



**Office of the City Auditor**

---

**Report to the City Council  
City of San José**

---

**AN AUDIT OF THE  
ENVIRONMENTAL SERVICES  
DEPARTMENT'S LABORATORY**

**The ESD Laboratory Needs To Improve  
Controls To Accurately Identify Its  
Workload And Costs**

---

**Report 05-03  
October 2005**

October 11, 2005

Honorable Mayor and Members  
of the City Council  
200 East Santa Clara Street  
San Jose, CA 95113

Transmitted herewith is a report on *An Audit Of The Environmental Services Department's Laboratory*. This report is in accordance with City Charter Section 805. An Executive Summary is presented on the blue pages in the front of this report. The City Administration's response is shown on the yellow pages before the appendices.

This report will be presented to the Making Government Work Better Committee at its October 20, 2005, meeting. If you need any additional information, please let me know. The City Auditor's staff members who participated in the preparation of this report are David Moreno and Lynda Flores Brouchoud.

Respectfully submitted,



Gerald A. Silva  
City Auditor

finaltr  
GS:lg

cc: John Stufflebean      Randy Shipes  
Del Borgsdorf          David Tucker  
Kay Winer

# Table of Contents

<b>Executive Summary .....</b>	<b>i</b>
<b>Introduction .....</b>	<b>1</b>
Background .....	1
Budget .....	3
Background On Lab Requirements .....	3
Audit Scope, Objectives, And Methodology .....	4
<b>Finding I</b>	
<b>The ESD Laboratory Needs To Improve Controls To Accurately Identify Its Workload And Costs.....</b>	<b>5</b>
The Lab Lacks Adequate And Documented Controls To Mitigate 19 Of The 29 Threats We Identified During Our Risk Assessment .....	5
Based Upon The City Auditor’s Risk And Vulnerability Assessments, The Lab Agreed To Develop Formal Procedures And Processes To Improve Its Internal Controls In The Areas We Identified.....	6
CONCLUSION .....	8
RECOMMENDATION .....	8
<b>Administration’s Response.....</b>	<b>9</b>
<b>Appendix A</b>	
<b>Definition Of Priority 1, 2, And 3 Audit Recommendations .....</b>	<b>A-1</b>
<b>Appendix B</b>	
<b>Risk Matrix – Environmental Services Department’s Laboratory .....</b>	<b>B-1</b>
<b>Appendix C</b>	
<b>Vulnerability Assessment – Environmental Services Department’s Laboratory .....</b>	<b>C-1</b>

## **Table of Exhibits**

### **Exhibit 1**

Number Of Lab Positions And Source Control Program Positions Prior To  
The 2001 Audit Of The Pretreatment Source Control Program ..... 2

### **Exhibit 2**

ESD Lab Budget ..... 3

# Executive Summary

In accordance with the City Auditor's 2005-06 Workplan, we have audited the Environmental Services Department's (ESD) Laboratory. This report is the third audit of programs in the ESD's Watershed Protection Division. We conducted this audit in accordance with generally accepted government auditing standards and limited our work to those areas specified in the Scope and Methodology section of this report.

---

## Finding I

### **The ESD Laboratory Needs To Improve Controls To Accurately Identify Its Workload And Costs**

The Environmental Services Department's (ESD) Laboratory (Lab) provides field sampling services and analytical support to ensure that the San Jose/Santa Clara Water Pollution Control Plant (WPCP) is in compliance with the water quality monitoring requirements from federal, state, and regional regulatory agencies. In 2004-05, the Lab processed an estimated 35,000 samples and performed over 50,000 tests on these samples.

During the course of our audit we identified 29 threats or exposures associated with the Lab's workload, data tracking and reporting, and resource allocation. Of these 29 threats or exposures we found the Lab had weak or no controls in place for 19 threats (66 percent). Based on our Risk and Vulnerability Assessment, we found that the Lab had significant gaps in its data collection, tracking, and processes that prevented management from being able to accurately identify the Lab's workload and cost.

In our opinion, the ESD needs to 1) identify the Lab's complete workload including samples, analyses, staff time, and projects; 2) develop reliable, complete, and appropriate management reports to ensure the Lab's workload, staffing levels, and costs are appropriate; and 3) revisit its workload analysis and resource allocation after the new LIMS is fully operational.

---

**RECOMMENDATION**

We recommend that the ESD Laboratory:

**Recommendation #1**

- **Continue to develop the procedures and controls to mitigate the threats we identified.**
- **Revisit its workload analysis and resource allocation after the new LIMS is fully operational. (Priority 2)**

# Introduction

In accordance with the City Auditor's 2005-06 Workplan, we have audited the Environmental Services Department's (ESD) Laboratory. This report is the third audit of programs in the ESD's Watershed Protection Division. We conducted this audit in accordance with generally accepted government auditing standards and limited our work to those areas specified in the Scope and Methodology section of this report.

The City Auditor's Office thanks the Laboratory and ESD staff for giving their time, information, insight, and cooperation during the audit process.

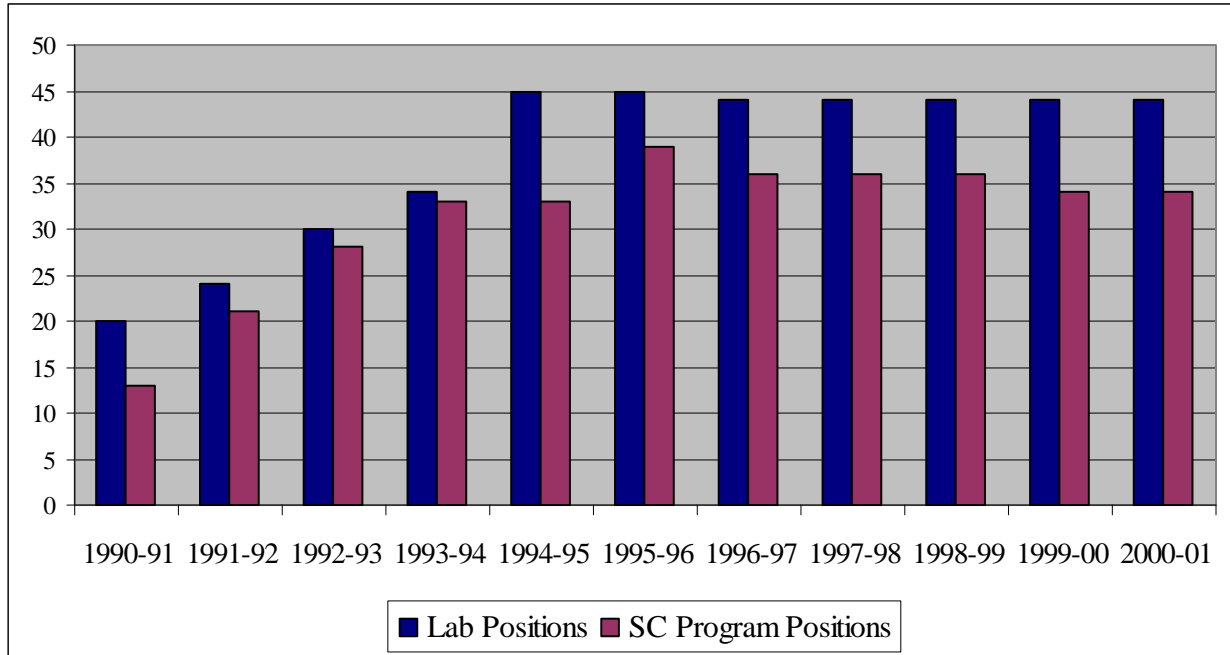
---

## Background

The Environmental Services Department's (ESD) Laboratory (Lab) provides field sampling services and analytical support for the San Jose/Santa Clara Water Pollution Control Plant (WPCP). The Lab analyzes samples to ensure the WPCP is in compliance with federal, state, and regional regulatory requirements as specified in the National Pollutant Discharge Elimination System (NPDES) permits. The Lab also analyzes samples collected through other NPDES permit programs such as the Pretreatment Source Control Program, and special requests from other City departments. Altogether, in 2004-05 the Lab estimates that it processed over 35,000 samples and performed over 50,000 tests on these samples. The Lab is also involved in special studies for projects associated with the City's NPDES Permit requirements and projects that it anticipates may become associated with future regulatory requirements.

In May 2001, the City Auditor issued "An Audit of the Pretreatment Source Control Program." In the audit report, the City Auditor found that ESD's Pretreatment Source Control Program (SC Program) was overstaffed, over-inspected industrial user facilities, and collected an excessive number of samples. As shown in the following chart, the number of Lab positions and the number of SC Program positions had experienced similar patterns during the previous years.

**Exhibit 1      Number Of Lab Positions And Source Control Program Positions Prior To The 2001 Audit Of The Pretreatment Source Control Program**



The excessive sampling we found in the SC Program impacted the Lab's workload. Accordingly, the City Auditor recommended that the ESD, "Make appropriate changes in SC Program services, such as Laboratory services, to reflect the SC Program's revised workload." This audit report is a follow-up to the ESD's implementation of the recommendation.

To implement the audit recommendation, ESD hired a consultant to study the Lab's workload and staffing levels. At the time of the consultant report in November 2001, the Lab had 38 positions with a \$3,542,402 personal services budget. The consultant concluded that, "It would be more cost effective to close the laboratory and subcontract the analytical workload to private sector laboratories, but other governing considerations favor currently maintaining laboratory operations and implementing changes to bring its productivity and cost effectiveness into line with commercial laboratory practices." The consultant's final recommendation was to restructure the Lab and eliminate 15 positions, reducing the staffing level from 38 to 23 positions.



In response to the consultant report, the ESD formed an internal review team to develop a Laboratory Evaluation and Management Plan (LEMP) that recommended the reduction of 6 positions, reducing the staffing level from 38 to 32 positions, or 9 fewer position eliminations than the consultant's recommended reduction of 15 positions. ESD management reviewed both the consultant and the LEMP recommendations and prepared a \$901,378 budget reduction proposal. Ultimately, the City's 2002-03 Adopted Operating Budget included a \$933,000 reduction. The ESD accomplished this reduction by transferring 5 positions to other ESD programs, and eliminating 6 Lab positions, and reducing 2 positions to part-time. Of the 38 2001-02 Lab positions, 26 positions were still in the Lab and 5 positions were reassigned to other ESD programs.

The Lab primarily reduced positions that supported the SC Program (Trace Analytical Support section) and moved positions associated with special projects to other places within the Watershed Protection Division of ESD. The Lab did not reduce any positions in the Wastewater Support Section that processes Plant samples. In April 2005, the ESD deleted another lab position.

---

**Budget**

The following chart shows the Lab's budget over the past five years. The decreases in non-personnel costs from 2001-02 to 2002-03 are primarily due to decreases in professional and consultant services. The decrease in personnel costs from 2001-02 to 2002-03 are due primarily to the restructuring and budget reductions mentioned earlier.

**Exhibit 2 ESD Lab Budget**

	2004-05 Adopted Budget	2003-04 Adopted Budget	2002-03 Adopted Budget	2001-02 Adopted Budget	2000-01 Adopted Budget
Personal Costs	\$2,544,865	\$2,515,510	\$2,385,418	\$3,542,402	\$3,453,186
Non-Personal Costs	\$919,819	\$937,254	\$977,409	\$1,086,959	\$1,768,156
<b>Total</b>	<b>\$3,464,684</b>	<b>\$3,452,764</b>	<b>\$3,362,827</b>	<b>\$4,629,361</b>	<b>\$5,221,342</b>

---

**Background On  
Lab Requirements**

In 2003, the California Regional Water Quality Control Board adopted the current NPDES Permit for the WPCP's waste discharge. The NPDES Permit is in effect through 2008 and it outlines the Lab's requirements for sample scheduling, testing,

and quality assurance. The NPDES Permit does not require that the WPCP have an on-site laboratory, however, the laboratory performing the analyses must use the methods listed in the NPDES Permit or approved alternate test procedures that are in accordance with the Code of Federal Regulations 40 CFR 136.4 and 136.5. The State has certified the Lab to perform certain tests. The Lab also contracts with other private laboratories to perform additional testing.

Prior to the Lab's reorganization, a section of the Lab worked on special studies that were either required in the NPDES Permit, or were anticipated for future regulation. The NPDES Permit specifies some required studies such as a mercury special study and an avian botulism control program.

---

**Audit Scope,  
Objectives, And  
Methodology**

The objective of our audit was to identify the operational threats facing the ESD Laboratory and the controls that the ESD has in place to prevent, eliminate, or minimize these threats.

Our audit scope focused on Lab data from 2000-01 to 2004-05. We reviewed the program's electronic tracking systems, Consultant report, Laboratory Evaluation and Management Plan (LEMP), interviewed Lab and ESD staff, and reviewed regulatory requirements.

In June 2004, ESD entered into contract to obtain a new Laboratory Information Management System. According to ESD, the new system has been installed and is currently in a beta testing phase. The new system is expected to be fully operational by December 2005.

## **Finding I**

### **The ESD Laboratory Needs To Improve Controls To Accurately Identify Its Workload And Costs**

The Environmental Services Department's (ESD) Laboratory (Lab) provides field sampling services and analytical support to ensure that the San Jose/Santa Clara Water Pollution Control Plant (WPCP) is in compliance with the water quality monitoring requirements from federal, state, and regional regulatory agencies. In 2004-05, the Lab processed an estimated 35,000 samples and performed over 50,000 tests on these samples.

During the course of our audit we identified 29 threats or exposures associated with the Lab's workload, data tracking and reporting, and resource allocation. Of these 29 threats or exposures we found the Lab had weak or no controls in place for 19 threats (66 percent). Based on our Risk and Vulnerability Assessment, we found that the Lab had significant gaps in its data collection, tracking, and processes that prevented management from being able to accurately identify the Lab's workload and cost.

In our opinion, the ESD needs to 1) identify the Lab's complete workload including samples, analyses, staff time, and projects; 2) develop reliable, complete, and appropriate management reports to ensure the Lab's workload, staffing levels, and costs are appropriate; and 3) revisit its workload analysis and resource allocation after the new LIMS is fully operational.

---

#### **The Lab Lacks Adequate And Documented Controls To Mitigate 19 Of The 29 Threats We Identified During Our Risk Assessment**

We identified the Lab's lack of adequate internal controls through our Risk Assessment process. The complete Risk Assessment can be found in Appendix B. The rationale for conducting a Risk Assessment is that auditors can limit testing and focus on those areas most vulnerable to noncompliance and abuse. We assigned an "A" to those controls that we perceived to be actual and existing. We assigned a "P" to those controls that we perceived to be either not formalized, or potential controls.

In addition to the Risk Assessment, we also conducted a Vulnerability Assessment (Appendix C). As the Vulnerability Assessment illustrates, we found that the Lab had only weak controls in place for 19 of the 29 threats (66 percent). In our

opinion, these controls were weak because they were inadequate, incomplete, and/or undocumented. Furthermore, we assessed the Lab's vulnerability rating as "high" for 14 (48 percent) of the threats we identified. Based upon our Risk and Vulnerability Assessments, the Lab has agreed to develop formal procedures and management reports to improve its internal controls.

---

**Based Upon The City Auditor's Risk And Vulnerability Assessments, The Lab Agreed To Develop Formal Procedures And Processes To Improve Its Internal Controls In the Areas We Identified**

The purpose of the City Auditor's Risk Assessment process is to identify the threats facing the program or operation under audit and to identify the controls or procedures the City has in place to prevent, eliminate, or minimize the associated threats related to 1) compliance with laws, rules, regulations, procedures, and policy; 2) economy; 3) efficiency; and 4) effectiveness. Our Risk Assessment of the Lab revealed that it had inadequate systems, processes, and procedures in the areas we identified. Specifically, the City Auditor's Office advised the Lab to address the following threats:

- The ESD estimates that it spent nearly \$800,000 from 1994 to 2001 to install a Laboratory Information Management System (LIMS), however, this system has not been fully operational and the Lab has relied on additional makeshift systems to track its workload and results;
- Lab staff spent excessive time manually tracking samples and analyses;
- The Lab could not accurately identify its workload, corresponding staffing levels, and resource allocation needed to efficiently satisfy its workload requirements;
- The Lab did not have adequate, reliable, and complete management information to assess its economy, efficiency, and effectiveness;
- The ESD lacked procedures to authorize, budget, outline the scope of work, and identify the benefit of special projects;
- The Lab's charges for services to other City departments may not accurately reflect the Lab's cost; and
- The ESD commissioned a \$50,000 consultant study to assess the most appropriate staffing levels and equipment for the Lab to perform the required functions under the regulatory requirements. However, ESD

conducted its own internal study called the Laboratory Evaluation and Management Plan (LEMP) and did not implement the consultant's recommendations.

We shared this information and the results of our Risk Assessment with ESD and Lab management. ESD management acknowledged the problems with its database tracking. During the time of our review, the City Council approved the ESD entering into a contract with PerkinElmer LAS, Inc, to purchase and implement a new LIMS. The new system is expected to be fully operational in December 2005.

The ESD is also in the process of developing procedures to address the threats we identified in the Risk Assessment. Specifically, the ESD:

- Developed a matrix to identify the regulatory requirements for sampling;
- Developed a list of Lab equipment and documented criteria to determine the need for replacement equipment;
- Is developing a procedure to improve controls over special projects;
- Agreed to review its procedure to improve its methodology for charging City departments for Lab tests, after the new LIMS system is fully operational.

In our opinion, the implementation of these steps and the new LIMS should improve ESD management's ability to assess the Lab's efficiency and effectiveness, and provide added assurance that the City is in compliance with regulatory requirements for workload and reporting to its regulatory agencies. While these steps will help address many of the weaknesses the City Auditor identified during its Risk and Vulnerability Assessment processes, the ESD needs to continue to develop and update controls and procedures for additional operational threats as they arise. Furthermore, because the implementation of the new LIMS is anticipated to address many of the threats we identified, we recommend that the Lab revisit its workload analysis and resource allocation after the new system is implemented.

We recommend that the ESD Laboratory:

**Recommendation #1**

- **Continue to develop the procedures and controls to mitigate the threats we identified.**
- **Revisit its workload analysis and resource allocation after the new LIMS is fully operational. (Priority 2)**

---

**CONCLUSION**

During the course of our audit we found that the Lab did not have adequate processes, procedures or controls in place to ensure its efficiency, economy, and effectiveness. We identified the lack of adequate and documented internal controls through our Risk Assessment and Vulnerability Assessment process. The Laboratory agreed to develop formal procedures and improve its internal controls in the areas we identified. In our opinion, the ESD Laboratory should 1) continue to develop the procedures and controls to mitigate the threats we identified and 2) revisit its workload analysis and resource allocation after the new LIMS is fully operational.

---

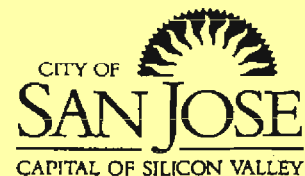
**RECOMMENDATION**

We recommend that the ESD Laboratory:

**Recommendation #1**

- **Continue to develop the procedures and controls to mitigate the threats we identified.**
- **Revisit its workload analysis and resource allocation after the new LIMS is fully operational. (Priority 2)**

# Memorandum



**TO:** Gerald Silva  
City Auditor

**FROM:** John Stufflebean  
Acting Director

**SUBJECT:** SEE BELOW

**DATE:** October 7, 2005

Approved

*Kay Winer*

Date

*10/11/05*

**SUBJECT: RESPONSE TO “AN AUDIT OF THE ENVIRONMENTAL SERVICES DEPARTMENT’S LABORATORY”**

The Administration has reviewed the City Auditor’s report entitled “An Audit of the Environmental Services Department Laboratory” and concurs with the report’s one recommendation:

**Recommendation #1**

- Continue to develop the procedures and controls to mitigate the threats we identified.
- Revisit the workload analysis and resource allocation after the new LIMS is fully operational. (Priority 2)

In June 2004, the Environmental Services Department (ESD) entered into a contract to obtain a new Laboratory Information Management System (LIMS), which will automate many of the data entry, tracking and control measures required for the Lab. LIMS has now been installed and is in the beta testing phase. It is expected to be fully operational by December 2005.

Through a collaborative process, staff from ESD and the City Auditor’s Office identified a number of operational risks and threats. ESD has begun implementing control strategies to address these and will:

- Incorporate Laboratory policies and procedures into a Procedures Manual for future staff and management reference;
- Develop and update controls, policies and procedures to address any new operational risks and threats as they may arise;
- Provide training on Laboratory policies and procedures within 60 days of appointing new staff;

- Provide refresher training on Laboratory policies and procedures to staff on a recurring basis;
- Revisit the workload analysis and resource allocation, once the new LIMS is fully operational in December.

ESD wishes to acknowledge the efforts of the City Auditor's Office and its staff for their time and effort to help us identify, document and implement enhanced operational controls for our Laboratory. ESD believes that the continued development and implementation of these controls will support improved service delivery and performance.



JOHN STUFFLEBEAN  
Acting Director  
Environmental Services



## APPENDIX A

### DEFINITIONS OF PRIORITY 1, 2, AND 3 AUDIT RECOMMENDATIONS

The City of San Jose's City Administration Manual (CAM) defines the classification scheme applicable to audit recommendations and the appropriate corrective actions as follows:

Priority Class <sup>1</sup>	Description	Implementation Category	Implementation Action <sup>3</sup>
1	Fraud or serious violations are being committed, significant fiscal or equivalent non-fiscal losses are occurring. <sup>2</sup>	Priority	Immediate
2	A potential for incurring significant fiscal or equivalent fiscal or equivalent non-fiscal losses exists. <sup>2</sup>	Priority	Within 60 days
3	Operation or administrative process will be improved.	General	60 days to one year

---

<sup>1</sup> The City Auditor is responsible for assigning audit recommendation priority class numbers. A recommendation which clearly fits the description for more than one priority class shall be assigned the higher number. (CAM 196.4)

<sup>2</sup> For an audit recommendation to be considered related to a significant fiscal loss, it will usually be necessary for an actual loss of \$25,000 or more to be involved or for a potential loss (including unrealized revenue increases) of \$50,000 to be involved. Equivalent non-fiscal losses would include, but not be limited to, omission or commission of acts by or on behalf of the City which would be likely to expose the City to adverse criticism in the eyes of its citizens. (CAM 196.4)

<sup>3</sup> The implementation time frame indicated for each priority class is intended as a guideline for establishing implementation target dates. While prioritizing recommendations is the responsibility of the City Auditor, determining implementation dates is the responsibility of the City Administration. (CAM 196.4)

**APPENDIX B**

		<b>C-1</b>	<b>C-2</b>	<b>C-3</b>	<b>C-4</b>	<b>C-5</b>	<b>C-6</b>	<b>C-7</b>	<b>C-8</b>	<b>C-9</b>
	<b>RISK MATRIX ESD Laboratory</b>	The Lab currently has an Access database to track most, but not all, samples.	The Lab manually enters and tracks lab results.	The Lab developed a matrix that shows the planned sampling frequency for each program.	The ESD Team that developed the LEMP used data from Access database to estimate and project the reduction.	The ESD Team that developed the LEMP consisted of a representative from each Lab Group to capture workload information on special projects.	Departments complete a "Test Request" form to request Lab work on a special project.	Lab Manager asked staff to estimate extent of involvement and time spent on special projects.	ESD prepared a matrix that identifies special projects required in the permit.	The Lab develops a Quality Assurance Program for certification.
<b>THREAT #</b>	<b>WORKLOAD</b>									
T-1	The Lab's databases do not accurately reflect its sampling and analytical workload	A	A							
T-2	The Lab's workload exceeds NPDES Permit and other requirements			A			A			
T-3	The Laboratory Evaluation and Management Plan (LEMP), that ESD used to help determine staffing levels, did not accurately report the reduction in the number of Source Control samples and overall Lab workload				A	A				
T-4	The Lab did not reduce staffing levels commensurate with the reduction in its sampling analytical workload.	A			A					
T-5	The ESD has not measured or quantified the impact special projects have on the Lab's workload							A		
T-6	Lab staff spends excessive time manually tracking samples and analyses	A	A							
T-7	Lab staff spends excessive time working on different databases that are incomplete or not linked	A								
T-8	The Lab's sampling frequency and quality control testing is excessive			A						A
T-9	The Lab does not analyze samples in an efficient manner									
T-10	The Lab lacks authority or discretion to manage its workload						A			
T-11	Research positions and Chemists are doing the work of technicians									
	<b>BUDGET</b>									
T-12	The Lab is more expensive compared to an outsourced service									
T-13	The Lab's chargebacks do not accurately reflect costs									
T-14	The Lab spent money on a Laboratory Information Management System (LIMS) that does not work									
T-15	ESD paid a consultant \$50,000 for an assessment of the Lab's appropriate staffing levels and equipment, but did not implement the consultant report's recommendations									
T-16	ESD management does not review special project proposals for cost and anticipated benefits								A	
T-17	The Lab does not use its equipment economically or efficiently									
T-18	The Lab does not have a complete equipment inventory and does not surplus replaced equipment									
T-19	The Lab purchases new and expensive equipment that it does not need or use									
T-20	The SJ/SC Plant conducts and incurs costs for special projects that other NPDES holders do not conduct.									
	<b>REPORTING AND TRACKING</b>									
T-21	Lab staff does not report to the appropriate ESD Division or Program									
T-22	The Plant does not have reliable sample and analysis data from the Lab to use in its report to regulatory agencies	A	A							
T-23	The Lab does not have adequate, reliable, and complete management information to assess its economy, efficiency and effectiveness	A								
T-24	Management reports do not allow staff to properly manage the Lab's workload	A								
T-25	Supervisors do not adequately review Lab results									
T-26	Lab staff does not receive adequate continuing education									
T-27	The Lab's reported workload is overstated	A								
T-28	The Lab's turnaround times are longer compared to an outsourced service									
T-29	The ESD does not measure the benefits of special projects in terms of regulatory relief, process savings, and other factors.									

A = Actual or existing control  
P = Potential or informal control

**APPENDIX B**

		<b>C-10</b>	<b>C-11</b>	<b>C-12</b>	<b>C-13</b>	<b>C-14</b>	<b>C-15</b>	<b>C-16</b>	<b>C-17</b>	<b>C-18</b>
	<b>RISK MATRIX ESD Laboratory</b>	Plant Operations and other programs decide on the sampling frequency and tests.	City pay scale and MQs define the pay, scope of work, and educational requirements/training for Lab positions.	ESD reduced the number of Lab positions, including Chemist positions, to more closely align staffing to its workload.	ESD Lab can provide Plant with 24/7 availability to process samples.	The Lab updates its chargeback rates by taking the average "published price" and subtracting 25%.	LIMS was budgeted in the City's capital budget and administered through the Plant's computer services section in existence at that time.	ESD Department Director made the final decision on what to do with the consultant's recommendations.	Management reviews each special project proposal along with estimated resources and samples before it is accepted. The proposal is also reviewed by the Lab Manager.	Deputy Director approves proposals for major equipment purchases, followed by TPAC approval and City Council approval.
<b>THREAT #</b>	<b>WORKLOAD</b>									
T-1	The Lab's databases do not accurately reflect its sampling and analytical workload									
T-2	The Lab's workload exceeds NPDES Permit and other requirements	A								
T-3	The Laboratory Evaluation and Management Plan (LEMP), that ESD used to help determine staffing levels, did not accurately report the reduction in the number of Source Control samples and overall Lab workload									
T-4	The Lab did not reduce staffing levels commensurate with the reduction in its sampling analytical workload.			A						
T-5	The ESD has not measured or quantified the impact special projects have on the Lab's workload								A	
T-6	Lab staff spends excessive time manually tracking samples and analyses									
T-7	Lab staff spends excessive time working on different databases that are incomplete or not linked									
T-8	The Lab's sampling frequency and quality control testing is excessive	A								
T-9	The Lab does not analyze samples in an efficient manner	A								
T-10	The Lab lacks authority or discretion to manage its workload	A							A	
T-11	Research positions and Chemists are doing the work of technicians		A	A						
	<b>BUDGET</b>									
T-12	The Lab is more expensive compared to an outsourced service			A	A					
T-13	The Lab's chargebacks do not accurately reflect costs					A				
T-14	The Lab spent money on a Laboratory Information Management System (LIMS) that does not work						A			
T-15	ESD paid a consultant \$50,000 for an assessment of the Lab's appropriate staffing levels and equipment, but did not implement the consultant report's recommendations							A		
T-16	ESD management does not review special project proposals for cost and anticipated benefits								A	
T-17	The Lab does not use its equipment economically or efficiently									
T-18	The Lab does not have a complete equipment inventory and does not surplus replaced equipment									
T-19	The Lab purchases new and expensive equipment that it does not need or use									A
T-20	The SJ/SC Plant conducts and incurs costs for special projects that other NPDES holders do not conduct.									
	<b>REPORTING AND TRACKING</b>									
T-21	Lab staff does not report to the appropriate ESD Division or Program									
T-22	The Plant does not have reliable sample and analysis data from the Lab to use in its report to regulatory agencies									
T-23	The Lab does not have adequate, reliable, and complete management information to assess its economy, efficiency and effectiveness									
T-24	Management reports do not allow staff to properly manage the Lab's workload									
T-25	Supervisors do not adequately review Lab results									
T-26	Lab staff does not receive adequate continuing education		A							
T-27	The Lab's reported workload is overstated			A						
T-28	The Lab's turnaround times are longer compared to an outsourced service									
T-29	The ESD does not measure the benefits of special projects in terms of regulatory relief, process savings, and other factors.									

**APPENDIX B**

		<b>C-19</b>	<b>C-20</b>	<b>C-21</b>	<b>C-22</b>	<b>C-23</b>	<b>C-24</b>
	<b>RISK MATRIX ESD Laboratory</b>	ESD developed a procedure requiring an annual list of Lab equipment.	Lab uses 6 criteria to determine the need for replacement equipment.	Most special projects derive from the NPDES Permit and SJ coordinates with Sunnyvale and Palo Alto to participate and share costs.	Lab generates reports from the Access database.	Lab has written procedures for supervisory review.	ESD is in the process of purchasing a new LIMS system to more accurately track samples, workload, and results.
<b>THREAT #</b>	<b>WORKLOAD</b>						
T-1	The Lab's databases do not accurately reflect its sampling and analytical workload						P
T-2	The Lab's workload exceeds NPDES Permit and other requirements						
T-3	The Laboratory Evaluation and Management Plan (LEMP), that ESD used to help determine staffing levels, did not accurately report the reduction in the number of Source Control samples and overall Lab workload						
T-4	The Lab did not reduce staffing levels commensurate with the reduction in its sampling analytical workload.						
T-5	The ESD has not measured or quantified the impact special projects have on the Lab's workload						
T-6	Lab staff spends excessive time manually tracking samples and analyses						P
T-7	Lab staff spends excessive time working on different databases that are incomplete or not linked						P
T-8	The Lab's sampling frequency and quality control testing is excessive						
T-9	The Lab does not analyze samples in an efficient manner						
T-10	The Lab lacks authority or discretion to manage its workload						
T-11	Research positions and Chemists are doing the work of technicians						
	<b>BUDGET</b>						
T-12	The Lab is more expensive compared to an outsourced service						
T-13	The Lab's chargebacks do not accurately reflect costs						
T-14	The Lab spent money on a Laboratory Information Management System (LIMS) that does not work						P
T-15	ESD paid a consultant \$50,000 for an assessment of the Lab's appropriate staffing levels and equipment, but did not implement the consultant report's recommendations						
T-16	ESD management does not review special project proposals for cost and anticipated benefits						
T-17	The Lab does not use its equipment economically or efficiently						
T-18	The Lab does not have a complete equipment inventory and does not surplus replaced equipment	A					
T-19	The Lab purchases new and expensive equipment that it does not need or use		A				
T-20	The SJ/SC Plant conducts and incurs costs for special projects that other NPDES holders do not conduct.			A			
	<b>REPORTING AND TRACKING</b>						
T-21	Lab staff does not report to the appropriate ESD Division or Program						
T-22	The Plant does not have reliable sample and analysis data from the Lab to use in its report to regulatory agencies				A		P
T-23	The Lab does not have adequate, reliable, and complete management information to assess its economy, efficiency and effectiveness				A		P
T-24	Management reports do not allow staff to properly manage the Lab's workload				A		P
T-25	Supervisors do not adequately review Lab results					A	
T-26	Lab staff does not receive adequate continuing education						
T-27	The Lab's reported workload is overstated				A		P
T-28	The Lab's turnaround times are longer compared to an outsourced service						P
T-29	The ESD does not measure the benefits of special projects in terms of regulatory relief, process savings, and other factors.						

**APPENDIX C**

**THREATS, CONTROLS, AND VULNERABILITY ASSESSMENT**

Threat/Control		Threat's Inherent Risk	Internal Control Rating	Vulnerability Assessment
<b>Workload</b>				
<b>T-1</b>	<b>The Lab's databases do not accurately reflect its sampling and analytical workload</b>	<b>High</b>	<b>Weak</b>	<b>High</b>
C-1	The Lab currently has an Access database to track most, but not all, samples.		Weak	
C-2	The Lab manually enters and tracks lab results.		Weak	
C-24	ESD is in the process of purchasing a new LIMS system to more accurately track samples, workload, and results		Potential Control	
<b>T-2</b>	<b>The Lab's workload exceeds NPDES Permit and other requirements</b>	<b>Moderate</b>	<b>Weak to Adequate</b>	<b>Moderate to High</b>
C-3	The Lab developed a matrix that shows the planned sampling frequency for each program		Weak	
C-6	Departments complete a "Test Request" form to request Lab work on a special project		Adequate	
C-10	Plant Operations and other programs decide on the sampling frequency and tests		Weak	
<b>T-3</b>	<b>The Laboratory Evaluation and Management Plan (LEMP), that ESD used to help determine staffing levels, did not accurately report the reduction in the number of Source Control samples and overall Lab workload</b>	<b>Moderate</b>	<b>Weak to Adequate</b>	<b>Moderate</b>
C-4	The ESD Team that developed the LEMP used data from Access database to estimate and project the reduction		Weak to Adequate	
C-5	The ESD Team that developed the LEMP consisted of a representative from each Lab Group to capture workload information on special projects		Weak to Adequate	
<b>T-4</b>	<b>The Lab did not reduce staffing levels commensurate with the reduction in its sampling analytical workload</b>	<b>High</b>	<b>Weak to Adequate</b>	<b>High</b>
C-4	The ESD Team that developed the LEMP used data from Access database to estimate and project the reduction		Weak to Adequate	
C-12	ESD reduced the number of Lab positions, including Chemist positions, to more closely align staffing to its workload		Weak to Adequate	
C-1	Lab currently has an Access database to track most, but not all, samples.		Weak	

**APPENDIX C**

<b>T-5</b>	<b>The ESD has not measured or quantified the impact special projects have on the Lab's workload</b>	<b>High</b>	<b>Weak</b>	<b>High</b>
C-7	Lab Manager asked staff to estimate extent of involvement and time spent on special projects		Weak	
C-17	Management reviews each special project proposal along with estimated resources and samples before it is accepted. The proposal is also reviewed by the Lab Manager		Weak	
<b>T-6</b>	<b>Lab staff spends excessive time manually tracking samples and analyses</b>	<b>High</b>	<b>Weak</b>	<b>High</b>
C-1	The Lab currently has an Access database to track most, but not all, samples.		Weak	
C-2	The Lab manually enters and tracks lab results		Weak	
C-24	ESD plans to purchase a new LIMS system to more accurately track samples, workload, and results		Potential Control	
<b>T-7</b>	<b>Lab staff spends excessive time working on different databases that are incomplete or not linked</b>	<b>High</b>	<b>Weak</b>	<b>High</b>
C-1	Lab currently has an Access database to track most samples.		Weak	
C-24	ESD plans to purchase a new LIMS system to more accurately track samples, workload, and results		Potential Control	
<b>T-8</b>	<b>The Lab's sampling frequency and quality control testing is excessive</b>	<b>High</b>	<b>Weak to Adequate</b>	<b>Moderate to High</b>
C-3	The Lab developed a matrix that shows the planned sampling frequency for each program		Weak to Adequate	
C-6	Departments complete a "Test Request" form to request Lab work on a special project		Weak to Adequate	
C-9	The Lab develops a Quality Assurance Program for certification		Adequate	
C-10	Plant Operations and other programs decide on the sampling frequency and tests		Weak	
<b>T-9</b>	<b>The Lab does not analyze samples in an efficient manner</b>	<b>Moderate</b>	<b>Weak</b>	<b>Moderate to High</b>
C-10	Plant Operations and other programs decide on the sampling frequency and tests		Weak	
<b>T-10</b>	<b>The Lab lacks authority or discretion to manage its workload</b>	<b>Moderate</b>	<b>Weak to Adequate</b>	<b>Moderate</b>
C-6	Departments complete a "Test Request" form to request Lab work on a special project		Adequate	
C-10	Plant Operations and other programs decide on the sampling frequency and tests		Weak	
C-17	Management reviews each special project proposal along with estimated resources and samples before it is accepted. The proposal is also reviewed by the Lab Manager		Adequate	

**APPENDIX C**

<b>T-11</b>	<b>Research positions and Chemists are doing the work of technicians</b>	<b>High</b>	<b>Weak</b>	<b>High</b>
C-11	City pay scale and MQs define the pay, scope of work, and educational requirements/training for Lab positions		Weak	
C-12	ESD reduced the number of Lab positions, including Chemist positions, to more closely align staffing to its workload		Weak	
<b>Budget</b>				
<b>T-12</b>	<b>The Lab is more expensive compared to an outsourced service</b>	<b>High</b>	<b>Weak</b>	<b>High</b>
C-12	ESD reduced the number of Lab positions, including Chemist positions, to more closely align staffing to its workload		Weak to Adequate	
C-13	ESD Lab can provide Plant with 24/7 availability to process samples		Weak	
<b>T-13</b>	<b>The Lab's chargebacks do not accurately reflect costs</b>	<b>Moderate</b>	<b>Weak</b>	<b>Moderate to High</b>
C-14	The Lab updates its chargeback rates by taking the average "published price" and subtracting 25%		Weak	
<b>T-14</b>	<b>The Lab spent money on a Laboratory Information Management System (LIMS) that does not work</b>	<b>High</b>	<b>Weak</b>	<b>High</b>
C-15	LIMS was budgeted in the City's capital budget and administered through the Plant's computer services section in existence at that time		Weak	
C-24	ESD is in the process of purchasing a new LIMS system to more accurately track samples, workload, and results		Potential Control	
<b>T-15</b>	<b>The ESD paid a consultant \$50,000 for an assessment of the Lab's appropriate staffing levels and equipment, but did not implement the consultant report's recommendations</b>	<b>High</b>	<b>Adequate</b>	<b>Moderate to High</b>
C-16	ESD Department Director made the final decision on what to do with the consultant's recommendations		Adequate	
<b>T-16</b>	<b>ESD management does not review special project proposals for cost, staff time, and anticipated benefits</b>	<b>High</b>	<b>Adequate</b>	<b>Moderate to High</b>
C-8	ESD prepared a matrix that identifies special projects required in the permit		Adequate	
C-17	Management reviews each special project proposal along with estimated resources and samples before it is accepted. The proposal is also reviewed by the Lab Manager		Adequate	
<b>T-17</b>	<b>The Lab does not use its equipment economically or efficiently</b>	<b>Moderate</b>	<b>Weak</b>	<b>Moderate to High</b>
	No identified control			

**APPENDIX C**

<b>T-18</b>	<b>The Lab does not have a complete equipment inventory and does not surplus replaced equipment</b>	<b>Moderate</b>	<b>Weak</b>	<b>Moderate to High</b>
C-19	ESD developed a procedure requiring an annual list of Lab equipment		Weak	
<b>T-19</b>	<b>The Lab purchases new and expensive equipment that it does not need or use</b>	<b>Moderate</b>	<b>Adequate</b>	<b>Moderate</b>
C-18	Deputy Director approves proposals for major equipment purchases, followed by TPAC approval and City Council approval		Adequate	
C-20	Lab uses 6 criteria to determine the need for replacement equipment		Adequate	
<b>T-20</b>	<b>The SJ/SC Plant conducts and incurs costs for special projects that other NPDES holders do not conduct</b>	<b>High</b>	<b>Adequate</b>	<b>Moderate to High</b>
C-21	Most special projects derive from the NPDES Permit and SJ coordinates with Sunnyvale and Palo Alto to participate and share costs		Adequate	
<b>Reporting and Tracking</b>				
<b>T-21</b>	<b>Lab staff does not report to the appropriate ESD Division or Program</b>	<b>High</b>	<b>Weak</b>	<b>High</b>
	No identified control			
<b>T-22</b>	<b>The Plant does not have reliable sample and analysis data from the Lab to use in its report to regulatory agencies</b>	<b>Moderate</b>	<b>Weak</b>	<b>Moderate to High</b>
C-1	The Lab currently has an Access database to track most, but not all, samples.		Weak	
C-2	The Lab manually enters and tracks lab results		Weak	
C-22	Lab generates reports from the Access database		Weak	
C-24	ESD is in the process of purchasing a new LIMS system to more accurately track samples, workload, and results		Potential Control	
<b>T-23</b>	<b>The Lab does not have adequate, reliable, and complete management information to assess its economy, efficiency and effectiveness</b>	<b>High</b>	<b>Weak</b>	<b>High</b>
C-1	The Lab currently has an Access database to track most, but not all, samples		Weak	
C-22	Lab generates reports from the Access database		Weak	
C-24	ESD is in the process of purchasing a new LIMS system to more accurately track samples, workload, and results		Potential Control	



**APPENDIX C**

<b>T-24</b>	<b>Management reports do not allow staff to properly manage the Lab's workload</b>	<b>High</b>	<b>Weak</b>	<b>High</b>
C-1	The Lab currently has an Access database to track most, but not all, samples		Weak	
C-22	Lab generates reports from the Access database		Weak	
C-24	ESD is in the process of purchasing a new LIMS system to more accurately track samples, workload, and results		Potential Control	
<b>T-25</b>	<b>Supervisors do not adequately review Lab results</b>	<b>Moderate</b>	<b>Adequate</b>	<b>Moderate</b>
C-23	Lab has written procedures for supervisory review		Adequate	
<b>T-26</b>	<b>Lab staff does not receive adequate continuing education</b>	<b>Moderate</b>	<b>Weak</b>	<b>Moderate to High</b>
C-11	City pay scale and MQs define the pay, scope of work, and educational requirements/training for Lab positions		Weak	
<b>T-27</b>	<b>The Lab's reported workload is overstated</b>	<b>High</b>	<b>Weak</b>	<b>High</b>
C-1	The Lab currently has an Access database to track most, but not all, samples.		Weak	
C-12	ESD reduced the number of Lab positions, including Chemist positions to more closely align staffing to its workload		Weak	
C-22	Lab generates reports from the Access database		Weak	
C-24	ESD is in the process of purchasing a new LIMS system to more accurately track samples, workload, and results		Potential Control	
<b>T-28</b>	<b>The Lab's turnaround times are longer compared to an outsourced service</b>	<b>High</b>	<b>Weak</b>	<b>High</b>
	No identified control			
C-24	ESD is in the process of purchasing a new LIMS system to more accurately track samples, workload, and results		Potential Control	
<b>T-29</b>	<b>The ESD does not measure the benefits of special projects in terms of regulatory relief, process savings, and other factors.</b>	<b>High</b>	<b>Weak</b>	<b>High</b>
	No identified control			