9
<del>SPPL 070411:1345</del>	<del>23</del>	<del>4.1</del>	<del>3.5</del>	<del>7.5</del>
<del>SPPL 070227:1623</del>	<del>61</del>	<del>8.5</del>	<del>48.1</del>	<del>56.6</del>
LTPL 072207:1610 070227:1610	59	11.6	44.8	56.4
LTPL 070411:1330	2.6	4.8	2.6	7.4
LTPL 070422:0700	76	11.8	73.1	84.9
<del>SPPL 070422:0750</del>	<del>54</del>	<del>19.6</del>	<del>64.4</del>	<del>84.0</del>
ECDM 070222:1130		5.6	9.5	15.1
HV7 070222:0900		9.9	33.3	43.2
HC-PL 070222:0850	1290	18.9	1363.4	1382.3
HC-A4 070222:0940	690	15.2	720.8	736.1
HV5 070222:0815		4.4	56.8	61.2
HV10 070222:0845		10.5	27.9	38.4
HV4 070222:0930		11.9	28.5	40.4
CMWR 070422:1126	48	8.7	41.1	49.8
LTAA 070422:1100	25	8.7	17.2	26.0
LTAA 070227:1430	60	11.4	46.9	58.3
K4 072225:0745		6.8	6.9	13.7
K4 070227:1320		12.2	9.4	21.6
UPB 070222:1000		6.7	10.5	17.2
BCFB 070222:0755		5.4	10.2	15.6
BH 070222:1038		13.0	109.5	122.5
UPP 070222:0912		4.6	8.7	13.3
BC 070222:0725		10.2	31.2	41.4
ECPM 070226:1619		35.3	37.9	73.2
ECDM 070226:1550		17.0	39.4	56.4

Mike Galloway

**Chris White**

**From:** Bill Svoboda @ Caltestlabs [BSvoboda@Caltestlabs.com]  
**Sent:** Tuesday, April 24, 2007 9:15 AM  
**To:** Zan Rubin  
**Cc:** cwhite@balancehydro.com; 'John Gartner'; 'Jonathan Owens'  
**Subject:** RE: 202018 Sample Coordination

*per CW advice, Zan called Bill and requested that sample be preserved and analyzed anyway as was only 1 hr past 48-hr hold time*

Morning Zan,

We received the samples this morning. Unfortunately, if the sample dates and time are correct the dissolved mercury for LTPL was received past the 48 hour hold time. the other dissolved mercury for SF was collected at 07:50 on 04/22/07 and we were able to filter and preserve this sample at 07:40 this morning.

The LTPL sample was filtered and preserved. Would you like us to proceed with the analysis of this sample for the dissolved mercury?

-----Original Message-----

**From:** Zan Rubin [mailto:zrubin@balancehydro.com]  
**Sent:** Monday, April 23, 2007 8:42 PM  
**To:** 'Bill Svoboda @ Caltestlabs'  
**Cc:** cwhite@balancehydro.com; 'John Gartner'; 'Jonathan Owens'  
**Subject:** RE: 202018 Sample Coordination

Bill,

The samples were collected as planned, and will be shipped to you by courier tomorrow by mid-day. There are no duplicates.

**Los Trancos Creek:**

Aluminum (total recoverable) – composite

Aluminum (dissolved) – composite

Nitrate – composite

Mercury (total recoverable) – grab

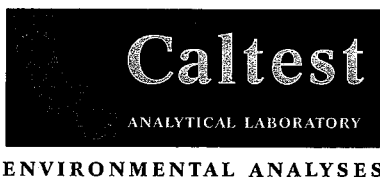
Mercury (dissolved) – grab

Diazinon – composite

Chlorpyrifos – composite

**San Francisquito Creek:**

Aluminum (total recoverable) – composite



202018 WB  
WY2007  
12/26-27/07  
SAMPLES

Tuesday, January 16, 2007

Chris White  
Balance Hydrologics, Inc.  
841 Folger Ave.  
Berkeley, CA 94710

RE: Lab Order: G120933  
Project ID: Stanford LTMAP/PIERS LANE


Collected By: ZAN RUBIN  
PO/Contract #: 202018

Dear Chris White:

Enclosed are the analytical results for sample(s) received by the laboratory on Thursday, December 28, 2006. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

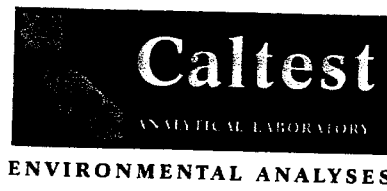
If you have any questions concerning this report, please feel free to contact me.

Enclosures

  
Project Manager: Bill Svoboda

  
Lab Director: Christine Horn





**SAMPLE SUMMARY**

Lab Order: G120933

Project ID: Stanford LTMAP/PIERS LANE

Lab ID	Sample ID	Matrix	Date Collected	Date Received
G120933001	SFPL COMP	Water	12/27/2006 13:00	12/28/2006 08:58
G120933002	SFPL GRAB	Water	12/26/2006 21:45	12/28/2006 08:58
G120933003	LTPL COMP	Water	12/27/2006 11:50	12/28/2006 08:58
G120933004	LTPL GRAB	Water	12/26/2006 21:45	12/28/2006 08:58
G120933005	SFPL GRAB	Water	12/26/2006 00:00	12/28/2006 08:58

1/16/2007 11:35

**REPORT OF LABORATORY ANALYSIS**

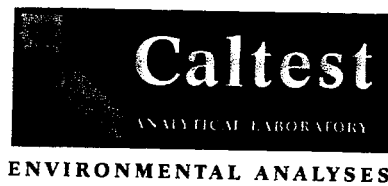
Page 2 of 11

This report shall not be reproduced, except in full,  
without the written consent of CALTEST ANALYTICAL LABORATORY.



1885 North Kelly Road • Napa, California 94558  
(707) 258-4000 • Fax: (707) 226-1001 • e-mail: info@caltestlabs.com



**NARRATIVE**

Lab Order: G120933

Project ID: Stanford LTM/PIERS LANE

**General Qualifiers and Notes**

CALTEST authorizes this report to be reproduced only in its entirety. Results are specific to the sample(s) as submitted and only to the parameter(s) reported.

Caltest certifies that test results meet all applicable NELAC requirements unless stated otherwise.

All analyses performed by EPA Methods or Standard Methods (SM) 18th Ed. except where noted.

Caltest collects samples in compliance with 40 CFR, EPA Methods, Cal. Title 22, and Standard Methods.

Dilution Factors (DF) reported greater than '1' have been used to adjust the result, Reporting Limit (R.L.), and Method Detection Limit (MDL).

All Solid, sludge, and/or biosolids data is reported in Wet Weight, unless otherwise specified below.

Results Qualifiers: Report fields may contain codes and non-numeric data correlating to one or more of the following definitions:

ND - Non Detect - indicates analytical result has not been detected.

RL - Reporting Limit is the quantitation limit at which the laboratory is able to detect an analyte with a certain level of confidence. Generally, this represents the laboratory's lowest calibration point.

J - reflects estimated analytical result value detected below the Reporting Limit (R.L.) and above the Method Detection Limit (MDL). The 'J' flag is equivalent to the DNQ Estimated Concentration flag.

E - indicates an estimated analytical result value.

B - indicates the analyte has been detected in the blank associated with the sample.

NC - means not able to be calculated for RPD or Spike Recoveries.

SS - compound is a Surrogate Spike used per laboratory quality assurance manual.

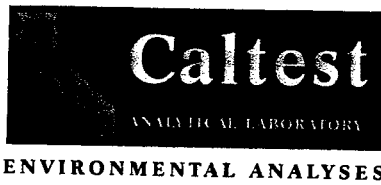
NOTE: This document represents a complete Analytical Report for the samples referenced herein and should be retained as a permanent record thereof.

**Qualifiers and Compound Notes**

1 Analytes reported as 'ND' were not detected at or above the listed Method Detection Limits (MDL).







**ANALYTICAL RESULTS**

Lab Order: G120933

Project ID Stanford LTMAP/PIERS LANE

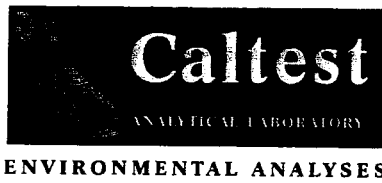
Parameters	Result	Units	R. L.	MDL	DF Prepared	Batch	Analyzed	Batch	Qual
<b>Lab ID: G120933001</b>	<b>Date Collected: 12/27/2006 13:00</b>		<b>Matrix: Water</b>						
<b>Sample ID: SFPL COMP</b>	<b>Date Received: 12/28/2006 08:58</b>								
<b>Metals Analysis by ICPMS, Dissolved</b>	<b>Prep Method:</b>		EPA 200.8 (filtered)		<b>Prep by:</b> UK				
	<b>Analytical Method:</b>		EPA 200.8 (filtered)				<b>Analyzed by:</b> SMD		
Aluminum	11	ug/L	10	1.6	1	01/02/07 00:00	MPR 3996	01/04/07 15:20	MMS 2958
<b>Metals Analysis by ICPMS</b>	<b>Prep Method:</b>		EPA 200.8		<b>Prep by:</b> UK				
	<b>Analytical Method:</b>		EPA 200.8				<b>Analyzed by:</b> SMD		
Aluminum	1900	ug/L	200	32	20	01/04/07 00:00	MPR 4003	01/10/07 13:45	MMS 2960
<b>Organophosphorous Pesticides</b>	<b>Prep Method:</b>		EPA 614		<b>Prep by:</b> RMD				
	<b>Analytical Method:</b>		EPA 614				<b>Analyzed by:</b> MDT		
Azinphos methyl (Guthion)	ND	ug/L	2.0	0.040	1	12/28/06 00:00	SPR 2289	01/04/07 02:49	SNP 1236 1
Chlorpyrifos (Dursban)	ND	ug/L	0.05	0.040	1	12/28/06 00:00	SPR 2289	01/04/07 02:49	SNP 1236
Demeton -O and -S	ND	ug/L	0.5	0.050	1	12/28/06 00:00	SPR 2289	01/04/07 02:49	SNP 1236
Diazinon	ND	ug/L	0.05	0.040	1	12/28/06 00:00	SPR 2289	01/04/07 02:49	SNP 1236
Disulfoton (Di-Syston)	ND	ug/L	0.5	0.040	1	12/28/06 00:00	SPR 2289	01/04/07 02:49	SNP 1236
Ethion	ND	ug/L	0.5	0.030	1	12/28/06 00:00	SPR 2289	01/04/07 02:49	SNP 1236
Malathion	ND	ug/L	0.5	0.050	1	12/28/06 00:00	SPR 2289	01/04/07 02:49	SNP 1236
Parathion (Parathion ethyl)	ND	ug/L	0.5	0.040	1	12/28/06 00:00	SPR 2289	01/04/07 02:49	SNP 1236
Parathion methyl	ND	ug/L	0.5	0.040	1	12/28/06 00:00	SPR 2289	01/04/07 02:49	SNP 1236
Tributylphosphate (SS)	84	%	10-126		1	12/28/06 00:00	SPR 2289	01/04/07 02:49	SNP 1236
Triphenylphosphate (SS)	89	%	58-118		1	12/28/06 00:00	SPR 2289	01/04/07 02:49	SNP 1236
<b>Anions by Ion Chromatography</b>	<b>Analytical Method:</b>		EPA 300.0				<b>Analyzed by:</b> MYS		
Nitrogen, Nitrate (as N)	0.37	mg/L	0.1	0.0060	1			12/28/06 15:41	WIC 1576

Parameters	Result	Units	R. L.	MDL	DF Prepared	Batch	Analyzed	Batch	Qual
<b>Lab ID: G120933002</b>	<b>Date Collected: 12/26/2006 21:45</b>		<b>Matrix: Water</b>						
<b>Sample ID: SFPL GRAB</b>	<b>Date Received: 12/28/2006 08:58</b>								
<b>Mercury Analysis, Trace Level, Dissolved</b>	<b>Prep Method:</b>		EPA 1631E (filtered)		<b>Prep by:</b> UK				
	<b>Analytical Method:</b>		EPA 1631E (filtered)				<b>Analyzed by:</b> LM		
Mercury	0.0016	ug/L	0.0005	0.00020	1	01/10/07 00:00	MPR 4023	01/11/07 00:00	MHG 1809
<b>Mercury Analysis, Trace Level</b>	<b>Prep Method:</b>		EPA 1631E		<b>Prep by:</b> UK				
	<b>Analytical Method:</b>		EPA 1631E				<b>Analyzed by:</b> LM		
Mercury	0.040	ug/L	0.0010	0.00040	2	01/10/07 00:00	MPR 4023	01/11/07 00:00	MHG 1809

**REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full, without the written consent of CALTEST ANALYTICAL LABORATORY.





**ANALYTICAL RESULTS**

Lab Order: G120933

Project ID Stanford LTMAP/PIERS LANE

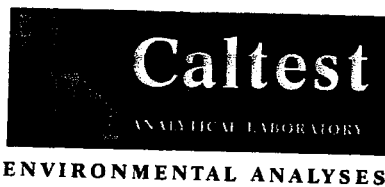
Lab ID:	G120933003	Date Collected:	12/27/2006 11:50	Matrix:	Water				
Sample ID:	LTPL COMP	Date Received:	12/28/2006 08:58						
Parameters	Result	Units	R. L.	MDL	DF Prepared	Batch	Analyzed	Batch	Qual
<b>Metals Analysis by ICPMS, Dissolved</b>		<b>Prep Method:</b> EPA 200.8 (filtered)		<b>Prep by:</b> UK					
		<b>Analytical Method:</b> EPA 200.8 (filtered)				<b>Analyzed by:</b> SMD			
Aluminum	J10	ug/L	10	1.6	1	01/02/07 00:00	MPR 3996	01/04/07 15:34	MMS 2958
<b>Metals Analysis by ICPMS</b>		<b>Prep Method:</b> EPA 200.8		<b>Prep by:</b> UK					
		<b>Analytical Method:</b> EPA 200.8				<b>Analyzed by:</b> LM			
Aluminum	1300	ug/L	200	32	20	01/04/07 00:00	MPR 4003	01/11/07 14:29	MMS 2960
<b>Organophosphorous Pesticides</b>		<b>Prep Method:</b> EPA 614		<b>Prep by:</b> RMD					
		<b>Analytical Method:</b> EPA 614				<b>Analyzed by:</b> MDT			
Azinphos methyl (Guthion)	ND	ug/L	2.0	0.040	1	12/28/06 00:00	SPR 2289	01/04/07 03:34	SNP 1236 1
Chlorpyrifos (Dursban)	ND	ug/L	0.05	0.040	1	12/28/06 00:00	SPR 2289	01/04/07 03:34	SNP 1236
Demeton -O and -S	ND	ug/L	0.5	0.050	1	12/28/06 00:00	SPR 2289	01/04/07 03:34	SNP 1236
Diazinon	ND	ug/L	0.05	0.040	1	12/28/06 00:00	SPR 2289	01/04/07 03:34	SNP 1236
Disulfoton (Di-Syston)	ND	ug/L	0.5	0.040	1	12/28/06 00:00	SPR 2289	01/04/07 03:34	SNP 1236
Ethion	ND	ug/L	0.5	0.030	1	12/28/06 00:00	SPR 2289	01/04/07 03:34	SNP 1236
Malathion	ND	ug/L	0.5	0.050	1	12/28/06 00:00	SPR 2289	01/04/07 03:34	SNP 1236
Parathion (Parathion ethyl)	ND	ug/L	0.5	0.040	1	12/28/06 00:00	SPR 2289	01/04/07 03:34	SNP 1236
Parathion methyl	ND	ug/L	0.5	0.040	1	12/28/06 00:00	SPR 2289	01/04/07 03:34	SNP 1236
Tributylphosphate (SS)	73	%	10-126		1	12/28/06 00:00	SPR 2289	01/04/07 03:34	SNP 1236
Triphenylphosphate (SS)	85	%	58-118		1	12/28/06 00:00	SPR 2289	01/04/07 03:34	SNP 1236
<b>Anions by Ion Chromatography</b>		<b>Analytical Method:</b> EPA 300.0				<b>Analyzed by:</b> MYS			
Nitrogen, Nitrate (as N)	1.1	mg/L	0.1	0.0060	1			12/28/06 15:58	WIC 1576

Lab ID:	G120933004	Date Collected:	12/26/2006 21:45	Matrix:	Water				
Sample ID:	LTPL GRAB	Date Received:	12/28/2006 08:58						
Parameters	Result	Units	R. L.	MDL	DF Prepared	Batch	Analyzed	Batch	Qual
<b>Mercury Analysis, Trace Level, Dissolved</b>		<b>Prep Method:</b> EPA 1631E (filtered)		<b>Prep by:</b> UK					
		<b>Analytical Method:</b> EPA 1631E (filtered)				<b>Analyzed by:</b> LM			
Mercury	0.0017	ug/L	0.0005	0.00020	1	01/10/07 00:00	MPR 4023	01/11/07 00:00	MHG 1809
<b>Mercury Analysis, Trace Level</b>		<b>Prep Method:</b> EPA 1631E		<b>Prep by:</b> UK					
		<b>Analytical Method:</b> EPA 1631E				<b>Analyzed by:</b> LM			
Mercury	0.035	ug/L	0.0010	0.00040	2	01/10/07 00:00	MPR 4023	01/11/07 00:00	MHG 1809

**REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full, without the written consent of CALTEST ANALYTICAL LABORATORY.





**ANALYTICAL RESULTS**

Lab Order: G120933

Project ID Stanford LTMAP/PIERS LANE

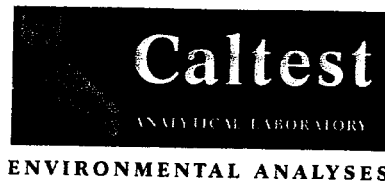
Lab ID: **G120933005** Date Collected: 12/26/2006 00:00 Matrix: Water  
 Sample ID: **SFPL GRAB** Date Received: 12/28/2006 08:58

Parameters	Result	Units	R. L.	MDL	DF Prepared	Batch	Analyzed	Batch	Qual
<b>Mercury Analysis, Trace Level</b>									
	<b>Prep Method:</b>		EPA 1631E		<b>Prep by:</b>		UK		
	<b>Analytical Method:</b>		EPA 1631E				<b>Analyzed by:</b> LM		
Mercury	0.032	ug/L	0.0010	0.00040	2	01/10/07 00:00	MPR 4023	01/11/07 00:00	MHG 1809

**REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full,  
 without the written consent of CALTEST ANALYTICAL LABORATORY.





**QUALITY CONTROL DATA**

Lab Order: G120933

Project ID: Stanford LTMAP/PIERS LANE

<b>Analysis Description:</b> Metals Analysis by ICPMS, Dissolved	<b>QC Batch:</b> MPR/3996
<b>Analysis Method:</b> EPA 200.8 (filtered)	<b>QC Batch Method:</b> EPA 200.8 (filtered)

METHOD BLANK: 132743

Parameter	Blank Result	Reporting Limit Units	Qualifiers
Aluminum	ND	10 ug/L	

LABORATORY CONTROL SAMPLE: 132744

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	40	39.468	99	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 132745 132746

Parameter	Units	G120933001 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Aluminum	ug/L	11	40	44.675	44.907	85	85	85-115	0.5	20	

<b>Analysis Description:</b> Metals Analysis by ICPMS	<b>QC Batch:</b> MPR/4003
<b>Analysis Method:</b> EPA 200.8	<b>QC Batch Method:</b> EPA 200.8

METHOD BLANK: 133086

Parameter	Blank Result	Reporting Limit Units	Qualifiers
Aluminum	ND	10 ug/L	

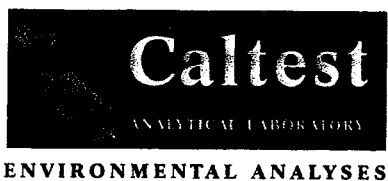
LABORATORY CONTROL SAMPLE: 133087

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	40	40.57	101	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 133088 133089

Parameter	Units	H010053006 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Aluminum	ug/L	58	40	80.491	84.599	56	66	85-115	5	20 3	





**QUALITY CONTROL DATA**

Lab Order: G120933

Project ID: Stanford LTMAP/PIERS LANE

<b>Analysis Description:</b>	Mercury Analysis, Trace Level	<b>QC Batch:</b>	MPR/4023
<b>Analysis Method:</b>	EPA 1631E (filtered)	<b>QC Batch Method:</b>	EPA 1631E (filtered)

<b>Analysis Description:</b>	Mercury Analysis, Trace Level	<b>QC Batch:</b>	MPR/4023
<b>Analysis Method:</b>	EPA 1631E	<b>QC Batch Method:</b>	EPA 1631E

METHOD BLANK: 133971

Parameter	Blank Result	Reporting Limit Units	Qualifiers
Mercury	ND	0.0005 ug/L	

LABORATORY CONTROL SAMPLE: 133972

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	0.02	0.021086	105	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 133975 133976

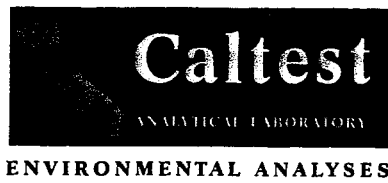
Parameter	Units	G120912002 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Mercury	ug/L	0.002	0.02	0.020628	0.020849	93	94	71-125	1.1	20	

<b>Analysis Description:</b>	Organophosphorous Pesticides	<b>QC Batch:</b>	SPR/2289
<b>Analysis Method:</b>	EPA 614	<b>QC Batch Method:</b>	EPA 614

METHOD BLANK: 132398

Parameter	Blank Result	Reporting Limit Units	Qualifiers
Malathion	ND	0.5 ug/L	
Chlorpyrifos (Dursban)	ND	0.05 ug/L	
Parathion methyl	ND	0.5 ug/L	
Disulfoton (Di-Syston)	ND	0.5 ug/L	
Diazinon	ND	0.05 ug/L	
Parathion (Parathion ethyl)	ND	0.5 ug/L	
Ethion	ND	0.5 ug/L	
Demeton -O and -S	ND	0.5 ug/L	
Azinphos methyl (Guthion)	ND	2.0 ug/L	1
Tributylphosphate (SS)	6.9	10-126 %	2





**QUALITY CONTROL DATA**

Lab Order: G120933

Project ID: Stanford LTMAP/PIERS LANE

<b>Analysis Description:</b> Organophosphorous Pesticides	<b>QC Batch:</b> SPR/2289
<b>Analysis Method:</b> EPA 614	<b>QC Batch Method:</b> EPA 614

Parameter	Blank Result	Reporting Limit Units	Qualifiers
Triphenylphosphate (SS)	78	58-118 %	

LABORATORY CONTROL SAMPLE: 132399

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Parathion methyl	ug/L	3	2.15	72	67-102	
Disulfoton (Di-Syston)	ug/L	3	1.57	52	35-113	
Diazinon	ug/L	3	2.19	73	62-118	
Azinphos methyl (Guthion)	ug/L	3	2.23	74	10-126	
Tributylphosphate (SS)	%			68	10-126	
Triphenylphosphate (SS)	%			74	58-118	

<b>Analysis Description:</b> Anions by Ion Chromatography	<b>QC Batch:</b> WIC/1576
<b>Analysis Method:</b> EPA 300.0	<b>QC Batch Method:</b> EPA 300.0

METHOD BLANK: 132725

Parameter	Blank Result	Reporting Limit Units	Qualifiers
Nitrogen, Nitrate (as N)	ND	0.1 mg/L	

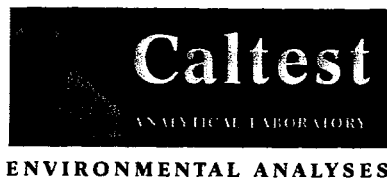
LABORATORY CONTROL SAMPLE: 132726

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Nitrate (as N)	mg/L	6.2	6.688	107	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 132728 132729

Parameter	Units	G120916001 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Nitrogen, Nitrate (as N)	mg/L	0.27	5	5.616	5.704	107	109	90-110	1.6	20	





## QUALITY CONTROL DATA QUALIFIERS

Lab Order: G120933

Project ID: Stanford LTMAP/PIERS LANE

---

### QUALITY CONTROL PARAMETER QUALIFIERS

**Results Qualifiers:** Report fields may contain codes and non-numeric data correlating to one or more of the following definitions:

NS - means not spiked and will not have recoveries reported for Analyte Spike Amounts

NC - means not able to be calculated for RPD or Spike Recoveries.

**QC Codes Keys:** These descriptors are used to help identify the specific QC samples and clarify the report.

MB - Method Blank

LCS/LCSD - Laboratory Control Spike / Laboratory Control Spike Duplicate

DUP - Duplicate of Original Sample Matrix

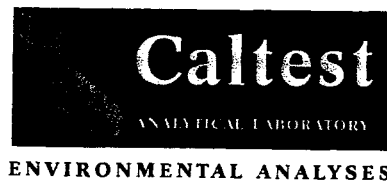
MS/MSD - Matrix Spike / Matrix Spike Duplicate

RPD - Relative Percent Difference

%Recovery - Spike Recovery stated as a percentage

- 1 Analytes reported as 'ND' were not detected at or above the listed Method Detection Limits (MDL).
- 2 Surrogates did not meet Caltests internal criteria. The sample passed all method criteria.
- 3 Low Matrix Spike recovery(ies) due to possible matrix interferences in the QC sample. QC batch accepted based on LCS and RPD results.



**QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Lab Order: G120933

Project ID: Stanford LTMAP/PIERS LANE

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
G120933002	SFPL GRAB	EPA 1631E	MPR/4023	EPA 1631E	MHG/1809
G120933002	SFPL GRAB	EPA 1631E (filtered)	MPR/4023	EPA 1631E (filtered)	MHG/1809
G120933004	LTPL GRAB	EPA 1631E	MPR/4023	EPA 1631E	MHG/1809
G120933004	LTPL GRAB	EPA 1631E (filtered)	MPR/4023	EPA 1631E (filtered)	MHG/1809
G120933005	SFPL GRAB	EPA 1631E	MPR/4023	EPA 1631E	MHG/1809
G120933001	SFPL COMP	EPA 200.8 (filtered)	MPR/3996	EPA 200.8 (filtered)	MMS/2958
G120933003	LTPL COMP	EPA 200.8 (filtered)	MPR/3996	EPA 200.8 (filtered)	MMS/2958
G120933001	SFPL COMP	EPA 200.8	MPR/4003	EPA 200.8	MMS/2960
G120933003	LTPL COMP	EPA 200.8	MPR/4003	EPA 200.8	MMS/2960
G120933001	SFPL COMP	EPA 614	SPR/2289	EPA 614	SNP/1236
G120933003	LTPL COMP	EPA 614	SPR/2289	EPA 614	SNP/1236
G120933001	SFPL COMP	EPA 300.0	WIC/1576		
G120933003	LTPL COMP	EPA 300.0	WIC/1576		







1885 N. KELLY ROAD • NAPA, CA 94558 • (707) 258-4000 • Fax (707) 226-1001 • www.caltestlab.com

**SAMPLE CHAIN OF CUSTODY**

LAB ORDER #: **6120933**

PAGE **1** OF **2**

CLIENT: **Balance Hydrologics**

ADDRESS: **841 Folger Ave Berkeley CA**

BILLING ADDRESS: **Marty Laporte Stanford University**

PHONE #: **510-704-1080** FAX PHONE: **704-1001**

SAMPLER (PRINT & SIGN NAME): **Zan Rubin**

STATE: **CA** ZIP: **94710**

REPORT TO: **Chris White**

PROJECT #/PROJECT NAME: **Stanford/LTMAP/Piers Lane**

P.O.# **202018**

ANALYSES REQUESTED

Aluminum (NO3-N)  
Total Nitrate (NO3-N)  
Total Ammonia Nitrogen  
Total Dissolved Mercury  
Total Mercury  
Chlorophyll  
Diazine Mercury

TURN-AROUND TIME  
 STANDARD  
 RUSH

DUE DATE:

CALTEST #	DATE SAMPLED	TIME SAMPLED	MATRIX	CONTAINER AMOUNT/TYPE	PRESERVATIVE	SAMPLE IDENTIFICATION SITE	CLIENT LAB #	COMP. OF GRAB	REMARKS
-1	12/27/06	1300	W	500 ml PE	HNO3	SFPL		C	X
↓		1300		250 ml PE	Ice	SFPL		C	X
↓		1300		250 ml PE	Ice	SFPL		C	X
-5	12/26/06	2400		250ml Glass	HCL	SFPL		G	X
-2	12/26/06	2145		250 ml Glass	Ice	SFPL		G	X
-1	12/27/06	1300		1L Amber Glass	Ice	SFPL		C	X
↓	12/27/06	1300		1L Amber Glass	Ice	SFPL		C	X
-2	12/26/06	2145		500ml Glass	HCL	SFPL		G	X

By submittal of sample(s), client agrees to abide by the Terms and Conditions set forth on the reverse of this document.

RELINQUISHED BY <b>Zan Rubin</b>	DATE/TIME <b>12/27/06 18:00</b>	RECEIVED BY <b>FedEx</b>	DATE/TIME <b>12/28/06 0858</b>	RECEIVED BY <b>Debra Datto</b>
Samples: WC <input checked="" type="checkbox"/> MICRO <input checked="" type="checkbox"/> BIO <input checked="" type="checkbox"/> SV <input checked="" type="checkbox"/> VOA <input checked="" type="checkbox"/>	AA <input checked="" type="checkbox"/> SV <input checked="" type="checkbox"/> VOA <input checked="" type="checkbox"/>	PH? <input type="checkbox"/> Y/N <input type="checkbox"/>	TEMP: <b>2</b>	SEALED: <input checked="" type="checkbox"/> Y/N <input type="checkbox"/>
BD: BIO <input type="checkbox"/> WC <input checked="" type="checkbox"/> AA <input checked="" type="checkbox"/>	COMMENTS			
CG: AA <input type="checkbox"/> SV <input type="checkbox"/> VOA <input type="checkbox"/>				
SILE: HP <input type="checkbox"/> PT <input type="checkbox"/> QT <input type="checkbox"/> VOA <input type="checkbox"/>				
W/HNO3 <input type="checkbox"/> H2SO4 <input type="checkbox"/> NaOH <input type="checkbox"/>				
PIE: HNO3 <input type="checkbox"/> H2SO4 <input type="checkbox"/> NaOH <input type="checkbox"/> HCL <input type="checkbox"/>				

**MATRIX:** AQ = Aqueous Nondrinking Water, Digested Metals; FE = Low R.L.s, Aqueous Nondrinking Water, Digested Metals; DW = Drinking Water; SL = Soil, Sludge, Solid; FP = Free Product

**CONTAINER TYPES:** AL = Amber Lifer; AHL = 500 ml Amber; PT = Pint (Plastic); QT = Quart (Plastic); HG = Half Gallon (Plastic); SU = Soil Jar; B4 = 4 oz. BACT; BT = Brass Tube; VOA = 40 mL VOA; OTC = Other Type Container



**Caltest**  
ANALYTICAL LABORATORY

1885 N. KELLY ROAD • NAPA, CA 94558 • (707) 258-4000 • Fax (707) 226-1001 • www.caltestlab.com

LAB ORDER #:  
**6120933**

PAGE **2** OF **3**

PROJECT #/PROJECT NAME  
**Stanford/LTMAP/Piers Lane**

REPORT TO:  
**Chris White**

CLIENT: **Balance Hydrologics**

P.O. #  
**202016**

STATE: **CA** ZIP: **94710**

ADDRESS: **641 Folger Ave, Berkeley, CA**

ANALYSES REQUESTED

SAMPLER (PRINT & SIGN NAME): **Zan Rubin**

BILLING ADDRESS: **Maury Lafayette - Stanford**

TURN-AROUND TIME

DATE SAMPLED: **12/27/06**

PHONE #: **510-704-1000**

STANDARD  RUSH

CITY: **Stanford**

FAX PHONE: **510-704-1001**

REMARKS

CONTAINER AMOUNT/TYPE

DATE SAMPLED

DISOLVED ALUMINUM

PRESERVATIVE

TIME SAMPLED

TOTAL MERCURY

AMBER GLASS

DATE SAMPLED

TOTAL MERCURY (NO3-)

ICE

DATE SAMPLED

EXTRACTED MERCURY

ICE

DATE SAMPLED

CHLORIDE

ICE

DATE SAMPLED

AMBER GLASS

ICE

DATE SAMPLED

AMBER GLASS

ICE

DATE SAMPLED

500 mL GLASS

ICE

DATE SAMPLED

500 mL GLASS

ICE

DATE SAMPLED

UNPRESERVED

ICE

DATE SAMPLED

TRACE LEVEL

ICE

DATE SAMPLED

PLEASE FILTER

ICE

DATE SAMPLED

PLEASE FILTER

ICE

DATE SAMPLED

PLEASE FILTER

ICE

DATE SAMPLED

PLEASE FILTER

ICE

DATE SAMPLED

PLEASE FILTER

ICE

DATE SAMPLED

PLEASE FILTER

ICE

DATE SAMPLED

PLEASE FILTER

ICE

DATE SAMPLED

PLEASE FILTER

ICE

DATE SAMPLED

PLEASE FILTER

ICE

DATE SAMPLED

PLEASE FILTER

ICE

DATE SAMPLED

PLEASE FILTER

ICE

DATE SAMPLED

PLEASE FILTER

ICE

DATE SAMPLED

FOR LAB USE ONLY

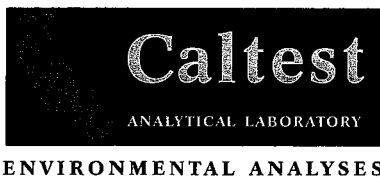
CALTEST #	DATE SAMPLED	TIME SAMPLED	MATRIX	CONTAINER AMOUNT/TYPE	PRESERVATIVE	SAMPLE IDENTIFICATION SITE	CLIENT LAB #	COMP. OR GRAB	REMARKS
-3	12/27/06	1150	W	250 mL PE	HNO3	LTPL		C	X
	12/27/06	1150		250 mL PE	Ice	LTPL		C	X
	12/27/06	1150		250 mL PE	Ice	LTPL		C	X
	12/27/06	1150		1L Amber Glass	Ice	LTPL		C	X
	12/27/06	1150		1L Amber Glass	Ice	LTPL		C	X
-4	12/26/06	2145		500 mL Glass	Ice	LTPL		G	X
	12/24/06	2145		500 mL Glass	Ice	LTPL		G	X

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME	RELINQUISHED BY	DATE/TIME	RECEIVED BY
Zan Rubin	12/27/06 16:00	Fed Ex	12/27/06 08:58	Fed Ex	12/27/06 08:58	Zan Rubin

By submittal of sample(s), client agrees to abide by the Terms and Conditions set forth on the reverse of this document.

MATRIX: AQ = Aqueous Nondrinking Water, Digested Metals; FE = Low R.L.s, Aqueous Nondrinking Water, Digested Metals; DW = Drinking Water, SL = Soil, Sludge, Solid; FP = Free Product

CONTAINER TYPES: AL = Amber Litter; AHL = 500 ml Amber; PT = Pint (Plastic); QT = Quart (Plastic); HG = Half Gallon (Plastic); SJ = Soil Jar; B4 = 4 oz. BACT; BT = Brass Tube; VOA = 40 mL VOA; OTC = Other Type Container



202018 LAB  
 WY 2007  
 2/10-11/07  
 SAMPLING

Friday, March 09, 2007

Chris White  
 Balance Hydrologics, Inc.  
 841 Folger Ave.  
 Berkeley, CA 94710

RE: Lab Order: H020555  
 Project ID: STANFORD/TLMAP/PIERS LANE


Collected By: ZAN RUBIN  
 PO/Contract #: 202018

Dear Chris White:

Enclosed are the analytical results for sample(s) received by the laboratory on Monday, February 12, 2007. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

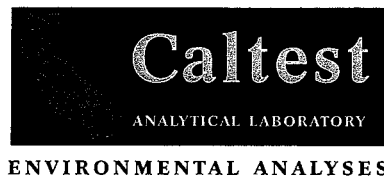
If you have any questions concerning this report, please feel free to contact me.

Enclosures

  
 Project Manager: Bill Svoboda

  
 Lab Director: Christine Horn



**SAMPLE SUMMARY**

Lab Order: H020555

Project ID: STANFORD/TLMAP/PIERS LANE

---

Lab ID	Sample ID	Matrix	Date Collected	Date Received
H020555001	SFPL COMP	Water	2/11/2007 00:00	2/12/2007 10:45
H020555002	SFPL GRAB	Water	2/11/2007 10:55	2/12/2007 10:45
H020555003	LTPL COMP	Water	2/11/2007 00:00	2/12/2007 10:45
H020555004	LTPL GRAB	Water	2/11/2007 10:30	2/12/2007 10:45

3/9/2007 07:13

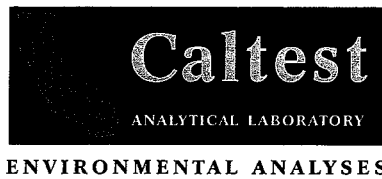
**REPORT OF LABORATORY ANALYSIS**

Page 2 of 10



This report shall not be reproduced, except in full,  
without the written consent of CALTEST ANALYTICAL LABORATORY.





## NARRATIVE

Lab Order: H020555

Project ID: STANFORD/TLMAP/PIERS LANE

### General Qualifiers and Notes

CALTEST authorizes this report to be reproduced only in its entirety. Results are specific to the sample(s) as submitted and only to the parameter(s) reported.

Caltest certifies that test results meet all applicable NELAC requirements unless stated otherwise.

All analyses performed by EPA Methods or Standard Methods (SM) 18th Ed. except where noted.

Caltest collects samples in compliance with 40 CFR, EPA Methods, Cal. Title 22, and Standard Methods.

Dilution Factors (DF) reported greater than '1' have been used to adjust the result, Reporting Limit (R.L.), and Method Detection Limit (MDL).

All Solid, sludge, and/or biosolids data is reported in Wet Weight, unless otherwise specified.

Results Qualifiers: Report fields may contain codes and non-numeric data correlating to one or more of the following definitions:

ND - Non Detect - indicates analytical result has not been detected.

RL - Reporting Limit is the quantitation limit at which the laboratory is able to detect an analyte with a certain level of confidence. Generally, this represents the laboratory's lowest calibration point.

J - reflects estimated analytical result value detected below the Reporting Limit (R.L.) and above the Method Detection Limit (MDL). The 'J' flag is equivalent to the DNQ Estimated Concentration flag.

E - indicates an estimated analytical result value.

B - indicates the analyte has been detected in the blank associated with the sample.

NC - means not able to be calculated for RPD or Spike Recoveries.

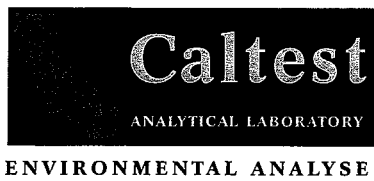
SS - compound is a Surrogate Spike used per laboratory quality assurance manual.

NOTE: This document represents a complete Analytical Report for the samples referenced herein and should be retained as a permanent record thereof.

### Qualifiers and Compound Notes

- 1 Analytes reported as 'ND' were not detected at or above the listed Method Detection Limits (MDL).
- 2 Analyte was not detected at or above the Method Detection Limit (MDL).





**ANALYTICAL RESULTS**

Lab Order: H020555

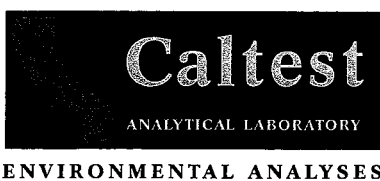
Project ID STANFORD/TLMAP/PIERS LANE

<b>Lab ID:</b>	<b>H020555001</b>	<b>Date Collected:</b>	2/11/2007 00:00	<b>Matrix:</b>	Water			
<b>Sample ID:</b>	<b>SFPL COMP</b>	<b>Date Received:</b>	2/12/2007 10:45					
Parameters	Result Units	R. L.	MDL	DF Prepared	Batch	Analyzed	Batch	Qual
<b>Metals Analysis by ICPMS, Dissolved</b>		<b>Prep Method:</b>	EPA 200.8 (filtered)	<b>Prep by:</b> UK				
		<b>Analytical Method:</b>	EPA 200.8 (filtered)			<b>Analyzed by:</b> SMD		
Aluminum	J2 ug/L	10	1.6	1	02/22/07 00:00	MPR 4179	02/27/07 12:18	MMS 3062
<b>Metals Analysis by ICPMS</b>		<b>Prep Method:</b>	EPA 200.8	<b>Prep by:</b> SMD				
		<b>Analytical Method:</b>	EPA 200.8			<b>Analyzed by:</b> SMD		
Aluminum	690 ug/L	100	16	10	02/28/07 00:00	MPR 4195	03/01/07 14:44	MMS 3071
<b>Organophosphorous Pesticides</b>		<b>Prep Method:</b>	EPA 614	<b>Prep by:</b> MDT				
		<b>Analytical Method:</b>	EPA 614			<b>Analyzed by:</b> MDT		
Azinphos methyl (Guthion)	ND ug/L	2.0	0.040	1	02/15/07 00:00	SPR 2367	03/04/07 04:53	SNP 1250 1
Chlorpyrifos (Dursban)	ND ug/L	0.05	0.040	1	02/15/07 00:00	SPR 2367	03/04/07 04:53	SNP 1250
Demeton -O and -S	ND ug/L	0.5	0.050	1	02/15/07 00:00	SPR 2367	03/04/07 04:53	SNP 1250
Diazinon	ND ug/L	0.05	0.040	1	02/15/07 00:00	SPR 2367	03/04/07 04:53	SNP 1250
Disulfoton (Di-Syston)	ND ug/L	0.5	0.040	1	02/15/07 00:00	SPR 2367	03/04/07 04:53	SNP 1250
Ethion	ND ug/L	0.5	0.030	1	02/15/07 00:00	SPR 2367	03/04/07 04:53	SNP 1250
Malathion	ND ug/L	0.5	0.050	1	02/15/07 00:00	SPR 2367	03/04/07 04:53	SNP 1250
Parathion (Parathion ethyl)	ND ug/L	0.5	0.040	1	02/15/07 00:00	SPR 2367	03/04/07 04:53	SNP 1250
Parathion methyl	ND ug/L	0.5	0.040	1	02/15/07 00:00	SPR 2367	03/04/07 04:53	SNP 1250
Tributylphosphate (SS)	91 %	10-126		1	02/15/07 00:00	SPR 2367	03/04/07 04:53	SNP 1250
Triphenylphosphate (SS)	91 %	58-118		1	02/15/07 00:00	SPR 2367	03/04/07 04:53	SNP 1250
<b>Anions by Ion Chromatography</b>		<b>Analytical Method:</b>	EPA 300.0			<b>Analyzed by:</b> MYS		
Nitrogen, Nitrate (as N)	0.40 mg/L	0.1	0.0060	1			02/12/07 22:57	WIC 1603

<b>Lab ID:</b>	<b>H020555002</b>	<b>Date Collected:</b>	2/11/2007 10:55	<b>Matrix:</b>	Water			
<b>Sample ID:</b>	<b>SFPL GRAB</b>	<b>Date Received:</b>	2/12/2007 10:45					
Parameters	Result Units	R. L.	MDL	DF Prepared	Batch	Analyzed	Batch	Qual
<b>Mercury Analysis, Trace Level</b>		<b>Prep Method:</b>	EPA 1631E	<b>Prep by:</b> UK				
		<b>Analytical Method:</b>	EPA 1631E			<b>Analyzed by:</b> LM		
Mercury	0.13 ug/L	0.0020	0.00080	4	02/27/07 00:00	MPR 4201	02/28/07 00:00	MHG 1858

<b>Lab ID:</b>	<b>H020555003</b>	<b>Date Collected:</b>	2/11/2007 00:00	<b>Matrix:</b>	Water			
<b>Sample ID:</b>	<b>LTPL COMP</b>	<b>Date Received:</b>	2/12/2007 10:45					
Parameters	Result Units	R. L.	MDL	DF Prepared	Batch	Analyzed	Batch	Qual
<b>Metals Analysis by ICPMS, Dissolved</b>		<b>Prep Method:</b>	EPA 200.8 (filtered)	<b>Prep by:</b> UK				





**ANALYTICAL RESULTS**

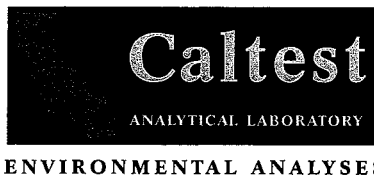
Lab Order: H020555

Project ID STANFORD/TLMAP/PIERS LANE

<b>Lab ID:</b>	<b>H020555003</b>	Date Collected:	2/11/2007 00:00	Matrix:	Water			
<b>Sample ID:</b>	<b>LTPL COMP</b>	Date Received:	2/12/2007 10:45					
Parameters	Result Units	R. L.	MDL	DF Prepared	Batch	Analyzed	Batch	Qual
<b>Aluminum</b>		<b>Analytical Method:</b> EPA 200.8 (filtered)		<b>Analyzed by:</b> SMD				
	ND ug/L	10	1.6	1	02/22/07 00:00	MPR 4179	02/27/07 12:38	MMS 3062 2
<b>Metals Analysis by ICPMS</b>		<b>Prep Method:</b> EPA 200.8		<b>Prep by:</b> SMD				
		<b>Analytical Method:</b> EPA 200.8		<b>Analyzed by:</b> SMD				
<b>Aluminum</b>	630 ug/L	100	16	10	02/28/07 00:00	MPR 4195	03/02/07 12:21	MMS 3071
<b>Organophosphorous Pesticides</b>		<b>Prep Method:</b> EPA 614		<b>Prep by:</b> MDT				
		<b>Analytical Method:</b> EPA 614		<b>Analyzed by:</b> MDT				
<b>Azinphos methyl (Guthion)</b>	ND ug/L	2.0	0.040	1	02/15/07 00:00	SPR 2367	03/04/07 05:39	SNP 1250 1
<b>Chlorpyrifos (Dursban)</b>	ND ug/L	0.05	0.040	1	02/15/07 00:00	SPR 2367	03/04/07 05:39	SNP 1250
<b>Demeton -O and -S</b>	ND ug/L	0.5	0.050	1	02/15/07 00:00	SPR 2367	03/04/07 05:39	SNP 1250
<b>Diazinon</b>	ND ug/L	0.05	0.040	1	02/15/07 00:00	SPR 2367	03/04/07 05:39	SNP 1250
<b>Disulfoton (Di-Syston)</b>	ND ug/L	0.5	0.040	1	02/15/07 00:00	SPR 2367	03/04/07 05:39	SNP 1250
<b>Ethion</b>	ND ug/L	0.5	0.030	1	02/15/07 00:00	SPR 2367	03/04/07 05:39	SNP 1250
<b>Malathion</b>	ND ug/L	0.5	0.050	1	02/15/07 00:00	SPR 2367	03/04/07 05:39	SNP 1250
<b>Parathion (Parathion ethyl)</b>	ND ug/L	0.5	0.040	1	02/15/07 00:00	SPR 2367	03/04/07 05:39	SNP 1250
<b>Parathion methyl</b>	ND ug/L	0.5	0.040	1	02/15/07 00:00	SPR 2367	03/04/07 05:39	SNP 1250
<b>Tributylphosphate (SS)</b>	87 %	10-126		1	02/15/07 00:00	SPR 2367	03/04/07 05:39	SNP 1250
<b>Triphenylphosphate (SS)</b>	86 %	58-118		1	02/15/07 00:00	SPR 2367	03/04/07 05:39	SNP 1250
<b>Anions by Ion Chromatography</b>		<b>Analytical Method:</b> EPA 300.0		<b>Analyzed by:</b> MYS				
<b>Nitrogen, Nitrate (as N)</b>	1.2 mg/L	0.1	0.0060	1			02/12/07 23:15	WIC 1603

<b>Lab ID:</b>	<b>H020555004</b>	Date Collected:	2/11/2007 10:30	Matrix:	Water			
<b>Sample ID:</b>	<b>LTPL GRAB</b>	Date Received:	2/12/2007 10:45					
Parameters	Result Units	R. L.	MDL	DF Prepared	Batch	Analyzed	Batch	Qual
<b>Mercury Analysis, Trace Level</b>		<b>Prep Method:</b> EPA 1631E		<b>Prep by:</b> UK				
		<b>Analytical Method:</b> EPA 1631E		<b>Analyzed by:</b> LM				
<b>Mercury</b>	0.024 ug/L	0.0005	0.00020	1	02/27/07 00:00	MPR 4201	02/28/07 00:00	MHG 1858





**QUALITY CONTROL DATA**

Lab Order: H020555

Project ID: STANFORD/TLMAP/PIERS LANE

<b>Analysis Description:</b> Metals Analysis by ICPMS, Dissolved	<b>QC Batch:</b> MPR/4179
<b>Analysis Method:</b> EPA 200.8 (filtered)	<b>QC Batch Method:</b> EPA 200.8 (filtered)

METHOD BLANK: 141057

Parameter	Blank Result	Reporting Limit Units	Qualifiers
Aluminum	ND	10 ug/L	

LABORATORY CONTROL SAMPLE: 141058

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	40	45.083	113	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 141059 141060

Parameter	Units	H020541009 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Aluminum	ug/L	75	40	116.225	118.422	103	108	85-115	1.9	20	

<b>Analysis Description:</b> Mercury Analysis, Trace Level	<b>QC Batch:</b> MPR/4201
<b>Analysis Method:</b> EPA 1631E	<b>QC Batch Method:</b> EPA 1631E

METHOD BLANK: 141671

Parameter	Blank Result	Reporting Limit Units	Qualifiers
Mercury	ND	0.0005 ug/L	

LABORATORY CONTROL SAMPLE: 141672

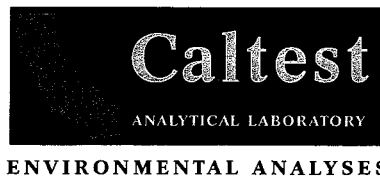
Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	0.02	0.020839	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 141673 141674

Parameter	Units	H020570001 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Mercury	ug/L	0.0042	0.02	0.023077	0.023037	94	94	71-125	0.2	20	







**QUALITY CONTROL DATA**

Lab Order: H020555

Project ID: STANFORD/TLMAP/PIERS LANE

<b>Analysis Description:</b> Metals Analysis by ICPMS	<b>QC Batch:</b> MPR/4195
<b>Analysis Method:</b> EPA 200.8	<b>QC Batch Method:</b> EPA 200.8

**METHOD BLANK:** 141647

Parameter	Blank Result	Reporting Limit Units	Qualifiers
Aluminum	ND	10 ug/L	

**LABORATORY CONTROL SAMPLE:** 141648

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	40	45.515	114	85-115	

**MATRIX SPIKE & MATRIX SPIKE DUPLICATE:** 141649 141650

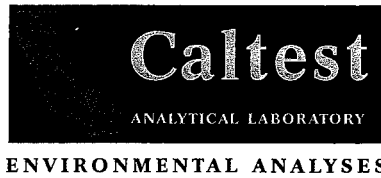
Parameter	Units	H020555001 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	Max RPD	RPD	Qualifiers
Aluminum	ug/L	690	40	860.89	860.693	436	436	85-115	0	20	3

<b>Analysis Description:</b> Organophosphorous Pesticides	<b>QC Batch:</b> SPR/2367
<b>Analysis Method:</b> EPA 614	<b>QC Batch Method:</b> EPA 614

**METHOD BLANK:** 139603

Parameter	Blank Result	Reporting Limit Units	Qualifiers
Malathion	ND	0.5 ug/L	
Chlorpyrifos (Dursban)	ND	0.05 ug/L	
Parathion methyl	ND	0.5 ug/L	
Disulfoton (Di-Syston)	ND	0.5 ug/L	
Diazinon	ND	0.05 ug/L	
Parathion (Parathion ethyl)	ND	0.5 ug/L	
Ethion	ND	0.5 ug/L	
Demeton -O and -S	ND	0.5 ug/L	
Azinphos methyl (Guthion)	ND	2.0 ug/L	1
Tributylphosphate (SS)	89	10-126 %	
Triphenylphosphate (SS)	104	58-118 %	





**QUALITY CONTROL DATA**

Lab Order: H020555

Project ID: STANFORD/TLMAP/PIERS LANE

<b>Analysis Description:</b> Organophosphorous Pesticides	<b>QC Batch:</b> SPR/2367
<b>Analysis Method:</b> EPA 614	<b>QC Batch Method:</b> EPA 614

**LABORATORY CONTROL SAMPLE:** 139604

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Parathion methyl	ug/L	3	2.84	95	67-102	
Disulfoton (Di-Syston)	ug/L	3	1.82	61	35-113	
Diazinon	ug/L	3	2.78	93	62-118	
Azinphos methyl (Guthion)	ug/L	3	2.87	96	10-126	
Tributylphosphate (SS)	%			81	10-126	
Triphenylphosphate (SS)	%			98	58-118	

<b>Analysis Description:</b> Anions by Ion Chromatography	<b>QC Batch:</b> WIC/1603
<b>Analysis Method:</b> EPA 300.0	<b>QC Batch Method:</b> EPA 300.0

**METHOD BLANK:** 140187

Parameter	Blank Result	Reporting Limit	Units	Qualifiers
Nitrogen, Nitrate (as N)	ND	0.1	mg/L	

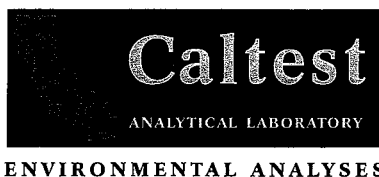
**LABORATORY CONTROL SAMPLE:** 140188

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Nitrate (as N)	mg/L	6.2	6.096	98	90-110	

**MATRIX SPIKE & MATRIX SPIKE DUPLICATE:** 140190 140191

Parameter	Units	H020545019 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Nitrogen, Nitrate (as N)	mg/L	2.9	5	8.013	7.987	102	101	90-110	0.3	20	





## QUALITY CONTROL DATA QUALIFIERS

Lab Order: H020555

Project ID: STANFORD/TLMAP/PIERS LANE

---

### QUALITY CONTROL PARAMETER QUALIFIERS

Results Qualifiers: Report fields may contain codes and non-numeric data correlating to one or more of the following definitions:

NS - means not spiked and will not have recoveries reported for Analyte Spike Amounts

NC - means not able to be calculated for RPD or Spike Recoveries.

QC Codes Keys: These descriptors are used to help identify the specific QC samples and clarify the report.

MB - Method Blank

LCS/LCSD - Laboratory Control Spike / Laboratory Control Spike Duplicate

DUP - Duplicate of Original Sample Matrix

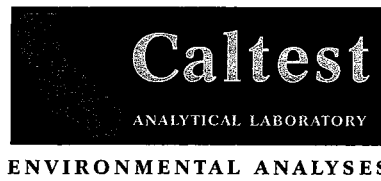
MS/MSD - Matrix Spike / Matrix Spike Duplicate

RPD - Relative Percent Difference

%Recovery - Spike Recovery stated as a percentage

- 1 Analytes reported as 'ND' were not detected at or above the listed Method Detection Limits (MDL).
- 3 Spike recovery outside control limits. Spike added less than one half sample concentration. LCS and Method Blank are in control.





### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Lab Order: H020555

Project ID: STANFORD/TLMAP/PIERS LANE

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
H020555002	SFPL GRAB	EPA 1631E	MPR/4201	EPA 1631E	MHG/1858
H020555004	LTPL GRAB	EPA 1631E	MPR/4201	EPA 1631E	MHG/1858
H020555001	SFPL COMP	EPA 200.8 (filtered)	MPR/4179	EPA 200.8 (filtered)	MMS/3062
H020555003	LTPL COMP	EPA 200.8 (filtered)	MPR/4179	EPA 200.8 (filtered)	MMS/3062
H020555001	SFPL COMP	EPA 200.8	MPR/4195	EPA 200.8	MMS/3071
H020555003	LTPL COMP	EPA 200.8	MPR/4195	EPA 200.8	MMS/3071
H020555001	SFPL COMP	EPA 614	SPR/2367	EPA 614	SNP/1250
H020555003	LTPL COMP	EPA 614	SPR/2367	EPA 614	SNP/1250
H020555001	SFPL COMP	EPA 300.0	WIC/1603		
H020555003	LTPL COMP	EPA 300.0	WIC/1603		





1885 N. KELLY ROAD • NAPA, CA 94558 • (707) 258-4000 • Fax (707) 226-1001 • www.caltestlab.com

PAGE 1 OF 2

LAB ORDER # H02055

CLIENT: BALANCE HYDROLOGICS, INC. CITY: BAY FOLGER AVE, BERKELEY  
 ADDRESS: 841 FOLGER AVE, BERKELEY  
 BILLING ADDRESS: MARTY LAPORTE, STANFORD UNIVERSITY  
 PHONE #: 4212 FAX PHONE: (510) 704-1000 (510) 704-1001  
 PROJECT # / PROJECT NAME: STANFORD/UT MAP/PIERS LANE  
 REPORT TO: CHRIS WHITE STATE: CA ZIP: 94710  
 ANALYSES REQUESTED: NITRATE (NO3-N), DISSOLVED ALUMINUM, CHLORIDE, TOTAL MERCURY, DISSOLVED MERCURY

CALTEST #	DATE SAMPLED	TIME SAMPLED	MATRIX	CONTAINER AMOUNT/TYPER	PRESERVATIVE	SAMPLE IDENTIFICATION SITE	CLIENT LAB #	COMP. or GRAB	REMARKS
1	2/16/07		W	250 ml PE	HND3	SF PL		C	X
1	2/16/07		W	250 ml PE	ICE	SF PL		C	X
1	2/16/07		W	1L AMBER GLASS	↓	SF PL		C	X
1	2/16/07		W	1L AMBER GLASS	↓	SF PL		C	X
2	2/16/07	1055	↓	250 ml PE	ICE	SF PL		C	X
2	2/16/07	1055	↓	250 ml Glass	HCL	SF PL		G	X
2	2/16/07	1055	↓	250 ml Glass	ICE	SF PL		G	X

By submittal of sample(s), client agrees to abide by the Terms and Conditions set forth on the reverse of this document.

RELINQUISHED BY: Client	DATE/TIME: / /	RECEIVED BY: Shotgun delivery	DATE/TIME: 2-12-07
RELINQUISHED BY: Shotgun delivery	DATE/TIME: / /	RECEIVED BY: CWP	DATE/TIME: 1045

FOR LAB USE ONLY

Samples: WC MICRO BIO AA SV VOA  
 BD: BIO WC AA  
 CC: AA SV VOA  
 SIL: HP PT QT VOA  
 W/HNO3 H2SO4 NaOH  
 P/L: HNO3 H2SO4 NaOH HCL

COMMENTS

SEALING: Y / N / N  
 INTACT: Y / N / N  
 TEMP: °C

MATRIX: AQ = Aqueous Nondrinking Water, Digested Metals; FE = Low R.L.s, Aqueous Nondrinking Water, Digested Metals; DW = Drinking Water, SL = Soil, Sludge, Solid; FP = Free Product  
 CONTAINER TYPES: AL = Amber Litter; AHL = 500 ml Amber; PT = Pint (Plastic); QT = Quart (Plastic); HG = Half Gallon (Plastic); SJ = Soil Jar; B4 = 4 oz. BACT; BT = Brass Tube; VOA = 40 mL VOA; OTC = Other Type Container



1885 N. KELLY ROAD • NAPA, CA 94558 • (707) 258-4000 • Fax (707) 226-1001 • www.caltestlab.com  
 SAMPLE CHAIN OF CUSTODY

LAB ORDER # H020555  
 PAGE 2 OF 2

CLIENT: BALANCE HYDROLOGICS, INC. CITY: STANFORD UNIVERSITY  
 ADDRESS: 84 FOLGER AVENUE BERKELEY CA 94710  
 BILLING ADDRESS: MARTY LAPORTE STANFORD UNIVERSITY  
 PHONE # 415-724-1000 FAX PHONE: (510) 704-1001  
 REPORT TO: CHRIS WHITE STATE: CA ZIP: 94710  
 PROJECT # / PROJECT NAME: STANFORD UTMAP/PIERS LAWS  
 ANALYSES REQUESTED: 202018

CALTEST #	DATE SAMPLED	TIME SAMPLED	MATRIX	CONTAINER AMOUNT/TYP	PRESERVATIVE	SAMPLE IDENTIFICATION SITE	CLIENT LAB #	COMP. or GRAB	REMARKS
-3	2/14/07	-	W	250ml PE	HND3	LTPL		C	X
				250ml PE	ICE	LTPL		C	X
				1 LAMBER GLASS		LTPL		C	X
				1L AMBER GLASS		LTPL		C	X
				250ml PE		LTPL		C	X
-4	2/16/07	10:30		250ml Glass	HCL	LTPL		G	X
				250ml Glass	ICE	LTPL		G	X

TURN-AROUND TIME STANDARD  RUSH   
 DUE DATE: \_\_\_\_\_

ANALYSES REQUESTED:  
 TOTAL ALUMINUM  
 DISSOLVED ALUMINUM  
 CHLORIDE ALUMINUM  
 NITRATE (NO3-N)  
 TOXIC METALS  
 0.50 LITER AMBER  
 0.50 LITER MORGAN

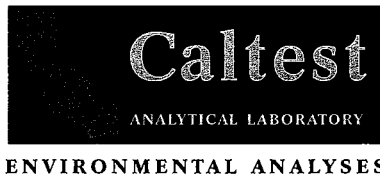
DATE/TIME RECEIVED BY: Client  
 DATE/TIME RECEIVED BY: 2-16-07 1045 WR

By submittal of sample(s), client agrees to abide by the Terms and Conditions set forth on the reverse of this document.

RELINQUISHED BY: Client RECEIVED BY: Shotgun delivery  
 RELINQUISHED BY: Shotgun delivery RECEIVED BY: Shotgun delivery

SEALING: Y / N / N  
 TEMP: \_\_\_\_\_  
 COMMENTS: \_\_\_\_\_

Samples: WC \_\_\_\_\_ MICRO \_\_\_\_\_ BIO \_\_\_\_\_ AA \_\_\_\_\_ SV \_\_\_\_\_ VOA \_\_\_\_\_  
 BD: BIO \_\_\_\_\_ WC \_\_\_\_\_ AA \_\_\_\_\_  
 CC: AA \_\_\_\_\_ SV \_\_\_\_\_ VOA \_\_\_\_\_  
 SIL: HP \_\_\_\_\_ PT \_\_\_\_\_ QT \_\_\_\_\_ VOA \_\_\_\_\_  
 W/HNO3 \_\_\_\_\_ H2SO4 \_\_\_\_\_ NaOH \_\_\_\_\_  
 P/L: HNO3 \_\_\_\_\_ H2SO4 \_\_\_\_\_ NaOH \_\_\_\_\_ HCL \_\_\_\_\_



202018 LAB  
WY2007  
2/26-27/07  
SAMPLING

Thursday, March 22, 2007

Chris White  
Balance Hydrologics, Inc.  
841 Folger Ave.  
Berkeley, CA 94710

RE: Lab Order: H021106  
Project ID: Stanford LTMAP

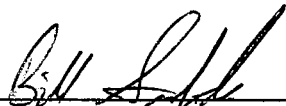
Collected By: ZAN RUBIN  
PO/Contract #: 202018

Dear Chris White:

Enclosed are the analytical results for sample(s) received by the laboratory on Wednesday, February 28, 2007. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

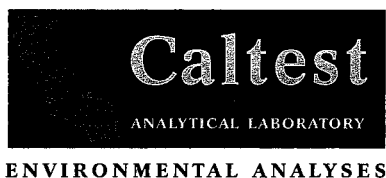
If you have any questions concerning this report, please feel free to contact me.

Enclosures

  
Project Manager: Bill Svoboda

  
Lab Director: Christine Horn





**SAMPLE SUMMARY**

Lab Order: H021106  
 Project ID: Stanford LTMAP

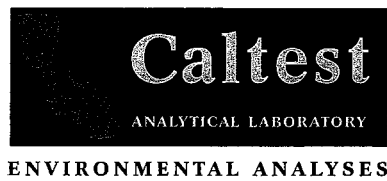
Lab ID	Sample ID	Matrix	Date Collected	Date Received
H021106001	SFPL COMP	Water	2/27/2007 17:30	2/28/2007 10:34
H021106002	SFPL GRAB	Water	2/26/2007 12:30	2/28/2007 10:34

**REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full,  
 without the written consent of CALTEST ANALYTICAL LABORATORY.







## NARRATIVE

Lab Order: H021106  
Project ID: Stanford LTMAP

---

### General Qualifiers and Notes

---

CALTEST authorizes this report to be reproduced only in its entirety. Results are specific to the sample(s) as submitted and only to the parameter(s) reported.

Caltest certifies that test results meet all applicable NELAC requirements unless stated otherwise.

All analyses performed by EPA Methods or Standard Methods (SM) 18th Ed. except where noted.

Caltest collects samples in compliance with 40 CFR, EPA Methods, Cal. Title 22, and Standard Methods.

Dilution Factors (DF) reported greater than '1' have been used to adjust the result, Reporting Limit (R.L.), and Method Detection Limit (MDL).

All Solid, sludge, and/or biosolids data is reported in Wet Weight, unless otherwise specified.

Results Qualifiers: Report fields may contain codes and non-numeric data correlating to one or more of the following definitions:

ND - Non Detect - indicates analytical result has not been detected.

RL - Reporting Limit is the quantitation limit at which the laboratory is able to detect an analyte with a certain level of confidence. Generally, this represents the laboratory's lowest calibration point.

J - reflects estimated analytical result value detected below the Reporting Limit (R.L.) and above the Method Detection Limit (MDL). The 'J' flag is equivalent to the DNQ Estimated Concentration flag.

E - indicates an estimated analytical result value.

B - indicates the analyte has been detected in the blank associated with the sample.

NC - means not able to be calculated for RPD or Spike Recoveries.

SS - compound is a Surrogate Spike used per laboratory quality assurance manual.

NOTE: This document represents a complete Analytical Report for the samples referenced herein and should be retained as a permanent record thereof.

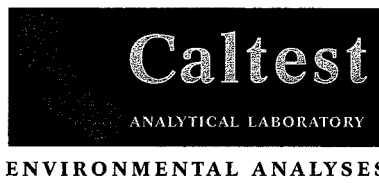
---

### Qualifiers and Compound Notes

---

1 Analytes reported as 'ND' were not detected at or above the listed Method Detection Limits (MDL).





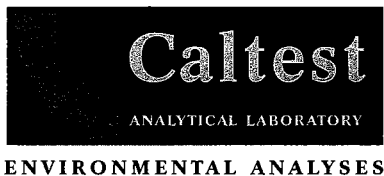
**ANALYTICAL RESULTS**

Lab Order: H021106  
 Project ID: Stanford LTMAP

Lab ID:	H021106001	Date Collected:	2/27/2007 17:30	Matrix:	Water				
Sample ID:	SFPL COMP	Date Received:	2/28/2007 10:34						
Parameters	Result	Units	R. L.	MDL	DF Prepared	Batch	Analyzed	Batch	Qual
<b>Metals Analysis by ICPMS, Dissolved</b>		<b>Prep Method:</b> EPA 200.8 (filtered)		<b>Prep by:</b> TLC					
		<b>Analytical Method:</b> EPA 200.8 (filtered)				<b>Analyzed by:</b> SMD			
Aluminum	36	ug/L	10	1.6	1	03/07/07 00:00	MPR 4237	03/08/07 16:36	MMS 3097
<b>Metals Analysis by ICPMS</b>		<b>Prep Method:</b> EPA 200.8		<b>Prep by:</b> TLC					
		<b>Analytical Method:</b> EPA 200.8				<b>Analyzed by:</b> SMD			
Aluminum	1600	ug/L	200	32	20	03/08/07 00:00	MPR 4240	03/12/07 15:33	MMS 3101
<b>Organophosphorous Pesticides</b>		<b>Prep Method:</b> EPA 614		<b>Prep by:</b> MZE					
		<b>Analytical Method:</b> EPA 614				<b>Analyzed by:</b> MDT			
Azinphos methyl (Guthion)	ND	ug/L	2.0	0.040	1	03/06/07 00:00	SPR 2396	03/16/07 00:01	SNP 1253 1
Chlorpyrifos (Dursban)	ND	ug/L	0.05	0.040	1	03/06/07 00:00	SPR 2396	03/16/07 00:01	SNP 1253
Demeton -O and -S	ND	ug/L	0.5	0.050	1	03/06/07 00:00	SPR 2396	03/16/07 00:01	SNP 1253
Diazinon	ND	ug/L	0.05	0.040	1	03/06/07 00:00	SPR 2396	03/16/07 00:01	SNP 1253
Disulfoton (Di-Syston)	ND	ug/L	0.5	0.040	1	03/06/07 00:00	SPR 2396	03/16/07 00:01	SNP 1253
Ethion	ND	ug/L	0.5	0.030	1	03/06/07 00:00	SPR 2396	03/16/07 00:01	SNP 1253
Malathion	ND	ug/L	0.5	0.050	1	03/06/07 00:00	SPR 2396	03/16/07 00:01	SNP 1253
Parathion (Parathion ethyl)	ND	ug/L	0.5	0.040	1	03/06/07 00:00	SPR 2396	03/16/07 00:01	SNP 1253
Parathion methyl	ND	ug/L	0.5	0.040	1	03/06/07 00:00	SPR 2396	03/16/07 00:01	SNP 1253
Tributylphosphate (SS)	97	%	10-126		1	03/06/07 00:00	SPR 2396	03/16/07 00:01	SNP 1253
Triphenylphosphate (SS)	100	%	58-118		1	03/06/07 00:00	SPR 2396	03/16/07 00:01	SNP 1253
<b>Anions by Ion Chromatography</b>		<b>Analytical Method:</b> EPA 300.0				<b>Analyzed by:</b> MYS			
Nitrogen, Nitrate (as N)	0.38	mg/L	0.1	0.0060	1			02/28/07 23:09	WIC 1619

Lab ID:	H021106002	Date Collected:	2/26/2007 12:30	Matrix:	Water				
Sample ID:	SFPL GRAB	Date Received:	2/28/2007 10:34						
Parameters	Result	Units	R. L.	MDL	DF Prepared	Batch	Analyzed	Batch	Qual
<b>Mercury Analysis, Trace Level, Dissolved</b>		<b>Prep Method:</b> EPA 1631E (filtered)		<b>Prep by:</b> TLC					
		<b>Analytical Method:</b> EPA 1631E (filtered)				<b>Analyzed by:</b> LM			
Mercury	0.0024	ug/L	0.0005	0.00020	1	03/12/07 00:00	MPR 4259	03/13/07 00:00	MHG 1872
<b>Mercury Analysis, Trace Level</b>		<b>Prep Method:</b> EPA 1631E		<b>Prep by:</b> TLC					
		<b>Analytical Method:</b> EPA 1631E				<b>Analyzed by:</b> LM			
Mercury	0.020	ug/L	0.0005	0.00020	1	03/12/07 00:00	MPR 4259	03/13/07 00:00	MHG 1872





**QUALITY CONTROL DATA**

Lab Order: H021106  
 Project ID: Stanford LTMAP

<b>Analysis Description:</b> Metals Analysis by ICPMS, Dissolved	<b>QC Batch:</b> MPR/4237
<b>Analysis Method:</b> EPA 200.8 (filtered)	<b>QC Batch Method:</b> EPA 200.8 (filtered)

METHOD BLANK: 143097

Parameter	Blank Result	Reporting Limit	Units	Qualifiers
Aluminum	ND	10	ug/L	

LABORATORY CONTROL SAMPLE: 143098

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	40	42.659	107	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 143099 143100

Parameter	Units	H030115001 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Aluminum	ug/L	5	40	41.675	40.592	93	90	85-115	2.6	20	

<b>Analysis Description:</b> Metals Analysis by ICPMS	<b>QC Batch:</b> MPR/4240
<b>Analysis Method:</b> EPA 200.8	<b>QC Batch Method:</b> EPA 200.8

METHOD BLANK: 143322

Parameter	Blank Result	Reporting Limit	Units	Qualifiers
Aluminum	ND	10	ug/L	

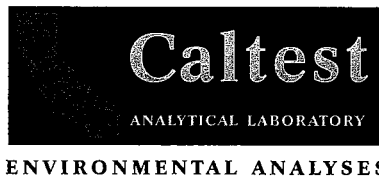
LABORATORY CONTROL SAMPLE: 143323

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	40	41.284	103	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 143324 143325

Parameter	Units	H021067002 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Aluminum	ug/L	140	40	183.2	195.113	104	133	85-115	6.3	20	4





**QUALITY CONTROL DATA**

Lab Order: H021106

Project ID: Stanford LTMAP

<b>Analysis Description:</b> Mercury Analysis, Trace Level	<b>QC Batch:</b> MPR/4259
<b>Analysis Method:</b> EPA 1631E (filtered)	<b>QC Batch Method:</b> EPA 1631E (filtered)

<b>Analysis Description:</b> Mercury Analysis, Trace Level	<b>QC Batch:</b> MPR/4259
<b>Analysis Method:</b> EPA 1631E	<b>QC Batch Method:</b> EPA 1631E

METHOD BLANK: 144112

Parameter	Blank Result	Reporting Limit Units	Qualifiers
Mercury	ND	0.0005 ug/L	

LABORATORY CONTROL SAMPLE: 144113

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	0.02	0.02052	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 144114 144115

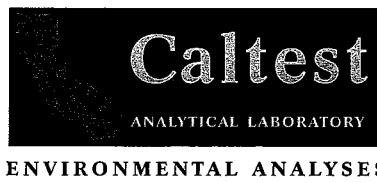
Parameter	Units	H021138002 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Mercury	ug/L	0.0062	0.02	0.025348	0.025098	96	94	71-125	1	20	

<b>Analysis Description:</b> Organophosphorous Pesticides	<b>QC Batch:</b> SPR/2396
<b>Analysis Method:</b> EPA 614	<b>QC Batch Method:</b> EPA 614

METHOD BLANK: 142684

Parameter	Blank Result	Reporting Limit Units	Qualifiers
Malathion	ND	0.5 ug/L	
Chlorpyrifos (Dursban)	ND	0.05 ug/L	
Parathion methyl	ND	0.5 ug/L	
Disulfoton (Di-Syston)	ND	0.5 ug/L	
Diazinon	ND	0.05 ug/L	
Parathion (Parathion ethyl)	ND	0.5 ug/L	
Ethion	ND	0.5 ug/L	
Demeton -O and -S	ND	0.5 ug/L	
Azinphos methyl (Guthion)	ND	2.0 ug/L	1
Tributylphosphate (SS)	84	10-126 %	





**QUALITY CONTROL DATA**

Lab Order: H021106

Project ID: Stanford LTMAP

<b>Analysis Description:</b> Organophosphorous Pesticides	<b>QC Batch:</b> SPR/2396
<b>Analysis Method:</b> EPA 614	<b>QC Batch Method:</b> EPA 614

Parameter	Blank Result	Reporting Limit Units	Qualifiers
Triphenylphosphate (SS)	98	58-118 %	

LABORATORY CONTROL SAMPLE: 142685

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Parathion methyl	ug/L	3	2.93	98	67-102	
Disulfoton (Di-Syston)	ug/L	3	2.34	78	35-113	
Diazinon	ug/L	3	2.96	99	62-118	
Azinphos methyl (Guthion)	ug/L	3	3.05	102	10-126	
Tributylphosphate (SS)	%			94	10-126	
Triphenylphosphate (SS)	%			102	58-118	

<b>Analysis Description:</b> Anions by Ion Chromatography	<b>QC Batch:</b> WIC/1619
<b>Analysis Method:</b> EPA 300.0	<b>QC Batch Method:</b> EPA 300.0

METHOD BLANK: 142140

Parameter	Blank Result	Reporting Limit Units	Qualifiers
Nitrogen, Nitrate (as N)	ND	0.1 mg/L	

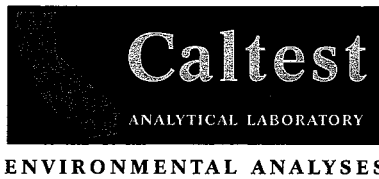
LABORATORY CONTROL SAMPLE: 142141

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Nitrate (as N)	mg/L	6.2	6.135	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 142143 142144

Parameter	Units	H021098001 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	Max RPD	Max RPD	Qualifiers
Nitrogen, Nitrate (as N)	mg/L	7	5	9.872	10.123	57	62	90-110	2.5	20	2





## QUALITY CONTROL DATA QUALIFIERS

Lab Order: H021106

Project ID: Stanford LTMAP

---

### QUALITY CONTROL PARAMETER QUALIFIERS

Results Qualifiers: Report fields may contain codes and non-numeric data correlating to one or more of the following definitions:

NS - means not spiked and will not have recoveries reported for Analyte Spike Amounts

NC - means not able to be calculated for RPD or Spike Recoveries.

QC Codes Keys: These descriptors are used to help identify the specific QC samples and clarify the report.

MB - Method Blank

LCS/LCSD - Laboratory Control Spike / Laboratory Control Spike Duplicate

DUP - Duplicate of Original Sample Matrix

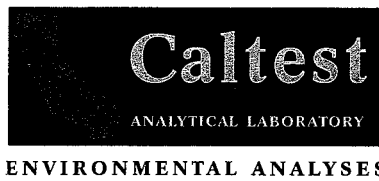
MS/MSD - Matrix Spike / Matrix Spike Duplicate

RPD - Relative Percent Difference

%Recovery - Spike Recovery stated as a percentage

- 1 Analytes reported as 'ND' were not detected at or above the listed Method Detection Limits (MDL).
- 2 Low Matrix Spike recovery(ies) due to possible matrix interferences in the QC sample. QC batch accepted based on LCS and RPD results.
- 3 Sample diluted prior to analysis in an effort to reduce matrix interferences resulting in (a) higher reporting limit(s).
- 4 Spike recovery outside control limits. Spike added less than one half sample concentration. LCS and Method Blank are in control.





### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Lab Order: H021106

Project ID: Stanford LTMAP

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
H021106002	SFPL GRAB	EPA 1631E	MPR/4259	EPA 1631E	MHG/1872
H021106002	SFPL GRAB	EPA 1631E (filtered)	MPR/4259	EPA 1631E (filtered)	MHG/1872
H021106001	SFPL COMP	EPA 200.8 (filtered)	MPR/4237	EPA 200.8 (filtered)	MMS/3097
H021106001	SFPL COMP	EPA 200.8	MPR/4240	EPA 200.8	MMS/3101
H021106001	SFPL COMP	EPA 614	SPR/2396	EPA 614	SNP/1253
H021106001	SFPL COMP	EPA 300.0	WIC/1619		





1885 N. KELLY ROAD • NAPA, CA 94558 • (707) 258-4000 • Fax (707) 226-1001 • www.caltestlab.com

PAGE 1 OF 3

LAB ORDER # A021106

PROJECT # / PROJECT NAME  
202016 / LTMAP / SFPL

REPORT TO: Chris White

STATE: CA ZIP: 94710

CITY: Berkeley

CLIENT: Balance Hydrologics

REPORT TO: Chris White

ADDRESS: 441 Folger Ave Berkeley CA

STATE: CA ZIP: 94710

BILLING ADDRESS: Marty Laporte - Stanford University

REPORT TO: Chris White

PHONE #: 510-704-1000

REPORT TO: Chris White

FAX PHONE: 510-704-1001

REPORT TO: Chris White

SAMPLER (PRINT & SIGN NAME): Zan Rubin

REPORT TO: Chris White

CALTEST #

REPORT TO: Chris White

DATE SAMPLED

REPORT TO: Chris White

TIME SAMPLED

REPORT TO: Chris White

MATRIX

REPORT TO: Chris White

CONTAINER AMOUNT/TYP

REPORT TO: Chris White

PRESERVATIVE

REPORT TO: Chris White

SAMPLE IDENTIFICATION SITE

REPORT TO: Chris White

CLIENT LAB #

REPORT TO: Chris White

COMP. OR GRAB

REPORT TO: Chris White

REMARKS

REPORT TO: Chris White

ANALYSES REQUESTED

REPORT TO: Chris White

TURN-AROUND TIME

REPORT TO: Chris White

STANDARD

REPORT TO: Chris White

RUSH

REPORT TO: Chris White

DUE DATE:

REPORT TO: Chris White

DISKED ALUMINUM

REPORT TO: Chris White

DISKED ALUMINUM

REPORT TO: Chris White

DISKED MERCURY

REPORT TO: Chris White

DISKED MERCURY

REPORT TO: Chris White

CHLORIDE

REPORT TO: Chris White

REMARKS

REPORT TO: Chris White

REMARKS

REPORT TO: Chris White

REMARKS

REPORT TO: Chris White

REMARKS

REPORT TO: Chris White

REMARKS

REPORT TO: Chris White

REMARKS

REPORT TO: Chris White

REMARKS

REPORT TO: Chris White

REMARKS

REPORT TO: Chris White

REMARKS

REPORT TO: Chris White

REMARKS

REPORT TO: Chris White

REMARKS

REPORT TO: Chris White

REMARKS

REPORT TO: Chris White

REMARKS

REPORT TO: Chris White

REMARKS

REPORT TO: Chris White

REMARKS

REPORT TO: Chris White

REMARKS

REPORT TO: Chris White

REMARKS

REPORT TO: Chris White

REMARKS

REPORT TO: Chris White

REV. 11/03

PINK - CLIENT COPY AS RECEIPT

YELLOW - CLIENT COPY TO ACCOMPANY FINAL REPORT

WHITE - LABORATORY

MATRIX: AQ = Aqueous Nondrinking Water, Digested Metals;  
FE = Low R.L.s, Aqueous Nondrinking Water, Digested Metals;  
DW = Drinking Water; SL = Soil, Sludge, Solid; FP = Free Product

CONTAINER TYPES: AL = Amber Liter; AHL = 500 ml Amber; PT = Pint (Plastic); QT = Quart (Plastic); HG = Half Gallon (Plastic); SJ = Soil Jar; B4 = 4 oz. BACT; BT = Brass Tube; VOA = 40 mL VOA; OTC = Other Type Container

R PR M F

By submittal of sample(s), client agrees to abide by the Terms and Conditions set forth on the reverse of this document.

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME	RECEIVED BY
<i>John Gartner</i>	2/26/07 9:30	<i>Wendy Cugala</i>	2/28/07 10:34	<i>Leah Kellato</i>

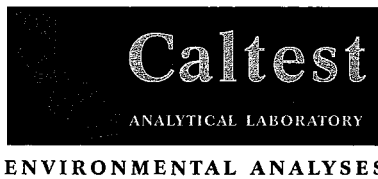
RELINQUISHED BY	RECEIVED BY	SEALING	TEMP	INTACT
<i>John Gartner</i>	<i>Wendy Cugala</i>	<i>Y</i>	<i>40C</i>	<i>Y</i>

SAMPLES	WC	MICRO	BIO	AA	SV	VOA	COMMENTS
BD							
CC							
SIL							
W/HNO3							
PIL							

FOR LAB USE ONLY





202018 LAB  
 WY 2007  
 2/26-27/2007  
 SAMPLING

Thursday, March 22, 2007

Chris White  
 Balance Hydrologics, Inc.  
 841 Folger Ave.  
 Berkeley, CA 94710

RE: Lab Order: H021107  
 Project ID: Stanford LTMAP

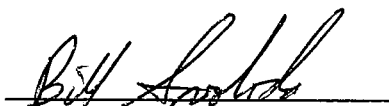
Collected By: ZAN RUBIN  
 PO/Contract #:

Dear Chris White:

Enclosed are the analytical results for sample(s) received by the laboratory on Wednesday, February 28, 2007. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

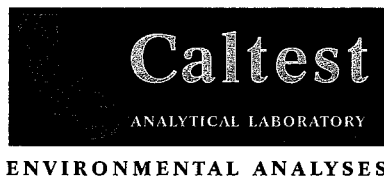
If you have any questions concerning this report, please feel free to contact me.

Enclosures

  
 Project Manager: Bill Svoboda

  
 Lab Director: Christine Horn



**SAMPLE SUMMARY**

Lab Order: H021107

Project ID: Stanford LTMAP

---

Lab ID	Sample ID	Matrix	Date Collected	Date Received
H021107001	LTPL COMP	Water	2/27/2007 17:00	2/28/2007 10:34
H021107002	LTPL GRAB	Water	2/26/2007 13:00	2/28/2007 10:34
H021107003	LTPL COMP	Water	2/27/2007 23:59	2/28/2007 10:34
H021107004	LTPL GRAB	Water	2/26/2007 23:59	2/28/2007 10:34

3/22/2007 07:09

**REPORT OF LABORATORY ANALYSIS**

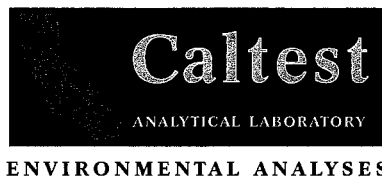
Page 2 of 11

This report shall not be reproduced, except in full,  
without the written consent of CALTEST ANALYTICAL LABORATORY.



1885 North Kelly Road • Napa, California 94558  
(707) 258-4000 • Fax: (707) 226-1001 • e-mail: info@caltestlabs.com





## NARRATIVE

Lab Order: H021107  
Project ID: Stanford LTMAP

### General Qualifiers and Notes

CALTEST authorizes this report to be reproduced only in its entirety. Results are specific to the sample(s) as submitted and only to the parameter(s) reported.

Caltest certifies that test results meet all applicable NELAC requirements unless stated otherwise.

All analyses performed by EPA Methods or Standard Methods (SM) 18th Ed. except where noted.

Caltest collects samples in compliance with 40 CFR, EPA Methods, Cal. Title 22, and Standard Methods.

Dilution Factors (DF) reported greater than '1' have been used to adjust the result, Reporting Limit (R.L.), and Method Detection Limit (MDL).

All Solid, sludge, and/or biosolids data is reported in Wet Weight, unless otherwise specified.

Results Qualifiers: Report fields may contain codes and non-numeric data correlating to one or more of the following definitions:

ND - Non Detect - indicates analytical result has not been detected.

RL - Reporting Limit is the quantitation limit at which the laboratory is able to detect an analyte with a certain level of confidence. Generally, this represents the laboratory's lowest calibration point.

J - reflects estimated analytical result value detected below the Reporting Limit (R.L.) and above the Method Detection Limit (MDL). The 'J' flag is equivalent to the DNQ Estimated Concentration flag.

E - indicates an estimated analytical result value.

B - indicates the analyte has been detected in the blank associated with the sample.

NC - means not able to be calculated for RPD or Spike Recoveries.

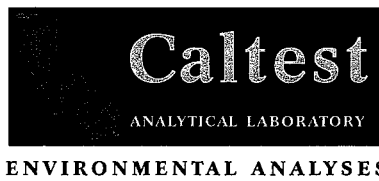
SS - compound is a Surrogate Spike used per laboratory quality assurance manual.

NOTE: This document represents a complete Analytical Report for the samples referenced herein and should be retained as a permanent record thereof.

### Qualifiers and Compound Notes

- 1 Analytes reported as 'ND' were not detected at or above the listed Method Detection Limits (MDL).





**ANALYTICAL RESULTS**

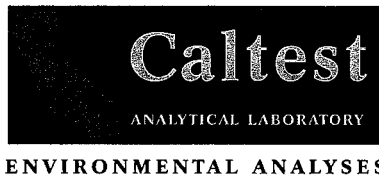
Lab Order: H021107

Project ID Stanford LTMAP

Lab ID:	H021107001	Date Collected:	2/27/2007 17:00	Matrix:	Water				
Sample ID:	LTPL COMP	Date Received:	2/28/2007 10:34						
Parameters	Result	Units	R. L.	MDL	DF Prepared	Batch	Analyzed	Batch	Qual
<b>Metals Analysis by ICPMS, Dissolved</b>		<b>Prep Method:</b> EPA 200.8 (filtered)		<b>Prep by:</b> TLC					
		<b>Analytical Method:</b> EPA 200.8 (filtered)				<b>Analyzed by:</b> SMD			
Aluminum	24	ug/L	10	1.6	1	03/07/07 00:00	MPR 4237	03/08/07 16:28	MMS 3097
<b>Metals Analysis by ICPMS</b>		<b>Prep Method:</b> EPA 200.8		<b>Prep by:</b> UK					
		<b>Analytical Method:</b> EPA 200.8				<b>Analyzed by:</b> SMD			
Aluminum	4600	ug/L	500	80	50	03/05/07 00:00	MPR 4236	03/09/07 14:22	MMS 3099
<b>Organophosphorous Pesticides</b>		<b>Prep Method:</b> EPA 614		<b>Prep by:</b> MZE					
		<b>Analytical Method:</b> EPA 614				<b>Analyzed by:</b> MDT			
Azinphos methyl (Guthion)	ND	ug/L	2.0	0.040	1	03/06/07 00:00	SPR 2396	03/15/07 22:29	SNP 1253 1
Chlorpyrifos (Dursban)	ND	ug/L	0.05	0.040	1	03/06/07 00:00	SPR 2396	03/15/07 22:29	SNP 1253
Demeton -O and -S	ND	ug/L	0.5	0.050	1	03/06/07 00:00	SPR 2396	03/15/07 22:29	SNP 1253
Diazinon	ND	ug/L	0.05	0.040	1	03/06/07 00:00	SPR 2396	03/15/07 22:29	SNP 1253
Disulfoton (Di-Syston)	ND	ug/L	0.5	0.040	1	03/06/07 00:00	SPR 2396	03/15/07 22:29	SNP 1253
Ethion	ND	ug/L	0.5	0.030	1	03/06/07 00:00	SPR 2396	03/15/07 22:29	SNP 1253
Malathion	ND	ug/L	0.5	0.050	1	03/06/07 00:00	SPR 2396	03/15/07 22:29	SNP 1253
Parathion (Parathion ethyl)	ND	ug/L	0.5	0.040	1	03/06/07 00:00	SPR 2396	03/15/07 22:29	SNP 1253
Parathion methyl	ND	ug/L	0.5	0.040	1	03/06/07 00:00	SPR 2396	03/15/07 22:29	SNP 1253
Tributylphosphate (SS)	104	%	10-126		1	03/06/07 00:00	SPR 2396	03/15/07 22:29	SNP 1253
Triphenylphosphate (SS)	113	%	58-118		1	03/06/07 00:00	SPR 2396	03/15/07 22:29	SNP 1253
<b>Anions by Ion Chromatography</b>		<b>Analytical Method:</b> EPA 300.0				<b>Analyzed by:</b> MYS			
Nitrogen, Nitrate (as N)	1.4	mg/L	0.1	0.0060	1			02/28/07 23:27	WIC 1619

Lab ID:	H021107002	Date Collected:	2/26/2007 13:00	Matrix:	Water				
Sample ID:	LTPL GRAB	Date Received:	2/28/2007 10:34						
Parameters	Result	Units	R. L.	MDL	DF Prepared	Batch	Analyzed	Batch	Qual
<b>Mercury Analysis, Trace Level, Dissolved</b>		<b>Prep Method:</b> EPA 1631E (filtered)		<b>Prep by:</b> TLC					
		<b>Analytical Method:</b> EPA 1631E (filtered)				<b>Analyzed by:</b> LM			
Mercury	0.0030	ug/L	0.0005	0.00020	1	03/12/07 00:00	MPR 4259	03/13/07 00:00	MHG 1872
<b>Mercury Analysis, Trace Level</b>		<b>Prep Method:</b> EPA 1631E		<b>Prep by:</b> TLC					
		<b>Analytical Method:</b> EPA 1631E				<b>Analyzed by:</b> LM			
Mercury	0.010	ug/L	0.0005	0.00020	1	03/08/07 00:00	MPR 4245	03/09/07 00:00	MHG 1870





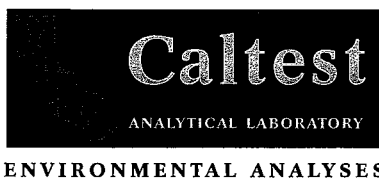
**ANALYTICAL RESULTS**

Lab Order: H021107  
Project ID: Stanford LTMAP

<b>Lab ID:</b>	<b>H021107003</b>	<b>Date Collected:</b>	<b>2/27/2007 23:59</b>	<b>Matrix:</b>	<b>Water</b>					
<b>Sample ID:</b>	<b>LTPL COMP</b>	<b>Date Received:</b>	<b>2/28/2007 10:34</b>							
Parameters	Result Units	R. L.	MDL	DF	Prepared	Batch	Analyzed	Batch	Qual	
<b>Metals Analysis by ICPMS, Dissolved</b>		<b>Prep Method:</b>	EPA 200.8 (filtered)		<b>Prep by:</b>		TLC			
		<b>Analytical Method:</b>	EPA 200.8 (filtered)				<b>Analyzed by:</b> SMD			
Aluminum	25 ug/L	10	1.6	1	03/07/07 00:00	MPR 4237	03/08/07 16:33	MMS 3097		
<b>Metals Analysis by ICPMS</b>		<b>Prep Method:</b>	EPA 200.8		<b>Prep by:</b>		UK			
		<b>Analytical Method:</b>	EPA 200.8				<b>Analyzed by:</b> SMD			
Aluminum	4500 ug/L	500	80	50	03/05/07 00:00	MPR 4236	03/09/07 14:26	MMS 3099		
<b>Organophosphorous Pesticides</b>		<b>Prep Method:</b>	EPA 614		<b>Prep by:</b>		MZE			
		<b>Analytical Method:</b>	EPA 614				<b>Analyzed by:</b> MDT			
Azinphos methyl (Guthion)	ND ug/L	2.0	0.040	1	03/06/07 00:00	SPR 2396	03/15/07 23:15	SNP 1253	1	
Chlorpyrifos (Dursban)	ND ug/L	0.05	0.040	1	03/06/07 00:00	SPR 2396	03/15/07 23:15	SNP 1253		
Demeton -O and -S	ND ug/L	0.5	0.050	1	03/06/07 00:00	SPR 2396	03/15/07 23:15	SNP 1253		
Diazinon	ND ug/L	0.05	0.040	1	03/06/07 00:00	SPR 2396	03/15/07 23:15	SNP 1253		
Disulfoton (Di-Syston)	ND ug/L	0.5	0.040	1	03/06/07 00:00	SPR 2396	03/15/07 23:15	SNP 1253		
Ethion	ND ug/L	0.5	0.030	1	03/06/07 00:00	SPR 2396	03/15/07 23:15	SNP 1253		
Malathion	ND ug/L	0.5	0.050	1	03/06/07 00:00	SPR 2396	03/15/07 23:15	SNP 1253		
Parathion (Parathion ethyl)	ND ug/L	0.5	0.040	1	03/06/07 00:00	SPR 2396	03/15/07 23:15	SNP 1253		
Parathion methyl	ND ug/L	0.5	0.040	1	03/06/07 00:00	SPR 2396	03/15/07 23:15	SNP 1253		
Tributylphosphate (SS)	97 %	10-126		1	03/06/07 00:00	SPR 2396	03/15/07 23:15	SNP 1253		
Triphenylphosphate (SS)	97 %	58-118		1	03/06/07 00:00	SPR 2396	03/15/07 23:15	SNP 1253		
<b>Anions by Ion Chromatography</b>		<b>Analytical Method:</b>	EPA 300.0				<b>Analyzed by:</b> MYS			
Nitrogen, Nitrate (as N)	1.3 mg/L	0.1	0.0060	1			02/28/07 23:45	WIC 1619		

<b>Lab ID:</b>	<b>H021107004</b>	<b>Date Collected:</b>	<b>2/26/2007 23:59</b>	<b>Matrix:</b>	<b>Water</b>					
<b>Sample ID:</b>	<b>LTPL GRAB</b>	<b>Date Received:</b>	<b>2/28/2007 10:34</b>							
Parameters	Result Units	R. L.	MDL	DF	Prepared	Batch	Analyzed	Batch	Qual	
<b>Mercury Analysis, Trace Level, Dissolved</b>		<b>Prep Method:</b>	EPA 1631E (filtered)		<b>Prep by:</b>		TLC			
		<b>Analytical Method:</b>	EPA 1631E (filtered)				<b>Analyzed by:</b> LM			
Mercury	0.0028 ug/L	0.0005	0.00020	1	03/12/07 00:00	MPR 4259	03/13/07 00:00	MHG 1872		
<b>Mercury Analysis, Trace Level</b>		<b>Prep Method:</b>	EPA 1631E		<b>Prep by:</b>		TLC			
		<b>Analytical Method:</b>	EPA 1631E				<b>Analyzed by:</b> LM			
Mercury	0.012 ug/L	0.0005	0.00020	1	03/08/07 00:00	MPR 4245	03/09/07 00:00	MHG 1870		





**QUALITY CONTROL DATA**

Lab Order: H021107

Project ID: Stanford LTMAP

<b>Analysis Description:</b>	Metals Analysis by ICPMS, Dissolved	<b>QC Batch:</b>	MPR/4237
<b>Analysis Method:</b>	EPA 200.8 (filtered)	<b>QC Batch Method:</b>	EPA 200.8 (filtered)

**METHOD BLANK:** 143097

Parameter	Blank Result	Reporting Limit Units	Qualifiers
Aluminum	ND	10 ug/L	

**LABORATORY CONTROL SAMPLE:** 143098

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	40	42.659	107	85-115	

**MATRIX SPIKE & MATRIX SPIKE DUPLICATE:** 143099 143100

Parameter	Units	H030115001 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Aluminum	ug/L	5	40	41.675	40.592	93	90	85-115	2.6	20	

<b>Analysis Description:</b>	Metals Analysis by ICPMS	<b>QC Batch:</b>	MPR/4236
<b>Analysis Method:</b>	EPA 200.8	<b>QC Batch Method:</b>	EPA 200.8

**METHOD BLANK:** 143022

Parameter	Blank Result	Reporting Limit Units	Qualifiers
Aluminum	ND	10 ug/L	

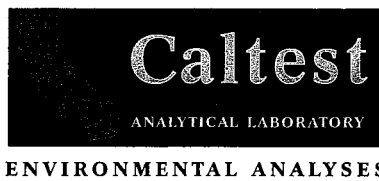
**LABORATORY CONTROL SAMPLE:** 143023

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	40	41.381	103	85-115	

**MATRIX SPIKE & MATRIX SPIKE DUPLICATE:** 143024 143025

Parameter	Units	H021091001 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Aluminum	ug/L	8	40	47.963	47.614	100	99	85-115	0.7	20	





**QUALITY CONTROL DATA**

Lab Order: H021107

Project ID: Stanford LTMAP

<b>Analysis Description:</b> Mercury Analysis, Trace Level	<b>QC Batch:</b> MPR/4245
<b>Analysis Method:</b> EPA 1631E	<b>QC Batch Method:</b> EPA 1631E

METHOD BLANK: 143349

Parameter	Blank Result	Reporting Limit Units	Qualifiers
Mercury	ND	0.0005 ug/L	

LABORATORY CONTROL SAMPLE: 143350

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	0.02	0.020198	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 143353 143354

Parameter	Units	H021090002 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Mercury	ug/L	0.0021	0.02	0.02147	0.021619	97	98	71-125	0.7	20	

<b>Analysis Description:</b> Mercury Analysis, Trace Level	<b>QC Batch:</b> MPR/4259
<b>Analysis Method:</b> EPA 1631E (filtered)	<b>QC Batch Method:</b> EPA 1631E (filtered)

METHOD BLANK: 144112

Parameter	Blank Result	Reporting Limit Units	Qualifiers
Mercury	ND	0.0005 ug/L	

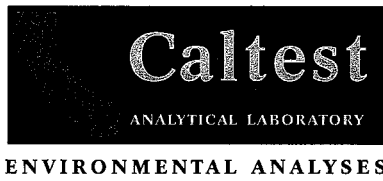
LABORATORY CONTROL SAMPLE: 144113

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	0.02	0.02052	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 144114 144115

Parameter	Units	H021138002 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Mercury	ug/L	0.0062	0.02	0.025348	0.025098	96	94	71-125	1	20	





**QUALITY CONTROL DATA**

Lab Order: H021107

Project ID: Stanford LTMAP

<b>Analysis Description:</b> Organophosphorous Pesticides	<b>QC Batch:</b> SPR/2396
<b>Analysis Method:</b> EPA 614	<b>QC Batch Method:</b> EPA 614

**METHOD BLANK:** 142684

Parameter	Blank Result	Reporting Limit Units	Qualifiers
Malathion	ND	0.5 ug/L	
Chlorpyrifos (Dursban)	ND	0.05 ug/L	
Parathion methyl	ND	0.5 ug/L	
Disulfoton (Di-Syston)	ND	0.5 ug/L	
Diazinon	ND	0.05 ug/L	
Parathion (Parathion ethyl)	ND	0.5 ug/L	
Ethion	ND	0.5 ug/L	
Demeton -O and -S	ND	0.5 ug/L	
Azinphos methyl (Guthion)	ND	2.0 ug/L	1
Tributylphosphate (SS)	84	10-126 %	
Triphenylphosphate (SS)	98	58-118 %	

**LABORATORY CONTROL SAMPLE:** 142685

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Parathion methyl	ug/L	3	2.93	98	67-102	
Disulfoton (Di-Syston)	ug/L	3	2.34	78	35-113	
Diazinon	ug/L	3	2.96	99	62-118	
Azinphos methyl (Guthion)	ug/L	3	3.05	102	10-126	
Tributylphosphate (SS)	%			94	10-126	
Triphenylphosphate (SS)	%			102	58-118	

<b>Analysis Description:</b> Anions by Ion Chromatography	<b>QC Batch:</b> WIC/1619
<b>Analysis Method:</b> EPA 300.0	<b>QC Batch Method:</b> EPA 300.0

**METHOD BLANK:** 142140

Parameter	Blank Result	Reporting Limit Units	Qualifiers
Nitrogen, Nitrate (as N)	ND	0.1 mg/L	

**LABORATORY CONTROL SAMPLE:** 142141

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
-----------	-------	-------------	------------	-----------	--------------	------------







**QUALITY CONTROL DATA**

Lab Order: H021107

Project ID: Stanford LTMAP

<b>Analysis Description:</b> Anions by Ion Chromatography	<b>QC Batch:</b> WIC/1619
<b>Analysis Method:</b> EPA 300.0	<b>QC Batch Method:</b> EPA 300.0

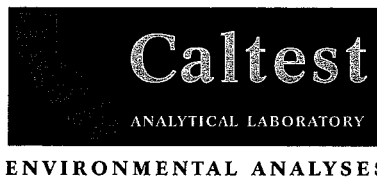
LABORATORY CONTROL SAMPLE: 142141

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Nitrate (as N)	mg/L	6.2	6.135	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 142143 142144

Parameter	Units	H021098001 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Nitrogen, Nitrate (as N)	mg/L	7	5	9.872	10.123	57	62	90-110	2.5	20	2





## QUALITY CONTROL DATA QUALIFIERS

Lab Order: H021107

Project ID: Stanford LTMAP

---

### QUALITY CONTROL PARAMETER QUALIFIERS

Results Qualifiers: Report fields may contain codes and non-numeric data correlating to one or more of the following definitions:

NS - means not spiked and will not have recoveries reported for Analyte Spike Amounts

NC - means not able to be calculated for RPD or Spike Recoveries.

QC Codes Keys: These descriptors are used to help identify the specific QC samples and clarify the report.

MB - Method Blank

LCS/LCSD - Laboratory Control Spike / Laboratory Control Spike Duplicate

DUP - Duplicate of Original Sample Matrix

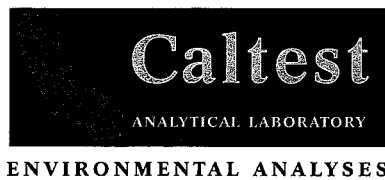
MS/MSD - Matrix Spike / Matrix Spike Duplicate

RPD - Relative Percent Difference

%Recovery - Spike Recovery stated as a percentage

- 1 Analytes reported as 'ND' were not detected at or above the listed Method Detection Limits (MDL).
- 2 Low Matrix Spike recovery(ies) due to possible matrix interferences in the QC sample. QC batch accepted based on LCS and RPD results.
- 3 Sample diluted prior to analysis in an effort to reduce matrix interferences resulting in (a) higher reporting limit(s).





### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Lab Order: H021107

Project ID: Stanford LTMAP

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
H021107002	LTPL GRAB	EPA 1631E	MPR/4245	EPA 1631E	MHG/1870
H021107004	LTPL GRAB	EPA 1631E	MPR/4245	EPA 1631E	MHG/1870
H021107002	LTPL GRAB	EPA 1631E (filtered)	MPR/4259	EPA 1631E (filtered)	MHG/1872
H021107004	LTPL GRAB	EPA 1631E (filtered)	MPR/4259	EPA 1631E (filtered)	MHG/1872
H021107001	LTPL COMP	EPA 200.8	MPR/4236	EPA 200.8	MMS/3099
H021107003	LTPL COMP	EPA 200.8	MPR/4236	EPA 200.8	MMS/3099
H021107001	LTPL COMP	EPA 200.8 (filtered)	MPR/4237	EPA 200.8 (filtered)	MMS/3097
H021107003	LTPL COMP	EPA 200.8 (filtered)	MPR/4237	EPA 200.8 (filtered)	MMS/3097
H021107001	LTPL COMP	EPA 614	SPR/2396	EPA 614	SNP/1253
H021107003	LTPL COMP	EPA 614	SPR/2396	EPA 614	SNP/1253
H021107001	LTPL COMP	EPA 300.0	WIC/1619		
H021107003	LTPL COMP	EPA 300.0	WIC/1619		





1885 N. KELLY ROAD • NAPA, CA 94558 • (707) 258-4000 • Fax (707) 226-1001 • www.caltestlab.com

**SAMPLE CHAIN OF CUSTODY**

PAGE 2 OF 3

LAB ORDER # HO21107

PROJECT # / PROJECT NAME  
Stanford / LT MAP / Piers Ln.

P.O.# 202018

CLIENT: Balance Hydrologics

REPORT TO: Chris White

ANALYSES REQUESTED

ADDRESS: 641 Folger Ave Berkeley CA 94710

BILLING ADDRESS: Marty LaPorte Stanford University

PHONE # 510704-1000 FAX PHONE: 704-1001

SAMPLER (PRINT & SIGN NAME): Zan Rubin

TURN-AROUND TIME  
 STANDARD  
 RUSH

DUE DATE:

CALTEST #	DATE SAMPLED	TIME SAMPLED	MATRIX	CONTAINER AMOUNT/TYPE	PRESERVATIVE	SAMPLE IDENTIFICATION SITE	CLIENT LAB #	COMP. or GRAB	REMARKS
-1	2/27/07	1700	W	250 PE	HN03	LTPL		C	X Please Filter
				500 mL PE	Ice	LTPL		C	X
				4L Amber Glass	Ice	LTPL		C	X
				4L Amber Glass	Ice	LTPL		C	X
				4L PE	Ice	LTPL		C	X
-2	2/26/07	1300		250 mL Glass	HCL	LTPL		G	X Trace Level
				250 mL Glass	Ice	LTPL		G	X Trace Level Please Filter

Aluminum  
Dissolved Aluminum  
Chlorophyll a  
Total Mercury  
Dissolved Mercury  
Nitrate

By submittal of sample(s), client agrees to abide by the Terms and Conditions set forth on the reverse of this document.

RELINQUISHED BY: John Gartner DATE/TIME: 2/28/07 9:30

RECEIVED BY: Wayne Cus DATE/TIME: 2/28/07 1034

RELINQUISHED BY: Wayne Cus RECEIVED BY: Wayne Cus

Samples: WC  MICRO  BIO  AA  SV  VOA  TEMP: 40 SEALED: Y  N  INTACT: Y  N

BD: BIO  WC  AA  SV  VOA

CC: AA  SV  VOA

SIL: HP  PT  QT  VOA

W/HNO<sub>3</sub>  H<sub>2</sub>SO<sub>4</sub>  NaOH

PIL: HNO<sub>3</sub>  H<sub>2</sub>SO<sub>4</sub>  NaOH  HCL

COMMENTS

**MATRIX:** AQ = Aqueous Nondrinking Water, Digested Metals; FE = Low R.L.s, Aqueous Nondrinking Water, Digested Metals; DW = Drinking Water; SL = Soil, Sludge, Solid; FP = Free Product

**CONTAINER TYPES:** AL = Amber Liter; AHL = 500 ml Amber; PT = Pint (Plastic); QT = Quart (Plastic); HG = Half Gallon (Plastic); SJ = Soil Jar; B4 = 4 oz. BACT; BT = Brass Tube; VOA = 40 mL VOA; OTC = Other Type Container

WHITE - LABORATORY YELLOW - CLIENT COPY TO ACCOMPANY FINAL REPORT PINK - CLIENT COPY AS RECEIPT

FOR LAB USE ONLY



**SAMPLE CHAIN OF CUSTODY**

1885 N. KELLY ROAD • NAPA, CA 94558 • (707) 258-4000 • Fax (707) 226-1001 • www.caltestlab.com

LAB ORDER #

PAGE 3 OF 3

H021107

PROJECT #/PROJECT NAME  
202014/LTMAP/ LTPL

P.O.#

202014

CLIENT: Balance Hydrologics

REPORT TO: Chris White

ANALYSES REQUESTED

ADDRESS: 481 Folger Avenue, Berkeley CA STATE: CA ZIP: 94710

BILLING ADDRESS: Marty Laporte - Stanford

PHONE #: 510-704-1000 FAX PHONE: 704-1001 SAMPLER (PRINT & SIGN NAME): Zan Rubin

TURN-AROUND TIME  
 STANDARD  
 RUSH

DUE DATE:

CALTEST #	DATE SAMPLED	TIME SAMPLED	MATRIX	CONTAINER AMOUNT/TYPE	PRESERVATIVE	SAMPLE IDENTIFICATION SITE	CLIENT LAB #	COMP. or GRAB	REMARKS
-3	2/21/07	2400	W	250 PE	HNO3	LTPL		C	X Total Alkalinity Total Hardness Total Mercury Discrete Mercury Chloride Nitrate Nitrite Total Phosphorus Total Ammonia Total Nitrogen
				500 ml PE	Ice	LTPL		C	X Please Filter
				1L PE	Ice	LTPL		C	X
				1L Amber Glass	Ice	LTPL		C	X
				1L Amber Glass	Ice	LTPL		C	X
				850 ml Glass	HCL	LTPL		G	X Trace Level Trace Level Please Filter
-4	2/26/07	2400		250 ml Glass	Ice	LTPL		G	X

By submittal of sample(s), client agrees to abide by the Terms and Conditions set forth on the reverse of this document.

RELINQUISHED BY John Gartner	DATE/TIME 2-28-07 9:30	RECEIVED BY Wayne Cugan	DATE/TIME 2/28/07 1034	RECEIVED BY Lead Analyst
---------------------------------	---------------------------	----------------------------	---------------------------	-----------------------------

TEMP: 4°C

SEALING: Y / N

INTACT: Y / N

COMMENTS

FOR LAB USE ONLY

WC: \_\_\_\_\_ MICRO: \_\_\_\_\_ BIO: \_\_\_\_\_ AA: \_\_\_\_\_ SV: \_\_\_\_\_ VOA: \_\_\_\_\_

BD: BIO: \_\_\_\_\_ WC: \_\_\_\_\_ AA: \_\_\_\_\_

CC: AA: \_\_\_\_\_ SV: \_\_\_\_\_ VOA: \_\_\_\_\_

SIL: HP: \_\_\_\_\_ PT: \_\_\_\_\_ QT: \_\_\_\_\_ VOA: \_\_\_\_\_

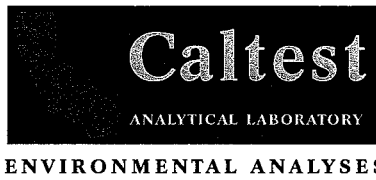
W/HNO3: \_\_\_\_\_ H2SO4: \_\_\_\_\_ NaOH: \_\_\_\_\_

PH: HNO3: \_\_\_\_\_ H2SO4: \_\_\_\_\_ NaOH: \_\_\_\_\_ HCL: \_\_\_\_\_

**MATRIX:** AQ = Aqueous Nondrinking Water, Digested Metals; FE = Low R.L.s., Aqueous Nondrinking Water, Digested Metals; DW = Drinking Water; SL = Soil, Sludge, Solid; FP = Free Product

**CONTAINER TYPES:** AL = Amber Litter; AHL = 500 ml Amber; PT = Pint (Plastic); QT=Quart (Plastic); HG = Half Gallon (Plastic); SJ = Soil Jar; B4 = 4 oz. BACT; BT = Brass Tube; VOA = 40 mL VOA; OTC = Other Type Container

R PR M F



202018 LAB  
 WY2007  
 4/22-23/0  
 SFPL SAMPL

Thursday, May 17, 2007

Chris White  
 Balance Hydrologics, Inc.  
 841 Folger Ave.  
 Berkeley, CA 94710

RE: Lab Order: H040908  
 Project ID: STANFORD/LTMAP

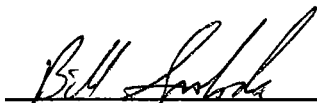
Collected By: Zan Rubin  
 PO/Contract #: 202018

Dear Chris White:

Enclosed are the analytical results for sample(s) received by the laboratory on Tuesday, April 24, 2007. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

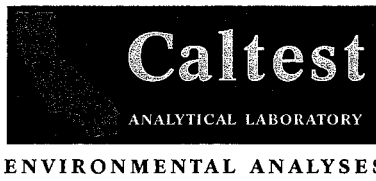
If you have any questions concerning this report, please feel free to contact me.

Enclosures

  
 Project Manager: Bill Svoboda

  
 Lab Director: Christine Horn





**SAMPLE SUMMARY**

Lab Order: H040908

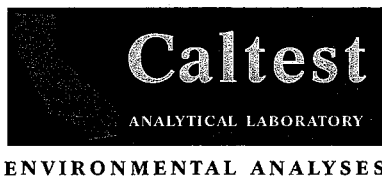
Project ID: STANFORD/LTMAP

Lab ID	Sample ID	Matrix	Date Collected	Date Received
H040908001	SFPL COMP	Water	4/23/2007 18:00	4/24/2007 07:30
H040908002	SFPL GRAB	Water	4/22/2007 07:50	4/24/2007 07:30

**REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full,  
without the written consent of CALTEST ANALYTICAL LABORATORY.





## NARRATIVE

Lab Order: H040908

Project ID: STANFORD/LTMAP

---

### General Qualifiers and Notes

---

CALTEST authorizes this report to be reproduced only in its entirety. Results are specific to the sample(s) as submitted and only to the parameter(s) reported.

Caltest certifies that test results meet all applicable NELAC requirements unless stated otherwise.

All analyses performed by EPA Methods or Standard Methods (SM) 18th Ed. except where noted.

Caltest collects samples in compliance with 40 CFR, EPA Methods, Cal. Title 22, and Standard Methods.

Dilution Factors (DF) reported greater than '1' have been used to adjust the result, Reporting Limit (R.L.), and Method Detection Limit (MDL).

All Solid, sludge, and/or biosolids data is reported in Wet Weight, unless otherwise specified.

Results Qualifiers: Report fields may contain codes and non-numeric data correlating to one or more of the following definitions:

ND - Non Detect - indicates analytical result has not been detected.

RL - Reporting Limit is the quantitation limit at which the laboratory is able to detect an analyte with a certain level of confidence. Generally, this represents the laboratory's lowest calibration point.

J - reflects estimated analytical result value detected below the Reporting Limit (R.L.) and above the Method Detection Limit (MDL). The 'J' flag is equivalent to the DNQ Estimated Concentration flag.

E - indicates an estimated analytical result value.

B - indicates the analyte has been detected in the blank associated with the sample.

NC - means not able to be calculated for RPD or Spike Recoveries.

SS - compound is a Surrogate Spike used per laboratory quality assurance manual.

NOTE: This document represents a complete Analytical Report for the samples referenced herein and should be retained as a permanent record thereof.

---

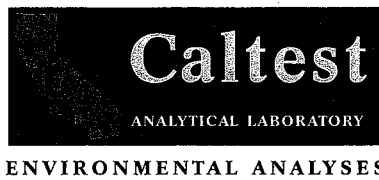
### Qualifiers and Compound Notes

---

- 1 Analytes reported as 'ND' were not detected at or above the listed Method Detection Limits (MDL).
- 2 Due to matrix interferences present in the sample, surrogate recoveries failed to meet the QA/QC acceptance criteria.







**ANALYTICAL RESULTS**

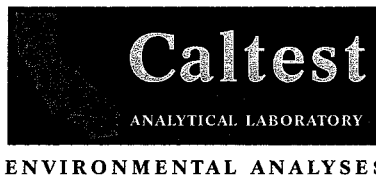
Lab Order: H040908

Project ID STANFORD/LTMAP

<b>Lab ID:</b>	<b>H040908001</b>	<b>Date Collected:</b>	4/23/2007 18:00	<b>Matrix:</b>	Water			
<b>Sample ID:</b>	<b>SFPL COMP</b>	<b>Date Received:</b>	4/24/2007 07:30					
<b>Parameters</b>	<b>Result Units</b>	<b>R. L.</b>	<b>MDL</b>	<b>DF Prepared</b>	<b>Batch</b>	<b>Analyzed</b>	<b>Batch</b>	<b>Qual</b>
<b>Metals Analysis by ICPMS, Dissolved</b>	<b>Prep Method:</b>	EPA 200.8 (filtered)		<b>Prep by:</b> UK				
	<b>Analytical Method:</b>	EPA 200.8 (filtered)				<b>Analyzed by:</b> SMD		
Aluminum	J6 ug/L	10	1.6	1	04/27/07 00:00	MPR 4449	05/02/07 22:46	MMS 3231
<b>Metals Analysis by ICPMS</b>	<b>Prep Method:</b>	EPA 200.8		<b>Prep by:</b> UK				
	<b>Analytical Method:</b>	EPA 200.8				<b>Analyzed by:</b> SMD		
Aluminum	810 ug/L	100	16	10	05/02/07 00:00	MPR 4469	05/09/07 16:59	MMS 3241
<b>Organophosphorous Pesticides</b>	<b>Prep Method:</b>	EPA 614		<b>Prep by:</b> SK				
	<b>Analytical Method:</b>	EPA 614				<b>Analyzed by:</b> MDT		
Chlorpyrifos (Dursban)	ND ug/L	0.05	0.040	1	04/24/07 00:00	SPR 2468	05/01/07 08:07	SNP 1267 1
Diazinon	ND ug/L	0.05	0.040	1	04/24/07 00:00	SPR 2468	05/01/07 08:07	SNP 1267
Tributylphosphate (SS)	114 %	10-126		1	04/24/07 00:00	SPR 2468	05/01/07 08:07	SNP 1267
Triphenylphosphate (SS)	125 %	58-118		1	04/24/07 00:00	SPR 2468	05/01/07 08:07	SNP 1267 2
<b>Anions by Ion Chromatography</b>	<b>Analytical Method:</b>	EPA 300.0				<b>Analyzed by:</b> EJP		
Nitrogen, Nitrate (as N)	0.31 mg/L	0.1	0.0060	1			04/24/07 19:39	WIC 1668

<b>Lab ID:</b>	<b>H040908002</b>	<b>Date Collected:</b>	4/22/2007 07:50	<b>Matrix:</b>	Water			
<b>Sample ID:</b>	<b>SFPL GRAB</b>	<b>Date Received:</b>	4/24/2007 07:30					
<b>Parameters</b>	<b>Result Units</b>	<b>R. L.</b>	<b>MDL</b>	<b>DF Prepared</b>	<b>Batch</b>	<b>Analyzed</b>	<b>Batch</b>	<b>Qual</b>
<b>Mercury Analysis, Trace Level, Dissolved</b>	<b>Prep Method:</b>	EPA 1631E (filtered)		<b>Prep by:</b> UK				
	<b>Analytical Method:</b>	EPA 1631E (filtered)				<b>Analyzed by:</b> LM		
Mercury	0.001 ug/L	0.0005	0.00020	1	04/30/07 00:00	MPR 4455	05/01/07 13:39	MHG 1921
<b>Mercury Analysis, Trace Level</b>	<b>Prep Method:</b>	EPA 1631E		<b>Prep by:</b> UK				
	<b>Analytical Method:</b>	EPA 1631E				<b>Analyzed by:</b> LM		
Mercury	0.010 ug/L	0.0005	0.00020	1	04/30/07 00:00	MPR 4455	05/01/07 12:59	MHG 1921





**QUALITY CONTROL DATA**

Lab Order: H040908

Project ID: STANFORD/LTMAP

<b>Analysis Description:</b> Mercury Analysis, Trace Level	<b>QC Batch:</b> MPR/4455
<b>Analysis Method:</b> EPA 1631E (filtered)	<b>QC Batch Method:</b> EPA 1631E (filtered)

<b>Analysis Description:</b> Mercury Analysis, Trace Level	<b>QC Batch:</b> MPR/4455
<b>Analysis Method:</b> EPA 1631E	<b>QC Batch Method:</b> EPA 1631E

**METHOD BLANK:** 151834

Parameter	Blank Result	Reporting Limit Units	Qualifiers
Mercury	ND	0.0005 ug/L	

**LABORATORY CONTROL SAMPLE:** 151835

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	0.02	0.021071	105	80-120	

**MATRIX SPIKE & MATRIX SPIKE DUPLICATE:** 151836 151837

Parameter	Units	H040939002 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Mercury	ug/L	0.0025	0.02	0.020967	0.02053	92	90	71-125	2.1	20	

<b>Analysis Description:</b> Metals Analysis by ICPMS, Dissolved	<b>QC Batch:</b> MPR/4449
<b>Analysis Method:</b> EPA 200.8 (filtered)	<b>QC Batch Method:</b> EPA 200.8 (filtered)

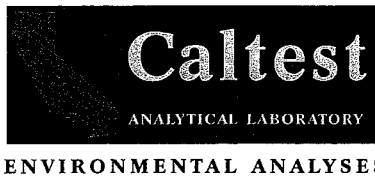
**METHOD BLANK:** 151618

Parameter	Blank Result	Reporting Limit Units	Qualifiers
Aluminum	ND	10 ug/L	

**LABORATORY CONTROL SAMPLE:** 151619

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	40	42.097	105	85-115	





**QUALITY CONTROL DATA**

Lab Order: H040908

Project ID: STANFORD/LTMAP

<b>Analysis Description:</b> Metals Analysis by ICPMS, Dissolved	<b>QC Batch:</b> MPR/4449
<b>Analysis Method:</b> EPA 200.8 (filtered)	<b>QC Batch Method:</b> EPA 200.8 (filtered)

**MATRIX SPIKE & MATRIX SPIKE DUPLICATE:** 151620 151621

Parameter	Units	H040908001 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Aluminum	ug/L	6	40	42.869	49.663	93	110	85-115	15	20	

<b>Analysis Description:</b> Metals Analysis by ICPMS	<b>QC Batch:</b> MPR/4469
<b>Analysis Method:</b> EPA 200.8	<b>QC Batch Method:</b> EPA 200.8

**METHOD BLANK:** 152240

Parameter	Blank Result	Reporting Limit	Units	Qualifiers
Aluminum	ND	10	ug/L	

**LABORATORY CONTROL SAMPLE:** 152241

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	40	39.7	99	85-115	

**MATRIX SPIKE & MATRIX SPIKE DUPLICATE:** 152242 152243

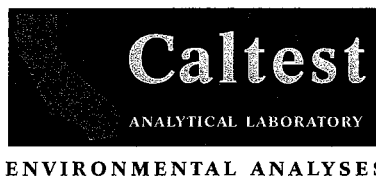
Parameter	Units	H040908001 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Aluminum	ug/L	810	40	1029.508	1166.465	542	884	85-115	12	20	4

<b>Analysis Description:</b> Organophosphorous Pesticides	<b>QC Batch:</b> SPR/2468
<b>Analysis Method:</b> EPA 614	<b>QC Batch Method:</b> EPA 614

**METHOD BLANK:** 150834

Parameter	Blank Result	Reporting Limit	Units	Qualifiers
Chlorpyrifos (Dursban)	ND	0.05	ug/L	
Diazinon	ND	0.05	ug/L	
Tributylphosphate (SS)	110	10-126	%	
Triphenylphosphate (SS)	81	58-118	%	





**QUALITY CONTROL DATA**

Lab Order: H040908

Project ID: STANFORD/LTMAP

<b>Analysis Description:</b> Organophosphorous Pesticides	<b>QC Batch:</b> SPR/2468
<b>Analysis Method:</b> EPA 614	<b>QC Batch Method:</b> EPA 614

LABORATORY CONTROL SAMPLE: 150835

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diazinon	ug/L	3	2.45	82	62-118	
Tributylphosphate (SS)	%			85	10-126	
Triphenylphosphate (SS)	%			93	58-118	

<b>Analysis Description:</b> Anions by Ion Chromatography	<b>QC Batch:</b> WIC/1668
<b>Analysis Method:</b> EPA 300.0	<b>QC Batch Method:</b> EPA 300.0

METHOD BLANK: 151622

Parameter	Blank Result	Reporting Limit	Units	Qualifiers
Nitrogen, Nitrate (as N)	ND	0.1	mg/L	

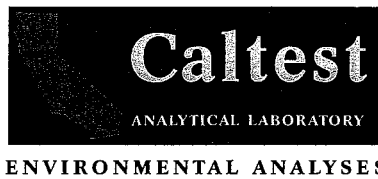
LABORATORY CONTROL SAMPLE: 151623

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Nitrate (as N)	mg/L	6.2	6.091	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 151625 151626

Parameter	Units	H040908001 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Nitrogen, Nitrate (as N)	mg/L	0.31	5	2.649	2.594	47	46	90-110	2.1	20	3





## QUALITY CONTROL DATA QUALIFIERS

Lab Order: H040908

Project ID: STANFORD/LTMAP

---

### QUALITY CONTROL PARAMETER QUALIFIERS

Results Qualifiers: Report fields may contain codes and non-numeric data correlating to one or more of the following definitions:

NS - means not spiked and will not have recoveries reported for Analyte Spike Amounts

NC - means not able to be calculated for RPD or Spike Recoveries.

QC Codes Keys: These descriptors are used to help identify the specific QC samples and clarify the report.

MB - Method Blank

LCS/LCSD - Laboratory Control Spike / Laboratory Control Spike Duplicate

DUP - Duplicate of Original Sample Matrix

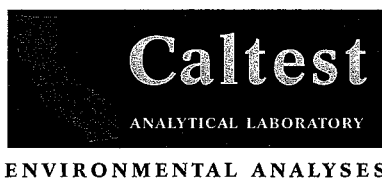
MS/MSD - Matrix Spike / Matrix Spike Duplicate

RPD - Relative Percent Difference

%Recovery - Spike Recovery stated as a percentage

- 3 Low Matrix Spike recovery(ies) due to possible matrix interferences in the QC sample. QC batch accepted based on LCS and RPD results.
- 4 Spike recovery outside control limits. Spike added less than one half sample concentration. LCS and Method Blank are in control.





### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Lab Order: H040908

Project ID: STANFORD/LTMAP

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
H040908002	SFPL GRAB	EPA 1631E	MPR/4455	EPA 1631E	MHG/1921
H040908002	SFPL GRAB	EPA 1631E (filtered)	MPR/4455	EPA 1631E (filtered)	MHG/1921
H040908001	SFPL COMP	EPA 200.8 (filtered)	MPR/4449	EPA 200.8 (filtered)	MMS/3231
H040908001	SFPL COMP	EPA 200.8	MPR/4469	EPA 200.8	MMS/3241
H040908001	SFPL COMP	EPA 614	SPR/2468	EPA 614	SNP/1267
H040908001	SFPL COMP	EPA 300.0	WIC/1668		





SAMPLE CHAIN OF CUSTODY

1040908

CLIENT:

Balance Hyalogics, Inc.

ADDRESS:

841 Folger Ave. Berkeley

BILLING ADDRESS:

Marty Laforte Stanford University

PHONE #:

510-704-1000 x210

FAX PHONE:

510-704-1001

SAMPLER (PRINT & SIGN NAME):

Zan Rubin

REPORT TO:

Chris White

STATE:

CA

ZIP:

94710

PROJECT # / PROJECT NAME

STANFORD / CTMAP

P.O. #

202018

ANALYSES REQUESTED

TURN-AROUND TIME  
 STANDARD  
 RUSH

DUE DATE:

*Aluminum*  
*Total Mercury*  
*Disinfection Mercury*  
*Chlorophylls*  
*Disinfection Mercury*  
*Total Mercury*  
*Disinfection Mercury*

CALTEST #	DATE SAMPLED	TIME SAMPLED	MATRIX	CONTAINER AMOUNT/TYPE	PRESERVATIVE	SAMPLE IDENTIFICATION SITE	CLIENT LAB #	COMP. or GRAB	REMARKS
-1	070423	1600	W	500 ml/PE	HNO3	SFPL		C	X
				2L/PE	ICE	SFPL		C	X
				2L/PE	ICE	SFPL		C	X
				2L/Amber Glass	ICE	SFPL		C	X
				2L/Amber Glass	ICE	SFPL		C	X
-2	070422	0750		500ml/Glass	HCL	SFPL		G	X
				500ml/Glass	ICE	SFPL		G	X

By submittal of sample(s), client agrees to abide by the Terms and Conditions set forth on the reverse of this document.

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME	RECEIVED BY
Zan Chantand	4-23-07 9:53 pm	Courier	4/24/07 07:30	Deborah

SEALING:  MICRO  BIO  AA  SV  VOA

BD: BIO  WC  AA  VOA

CC: AA  SV  VOA

SIL: HP  PT  QT  VOA

W/HNO3  H2SO4  NaOH

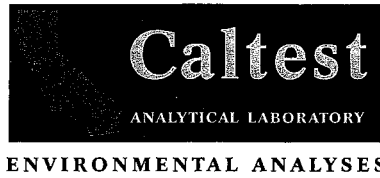
PL: HNO3  H2SO4  NaOH  HCL

TEMP:  SEALING:  INTACT:

COMMENTS

MATRIX: AQ = Aqueous Nondrinking Water, Digested Metals; FE = Low R.L.s., Aqueous Nondrinking Water, Digested Metals; DW = Drinking Water; SL = Soil, Sludge, Solid; FP = Free Product

CONTAINER TYPES: AL = Amber Liter; AHL = 500 ml Amber; PT = Pint (Plastic); QT = Quart (Plastic); HG = Half Gallon (Plastic); SJ = Soil Jar; BA = 4 oz. BACT; BT = Brass Tube; VOA = 40 mL VOA; OTC = Other Type Container



202018 LAB  
WY2007  
4/22-23/07  
LTPL SAMPLE

Thursday, May 17, 2007

Chris White  
Balance Hydrologics, Inc.  
841 Folger Ave.  
Berkeley, CA 94710

RE: Lab Order: H040909  
Project ID: STANFORD/LTMAP

Collected By: Zan Rubin  
PO/Contract #: 202018

Dear Chris White:

Enclosed are the analytical results for sample(s) received by the laboratory on Tuesday, April 24, 2007. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

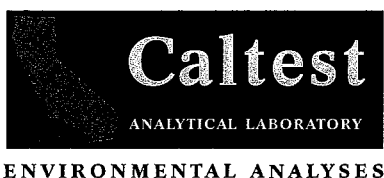
Enclosures

Project Manager: Bill Svoboda

Lab Director: Christine Horn





**SAMPLE SUMMARY**

Lab Order: H040909

Project ID: STANFORD/LTMAP

---

Lab ID	Sample ID	Matrix	Date Collected	Date Received
H040909001	LTPL COMP	Water	4/23/2007 17:00	4/24/2007 07:30
H040909002	LTPL GRAB	Water	4/22/2007 07:00	4/24/2007 07:30





## NARRATIVE

Lab Order: H040909  
Project ID: STANFORD/LTMAP

### General Qualifiers and Notes

CALTEST authorizes this report to be reproduced only in its entirety. Results are specific to the sample(s) as submitted and only to the parameter(s) reported.

Caltest certifies that test results meet all applicable NELAC requirements unless stated otherwise.

All analyses performed by EPA Methods or Standard Methods (SM) 18th Ed. except where noted.

Caltest collects samples in compliance with 40 CFR, EPA Methods, Cal. Title 22, and Standard Methods.

Dilution Factors (DF) reported greater than '1' have been used to adjust the result, Reporting Limit (R.L.), and Method Detection Limit (MDL).

All Solid, sludge, and/or biosolids data is reported in Wet Weight, unless otherwise specified.

Results Qualifiers: Report fields may contain codes and non-numeric data correlating to one or more of the following definitions:

ND - Non Detect - indicates analytical result has not been detected.

RL - Reporting Limit is the quantitation limit at which the laboratory is able to detect an analyte with a certain level of confidence. Generally, this represents the laboratory's lowest calibration point.

J - reflects estimated analytical result value detected below the Reporting Limit (R.L.) and above the Method Detection Limit (MDL). The 'J' flag is equivalent to the DNQ Estimated Concentration flag.

E - indicates an estimated analytical result value.

B - indicates the analyte has been detected in the blank associated with the sample.

NC - means not able to be calculated for RPD or Spike Recoveries.

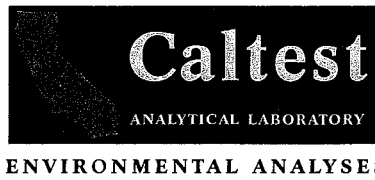
SS - compound is a Surrogate Spike used per laboratory quality assurance manual.

NOTE: This document represents a complete Analytical Report for the samples referenced herein and should be retained as a permanent record thereof.

### Qualifiers and Compound Notes

1 Analytes reported as 'ND' were not detected at or above the listed Method Detection Limits (MDL).





**ANALYTICAL RESULTS**

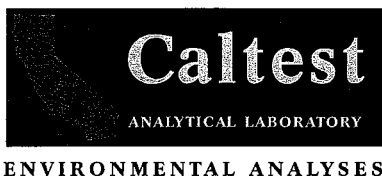
Lab Order: H040909

Project ID STANFORD/LTMAP

<b>Lab ID:</b>	<b>H040909001</b>	<b>Date Collected:</b>	4/23/2007 17:00	<b>Matrix:</b>	Water					
<b>Sample ID:</b>	<b>LTPL COMP</b>	<b>Date Received:</b>	4/24/2007 07:30							
Parameters	Result	Units	R. L.	MDL	DF Prepared	Batch	Analyzed	Batch	Qual	
<b>Metals Analysis by ICPMS, Dissolved</b>	<b>Prep Method:</b>		EPA 200.8 (filtered)		<b>Prep by:</b>		UK			
	<b>Analytical Method:</b>		EPA 200.8 (filtered)				<b>Analyzed by:</b> SMD			
Aluminum	J6	ug/L	10	1.6	1	04/27/07 00:00	MPR 4449	05/02/07 23:07	MMS 3231	
<b>Metals Analysis by ICPMS</b>	<b>Prep Method:</b>		EPA 200.8		<b>Prep by:</b>		UK			
	<b>Analytical Method:</b>		EPA 200.8				<b>Analyzed by:</b> SMD			
Aluminum	680	ug/L	100	16	10	05/02/07 00:00	MPR 4470	05/15/07 13:15	MMS 3242	
<b>Organophosphorous Pesticides</b>	<b>Prep Method:</b>		EPA 614		<b>Prep by:</b>		SK			
	<b>Analytical Method:</b>		EPA 614				<b>Analyzed by:</b> MDT			
Chlorpyrifos (Dursban)	ND	ug/L	0.05	0.040	1	04/30/07 00:00	SPR 2475	05/03/07 02:38	SNP 1268 1	
Diazinon	ND	ug/L	0.05	0.040	1	04/30/07 00:00	SPR 2475	05/03/07 02:38	SNP 1268	
Tributylphosphate (SS)	73	%	10-126		1	04/30/07 00:00	SPR 2475	05/03/07 02:38	SNP 1268	
Triphenylphosphate (SS)	76	%	58-118		1	04/30/07 00:00	SPR 2475	05/03/07 02:38	SNP 1268	
<b>Anions by Ion Chromatography</b>	<b>Analytical Method:</b>		EPA 300.0				<b>Analyzed by:</b> EJP			
Nitrogen, Nitrate (as N)	1.7	mg/L	0.1	0.0060	1			04/24/07 22:40	WIC 1668	

<b>Lab ID:</b>	<b>H040909002</b>	<b>Date Collected:</b>	4/22/2007 07:00	<b>Matrix:</b>	Water					
<b>Sample ID:</b>	<b>LTPL GRAB</b>	<b>Date Received:</b>	4/24/2007 07:30							
Parameters	Result	Units	R. L.	MDL	DF Prepared	Batch	Analyzed	Batch	Qual	
<b>Mercury Analysis, Trace Level, Dissolved</b>	<b>Prep Method:</b>		EPA 1631E (filtered)		<b>Prep by:</b>		UK			
	<b>Analytical Method:</b>		EPA 1631E (filtered)				<b>Analyzed by:</b> LM			
Mercury	0.0029	ug/L	0.0005	0.00020	1	04/30/07 00:00	MPR 4455	05/01/07 13:44	MHG 1921	
<b>Mercury Analysis, Trace Level</b>	<b>Prep Method:</b>		EPA 1631E		<b>Prep by:</b>		UK			
	<b>Analytical Method:</b>		EPA 1631E				<b>Analyzed by:</b> LM			
Mercury	0.034	ug/L	0.0005	0.00020	1	04/30/07 00:00	MPR 4455	05/01/07 13:04	MHG 1921	





**QUALITY CONTROL DATA**

Lab Order: H040909

Project ID: STANFORD/LTMAP

<b>Analysis Description:</b> Mercury Analysis, Trace Level	<b>QC Batch:</b> MPR/4455
<b>Analysis Method:</b> EPA 1631E (filtered)	<b>QC Batch Method:</b> EPA 1631E (filtered)

<b>Analysis Description:</b> Mercury Analysis, Trace Level	<b>QC Batch:</b> MPR/4455
<b>Analysis Method:</b> EPA 1631E	<b>QC Batch Method:</b> EPA 1631E

METHOD BLANK: 151834

Parameter	Blank Result	Reporting Limit Units	Qualifiers
Mercury	ND	0.0005 ug/L	

LABORATORY CONTROL SAMPLE: 151835

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	0.02	0.021071	105	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 151836 151837

Parameter	Units	H040939002 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Mercury	ug/L	0.0025	0.02	0.020967	0.02053	92	90	71-125	2.1	20	

<b>Analysis Description:</b> Metals Analysis by ICPMS, Dissolved	<b>QC Batch:</b> MPR/4449
<b>Analysis Method:</b> EPA 200.8 (filtered)	<b>QC Batch Method:</b> EPA 200.8 (filtered)

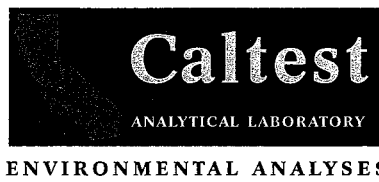
METHOD BLANK: 151618

Parameter	Blank Result	Reporting Limit Units	Qualifiers
Aluminum	ND	10 ug/L	

LABORATORY CONTROL SAMPLE: 151619

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	40	42.097	105	85-115	





**QUALITY CONTROL DATA**

Lab Order: H040909

Project ID: STANFORD/LTMAP

<b>Analysis Description:</b> Metals Analysis by ICPMS, Dissolved	<b>QC Batch:</b> MPR/4449
<b>Analysis Method:</b> EPA 200.8 (filtered)	<b>QC Batch Method:</b> EPA 200.8 (filtered)

**MATRIX SPIKE & MATRIX SPIKE DUPLICATE:** 151620 151621

Parameter	Units	H040908001 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Aluminum	ug/L	6	40	42.869	49.663	93	110	85-115	15	20	

<b>Analysis Description:</b> Metals Analysis by ICPMS	<b>QC Batch:</b> MPR/4470
<b>Analysis Method:</b> EPA 200.8	<b>QC Batch Method:</b> EPA 200.8

**METHOD BLANK:** 152247

Parameter	Blank Result	Reporting Limit	Units	Qualifiers
Aluminum	ND	10	ug/L	

**LABORATORY CONTROL SAMPLE:** 152248

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	40	39.39	98	85-115	

**MATRIX SPIKE & MATRIX SPIKE DUPLICATE:** 152249 152250

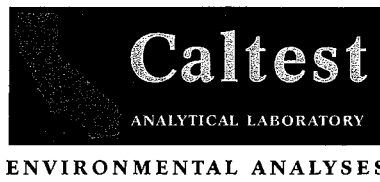
Parameter	Units	H040909001 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Aluminum	ug/L	680	40	764.387	766.32	218	223	85-115	0.3	20	4

<b>Analysis Description:</b> Organophosphorous Pesticides	<b>QC Batch:</b> SPR/2475
<b>Analysis Method:</b> EPA 614	<b>QC Batch Method:</b> EPA 614

**METHOD BLANK:** 151695

Parameter	Blank Result	Reporting Limit	Units	Qualifiers
Chlorpyrifos (Dursban)	ND	0.05	ug/L	
Diazinon	ND	0.05	ug/L	
Tributylphosphate (SS)	80	10-126	%	
Triphenylphosphate (SS)	85	58-118	%	





**QUALITY CONTROL DATA**

Lab Order: H040909

Project ID: STANFORD/LTMAP

<b>Analysis Description:</b> Organophosphorous Pesticides	<b>QC Batch:</b> SPR/2475
<b>Analysis Method:</b> EPA 614	<b>QC Batch Method:</b> EPA 614

LABORATORY CONTROL SAMPLE: 151696

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Diazinon	ug/L	3	2.01	67	62-118	
Tributylphosphate (SS)	%			66	10-126	
Triphenylphosphate (SS)	%			74	58-118	

<b>Analysis Description:</b> Anions by Ion Chromatography	<b>QC Batch:</b> WIC/1668
<b>Analysis Method:</b> EPA 300.0	<b>QC Batch Method:</b> EPA 300.0

METHOD BLANK: 151622

Parameter	Blank Result	Reporting Limit	Units	Qualifiers
Nitrogen, Nitrate (as N)	ND	0.1	mg/L	

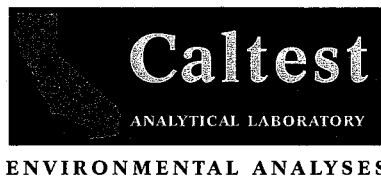
LABORATORY CONTROL SAMPLE: 151623

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Nitrate (as N)	mg/L	6.2	6.091	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 151625 151626

Parameter	Units	H040908001 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Nitrogen, Nitrate (as N)	mg/L	0.31	5	2.649	2.594	47	46	90-110	2.1	20	2





## QUALITY CONTROL DATA QUALIFIERS

Lab Order: H040909

Project ID: STANFORD/LTMAP

---

### QUALITY CONTROL PARAMETER QUALIFIERS

Results Qualifiers: Report fields may contain codes and non-numeric data correlating to one or more of the following definitions:

NS - means not spiked and will not have recoveries reported for Analyte Spike Amounts

NC - means not able to be calculated for RPD or Spike Recoveries.

QC Codes Keys: These descriptors are used to help identify the specific QC samples and clarify the report.

MB - Method Blank

LCS/LCSD - Laboratory Control Spike / Laboratory Control Spike Duplicate

DUP - Duplicate of Original Sample Matrix

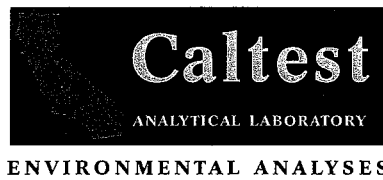
MS/MSD - Matrix Spike / Matrix Spike Duplicate

RPD - Relative Percent Difference

%Recovery - Spike Recovery stated as a percentage

- 2 Low Matrix Spike recovery(ies) due to possible matrix interferences in the QC sample. QC batch accepted based on LCS and RPD results.
- 4 Spike recovery outside control limits. Spike added less than one half sample concentration. LCS and Method Blank are in control.





### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Lab Order: H040909

Project ID: STANFORD/LTMAP

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
H040909002	LTPL GRAB	EPA 1631E	MPR/4455	EPA 1631E	MHG/1921
H040909002	LTPL GRAB	EPA 1631E (filtered)	MPR/4455	EPA 1631E (filtered)	MHG/1921
H040909001	LTPL COMP	EPA 200.8 (filtered)	MPR/4449	EPA 200.8 (filtered)	MMS/3231
H040909001	LTPL COMP	EPA 200.8	MPR/4470	EPA 200.8	MMS/3242
H040909001	LTPL COMP	EPA 614	SPR/2475	EPA 614	SNP/1268
H040909001	LTPL COMP	EPA 300.0	WIC/1668		







**Caltest**  
ANALYTICAL LABORATORY

1885 N. KELLY ROAD • NAPA, CA 94558 • (707) 258-4000 • Fax (707) 226-1001 • www.caltestlab.com

PAGE 2 OF 2

LAB ORDER # AB40909

CLIENT: Balance Hydrologics, Inc.

ADDRESS: 841 Folger Ave. Berkeley

BILLING ADDRESS: Warty La Porte Stanford University

PROJECT # / PROJECT NAME: STANFORD / LTMAP

REPORT TO: Chris White

STATE: CA ZIP: 94710

ANALYSES REQUESTED

TURN-AROUND TIME

STANDARD

RUSH

DUE DATE: \_\_\_\_\_

PHONE #: 50-704-1000x20

FAX PHONE: 510 704-1001

SAMPLER (PRINT & SIGN NAME): Zan Rubin

CALTEST #	DATE SAMPLED	TIME SAMPLED	MATRIX	CONTAINER AMOUNT/TYPER	PRESERVATIVE	SAMPLE IDENTIFICATION SITE	CLIENT LAB #	COMP. or GRAB	REMARKS
1	070423	1700	W	500 mL / PE	HNO3	LTPL		C	Total Aluminum Dissolved Aluminum Nitrate-N Total Mercury Dissolved Mercury Diazepam Chlasep F/Es
				500 mL / PE		LTPL		C	Please Filter
				500 mL / PE		LTPL		C	
				500 mL / PE		LTPL		C	
				AL / Amber Glass		LTPL		C	
				11		ICE		C	
2	070422	0700		500 mL / Glass	HCl	LTPL		G	Trace Level
				500 mL / Glass		ICE		G	Trace Level Please Filter

By submittal of sample(s), client agrees to abide by the Terms and Conditions set forth on the reverse of this document.

RELINQUISHED BY: [Signature] DATE/TIME: 4/23/07 9:53 PM

RECEIVED BY: [Signature] DATE/TIME: 4/24/07 0730

RELINQUISHED BY: [Signature]

RECEIVED BY: [Signature]

COMMENTS: \_\_\_\_\_

TEMP: 1<sup>st</sup>

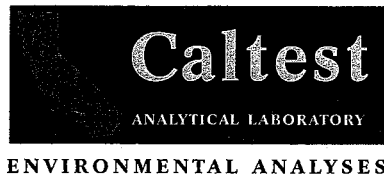
SEALED: Y / / N

INTACT: Y / / N

MATRIX: AQ = Aqueous Nondrinking Water, Digested Metals; FE = Low R.L.s, Aqueous Nondrinking Water, Digested Metals; DW = Drinking Water, SL = Soil, Sludge, Solid; FP = Free Product

CONTAINER TYPES: AL = Amber Litrer, AHL = 500 ml Amber; PT = Pint (Plastic); QT = Quart (Plastic); HG = Half Gallon (Plastic); SJ = Soil Jar; B4 = 4 oz. BACT; BT = Brass Tube; VOA = 40 mL VOA; OTC = Other Type Container

R \_\_\_\_\_ M \_\_\_\_\_ F \_\_\_\_\_



202018 LAB  
 WY2007  
 4/10-11/2007  
 SAMPLE

Tuesday, May 15, 2007

Chris White  
 Balance Hydrologics, Inc.  
 841 Folger Ave.  
 Berkeley, CA 94710

RE: Lab Order: H040576  
 Project ID: Stanford/LTMAP/Piers Lane


Collected By: ZAN RUBIN  
 PO/Contract #: 202018

Dear Chris White:

Enclosed are the analytical results for sample(s) received by the laboratory on Friday, April 13, 2007. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

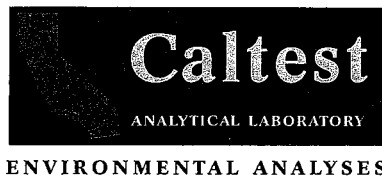
If you have any questions concerning this report, please feel free to contact me.

Enclosures

  
 Project Manager: Bill Svoboda

  
 Lab Director: Christine Horn



**SAMPLE SUMMARY**

Lab Order: H040576

Project ID: Stanford/LTMAP/Piers Lane

---

Lab ID	Sample ID	Matrix	Date Collected	Date Received
H040576001	LTPL COMP	Water	4/12/2007 00:00	4/13/2007 10:46
H040576002	SFPL COMP	Water	4/12/2007 00:00	4/13/2007 10:46
H040576003	LTPL GRAB	Water	4/11/2007 13:30	4/13/2007 10:46
H040576004	SFPL GRAB	Water	4/11/2007 13:45	4/13/2007 10:46

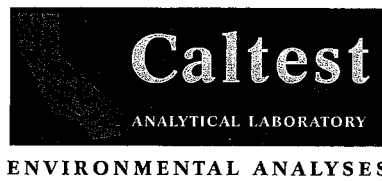
5/15/2007 12:13

**REPORT OF LABORATORY ANALYSIS**

Page 2 of 11

This report shall not be reproduced, except in full,  
without the written consent of CALTEST ANALYTICAL LABORATORY.





## NARRATIVE

Lab Order: H040576

Project ID: Stanford/LTMAP/Piers Lane

---

### General Qualifiers and Notes

---

CALTEST authorizes this report to be reproduced only in its entirety. Results are specific to the sample(s) as submitted and only to the parameter(s) reported.

Caltest certifies that test results meet all applicable NELAC requirements unless stated otherwise.

All analyses performed by EPA Methods or Standard Methods (SM) 18th Ed. except where noted.

Caltest collects samples in compliance with 40 CFR, EPA Methods, Cal. Title 22, and Standard Methods.

Dilution Factors (DF) reported greater than '1' have been used to adjust the result, Reporting Limit (R.L.), and Method Detection Limit (MDL).

All Solid, sludge, and/or biosolids data is reported in Wet Weight, unless otherwise specified.

Results Qualifiers: Report fields may contain codes and non-numeric data correlating to one or more of the following definitions:

ND - Non Detect - indicates analytical result has not been detected.

RL - Reporting Limit is the quantitation limit at which the laboratory is able to detect an analyte with a certain level of confidence. Generally, this represents the laboratory's lowest calibration point.

J - reflects estimated analytical result value detected below the Reporting Limit (R.L.) and above the Method Detection Limit (MDL). The 'J' flag is equivalent to the DNQ Estimated Concentration flag.

E - indicates an estimated analytical result value.

B - indicates the analyte has been detected in the blank associated with the sample.

NC - means not able to be calculated for RPD or Spike Recoveries.

SS - compound is a Surrogate Spike used per laboratory quality assurance manual.

NOTE: This document represents a complete Analytical Report for the samples referenced herein and should be retained as a permanent record thereof.

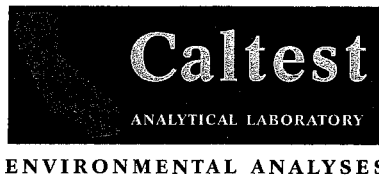
---

### Qualifiers and Compound Notes

---

1 Analytes reported as 'ND' were not detected at or above the listed Method Detection Limits (MDL).





**ANALYTICAL RESULTS**

Lab Order: H040576

Project ID Stanford/LTMAP/Piers Lane

<b>Lab ID:</b>	<b>H040576001</b>	<b>Date Collected:</b>	4/12/2007 00:00	<b>Matrix:</b>	Water			
<b>Sample ID:</b>	<b>LTPL COMP</b>	<b>Date Received:</b>	4/13/2007 10:46					
<b>Parameters</b>	<b>Result Units</b>	<b>R. L.</b>	<b>MDL</b>	<b>DF Prepared</b>	<b>Batch</b>	<b>Analyzed</b>	<b>Batch</b>	<b>Qual</b>
<b>Metals Analysis by ICPMS, Dissolved</b>	<b>Prep Method:</b>	EPA 200.8 (filtered)		<b>Prep by:</b>	UK	<b>Analyzed by:</b>	SMD	
	<b>Analytical Method:</b>	EPA 200.8 (filtered)						
Aluminum	ND ug/L	10	1.6	1	04/19/07 00:00	MPR 4413	04/25/07 15:21	MMS 3204 1
<b>Metals Analysis by ICPMS</b>	<b>Prep Method:</b>	EPA 200.8		<b>Prep by:</b>	UK	<b>Analyzed by:</b>	SMD	
	<b>Analytical Method:</b>	EPA 200.8						
Aluminum	25 ug/L	10	1.6	1	04/20/07 00:00	MPR 4420	04/25/07 19:58	MMS 3210
<b>Organophosphorous Pesticides</b>	<b>Prep Method:</b>	EPA 614		<b>Prep by:</b>	SK	<b>Analyzed by:</b>	MDT	
	<b>Analytical Method:</b>	EPA 614						
Azinphos methyl (Guthion)	ND ug/L	2.0	0.040	1	04/17/07 00:00	SPR 2461	04/23/07 22:48	SNP 1265 1
Chlorpyrifos (Dursban)	ND ug/L	0.05	0.040	1	04/17/07 00:00	SPR 2461	04/23/07 22:48	SNP 1265
Demeton -O and -S	ND ug/L	0.5	0.050	1	04/17/07 00:00	SPR 2461	04/23/07 22:48	SNP 1265
Diazinon	ND ug/L	0.05	0.040	1	04/17/07 00:00	SPR 2461	04/23/07 22:48	SNP 1265
Disulfoton (Di-Syston)	ND ug/L	0.5	0.040	1	04/17/07 00:00	SPR 2461	04/23/07 22:48	SNP 1265
Ethion	ND ug/L	0.5	0.030	1	04/17/07 00:00	SPR 2461	04/23/07 22:48	SNP 1265
Malathion	ND ug/L	0.5	0.050	1	04/17/07 00:00	SPR 2461	04/23/07 22:48	SNP 1265
Parathion (Parathion ethyl)	ND ug/L	0.5	0.040	1	04/17/07 00:00	SPR 2461	04/23/07 22:48	SNP 1265
Parathion methyl	ND ug/L	0.5	0.040	1	04/17/07 00:00	SPR 2461	04/23/07 22:48	SNP 1265
Tributylphosphate (SS)	101 %	10-126		1	04/17/07 00:00	SPR 2461	04/23/07 22:48	SNP 1265
Triphenylphosphate (SS)	99 %	58-118		1	04/17/07 00:00	SPR 2461	04/23/07 22:48	SNP 1265
<b>Nitrogen, Nitrate-Nitrite Analysis</b>	<b>Analytical Method:</b>	EPA 353.2				<b>Analyzed by:</b>	AL	
Nitrogen, Nitrate-Nitrite	J0.046 mg/L	0.1	0.030	1			05/09/07 00:00	WCO 3165

<b>Lab ID:</b>	<b>H040576002</b>	<b>Date Collected:</b>	4/12/2007 00:00	<b>Matrix:</b>	Water			
<b>Sample ID:</b>	<b>SFPL COMP</b>	<b>Date Received:</b>	4/13/2007 10:46					
<b>Parameters</b>	<b>Result Units</b>	<b>R. L.</b>	<b>MDL</b>	<b>DF Prepared</b>	<b>Batch</b>	<b>Analyzed</b>	<b>Batch</b>	<b>Qual</b>
<b>Metals Analysis by ICPMS, Dissolved</b>	<b>Prep Method:</b>	EPA 200.8 (filtered)		<b>Prep by:</b>	UK	<b>Analyzed by:</b>	SMD	
	<b>Analytical Method:</b>	EPA 200.8 (filtered)						
Aluminum	ND ug/L	10	1.6	1	04/19/07 00:00	MPR 4413	04/25/07 15:32	MMS 3204 1
<b>Metals Analysis by ICPMS</b>	<b>Prep Method:</b>	EPA 200.8		<b>Prep by:</b>	UK	<b>Analyzed by:</b>	SMD	
	<b>Analytical Method:</b>	EPA 200.8						
Aluminum	30 ug/L	10	1.6	1	04/20/07 00:00	MPR 4420	04/25/07 20:01	MMS 3210
<b>Organophosphorous Pesticides</b>	<b>Prep Method:</b>	EPA 614		<b>Prep by:</b>	SK	<b>Analyzed by:</b>	MDT	
	<b>Analytical Method:</b>	EPA 614						
Azinphos methyl (Guthion)	ND ug/L	2.0	0.040	1	04/17/07 00:00	SPR 2461	04/23/07 23:34	SNP 1265 1
Chlorpyrifos (Dursban)	ND ug/L	0.05	0.040	1	04/17/07 00:00	SPR 2461	04/23/07 23:34	SNP 1265

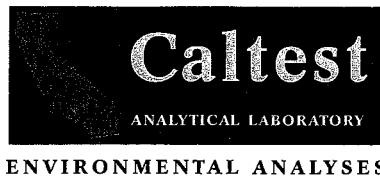
5/15/2007 12:13

**REPORT OF LABORATORY ANALYSIS**

Page 4 of 11

This report shall not be reproduced, except in full,  
without the written consent of CALTEST ANALYTICAL LABORATORY.





**ANALYTICAL RESULTS**

Lab Order: H040576

Project ID Stanford/LTMAP/Piers Lane

<b>Lab ID:</b>	<b>H040576002</b>	<b>Date Collected:</b>	4/12/2007 00:00	<b>Matrix:</b>	Water
<b>Sample ID:</b>	<b>SFPL COMP</b>	<b>Date Received:</b>	4/13/2007 10:46		

Parameters	Result	Units	R. L.	MDL	DF Prepared	Batch	Analyzed	Batch	Qual
Demeton -O and -S	ND	ug/L	0.5	0.050	1	04/17/07 00:00	SPR 2461	04/23/07 23:34	SNP 1265
Diazinon	ND	ug/L	0.05	0.040	1	04/17/07 00:00	SPR 2461	04/23/07 23:34	SNP 1265
Disulfoton (Di-Syston)	ND	ug/L	0.5	0.040	1	04/17/07 00:00	SPR 2461	04/23/07 23:34	SNP 1265
Ethion	ND	ug/L	0.5	0.030	1	04/17/07 00:00	SPR 2461	04/23/07 23:34	SNP 1265
Malathion	ND	ug/L	0.5	0.050	1	04/17/07 00:00	SPR 2461	04/23/07 23:34	SNP 1265
Parathion (Parathion ethyl)	ND	ug/L	0.5	0.040	1	04/17/07 00:00	SPR 2461	04/23/07 23:34	SNP 1265
Parathion methyl	ND	ug/L	0.5	0.040	1	04/17/07 00:00	SPR 2461	04/23/07 23:34	SNP 1265
Tributylphosphate (SS)	91	%	10-126		1	04/17/07 00:00	SPR 2461	04/23/07 23:34	SNP 1265
Triphenylphosphate (SS)	89	%	58-118		1	04/17/07 00:00	SPR 2461	04/23/07 23:34	SNP 1265

<b>Nitrogen, Nitrate-Nitrite Analysis</b>	<b>Analytical Method:</b>	EPA 353.2					<b>Analyzed by:</b>	AL
Nitrogen, Nitrate-Nitrite	0.63	mg/L	0.1	0.030	1		05/09/07 00:00	WCO 3165

<b>Lab ID:</b>	<b>H040576003</b>	<b>Date Collected:</b>	4/11/2007 13:30	<b>Matrix:</b>	Water
<b>Sample ID:</b>	<b>LTPL GRAB</b>	<b>Date Received:</b>	4/13/2007 10:46		

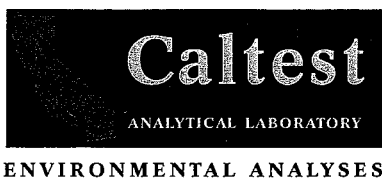
Parameters	Result	Units	R. L.	MDL	DF Prepared	Batch	Analyzed	Batch	Qual
<b>Mercury Analysis, Trace Level, Dissolved</b>	<b>Prep Method:</b>		EPA 1631E (filtered)		<b>Prep by:</b> UK				
	<b>Analytical Method:</b>		EPA 1631E (filtered)		<b>Analyzed by:</b> LM				
Mercury	0.0011	ug/L	0.0005	0.00020	1	04/18/07 00:00	MPR 4411	04/19/07 14:27	MHG 1912
<b>Mercury Analysis, Trace Level</b>	<b>Prep Method:</b>		EPA 1631E		<b>Prep by:</b> UK				
	<b>Analytical Method:</b>		EPA 1631E		<b>Analyzed by:</b> LM				
Mercury	0.0019	ug/L	0.0005	0.00020	1	04/18/07 00:00	MPR 4411	04/19/07 14:37	MHG 1912

<b>Lab ID:</b>	<b>H040576004</b>	<b>Date Collected:</b>	4/11/2007 13:45	<b>Matrix:</b>	Water
<b>Sample ID:</b>	<b>SFPL GRAB</b>	<b>Date Received:</b>	4/13/2007 10:46		

Parameters	Result	Units	R. L.	MDL	DF Prepared	Batch	Analyzed	Batch	Qual
<b>Mercury Analysis, Trace Level, Dissolved</b>	<b>Prep Method:</b>		EPA 1631E (filtered)		<b>Prep by:</b> UK				
	<b>Analytical Method:</b>		EPA 1631E (filtered)		<b>Analyzed by:</b> LM				
Mercury	0.0006	ug/L	0.0005	0.00020	1	04/18/07 00:00	MPR 4411	04/19/07 14:32	MHG 1912
<b>Mercury Analysis, Trace Level</b>	<b>Prep Method:</b>		EPA 1631E		<b>Prep by:</b> UK				
	<b>Analytical Method:</b>		EPA 1631E		<b>Analyzed by:</b> LM				
Mercury	0.0017	ug/L	0.0005	0.00020	1	04/18/07 00:00	MPR 4411	04/19/07 14:43	MHG 1912





**QUALITY CONTROL DATA**

Lab Order: H040576

Project ID: Stanford/LTMAP/Piers Lane

<b>Analysis Description:</b> Mercury Analysis, Trace Level	<b>QC Batch:</b> MPR/4411
<b>Analysis Method:</b> EPA 1631E (filtered)	<b>QC Batch Method:</b> EPA 1631E (filtered)

<b>Analysis Description:</b> Mercury Analysis, Trace Level	<b>QC Batch:</b> MPR/4411
<b>Analysis Method:</b> EPA 1631E	<b>QC Batch Method:</b> EPA 1631E

**METHOD BLANK:** 150116

Parameter	Blank Result	Reporting Limit	Units	Qualifiers
Mercury	ND	0.0005	ug/L	

**LABORATORY CONTROL SAMPLE:** 150117

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	0.02	0.020992	105	80-120	

**MATRIX SPIKE & MATRIX SPIKE DUPLICATE:** 150120 150121

Parameter	Units	H040561002 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	Max RPD	Qualifiers
Mercury	ug/L	0.0031	0.02	0.021886	0.021318	94	91	71-125	2.6	20

<b>Analysis Description:</b> Metals Analysis by ICPMS, Dissolved	<b>QC Batch:</b> MPR/4413
<b>Analysis Method:</b> EPA 200.8 (filtered)	<b>QC Batch Method:</b> EPA 200.8 (filtered)

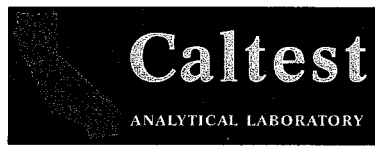
**METHOD BLANK:** 150344

Parameter	Blank Result	Reporting Limit	Units	Qualifiers
Aluminum	ND	10	ug/L	

**LABORATORY CONTROL SAMPLE:** 150345

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	40	43.463	109	85-115	





ENVIRONMENTAL ANALYSES

QUALITY CONTROL DATA

Lab Order: H040576

Project ID: Stanford/LTMAP/Piers Lane

<b>Analysis Description:</b> Metals Analysis by ICPMS, Dissolved	<b>QC Batch:</b> MPR/4413
<b>Analysis Method:</b> EPA 200.8 (filtered)	<b>QC Batch Method:</b> EPA 200.8 (filtered)

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 150346 150347

Parameter	Units	H040576001 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	Max RPD	Max RPD	Qualifiers
Aluminum	ug/L	0	40	35.202	35.236	88	88	85-115	0.1	20	

<b>Analysis Description:</b> Metals Analysis by ICPMS	<b>QC Batch:</b> MPR/4420
<b>Analysis Method:</b> EPA 200.8	<b>QC Batch Method:</b> EPA 200.8

METHOD BLANK: 150583

Parameter	Blank Result	Reporting Limit	Units	Qualifiers
Aluminum	ND	10	ug/L	

LABORATORY CONTROL SAMPLE: 150584

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	40	41.31	103	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 150585 150586

Parameter	Units	H040572001 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	Max RPD	Max RPD	Qualifiers
Aluminum	ug/L	210	40	236.156	232.406	60	51	85-115	1.6	20	3

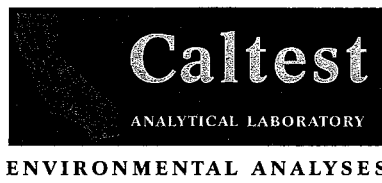
<b>Analysis Description:</b> Organophosphorous Pesticides	<b>QC Batch:</b> SPR/2461
<b>Analysis Method:</b> EPA 614	<b>QC Batch Method:</b> EPA 614

METHOD BLANK: 149724

Parameter	Blank Result	Reporting Limit	Units	Qualifiers
Malathion	ND	0.5	ug/L	
Chlorpyrifos (Dursban)	ND	0.05	ug/L	
Parathion methyl	ND	0.5	ug/L	
Disulfoton (Di-Syston)	ND	0.5	ug/L	
Diazinon	ND	0.05	ug/L	
Parathion (Parathion ethyl)	ND	0.5	ug/L	







**QUALITY CONTROL DATA**

Lab Order: H040576

Project ID: Stanford/LTMAP/Piers Lane

<b>Analysis Description:</b> Organophosphorous Pesticides	<b>QC Batch:</b> SPR/2461
<b>Analysis Method:</b> EPA 614	<b>QC Batch Method:</b> EPA 614

Parameter	Blank Result	Reporting Limit Units	Qualifiers
Ethion	ND	0.5 ug/L	
Demeton -O and -S	ND	0.5 ug/L	
Azinphos methyl (Guthion)	ND	2.0 ug/L	1
Tributylphosphate (SS)	107	10-126 %	
Triphenylphosphate (SS)	111	58-118 %	

LABORATORY CONTROL SAMPLE: 149725

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Parathion methyl	ug/L	3	3.13	104	67-102	2
Disulfoton (Di-Syston)	ug/L	3	1.38	46	20-113	
Diazinon	ug/L	3	3.09	103	62-118	
Azinphos methyl (Guthion)	ug/L	3	3.02	101	10-126	
Tributylphosphate (SS)	%			101	10-126	
Triphenylphosphate (SS)	%			105	58-118	

<b>Analysis Description:</b> Nitrogen, Nitrate-Nitrite Analysis	<b>QC Batch:</b> WCO/3165
<b>Analysis Method:</b> EPA 353.2	<b>QC Batch Method:</b> EPA 353.2

METHOD BLANK: 153383

Parameter	Blank Result	Reporting Limit Units	Qualifiers
Nitrogen, Nitrate-Nitrite	ND	0.1 mg/L	

LABORATORY CONTROL SAMPLE: 153384

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Nitrate-Nitrite	mg/L	1	0.9811	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 153385 153386

Parameter	Units	H050130002 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	Max RPD	RPD	Qualifiers
-----------	-------	-------------------	-------------	-----------	------------	----------	-----------	-------------	---------	-----	------------





ENVIRONMENTAL ANALYSES

QUALITY CONTROL DATA

Lab Order: H040576

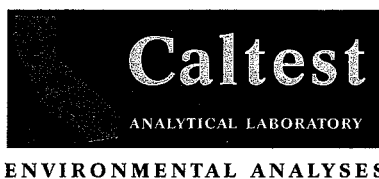
Project ID: Stanford/LTMAP/Piers Lane

<b>Analysis Description:</b> Nitrogen, Nitrate-Nitrite Analysis	<b>QC Batch:</b> WCO/3165
<b>Analysis Method:</b> EPA 353.2	<b>QC Batch Method:</b> EPA 353.2

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 153385 153386

Parameter	Units	H050130002 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	Max		Qualifiers
									RPD	RPD	
Nitrogen, Nitrate-Nitrite	mg/L	13	2	14.5872	14.3462	98	86	90-110	1.7	20	4





## QUALITY CONTROL DATA QUALIFIERS

Lab Order: H040576

Project ID: Stanford/LTMAP/Piers Lane

---

### QUALITY CONTROL PARAMETER QUALIFIERS

Results Qualifiers: Report fields may contain codes and non-numeric data correlating to one or more of the following definitions:

NS - means not spiked and will not have recoveries reported for Analyte Spike Amounts

NC - means not able to be calculated for RPD or Spike Recoveries.

QC Codes Keys: These descriptors are used to help identify the specific QC samples and clarify the report.

MB - Method Blank

LCS/LCSD - Laboratory Control Spike / Laboratory Control Spike Duplicate

DUP - Duplicate of Original Sample Matrix

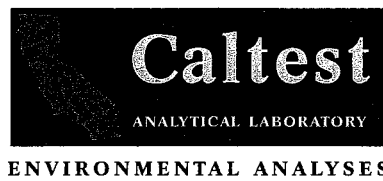
MS/MSD - Matrix Spike / Matrix Spike Duplicate

RPD - Relative Percent Difference

%Recovery - Spike Recovery stated as a percentage

- 1 Analytes reported as 'ND' were not detected at or above the listed Method Detection Limits (MDL).
- 2 High spike recovery on LCS doesn't affect data as all samples are ND.
- 3 Spike recovery outside control limits. Spike added less than one half sample concentration. LCS and Method Blank are in control.
- 4 Low Matrix Spike recovery(ies) due to possible matrix interferences in the QC sample. QC batch accepted based on LCS and RPD results.





### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Lab Order: H040576

Project ID: Stanford/LTMAP/Piers Lane

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
H040576003	LTPL GRAB	EPA 1631E	MPR/4411	EPA 1631E	MHG/1912
H040576003	LTPL GRAB	EPA 1631E (filtered)	MPR/4411	EPA 1631E (filtered)	MHG/1912
H040576004	SFPL GRAB	EPA 1631E	MPR/4411	EPA 1631E	MHG/1912
H040576004	SFPL GRAB	EPA 1631E (filtered)	MPR/4411	EPA 1631E (filtered)	MHG/1912
H040576001	LTPL COMP	EPA 200.8 (filtered)	MPR/4413	EPA 200.8 (filtered)	MMS/3204
H040576002	SFPL COMP	EPA 200.8 (filtered)	MPR/4413	EPA 200.8 (filtered)	MMS/3204
H040576001	LTPL COMP	EPA 200.8	MPR/4420	EPA 200.8	MMS/3210
H040576002	SFPL COMP	EPA 200.8	MPR/4420	EPA 200.8	MMS/3210
H040576001	LTPL COMP	EPA 614	SPR/2461	EPA 614	SNP/1265
H040576002	SFPL COMP	EPA 614	SPR/2461	EPA 614	SNP/1265
H040576001	LTPL COMP	EPA 353.2	WCO/3165		
H040576002	SFPL COMP	EPA 353.2	WCO/3165		





1885 N. KELLY ROAD • NAPA, CA 94558 • (707) 258-4000 • Fax (707) 226-1001 • www.caltestlab.com  
**SAMPLE CHAIN OF CUSTODY**

LAB ORDER # 7040576  
 PAGE 1 OF 2

CLIENT: Balance Hydrologists CITY: White STATE: CA ZIP: 94710  
 ADDRESS: 841 Folger Avenue, Berkeley, CA  
 BILLING ADDRESS: Marty Laporte - Stanford University  
 PHONE #: 510-704-1001 FAX PHONE: 704-1001 PROJECT # / PROJECT NAME: Stanford / LTMAP/Piers Lane  
 REPORT TO: Chris White P.O.#: 202014

SAMPLER (PRINT & SIGN NAME): Zan Rubin  
 ANALYSES REQUESTED:  
 Total Aluminum  
 Dissolved Aluminum  
 Total Nitrate (NO3-N)  
 Dissolved Mercury  
 Total Mercury  
 Chlorophyll a  
 Discolored Matter

CALTEST #	DATE SAMPLED	TIME SAMPLED	MATRIX	CONTAINER AMOUNT/TYPE	PRESERVATIVE	SAMPLE IDENTIFICATION SITE	CLIENT LAB #	COMP. OR GRAB	REMARKS
1	070412	-	W	500ml PE	HNO3	LTPL		C	X
				500ml PE	ICE	LTPL		C	X
				1L Amber Glass	ICE	LTPL		C	X
				1L Amber Glass	ICE	LTPL		C	X
				500ml PE	ICE	LTPL		C	X
-3	070411	13:30		500ml Glass	HCL	LTPL		G	X
				500ml Glass	ICE	LTPL		G	X

By submittal of sample(s), client agrees to abide by the Terms and Conditions set forth on the reverse of this document.

RELINQUISHED BY: Shoutoun DATE/TIME: 4/13/07 10AM RECEIVED BY: [Signature] DATE/TIME: 4/13 1046

RELINQUISHED BY: Courier RECEIVED BY: [Signature]

SEALING: MICRO  BIO  AA  SV  VOA  TEMP: \_\_\_\_\_ SEaled: Y  / N  INTACT: Y  / N

COMMENTS: \_\_\_\_\_

SIL: HF \_\_\_\_\_ PT \_\_\_\_\_ QT \_\_\_\_\_ VOA \_\_\_\_\_  
 W/HNO3 \_\_\_\_\_ H2SO4 \_\_\_\_\_ NaOH \_\_\_\_\_  
 PIL: HNO3 \_\_\_\_\_ H2SO4 \_\_\_\_\_ NaOH \_\_\_\_\_ HCL \_\_\_\_\_

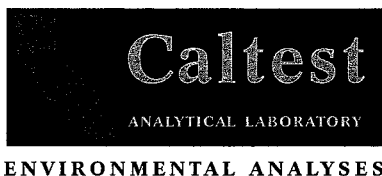
FOR LAB USE ONLY

MATRIX: AQ = Aqueous Nondrinking Water, Digested Metals;  
 FE = Low R.L.s, Aqueous Nondrinking Water, Digested Metals;  
 DW = Drinking Water; SL = Soil, Sludge, Solid; FP = Free Product  
 CONTAINER TYPES: AL = Amber Litter; AHL = 500 ml Amber; PT = Pint (Plastic); QT=Quart (Plastic); HG = Half Gallon (Plastic); SJ = Soil Jar; B4 = 4 oz. BACT; BT = Brass Tube; VOA = 40 mL VOA; OTC = Other Type Container

REV. 11/03

WHITE - LABORATORY YELLOW - CLIENT COPY TO ACCOMPANY FINAL REPORT PINK - CLIENT COPY AS RECEIPT





202018  
WY 2007  
LAB  
7-17-07  
SAMPLES

Friday, July 20, 2007

Chris White  
Balance Hydrologics, Inc.  
841 Folger Ave.  
Berkeley, CA 94710

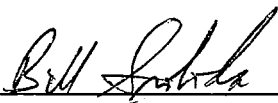
RE: Lab Order: H070458  
Project ID: STANFORD/LTMAP/PIERS LANE

Collected By: ZAN RUBIN  
PO/Contract #: 202018

Dear Chris White:

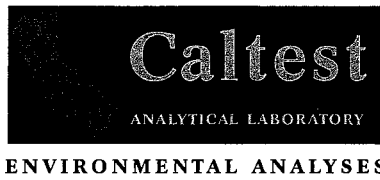
Enclosed are the analytical results for sample(s) received by the laboratory on Thursday, July 12, 2007. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report. If you have any questions concerning this report, please feel free to contact me.

Enclosures

  
Project Manager: Bill Svoboda

  
Lab Director: Christine Horn



**SAMPLE SUMMARY**

Lab Order: H070458

Project ID: STANFORD/LTMAP/PIERS LANE

Lab ID	Sample ID	Matrix	Date Collected	Date Received
H070458001	LTPL	Water	7/11/2007 17:30	7/12/2007 11:18
H070458002	SFPL	Water	7/11/2007 18:00	7/12/2007 11:18

7/20/2007 15:15

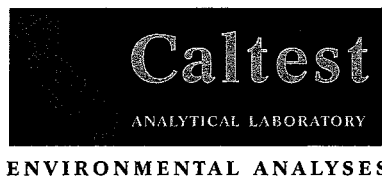
**REPORT OF LABORATORY ANALYSIS**

Page 2 of 7

This report shall not be reproduced, except in full,  
without the written consent of CALTEST ANALYTICAL LABORATORY.







## NARRATIVE

Lab Order: H070458

Project ID: STANFORD/LTMAP/PIERS LANE

---

### General Qualifiers and Notes

---

CALTEST authorizes this report to be reproduced only in its entirety. Results are specific to the sample(s) as submitted and only to the parameter(s) reported.

Caltest certifies that test results meet all applicable NELAC requirements unless stated otherwise.

All analyses performed by EPA Methods or Standard Methods (SM) 18th Ed. except where noted.

Caltest collects samples in compliance with 40 CFR, EPA Methods, Cal. Title 22, and Standard Methods.

Dilution Factors (DF) reported greater than '1' have been used to adjust the result, Reporting Limit (R.L.), and Method Detection Limit (MDL).

All Solid, sludge, and/or biosolids data is reported in Wet Weight, unless otherwise specified.

Results Qualifiers: Report fields may contain codes and non-numeric data correlating to one or more of the following definitions:

ND - Non Detect - indicates analytical result has not been detected.

RL - Reporting Limit is the quantitation limit at which the laboratory is able to detect an analyte with a certain level of confidence. Generally, this represents the laboratory's lowest calibration point.

J - reflects estimated analytical result value detected below the Reporting Limit (R.L.) and above the Method Detection Limit (MDL). The 'J' flag is equivalent to the DNQ Estimated Concentration flag.

E - indicates an estimated analytical result value.

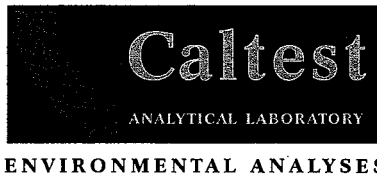
B - indicates the analyte has been detected in the blank associated with the sample.

NC - means not able to be calculated for RPD or Spike Recoveries.

SS - compound is a Surrogate Spike used per laboratory quality assurance manual.

NOTE: This document represents a complete Analytical Report for the samples referenced herein and should be retained as a permanent record thereof.





**ANALYTICAL RESULTS**

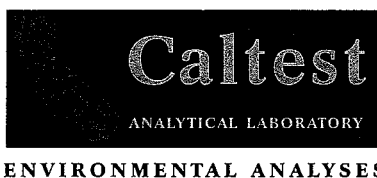
Lab Order: H070458

Project ID STANFORD/LTMAP/PIERS LANE

<b>Lab ID:</b>	<b>H070458001</b>	<b>Date Collected:</b>	7/11/2007 17:30	<b>Matrix:</b>	Water			
<b>Sample ID:</b>	<b>LTPL</b>	<b>Date Received:</b>	7/12/2007 11:18					
<b>Parameters</b>	<b>Result Units</b>	<b>R. L.</b>	<b>MDL</b>	<b>DF Prepared</b>	<b>Batch</b>	<b>Analyzed</b>	<b>Batch</b>	<b>Qual</b>
<b>Anions by Ion Chromatography</b>	<b>Analytical Method:</b>		EPA 300.0		<b>Analyzed by:</b> MYS			
Nitrogen, Nitrate (as N)	3.2 mg/L	0.1	0.010	1		07/13/07 04:17	WIC 1729	

<b>Lab ID:</b>	<b>H070458002</b>	<b>Date Collected:</b>	7/11/2007 18:00	<b>Matrix:</b>	Water			
<b>Sample ID:</b>	<b>SFPL</b>	<b>Date Received:</b>	7/12/2007 11:18					
<b>Parameters</b>	<b>Result Units</b>	<b>R. L.</b>	<b>MDL</b>	<b>DF Prepared</b>	<b>Batch</b>	<b>Analyzed</b>	<b>Batch</b>	<b>Qual</b>
<b>Anions by Ion Chromatography</b>	<b>Analytical Method:</b>		EPA 300.0		<b>Analyzed by:</b> MYS			
Nitrogen, Nitrate (as N)	1.1 mg/L	0.1	0.010	1		07/13/07 04:35	WIC 1729	





**QUALITY CONTROL DATA**

Lab Order: H070458

Project ID: STANFORD/LTMAP/PIERS LANE

<b>Analysis Description:</b> Anions by Ion Chromatography	<b>QC Batch:</b> WIC/1729
<b>Analysis Method:</b> EPA 300.0	<b>QC Batch Method:</b> EPA 300.0

**METHOD BLANK:** 164717

Parameter	Blank Result	Reporting Limit Units	Qualifiers
Nitrogen, Nitrate (as N)	0.065	0.1 mg/L	

**LABORATORY CONTROL SAMPLE:** 164718

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Nitrate (as N)	mg/L	6.2	6.239	100	90-110	

**MATRIX SPIKE & MATRIX SPIKE DUPLICATE:** 164719 164720

Parameter	Units	H070457001 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Nitrogen, Nitrate (as N)	mg/L	0.065	5	4.636	4.629	91	91	90-110	0.2	20	
Nitrogen, Nitrate (as N)	mg/L	0.065	5	6.255	4.629	91	91	90-110	0.2	20	





**QUALITY CONTROL DATA QUALIFIERS**

Lab Order: H070458

Project ID: STANFORD/LTMAP/PIERS LANE

---

**QUALITY CONTROL PARAMETER QUALIFIERS**

Results Qualifiers: Report fields may contain codes and non-numeric data correlating to one or more of the following definitions:

NS - means not spiked and will not have recoveries reported for Analyte Spike Amounts

NC - means not able to be calculated for RPD or Spike Recoveries.

QC Codes Keys: These descriptors are used to help identify the specific QC samples and clarify the report.

MB - Method Blank

LCS/LCSD - Laboratory Control Spike / Laboratory Control Spike Duplicate

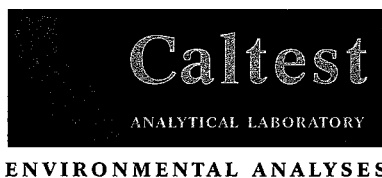
DUP - Duplicate of Original Sample Matrix

MS/MSD - Matrix Spike / Matrix Spike Duplicate

RPD - Relative Percent Difference

%Recovery - Spike Recovery stated as a percentage



**QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Lab Order: H070458

Project ID: STANFORD/LTMAP/PIERS LANE

---

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
H070458001	LTPL	EPA 300.0	WIC/1729		
H070458002	SFPL	EPA 300.0	WIC/1729		

---





20208  
W42007 LAB/G**Chris White**

**From:** Zittle, Margaret [Margaret.Zittle@CityofPaloAlto.org]  
**Sent:** Monday, April 23, 2007 10:23 AM  
**To:** Chris White  
**Subject:** RE: Piers Lane Sampling Results for 2/26-27/2007

Hi Chris,

There is no Ag analysis because it was not listed on the COC for both 2/10-11 or 2/26-27. No list of metals were on the 2/26-27 COC and Ag was left off the 2/10-11 COC so when I processed the 2/26-27 samples I went by the previous COC which was 2/10-11.

Sorry for the error

Margaret Zittle

---

**From:** Chris White [mailto:cwhite@balancehydro.com]  
**Sent:** Sunday, April 22, 2007 9:33 PM  
**To:** Zittle, Margaret  
**Subject:** RE: Piers Lane Sampling Results for 2/26-27/2007

Hi Margaret,

The lab analyses for the 2/26-27/2007 Piers Lane samples you sent us on April 10 match the COC submitted, except for one item:

--no total or dissolved silver analyses were reported for grab, composite or duplicate samples from either the SFC or LTC stations at Piers Lane.

Could you please look into it and get back to me as to whether or not any of these samples were analyzed for silver?

Thank you,  
 Chris

Chris White, Principal  
 Balance Hydrologics, Inc.  
 281 Nevada Street  
 Auburn, CA 95603  
 (530) 887-9988  
 (530) 887-9966 (fax)  
 (530) 401-4255 (cell)

Our newest office is located just off I-80 Reno in central Auburn. A map to the Auburn office is posted on the Balance website: [www.balancehydro.com](http://www.balancehydro.com).

---

**From:** Zittle, Margaret [mailto:Margaret.Zittle@CityofPaloAlto.org]  
**Sent:** Tuesday, April 10, 2007 1:39 PM  
**To:** Chris White  
**Subject:** RE: Piers Lane Sampling Results for 2/10-11/2007

4/23/2007

202018 US  
WT2007

**Chris White**

**From:** Zittle, Margaret [Margaret.Zittle@CityofPaloAlto.org]  
**Sent:** Thursday, March 15, 2007 10:22 AM  
**To:** cwhite@balancehydro.com  
**Subject:** Sampling Results

12/26-27/07  
SAMPLING  
RESULTS

**Attachments:** sfcreek70318.pdf; sfcreek70001.pdf; sfcreek70002.pdf; sfcreek70003.pdf; sfcreek70004.pdf; sfcreek70005.pdf; sfcreek70006.pdf; sfcreek70007.pdf; sfcreek70008.pdf; sfcreek70009.pdf; sfcreek70010.pdf; sfcreek70011.pdf; sfcreek70012.pdf; sfcreek70013.pdf; sfcreek70014.pdf; sfcreek70015.pdf; sfcreek70016.pdf; sfcreek70017.pdf; sfcreek70019.pdf; sfcreek70020.pdf; sfcreek70021.pdf; sfcreek70022.pdf; sfcreek70023.pdf; sfcreek70025.pdf; sfcreek70026.pdf; sfcreek70027.pdf; sfcreek70315.pdf; sfcreek70317.pdf

LTPC - 12/26-27/07

Newell Creek 4/12-15  
sent by mistake  
(deleted)

SFPL - 12/26-27/07

Hi Chris,

Here are the latest results from our lab for the San Francisquito creek sampling event.

Margaret Zittle  
City of Palo Alto  
Environmental Compliance  
2501 Embarcadero Way  
Palo Alto, CA 94303  
(650) 329-2514

\_\_\_\_\_ NOD32 2117 (20070315) Information \_\_\_\_\_

This message was checked by NOD32 antivirus system.  
<http://www.eset.com>



# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 3/6/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention:* ROBERTO MEDINA

Sample ID: 20070007

Permit No: 5006

Sampling Location: 14

Sampling Type: CM 15

Flow Rate (gpd) : 1

Location : SITE #2; SFC-PIERS LANE

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	12/26/2006	9:45 PM	IU			
START	12/26/2006	9:45 PM				
END	12/27/2006	9:45 PM				
PICKUP	12/27/2006	1:00 PM	IU	2		
PRESERVED	12/27/2006	1:00 PM	IU	1		
DELIVERED	1/2/2007	11:30 AM	MZ	2		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
Ag	ND	0.0002	0.25				
Cu	0.028	0.0006	2				
HRD	241	1					
Ni	0.011	0.0006	0.5				
Pb	0.0033	0.0004	0.5				
Se	0.0003	0.0001	1				
Zn	0.03	0.005	2				

**Notes:** All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated. **Comments:**

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 3/6/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention:* ROBERTO MEDINA

Sample ID: 20070008  
Permit No: 5006  
Sampling Location: 7  
Sampling Type: CM 15  
Flow Rate (gpd) : 1

Location : STATION #4 - SFC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	12/26/2006	9:45 PM	IU			
START	12/26/2006	9:45 PM				
END	12/27/2006	9:45 PM				
PICKUP	12/27/2006	1:00 PM	IU	1		
PRESERVED	12/27/2006					
DELIVERED	1/2/2007	11:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
S_Ag	ND	0.0002					
S_Cu	0.0046	0.0006					
S_Ni	0.0031	0.0006					
S_Pb	ND	0.0004					
S_Se	0.0002	0.0001					
S_Zn	ND	0.005					

**Notes:** All values in mg/l except for pH and flow rate      **Comments:**  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 3/6/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention:* ROBERTO MEDINA

Sample ID: **20070009**  
Permit No: **5006**  
Sampling Location: **7**  
Sampling Type: **CM 15**  
Flow Rate (gpd) : **1**

Location : **STATION #4 - SFC - PIER5**

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	12/26/2006	11:00 PM	IU			
START	12/26/2006	11:00 PM				
END	12/27/2006	11:00 PM				
PICKUP	12/27/2006	1:00 PM	IU	1		
PRESERVED	12/27/2006					
DELIVERED	1/2/2007	11:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
S_Ag	ND	0.0002					
S_Cu	0.0053	0.0006					
S_Ni	0.0036	0.0006					
S_Pb	ND	0.0004					
S_Se	0.0002	0.0001					
S_Zn	ND	0.005					

**Notes:** All values in mg/l except for pH and flow rate      **Comments:**  
 "\*\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 3/6/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention:* ROBERTO MEDINA

Sample ID: 20070010

Permit No: 5006

Sampling Location: 7

Sampling Type: GR

Flow Rate (gpd) : 1

Location : STATION #4 - SFC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	12/26/2006	9:45 PM	IU	1		
PRESERVED	12/26/2006					
DELIVERED	1/2/2007	11:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
S_Ag	ND	0.0002					
S_Cu	0.0053	0.0006					
S_Ni	0.0038	0.0006					
S_Pb	ND	0.0004					
S_Se	0.0002	0.0001					
S_Zn	0.008	0.005					

**Notes:** All values in mg/l except for pH and flow rate      **Comments:**  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 3/6/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070011  
Permit No: 5006  
Sampling Location: 7  
Sampling Type: GR  
Flow Rate (gpd) : 1

Location : STATION #4 - SFC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	12/26/2006	11:00 PM	IU	1		
PRESERVED	12/26/2006					
DELIVERED	1/2/2007	11:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
S_Ag	ND	0.0002					
S_Cu	0.0047	0.0006					
S_Ni	0.0032	0.0006					
S_Pb	ND	0.0004					
S_Se	0.0002	0.0001					
S_Zn	ND	0.005					

**Notes:** All values in mg/l except for pH and flow rate      **Comments:**  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant**  
**Operated by the City of Palo Alto**

**Date:** 3/6/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
 Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
 WOODLAND AVE. AT EAST PALO  
 ALTO  
 FRONTING 1855 WOODLAND  
 PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070012

Permit No: 5006

Sampling Location: 7

Sampling Type: CM 15

Flow Rate (gpd) : 1

Location : STATION #4 - SFC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	12/26/2006	9:45 PM	IU			
START	12/26/2006	9:45 PM				
END	12/27/2006	9:45 PM				
PICKUP	12/27/2006	1:00 PM	IU	1		
PRESERVED	12/27/2006	1:00 PM	IU	1		
DELIVERED	1/2/2007	11:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
PO4	0.552	0.02					

**Notes:** All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

**Comments:**

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant**  
**Operated by the City of Palo Alto**

**Date:** 3/6/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
 Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
 WOODLAND AVE. AT EAST PALO  
 ALTO  
 FRONTING 1855 WOODLAND  
 PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: **20070013**  
 Permit No: **5006**  
 Sampling Location: **7**  
 Sampling Type: **GR**  
 Flow Rate (gpd) : **1**

Location : **STATION #4 - SFC - PIERS**

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	12/26/2006	9:45 PM	IU	1		
PRESERVED	12/26/2006	9:45 PM	IU	1		
DELIVERED	1/2/2007	11:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
NH3	ND	0.2					

**Notes:** All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated. **Comments:**

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 3/6/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070014

Permit No: 5006

Sampling Location: 7

Sampling Type: GR

Flow Rate (gpd) : 1

Location : STATION #4 - SFC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	12/26/2006	11:00 PM	IU	1		
PRESERVED	12/26/2006	11:00 PM	IU	1		
DELIVERED	1/2/2007	11:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
NH3	ND	0.2					

**Notes:** All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

**Comments:**



# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 3/6/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: **20070015**  
Permit No: **5006**  
Sampling Location: **7**  
Sampling Type: **CM 15**  
Flow Rate (gpd) : **1**

Location : STATION #4 - SFC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	12/26/2006	9:45 PM	IU			
START	12/26/2006	9:45 PM				
END	12/27/2006	9:45 PM				
PICKUP	12/27/2006	1:00 PM	IU	1		
PRESERVED	12/27/2006					
DELIVERED	1/2/2007	11:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
SS	64	0.5	3000				

**Notes:** All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 3/6/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070001

Permit No: 5006

Sampling Location: 8

Sampling Type: CM 15

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	12/26/2006	9:45 PM	IU			
START	12/26/2006	9:45 PM				
END	12/27/2006	9:45 PM				
PICKUP	12/27/2006	11:50 AM	IU	2		
PRESERVED	12/27/2006	11:50 AM	IU	1		
DELIVERED	1/2/2007	11:30 AM	MZ	2		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
Ag	ND	0.0002	0.25				
Cu	0.0136	0.0006	2				
HRD	281	1					
Ni	0.009	0.0006	0.5				
Pb	0.0018	0.0004	0.5				
Se	0.0002	0.0001	1				
Zn	0.03	0.005	2				

**Notes:** All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated. **Comments:**

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 3/6/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
**attention:** ROBERTO MEDINA

Sample ID: 20070002

Permit No: 5006

Sampling Location: 8

Sampling Type: CM 15

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	12/26/2006	9:45 PM	IU			
START	12/26/2006	9:45 PM				
END	12/27/2006	9:45 PM				
PICKUP	12/27/2006	11:50 AM	IU	1		
PRESERVED	12/27/2006					
DELIVERED	1/2/2007	11:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
S_Ag	ND	0.0002					
S_Cu	0.0034	0.0006					
S_Ni	0.0024	0.0006					
S_Pb	ND	0.0004					
S_Se	0.0002	0.0001					
S_Zn	ND	0.005					

**Notes:** All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated. **Comments:**

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 3/6/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070003

Permit No: 5006

Sampling Location: 8

Sampling Type: GR

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	12/26/2006	9:45 PM	IU	1		
PRESERVED	12/26/2006					
DELIVERED	1/2/2007	11:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
S_Ag	ND	0.0002					
S_Cu	0.007	0.0006					
S_Ni	0.0034	0.0006					
S_Pb	ND	0.0004					
S_Se	0.0001	0.0001					
S_Zn	0.02	0.005					

**Notes:** All values in mg/l except for pH and flow rate      **Comments:**  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 3/6/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070004

Permit No: 5006

Sampling Location: 8

Sampling Type: CM 15

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	12/26/2006	9:45 PM	IU			
START	12/26/2006	9:45 PM				
END	12/27/2006	9:45 PM				
PICKUP	12/27/2006	11:50 AM	IU	1		
PRESERVED	12/27/2006	11:50 AM	IU	1		
DELIVERED	1/2/2007	11:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
PO4	0.904	0.02					

**Notes:** All values in mg/l except for pH and flow rate      **Comments:**  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 3/6/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention:* ROBERTO MEDINA

Sample ID: 20070005

Permit No: 5006

Sampling Location: 8

Sampling Type: GR

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	12/26/2006	9:45 PM	IU	1		
PRESERVED	12/26/2006	9:45 PM	IU	1		
DELIVERED	1/2/2007	11:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
NH3	ND	0.2					

**Notes:** All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated. **Comments:**

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 3/6/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

**Sample ID:** 20070006

**Permit No:** 5006

**Sampling Location:** 8

**Sampling Type:** CM 15

**Flow Rate (gpd) :** 1

**Location :** STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	12/26/2006	9:45 PM	IU			
START	12/26/2006	9:45 PM				
END	12/27/2006	9:45 PM				
PICKUP	12/27/2006	11:50 AM	IU	1		
PRESERVED	12/27/2006					
DELIVERED	1/2/2007	11:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
SS	48	0.5	3000				

**Notes:** All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated

202018 LAF  
WY2007

Chris White

**From:** Zittle, Margaret [Margaret.Zittle@CityofPaloAlto.org]  
**Sent:** Thursday, March 15, 2007 10:22 AM  
**To:** cwhite@balancehydro.com  
**Subject:** Sampling Results

2/10-11/07  
SAMPLING

**Attachments:** sfcreek70318.pdf; sfcreek70001.pdf; sfcreek70002.pdf; sfcreek70003.pdf; sfcreek70004.pdf; sfcreek70005.pdf; sfcreek70006.pdf; sfcreek70007.pdf; sfcreek70008.pdf; sfcreek70009.pdf; sfcreek70010.pdf; sfcreek70011.pdf; sfcreek70012.pdf; sfcreek70013.pdf; sfcreek70014.pdf; sfcreek70015.pdf; sfcreek70016.pdf; sfcreek70017.pdf; sfcreek70019.pdf; sfcreek70020.pdf; sfcreek70021.pdf; sfcreek70022.pdf; sfcreek70023.pdf; sfcreek70025.pdf; sfcreek70026.pdf; sfcreek70027.pdf; sfcreek70315.pdf; sfcreek70317.pdf

SFPL - 2/10-11/2007  
LTPL - 2/10-11/2007

Hi Chris,

Here are the latest results from our lab for the San Francisquito creek sampling event.

Margaret Zittle  
City of Palo Alto  
Environmental Compliance  
2501 Embarcadero Way  
Palo Alto, CA 94303  
(650) 329-2514

\_\_\_\_\_ NOD32 2117 (20070315) Information \_\_\_\_\_

This message was checked by NOD32 antivirus system.  
<http://www.eset.com>



# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 3/6/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070016  
Permit No: 5006  
Sampling Location: 7  
Sampling Type: CM 15  
Flow Rate (gpd) : 1

Location : STATION #4 - SFC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	2/10/2007	10:55 AM	IU			
START	2/10/2007	10:55 AM				
END	2/11/2007	10:55 AM				
PICKUP	2/11/2007	3:00 PM	IU	1		
PRESERVED	2/11/2007	3:00 PM	IU	1		
DELIVERED	2/14/2007	9:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
Cu	0.0137	0.0006	2				
HRD	289	1					
Ni	0.006	0.0006	0.5				
Pb	0.0015	0.0004	0.5				
Se			1				
Zn	0.016	0.005	2				

**Notes:** All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated. **Comments:**

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant**  
**Operated by the City of Palo Alto**

**Date:** 3/6/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
 Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
 WOODLAND AVE. AT EAST PALO  
 ALTO  
 FRONTING 1855 WOODLAND  
 PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070017  
 Permit No: 5006  
 Sampling Location: 7  
 Sampling Type: **CM 15**  
 Flow Rate (gpd) : 1

Location : STATION #4 - SFC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	2/10/2007	10:55 AM	IU			
START	2/10/2007	10:55 AM				
END	2/11/2007	10:55 AM				
PICKUP	2/11/2007	3:00 PM	IU	1		
PRESERVED	2/11/2007					
DELIVERED	2/14/2007	9:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
S_Cu	0.0043	0.0006					
S_Ni	0.003	0.0006					
S_Pb	ND	0.0004					
S_Se							
S_Zn	0.028	0.005					

**Notes:** All values in mg/l except for pH and flow rate      **Comments:**  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 3/6/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: **20070019**  
Permit No: **5006**  
Sampling Location: **7**  
Sampling Type: **CM 15**  
Flow Rate (gpd) : **1**

Location : STATION #4 - SFC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	2/10/2007	10:55 AM	IU			
START	2/10/2007	10:55 AM				
END	2/11/2007	10:55 AM				
PICKUP	2/11/2007	3:00 PM	IU	1		
PRESERVED	2/11/2007					
DELIVERED	2/14/2007	9:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
SS	34	0.5	3000				

**Notes:** All values in mg/l except for pH and flow rate      **Comments:**  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 3/6/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

**Sample ID:** 20070020

**Permit No:** 5006

**Sampling Location:** 7

**Sampling Type:** GR

**Flow Rate (gpd) :** 1

**Location :** STATION #4 - SFC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	2/10/2007	10:55 AM	IU	1		
PRESERVED	2/10/2007	10:55 AM	IU	1		
DELIVERED	2/14/2007	9:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
NH3	ND	0.2					

**Notes:** All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

**Comments:**

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 3/6/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070021  
Permit No: 5006  
Sampling Location: 7  
Sampling Type: GR  
Flow Rate (gpd) : 1

Location : STATION #4 - SFC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	2/10/2007	10:55 AM	IU	1		
PRESERVED	2/10/2007					
DELIVERED	2/14/2007	9:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
S_Cu	0.003	0.0006					
S_Ni	0.0031	0.0006					
S_Pb	ND	0.0004					
S_Se							
S_Zn	0.018	0.005					

*Notes: All values in mg/l except for pH and flow rate      Comments:*  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 3/6/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention:* ROBERTO MEDINA

Sample ID: 20070022

Permit No: 5006

Sampling Location: 8

Sampling Type: CM 15

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	2/10/2007	10:30 AM	IU			
START	2/10/2007	10:30 AM				
END	2/11/2007	10:30 AM				
PICKUP	2/11/2007	3:00 PM	IU	1		
PRESERVED	2/11/2007	3:00 PM	IU	1		
DELIVERED	2/14/2007	9:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
Cu	0.0045	0.0006	2				
HRD	392	1					
Ni	0.0046	0.0006	0.5				
Pb	0.001	0.0004	0.5				
Se			1				
Zn	0.01	0.005	2				

**Notes:** All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

**Comments:**

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant**  
**Operated by the City of Palo Alto**

**Date:** 3/6/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
 Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
 WOODLAND AVE. AT EAST PALO  
 ALTO  
 FRONTING 1855 WOODLAND  
 PALO ALTO CA 90000-0000  
**attention:** ROBERTO MEDINA

Sample ID: 20070023

Permit No: 5006

Sampling Location: 8

Sampling Type: CM 15

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	2/10/2007	10:30 AM	IU			
START	2/10/2007	10:30 AM				
END	2/11/2007	10:30 AM				
PICKUP	2/11/2007	3:00 PM	IU	1		
PRESERVED	2/11/2007					
DELIVERED	2/14/2007	9:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
S_Cu	0.0029	0.0006					
S_Ni	0.014	0.0006					
S_Pb	ND	0.0004					
S_Se							
S_Zn	ND	0.005					

**Notes:** All values in mg/l except for pH and flow rate  
 Comments:  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 3/6/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention:* ROBERTO MEDINA

Sample ID: 20070025

Permit No: 5006

Sampling Location: 8

Sampling Type: CM 15

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	2/10/2007	10:30 AM	IU			
START	2/10/2007	10:30 AM				
END	2/11/2007	10:30 AM				
PICKUP	2/11/2007	3:00 PM	IU	1		
PRESERVED	2/11/2007					
DELIVERED	2/14/2007	9:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
SS	27	0.5	3000				

**Notes:** All values in mg/l except for pH and flow rate      **Comments:**  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.



# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 3/6/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: **20070026**

Permit No: **5006**

Sampling Location: **8**

Sampling Type: **GR**

Flow Rate (gpd) : **1**

Location : **STATION #7 - LTC - PIERS**

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	2/10/2007	10:30 AM	IU	1		
PRESERVED	2/10/2007	10:30 AM	IU	1		
DELIVERED	2/14/2007	9:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
NH3	ND	0.2					

**Notes:** All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

**Comments:**

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant**  
**Operated by the City of Palo Alto**

**Date:** 3/6/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
 Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
 WOODLAND AVE. AT EAST PALO  
 ALTO  
 FRONTING 1855 WOODLAND  
 PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070027

Permit No: 5006

Sampling Location: 8

Sampling Type: GR

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	2/10/2007	10:30 AM	IU	1		
PRESERVED	2/10/2007					
DELIVERED	2/14/2007	9:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
S_Cu	0.0044	0.0006					
S_Ni	0.0023	0.0006					
S_Pb	ND	0.0004					
S_Se							
S_Zn	0.013	0.005					

**Notes:** All values in mg/l except for pH and flow rate      **Comments:**  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

Date: 3/12/2007

To: SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070315  
Permit No: 5006  
Sampling Location: 1  
Sampling Type: CM 15  
Flow Rate (gpd) C : 1

Location : SITE #1; NEWELL - WOODLAND

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	2/13/2007	11:09 AM	BJ			
START	2/13/2007	11:09 AM	BJ			
END	2/14/2007	11:09 AM	BJ			
PICKUP	2/14/2007	11:14 AM	BJ	1		
PRESERVED	2/14/2007	11:44 AM	BJ	0		
DELIVERED	2/14/2007	11:57 AM	BJ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
SS	9.8	0.5	3000				

**Notes:** All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated. **Comments:**

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant**  
**Operated by the City of Palo Alto**

**Date:** 3/12/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
 Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
 WOODLAND AVE. AT EAST PALO  
 ALTO  
 FRONTING 1855 WOODLAND  
 PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070317

Permit No: 5006

Sampling Location: 1

Sampling Type: GR

Flow Rate (gpd) C : 1

Location : SITE #1; NEWELL - WOODLAND

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	2/14/2007	11:15 AM	BJ	1		
PRESERVED	2/14/2007	11:44 AM	BJ	1		
DELIVERED	2/14/2007	11:57 AM	BJ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
NH3	ND	0.2					

**Notes:** All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated

**Comments:**

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 3/12/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

**Sample ID:** 20070318

**Permit No:** 5006

**Sampling Location:** 1

**Sampling Type:** CM 15

**Flow Rate (gpd) C :** 1

**Location :** SITE #1; NEWELL - WOODLAND

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	2/13/2007	11:12 AM	BJ			
START	2/13/2007	11:12 AM	BJ			
END	2/14/2007	11:12 AM	BJ			
PICKUP	2/14/2007	11:16 AM	BJ	1		
PRESERVED	2/14/2007	11:44 AM	BJ	1		
DELIVERED	2/14/2007	11:57 AM	BJ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
HRD	235	1					

**Notes:** All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

**Chris White**

**From:** Zittle, Margaret [Margaret.Zittle@CityofPaloAlto.org]  
**Sent:** Tuesday, April 10, 2007 1:39 PM  
**To:** Chris White  
**Subject:** RE: Piers Lane Sampling Results for ~~2/10-11/2007~~ <sup>2/26-27/07</sup>

**Attachments:** sf creek70047.pdf, sf creek70024.pdf, sf creek70031.pdf, sf creek70032.pdf, sf creek70033.pdf, sf creek70034.pdf, sf creek70035.pdf, sf creek70036.pdf, sf creek70037.pdf, sf creek70038.pdf, sf creek70039.pdf, sf creek70040.pdf, sf creek70041.pdf, sf creek70042.pdf, sf creek70043.pdf, sf creek70044.pdf, sf creek70045.pdf, sf creek70046.pdf

Hi Chris,

Here are more of the SF Creek monitoring sample results.

*Handwritten notes:*  
2/10-11/2007 - LTC (Total P)  
SFPL 2/26-27/07  
LTPC 2/26-27/07

---

**From:** Chris White [mailto:cwhite@balancehydro.com]  
**Sent:** Thursday, March 15, 2007 1:33 PM  
**To:** Zittle, Margaret  
**Subject:** RE: Piers Lane Sampling Results for 2/10-11/2007

Hi Margaret.

I reviewed the results against the COCs and had a couple of questions.

RE 2/10-11/2007 samples:

--we submitted one sample each, LTC and SFC, for Total P analysis but I couldn't find any results for this parameter for this date?

-all sample metals analyses, both total and dissolved, were missing the selenium analysis?

I also noted that the sample results report sequence skipped sf creek 70018 and 70024, if that is related to the above?

Thanks,  
Chris

Chris White, Principal  
Balance Hydrologics, Inc.  
281 Nevada Street  
Auburn, CA 95603  
(530) 887-9988  
(530) 887-9966 (fax)  
(530) 401-4255 (cell)

Our newest office is located just off I-80 Reno in central Auburn. A map to the Auburn office is posted on the Balance website: [www.balancehydro.com](http://www.balancehydro.com).

---

**From:** Zittle, Margaret [mailto:Margaret.Zittle@CityofPaloAlto.org]  
**Sent:** Thursday, March 15, 2007 10:22 AM  
**To:** cwhite@balancehydro.com

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 4/5/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention:* ROBERTO MEDINA

Sample ID: 20070043

Permit No: 5006

Sampling Location: 8

Sampling Type: GR

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	2/26/2007	11:00 PM	IU	1		
PRESERVED	2/26/2007	11:00 PM	IU	1		
DELIVERED	3/2/2007	9:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
NH3	ND	0.2					

*Notes: All values in mg/l except for pH and flow rate      Comments:*  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 4/5/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention:* ROBERTO MEDINA

Sample ID: 20070039

Permit No: 5006

Sampling Location: 8

Sampling Type: GR

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	2/26/2007	1:00 PM	IU	1		
PRESERVED	2/26/2007	1:00 PM	IU	1		
DELIVERED	3/2/2007	9:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
NH3	ND	0.2					

*Notes: All values in mg/l except for pH and flow rate*      *Comments:*  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.



# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 4/5/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070041

Permit No: 5006

Sampling Location: 8

Sampling Type: CM 15

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	2/26/2007	11:00 PM	IU			
START	2/26/2007	11:00 PM				
END	2/27/2007	11:00 PM				
PICKUP	2/27/2007	11:00 PM	IU	1		
PRESERVED	2/27/2007	11:00 PM	IU	1		
DELIVERED	3/1/2007	2:00 PM	BE	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
PO4	0.827	0.02					

**Notes:** All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated. **Comments:**

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 4/5/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To: SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA***

**Sample ID: 20070040**

**Permit No: 5006**

**Sampling Location: 8**

**Sampling Type: CM 15**

**Flow Rate (gpd) : 1**

**Location : STATION #7 - LTC - PIERS**

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	2/26/2007	11:00 PM	IU			
START	2/26/2007	11:00 PM				
END	2/27/2007	11:00 PM				
PICKUP	2/27/2007	5:00 PM	IU	1		
PRESERVED	2/27/2007	5:00 PM	IU	1		
DELIVERED	3/1/2007	2:00 PM	BE	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
PO4	0.889	0.02					

**Notes:** All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated. **Comments:**

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 4/5/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO

Sample ID: 20070045

FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000

Permit No: 5006

Sampling Location: 8

Sampling Type: CM 15

**attention:** ROBERTO MEDINA

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	2/26/2007	11:00 PM	IU			
START	2/26/2007	11:00 PM				
END	2/27/2007	11:00 PM				
PICKUP	2/27/2007	11:00 PM	IU	1		
PRESERVED	2/27/2007	11:00 PM	IU	1		
DELIVERED	3/2/2007	9:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
Cu	0.0141	0.0006	2				
HRD	223	1					
Ni	0.018	0.0006	0.5				
Pb	0.004	0.0004	0.5				
Se	0.0002	0.0001	1				
Zn	0.037	0.005	2				

**Notes:** All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 4/5/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070044  
Permit No: 5006  
Sampling Location: 8  
Sampling Type: CM 15  
Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	2/26/2007	11:00 PM	IU			
START	2/26/2007	11:00 PM				
END	2/27/2007	11:00 PM				
PICKUP	2/27/2007	5:00 PM	IU	1		
PRESERVED	2/27/2007	5:00 PM	IU	1		
DELIVERED	3/2/2007	9:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
Cu	0.0138	0.0006	2				
HRD	222	1					
Ni	0.018	0.0006	0.5				
Pb	0.004	0.0004	0.5				
Se	0.0002	0.0001	1				
Zn	0.03	0.005	2				

**Notes:** All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated. **Comments:**

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 4/5/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention:* ROBERTO MEDINA

Sample ID: 20070046

Permit No: 5006

Sampling Location: 8

Sampling Type: GR

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	2/26/2007	11:00 PM	IU	1		
PRESERVED	2/26/2007					
DELIVERED	3/1/2007	9:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
S_Cu	0.0045	0.0006					
S_Ni	0.0025	0.0006					
S_Pb	ND	0.0004					
S_Se	ND	0.0001					
S_Zn	0.01	0.005					

*Notes: All values in mg/l except for pH and flow rate      Comments:*  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant**  
**Operated by the City of Palo Alto**

**Date:** 4/5/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
 Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
 WOODLAND AVE. AT EAST PALO  
 ALTO  
 FRONTING 1855 WOODLAND  
 PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070042

Permit No: 5006

Sampling Location: 8

Sampling Type: GR

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	2/26/2007	1:00 PM	IU	1		
PRESERVED	2/26/2007					
DELIVERED	3/1/2007	9:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
S_Cu	0.0044	0.0006					
S_Ni	0.0023	0.0006					
S_Pb	ND	0.0004					
S_Se	ND	0.0001					
S_Zn	0.01	0.005					

*Notes: All values in mg/l except for pH and flow rate      Comments:*  
*\*\*" denotes violation*  
*ND denoted "less than detection limit"*  
*gpd = gallons per day*  
*Flow Rate: (D)efault, (C)alculated.*

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 4/5/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070047

Permit No: 5006

Sampling Location: 8

Sampling Type: CM 15

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	2/26/2007	11:00 PM	IU			
START	2/26/2007	11:00 PM				
END	2/27/2007	11:00 PM				
PICKUP	2/27/2007	5:00 PM	IU	1		
PRESERVED	2/27/2007					
DELIVERED	3/1/2007	9:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
S_Cu	0.0044	0.0006					
S_Ni	0.0031	0.0006					
S_Pb	ND	0.0004					
S_Se	ND	0.0001					
S_Zn	0.014	0.005					

*Notes: All values in mg/l except for pH and flow rate      Comments:*  
 "\*\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 4/5/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070037  
Permit No: 5006  
Sampling Location: 8  
Sampling Type: GR  
Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	2/27/2007	5:00 PM	IU	1		
PRESERVED	2/27/2007					
DELIVERED	3/2/2007	9:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
SS	150	0.5	3000				

*Notes: All values in mg/l except for pH and flow rate      Comments:*  
*"\*" denotes violation*  
*ND denoted "less than detection limit"*  
*gpd = gallons per day*  
*Flow Rate: (D)efault, (C)alculated.*



# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 4/5/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070036

Permit No: 5006

Sampling Location: 8

Sampling Type: GR

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	2/27/2007	11:00 PM	IU	1		
PRESERVED	2/27/2007					
DELIVERED	3/2/2007	9:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
SS	150	0.5	3000				

*Notes: All values in mg/l except for pH and flow rate*      *Comments:*  
*"\*" denotes violation*  
*ND denoted "less than detection limit"*  
*gpd = gallons per day*  
*Flow Rate: (D)efault, (C)alculated.*

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 4/5/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070032

Permit No: 5006

Sampling Location: 7

Sampling Type: GR

Flow Rate (gpd) : 1

Location : STATION #4 - SFC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	2/26/2007	12:30 PM	IU	1		
PRESERVED	2/26/2007	12:30 PM	IU	1		
DELIVERED	3/2/2007	9:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
NH3	ND	0.2					

*Notes: All values in mg/l except for pH and flow rate      Comments:*  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 4/5/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention:* ROBERTO MEDINA

Sample ID: 20070033  
Permit No: 5006  
Sampling Location: 7  
Sampling Type: GR  
Flow Rate (gpd) : 1

Location : STATION #4 - SFC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	2/27/2007	5:30 PM	IU	1		
PRESERVED	2/27/2007	5:30 PM	IU	1		
DELIVERED	3/1/2007	2:00 PM	BE	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
PO4	0.398	0.02					

**Notes:** All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 4/5/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To: SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA***

**Sample ID: 20070034  
Permit No: 5006  
Sampling Location: 7  
Sampling Type: GR  
Flow Rate (gpd) : 1**

Location : STATION #4 - SFC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	2/27/2007	5:30 PM	IU	1		
PRESERVED	2/27/2007	5:30 PM	IU	1		
DELIVERED	3/2/2007	9:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
Cu	0.018	0.0006	2				
HRD	161	1					
Ni	0.007	0.0006	0.5				
Pb	0.0025	0.0004	0.5				
Se	0.0002	0.0001	1				
Zn	0.018	0.005	2				

**Notes:** All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

**Comments:**

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 4/5/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To: SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA***

**Sample ID: 20070038**

**Permit No: 5006**

**Sampling Location: 7**

**Sampling Type: GR**

**Flow Rate (gpd) : 1**

**Location : STATION #4 - SFC - PIERS**

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	2/27/2007	5:30 PM	IU	1		
PRESERVED	2/27/2007					
DELIVERED	3/1/2007	9:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
S_Cu	0.0037	0.0006					
S_Ni	0.0026	0.0006					
S_Pb	ND	0.0004					
S_Se	0.0002	0.0001					
S_Zn	0.01	0.005					

**Notes:** All values in mg/l except for pH and flow rate      **Comments:**  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 4/5/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070031

Permit No: 5006

Sampling Location: 7

Sampling Type: GR

Flow Rate (gpd) : 1

Location : STATION #4 - SFC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	2/26/2007	12:30 PM	IU	1		
PRESERVED	2/26/2007					
DELIVERED	3/1/2007	9:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
S_Cu	0.0053	0.0006					
S_Ni	0.003	0.0006					
S_Pb	ND	0.0004					
S_Se	0.0001	0.0001					
S_Zn	0.012	0.005					

**Notes:** All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 4/5/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention:* ROBERTO MEDINA

Sample ID: 20070035  
Permit No: 5006  
Sampling Location: 7  
Sampling Type: GR  
Flow Rate (gpd) : 1

Location : STATION #4 - SFC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	2/27/2007	5:30 PM	IU	1		
PRESERVED	2/27/2007					
DELIVERED	3/2/2007	9:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
SS	57	0.5	3000				

**Notes:** All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated. **Comments:**

WY2007 LAB

SFPL 4/10-11/2007

Chris White

**From:** Zittle, Margaret [Margaret.Zittle@CityofPaloAlto.org]  
**Sent:** Friday, May 11, 2007 2:16 PM  
**To:** Chris White  
**Subject:** RE: LTMAP Piers Lane WY2007 Lab Results--selenium in 2/10-11/2007 samples?

LTP 4/10-11/2007

**Attachments:** sfcreek70084.pdf; sfcreek70056.pdf; sfcreek70057.pdf; sfcreek70058.pdf; sfcreek70059.pdf; sfcreek70061.pdf; sfcreek70062.pdf; sfcreek70063.pdf; sfcreek70064.pdf; sfcreek70065.pdf; sfcreek70067.pdf; sfcreek70073.pdf; sfcreek70074.pdf; sfcreek70075.pdf; sfcreek70077.pdf; sfcreek70078.pdf; sfcreek70079.pdf; sfcreek70080.pdf; sfcreek70081.pdf; sfcreek70082.pdf; sfcreek70083.pdf; sfcreek70076.pdf; sfcreek70016.pdf; sfcreek70017.pdf; sfcreek70021.pdf; sfcreek70022.pdf; sfcreek70023.pdf; sfcreek70027.pdf

all from 4/10-11/2007 sampling but selenium data still not entered (cell empty)

Chris,

Here are the latest results of your tests. Included is the April testing both days and the Se results for February.

---

**From:** Chris White [mailto:cwhite@balancehydro.com]  
**Sent:** Saturday, May 05, 2007 5:13 PM  
**To:** Zittle, Margaret  
**Cc:** Eggleston, Brad  
**Subject:** FW: LTMAP Piers Lane WY2007 Lab Results--selenium in 2/10-11/2007 samples?

Hi Margaret,

I won't bury the question so deep this time! What about the missing 2/10-11/2007 total and dissolved selenium analyses? Selenium was specified on the COC we submitted with those samples. In addition, the lab reports you sent me show a line for selenium but no data, which is why I thought that its' absence might simply be an oversight.

Also, we will need to submit an interim WY2007 monitoring report to the TAC by mid-June, so we would greatly appreciate receiving the lab analyses for the final two wet-season samples (approximate sampling dates of 4/11 and 4/23) at your earliest convenience so that we have time to enter them into our spreadsheets and tables, perform preliminary analyses and resolve any remaining questions with you in advance of submittal.

4/23 and .

Chris White, Principal  
Balance Hydrologics, Inc.  
281 Nevada Street  
Auburn, CA 95603  
(530) 887-9988  
(530) 887-9966 (fax)  
(530) 401-4255 (cell)  
[www.balancehydro.com](http://www.balancehydro.com)

---

**From:** Chris White [mailto:cwhite@balancehydro.com]  
**Sent:** Monday, April 23, 2007 2:19 PM  
**To:** 'Zittle, Margaret'  
**Cc:** 'Jonathan Owens'; 'Zan Rubin'; 'John Gartner'

5/14/2007



# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 5/10/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention:* ROBERTO MEDINA

Sample ID: **20070059**  
Permit No: **5006**  
Sampling Location: **7**  
Sampling Type: **GR**  
Flow Rate (gpd) : **1**

Location : **STATION #4 - SFC - PIERS**

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	4/11/2007	1:45 PM	IU	1		
PRESERVED	4/11/2007	1:45 PM	IU	1		
DELIVERED	4/13/2007	1:00 PM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
NH3	ND	0.2					

*Notes: All values in mg/l except for pH and flow rate      Comments:*  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 5/10/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention:* ROBERTO MEDINA

Sample ID: 20070058

Permit No: 5006

Sampling Location: 7

Sampling Type: CM 15

Flow Rate (gpd) : 1

Location : STATION #4 - SFC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	4/11/2007	11:00 PM	IU			
START	4/11/2007	11:00 PM				
END	4/12/2007	11:00 PM				
PICKUP	4/12/2007	3:00 PM	IU	1		
PRESERVED	4/12/2007	3:00 PM	IU	1		
DELIVERED	4/13/2007	9:00 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
PO4	0.092	0.02					

*Notes:* All values in mg/l except for pH and flow rate      *Comments:*  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

Regional Water Quality Control Plant  
 Operated by the City of Palo Alto

Date: 5/10/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
 Phone: 1-650-329-2598 Fax: 1-650-494-3531

To: SAN FRANCISQUITO CREEK  
 WOODLAND AVE. AT EAST PALO  
 ALTO  
 FRONTING 1855 WOODLAND  
 PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070056

Permit No: 5006

Sampling Location: 7

Sampling Type: CM 15

Flow Rate (gpd) : 1

Location : STATION #4 - SFC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	4/11/2007	11:00 PM	IU			
START	4/11/2007	11:00 PM				
END	4/12/2007	11:00 PM				
PICKUP	4/12/2007	3:00 PM	IU	1		
PRESERVED	4/12/2007	3:00 PM	IU	1		
DELIVERED	4/13/2007	9:00 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
Ag	ND	0.0002	0.25				
Cu	0.0027	0.0006	2				
HRD	349	1					
Ni	0.0034	0.0006	0.5				
Pb	ND	0.0004	0.5				
Se	0.0004	0.0001	1				
Zn	ND	0.005	2				

Notes: All values in mg/l except for pH and flow rate      Comments:  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

Date: 5/10/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070057

Permit No: 5006

Sampling Location: 7

Sampling Type: CM 15

Flow Rate (gpd) : 1

Location : STATION #4 - SFC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	4/11/2007	11:00 PM	IU			
START	4/11/2007	11:00 PM				
END	4/12/2007	11:00 PM				
PICKUP	4/12/2007	3:00 PM	IU	1		PLEASE FILTER
PRESERVED	4/12/2007					
DELIVERED	4/13/2007	9:00 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
S_Ag	ND	0.0002					
S_Cu	0.0023	0.0006					
S_Ni	0.0032	0.0006					
S_Pb	ND	0.0004					
S_Se	0.0004	0.0001					
S_Zn	0.013	0.005					

*Notes: All values in mg/l except for pH and flow rate      Comments:*  
*"\*" denotes violation*  
*ND denoted "less than detection limit"*  
*gpd = gallons per day*  
*Flow Rate: (D)efault, (C)alculated.*

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant**  
**Operated by the City of Palo Alto**

**Date:** 5/10/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
 Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
 WOODLAND AVE. AT EAST PALO  
 ALTO  
 FRONTING 1855 WOODLAND  
 PALO ALTO CA 90000-0000  
**attention:** ROBERTO MEDINA

Sample ID: 20070061

Permit No: 5006

Sampling Location: 7

Sampling Type: GR

Flow Rate (gpd) : 1

Location : STATION #4 - SFC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	4/11/2007	1:45 PM	IU	1		PLEASE FILTER
PRESERVED	4/11/2007					
DELIVERED	4/13/2007	9:00 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
S_Ag	ND	0.0002					
S_Cu	0.0023	0.0006					
S_Ni	0.0031	0.0006					
S_Pb	ND	0.0004					
S_Se	0.0003	0.0001					
S_Zn	0.011	0.005					

*Notes: All values in mg/l except for pH and flow rate      Comments:*  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 5/10/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention:* ROBERTO MEDINA

Sample ID: 20070065

Permit No: 5006

Sampling Location: 8

Sampling Type: GR

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	4/11/2007	1:30 PM	IU	1		
PRESERVED	4/11/2007	1:30 PM	IU	1		
DELIVERED	4/13/2007	9:00 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
NH3	ND	0.2					

*Notes:* All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 5/10/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention:* ROBERTO MEDINA

Sample ID: 20070064

Permit No: 5006

Sampling Location: 8

Sampling Type: CM 15

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	4/11/2007	1:30 PM	IU			
START	4/11/2007	1:30 PM				
END	4/12/2007	1:30 PM				
PICKUP	4/12/2007	1:30 PM	IU	1		
PRESERVED	4/12/2007	1:30 PM	IU	1		
DELIVERED	4/13/2007	9:00 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
PO4	0.245	0.02					

*Notes: All values in mg/l except for pH and flow rate      Comments:*  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 5/10/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070062

Permit No: 5006

Sampling Location: 8

Sampling Type: CM 15

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	4/11/2007	1:30 PM	IU			
START	4/11/2007	1:30 PM				
END	4/12/2007	1:30 PM				
PICKUP	4/12/2007	1:30 PM	IU	1		
PRESERVED	4/12/2007	1:30 PM	IU	1		
DELIVERED	4/13/2007	9:00 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
Ag	ND	0.0002	0.25				
Cu	0.0028	0.0006	2				
HRD	469	1					
Ni	0.0029	0.0006	0.5				
Pb	ND	0.0004	0.5				
Se	0.0001	0.0001	1				
Zn	ND	0.005	2				

*Notes: All values in mg/l except for pH and flow rate      Comments:*  
*"" denotes violation*  
*ND denoted "less than detection limit"*  
*gpd = gallons per day*  
*Flow Rate: (D)efault, (C)alculated.*



# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 5/10/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070063

Permit No: 5006

Sampling Location: 8

Sampling Type: CM 15

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	4/11/2007	1:30 PM	IU			
START	4/11/2007	1:30 PM				
END	4/12/2007	1:30 PM				
PICKUP	4/12/2007	1:30 PM	IU	1		PLEASE FILTER
PRESERVED	4/12/2007					
DELIVERED	4/13/2007	9:00 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
S_Ag	ND	0.0002					
S_Cu	0.0025	0.0006					
S_Ni	0.0027	0.0006					
S_Pb	ND	0.0004					
S_Se	0.0002	0.0001					
S_Zn	0.01	0.005					

*Notes: All values in mg/l except for pH and flow rate      Comments:*  
 "\*\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant**  
**Operated by the City of Palo Alto**

**Date:** 5/10/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
 Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
 WOODLAND AVE. AT EAST PALO  
 ALTO  
 FRONTING 1855 WOODLAND  
 PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070067

Permit No: 5006

Sampling Location: 8

Sampling Type: GR

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	4/11/2007	1:30 PM	IU	1		PLEASE FILTER
PRESERVED	4/11/2007					
DELIVERED	4/13/2007	9:00 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
S_Ag	ND	0.0002					
S_Cu	0.0042	0.0006					
S_Ni	0.0036	0.0006					
S_Pb	ND	0.0004					
S_Se	0.0002	0.0001					
S_Zn	0.006	0.005					

*Notes: All values in mg/l except for pH and flow rate      Comments:*  
*"\*" denotes violation*  
*ND denoted "less than detection limit"*  
*gpd = gallons per day*  
*Flow Rate: (D)efault, (C)alculated.*

602018 WY2007  
LAB

SFL 4/22-23/2007

LTR 4/22-23/2007

**Chris White**

**From:** Zittle, Margaret [Margaret.Zittle@CityofPaloAlto.org]  
**Sent:** Friday, May 11, 2007 2:16 PM  
**To:** Chris White  
**Subject:** RE: LTMAP Piers Lane WY2007 Lab Results--selenium in 2/10-11/2007 samples?  
**Attachments:** sfcreek70084.pdf, sfcreek70056.pdf, sfcreek70057.pdf, sfcreek70058.pdf, sfcreek70059.pdf, sfcreek70061.pdf, sfcreek70062.pdf, sfcreek70063.pdf, sfcreek70064.pdf, sfcreek70065.pdf, sfcreek70067.pdf, sfcreek70073.pdf, sfcreek70074.pdf, sfcreek70075.pdf, sfcreek70077.pdf, sfcreek70078.pdf, sfcreek70079.pdf, sfcreek70080.pdf, sfcreek70081.pdf, sfcreek70082.pdf, sfcreek70083.pdf, sfcreek70076.pdf, sfcreek70015.pdf, sfcreek70017.pdf, sfcreek70021.pdf, sfcreek70022.pdf, sfcreek70023.pdf, sfcreek70027.pdf

All from 4/10-11/2007 sampling but Selenium results still not included

Chris,

Here are the latest results of your tests. Included is the April testing both days and the Se results for February.

**From:** Chris White [mailto:cwhite@balancehydro.com]  
**Sent:** Saturday, May 05, 2007 5:13 PM  
**To:** Zittle, Margaret  
**Cc:** Eggleston, Brad  
**Subject:** FW: LTMAP Piers Lane WY2007 Lab Results--selenium in 2/10-11/2007 samples?

Hi Margaret,

I won't bury the question so deep this time! What about the missing 2/10-11/2007 total and dissolved selenium analyses? Selenium was specified on the COC we submitted with those samples. In addition, the lab reports you sent me show a line for selenium but no data, which is why I thought that its' absence might simply be an oversight.

Also, we will need to submit an interim WY2007 monitoring report to the TAC by mid-June, so we would greatly appreciate receiving the lab analyses for the final two wet-season samples (approximate sampling dates of 4/11 and 4/23) at your earliest convenience so that we have time to enter them into our spreadsheets and tables, perform preliminary analyses and resolve any remaining questions with you in advance of submittal.

4/23 and .

Chris White, Principal  
 Balance Hydrologics, Inc.  
 281 Nevada Street  
 Auburn, CA 95603  
 (530) 887-9988  
 (530) 887-9966 (fax)  
 (530) 401-4255 (cell)  
[www.balancehydro.com](http://www.balancehydro.com)

**From:** Chris White [mailto:cwhite@balancehydro.com]  
**Sent:** Monday, April 23, 2007 2:19 PM  
**To:** 'Zittle, Margaret'  
**Cc:** 'Jonathan Owens'; 'Zan Rubin'; 'John Gartner'

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 5/10/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention:* ROBERTO MEDINA

Sample ID: **20070084**

Permit No: **5006**

Sampling Location: **7**

Sampling Type: **GR**

Flow Rate (gpd) : **1**

Location : **STATION #4 - SFC - PIERS**

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	4/22/2007	7:50 AM	IU	1		
PRESERVED	4/22/2007	7:50 AM	IU	1		
DELIVERED	4/24/2007	2:30 PM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
NH3	ND	0.2					

*Notes: All values in mg/l except for pH and flow rate      Comments:*  
*"\*" denotes violation*  
*ND denoted "less than detection limit"*  
*gpd = gallons per day*  
*Flow Rate: (D)efault, (C)alculated.*

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant**  
**Operated by the City of Palo Alto**

**Date:** 5/10/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
 Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
 WOODLAND AVE. AT EAST PALO  
 ALTO  
 FRONTING 1855 WOODLAND  
 PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: **20070081**

Permit No: **5006**

Sampling Location: **7**

Sampling Type: **CM 15**

Flow Rate (gpd) : **1**

Location : **STATION #4 - SFC - PIERS**

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	4/22/2007	7:50 AM	IU			
START	4/22/2007	7:50 AM				
END	4/23/2007	7:50 AM				
PICKUP	4/23/2007	6:00 PM	IU	1		
PRESERVED	4/23/2007	6:00 PM	IU	1		
DELIVERED	4/24/2007	2:30 PM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
PO4	0.398	0.02					

*Notes: All values in mg/l except for pH and flow rate      Comments:*  
*"\*" denotes violation*  
*ND denoted "less than detection limit"*  
*gpd = gallons per day*  
*Flow Rate: (D)efault, (C)alculated.*

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 5/10/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention:* ROBERTO MEDINA

Sample ID: 20070079

Permit No: 5006

Sampling Location: 7

Sampling Type: CM 15

Flow Rate (gpd) : 1

Location : STATION #4 - SFC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	4/22/2007	7:50 AM	IU			
START	4/22/2007	7:50 AM				
END	4/23/2007	7:50 AM				
PICKUP	4/23/2007	6:00 PM	IU	1		
PRESERVED	4/23/2007	6:00 PM	IU	1		
DELIVERED	4/24/2007	2:30 PM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
Ag	ND	0.0002	0.25				
Cu	0.029	0.0006	2				
HRD	262	1					
Ni	0.007	0.0006	0.5				
Pb	0.0031	0.0004	0.5				
Se	0.0003	0.0001	1				
Zn	0.026	0.005	2				

*Notes:* All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 5/10/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention:* ROBERTO MEDINA

Sample ID: 20070083

Permit No: 5006

Sampling Location: 7

Sampling Type: GR

Flow Rate (gpd) : 1

Location : STATION #4 - SFC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	4/22/2007	7:50 AM	IU	1		
PRESERVED	4/22/2007					
DELIVERED	4/24/2007	2:30 PM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
S_Ag	ND	0.0002					
S_Cu	0.003	0.0006					
S_Ni	0.0027	0.0006					
S_Pb	ND	0.0004					
S_Se	0.0002	0.0001					
S_Zn	0.016	0.005					

*Notes:* All values in mg/l except for pH and flow rate      *Comments:*  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant**  
**Operated by the City of Palo Alto**

**Date:** 5/10/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
 Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
 WOODLAND AVE. AT EAST PALO  
 ALTO  
 FRONTING 1855 WOODLAND  
 PALO ALTO CA 90000-0000  
**attention:** ROBERTO MEDINA

Sample ID: 20070080

Permit No: 5006

Sampling Location: 7

Sampling Type: CM 15

Flow Rate (gpd) : 1

Location : STATION #4 - SFC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	4/22/2007	7:50 AM	IU			
START	4/22/2007	7:50 AM				
END	4/23/2007	7:50 AM				
PICKUP	4/23/2007	6:00 PM	IU	1		PLEASE FILTER
PRESERVED	4/23/2007					
DELIVERED	4/24/2007	2:30 PM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
S_Ag	ND	0.0002					
S_Cu	0.0048	0.0006					
S_Ni	0.0029	0.0006					
S_Pb	ND	0.0004					
S_Se	0.0003	0.0001					
S_Zn	0.017	0.005					

**Notes:** All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated. **Comments:**



# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 5/10/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070082

Permit No: 5006

Sampling Location: 7

Sampling Type: CM 15

Flow Rate (gpd) : 1

Location : STATION #4 - SFC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	4/22/2007	7:50 AM	IU			
START	4/22/2007	7:50 AM				
END	4/23/2007	7:50 AM				
PICKUP	4/23/2007	6:00 PM	IU	1		
PRESERVED	4/23/2007					
DELIVERED	4/24/2007	2:30 PM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
SS	58	0.5	3000				

*Notes: All values in mg/l except for pH and flow rate      Comments:*  
*"\*" denotes violation*  
*ND denoted "less than detection limit"*  
*gpd = gallons per day*  
*Flow Rate: (D)efault, (C)alculated.*

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 5/10/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention:* ROBERTO MEDINA

Sample ID: 20070078

Permit No: 5006

Sampling Location: 8

Sampling Type: GR

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	4/22/2007	7:00 AM	IU	1		
PRESERVED	4/22/2007	7:00 AM	IU	1		
DELIVERED	4/24/2007	2:30 PM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
NH3	ND	0.2					

*Notes: All values in mg/l except for pH and flow rate*      *Comments:*  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

Date: 5/10/2007

To: SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070075

Permit No: 5006

Sampling Location: 8

Sampling Type: CM 15

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	4/22/2007	7:00 AM	IU			
START	4/22/2007	7:00 AM				
END	4/23/2007	7:00 AM				
PICKUP	4/23/2007	5:00 PM	IU	1		
PRESERVED	4/23/2007	5:00 PM	IU	1		
DELIVERED	4/24/2007	2:30 PM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
PO4	0.582	0.02					

*Notes: All values in mg/l except for pH and flow rate      Comments:*  
*"\*" denotes violation*  
*ND denoted "less than detection limit"*  
*gpd = gallons per day*  
*Flow Rate: (D)efault, (C)alculated.*

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

Date: 5/10/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

To: SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070073

Permit No: 5006

Sampling Location: 8

Sampling Type: CM 15

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	4/22/2007	7:00 AM	IU			
START	4/22/2007	7:00 AM				
END	4/23/2007	7:00 AM				
PICKUP	4/23/2007	5:00 PM	IU	1		
PRESERVED	4/23/2007	5:00 PM	IU	1		
DELIVERED	4/24/2007	2:30 PM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
Ag	ND	0.0002	0.25				
Cu	0.0074	0.0006	2				
HRD	343	1					
Ni	0.007	0.0006	0.5				
Pb	0.0017	0.0004	0.5				
Se	0.0002	0.0001	1				
Zn	0.019	0.005	2				

Notes: All values in mg/l except for pH and flow rate      Comments:  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant**  
**Operated by the City of Palo Alto**

Date: 5/10/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
 Phone: 1-650-329-2598 Fax: 1-650-494-3531

To: SAN FRANCISQUITO CREEK  
 WOODLAND AVE. AT EAST PALO  
 ALTO  
 FRONTING 1855 WOODLAND  
 PALO ALTO CA 90000-0000  
**attention:** ROBERTO MEDINA

Sample ID: 20070074

Permit No: 5006

Sampling Location: 8

Sampling Type: CM 15

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	4/22/2007	7:00 AM	IU			
START	4/22/2007	7:00 AM				
END	4/23/2007	7:00 AM				
PICKUP	4/23/2007	5:00 PM	IU	1		PLEASE FILTER
PRESERVED	4/23/2007					
DELIVERED	4/24/2007	2:30 PM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
S_Ag	ND	0.0002					
S_Cu	0.0037	0.0006					
S_Ni	0.0028	0.0006					
S_Pb	ND	0.0004					
S_Se	0.0001	0.0001					
S_Zn	0.028	0.005					

*Notes: All values in mg/l except for pH and flow rate      Comments:*  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

Regional Water Quality Control Plant  
 Operated by the City of Palo Alto

Date: 5/10/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
 Phone: 1-650-329-2598 Fax: 1-650-494-3531

To: SAN FRANCISQUITO CREEK  
 WOODLAND AVE. AT EAST PALO  
 ALTO  
 FRONTING 1855 WOODLAND  
 PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070077

Permit No: 5006

Sampling Location: 8

Sampling Type: GR

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	4/22/2007	7:00 AM	IU	1		PLEASE FILTER
PRESERVED	4/22/2007					
DELIVERED	4/24/2007	2:30 PM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
S_Ag	ND	0.0002					
S_Cu	0.0059	0.0006					
S_Ni	0.0032	0.0006					
S_Pb	ND	0.0004					
S_Se	0.0002	0.0001					
S_Zn	0.027	0.005					

Notes: All values in mg/l except for pH and flow rate      Comments:

    "\*" denotes violation

    ND denoted "less than detection limit"

    gpd = gallons per day

    Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant**  
**Operated by the City of Palo Alto**

**Date:** 5/11/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
 Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
 WOODLAND AVE. AT EAST PALO  
 ALTO  
 FRONTING 1855 WOODLAND  
 PALO ALTO CA 90000-0000

Sample ID: 20070076

Permit No: 5006

Sampling Location: 8

Sampling Type: CM 15

Flow Rate (gpd) : 1

**attention:** ROBERTO MEDINA

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	4/22/2007	7:00 AM	IU			
START	4/22/2007	7:00 AM				
END	4/23/2007	7:00 AM				
PICKUP	4/23/2007	5:00 PM	IU	1		
PRESERVED	4/23/2007					
DELIVERED	4/24/2007	2:30 PM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
SS	46	0.5	3000				

*Notes: All values in mg/l except for pH and flow rate      Comments:*

*"\*" denotes violation*

*ND denoted "less than detection limit"*

*gpd = gallons per day*

*Flow Rate: (D)efault, (C)alculated.*

**Chris White**

**From:** Zittle, Margaret [Margaret.Zittle@CityofPaloAlto.org]  
**Sent:** Monday, April 23, 2007 10:41 AM  
**To:** Chris White  
**Subject:** RE: Piers Lane Sampling Results for 2/10-11/2007=Newell Road for 2/26-27/2007?  
**Attachments:** sfcreek70041.pdf, sfcreek70016.pdf, sfcreek70017.pdf, sfcreek70021.pdf, sfcreek70022.pdf, sfcreek70023.pdf, sfcreek70024.pdf, sfcreek70027.pdf, sfcreek70033.pdf, sfcreek70040.pdf, sfcreek70018.pdf

*2/10-11/07 - missing TOTAL P analysis*  
*2/10-11/2007 - SFPL*  
*2/10-11/2007 - LPL*  
*2/26-27/2007*

Hi Chris,

Here are the analysis reports that belong to the samples in question that you are still looking for. I hope I have answered all of your questions.

Regards,

\*

Margaret

---

**From:** Chris White [mailto:cwhite@balancehydro.com]  
**Sent:** Sunday, April 22, 2007 9:37 PM  
**To:** Zittle, Margaret  
**Subject:** RE: Piers Lane Sampling Results for 2/10-11/2007=Newell Road for 2/26-27/2007?

Hi Margaret,

Just a reminder that when we spoke on 4/10, I let you know that the sample analyses accompanying the email below appeared to be for the Newell Road station on 2/26-27 and not for either of our Piers Lane stations. You were going to look into it and I would appreciate a simple confirmation that none of them were for one of the Piers Lane stations (i.e., the missing 2/10-11 SFC Total Phosphate sample).

Thanks,  
Chris

Chris White, Principal  
Balance Hydrologics, Inc.  
281 Nevada Street  
Auburn, CA 95603  
(530) 887-9988  
(530) 887-9966 (fax)  
(530) 401-4255 (cell)

Our newest office is located just off I-80 Reno in central Auburn. A map to the Auburn office is posted on the Balance website: [www.balancehydro.com](http://www.balancehydro.com).

---

**From:** Zittle, Margaret [mailto:Margaret.Zittle@CityofPaloAlto.org]  
**Sent:** Tuesday, April 10, 2007 1:44 PM  
**To:** Chris White  
**Subject:** RE: Piers Lane Sampling Results for 2/10-11/2007

I forgot some.....

4/23/2007



# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 4/23/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To: SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA***

**Sample ID: 20070018**

**Permit No: 5006**

**Sampling Location: 7**

**Sampling Type: CM 15**

**Flow Rate (gpd) : 1**

**Location : STATION #4 - SFC - PIERS**

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	2/10/2007	10:55 AM	IU			
START	2/10/2007	10:55 AM				
END	2/11/2007	10:55 AM				
PICKUP	2/11/2007	3:00 PM	IU	1		
PRESERVED	2/11/2007	3:00 PM	IU	1		
DELIVERED	2/14/2007	9:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
PO4	0.337	0.02					

**Notes:** All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

**Comments:**

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 4/5/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To: SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention:* ROBERTO MEDINA**

Sample ID: 20070041

Permit No: 5006

Sampling Location: 8

Sampling Type: CM 15

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	2/26/2007	11:00 PM	IU			
START	2/26/2007	11:00 PM				
END	2/27/2007	11:00 PM				
PICKUP	2/27/2007	11:00 PM	IU	1		
PRESERVED	2/27/2007	11:00 PM	IU	1		
DELIVERED	3/1/2007	2:00 PM	BE	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
PO4	0.827	0.02					

*Notes: All values in mg/l except for pH and flow rate      Comments:*  
*"\*" denotes violation*  
*ND denoted "less than detection limit"*  
*gpd = gallons per day*  
*Flow Rate: (D)efault, (C)alculated.*

202018 WY2007  
LAB RESULTS  
missing data from  
2/10-11/2007  
4/10-11/2007  
Samples

**Chris White**

**From:** Zittle, Margaret [Margaret.Zittle@CityofPaloAlto.org]  
**Sent:** Wednesday, May 16, 2007 3:34 PM  
**To:** Chris White  
**Subject:** RE: LTMAP Piers Lane WY2007 Lab Results--no Tss result for SFC-Piers 4/10-11/2007 sample?

**Attachments:** sfcreekfeb&apr.pdf — saved as 6 individual pdfs  
— total w/ previously received (electronically) analyses

70016  
70017 = Se for total dissolved SFC & LTC  
70027  
70023  
70060 = TSS for 4/11-12/07  
70066 = TSS for SFC & LTC

Here are hopefully the last of the reports.

**From:** Chris White [mailto:cwhite@balancehydro.com]  
**Sent:** Tuesday, May 15, 2007 11:13 AM  
**To:** Zittle, Margaret  
**Subject:** RE: LTMAP Piers Lane WY2007 Lab Results--no Tss result for SFC-Piers 4/10-11/2007 sample?

Hi Margaret,

I just finished reviewing the lab reports you sent me last week.

RE lab results for the 4/10-11/2007 samples: the lab reports match the Chain of Custody (COC) form EXCEPT that we didn't receive back from you a total suspended solids analysis for the SFC station. Looking at the sequencing of the lab reports: could it be lab report 70060 or 70066?

The other SFC analyses and all of the LTC analyses were accounted for.

RE lab results for the 4/22-23/samples: All SFC and LTC analyses requested on the COC were accounted for.

RE samples for the 2/10-11/2007: the total and dissolved selenium data are still missing (see separate email sent earlier this morning).

Your help in resolving these remaining questions would be much appreciated!

Thank you,  
Chris

Chris White, Principal  
Balance Hydrologics, Inc.  
281 Nevada Street  
Auburn, CA 95603  
(530) 887-9988  
(530) 887-9966 (fax)  
(530) 401-4255 (cell)  
[www.balancehydro.com](http://www.balancehydro.com)

**From:** Zittle, Margaret [mailto:Margaret.Zittle@CityofPaloAlto.org]

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 5/16/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention:* ROBERTO MEDINA

**Sample ID:** 20070023

**Permit No:** 5006

**Sampling Location:** 8

**Sampling Type:** CM 15

**Flow Rate (gpd) :** 1

**Location :** STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	2/10/2007	10:30 AM	IU			
START	2/10/2007	10:30 AM				
END	2/11/2007	10:30 AM				
PICKUP	2/11/2007	3:00 PM	IU	1		
PRESERVED	2/11/2007					
DELIVERED	2/14/2007	9:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
S_Cu	0.0029	0.0006					
S_Ni	0.014	0.0006					
S_Pb	ND	0.0004					
S_Se	ND	0.0001					
S_Zn	ND	0.005					

**Notes:** All values in mg/l except for pH and flow rate      **Comments:**  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 5/16/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000

**Sample ID:** 20070022

**Permit No:** 5006

**Sampling Location:** 8

**Sampling Type:** CM 15

**Flow Rate (gpd) :** 1

**attention:** ROBERTO MEDINA

**Location :** STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	2/10/2007	10:30 AM	IU			
START	2/10/2007	10:30 AM				
END	2/11/2007	10:30 AM				
PICKUP	2/11/2007	3:00 PM	IU	1		
PRESERVED	2/11/2007	3:00 PM	IU	1		
DELIVERED	2/14/2007	9:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
Cu	0.0045	0.0006	2				
HRD	392	1					
Ni	0.0046	0.0006	0.5				
Pb	0.001	0.0004	0.5				
Se	ND	0.0001	1				
Zn	0.01	0.005	2				

**Notes:** All values in mg/l except for pH and flow rate      **Comments:**

"\*" denotes violation

ND denoted "less than detection limit"

gpd = gallons per day

Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 5/16/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention:* ROBERTO MEDINA

Sample ID: 20070017

Permit No: 5006

Sampling Location: 7

Sampling Type: CM 15

Flow Rate (gpd) : 1

Location : STATION #4 - SFC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	2/10/2007	10:55 AM	IU			
START	2/10/2007	10:55 AM				
END	2/11/2007	10:55 AM				
PICKUP	2/11/2007	3:00 PM	IU	1		
PRESERVED	2/11/2007					
DELIVERED	2/14/2007	9:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
S_Cu	0.0043	0.0006					
S_Ni	0.003	0.0006					
S_Pb	ND	0.0004					
S_Se	0.0001	0.0001					
S_Zn	0.028	0.005					

*Notes: All values in mg/l except for pH and flow rate      Comments:*  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 5/16/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000

Sample ID: 20070016

Permit No: 5006

Sampling Location: 7

Sampling Type: CM 15

Flow Rate (gpd) : 1

**attention:** ROBERTO MEDINA

Location : STATION #4 - SFC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	2/10/2007	10:55 AM	IU			
START	2/10/2007	10:55 AM				
END	2/11/2007	10:55 AM				
PICKUP	2/11/2007	3:00 PM	IU	1		
PRESERVED	2/11/2007	3:00 PM	IU	1		
DELIVERED	2/14/2007	9:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
Cu	0.0137	0.0006	2				
HRD	289	1					
Ni	0.006	0.0006	0.5				
Pb	0.0015	0.0004	0.5				
Se	0.0002	0.0001	1				
Zn	0.016	0.005	2				

**Notes:** All values in mg/l except for pH and flow rate  
 "\*\*\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 5/16/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention:* ROBERTO MEDINA

Sample ID: 20070060  
Permit No: 5006  
Sampling Location: 7  
Sampling Type: CM 15  
Flow Rate (gpd) : 1

Location : STATION #4 - SFC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	4/11/2007	11:00 PM	IU			
START	4/11/2007	11:00 PM				
END	4/12/2007	11:00 PM				
PICKUP	4/12/2007	1:00 PM	IU	1		
PRESERVED	4/12/2007					
DELIVERED	4/13/2007	9:00 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
SS	2	0.5	3000				

*Notes: All values in mg/l except for pH and flow rate      Comments:*  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.



# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 5/16/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention:* ROBERTO MEDINA

**Sample ID:** 20070066

**Permit No:** 5006

**Sampling Location:** 8

**Sampling Type:** CM 15

**Flow Rate (gpd) :** 1

**Location :** STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP	4/11/2007	1:30 PM	IU			
START	4/11/2007	1:30 PM				
END	4/12/2007	1:30 PM				
PICKUP	4/12/2007	1:30 PM	IU	1		
PRESERVED	4/12/2007					
DELIVERED	4/13/2007	9:00 AM	IU	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
SS	1	0.5	3000				

**Notes:** All values in mg/l except for pH and flow rate      **Comments:**  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

202018 WY 2007  
US2/8-10/2007  
SAMPLING  
(Corrected)**Chris White**

**From:** Zittle, Margaret [Margaret.Zittle@CityofPaloAlto.org]  
**Sent:** Tuesday, July 10, 2007 9:28 AM  
**To:** Chris White  
**Subject:** RE: LTMAP Piers Lane Water Year 2007---seeking three more analyses?  
**Attachments:** sfcreek70016.pdf; sfcreek70019.pdf; sfcreek70027.pdf; sfcreek70017.pdf; sfcreek70021.pdf; sfcreek70022.pdf; sfcreek70023.pdf

Chris,

Here are all the sample results I believe you needed.

Thanks,

Margaret

---

**From:** Chris White [mailto:cwhite@balancehydro.com]  
**Sent:** Thursday, July 05, 2007 3:05 PM  
**To:** Zittle, Margaret  
**Subject:** LTMAP Piers Lane Water Year 2007---seeking three more analyses?

Hi Margaret,

I have now entered all of the 2006-07 WQ data for the two LTMAP Piers Lane stations and found three missing data points from samples submitted to the RWQCP for analysis. I have checked through all of our files and our communications and still couldn't find them, so I'm hoping that these reports were simply overlooked in our exchanges and that you can provide me with them ASAP.

The three missing items are:

- ✓ 1) Dissolved selenium for grab samples collected 2/10/2007: lab reports #20070021 (SFC-Piers Lane) and 20070027 (LTC-Piers Lane). You did send me the missing total and dissolved selenium analyses for other lab reports from the same sampling event but not for these two.
- ✗ 2) Total suspended solids for the composite sample collected from SFC-Piers Lane on 4/10-11/2007. I don't have a lab report number for this one. *HAD REPORT*

Please call me if you have any questions.

Thank you,  
Chris

Chris White, Principal  
 Balance Hydrologics, Inc.  
 281 Nevada Street  
 Auburn, CA 95603  
 (530) 887-9988  
 (530) 887-9966 (fax)  
 (530) 401-4255 (cell)  
[www.balancehydro.com](http://www.balancehydro.com)

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 7/10/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070021

Permit No: 5006

Sampling Location: 7

Sampling Type: GR

Flow Rate (gpd) : 1

Location : STATION #4 - SFC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	2/10/2007	10:55 AM	IU	1		
PRESERVED	2/10/2007					
DELIVERED	2/14/2007	9:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
S_Cu	0.003	0.0006					
S_Ni	0.0031	0.0006					
S_Pb	ND	0.0004					
S_Se	0.0001	0.0001					
S_Zn	0.018	0.005					

**Notes:** All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated. **Comments:**

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 7/10/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070027

Permit No: 5006

Sampling Location: 8

Sampling Type: GR

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	2/10/2007	10:30 AM	IU	1		
PRESERVED	2/10/2007					
DELIVERED	2/14/2007	9:30 AM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
S_Cu	0.0044	0.0006					
S_Ni	0.0023	0.0006					
S_Pb	ND	0.0004					
S_Se	0.0001	0.0001					
S_Zn	0.013	0.005					

**Notes:** All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated. **Comments:**

2020:8  
WY 2007  
LAB  
July 11, 2007  
Sampling

**Chris White**

---

**From:** Zittle, Margaret [Margaret.Zittle@CityofPaloAlto.org]  
**Sent:** Tuesday, August 28, 2007 11:16 AM  
**To:** Chris White  
**Subject:** Sampling Results  
**Attachments:** sfcreek70912.pdf; sfcreek70913.pdf; sfcreek70914.pdf; sfcreek70915.pdf; sfcreek70916.pdf; sfcreek70917.pdf; sfcreek70918.pdf; sfcreek70919.pdf

Hi Chris,

The attached files are the recent sampling results from SF Creek monitoring. If you have any questions, just give me a call.

Thanks,

Margaret Zittle  
City of Palo Alto  
Environmental Compliance  
2501 Embarcadero Way  
Palo Alto, CA 94303  
(650) 329-2514

\_\_\_\_\_ NOD32 2489 (20070828) Information \_\_\_\_\_

This message was checked by NOD32 antivirus system.  
<http://www.eset.com>

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

Regional Water Quality Control Plant  
Operated by the City of Palo Alto

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

Date: 8/24/2007

To: SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070919

Permit No: 5006

Sampling Location: 7

Sampling Type: GR

Flow Rate (gpd) : 1

Location : STATION #4 - SFC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	7/11/2007	6:00 PM	IU	1		
PRESERVED	7/11/2007	6:00 PM	IU	1		
DELIVERED	7/12/2007	1:45 PM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
NH3	ND	0.2					

*Notes: All values in mg/l except for pH and flow rate*  
*"\*" denotes violation*  
*ND denoted "less than detection limit"*  
*gpd = gallons per day*  
*Flow Rate: (D)efault, (C)alculated.*

*Comments:*

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 8/24/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention:* ROBERTO MEDINA

Sample ID: 20070918

Permit No: 5006

Sampling Location: 7

Sampling Type: GR

Flow Rate (gpd) : 1

Location : STATION #4 - SFC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	7/11/2007	6:00 PM	IU	1		
PRESERVED	7/11/2007	6:00 PM	IU	1		
DELIVERED	7/12/2007	1:45 PM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
PO4	0.184	0.02					

*Notes: All values in mg/l except for pH and flow rate*      *Comments:*  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant**  
**Operated by the City of Palo Alto**

**Date:** 8/24/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
 Phone: 1-650-329-2598 Fax: 1-650-494-3331

**To:** SAN FRANCISQUITO CREEK  
 WOODLAND AVE. AT EAST PALO ALTO  
 FRONTING 1855 WOODLAND  
 PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070917

Permit No: 5006

Sampling Location: 7

Sampling Type: GR

Flow Rate (gpd) : 1

Location : STATION #4 - SFC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	7/11/2007	6:00 PM	IU	1		
PRESERVED	7/11/2007	6:00 PM	IU	1		
DELIVERED	7/12/2007	1:45 PM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
HRD	455	1					

**Notes:** All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.



# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant**  
**Operated by the City of Palo Alto**

**Date:** 8/24/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
 Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
 WOODLAND AVE. AT EAST PALO  
 ALTO  
 FRONTING 1855 WOODLAND  
 PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070916

Permit No: 5006

Sampling Location: 7

Sampling Type: GR

Flow Rate (gpd) : 1

Location : STATION #4 - SFC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	7/11/2007	6:00 PM	IU	1		PLEASE FILTER
PRESERVED	7/11/2007					
DELIVERED	7/12/2007	1:45 PM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
S_Ag	ND	0.0002					
S_Cu	0.0016	0.0006					
S_Ni	0.003	0.0006					
S_Pb	ND	0.0004					
S_Se	0.0003	0.0001					
S_Zn	ND	0.005					

*Notes: All values in mg/l except for pH and flow rate*      *Comments:*  
*"" denotes violation*  
*ND denoted "less than detection limit"*  
*gpd = gallons per day*  
*Flow Rate: (D)efault, (C)alculated.*

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant**  
**Operated by the City of Palo Alto**

**Date:** 8/24/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
 Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To: SAN FRANCISQUITO CREEK**  
**WOODLAND AVE. AT EAST PALO**  
**ALTO**  
**FRONTING 1855 WOODLAND**  
**PALO ALTO CA 90000-0000**  
*attention: ROBERTO MEDINA*

Sample ID: 20070915

Permit No: 5006

Sampling Location: 8

Sampling Type: GR

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	7/11/2007	5:30 PM	IU	1		
PRESERVED	7/11/2007	5:30 PM	IU	1		
DELIVERED	7/12/2007	1:45 PM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
NH3	ND	0.2					

*Notes: All values in mg/l except for pH and flow rate*      *Comments:*  
 "\*\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 8/24/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070914

Permit No: 5006

Sampling Location: 8

Sampling Type: GR

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	7/11/2007	5:30 PM	IU	1		
PRESERVED	7/11/2007	5:30 PM	IU	1		
DELIVERED	7/12/2007	1:45 PM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
PO4	0.337	0.02					

**Notes:** All values in mg/l except for pH and flow rate      **Comments:**  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated.

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 8/24/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070913

Permit No: 5006

Sampling Location: 8

Sampling Type: GR

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	7/11/2007	5:30 PM	IU	1		
PRESERVED	7/11/2007	5:30 PM	IU	1		
DELIVERED	7/12/2007	1:45 PM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
HRD	805	1					

**Notes:** All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated. **Comments:**

# SAMPLE CHAIN OF CUSTODY AND ANALYSIS REPORT

**Regional Water Quality Control Plant  
Operated by the City of Palo Alto**

**Date:** 8/24/2007

2501 Embarcadero Way, Palo Alto, CA 94303  
Phone: 1-650-329-2598 Fax: 1-650-494-3531

**To:** SAN FRANCISQUITO CREEK  
WOODLAND AVE. AT EAST PALO  
ALTO  
FRONTING 1855 WOODLAND  
PALO ALTO CA 90000-0000  
*attention: ROBERTO MEDINA*

Sample ID: 20070912

Permit No: 5006

Sampling Location: 8

Sampling Type: GR

Flow Rate (gpd) : 1

Location : STATION #7 - LTC - PIERS

Activity	Date	Time	By	Bottle	pH	Remarks
SET UP						
START						
END						
PICKUP	7/11/2007	5:30 PM	IU	1		PLEASE FILTER
PRESERVED	7/11/2007					
DELIVERED	7/12/2007	1:45 PM	MZ	1		
RECEIVED						

Parameter	Result	Detect Limit	Limits				
			Local	Special	Fed Max	Fed 30D	Fed 4D
S_Ag	ND	0.0002					
S_Cu	0.0022	0.0006					
S_Ni	0.0033	0.0006					
S_Pb	ND	0.0004					
S_Se	0.0003	0.0001					
S_Zn	ND	0.005					

**Notes:** All values in mg/l except for pH and flow rate  
 "\*" denotes violation  
 ND denoted "less than detection limit"  
 gpd = gallons per day  
 Flow Rate: (D)efault, (C)alculated. **Comments:**

## **APPENDIX B**

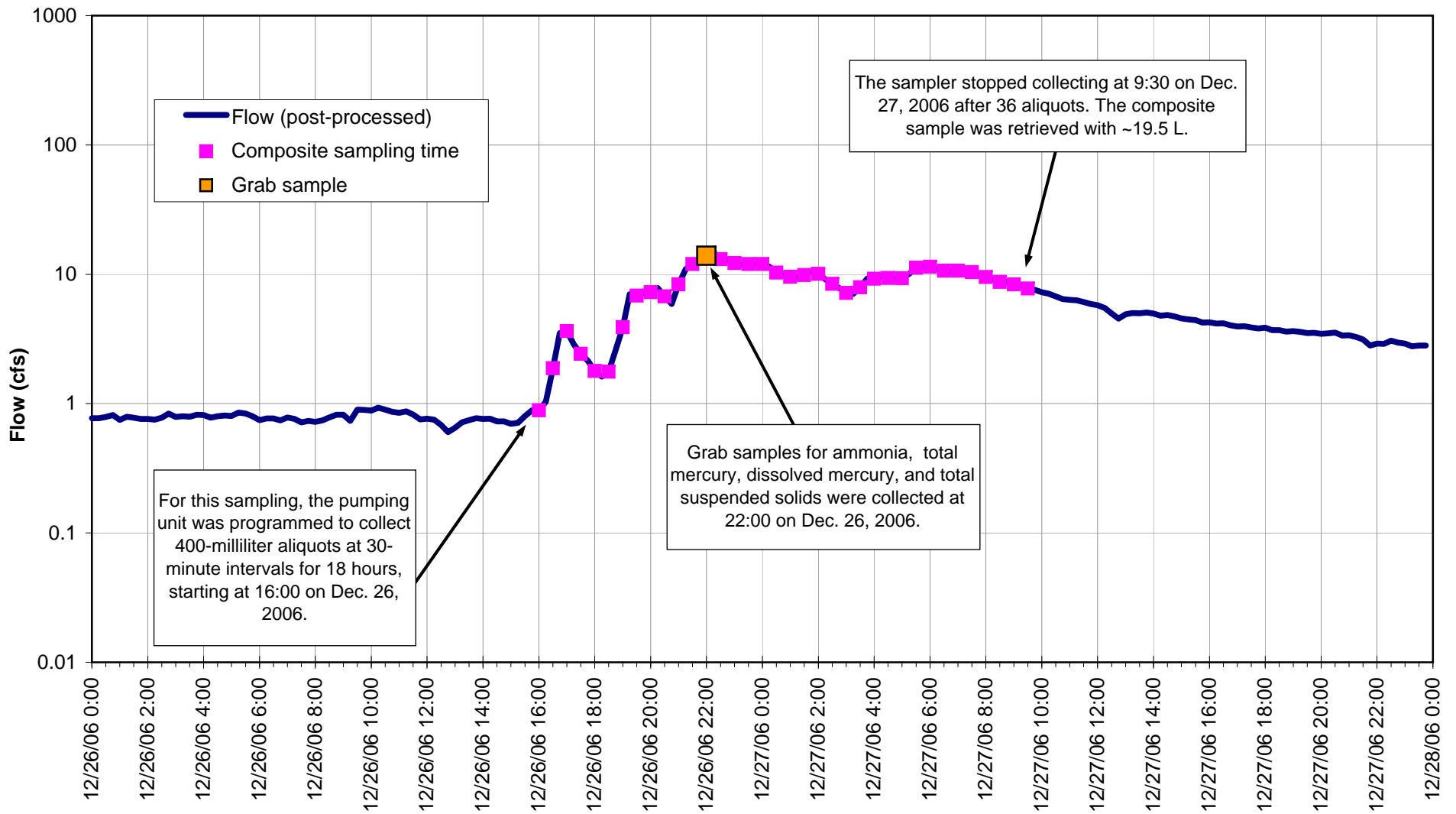
### **Laboratory Results and Chain of Custody Forms (Bear Creek)**

Placeholder included in this year's report because no water quality sampling occurred at Bear Creek in Water Year 2007

## **APPENDIX C**

### **Detailed Hydrographs of Periods during which Composite Samples were Collected**

- Figure C1. Water-quality sampling detailed hydrograph, Dec. 26 to 27, 2006, Los Trancos Creek at Piers Lane
- Figure C2. Water-quality sampling detailed hydrograph, Dec. 26 to 27, 2006, San Francisquito Creek at Piers Lane
- Figure C3. Water-quality sampling detailed hydrograph, Feb. 8 to 10, 2007, Los Trancos Creek at Piers Lane
- Figure C4. Water-quality sampling detailed hydrograph, Feb. 8 to 10, 2007, San Francisquito Creek at Piers Lane
- Figure C5. Water-quality sampling detailed hydrograph, Feb. 26 to 28 2007, Los Trancos Creek at Piers Lane
- Figure C6. Water-quality sampling detailed hydrograph, Feb. 26 to 28 2007, San Francisquito Creek at Piers Lane
- Figure C7. Water-quality sampling detailed hydrograph, April 11 to 12, 2007, Los Trancos Creek at Piers Lane
- Figure C8. Water-quality sampling detailed hydrograph, April 11 to 12, 2007, San Francisquito Creek at Piers Lane
- Figure C9. Water-quality sampling detailed hydrograph, April 21 to 22, 2007, Los Trancos Creek at Piers Lane
- Figure C10. Water-quality sampling detailed hydrograph, April 21 to 22, 2007, San Francisquito Creek at Piers Lane
- Figure C11. Water-quality sampling detailed hydrograph, July 11, 2007, Los Trancos, Creek at Piers Lane
- Figure C12. Water-quality sampling detailed hydrograph, July 11, 2007, San Francisquito Creek at Piers Lane

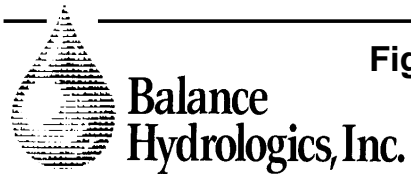
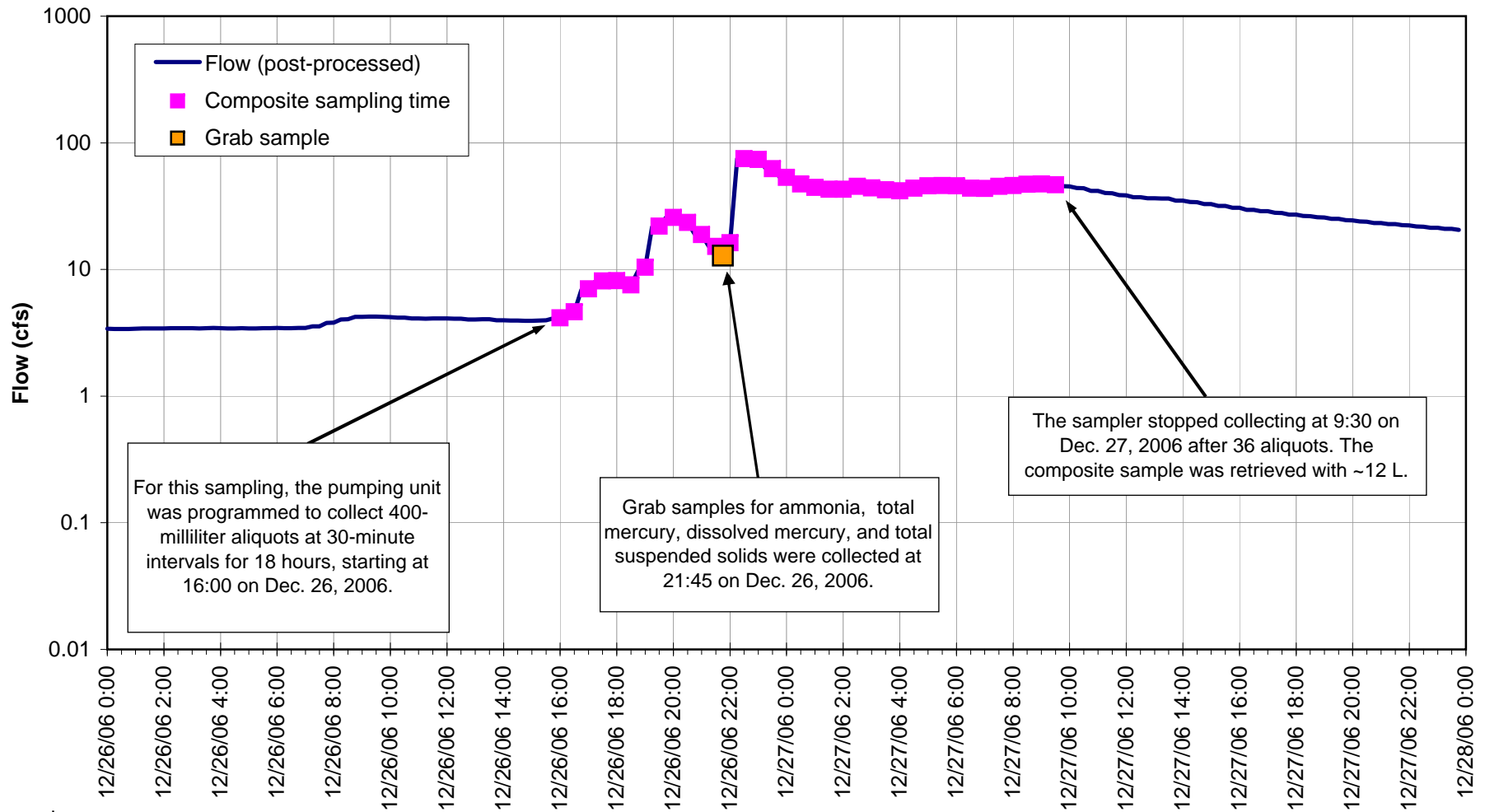


**Balance  
Hydrologics, Inc.**

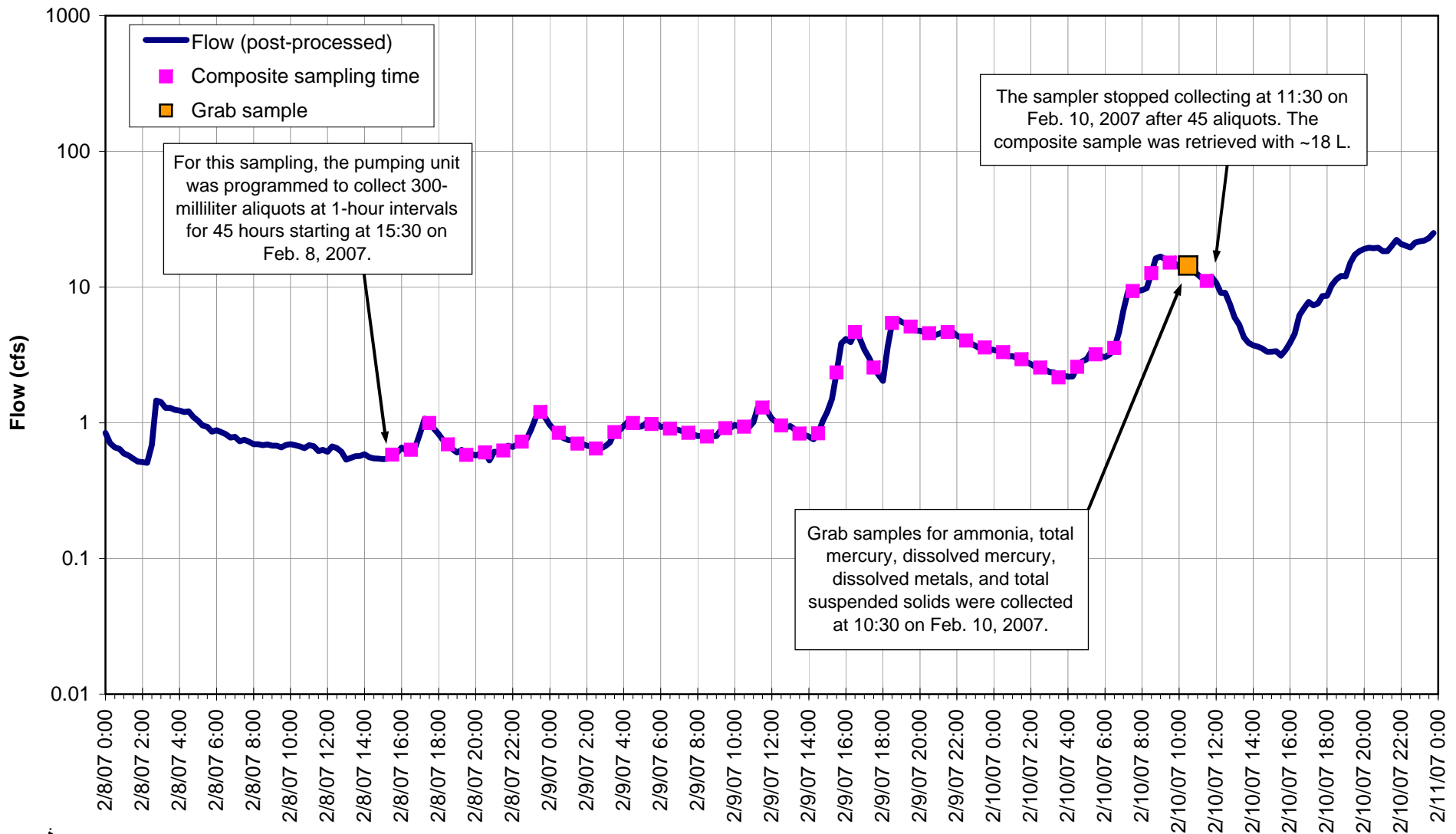
**Figure C1. Water-quality sampling detailed hydrograph, December 26 to 27, 2006, Los**

**Trancos Creek at Piers Lane.** This sampling was intended to capture runoff from the first-flush event. The sampling (using the automated sampler) was time-paced and grab samples were collected at the flow peak.





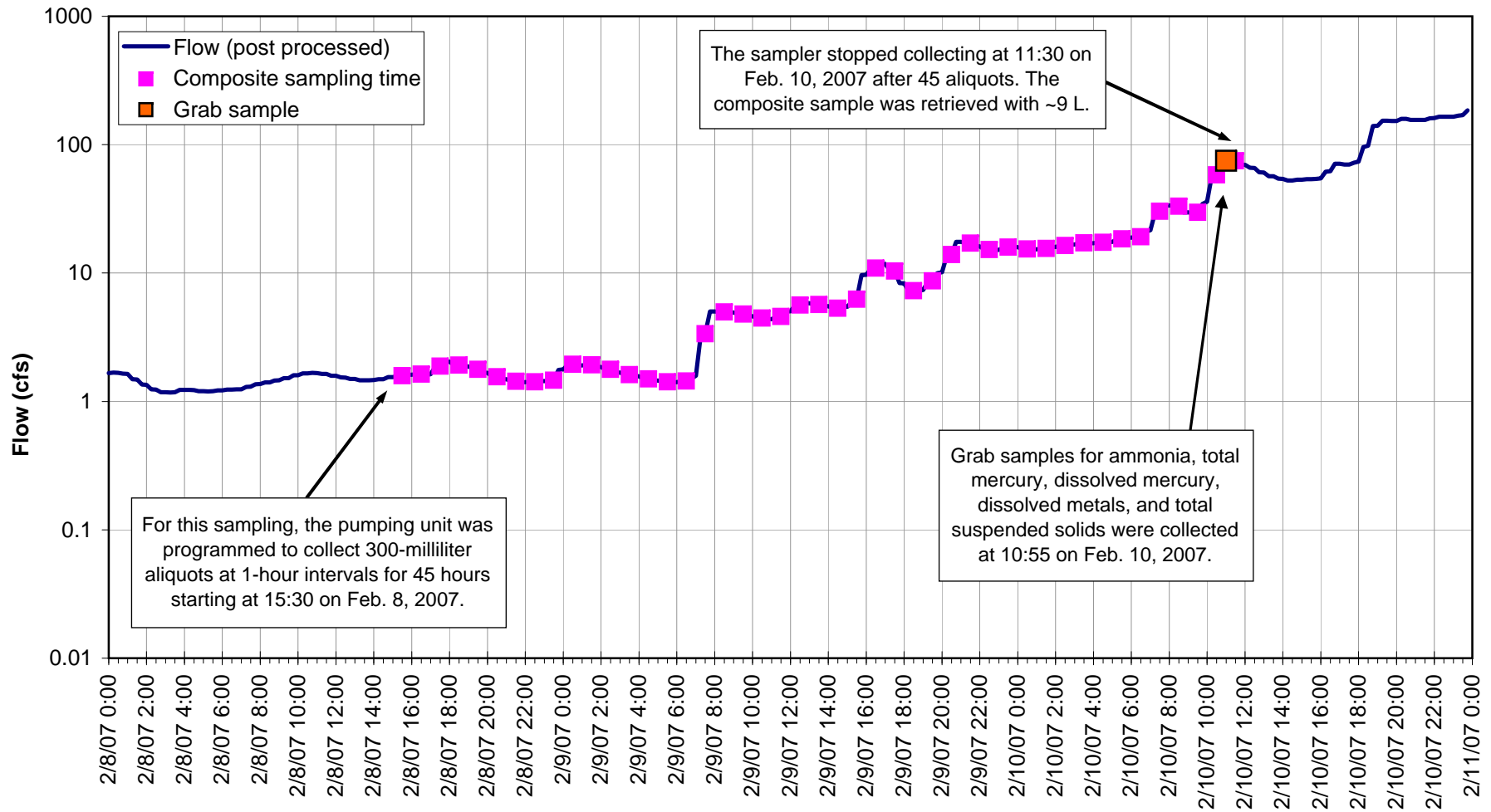
**Figure C2. Water-quality sampling detailed hydrograph, December 26 to 27, 2006, San Francisquito Creek at Piers Lane.** This sampling was intended to capture runoff from the first-flush event. The sampling (using the automated sampler) was time-paced and grab samples were collected before the largest flow peak.



**Balance  
Hydrologics, Inc.**

**Figure C3. Water-quality sampling detailed hydrograph, February 8 to 10, 2007, Los Trancos**

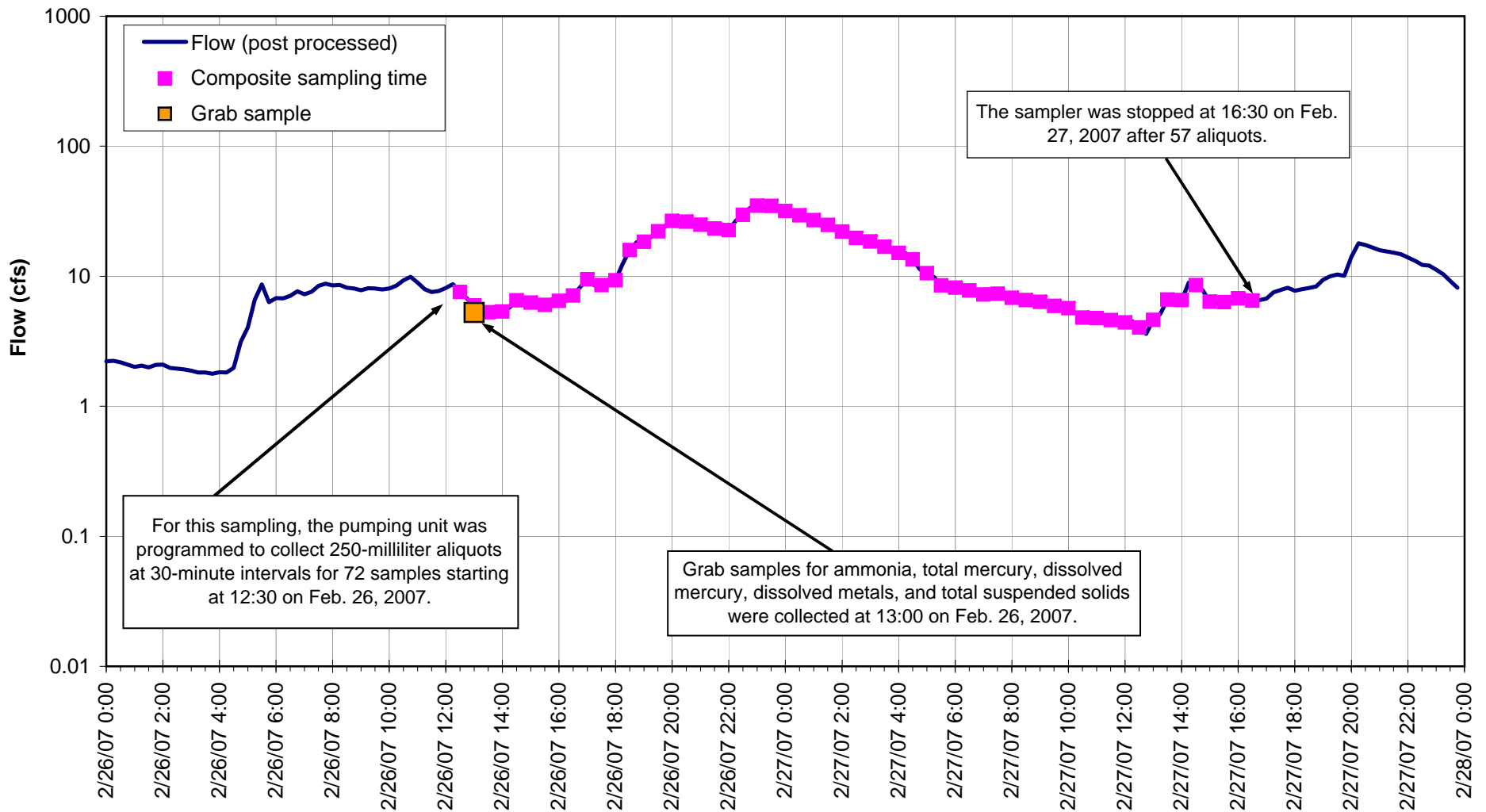
**Creek at Piers Lane.** This sampling was intended to capture runoff from a moderate winter storm. The sampling (using the automated sampler) was time-paced and grab samples were collected just after an initial flow peak on Feb. 10, 2007, although the creek did rise higher on Feb. 11, 2007.



**Balance  
Hydrologics, Inc.**

**Figure C4. Water-quality sampling detailed hydrograph, February 8 to 10, 2007, San**

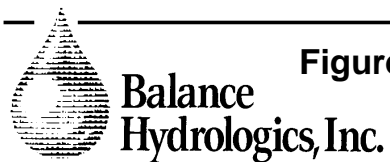
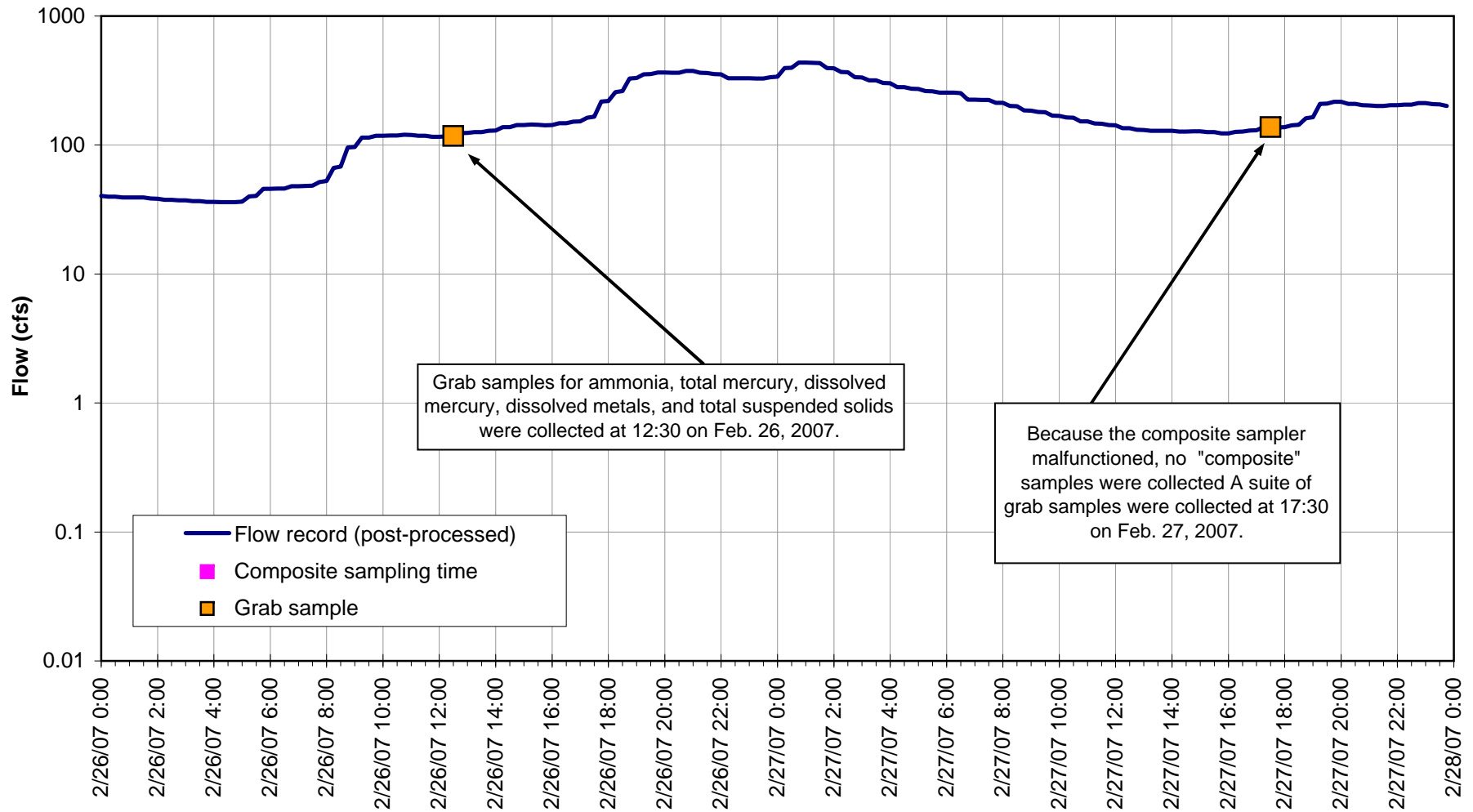
**Francisquito Creek at Piers Lane.** This sampling was intended to capture runoff from a moderate winter storm. The sampling (using the automated sampler) was time-paced and grab samples were collected just after an initial flow peak on Feb. 10, 2007, although the creek did rise higher on Feb. 11, 2007.



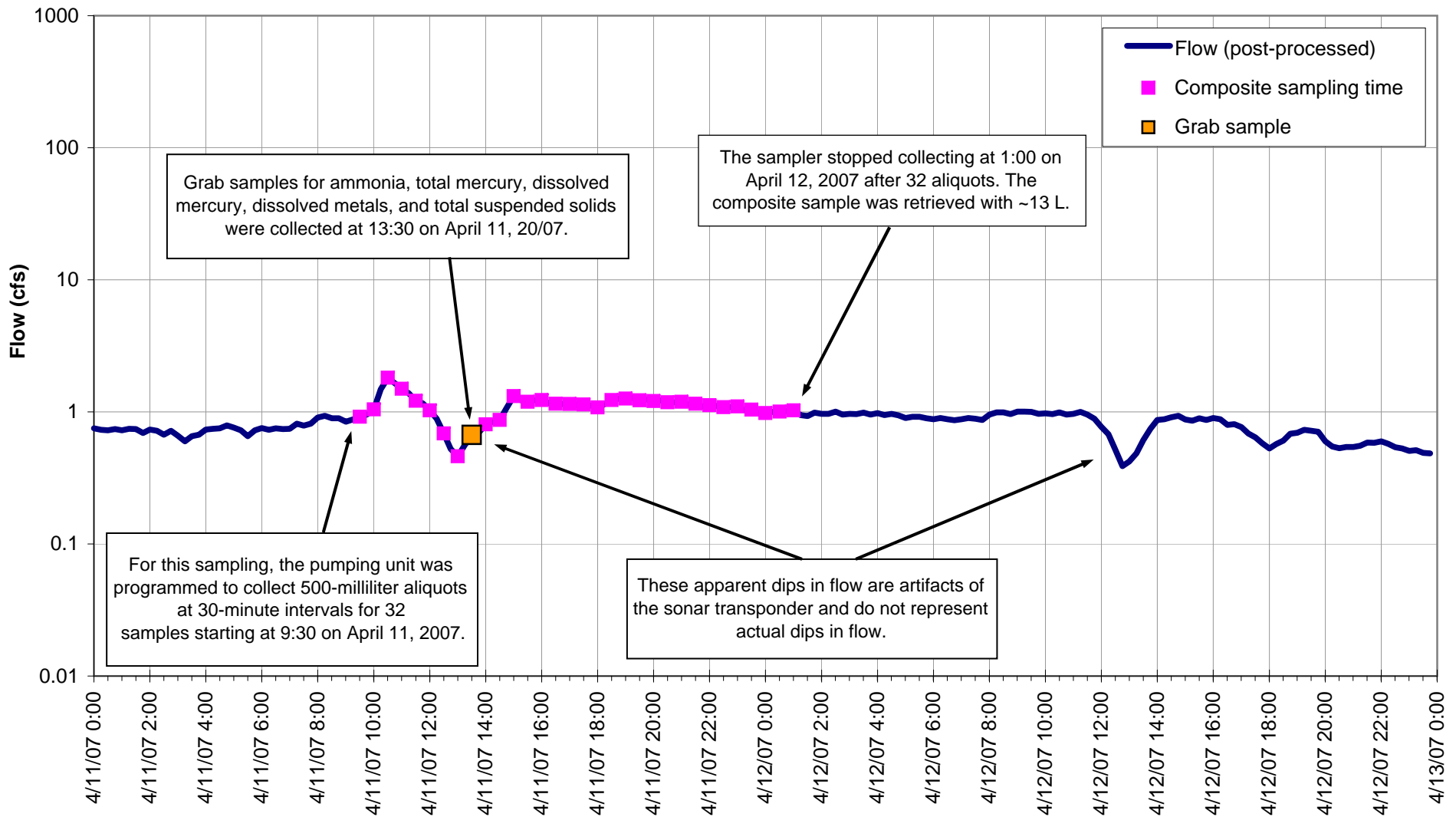
**Balance  
Hydrologics, Inc.**

**Figure C5. Water-quality sampling detailed hydrograph, February 26 to 28, 2007, Los**

**Trancos Creek at Piers Lane.** This sampling captured runoff from a winter storm with moderately high flows. The sampling (using the automated sampler) was time-paced and grab samples were collected before the storm peak.

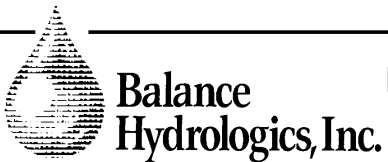
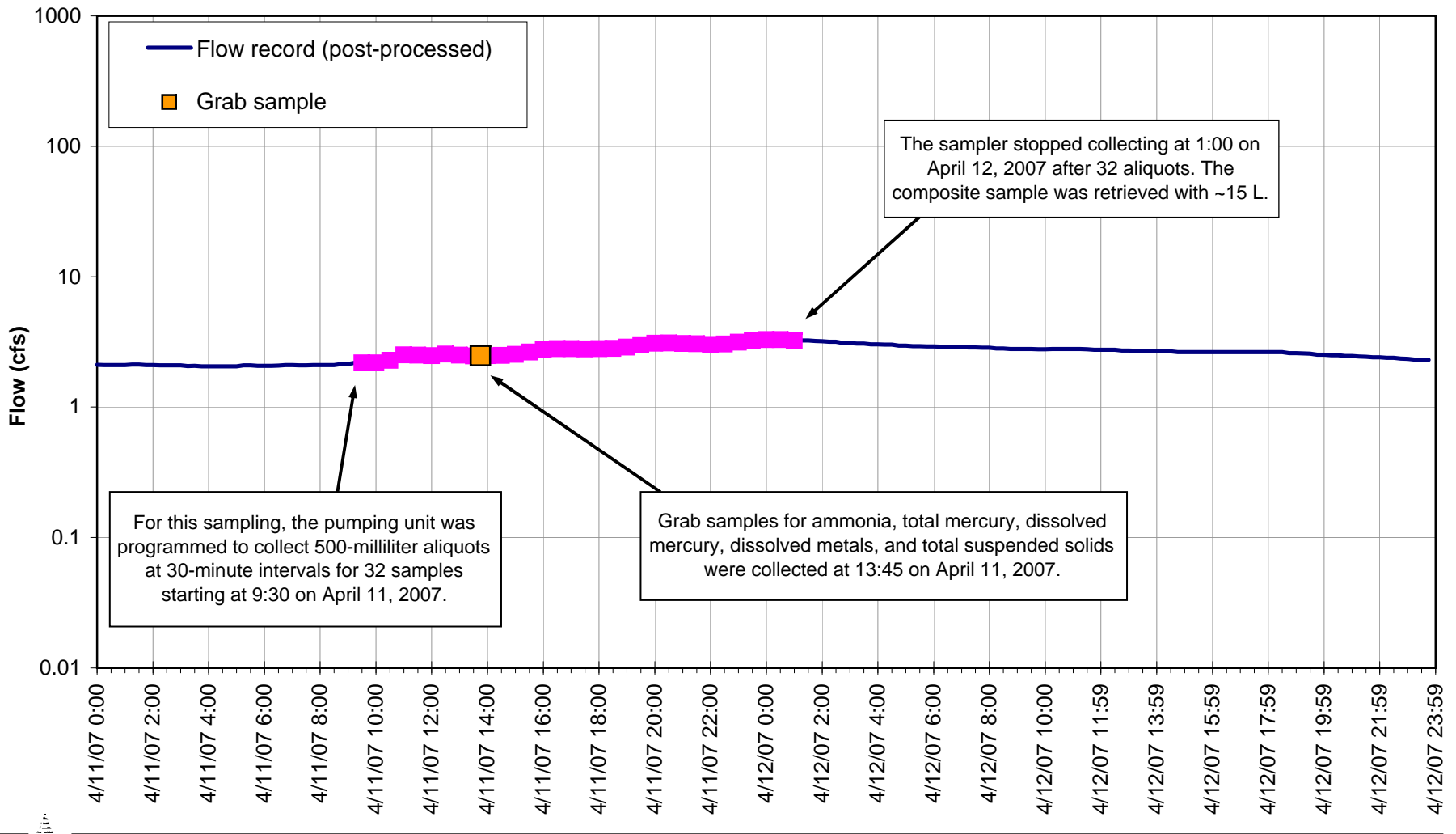


**Figure C6. Water-quality sampling detailed hydrograph, February 26 to 27, 2007, San Francisquito Creek at Piers Lane.** This sampling was intended to capture runoff from a moderate winter storm event, with flows among the highest of the water year. The time-paced composite sampler malfunctioned, so only grab samples were collected.

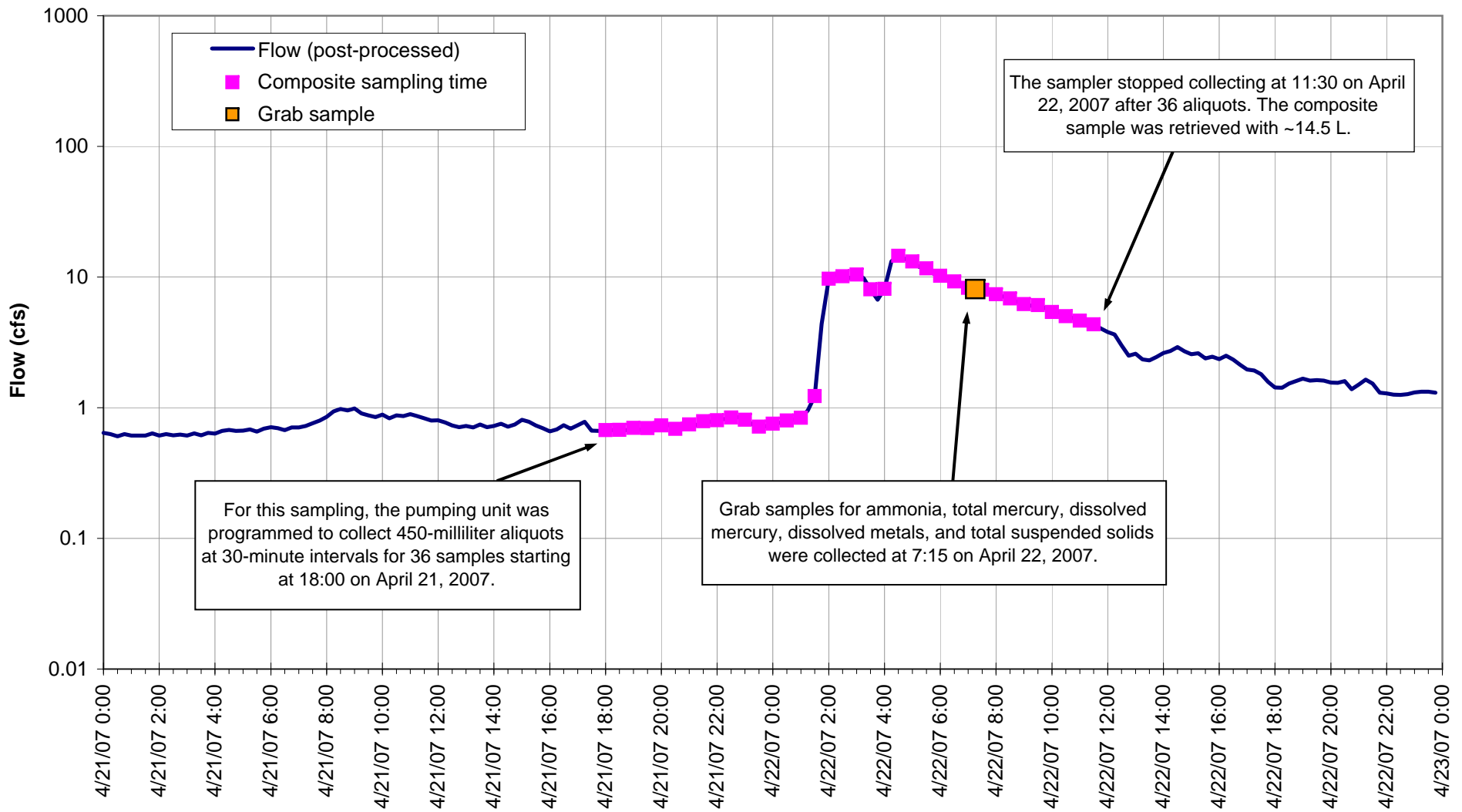


**Balance  
Hydrologics, Inc.**

**Figure C7. Water-quality sampling detailed hydrograph, April 11 to 12, 2007, Los Trancos Creek at Piers Lane.** This sampling captured a small spring storm after an extended dry period. The sampling (using the automated sampler) was time-paced and Grab samples were collected on April 11, 2007.



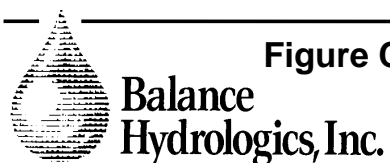
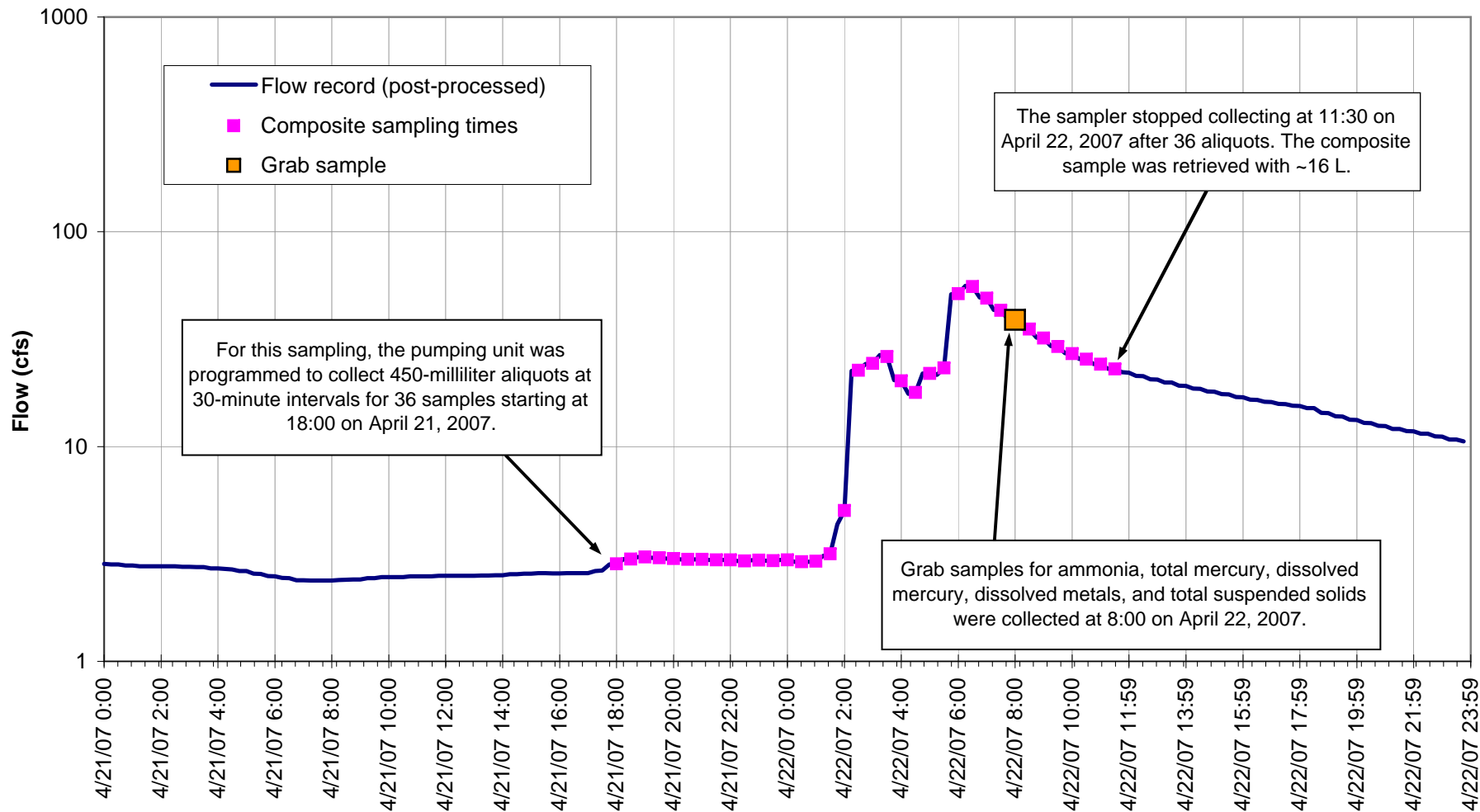
**Figure C8. Water-quality sampling detailed hydrograph, April 11 to 12, 2007, San Francisquito Creek at Piers Lane.** This sampling (using the automated sampler) captured a small spring storm event following a dry period of several weeks. Grab samples were collected before the peak.



**Balance  
Hydrologics, Inc.**

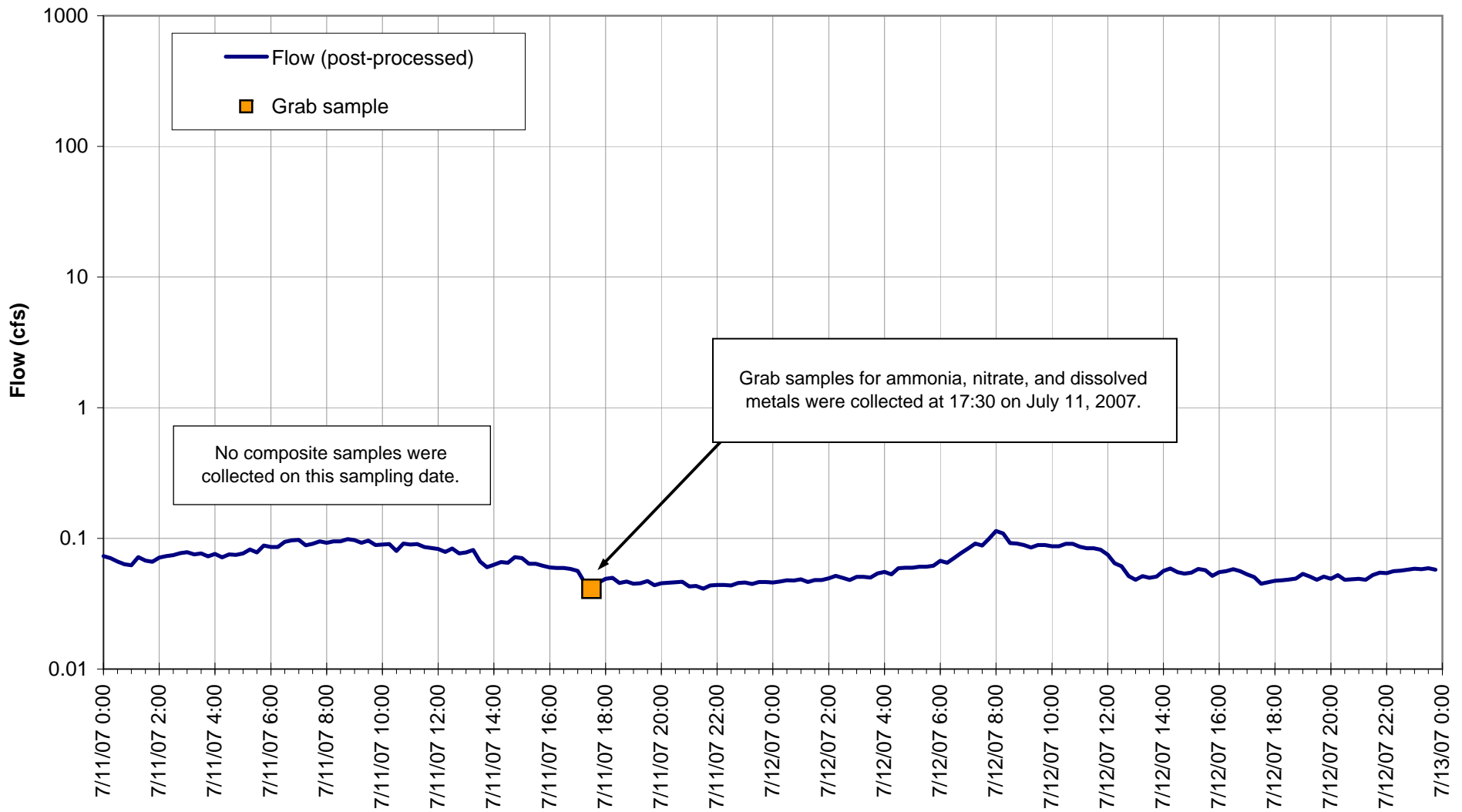
**Figure C9. Water-quality sampling detailed hydrograph, April 21 to 22, 2007, Los Trancos Creek at Piers Lane.** This time-paced sampling (using the automated sampler) was intended to characterize a moderately large late-spring storm following a drier than average winter. Grab samples were collected just after the peak flow on April 22, 2007.





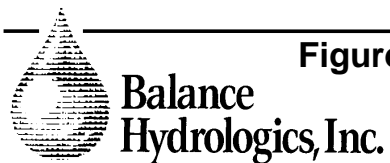
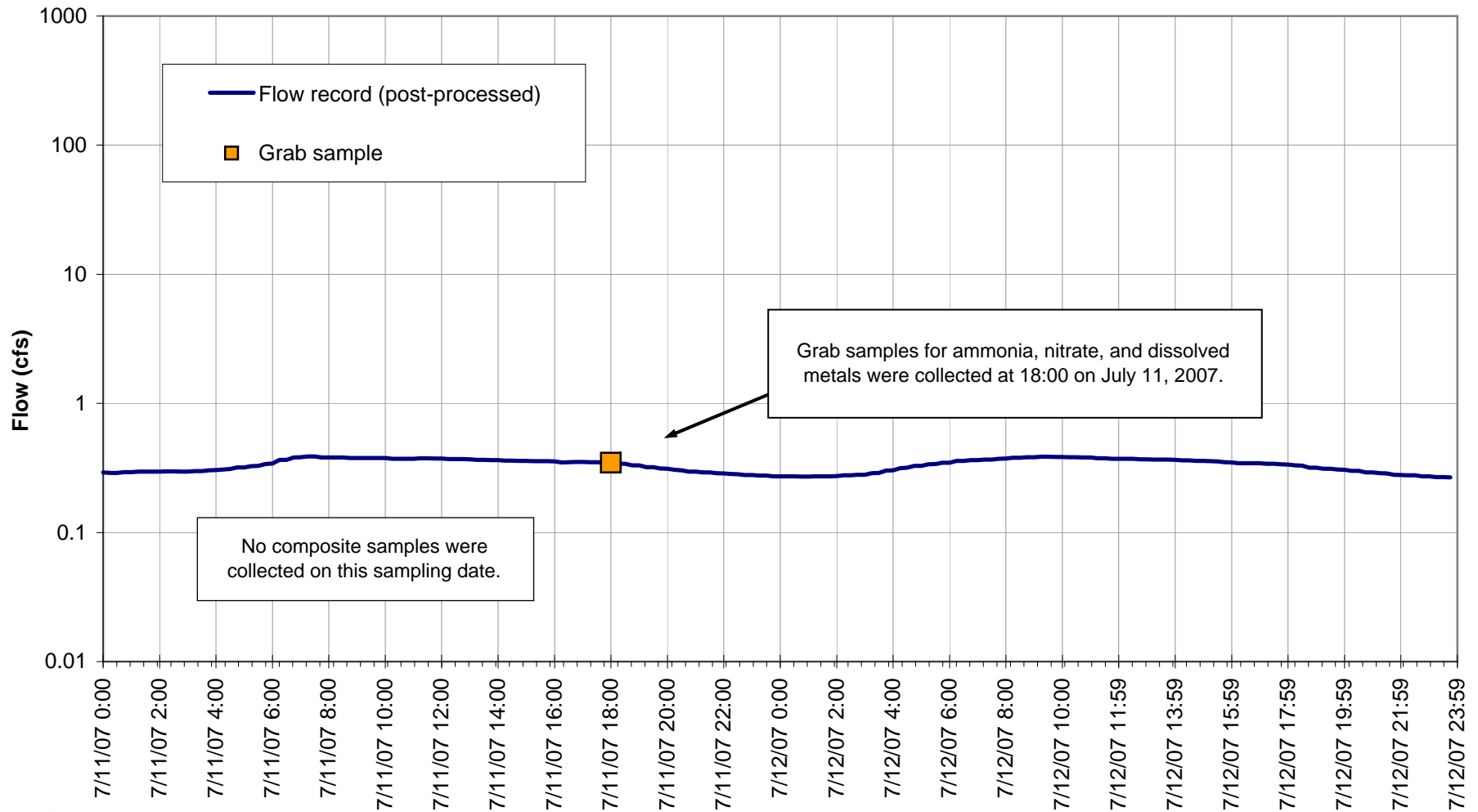
**Figure C10. Water-quality sampling detailed hydrograph, April 21 to 22, 2007, San**

**Francisquito Creek at Piers Lane.** This time-paced sampling (using the automated sampler) was intended to characterize a moderate spring storm at the end of a relatively dry winter. Sampling was time-paced and grab samples were collected just after the storm peak on April 22, 2007.



**Balance  
Hydrologics, Inc.**

**Figure C11. Water-quality sampling detailed hydrograph, July 11, 2007, Los Trancos Creek at Piers Lane.** This sampling captured summer baseflow conditions. The automated pump sampler was not used. Grab samples were collected on July 11, 2007.

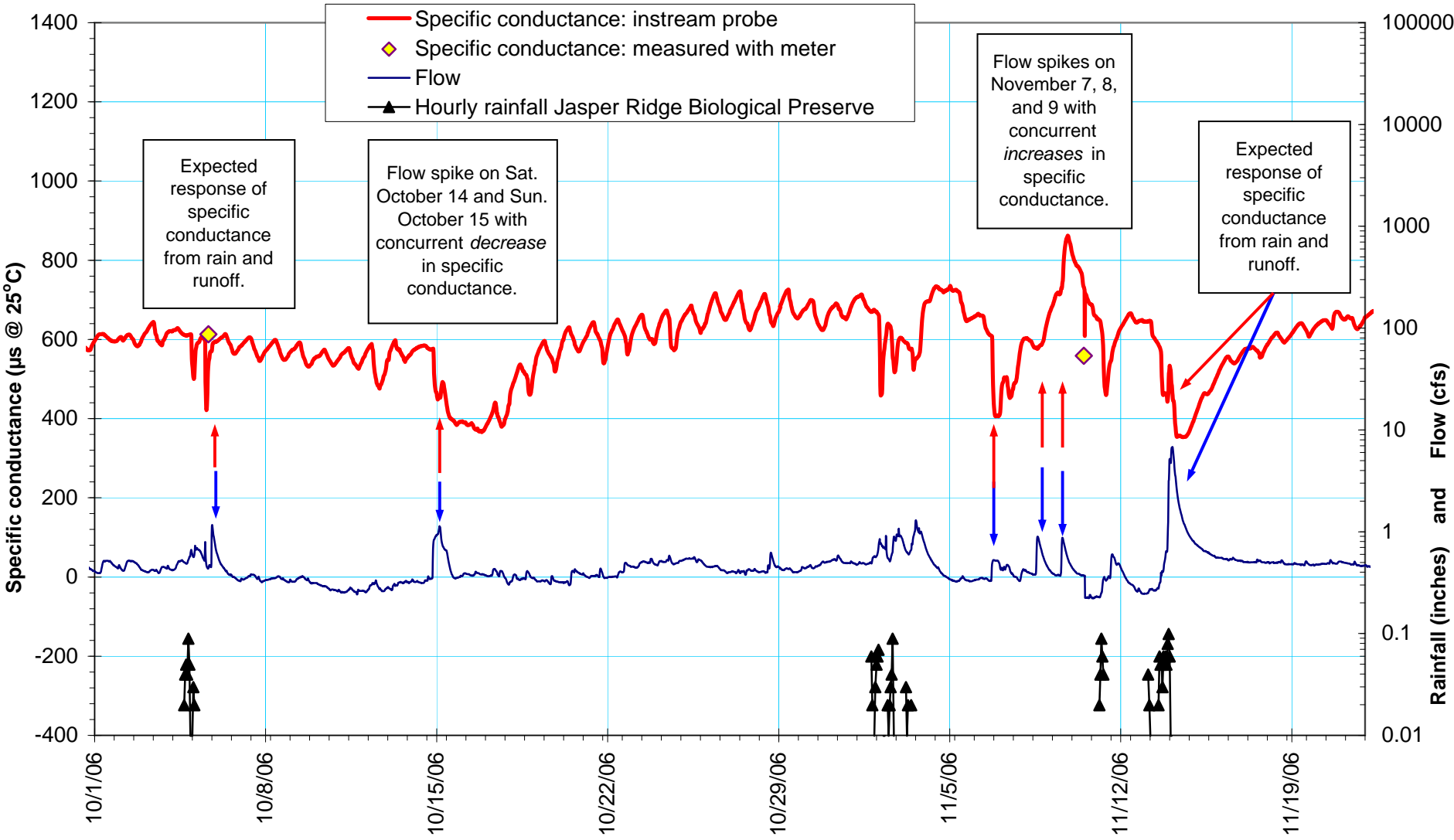


**Figure C12. Water-quality sampling detailed hydrograph, July 11, 2007, San Francisquito Creek at Piers Lane.** This sampling captured summer baseflow conditions. The automated pump sampler was not used. Grab samples were collected on July 11, 2007.

**APPENDIX D**

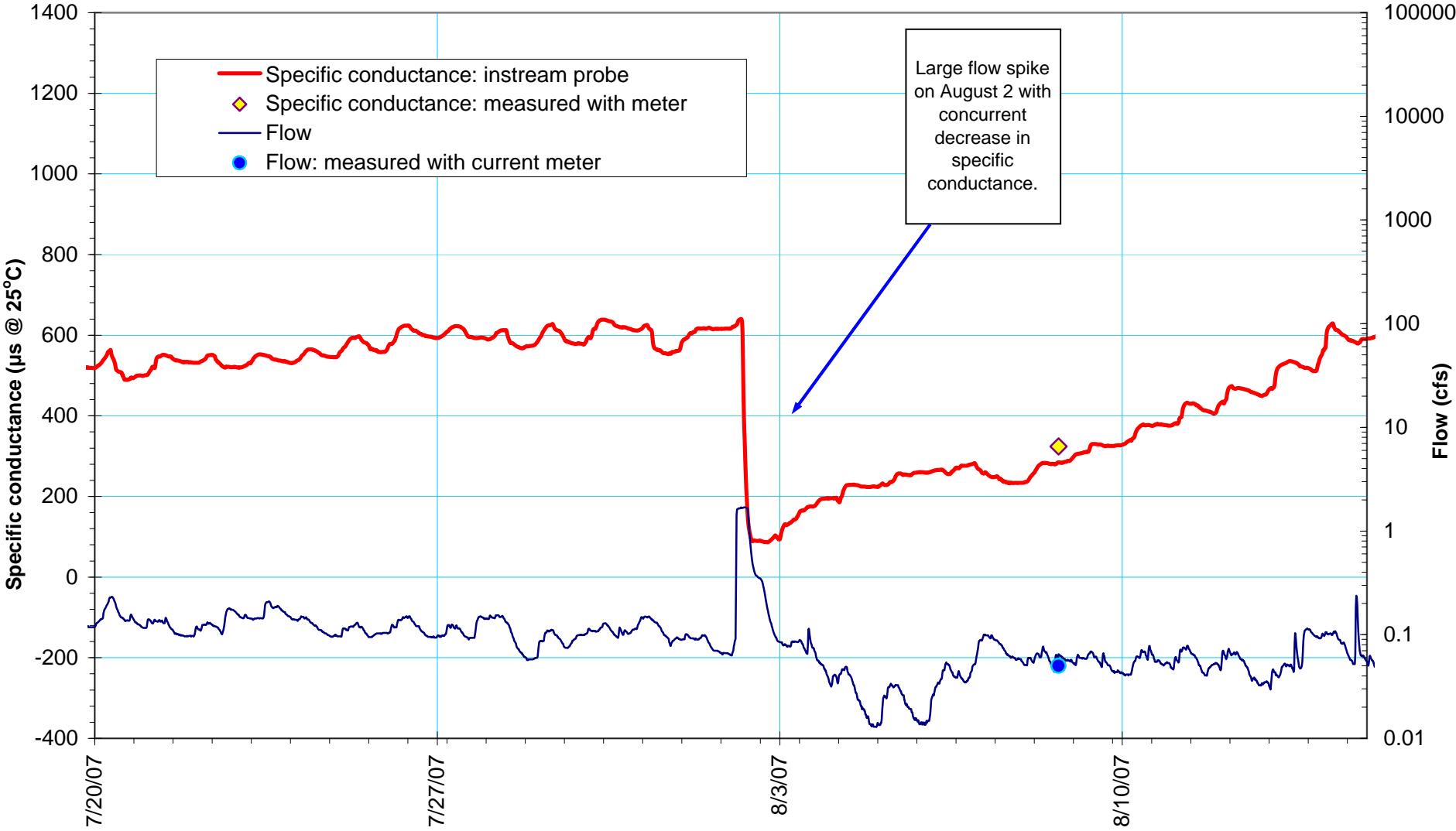
**Figure D1**

**Specific Conductance Anomalies at Bear Creek  
at Sand Hill Road**



**Balance Hydrologics, Inc.**

**Figure D1. Flow and specific conductance anomalies at Bear Creek at Sand Hill Road.** Changes in specific conductance indicate that flow spikes on October 14-15 were from discharges that were considerably less saline than water already in the creek, while the multiple flow spikes on November 7, 8, and 9 were from discharges that were more saline than background creek water.



**Balance Hydrologics, Inc.**

**Figure D2. Flow and specific conductance anomaly at Bear Creek at Sand Hill Road.** The dip in specific conductance indicates that the increase in flow on August 2 is from water that is considerably less saline than the background creek water. Flow increased quickly on August 2nd from 0.07 cfs (31 gpm) at 1:15 A.M to 1.65 cfs (741 gpm) at 3:45 A.M.