BOARD of SUPERVISORS

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MEMORANDUM

Date: June 1, 2016

To: Honorable Members, Board of Supervisors

From: Angela Calvillo, Clerk of the Board

Subject: 2015-2016 CIVIL GRAND JURY REPORT

We are in receipt of the San Francisco Civil Grand Jury (CGJ) report released Wednesday, June 1, 2016, entitled: **San Francisco's Crime Lab - Promoting Confidence and Building Credibility** (attached).

Pursuant to California Penal Code, Sections 933 and 933.05, the Board must:

1. Respond to the report within 90 days of receipt, or no later than August 30, 2016.
2. For each finding:
   - agree with the finding or
   - disagree with the finding, wholly or partially, and explain why.
3. For each recommendation indicate:
   - that the recommendation has been implemented and a summary of how it was implemented;
   - that the recommendation has not been, but will be, implemented in the future, with a timeframe for implementation;
   - that the recommendation requires further analysis, with an explanation of the scope of the analysis and timeframe of no more than six months; or
   - that the recommendation will not be implemented because it is not warranted or reasonable, with an explanation.

Pursuant to San Francisco Administrative Code, Section 2.10, in coordination with the Committee Chair, the Clerk will schedule a public hearing before the Government Audit and Oversight Committee to allow the Board the necessary time to review and formally respond to the findings and recommendations.

The Budget and Legislative Analyst will prepare a resolution, outlining the findings and recommendations for the Committee's consideration, to be heard at the same time as the hearing on the report.

Attachment

c: Honorable John K. Stewart, Presiding Judge
Nicole Elliott, Mayor's Office
Ben Rosenfield, Office of the Controller
Asja Steeves, Office of the Controller
Jon Givner, Office of the City Attorney
Alisa Somera, Office of the Clerk of the Board
Debra Newman, Office of the Budget and Legislative Analyst
Severin Campbell, Office of the Budget and Legislative Analyst
Jadie Wasilco, Office of the Budget and Legislative Analyst
Jay Cunningham, Foreperson, San Francisco Civil Grand Jury

COB

CITY AND COUNTY OF SAN FRANCISCO
CIVIL GRAND JURY

RECEIVED
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BY

May 26, 2016

Angela Calvillo
Clerk of the Board
SF Board of Supervisors
City Hall, Room 244
1 Dr. Carlton B. Goodlett Place
San Francisco, CA 94102

Dear Ms. Calvillo,

The 2015 – 2016 Civil Grand Jury will release its report entitled, "San Francisco's Crime Lab – Promoting Confidence and Building Credibility" to the public on Wednesday, June 1, 2016. Enclosed is an advance copy of this report. Please note that by order of the Presiding Judge of the Superior Court, Hon. John K. Stewart, this report **is to be kept confidential until the date of release (June 1st).**

California Penal Code §933 (c) requires a response to be submitted to the Presiding Judge no later than 90 days. California Penal Code §933.5 states that for each finding in the report, the responding person or entity shall indicate one of the following: (1) agree with the finding; or (2) disagree with it, wholly or partially, and explain why.

Further, as to each recommendation, your response must either indicate:

1) That the recommendation has been implemented, with a summary of how it was implemented;
2) That the recommendation has not been, but will be, implemented in the future, with a timeframe for implementation;
3) That the recommendation requires further analysis, with an explanation of the scope of that analysis and a timeframe for discussion, not more than six months from the release of the report; or
4) That the recommendation will not be implemented because it is not warranted or reasonable, with an explanation.

Please provide your response to Presiding Judge Stewart at the following address:
400 McAllister Street, Room 008
San Francisco, CA 94102-4512

Respectfully,

Jay Cunningham, Foreperson
2015 – 2016 Civil Grand Jury

City Hall, Room 482
1 Dr. Carlton B. Goodlett Pl, San Francisco, CA 94102
Phone: 415-554-6630

SAN FRANCISCO'S CRIME LAB

Promoting Confidence and Building Credibility

March 2016

City and County of San Francisco
Civil Grand Jury, 2015-2016

Members of the Civil Grand Jury

Jay Cunningham, Foreperson

Alison Ileen Scott, Esq., Foreperson Pro Tem

Arti M. Sharma, M.S., Recording Secretary

Sheldon Bachus

Richard Baker-Lehne

Mary Lou Bartoletti, M.B.A.

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Catherine Covey, M.D.

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Andrew Lynch

Wassim J. Nassif

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Michael Skahill, Ph.D.

David Stein

Charles Thompson

Eric S. Vanderpool, Esq.

THE CIVIL GRAND JURY

The Civil Grand Jury is a government oversight panel of volunteers who serve for one year. It makes findings and recommendations resulting from its investigations.

Reports of the Civil Grand Jury do not identify individuals by name.
Disclosure of information about individuals interviewed by the jury is prohibited.
California Penal Code, section 929

STATE LAW REQUIREMENT

California Penal Code, section 933.05

Each published report includes a list of those public entities that are required to respond to the Presiding Judge of the Superior Court within 60 to 90 days as specified.

A copy must be sent to the Board of Supervisors. All responses are made available to the public.

For each finding, the response must:

1) agree with the finding , or
2) disagree with it, wholly or partially, and explain why.

As to each recommendation the responding party must report that:

1) the recommendation has been implemented, with a summary explanation; or
2) the recommendation has not been implemented but will be within a set timeframe as provided; or
3) the recommendation requires further analysis. The officer or agency head must define what additional study is needed. The Grand Jury expects a progress report within six months; or
4) the recommendation will not be implemented because it is not warranted or reasonable, with an explanation.

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SUMMARY

Over the past several years, the credibility of the San Francisco Police Department Criminalistics Laboratory (Crime Lab or the Lab) has been marred by scandals that have interfered with its mission to present accurate, unbiased, and convincing testimony in court. These incidents have ranged from theft in the Drug Analysis Laboratory to the well-publicized failure of two criminalists to pass a national proficiency test.

Our report summarizes the past incidents that have damaged the credibility of the Crime Lab. We point out what remedial steps have been taken to improve the quality of work in the Lab, and we outline additional steps needed to sustain the progress made and prevent similar problems in the future.

We found that

- The Crime Lab suffers from being too closely managed by the Police Department. It has been headed by a rotating succession of police captains who lack the scientific knowledge to understand the intricate workings of the Laboratory. Scientific errors and disputes are often handled using a police Internal Affairs model of discipline. This model investigates problems secretively, does not provide transparency, and has the effect of immediately halting constructive dialog between management and criminalists. Under the Police Department, the Crime Lab is often viewed as biased for the prosecution, rather than an independent arm of the criminal justice system.
- The backlog of DNA cases has been reduced. Turnaround time for case completion has also improved, but both need further improvement to satisfy the requirements of all potential users, including crime victims and defense representatives.
- Outsourcing of DNA cases is being used effectively, especially given that the Lab has a reported shortfall of five to eight DNA analysts. Outsourcing has been especially useful in dealing with the influx of untested rape kits delivered to the Crime Lab in June 2015 by the San Francisco Police Department (SFPD).
- Re-opening the Drug Analysis Lab, which has been closed since the discovery of cocaine theft in 2010, would benefit both the City and the Crime Lab.
- The Lab's case tracking system is outdated and lacks modern capabilities. It needs to be updated to improve internal management of cases, as well as to allow better communication with the Crime Lab's customers: The Police Department, the District Attorney's Office, and, perhaps in the future, the defense community.
- Although several comprehensive reviews of past work have been undertaken by Crime Lab management, an external audit by forensic experts trusted by all stakeholders of the Crime Lab is crucial to confirm the results of these internal reviews and validate the policies and practices of the Lab.
- Although the Crime Lab is fully accredited, quality can only be assured by a robust quality management system.

We recommend

- Separation from the SFPD in a two step process that will eventually lead to an independent Crime Lab. The first step should be to replace the sworn police Director with

the civilian scientist manager as head of the Lab. The second step should be the establishment of an autonomous, independently-funded Crime Lab.

- Reopening the Drug Analysis Lab.
- Implementation of a modern laboratory information management system.
- More collaboration with stakeholders of the Crime Lab (the District Attorney, Police Inspectors, and the Defense) by
    - Providing restricted electronic access on the status and progress of their cases using a modern laboratory information management system.
    - Seeking stakeholder input regarding appropriate turnaround times and an optimal "not-to-exceed" number of backlogged cases in the Crime Lab.
- An independent external review by respected forensic experts whom all stakeholders agree are trustworthy. These auditors should not be selected by the City on the basis of lowest cost but rather because of their trusted reputation.
- Adherence to the goals of California's AB 1517, the Sexual Assault Victim's DNA Bill of Rights, which recommends timeliness for analysis of DNA evidence collected after an assault and for notification of the victim, if requested, that analysis of the evidence has been completed.
- More favorable interaction with the Public, using an updated website.
- Establishment of a scientific advisory board which would provide an additional source of technological expertise to the Lab.

BACKGROUND

The credibility of the San Francisco Police Department Criminalistics Laboratory (Crime Lab or Lab) has suffered due to multiple incidents widely reported by the news media over the last several years. These incidents are summarized below to give an indication of the extent of past criticism. Because some of the incidents relate to evidence presented in criminal cases just now coming to trial after a delay of several years, the credibility of the Crime Lab continues to be questioned as new cases are brought to trial.

Sample Switch and Record Destruction. In fall 2008 an analyst in the Crime Lab mixed up two samples of DNA evidence during testing in a homicide case. In a serious breach of forensics protocol, she was directed by her supervisor to re-label the samples and discard the records of the mistake. This breach was subsequently reported by an anonymous whistleblower in a letter to a lawyer in the Public Defender's Office. The Public Defender's Office reported the sample switch, its concealment, and other concerns about the Crime Lab to the U.S. Attorney's Office.

In July 2009 the whistleblower notified ASCLD/LAB[1], the accrediting agency for the Crime Lab, of the allegations. ASCLD/LAB, in turn, asked for a response from the then Crime Lab director who denied knowledge of the sample switch. Subsequently, upon learning that ASCLD/LAB had confirmed the switch, the Public Defender called for an investigation into whether the destruction of the record of the switch was a criminal act.

Theft of Drugs. In March 2010 a criminalist in the Drug Analysis Lab was found to be using cocaine stolen from evidence. The then police chief immediately halted all further drug testing at the Lab, and, in May 2010, closed the Drug Lab permanently. The Drug Lab is closed to this day with its equipment still in place. Drug analysis is currently outsourced to the Alameda Sheriff's Crime Lab.

The Bicycle Case. Also in March 2010, a well-known attorney contracted by the SF District Attorney's (DA's) office to work in its Cold Case section sent the DA a memo highly critical of the competence of a Crime Lab DNA analyst. At the same time, this analyst's methods were also being criticized publicly by another expert in the DNA community. The case in question, dubbed the "Bicycle Case", was the *State of California vs. Joc Wilson and Emon Brown*. In 2007 Byron Smith was gunned downed by men on bicycles in what police suspected was a gang turf war. A second victim had been murdered in a similar manner. In court, the Crime Lab analyst testified that the DNA of Brown was on the handlebars of one recovered bicycle and that of Wilson on the other bicycle. In her testimony, however, the analyst failed to mention that the predominant DNA found on both bikes was actually from a third person who has never been named. By omitting this finding, the analyst was accused of being in violation of the Brady Rule, which states that exculpatory evidence must be shared with the defense. After the defendants were acquitted, their lawyer wrote to the Chief of Police, as head of the Crime Lab, complaining that the testifying analyst had behaved unethically and that her behavior "might constitute criminal conduct warranting further investigation."

[1] ASCLD/LAB is the accrediting arm of the American Society of Crime Lab Directors.

Marco Hernandez Case. In December 2014 additional Crime Lab problems came to light during the trial of a child molestation defendant. A criminalist uploaded a DNA profile into CODIS, the FBI software program used to compare subjects to known offender databases (see "What is CODIS" in Appendix A). Although the profile was partial and would not be acceptable by today's standards, the main errors in the upload involved assumptions that were made that altered the results of the search. The defendant was deemed a possible match, but another profile, which also should have been deemed a match, was not pursued. At trial, the excluded profile was brought up by the defense who cast doubt on both the criminalist who was testifying and on the Crime Lab itself. Problems with this CODIS upload by the criminalist and her supervisors have resulted in questioning of many other cases as they come to trial. Pre-trial evidentiary hearings have been necessary, further burdening the court system as DNA results are questioned. At least 500 cases were uploaded during this period and have since been reviewed by the Crime Lab.

Proficiency Failure. In August 2014 the same criminalist failed a nationwide DNA proficiency examination. A second criminalist, who was her supervisor, reviewed her results and agreed with them, thereby failing the test herself. Notably, these two were the only criminalists of 343 in the nation who failed the examination. Both criminalists were removed from their duties in the Crime Lab, have been investigated by SFPD Internal Affairs, and are participating in further hearings at this time. They have been reassigned to other areas within the SFPD, but they remain on the Crime Lab payroll.

OBJECTIVES

The Civil Grand Jury undertook this investigation to

- assess the extent to which the Crime Lab has effectively identified its past problems
- evaluate whether the Crime Lab has taken action to correct the root causes of these problems and
- identify additional steps necessary for its continued improvement.

SCOPE AND METHODOLOGY

The Civil Grand Jury conducted over 30 interviews that included:

- Crime Lab personnel, both current and past. We interviewed senior management, as well as non-management employees chosen to provide a broad view of the Crime Lab. We also interviewed past employees of the Crime Lab for their perspective on historical problems and the culture of the Crime Lab.
- Attorneys, from both the defense and the prosecution, including those whose complaints have led to intense scrutiny of the Crime Lab.
- Users and potential users of the services of the Crime Lab, including district attorneys, public defenders, and police inspectors.
- Directors of other crime labs in the Bay Area and California.
- Forensic experts, including leaders of national forensic accreditation organizations, scientists associated with the National Institute of Standards and Technology (NIST), and academicians, for their opinions on best practices in Crime Lab operations.

We wish to thank all those we interviewed for the generous gift of their time and for their thoughtful, candid opinions.

We attended a pretrial evidentiary hearing (402 hearing) in which the defense and prosecution debated whether the Crime Lab analyst involved in the Hernandez case was qualified to present DNA evidence to the jury.

We also examined many documents related to the Crime Lab, including accreditation documents, whistleblower letters alleging misconduct, official responses to allegations, previous audits, trial testimony, and training materials. We reviewed the 2009 reports of the National Academy of Sciences[2] and the California Crime Laboratory Review Task Force[3] examining the state of the forensics community. In addition, we reviewed the many media articles about problems in the Crime Lab over the last several years. These articles, which reported the incidents summarized in or Background section, originally sparked the Civil Grand Jury's interest in the Crime Lab and led to this investigation.

Because most of the past problems of the Crime Lab have involved the Drug Analysis and the DNA units, we focused our attention on these units. We conducted this review from August 2015 through March 15, 2016.

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[2] The National Academy of Sciences, "Strengthening Forensic Science in the United States: A Path Forward" /www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf (accessed 2/13/16)

[3] California Crime Laboratory Review Task Force, "An Examination of Forensic Science in California November 2009" oag.ca.gov/publications/crime_labs_report.pdf (accessed 2/13/16)

ORGANIZATION

The Crime Laboratory is a public laboratory administered and funded by the SFPD. It provides forensics services primarily to the San Francisco Police Department and the District Attorney's office. Theoretically, its services could be used by others, including the SF Public Defender's Office, but this occurs rarely. Non-users cite what they feel is bias for the prosecution and long turnaround times as reasons for not utilizing the Crime Lab.

Crime Lab services include analysis of:

- Biology/DNA
- Firearms/Toolmarks
- Trace Evidence (gunshot residue and shoeprints only)
- Breath Alcohol

Since March 2010, after the closure of the Drug Analysis Lab due to theft of drugs by an analyst, controlled substance testing has been outsourced to another public laboratory.

The Crime Lab is staffed with 25 employees, primarily civilians (Appendix B). In the DNA lab entry-level criminalists (Criminalists I) perform screening tasks to prepare evidence for analysis. Journeyman criminalists (Criminalists II) perform casework to analyze DNA evidence. Supervising criminalists (Criminalists III) are more experienced criminalists who assign cases, coordinate the efforts of the Criminalists II, review completed work, administer grants, and perform other administrative duties. The Technical Lead is a Criminalist III who ensures that the methodology and procedures used in performing casework are in compliance with established standards, that these methods are validated, and that analysts are properly trained. (See Glossary).

In the Crime Lab we found the Criminalists II and III, as well as the Technical Lead, to be well educated with master's degrees. Several had extensive experience in other public and private forensic labs prior to coming to the SF Crime Lab. Many of them were hired recently and were not involved in the scandals mentioned in our background section.

Several positions remain unfilled, and the two DNA analysts whose work is under investigation are currently reassigned to other areas within the police department.

We learned that salaries for criminalists are highly competitive. In fact, they are among the highest in the nation.[4] However, hiring in San Francisco government is a cumbersome process.[5] For example, a firearms analyst who was interviewed in 2014 just began working in September 2015. The delay in bringing him to work was attributed to a slow progression through the SFPD Human Resources (HR) process and then the City HR process.

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[4] An Examination of Forensic Science in California November 2009 ag.ca.gov/publications/crime_labs_report.pdf

[5] Office of the Controller, City Services Auditor "How Long Does It Take to Hire in the City and County of San Francisco? Analysis and Recommendations" http://openbook.sfgov.org/webreports/details3.aspx?id=1907 (accessed 2/13/15)

FACILITIES

The Crime Lab is housed in Police Building 606 at the former Naval Shipyard in Hunter's Point. The facility has always been considered temporary because the area is slated to undergo redevelopment. In 2014 San Francisco voters approved an Earthquake Safety and Emergency Response Bond to build a new facility, now proposed for 1965 Evans Avenue, to house the Crime Lab. Planning for the new facility, which will also house the Office of the Medical Examiner, has started. Completion is estimated for the end of 2019.

GENERAL DISCUSSION

A. Day-to-day management of the Crime Lab should be removed from direct police supervision

DISCUSSION

Currently, a professional civilian scientist serves as Manager of the Crime Lab. He serves under the Director of Forensic Services of the SFPD, usually a police captain who reports to the assistant Chief and, ultimately, the Chief of the SFPD. Currently the police captain, the Director of Forensic Services, is also in charge of the Crime Scene Investigation (CSI) Unit and the Identification Unit (fingerprints).

Since 2010 the Crime Lab has changed top management at an alarming rate. The last civilian scientist Director of Forensic Services resigned in 2010. Subsequently, no fewer than six police captains have held the title of Director of Forensic Services. Director of Forensic Services has been part of an appointed rotation available to 25-30 police captains, a rotation that includes precinct head as well as other posts of higher or lesser advancement. Levels of education have varied. One captain did not have a college degree, and few have had degrees in science. This fact is important because understanding the highly scientific nature and the rapid evolution of DNA technology is difficult. Unintended damage and obstruction to progress has occurred in the past because a captain did not understand the challenges faced by the Lab and how to manage them effectively. As Lab personnel lamented to us, "We keep having to train another captain." A former employee told us, "I called our captain Captain Chaos." On the last day of our investigation, a new captain was appointed, the sixth in less than six years.

In the 2015 ASCLD/LAB accreditation report, the Crime Lab was criticized for having a non-scientist as its Director.

Having a sworn officer as head of the Crime Lab has also led to an approach to discipline based on a police model. When errors or misconduct are uncovered, investigations have been conducted by police Internal Affairs. These investigations are prolonged and highly secretive, often leading to the impression that the Crime Lab is covering up. In addition, many of those we interviewed believe that the police command has tended to over-react to situations in the past which could have been handled instead by remedial training or a change in protocol. The permanent closure of the Drug Analysis Lab was cited as an example.

In addition, actual or perceived conflicts of interest could arise when the Crime Lab conducts forensic examinations on evidence relating to police officers, since both are under the Police Department. Examples include analysis of gunshot residue and firearm evidence in officer-involved shootings.

Most importantly, placing a sworn officer without scientific training as the head of the Crime Lab contradicts a major recommendation of the National Academy of Sciences. In 2009 a blue ribbon committee of the Academy made a number of recommendations to improve forensic

science in this country.[6] One of its principal recommendations was that all public forensic laboratories and facilities should be removed from the administrative control of law enforcement agencies or prosecutors' offices. The committee stated: "Forensic scientists who sit administratively in law enforcement agencies or prosecutors' offices, or who are hired by those units, are subject to a general risk of bias." The U.S. Supreme Court has also underscored the need for independent forensic science. In *Melendez-Diaz v. Massachusetts*[7] it quoted the National Academy of Sciences report and warned that, when forensic laboratories are administered by law enforcement agencies, "[a] forensic analyst responding to a request from a law enforcement official may feel pressure -- or have an incentive -- to alter the evidence in a manner favorable to the prosecution."

FINDINGS

F.A.1. The position of the police captain Director has been a high turnover position, and the learning curve for the Crime Lab is steep. Putting a police captain in charge of day to day management has, in the past, resulted in the sworn Director having difficulty understanding the challenges of the Crime Lab and dealing with them appropriately.

F.A.2. Under police management, discipline has often been handled using a police model. Investigations of scientific errors have been conducted secretly under the cover of police Internal Affairs and give the impression that the Crime Lab itself is covering up.

F.A.3. Once the disciplinary process goes to Internal Affairs, we observed an immediate halt to dialog between staff and management aimed at resolving technical issues in a scientific manner.

F.A.4. The positioning of San Francisco's Crime Lab within the police department is contrary to the National Academy of Sciences' 2009 recommendation that Crime Lab scientists be distanced from law enforcement.

RECOMMENDATIONS

R.A.1. The Crime Lab should be separated from the SFPD and function as an independent entity. Such an entity would be not unprecedented in San Francisco. The Office of the Medical Examiner (OME) is an independent agency funded by the General Services Agency. It provides forensic pathology and toxicology services for other City agencies, including the SFPD and the DA, but is not governed by them.

R.A.2. The Mayor should direct, the Board of Supervisors (BOS) should approve, and the Controller should facilitate a transfer of budget, facilities, assets, personnel, and management of the Crime Lab from the SFPD to the General Services Agency.

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[6] The National Academy of Sciences," Strengthening Forensic Science in the United States: A Path Forward" /www.ncjrs.gov/pdffiles1/nij/grants/228091.pdf (accessed 2/13/16)

[7] ***Melendez-Diaz v. Massachusetts***, 557 U.S. 305, 129 S. Ct. 2527, 2542 (2009) (No. 07–591)

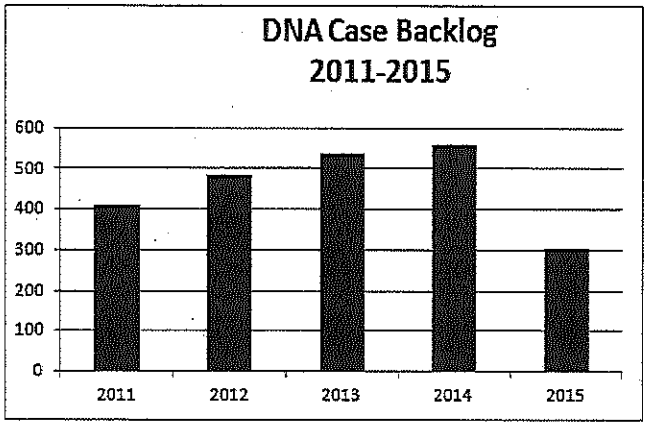
R.A.3. Because establishing an autonomous Crime Lab will no doubt be a lengthy process, we recommend an interim step for the Crime Lab to achieve greater separation from the SFPD: The sworn police captain should be replaced by the civilian scientist manager as Director of the Crime Lab. The police captain could continue his role as commanding officer overseeing CSI and Identification, but the management of the Crime Lab itself should be headed by a professional scientist.

R.A.4. As long as the Crime Lab remains part of the SFPD, we recommend that the civilian head of the Crime Lab report directly to the Chief without the intermediate layer of a captain.

B. A more modern information system is needed to track cases and manage the backlog

DISCUSSION

Crime lab backlog is costly for all factions of the criminal justice system. If analysis of evidence is delayed, guilty individuals may go unidentified, free to commit further crimes. Suspects spend more time in jail awaiting trial and possible exoneration. Victims of crime feel deprived of justice.



Note: Backlog refers to case requests received but not yet reported

From 2010 to 2014, the Crime Lab had a large DNA case backlog that peaked in 2014 at 558 cases. The Crime Lab addressed this unacceptably large backlog and reduced it by outsourcing cases and by increasing lab efficiency. As a result, in December 2015 the backlog was reduced to 303 cases (see graph above).

A major contributor to the backlog has been a shortfall of DNA analysts. During our investigation we were told the shortfall ranged from five to eight Criminalists II, not including the two criminalists reassigned to other areas and no longer working in the DNA Lab. In spite of this shortfall, and in spite of an increase in the total number of cases received, the Crime Lab was able to reduce its backlog by outsourcing cases and by improving lab efficiency. We were told that efficiency was improved in several ways:

- Grant money was used to participate in an initiative often used in industry called *Lean Six Sigma*, which analyzed the entire lab's process and recommended changes to workflow and protocols. Time needed for all steps of the process was reportedly reduced.
- Robotics replaced manual methods of extraction, reducing the time required for this step of DNA analysis. Robotic extraction, capable of processing up to 14 samples at a time, has also reduced the chance of human error during this step.

- Lab protocols were streamlined. Redundancies were eliminated.
- Automation of report writing was instituted, saving time when reports are written and reviewed. Automation has also improved uniformity of reports.

Tracking the backlog is difficult

Essential to managing cases and reducing backlog is the ability to follow cases as they move through the Crime Lab's system. We found the Laboratory's computerized tracking systems to be outdated and inadequate. The Crime Lab has two systems: The Forensic Services Division database, which registers all cases as they come to the Crime Lab and is used for tracking of Firearms, Gunshot Residue, and Trace Evidence cases, and a second system exclusively for DNA cases. These two systems have limited capabilities and cannot perform the sophisticated functions needed by today's crime labs.

A modern laboratory information management system (LIMS) not only allows for efficient tracking but helps with personnel and lab management. It can track the status of cases and the flow of evidence. It can allow entry of discovery orders and court dates. With proper configuration, it can also allow users of the lab to access their reports. For the criminalist, it offers increased efficiency in report writing and automated data input. After years of failing to obtain budget approval for a new LIMS, the Crime Lab has just purchased a modern LIMS, and is proceeding with plans to implement it and to migrate data from the old systems.

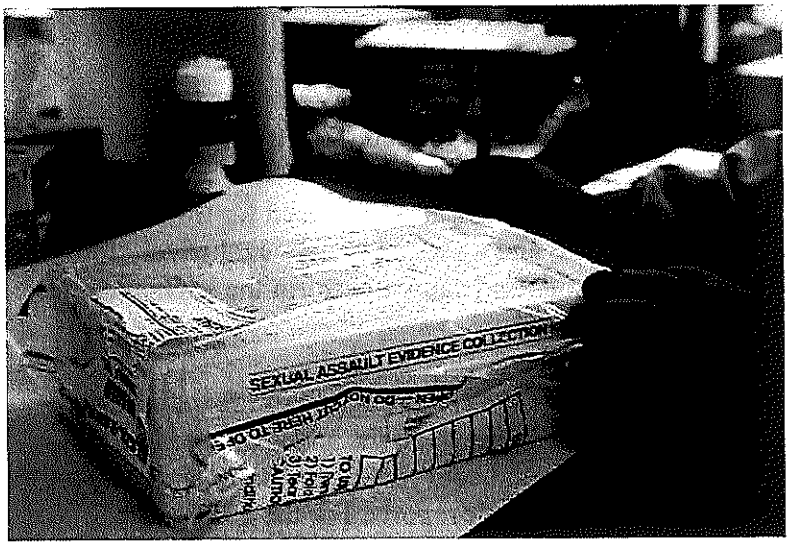
Turnaround time is better but needs to improve

Users of the Crime Lab repeatedly expressed frustration about the long wait for results. The DA's office cited two instances in which charges could not be filed because analysis of the evidence wasn't completed quickly enough. The Public Defender's office told us that it never requests that evidence be processed by the Crime Lab, not only because of its serious concern about prosecution bias but also because of long turnaround times.

In fairness, it should be noted that casework priority is set for the Crime Lab by the Police Inspector who submits the evidence. The Inspector assigns one of three categories of urgency: *Routine*, *Immediate*, and *Priority*. When we tried to find the turnaround times for each of these categories, we were told that the current laboratory information system is not capable of determining them by category. Estimates of turnaround times varied depending on which supervisor we asked. For *Immediate* 30 to 60 days was estimated. For *Priority* 60 to 120 days was estimated. The actual average turnaround time for all DNA cases completed from July 2015 to December 31, 2015, was 274 days.

We were told that the goal of the Crime Lab when fully staffed is to reduce the average turnaround time for all cases to 60-120 days. A modern LIMS will be essential to increase lab efficiency and to determine if goals are being met.

Untested Rape Kits: A Special Backlog



The untested sexual assault kit backlog is a serious problem not created by the Crime Lab but which it is now tasked with solving. After a sexual assault, a victim may choose to undergo an invasive medical examination with the hope that the evidence will lead to the conviction of the assailant. However, the "sexual assault kit" or "rape kit" is submitted for DNA analysis only at the discretion of the police investigator or the District Attorney. An estimated 50% of kits nationally have never been submitted to a crime lab for analysis and lie in storage untested. The Justice Department estimates that there are 70,000 untested kits nationwide.[8] Other estimates have been much higher.[9] In September 2015, the District Attorney of New York announced that his office would award $38 million in grants to jurisdictions in 20 states to eliminate the backlog, augmenting the $41 million available from the Department of Justice for the same purpose.

In San Francisco, a police department audit of evidence rooms showed that 753 sexual assault kits were never submitted to the Crime Lab for testing. Subsequently another 473 kits, which exceeded the state's 10 year statute of limitation for prosecution, were identified. They represent San Francisco's known backlog as of 2015.

In June 2015, the City District Attorney asked the SFPD to join with him in applying for a grant to reduce the backlog. SFPD declined publicly, but several days later announced that money from the SFPD budget was available to test the kits. The kits were delivered to the Crime Lab, and, by August 2015, SFPD announced that all of the kits had been outsourced for testing at a private lab. Why didn't the SFPD and the Crime Lab join with the DA's office to apply for the rape kit testing grant money? When we asked, Crime Lab administration told us that the Crime Lab had competing grants which might be forfeited if new grants were obtained, and that a plan for testing the kits was already in place at the time of the DA's request.

After the outsourced tests come back, the Crime Lab is tasked with the disposition of the results. Many of the assaults have passed the 10-year statute of limitation for prosecution. Many results

[8] The Road ahead: Unanalyzed evidence in Sexual Assault Cases. National Institute of Justice https://www.ncjrs.gov/pdffiles1/nij/233279.pdf (accessed 2/13/16)

[9] A White House report in 2015 estimated that 400,000 kits remain untested. https://www.whitehouse.gov/the-press-office/2015/03/16/fact-sheet-investments-reduce-national-rape-kit-backlog-and-combat-viole (accessed 2/13/16)

are being sent back directly from the outsourcing lab to police inspectors to be placed in the case file without further action. However, the Crime Lab expects to enter all CODIS-qualifying DNA profiles from the outsourced testing into the state and federal databases. By uploading the profiles to CODIS, serial stranger rapists may be identified. In addition, uploading honors the intent of victims who have consented to the sexual assault examination.

In January 2016 a federal civil rights lawsuit was filed against the City alleging the SFPD mishandled a sexual assault case.[10] In her complaint, which is critical of the entire law enforcement system dealing with the assault, the plaintiff describes in detail the difficulty she experienced in finding out if the DNA evidence was analyzed and any profile searched using CODIS, as well as the lengthy time it took to process the evidence.

We learned that current procedures for handling sexual assault evidence have changed. Each sexual assault kit is delivered by police courier to the Crime Lab where it is automatically assigned *Immediate* priority status (see above under turnaround times). Work is begun even without waiting for receipt of complete paperwork from the Police Inspector.

Public dismay about the nationwide backlog is strong, and legislators have weighed in. The SF Board of Supervisors passed an ordinance in 2010 that the SFPD devise a plan to assure testing of all rape kits.[11] The California State Assembly passed AB-1517, "The Sexual Assault Victim's DNA Bill of Rights." It is an unfunded mandate advising that, as of January 2016, crime labs process sexual assault evidence, create DNA profiles when possible, and upload qualifying profiles into CODIS as soon as possible, but no later than 120 days after receiving the evidence. If a crime lab is unable to accomplish that, it should transmit the evidence to another lab within 30 days of receiving the evidence. It also mandates that, if requested, the victim be notified that the evidence was analyzed.

FINDINGS

F.B.1. The computer management system of the Crime Lab is outdated and lacks many analytical functions. It impedes tracking of cases by all users, evaluating turnaround times, and identifying at which points case progression through the Crime Lab is bottlenecked. It does not increase the efficiency of the Lab.

F.B.2. State AB 1517, the Sexual Assault Victim's DNA Bill of Rights, took effect in January 2016. This mandate puts additional pressure on the Crime Lab to complete and track DNA analysis from sexual assault victims in an expedient time frame and to notify, if requested by the victim, that the analysis has been done.

RECOMMENDATIONS

R.B.1. The Crime Lab and the Police Department's Office of Technology should devote all necessary resources to install and implement a user-friendly laboratory information

[10] Marlowe v. City and County of San Francisco, et al

[11] http://www.sfbos.org/ftp/uploadedfiles/bdsupvrs/ordinances10/o0317-10.pdf (accessed 2-28-16)

management system that will track cases, increase laboratory efficiency, facilitate outcomes evaluation, and allow real-time sharing of information.

R.B.2. When the LIMS is installed and customized for the Lab, input from the DA's office, the defense community, and Police Inspectors should be solicited as to the features that will help them obtain the information they need in their own work. At the very least, a secure, password-protected open discovery record[12] in the LIMS should allow the Defense, the Prosecutor, and the Inspector direct access to a completed Crime Lab report.

R.B.3. The Crime Lab should conform to the mandate of AB 1517 and should go a step beyond by publishing its compliance statistics quarterly.

C. Outsourcing can be effective but should be used judiciously.

DISCUSSION

In 2015, 284 cases, not including the backlog of untested sexual assault kits, were outsourced to private labs. Homicides and other violent crimes, with the exception of rape, are not outsourced. Outsourcing appears to be a good way to reduce backlog in the Crime Lab, particularly in view of the current unfilled positions in the DNA Lab.

Why not outsource everything?

A 2010 financial audit by the SF Controller's office[13] recommended that all forensic work be outsourced and the Crime Lab closed. The recommendation was based, in large measure, on the savings from not having to construct a new crime lab facility. However, we learned that there are several downsides to outsourcing the work of the Crime Lab. These include:

- Crime Lab personnel are still required to screen and prepare evidence before sending it to an outsourced lab.
- Private labs are not allowed by the FBI to use CODIS to submit DNA profiles for comparison to offender databases. Once DNA results are received from the outside lab, local CODIS-trained administrators are needed to determine the technical suitability of the results before uploading them into CODIS. They must make a disposition of results received back from CODIS and then inform the Police Inspectors of the results.
- Outsourcing has a financial cost to the City, which pays for expensive out-of-area expert witnesses to present the results of testing in court. If a witness is called in from the East Coast, for example, the DA's office must pay for the expert's time, transportation, and expenses. If the trial is delayed at the last minute, the expenses increase.
- Finally, outsourcing also has its own potential to obscure transparency. Private labs are not immune to error and have had their own highly publicized quality problems. Even

[12] A discovery record includes among other things the completed case report, the qualifications of the analyst, the chain of custody, and information about the testing performed

[13] Office of the Controller, City Services Auditor *Cost Estimates for Achieving Operational Effectiveness in Crime Lab Operations* http://sfcontroller.org/Modules/ShowDocument.aspx?documentid=866 (accessed 2/13/16)

though outsourcing removes the process from immediate scrutiny, someone must assure that the outsourcing lab has followed proper procedures. ASCLD/LAB also requires that the Crime Lab review work from "vendors." Monitoring several labs from a distance is more difficult than monitoring a nearby lab.

The Drug Analysis Lab should be re-opened

When faced with the discovery in 2010 that a criminalist was using drugs taken from evidence, the then Chief of Police closed the Drug Analysis Lab. In our view, to close the Drug Lab rather than to correct its problems was overkill. Since that time, drug analysis has been outsourced to the Alameda County Sheriff's Crime Lab. We are told that two San Francisco police officers drive across the Bay Bridge twice daily with drug evidence for analysis. In addition, the Sheriff's Lab charges a fee to analyze each sample. For the last three years, total fees paid to the Alameda Sheriff's Lab have exceeded $400,000 per year, although Proposition 47[14] may lead to a decrease in the number of analyses done in the future.

Currently, the SF Crime Lab Drug Analysis Lab sits intact but idle. Equipment remains in place that can be re-calibrated and validated. Some of the current analysts have had previous drug analysis experience, and others can be cross-trained. A new supervisor will need to be hired. Safeguards to prevent theft in the Crime Lab can be established. These might include monitoring with internet-enabled cameras to allow remote observation of the laboratory, using secure storage units, and establishing security procedures that will make theft by a single individual difficult.

Crime Lab leadership estimates that cost savings for San Francisco will result if the Drug Analysis Lab is re-opened. The expense of twice daily transport of drugs to the East Bay by two sworn officers would be eliminated, as would the $400,000 paid in outsourcing fees each year. Because we were unable to estimate the cost of additional personnel and resources needed for analyzing drugs in-house, we cannot state with certainty that net cost savings will result.

However, the benefits of re-establishing the Drug Lab go far beyond monetary savings. It is traditional in a full service Crime Lab for entry level criminalists to be trained in basic forensic disciplines, such as blood alcohol and solid drug analysis, before going on to more complex tasks. In addition, by observing the work of new employees in these disciplines, management can better evaluate the potential of a new trainee in a less complex setting than the DNA lab. Finally, the Drug Analysis Lab traditionally serves as an excellent training ground in which new criminalists can develop their basic courtroom testifying skills.

[14] Proposition 47. passed by California voters in 2014, reduced several simple drug possession charges from felonies to misdemeanors

FINDINGS

F.C.1. Outsourcing is a useful tool to reduce case backlog and lower turnaround times during the current period of staffing shortages.

F.C.2. Outsourcing incurs additional cost for the DA and the City because the expenses of trial testimony given by expert witnesses from outside the area must be paid.

F.C.3. Better utilization and evaluation of Crime Lab personnel can be accomplished by re-opening the Drug Analysis Laboratory.

RECOMMENDATIONS

R.C.1. The Crime Lab should continue to use flexible outsourcing when in-house staffing is insufficient to keep up with the work load.

R.C.2. The Crime Lab should continue its efforts to staff the Lab fully so that the expense incurred by using outsourced expert witnesses can be reduced.

R.C.3. The Drug Analysis Lab should be re-established in the Crime Lab.

D. A Robust Quality Assurance Program is Needed

DISCUSSION

Efficiency and a reduced backlog are meaningless, however, if they are not backed by credible, quality work.

Accreditation is not enough. The Crime Lab was accredited (Appendix C) in 2015 by ASCLD/LAB using more rigorous standards than applied in previous accreditations. Accreditation is vitally important to make sure that a lab meets national standards for training and quality of staff, has the correct equipment that has been properly calibrated and maintained, uses valid protocols for testing, and accurately records and reports procedures. Accreditation is required to use CODIS. In the Crime Lab the areas of DNA, firearms, and trace evidence passed the 2015 accreditation review with few citations. The DNA lab also passed its most recent external audit in 2015.

An accreditation survey is done using a standard checklist. However, what happens when inspectors are presented with discrepancies not on their checklist?[15] This happened during the 2010 ASCLD/LAB review when accreditation was awarded despite the fact that the criminal

[15] Budowle, Bruce and Harmon, Rockne, *The Illusion of Quality through Accreditation,* presentation at the International Symposium on Human Identification, Oct 2015, http://ishinews.com/presentation/recent-developments-the-illusion-of-quality-through-accreditation/ (accessed 2/13/16)

scandal that led to the closure of the Drug Lab was occurring at the same time, and the deficiencies of the Bicycle Case were being debated in the forensic community.

Moreover, what if a quality breach occurs just after an accreditation review cycle? Because accreditation is done every five years for the entire lab and an external review is done every two years in the DNA lab, months to years might pass before the next external review, although the Lab is required to self-report "incidents" on an annual basis.

Accreditation must be accompanied by a robust Quality Assurance (QA) program. ASCLD/LAB requires each accredited Crime Lab to have a Quality Assurance Manager (QAM) who oversees both the laboratory itself and the competency of the individuals who work there. Errors occur in any lab, and the QAM must identify and determine the source of error, measure the extent, inform stakeholders of the potential damage, and take corrective action to reduce the chance of future incidences. The QAM must help to determine the root cause of the incident and decide if it is due to systemic or individual error.

In the SFPD Crime Lab, this important position was essentially unfilled by a QAM specifically dedicated to the position starting in 2013, when the previous QAM retired, to March 2015.[16] In addition, prior to 2013, even though the QAM was allowed to review the rest of the Lab, she was excluded from DNA QA because DNA QA was overseen by the DNA Technical Lead. Currently the Lab has a QAM who has held this part time position since March 2015. Crime Lab management told us that the new QAM is a committed worker who is dedicated to rebuilding a program. However, the manager is new to QA and lacks an onsite mentor who has previously specialized in this role.

A new approach to errors is professed. In the past, attempts were made to hide errors (see Background). By contrast, Crime Lab supervisors now admit openly that errors do happen. Their admissions reflect a national trend in forensics toward greater transparency. In July 2015 the National Institute of Standards and Technology (NIST) held an international conference *Dealing with Forensic Errors*[17] which reviewed past errors and encouraged criminalists to be candid about their mistakes in order to learn from them. Rather than denying that errors happen, SFPD Crime Lab supervisors shared with us the logs that they give regularly to the DA's office outlining errors.

We were especially concerned by the frequency of contamination errors in the Lab (Appendix D), and we believe that admitting to errors is not sufficient. Corrective procedures need to be developed and metrics established to determine whether corrective processes have been successful in reducing future incidents.

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[16] The Crime Lab Manager temporarily held the vacant QAM position during this period, contrary to the intent of this position.

[17] NIST International Symposium on Forensic Error. http://www.nist.gov/forensics/forensic_error_mgmt_2015.cfm (accessed 2/13/16)

FINDINGS

F.D.1. The Crime Lab earned accreditation from ASCLD/LAB in 2015 using rigorous ISO standards.

F.D.2. Accreditation alone is not enough. A mistake may happen years before an accreditation review is due. Or, as it did during the accreditation review in 2010, a problem may not be addressed because it is not on a standard checklist.

F.D.3. The Crime Lab has lacked a person specifically assigned to QA for over two years, although for administrative purposes the Crime Lab Manager filled the position. Even prior to that time, the quality assurance program for DNA was overseen by the Technical Leader of the Lab, a situation that some have compared to the fox watching the hen house.

RECOMMENDATIONS

R.D.1. We commend the Crime Lab for earning accreditation using rigorous ISO standards.

R.D.2 A robust quality assurance program is needed to address day-to-day problems and go beyond the basic check list of accreditation. The quality assurance manager (QAM) position should be accorded utmost importance and have sufficient authority to shut down laboratory operations if necessary until a problem is resolved

R.D.3. We recommend initial outside consultation to provide the new QAM access to mentoring, training in the process of root cause analysis, and general oversight.

R.D.4. The QAM should be required to visit other Bay Area Crime Labs with well-established QA programs to learn from them and to consult with their QAM's.

E. Implementation of modern technology and new protocols requires careful oversight

DISCUSSION

Compared to many other crime labs in California, the SFPD Crime Lab lagged behind at least five years in implementing updated DNA technology. It acquired ASCLD/LAB accreditation for the first time only in 2004.[18] It has been trying to catch up to technology for the last decade.

2014 was a year filled with change as procedures were updated and new protocols written in order to modernize the Lab (Appendix E). Shortly after these necessary changes were

[18]An Examination of Forensic Science in California November 2009 ag.ca.gov/publications/crime_labs_report.pdf

implemented, a regularly scheduled proficiency test administered by a commercial testing firm was given to DNA analysts. It was this test that San Francisco's Crime Lab analyst failed, gaining notoriety with the supervisor who reviewed her work as the only test takers in the nation to fail the proficiency test.

Even though four other criminalists from the Crime Lab passed this proficiency test, we asked if inadequate internal training contributed to the analyst's failure or if her competency had been poorly assessed previously. In order to find answers, we reviewed the training given to all criminalists at every level in the DNA lab.

When we reviewed the training module given to Criminalist I's who screen and prepare evidence for testing, we found it a comprehensive program of reading and evaluation. Tests were graded, and appropriate feedback was given. We then reviewed a separate training module given to all ten DNA analysts (Criminalists II) in 2014 when several protocols changed (Appendix E). It consisted of a reading list, practical hands-on training using four samples to produce PCR amplifications to interpret, validation studies, and simulated data from three cases involving DNA mixtures from multiple donors. We noted that in one of the mixture exercises the conclusions made by two of the analysts, one of whom failed the national proficiency test two months later, differed from the rest of the group. We were told by Crime Lab supervisors that these two received verbal feedback about their non-conforming answers. Their supervisors felt that they comprehended the feedback and deemed them competent to start with case work.

In January 2017 the FBI will require inclusion of seven more loci to its CODIS profile, bringing the total of potential matching sites to 20. This requirement will require the use of a new DNA identification kit and new lab protocols. The Crime Lab is in the process of implementing these changes and making sure that all personnel are trained and competent in these changes.

The Challenge of Mixture Analysis. Like all forensic labs, the Crime Lab uses DNA technology to analyze microscopic amounts of body fluids to develop DNA profiles to be compared to known victims and suspects and to generate unidentified profiles to search against databases. The method is very sensitive and highly discriminating. A match can often identify a single individual to the exclusion of everyone else. It is fairly definitive when the DNA is from a single source, such as saliva on a cigarette or a blood stain. Interpretation of results, however, becomes increasingly more complex when the source is a mixture of multiple DNA donors. As one author writes, "analyzing these DNA mixtures isn't about achieving certainty. It's about partial matches, probabilities, big-time math, and a healthy dose of judgment calls by forensic scientists."[19]

Errors can be disastrous and can lead to false links between a crime and an individual. Mistakes by other labs in interpreting mixtures of DNA from multiple contributors have led to the arrest of innocent citizens who were later found not to have been even in the vicinity of the crime scene.[20] As part of a survey, the National Institute of Technology and Standards (NIST) in 2013 sent

[19] Berdick, Chris. *Dubious DNA.* Boston University Research. http://www.bu.edu/research/articles/dna-profiling/ (accessed 2/13/16)
[20] Berdick, ibid

mixture exercises[21] to crime labs across the country and found a wide range of variation of test results within and between laboratories. The NIST survey, which found that discrepancies in interpreting mixtures are widespread in the United States, has led to a call for national guidelines for interpreting mixtures.

The SF Crime Lab uses at least one computerized program to help in the statistical analysis of mixtures. It is also exploring another that uses mathematical and biological probability modeling to help separate mixed profiles. Unfortunately, no computerized program at this time can replace human judgment. For this reason, it is essential that the competency of each criminalist be firmly established during and at the completion of training before casework is started. We believe that training exercises should simulate actual casework rather than be theoretical exercises on paper, and evaluation of competency should be formally defined before casework begins.

In the Lab, collaboration is also essential. The Crime Lab informed us that it uses protocols so that casework is reviewed by "many pairs of eyes," not just those of one analyst. After a case is completed, it undergoes scrutiny by at least three more reviewers.[22]

FINDINGS

F.E.1. Training modules for policy and procedural change in the Crime Lab seem well designed and thorough.

F.E.2. Individual competency assessment prior to starting casework is not well defined, and the bar of "passing" is set too low.

F.E.3. Faulty analysis of DNA mixtures by other crime labs has had serious consequences, leading not only to failures in apprehension of the guilty but also to wrongful accusation of the innocent.

RECOMMENDATIONS

R.E.1. For a specified period of time after a change in protocol the technical review of a completed case should be done only by a supervisor Criminalist III. Currently technical review is done by peer Criminalists II as well as supervisors.

R.E.2. Given the potentially disastrous impact of flawed mixture interpretation, intensive training in mixture analysis should be a high priority.

[21] Three of these exercises were later used in the 2014 Crime Lab Training Module mentioned above.
[22] A completed case typically undergoes Technical Review to assure proper science was used, Administrative Review to make sure the report was written properly and the policies of the Lab were followed, and CODIS review when the DNA profile is uploaded into CODIS.

F. An independent outside review is necessary

DISCUSSION

The Hernandez case in 2014 (see Background) publicly raised doubt in court about the Crime Lab's ability to use CODIS correctly. In this child molestation case, a match in addition to that of the accused was received but improperly dismissed. The actual CODIS printout was never included in the Crime Lab's discovery packet, but the defense was able to obtain the report to question the analyst's and the CODIS administrator's practices. Fallout from this case has been widespread, and potentially may result in additional pre-trial hearings questioning the qualifications of the analyst to testify in upcoming trials.

We reviewed the Crime Lab's file of this case and obtained the opinion of many people knowledgeable in the case. We found that not only were errors made by the criminalist and the CODIS administrator, but that several other individuals involved in the review process neglected to take proactive measures to prevent the fallout in court. As a result, the reputation of both the criminalist and the Crime Lab suffered.

Internal audits of past work have been done. Much to its credit, when faced with the errors of the Hernandez case, Crime Lab management undertook a comprehensive internal audit of cases uploaded during the tenure of the CODIS administrator in charge of the Hernandez case. It has been forthcoming about errors found. In Phase I of the audit all cases uploaded to CODIS from 2008-2013 were re-examined. Seven hundred six uploads involving 595 cases were reviewed. Twenty-three percent were found to have errors (Appendix F shows the breakdown of errors), which we are told have been addressed.

In Phase 2 of the audit approximately 1200 files from 2008-2013 were manually pulled from storage to determine if they should have been uploaded to CODIS but were not. Nine percent had errors (Appendix F). The errors found in each case are currently in the process of being addressed. Police inspectors are being apprised of any changes. New information is being gathered as necessary. Amended reports are being written.

As a result of the Hernandez case, the DA's office, which relies on Crime Lab evidence to charge and convict, has lost even more confidence in the the Crime Lab. Attorneys from this office have told both the Civil Grand Jury and the Laboratory that internal audits are not enough to restore their trust. In an effort to restore the credibility of the Crime Lab, representatives of the DA's office, the police department, including the Crime Lab, the Public Defender's office, and defense attorneys from both the public and private sectors agreed to seek an external audit of Crime Lab work and procedures. Two nationally respected forensic experts trusted by all members of the group were specifically endorsed as acceptable to each faction. Crime Lab supervisors told us that they would welcome such an audit. Unfortunately, we have since been told that the City may require that the audit be put out for competitive bidding. In our opinion,

the entire purpose of such an audit would be defeated if the auditors were unknown or untrusted by the stakeholders.

FINDINGS

F.F.1. Approximately 2000 cases have been reviewed by the Crime Lab in two internal audits. Errors have been found and are being addressed.

F.F.2. Internal audits are not sufficient to restore stakeholders' trust in the Crime Lab.

RECOMMENDATIONS

R.F.1. As cases from the 2008-2013 come to trial, the Crime Lab should conduct a comprehensive review of each case and write an amended report if warranted.

R.F.2. An external audit by forensic experts trusted by all stakeholders of the Crime Lab is warranted to assure that the internal audits as well as the policies and procedures of the Crime Lab are correct.

R.F.3. The external audit should be conducted by experts who have been identified as trustworthy to all factions rather than selected by a competitive bidding process based on cost.

G. The Crime Lab needs to improve stakeholder participation

DISCUSSION

Many Crime Lab stakeholders (or "customers", such as the DA or Public Defender) of the Crime Lab expressed longstanding frustration with not being able to get results easily and in what they consider a reasonable time frame. At the same time, however, many of those we interviewed believed that their individual communication with the Crime Lab has improved in the past few years. Representatives of the defense community, the DA's office, and the police department---many of whom have been very critical of their interaction with the Crime Lab in the past---noted that it is now possible to call a Crime Lab supervisor, whom they know personally, to get results, find out when a case will be completed, or ask that it be completed more expeditiously.

The Crime Lab has not recently solicited input from stakeholders about their expectations of the Lab. This input should include goals for turnaround time and a "not-to-exceed" target number for backlogged cases.

We also found that some users had unrealistic expectations of what DNA testing can achieve, such as the limitations of Touch DNA, for example (Appendix G).

FINDINGS

F.G.1. Communication by stakeholders with Crime Lab supervisors has improved on a personal basis. As valuable as a personal phone call can be, however, it is important to implement systems that give stakeholders formal, real-time electronic access to results.

F.G.2. Stakeholders currently lack adequate input into the goals of the Crime Lab.

F.G.3. Some Crime Lab users have unrealistic expectations of some aspects of DNA testing. Touch DNA is an example.

RECOMMENDATIONS

R.G.1. When the new LIMS is installed, it should allow confidential, restricted, real-time access to allow the District Attorney, the Police Inspectors, and the Defense to follow the progress of their own cases.

R.G.2. The Crime Lab should solicit input from its users regarding its goals, including acceptable turnaround time and a "not-to-exceed number" of backlogged cases.

R.G.3. The Crime Lab should educate police inspectors and attorneys on the limitations and hazards of some aspects of DNA forensics, such as touch DNA.

H. The Crime Lab needs to polish its public image

DISCUSSION

The Crime Lab website is out of date and has little content.[23] A long-retired captain is listed as head of Forensics Services. We learned that the Crime Lab's mission statement, which once appeared on the website, had been removed by a former captain because he felt that the Crime Lab's mission should be identical to that expressed by the larger Police Department. When we searched "San Francisco Crime Lab" with internet search engines, negative publicity, mostly from the media, dominated our searches.

We believe that both the public and the Crime Lab would benefit from a current, updated web page in which the Crime Lab could

- state its mission and purpose,
- outline its organizational structure,
- advertise job openings,
- report significant accomplishment,
- cite examples in which its work played a critical role in solving some sensational cases,
- and educate the general public.

[23] Forensics Services Web Page http://www.sf-police.org/index.aspx?page=3405 (accessed 2/13/16)

For example, when the Crime Lab held a seminar earlier this year on cognitive bias, it could have used the website to talk about cognitive bias and to report how the Crime Lab plans to improve the quality of its work by using new approaches to recognize and diminish bias.

In addition, accomplishments of the staff could be recognized. The Crime Lab could report, for example, that one of its Criminalist IIIs has been appointed to a prestigious national forensic committee, or it could recognize the work of other criminalists who meet regularly with the members of San Francisco's SART (Sexual Assault Response Team) to improve collection of sexual assault evidence.

FINDING

F.H.1. The Crime Lab has a mostly empty outdated website that prevents public recognition of its official presence and accomplishments.

RECOMMENDATION

R.H.1. The Crime Lab should produce a website that will spell out its mission, outline its organizational structure, publicize accomplishments, and educate the public.

I. The Crime Lab should seek scientific collaboration

DISCUSSION

The Greater Bay Area is rich with forensic expertise. Seven public crime labs exist in the area, and two universities offer programs in forensics. In addition, another university in Northern California offers a master's program in forensic science (Appendix H). The California Criminalistics Institute, which provides forensic training for law enforcement agencies and crime labs, is located in Sacramento. There are also many other forensic experts who have chosen to live in the Bay Area after serving in other geographic areas.

FINDING

F.I.1. Universities, other forensic institutions, and individuals are rich sources of local talent and advice that could be utilized by the Crime Lab.

RECOMMENDATION

R.I.1. We recommend using local experts to form a scientific advisory board to serve as a technological resource, both supporting the staff and strengthening the Crime Lab's technological foundation.

CONCLUSION

The Crime Lab has been justly criticized in the past for errors that continue to cast doubt upon its reliability. We found that it has taken several positive steps toward improvement and believe it has the potential to become a reputable and progressive lab. It is rich in financial support. Grants, including $410,000 for this year alone, have allowed it to modernize equipment and update procedures. Salaries, which are among the highest in the nation, have attracted a core of well-educated, talented, and experienced criminalists who express a new openness about errors and a determination to minimize them. Several more steps need to be taken, however. A new computer system needs to be implemented. Turnaround times need to be improved. Systems need to be established to make results more accessible to its stakeholders. An external audit needs to be done. Bias needs to be reduced by distancing the Crime Lab from the Police Department, eventually as an independent lab. Most of all, a robust system of checks and balances needs to be established at all levels to minimize individual and systemic errors in the future. Rebuilding the Lab's credibility is a long term commitment.

FINDINGS AND REQUIRED RESPONSE MATRIX

FINDING	RESPONDER
F.A.1. The position of the police captain Director has been a high turnover position, and the learning curve for the Crime Lab steep. Putting a police captain in charge of day to day management has in the past resulted the sworn Director having difficulty in understanding the challenges of the Crime Lab and dealing with them appropriately.	Chief of Police
F.A.2. Under police management discipline has often been handled using a police model. Investigations of scientific errors have been conducted secretively under the cover of police Internal Affairs and give the impression that the Crime Lab is covering up.	Chief of Police
F.A.3. Once the disciplinary process goes to Internal Affairs we observed an immediate halt to dialog between staff and management aimed at resolving technical issues in a scientific manner.	Chief of Police
F.A.4. The positioning of San Francisco's Crime Lab within the police department is inconsistent with the National Academy of Science's 2009 recommendation that the Crime Lab scientist be distanced from law enforcement.	Office of the Mayor
F.B.1. The computer management system of the Crime Lab is outdated and lacks many analytic functions. It impedes tracking of cases by all users, evaluating turnaround times, and identifying at which points case progression through the Crime Lab is bottlenecked. It does not increase the efficiency of the Lab.	Deputy Chief of Administration, SFPD
F.B.2. State AB 1517, the Sexual Assault Victim's DNA Bill of Rights, took effect in January 2016. This mandate puts additional pressure on the Crime Lab to complete and track DNA analysis from sexual assault victims in an expedient time frame and to notify, if requested by the victim, that the analysis has been done.	Deputy Chief of Administration, SFPD
F.C.1. Outsourcing is a useful tool to reduce case backlog and lower turnaround times during the current period of staffing shortages.	Deputy Chief of Administration, SFPD
F.C.2. Outsourcing incurs additional cost for the DA and the City because the expenses of trial testimony given by expert witnesses from outside the area must be paid.	Deputy Chief of Administration, SFPD

F.C.3. Better utilization and evaluation of Crime Lab personnel can be accomplished by re-opening the Drug Analysis Laboratory.	Chief of Police
F.D.1. We commend the Crime Lab for earning accreditation from ASCLD/LAB in 2015 using rigorous ISO standards.	No response needed
F.D.2. Accreditation alone is not enough. A mistake may happen years before an accreditation review is due. Or, as it did during the accreditation review in 2010, a problem may not be addressed because it is not on a standard checklist.	Deputy Chief of Administration, SFPD
F.D.3. The Crime Lab lacked a person other than the Manager specifically assigned to QA for over two years.	Deputy Chief of Administration, SFPD
F.E.1. Training modules for policy and procedural change in the Crime Lab seem well designed and thorough.	Deputy Chief of Administration, SFPD
F.E.2. Individual competency assessment prior to starting casework is not well defined, and the bar of "passing" is set too low.	Deputy Chief of Administration, SFPD
F.E.3. Faulty analysis of DNA mixtures by other crime labs has had serious consequences.	Deputy Chief of Administration, SFPD
F.F.1. Approximately 2000 cases have been reviewed by the Crime Lab in two internal audits. Errors have been found and are being addressed.	Deputy Chief of Administration, SFPD
F.F.2. Internal audits are not sufficient to restore stakeholders' trust in the Crime Lab.	Deputy Chief of Administration, SFPD
F.G.1. Communication by stakeholders with Crime Lab supervisors has improved on a personal basis, but formal real- time electronic communication has not yet been established. This has contributed to frustration by the users when they try to obtain results.	Deputy Chief of Administration, SFPD
F.G.2. Stakeholders currently lack adequate input into the goals of the Crime Lab.	Deputy Chief of Administration, SFPD
F.G.3. Some Crime Lab users have unrealistic expectations of some aspects of DNA forensics. Touch DNA is an example.	Deputy Chief of Administration, SFPD
F.H.1. The Crime Lab has a mostly empty, outdated website that prevents public recognition of its official presence and accomplishments.	Deputy Chief of Administration, SFPD

F.I.1. Universities, other forensic institutions, and individuals are rich sources of local talent and advice that could be utilized by the Crime Lab.	Deputy Chief of Administration, SFPD

RECOMMENDATIONS AND REQUIRED RESPONSE MATRIX

RECOMMENDATION	RESPONDER
R.A.1. The Crime Lab should be separated from the SFPD and function as an independent entity in the General Services Agency	Office of the Mayor
R.A.2 The Mayor should direct, the Board of Supervisors (BOS) should approve, and the Controller should facilitate a transfer of budget, facilities, assets, personnel, and management of the Crime Lab from the SFPD to the General Services Agency, Department of Administrative Services.	Office of the Mayor, BOS Controller's Office
R.A.3. Because establishing an independent Crime Lab will no doubt be a lengthy process, we recommend an interim step for the Crime Lab to achieve greater separation from the SFPD: The sworn police captain should be removed as the head of the Crime Lab and replaced by the current civilian scientist lab manager.	Chief of Police
R.A.4. As long as the Crime Lab remains part of the SFPD, we recommend that the civilian head of the Crime Lab report directly to the Chief without the intermediate layer of a captain assigned to the Crime Lab.	Chief of Police
R.B.1. The Crime Lab and the Police Department's Office of Technology should devote all necessary resources to install and implement a user friendly laboratory information management system (LIMS) that will track cases, increase laboratory efficiency, facilitate outcomes evaluation, and allow real time sharing of information.	Mayor's Office of Public Policy and Finance, BOS, Deputy Chief of Operations Deputy Chief of Administration
R.B.2 When the LIMS is installed and customized for the Lab, the DA's office, the defense community, and Police Inspectors should have input as to the features that will help them obtain the information they need in their own work.	City Administrator
R.B.3. The Crime Lab should conform to the mandate of AB 1517, the Sexual Assault Victim's DNA Bill of Rights, by analyzing evidence within 120 days and notifying the victim, if requested, that the evidence has been processed. It should publish the statistics of its compliance quarterly.	Deputy Chief of Administration, SFPD
R.C.1. The Crime Lab should continue to use flexible outsourcing when in-house staffing is insufficient to keep up with the work load.	Deputy Chief of Administration, SFPD

R.C.2. The Crime Lab should continue with its efforts to staff the Lab fully so that the expense incurred by using outsourced expert witnesses can be reduced.	Deputy Chief of Administration, SFPD
R.C.3. The Drug Analysis Lab should be re-established in the Crime Lab.	Chief of Police
R.D.1. The Crime Lab should be recognized for earning accreditation using rigorous ISO standards.	No response required
R.D.2. A robust quality assurance program is need to address day- to- day problems and go beyond the basic check list of accreditation.	Deputy Chief of Administration, SFPD
R.D.3. We recommend initial outside consultation to provide the new Quality Assurance Manager access to mentoring, training in the process of root cause analysis and general oversight. The QAM should be required to visit other Bay Area Crime Labs with well-established QA programs to learn from them.	Deputy Chief of Administration, SFPD
R.E.1. After a change in protocol, the technical review of a completed case should be done only by a supervisor Criminalist III.	Deputy Chief of Administration, SFPD
R.E.2. Given the potentially disastrous impact of flawed mixture interpretation, intensive training in mixture analysis should be a high priority.	Deputy Chief of Administration, SFPD
R.F.1. As cases from 2008-2013 come up for trial, the Crime Lab should review each case again and make an amended report if indicated.	Deputy Chief of Administration, SFPD
R.F.2. An external review by forensic experts trusted by all stakeholders of the Crime Lab should be made to assure that the internal audits as well as the policies and procedures of the Crime Lab are correct.	Deputy Chief of Administration, SFPD
R.F.3. The external review should be conducted by experts who have been identified as trustworthy to all stakeholder rather than selected by a competitive bidding process based on cost.	Chief of Police
R.G.1. A new LIMS is needed. When it is installed it should allow confidential, restricted real-time access to allow the District Attorney, the Police Inspectors, and the Defense to follow the progress of their own cases	Deputy Chief of Administration, SFPD

R.G.2. The Crime Lab should solicit input from its users regarding its goals, including acceptable turnaround time and a "not to exceed number" of backlogged cases.	Deputy Chief of Administration, SFPD
R.G.3. The Crime Lab needs to educate police inspectors and attorneys on the limitations and hazards of some aspects of DNA forensics, such as Touch DNA.	Deputy Chief of Administration, SFPD
R.H.1. The Crime Lab should produce a website that will spell out its mission, outline its organizational structure, publicize accomplishments, and educate the public.	Deputy Chief of Administration, SFPD
R.I.1. Local experts should be used to form a scientific advisory board to serve as a technological resource, both supporting the staff and strengthening the Crime Lab's technological foundation.	Deputy Chief of Administration, SFPD

Reports issued by the Grand Jury do not identify individuals interviewed. Penal Code section 929 requires that reports of the Grand Jury not contain the name of any person or facts leading to the identity of any person who provides information to the Grand Jury.

GLOSSARY

ASCLD	American Society of Crime Laboratory Directors
ASCLD/LAB	American Society of Crime Laboratory Directors/Laboratory Accreditation Board. The accreditation arm of ASCLD
BOS	Board of Supervisors
CODIS	Combined DNA Index System (see What is CODIS Appendix A)
CODIS Administrator	Criminalist who is assigned to monitor and manage CODIS after undergoing FBI training
Crime Lab	Criminalistics Laboratory
Criminalists	A criminalist is an individual who scientifically studies and evaluates physical evidence involved in the commission of a crime. The Crime Lab employs three classes of criminalists: Criminalist I - Entry level criminalist who in the SF Crime Lab prepares evidence for processing Criminalist II - Journeyman criminalist who analyzes DNA and prepares a report Criminalist III - Experienced criminalist who supervises and coordinates the efforts of the Criminalists II, reviews their work, administers grants, and performs other administrative duties
CSI	Crime Scene Investigation
DA	District Attorney
DOJ	Department of Justice. Can refer to either the California DOJ or the United States DOJ
ISO	International Organization for Standards
LIMS	Laboratory Information Management System
NIST	National Institute of Standards and Technology
QA	Quality Assurance
QAM	Quality Assurance Manager
SF	San Francisco
SFPD	San Francisco Police Department
Stranger Rapist	Term used to designate a sexual assailant unknown to the victim
Technical Lead	Experienced criminalist in the lab responsible for assuring that the methodology and procedures used in performing casework are in compliance with established standards and the staff is trained in these

APPENDICES

APPENDIX A

What is CODIS?

CODIS is the acronym for the "Combined DNA Index System" and is the generic term used to describe the FBI's program of support for criminal justice DNA databases as well as the software used to run these databases.

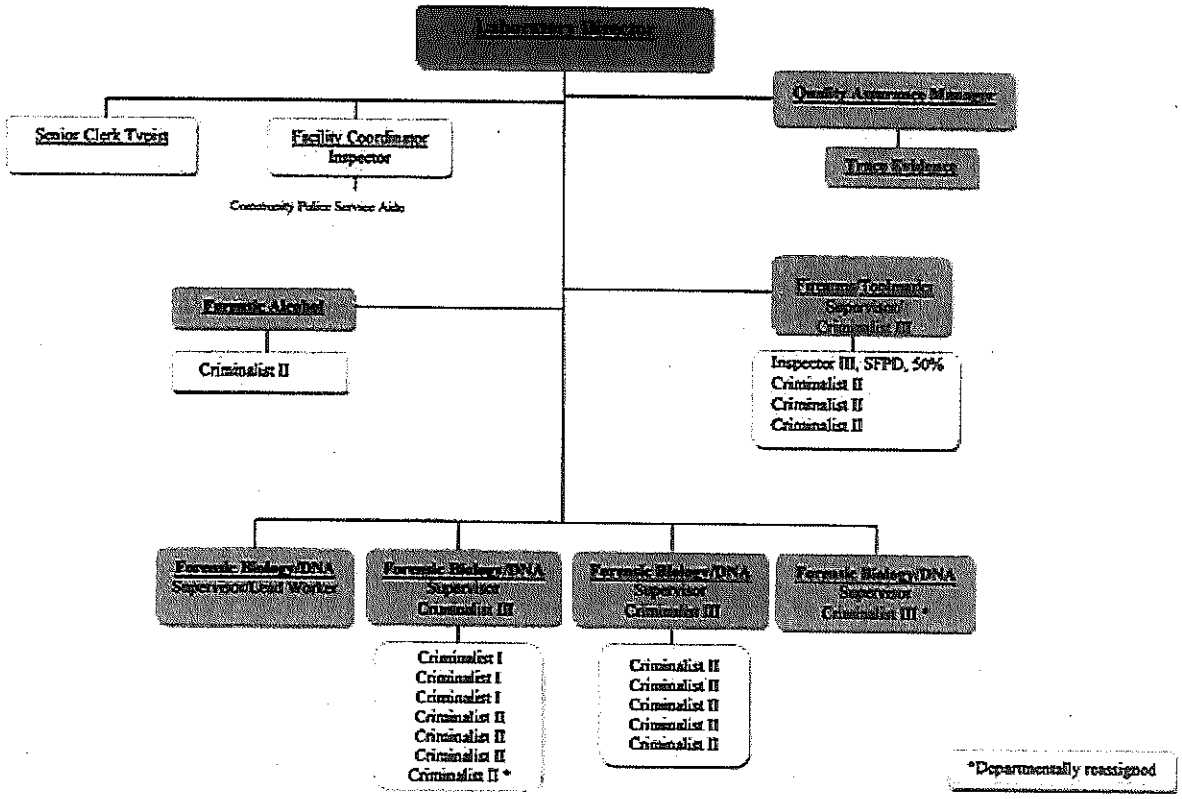
For example, in the case of a sexual assault where an evidence kit is collected from the victim, a DNA profile of the suspect is developed from the swabs in the kit. This profile is searched against California's database of convicted offender and arrestee profiles and against a national database as well. If there is a candidate match in the Convicted Offender or Arrestee Index, the laboratory will go through procedures to confirm the match. If confirmed, the laboratory will obtain the identity of the suspect.

At present, only public labs with accreditation may enter profiles into CODIS. In the Crime Lab, a specific analyst is designated the *CODIS Administrator* and must undergo special FBI training . He/she makes sure that profiles are appropriate for uploading and deals with disposition once a "hit" or match is made.

FBI Website
https://www.fbi.gov/about-us/lab/biometric-analysis/codis/codis-and-ndis-fact-sheet (accessed 2/28/16)

APPENDIX B

San Francisco Police Department Criminalistics
Laboratory Organizational Chart January 2016



Appendix C.

American Society of Crime Laboratory Directors / Laboratory Accreditation Board

ASCLD/LAB-*International* Program

SCOPE of ACCREDITATION

Corresponds to Certificate Number **ALI-393-T**

Name and Address of Accredited Laboratory

San Francisco Police Department
Criminalistics Laboratory
1245 3rd Street
San Francisco, California 94158

Laboratory Contact Information

Laboratory Director:
Phone:
Fax:
E-Mail:

The management and technical operations of this laboratory were assessed and found to conform with **ISO/IEC 17025:2005**, the **ASCLD/LAB-*International* Supplemental Requirements for Testing Laboratories (2011)** and all other requirements of the ASCLD/LAB-*International* program. The laboratory was found to be competent and was accredited in the following area (s):

Field of Accreditation

Forensic Science Testing

Discipline (s)

3.0 Biology
4.0 Trace Evidence
5.0 Firearms/Toolmarks
10.0 Other

Categories of Testing:

3.1 DNA - Nuclear
3.3 Body Fluid Identification
4.4 Gunshot Residue
5.1 Firearms
5.2 Toolmarks
10.1 Impression Evidence (footwear/tires)
10.2 Serial Number Restoration

Note: In this laboratory, testing category 10.1 is considered part of the Trace Evidence discipline and 10.2 is considered part of the Firearms/Toolmarks discipline.

Customers Served: The San Francisco Police Department Criminalistics Laboratory is a local government laboratory that provides services and assistance to law enforcement agencies in and around San Francisco, California.

Accreditation Dates

Date Granted: August 17, 2015
Date Expires: August 16, 2019
Date Last Updated: No Updates

Troy Hamlin
Accreditation Program Manager-Testing
ASCLD/LAB-*International*

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APPENDIX D

Contamination Errors

As DNA analysis becomes more sensitive, the potential for contamination of the assay increases. When DNA unrelated to the case is identified in a sample, this is an indication of a contamination error. Frequently the DNA is that of a criminalist working in the lab. A library of reference DNA from workers or visitors to the lab is kept. In the Crime Lab there were nine contamination errors identified in 2014 and 11 in 2015.

APPENDIX E

Changes made in 2014 by instituting Protocol 3.31.14 in the DNA Lab

- Use of Genemapper 3130xl, a DNA sequencer capable of running multiple samples simultaneously and automatically
- Use of EZ1 Advanced XL, a DNA extraction system which allows up to 14 samples to be extracted at one time
- Use of Quantifiler Duo designed to quantify the amount of human DNA and human male DNA in a sample
- Use of Identifiler Plus, a PCR amplification kit. Polymerase chain reaction (PCR), "molecular photocopying", is used to replicate small segments of DNA to generate many copies for analysis

APPENDIX F

Results of the Internal Audit for CODIS Upload

Phase I 595 cases uploaded to CODIS from 2008-2013

- 24 cases of "potential investigative lead missed". This category includes samples not entered into CODIS or not entered in a timely manner and incomplete or non-optimal data
- 79 cases of poor scientific judgment
- 65 cases of violation of CODIS protocol, (for example, not asking for the victim's partner's sample for exclusion.)

Phase II 1200 cases not uploaded to CODIS from 2008-2013. Were there cases which should have been uploaded but were not?

- 93 cases of potential investigative lead missed
- 14 cases of poor scientific judgment
- 3 cases of violation of CODIS protocol

APPENDIX G

Touch DNA

Touch DNA is a term which refers to the minute amount of skin cell DNA left behind at a crime scene or transferred when a person touches a surface such as a weapon. A person sheds about 400,000 skin cells per day, and as few as 30 are sufficient to produce a DNA profile. The technique is highly susceptible to contamination and does not tell investigators when the cells were deposited. An inappropriate request is to ask the Crime Lab to determine whose DNA is on the trigger of a gun. Because the identity and number of individuals is unknown and the contribution of each varies, an attempt to interpret a complex mixture of multiple DNA profiles is hazardous.

APPENDIX H

Bay Area Crime Labs and University Resources

Public crime labs in the Bay Area

Alameda County Sheriff's Office Criminalistics Laboratory
Jan Bashinski DNA Laboratory of the California Department of Justice
Contra Costa County Sheriff's Department Crime Lab
Oakland Police Department Criminalistics Laboratory
San Francisco Police Department Criminalistics Laboratory
San Mateo County Sheriff's Office Forensic Laboratory
Santa Clara County District Attorney's Crime Laboratory

Institutions offering Forensic Studies in Northern California

San Jose State University
Cal State, East Bay
UC, Davis
California Criminalistics Institute- offers criminalistics training to state law enforcement agencies