

# **Summary of Recommendations of the Independent Investigator for the HPD Crime Lab and Property Room**

**Michael R. Bromwich  
Independent Investigator**

Fried, Frank, Harris, Shriver & Jacobson LLP  
1001 Pennsylvania Avenue, N.W., Suite 900  
Washington, DC 20004  
202.639.7000

<http://www.hpdlabinvestigation.org>

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## Introduction

The Independent Investigation of the Houston Police Department (“HPD”) Crime Laboratory and Property Room issued its final report on June 13, 2007.<sup>1</sup> One of the primary purposes of the independent investigation was to provide HPD and the City of Houston (the “City”) with a comprehensive set of recommendations designed to assist HPD in achieving its stated goal of building one of the premier forensic science laboratories in the United States and to ensure that the Crime Lab and Property Room meet the public’s legitimate expectations for those facilities.

This document is a consolidated summary of all of our recommendations based on our review of over 3,500 cases analyzed both by the historical Crime Lab and under its current management, as well as on our comprehensive review of the current operations of the Crime Lab and Property Room. Each of our recommendations was developed in close consultation with our team of highly experienced forensic scientists and crime laboratory managers. We are providing the City, HPD, and the public with this summary of our recommendations as a reference tool to more easily review the full set of recommendations set forth in our Final Report and so that HPD’s progress in implementing these recommendations -- or in taking substantially similar measures designed to address the issues identified in our Final Report -- can be monitored. There are no substantive differences between the recommendations contained in this summary and the recommendations contained in our Final Report.

## Historical Serology Cases (1980 – 1992)

Based on the findings of our review of 850 serology cases processed by the Crime Lab between 1980 and 1992 and which relate to a defendant who currently is in prison, we make the following recommendations:

- HPD must determine whether evidence currently exists and can be located in the following categories of cases:
  - (1) Cases (274) in which evidence was screened positively for blood or semen, but no ABO typing was performed;

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<sup>1</sup> All six of the reports of the independent investigation, including the Final Report, are posted on our Web site at [www.hpdlabinvestigation.org](http://www.hpdlabinvestigation.org).

- (2) Cases (139) in which the Crime Lab performed ABO typing on evidence samples, but no comparison to known reference samples was made;
  - (3) Cases (6) in which DNA analysis performed contemporaneously by an outside laboratory failed to include the suspect; and
  - (4) All cases (180) we identified as containing a major issue with the reliability of the Crime Lab's work or the accuracy of its reported results.
- The District Attorney's Office and HPD should notify every prisoner whose case falls into one of the above categories that the independent investigation has identified a potential issue with the forensic serology work performed by the Crime Lab in his case and that HPD is attempting to locate any biological evidence that may relate to the prisoner's case. The District Attorney's Office and HPD should keep each prisoner who receives such a notice apprised of the status of the Department's efforts to locate biological evidence related to his case.
  - In cases in which HPD is successful in locating evidence containing potential biological samples, the District Attorney's Office should notify the prisoner of the existence of this evidence, advise him that it is possible that DNA testing could be performed on the evidence, and ask the prisoner whether he wants DNA analysis to be performed on the evidence.
    - In cases in which the prisoner requests DNA analysis, Harris County and HPD should arrange for the analysis to be performed without cost to the prisoner.
  - Harris County and the City should appoint a special master to review the complete investigative, prosecutorial, appellate, and post-conviction *habeas* record for all 180 of the major issue serology cases we identified that relate to a currently incarcerated prisoner as well as the 6 cases in which DNA testing already performed did not include the prisoner as a potential contributor of the evidence. The purpose of this review should be to determine (1) what role, if any, work performed by the Crime Lab played in the defendant's conviction and (2) whether DNA analysis of evidence in the case should be performed in order to substantiate the defendant's conviction, regardless of whether serology evidence processed by the Lab was used in the prosecution of the defendant.
    - In cases in which the special master determines that DNA analysis should be performed to substantiate the conviction, Harris County and the City should arrange for the DNA analysis of evidence in the case without cost to the prisoner.

# Recommendations Regarding the Crime Lab

## I. Management of the Current Crime Lab<sup>2</sup>

We have the following global recommendations regarding the current management and operations of the Crime Lab.

### A. Funding and Staffing

Funding levels for the Crime Lab must be maintained at least at current levels as adjusted for inflation and the addition of new personnel. The Crime Lab must fill currently vacant forensic science staff positions. As these positions are filled, the Crime Lab's overall budget must be adjusted proportionately upward so that equipment and other resources available to all of the analysts and sections in the Lab are not adversely affected by the addition of new staff. Moreover, the Crime Lab must maintain at least its current ratio of funding per criminalist, adjusted annually for inflation and growth in the number of analysts in the Lab, devoted to training and professional development activities.

The Crime Lab's current budget includes significant allocations for outside consultants, which the City and HPD may be tempted to eliminate or substantially reduce in light of the Lab's accreditation and the conclusion of this investigation. However, as discussed below, because of the relative inexperience of many of the staff, the need for further technical improvements in some areas, and the heightened scrutiny to which the Crime Lab will continue to be subjected, the Lab still has a significant need for outside technical assistance, including technical reviews, particularly in the areas of DNA analysis and trace evidence examination.

It also is critical that the Crime Lab rapidly fill all vacancies in forensic science staff positions and:

- Hire (or promote internally) at least one additional experienced controlled substances analyst who can assist with the supervision of the Controlled

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<sup>2</sup> All of our recommendations should be construed consistently with applicable accreditation criteria and quality assurance standards for forensic laboratories. All of our forensic experts are veterans of the forensic laboratory process -- collectively, they have participated in hundreds of accreditation reviews. None of our recommendations is in any way inconsistent with ASCLD/LAB standards.

Substances Section, and hire at least one additional controlled substances line analyst.

- Hire (or train) two qualified and experienced firearms examiners.
- Hire at least two additional inventory management clerks to work in Central Evidence Receiving (“CER”), which receives, processes, and stores drug evidence for the Crime Lab. HPD and the Crime Lab also should consider whether salary adjustments for CER staff would be appropriate in light of the difficulty staffing these positions due to the nature of the work -- handling significant volumes of drug evidence -- and the associated environmental issues.

Finally, one consequence of the “flattened” organizational structure implemented in connection with the Crime Lab’s career ladder is that the delineation between supervisors and bench analysts is less clear than it was under the Lab’s former organization. The Crime Lab must ensure that an appropriate “span of control” -- or ratio between supervisors and subordinates -- is maintained in each of the sections. The appropriate span of control varies by section -- for example, a higher ratio of analysts to supervisors is more appropriate for the Controlled Substances Section than for the Biology Section. However, each section must be adequately staffed by supervisors whose daily job duties include providing technical guidance and job performance feedback to bench analysts.<sup>3</sup>

## **B. Quality Assurance**

The Needs Analysis Report prepared by the National Forensic Science Technology Center (“NFSTC”) for the Crime Lab in July 2003 recommended that HPD establish two positions dedicated to quality assurance. We support this recommendation. The current Quality Assurance / Quality Control Manager (“QA/QC Manager”) should be provided with a qualified staff person, preferably with a background in or familiarity with the technical aspects of forensic serology and DNA analysis.

We recommend that the QA/QC Manager and Crime Lab supervisors and staff implement the following measures to formalize and refine the Lab’s current QA/QC program.

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<sup>3</sup> Where appropriate below, we make specific observations and recommendations with respect to the current supervisory and technical review structure of the Crime Lab’s individual sections.

- Develop a defined methodology for the selection of cases from each of the sections of the Crime Lab to be periodically reviewed by the QA/QC staff. The methodology should be designed to include samples of the work performed by every analyst and examiner in the Crime Lab. The QA/QC Manager, in consultation with section leaders, should develop a checklist of issues to be covered in each case review and complete the checklist for each case reviewed. The QA/QC staff should prepare a report for section leaders and the Crime Lab Director summarizing the results of each review, identifying specific technical and administrative issues that should be addressed, and identifying any trends or Lab-wide issues that are apparent as a result of the reviews.
- In addition to reviews of paper files, the random case inspection process should include the periodic selection of a small number of cases from each section to be re-analyzed or re-examined by a forensic scientist other than the original staff member who worked on the case.
- The QA/QC Manager should prepare a monthly written report for the Crime Lab Director that summarizes all QA/QC activity for the previous month, identifies any quality assurance-related incidents, discusses any observed declining or improving trends in performance, and contains recommendations regarding areas for improvement or issues that the Lab should address.
- In addition to the incident log and files currently maintained by the QA/QC Manager, the QA/QC Section should develop a spreadsheet database that tracks each quality-related incident that occurs in the Crime Lab (including the date of the incident, its nature, and involved personnel) the staff members assigned to address the incident; the remediation efforts, if any, that were taken; and the date on which the incident is deemed resolved. The QA/QC Manager should include the current incident tracking spreadsheet with the monthly reports provided to the Lab Director.

Crime Lab staff who attend outside training and professional development activities should be required to report during section- or Lab-wide meetings on issues covered during the programs that relate in some way to QA/QC. Crime Lab staff also should be encouraged to provide their section leaders and the QA/QC Manager with any recommendations for improving the Lab's procedures or practices stemming from the programs.

The Crime Lab should reconsider its system of peer technical reviews, particularly in the areas of DNA analysis and trace evidence examination, where the vast majority of staff members are newly trained and newly qualified in their disciplines. We recommend that the Crime Lab retain highly qualified and experienced



forensic science consultants to perform technical reviews of the Lab's work in these areas, as well as to train and mentor the supervisors and staff in those sections specifically on performing technical and administrative reviews of forensic casework.

### C. Information Systems

HPD and the Crime Lab have long understood the urgent need for the Department to improve its information systems related to case management and evidence tracking. We are advised that HPD is in the process of retaining vendors to design a laboratory information management system ("LIMS") for the Crime Lab as well as a Department-wide records management system ("RMS") and that the City and HPD have hired consultants to assist HPD in defining the requirements of these systems and to help oversee their development. With respect to the information system needs of the Crime Lab, the new systems should include the following capabilities:<sup>4</sup>

- The LIMS should apply to all sections and be integrated into the Department-wide RMS to provide a unified system for tracking the location and status of evidence on which forensic analysis may be performed. This integration must not compromise the effectiveness of the system for the Crime Lab.
- The LIMS should manage and track evidence items, as well as monitor work flow in each of the sections and Lab-wide.
- The LIMS should provide the Crime Lab with the ability to track cases based on the type of analysis performed on the evidence, as opposed to the current system that is based on UCR codes assigned by investigators based on the underlying offense. The LIMS should support the QA/QC program in efficiently selecting cases for random inspection.
- The LIMS, in combination with the Crime Lab's other information systems, should provide Lab managers with reports and information necessary to evaluate the Lab's performance, including case turn-around times by section, the number and types of tests conducted by Lab analysts, court appearances,

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<sup>4</sup> Our discussion regarding the Property Room includes additional recommendations regarding functionality that should be included in the RMS and electronic evidence tracking systems that HPD also is in the process of developing.

subpoenas and court orders received by the Crime Lab, time spent by Crime Lab staff on activities other than casework, and analysts' training and performance.<sup>5</sup>

In the meantime, while the LIMS is in development, we recommend that the Crime Lab take the following measures to contend with the limitations of HPD's outdated On-line Offense ("OLO") reporting system:

- Reports issued by the DNA Section should include a statement that an allelic table has been prepared and is incorporated as part of the Crime Lab report. This allelic table should be provided to all users of the Crime Lab report, including investigators, prosecutors, representatives of a suspect or defendant, and the court.<sup>6</sup>
- Crime Lab staff should stay in regular contact with investigators via telephone and email communications to apprise them of the status of cases submitted for analysis. Notice via telephone or email should be provided to investigators when a report has been entered into OLO.
- The Crime Lab should have analysts prepare printed draft reports on their desktop computers prior to entering the report into OLO. These draft reports should be administratively and technically reviewed, and any resultant changes to a report should be made, before the report is entered into OLO.

#### **D. Relationships with Users of the Crime Lab's Services**

The Crime Lab already has begun meeting with investigators to disseminate information about the range of services offered by the Lab and to educate officers about forensic science. We recommend that the Crime Lab continue to enhance those efforts and:

- Provide training to new police recruits at the HPD training academy about the Crime Lab, forensic science, and understanding the Lab's reports.

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<sup>5</sup> HPD reports that each of these recommendations regarding LIMS functionality is addressed in its Request for Proposals ("RFP") for the new LIMS.

<sup>6</sup> Due to the technical limitations of the OLO reporting system currently used by HPD and the Crime Lab, DNA analysts are not able to include an allelic table with the report entered into OLO. However, we are advised that an allelic table (sometimes handwritten) is included with a hard copy of the DNA reports distributed to investigators. The Crime Lab and HPD must assure that these allelic tables are provided to all users of the Crime Lab's DNA reports.

- Provide similar training periodically to officers and investigators through HPD's in-service training program.
- Hold meetings with executive command staff and senior officers in the investigative and patrol commands to promote the services offered by the Crime Lab and to obtain feedback regarding the Lab's performance.
- Although it is generally not necessary for Crime Lab personnel to be regularly involved in processing crime scenes, analysts should, as part of their continuing training, periodically observe crime scenes so that they understand the methods used by HPD investigators to collect evidence that may be submitted for forensic analysis.
- Trace evidence examiners should regularly consult with investigators about potential trace evidence to be recovered from crime scenes.
- Crime Lab analysts should be involved in training programs for prosecutors regarding forensic science and understanding the results generated by the Lab, particularly, but not exclusively, in the area of DNA analysis. HPD and the Crime Lab should consider offering to provide similar training to members of the criminal defense bar.

#### **E. Strategic Vision for the Crime Lab**

Now that each section of the Crime Lab has received some form of accreditation and is reporting casework, Lab managers should focus on what comes next. The Crime Lab, based on input from all supervisors and staff, should develop a strategic plan which is updated annually that includes goals and objectives, as well as action plans to achieve them. Crime Lab personnel should be assigned specific responsibilities for advancing the articulated goals and objectives. Some areas that the Crime Lab should consider addressing in its strategic plan include:

- Recruiting analysts and examiners.
- Increasing its profile in national and regional forensic science and professional organizations.
- Promoting and expanding the existing services it provides.
- Evaluating new technology, equipment, and forensic science analytical techniques.

- Making improvements in the areas of security, health and safety, biohazards, and contamination.
- Identifying improvements the Crime Lab can make to manage caseload, process evidence, and transfer evidence (particularly drug evidence) not needed for analysis out of the Crime Lab.
- Integrating the Firearms and Questioned Documents Sections into the Crime Lab.<sup>7</sup>

## II. The Biology Section

Based on our review of the Biology Section's current operations, we have developed the following recommendations for HPD and the Crime Lab, which are designed to address the issues we identified with respect to certain aspects of the Section's approach to case analysis, body fluid identification, result interpretation, and report writing.

### A. Technical Reviews

We recommend that HPD retain an outside consultant to assist the Crime Lab in performing technical reviews of the DNA work performed by analysts in the Biology Section. The outside consultant should have the following qualifications and responsibilities:

- The consultant should have a minimum of 10 years' experience as the technical leader of an accredited forensic DNA laboratory and in the performance of technical reviews of forensic DNA casework.
- The consultant, who should be retained by HPD for a period of at least two years, should report directly to the Biology Section's Criminalist Manager.
- The consultant should perform the technical reviews of all of the cases reported by the Crime Lab that involve forensic DNA analysis.

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<sup>7</sup> HPD reports that the Crime Lab has taken steps relevant to each of the areas listed above, and, to varying degrees, it has. Our recommendation that the Crime Lab periodically prepare a strategic vision document, however, is meant to encourage the Lab to develop a formal system for defining its goals and measuring its success in achieving them. We expect that the Crime Lab's strategic vision will change over time, and the areas listed above for the Lab to consider in setting its current objectives are by no means exhaustive.

- The consultant should mentor the Biology Section's supervisors in the technical review process.
- The consultant should assist the Biology Section's supervisors in mentoring staff on technical issues related to DNA analysis and in performing technical and administrative reviews.
- The consultant should assist the Biology Section in performing and analyzing the validation studies recommended below.
- The consultant should work with Biology Section managers to improve the clarity and precision of the DNA reports issued by the Crime Lab. A significant step in improving the comprehensibility of the Crime Lab's DNA reports would be to include a typewritten allelic table with all reports.
- The consultant should review the Biology Section's training program, the Crime Lab's QA/QC program as it relates to the Biology Section, and the Biology Section's Standard Operating Procedures ("SOPs").
- The consultant should ensure that DNA reports are not entered into the OLO system until after both the technical and administrative reviews of the case have been completed.

## **B. Forensic Case Management**

The Biology Section currently has a Criminalist Specialist who is designated as the Section's case manager. We recommend that the Biology Section case manager focus on performing the following functions:

- Establishing the priority of cases and managing case assignments.
- Tracking the status of each case submitted to the Biology Section.
- Reviewing all information, including submissions forms and investigative reports, related to cases submitted to the Crime Lab with the assigned analysts in order to develop a forensic case strategy to ensure that all forensic evidence (including reference standards) is obtained by the Lab and fully exploited.
- Coordinating interactions among Biology Section analysts, investigators, and prosecutors.
- Assisting analysts in obtaining information and reference standards from investigators.

- Reviewing the results obtained by DNA analysts to determine whether additional testing of available evidence samples should be performed in order to develop potentially probative information.

### **C. Validation Studies**

We have the following recommendations for the Crime Lab regarding further validation work that the Biology Section should perform in order to support refinements to the Section's instrumentation and procedures:

- Staff members performing validation studies should prepare an experiment plan and a final analytical report, both of which should be reviewed and approved by the Biology Section's technical leader, the outside consultant that we recommend be retained, and the Crime Lab's QA/QC Manager.
- The Biology Section should perform an extensive validation study to assess whether any changes to the DNA analysis software's current stutter filter settings would be appropriate at each locus tested.
- Additional validation experiments should be conducted on the various DNA extraction methods used by the Biology Section to ascertain the optimal extraction method for common sample types submitted to the Crime Lab for analysis.

### **D. Training**

Personnel in the Biology Section enjoy a great deal more training, both in-house and through external programs, than analysts in the historical DNA Section ever received. We recommend that the Biology Section's training program include focused training in statistics, including the principles underlying random match probabilities, the calculation of frequency estimates, and the presentation of statistical data in laboratory reports and during testimony. We also recommend that the Biology Section staff receive focused training on forensic serology techniques, including screening for semen and identification of spermatozoa.<sup>8</sup>

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<sup>8</sup> In 2003, the Crime Lab invited a renowned serology expert to provide training to the Crime Lab's serology staff. There has been a great deal of turnover and new hiring within the Biology Section since then. We recommend that this same expert be invited to provide serology training to the Biology Section's current staff.

### **E. Refinement of the Biology Section's SOPs**

The Crime Lab has devoted significant attention to revising the Biology Section and DNA SOPs, and they are dramatically improved over the SOPs used by the historical DNA/Serology Section. However, we observed several technical issues with regard to the SOPs used by the Biology Section. We have the following recommendations to improve and refine these SOPs:

- The SOPs should include separate forms for administrative and technical reviews.
- The SOPs should include testing procedures to characterize possible saliva stains.
- The SOPs should specify an exact target amount of input DNA for the amplification reaction (e.g., 1 ng of DNA), as opposed to allowing for a broad range of input DNA, which may result in unnecessarily low relative fluorescent unit ("rfu") values or missing loci.<sup>9</sup> Also, the SOPs should include an automated method to calculate the appropriate dilutions used to obtain the exact amount of target DNA needed for amplification.
- The SOPs should be expanded to contain more detailed information and guidance regarding the use and calculation of frequency estimates.

### **III. The Trace Evidence Section**

The key finding in our historical case review of the Trace Evidence Section was that HPD was not receiving the full potential benefit of trace evidence examinations. Our review of current operations indicates that this is still true. Because of the relatively low utilization of the Trace Evidence Section, the limited range of examinations currently performed, and the lack of results from the hair examinations performed to date, we believe that much more can and should be done by the Section and by investigators to make better use of the existing trace evidence resources. We also believe that expanding the range of examinations performed could yield more information of evidentiary significance.

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<sup>9</sup> In some cases, it is not possible to obtain the target amount of input DNA due to degradation or sample quality. However, a standard target concentration of input DNA would help ensure that each analyst consistently uses an amount of DNA that is likely to produce clear and interpretable DNA profile results.

### **A. Follow-Up With Investigators**

Affirmative steps should be taken by examiners to contact investigators to request known or elimination samples whenever possible. For example, if no known or elimination hair samples were provided by an officer submitting hair evidence, an examiner should promptly contact the officer to see if collection is feasible. If the examiner receives no response from the officer, a tickler system should be created to follow up with the officer in approximately one month. If there is still no response or the officer indicates that no known or elimination samples are available, the examiner should then document the steps taken and close the file, with the understanding that the samples already collected remain available in the event future examination is required.

By increasing the likelihood of meaningful review and productive results, such steps can lead to more scrupulous evidence collection by investigators and increased utilization of the trace evidence resources being developed by the Crime Lab.

### **B. Expand Available Services**

Disagreement exists in the forensic community regarding the utility of microscopic hair comparisons in light of existing DNA technologies. Although some forensic experts continue to find significant value in microscopic hair comparisons, we believe the Crime Lab should begin focusing some of its efforts on other types of trace evidence examinations.

For example, an increased emphasis on the collection and examination of fibers could yield valuable evidence in a wide range of cases. Many forensic laboratories perform fiber examinations in the same unit that performs hair comparisons (sometimes referred to as the "Microscopy Unit"). Much of the equipment required and some of the methods used are similar, and, with additional training, inclusion of fiber examinations would be very beneficial to the Crime Lab and to HPD.

Shifting some of the focus from hair examinations to paint and glass analyses would enable the Section to provide valuable services in burglaries and in motor vehicle accidents, including hit-and-run cases. We recognize that the equipment for performing certain types of examinations (e.g., soil examinations) and the training required can be expensive and may not, at least initially, provide an appropriate return on investment. Another concern is that the lack of past demand for certain types of examinations means that analysts will have difficulty maintaining proficiency to perform examinations that are in low demand. For such cases, an SOP should be developed to describe the procedure for outsourcing the examinations.



### **C. Reconsider Technical Review Plans**

For the foreseeable future, the Trace Evidence Section should continue to outsource the technical reviews of its cases to a highly qualified outside expert, even after the second examiner is qualified. Both of the Crime Lab's current trace examiners are newly trained and inexperienced as fully qualified trace evidence examiners.<sup>10</sup> These examiners cannot be expected to perform high level technical reviews at this stage, and they would not be able to provide each other with the technical guidance and mentoring that they should each receive as they continue to develop as trace evidence experts.

### **D. Revisions to the Trace Evidence SOPs**

Trace evidence SOPs should be revised and expanded so that they function as a stand-alone resource and do not require reference to other manuals. The SOPs should be revised to include specific examples of good reporting language. Such model language would help examiners identify descriptive terms that better communicate to investigators and prosecutors the significance of a particular finding. The Crime Lab should also ensure that equipment required to perform specific examinations referenced in the SOPs is actually available in the Lab.

Because the characteristics of hair can change dramatically after approximately six to nine months, SOPs should be revised to reflect a six-to-nine-month (if possible) outer limit for the collection of known samples, rather than the current five-year standard.

### **E. Restore Firearms-Related Services to the Firearms Section**

Serial number restorations and gunshot residue (muzzle-to-target distance) testing should be performed by Firearms Section examiners, as was traditionally done in the Crime Lab. Performing serial number restorations in the Firearms Section reduces unnecessary handoffs and transportation of firearms between sections. If equipment, space, and personnel in the Firearms Section are inadequate for this task, the Crime Lab should make the necessary physical improvements and additions to that Section's facility and staff as soon as possible. The expertise required for trace evidence and firearms examinations differs, and the two sections are better served if examiners focus on maintaining proficiency in their own areas of expertise. Although chemicals

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<sup>10</sup> One of the current trace evidence examiners has prior experience as a laboratory assistant with the Georgia Bureau of Investigation, where she assisted with the examination of trace evidence.

are used for both serial number restorations and gunshot residue examinations, it is not necessary to have a chemistry background to perform these examinations.

#### **IV. The Controlled Substances Section**

The Controlled Substances Section is to be commended for generally performing high quality work and for making many changes that have addressed a number of the issues we identified in previous reports. We recommend that the Section implement the following recommendations and that the Section continually evaluate its own procedures, practices, and work product to ensure that the quality of its work is maintained and improved as the Crime Lab grows.

##### **A. Technical Reviews**

The Controlled Substances Section has considered instituting a system in which two analysts spend one day per week performing technical reviews; however, we believe the Crime Lab would benefit from a more rigorous standard for accomplishing technical reviews. Therefore, we recommend that the Crime Lab change its policy and practices so that technical reviews occur no later than two days after the analysis is completed and prior to the issuance of an oral or written report.

We understand that the Controlled Substances Section is instituting an additional review system whereby randomly selected cases will receive a secondary review, above and beyond the already required administrative and technical reviews.<sup>11</sup> A secondary review can benefit the quality assurance system of the Lab, but it would lose much of that beneficial effect if not performed in a timely manner (e.g., if it occurs well after a case's legal disposition is likely to have been determined). Therefore, we recommend that any secondary reviews done in the Section be conducted in a timely fashion.

Timing is important for the technical review process, but *who* performs the reviews is also significant. We recommend that the Controlled Substances Section allow all analysts to perform administrative reviews of other analysts' reports. However, the technical review process and any secondary review process should be limited to the most experienced analysts and supervisors in the Section.

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<sup>11</sup> The secondary review is not currently part of the Crime Laboratory Division Quality and Operations Manual or SOPs.

## **B. Supervision**

In order to assure that analysts receive the proper amount of supervision, the Crime Lab managers should evaluate the duties assigned to section supervisors. It appears that the one supervisor currently in the Controlled Substances Section does not have enough time to properly supervise all the analysts in the Section and also perform his other duties. We recommend that no single supervisor in this Section be responsible for overseeing the work of more than ten analysts. The Crime Lab should take the necessary steps to fill the vacant Criminalist Specialist position and hire at least one additional experienced supervisor for the Controlled Substances Section.<sup>12</sup> If these new hires are made, we recommend that one new supervisor be hired from outside of the Crime Lab in order to bring a fresh perspective to the Section.

We also recommend that the Controlled Substances Section establish another tier in its hierarchy of analysts in order to distinguish less experienced analysts from more experienced analysts who are capable of handling certain supervisory tasks, such as training and conducting technical reviews. Adding this additional tier of more experienced analysts should also help to free up time for the highest level of supervisors, who could then focus on developing and reviewing policies and procedures as well as ensuring that the Section is maintaining the quality of its work.

## **C. Documentation**

To reduce the difficulty that currently exists when correlating items listed on an officer's submission form with the items examined by analysts and listed on the lab report, we recommend that a consistent item designation system be developed and that the unique item identifiers be documented on the Section's submission forms, worksheets, analytical testing documents, and supplemental reports. We believe this will assist not only analysts and technical reviewers but also investigators, prosecutors, and defense attorneys.

Additionally, we recommend that the Section's SOPs be modified so that descriptions of any discrepancies between information on the evidence submission form and the evidence actually submitted are documented on the analysts' worksheets rather than on the submission forms. In addition, we also suggest that any discrepancies be brought to the attention of both a Controlled Substances Section supervisor and an HPD Narcotics supervisor, each of whom would also document the

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<sup>12</sup> The Controlled Substances Section traditionally was staffed with three Criminalist III supervisors. This level of supervision contributed to the Crime Lab's ability to detect the historical drylabbing incidents involving James Price and Vipul Patel.

discrepancies. The supervisors would then have the information needed to identify any problematic patterns indicating that evidence is being lost or stolen instead of just being accidentally miscounted or inaccurately recorded.<sup>13</sup>

#### D. Security

Any laboratory dealing with large amounts of controlled substances has to take precautions to ensure that those substances are not being misappropriated. Therefore, the Crime Lab needs to evaluate how best to prevent security problems, and it should consider taking some or all of the following measures to help deter the improper use or theft of controlled substances:

- implementing a procedure where random sampling tests are used to determine whether a stored controlled substance has been replaced or diluted, indicating that a portion has been stolen and replaced with a filler substance;<sup>14</sup>
- installing electronic devices to track those entering and exiting rooms holding controlled substances;
- putting in place a random urine testing program for employees; and
- implementing a blind testing program in which known, non-evidentiary samples are submitted to CER for analysis by the Controlled Substances Section as if they were evidence related to an investigation in order to evaluate the Crime Lab's processes for handling evidence as well as the proficiency and integrity of the Lab's controlled substances staff.<sup>15</sup>

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<sup>13</sup> By instituting a policy where the submitting officer's supervisor receives notification of a discrepancy and then documents the issue, the officer will be able to use that information if called to testify. Additionally, the notification of HPD supervisors may encourage officers to more carefully document future submissions.

<sup>14</sup> In implementing this procedure, a small sample would be taken before the analyst begins testing the substance; then, at a later date, testing of the stored controlled substance could be compared to testing of that small sample. This security procedure has the added benefit of serving as a quality assurance tool because the re-testing of the substance could be used to verify the analyst's original testing.

<sup>15</sup> In implementing a blind testing program, we would recommend that the Crime Lab's QA/QC Manager work with a designated HPD Narcotics Division supervisor to ensure that each analyst receives at least one blind test per year. While the supervisor and members of the Controlled Substances Section should be aware of the blind testing program, they should not be advised of the tests in advance or even be aware of the number of tests provided during any given time

### **E. Retention of Evidence**

We recommend that a requirement be established that, absent a well-documented reason, evidence must be returned within one week after the analyst has completed testing. Additionally, the time between retrieval of evidence by an analyst and the analyst's return of the evidence should be less than one month.<sup>16</sup>

### **F. Retention Times for Standards**

We found during our review of current operations that the standard retention times of less commonly encountered drugs are not regularly obtained for each gas chromatograph / mass spectrometer ("GC/MS") instrument in the laboratory. We recommend that the Section ensure that:

- the retention times for drug standards should be verified more frequently and updated on the master list; and
- for drugs encountered less frequently in the Crime Lab, analysts should run the standards within the same timeframe that the evidence sample is tested, and a copy of the standard run should be retained in the case file.

### **G. Case Turnaround Times and Backlog**

We recommend that the Controlled Substances Section change its current procedure under which analysts are assigned a specific number of cases (usually six to eight) per day. Analysts should be able and encouraged to work more cases whenever it is practical to do so. Additionally, to encourage analysts to complete a greater number of cases, the Lab could establish a yearly case expectation number. The quantity of cases that an analyst works per year, along with the quality of the work done by the analyst, could be considered in an annual performance evaluation.

While backlogs are a common problem suffered by many forensic laboratories, we recommend that the Section develop a plan to reduce its turnaround times and

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period. The tests should include both controlled and non-controlled substances. In addition to testing security and integrity in the Controlled Substances Section, these blind tests will also serve to test the competency of the analysts and supervisors.

<sup>16</sup> To ensure that analysts are not in possession of evidence for longer than a month, we recommend that CER conduct a regular inventory of both the evidence it is storing and the evidence currently in the possession of analysts.

backlog. One suggestion would be for the Crime Lab to eliminate from its backlog older cases that either have already been adjudicated or will never go to court, such as found property and no-suspect cases. The Crime Lab should also seek to establish a policy regarding this issue so that these cases are automatically culled out and do not become a part of any future backlog.<sup>17</sup> Finally, we suggest that the Crime Lab seek guidance from other drug laboratories concerning backlog reduction methods.

## V. The Firearms Section

Based on our review of the current operations of the Firearms Section, we have the following recommendations.

### A. Technical and Administrative Reviews

The Section should develop and use separate checklists for technical and administrative reviews to ensure that the reviews are uniform and thorough. The technical and administrative review forms should require the reviewers to confirm that each step in the review process has been performed.<sup>18</sup>

### B. Caseload and Backlog

We have the following recommendations to help the Firearms Section address its current backlog of cases.

- The Firearms Section should consider contracting with retired examiners to assist with casework.
- Retired examiners could also help train the new firearms examiners in-house at HPD in order to allow current firearms examiners to concentrate on casework.

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<sup>17</sup> In addition to eliminating these types of cases from the Section's backlog, the Crime Lab also needs to secure authorization to destroy such evidence so that it is not using its space and resources to store tons of substances that will never need to be analyzed.

<sup>18</sup> The Firearms Section's SOPs contain lists of items to be covered during technical and administrative reviews. See Firearms Section SOPs at FTM-QA-1. Our recommendation is that the Crime Lab create separate forms for administrative and technical reviews that list each of the relevant areas to be covered by the reviews, as described in the SOPs, and that reviewers check off each of the items and include the forms in the case file. Such forms for technical and administrative reviews are used, for example, by the Crime Lab's Biology Section (although, as discussed above, we have recommendations for improvement of the Biology Section's current review forms).

- HPD also should explore coordinating the training of new firearms examiners through partnerships with Harris County, the DPS, and the Pasadena (Texas) Police Department.
- The Firearms Section should also continue exploring the possibility of sending some cases to the DPS, the FBI, and the Bureau of Alcohol, Tobacco, Firearms and Explosives (“ATF”) until the backlog is substantially reduced.<sup>19</sup>
- HPD, in coordination with the District Attorney’s Office, should develop a system to assign priority to cases requiring firearms examination based on those cases that are pending in court. The system should be designed to notify the Firearms Section as soon as possible when a case requiring examination is assigned a court date.
- The Firearms Section should consider suspending the entry of information regarding revolvers into IBIS, as fired cartridge casings from these firearms have only limited information for search purposes.
- Where appropriate, the Section should restrict the examination of firearms evidence in suicide cases and minimize examinations in cases where no charges have been, or are likely to be, filed.

### **C. Serial Number Restoration**

As is noted in the Trace Evidence Section discussion above, serial number restoration work is being handled by that Section because its workload is light relative to that of the Firearms Section. This understandable effort to maximize the efficiency of the Crime Lab is not an ideal arrangement and should be temporary. Firearms examiners are much more familiar with the nature and locations, including hidden locations, of these numbers on firearms and thus better able to perform this work.

Until the backlog is alleviated, we recommend a temporary transfer of some of the work involved in muzzle-to-target distance determinations to the Trace Evidence Section. Firearms examiners could carry out the necessary test firing into cloth test panels and send the panels to the Trace Evidence Section for subsequent Griess and sodium rhodizonate testing and other chemical development work. When the caseload

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<sup>19</sup> HPD reports that it has contacted outside agencies, including DPS, the FBI and ATF, about assisting the Crime Lab with its backlog of firearms cases but that, to date, outsourcing has not proven to be a viable alternative in addressing this problem.

and facility permit, we recommend that all steps of distance determination be returned to the Firearms Section.<sup>20</sup>

#### **D. Inefficient Use of Examiners**

The responsibilities of the current clerical person in the Section should be expanded or an additional clerk should be hired in the Firearms Section to reduce the amount of clerical work handled by examiners. For many reasons, including reasons described elsewhere in this report, all firearms evidence should be submitted to the Property Room. An evidence technician should be responsible for receiving and inventorying evidence from the Property Room and for returning evidence to the Property Room.

#### **E. Professional Development**

Providing opportunities for professional development will improve the quality of work, morale, and staff retention in the Firearms Section. Each firearms examiner should be provided sufficient time, opportunity, and funding to maintain at least one professional membership and to attend at least one professional meeting or training seminar annually.

#### **F. Facility Improvements**

We recommend that the following improvements to the Firearms Section's facility and work space:

- Acquire weapons for reference purposes and storage cabinets to contain them, although we recognize that space for such storage cabinets is a major concern. If the Property Room takes over all firearms evidence receipt and long-term evidence storage, as we recommend, adequate space could be made available in the firearms vault.
- The comparison microscopy equipment should be moved into the larger existing cubicles to maximize the use of space. Alternatively, partitions should be placed in the current microscopy area to isolate the microscopes.

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<sup>20</sup> The Firearms Section has only one fume hood, which is located in the front office area. There is no water available in this fume hood, and its size is unsuitable for the efficient examination of long guns. The primary need for a fume hood is to perform serial number restorations and chemical testing of gunshot residues. Once workload distribution permits the recommended return of serial number restorations and residue testing to their proper location in the Firearms Section, an adequate fume hood should be installed in a more appropriate location in the Section.



- Install a stainless steel sink of an appropriate size in the Firearms Section as soon as possible, and provide rubber aprons and gloves for washing evidence.

### **G. Refinements to the Current SOPs**

The updated Firearms Section's current SOPs are in keeping with generally accepted forensic science laboratory principles. However, we suggest a few refinements to existing protocols.

- Garment and Vehicle Examination Forms. Current procedures call for the use of examination sheets with "generic" clothing diagrams ("T-shirt," "trousers," etc.) and vehicle diagrams. Better options include creating digital images of the evidence items themselves and using available software that provides more realistic choices for garment and vehicle representations. Many crime laboratories favor using digital images while also utilizing hand-drawn sketches in the notes.
- Digital Imaging. Photographs are routinely used by the Firearms Section to document ammunition component comparisons. Many laboratories also document serial number restorations photographically in order to create a record of what may be a transitory restoration. We also suggest expanding the use of photographic and digital imaging to include all submitted firearms evidence items, such as weapons, fired cartridge casings, and bullets; the results of gunshot residue tests; and any other appropriate test results and scene evaluations.<sup>21</sup>
- Documentation of Trace Evidence Identified on Firearms Evidence. We recommend that the SOPs include a written protocol addressing the documentation of trace evidence found on all items of evidence examined by the Firearms Section, including firearms, ammunition components, and tools. Additionally, space should be added to the worksheets to ensure that the presence of any trace evidence is recorded. This protocol should include taking

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<sup>21</sup> HPD firearms examiners use various means, including written descriptions, diagrams, and sketches, in addition to digital photographs to document evidence. While these traditional methods of documenting evidence may be adequate in many cases and are not inconsistent with general accepted forensic science principles, there are a number of advantages with digital photography -- including the resolution, detail, and accuracy of the images and the convenience of digital data -- that support our recommendation that the Crime Lab make greater use of digital imagery.

digital photographs of the trace evidence in place on the firearms evidence prior to its removal.

- Physical Examination and Classification of Tools. We recommend developing a specific worksheet to guide examiners in toolmark examinations and maintaining photographic documentation of toolmark identifications. The SOPS should also provide that casts of evidence toolmarks should be retained, as well as toolmark tests and distance test patterns.
- Modified Griess – Direct Application Technique (DAT) Test. The current procedures outline the use of the Modified Griess Test, as opposed to the traditional Griess Test, as a method for transferring nitrite residues in muzzle-to-target distance tests. While the traditional version was criticized years ago for its use of suspected carcinogenic chemicals, it produces superior results to the modified version. We recommend that the Section review recent literature regarding these tests and consider reverting to the traditional Griess Test.<sup>22</sup>

## VI. The Toxicology Section

We understand that the Crime Lab is evaluating the Toxicology Section's staffing needs, and it is currently training an additional analyst to perform blood, breath, and urine alcohol testing. There are currently no plans to expand the range of toxicology analyses performed in the Crime Lab unless HPD experiences a large increase in demand for these services. We agree that expanding the range of toxicology services provided by the Crime Lab beyond alcohol analysis is not advisable at this time for a number of reasons:

- The current configuration of the Crime Lab, and the Toxicology Section's proximity to the Controlled Substances Section work area, would create ongoing risks of contamination caused by materials handled in the Controlled Substances Section work area. If the range of analyses provided by the Toxicology Section is expanded, the tests must be performed in a location as far removed from the Controlled Substances Section as possible.
- An expanded analysis program should be led by a very experienced forensic toxicologist, preferably one who has completed a relevant doctoral program.

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<sup>22</sup> Specifically, we recommend two articles that appeared in the AFTE Journal in 2001: *An Evaluation of Various Griess and Modified Griess Test Protocols*, by James Carroll, LAPD, and *A Simplified Griess and Sodium Rhodizonate Test*, by Robert Shem, Alaska DPS.

Based on our historical case review and on our review of the Toxicology Section's current operations, we also make the following recommendations and observations:

- We understand that Crime Lab managers are already considering using commercially prepared calibration solutions, and we encourage them to do so.
- The Crime Lab should resume participation in an external forensic alcohol proficiency testing program for Toxicology Section analysts.

## **VII. The Questioned Documents Section**

A police department in a city the size of Houston should be generating significantly more work for its document examiner. We therefore recommend the following:

- HPD should adopt a policy requiring that all potential questioned document evidence be submitted to the Questioned Documents Section for examination. Questioned document evidence should be defined to include all robbery notes, suicide notes, drug tally sheets, gambling tip sheets, bomb threats, threatening letters, and a wide variety of documents in fraud cases.
- The Crime Lab should provide training sessions on recognizing document evidence for all crime scene technicians, department units, and training schools. These sessions should cover all of the types of evidence described above, as well as writings that appear on building surfaces.
- The Questioned Documents Examiner should contact other forensic document units and examiners in other law enforcement agencies to determine how they disseminate information about the capabilities of their units throughout their agencies. Attending at least one national meeting and one regional meeting of forensic document examiners each year would facilitate this process. Such meetings also provide professional development and training opportunities that are especially important in a one-person, underutilized operation.

We believe that raising the profile and increasing the use of the Questioned Documents Section would assist in maintaining the Section's credibility. As investigators see that investigative leads and positive results are generated from document submissions, the value of questioned documents examinations will become obvious, and demand for these important services will increase.

# Recommendations Regarding the Property Room

The primary purpose of our review of CER and the Property Room was to evaluate evidence handling issues that have the potential to affect the integrity of evidence or otherwise undermine the effectiveness of the Crime Lab. Many of the recommendations provided below have global application and are, therefore, equally relevant to other uses of evidence.

Additionally, we reiterate our strong recommendation that HPD and the City give careful consideration to the advice contained in the Review and Assessment of the Property Room completed last year by Joe Latta.

## A. Global Evidence-Related Recommendations

We have the following global recommendations regarding HPD's collection, packaging, and storage of evidence.

- HPD should develop standard evidence procedures specifically for all types of forensic evidence and require that evidence be submitted to one central location, rather than to the several units that are currently used (including the Property Room, CER, the Firearms Section, and the Questioned Document Section).
- All long-term storage of forensic evidence should occur in one location, rather than the multiple locations currently used in the Harris County criminal justice system.
- A new evidence tracking system must be implemented that includes complete seamless integration with all of the existing evidence tracking systems. The software vendor(s) and HPD management should be held accountable for the creation and implementation of a new evidence tracking system that integrates all evidence in the Property Room and CER into a user-friendly, numerically sequential program.
- Until improved evidence tracking software is installed, a multi-part chain of custody form or a photocopy receipt should be used so that chain of custody documentation of the evidence transfer remains with the section or unit that transferred the evidence, as well as with the entity to which it has been transferred.

- Many law enforcement agencies currently use transparent, breathable evidence bags. We recommend that these should be provided to all HPD personnel who collect, submit, examine, or handle evidentiary items. Various bag sizes and types are available, and they can accommodate large and small items, as well as long firearms and biological evidence. Bags can be purchased without labels or with evidence labels permanently affixed.
- HPD should emphasize the proper collection, packaging, and submission of all types of forensic evidence -- including biological evidence and suspected controlled substances evidence -- during in-service training. Investigative and patrol supervisors should ensure that officers in their command follow proper procedures and practices related to the collection and handling of evidence.
- In order to reduce the unnecessary retention of evidence in resolved cases, investigative supervisors should be required to provide a detailed justification in response to requests from the Property Room seeking authorization to destroy evidence if the determination is that the evidence should be retained.
- We understand that the limitations of OLO are well recognized and that efforts to implement a new records management system ("RMS") are under consideration at HPD. We strongly suggest that the following features be included in any RMS adopted by HPD:
  - The RMS should work effectively with any evidence-tracking and LIMS adopted by the Property Room and the Crime Lab.
  - The RMS should accommodate identification numbering systems used by other agencies in the Harris County criminal justice system. For example, case information should be retrievable using any one of the various identification numbers assigned by different agencies or HPD divisions to the same matter.
  - An acknowledgement of receipt should be generated whenever an investigator's request for examination of evidence is sent to the Crime Lab.
  - Investigators who have requested examination of evidence by the Crime Lab should be notified automatically when results of the analysis are available.

## **B. Central Evidence Receiving**

We have the following recommendations intended specifically for CER.

- Because 20 to 40% of the cases submitted to CER are reportedly improperly sealed or marked, officers who make direct submissions should be provided a work area with supplies where they can remedy the deficiencies. When evidence deposited in lockboxes has been handled or submitted improperly, the submitting officers' supervisor should be notified of the deficiencies so that the errors can be corrected and the responsible officers provided remedial training regarding the proper collection and submission of evidence. Finally, CER should review current departmental guidelines for relevance and provide training to officers on evidence submission procedures.
- HPD should create a career ladder for CER by implementing senior inventory clerk or evidence technician positions to address the high turnover in this unit, which contributes to the inefficiency of the transfer, storage, and disposal of evidence. Current pay levels are inadequate for personnel who are given a great deal of responsibility for handling and accounting for evidence.
- Staffing in CER is inadequate, and all vacant positions (one supervisor and four clerk positions) should be filled immediately.
- CER and HPD should review existing evidence destruction procedures to identify ways to reduce the time evidence is stored at CER after adjudication.
- A complete inventory and reconciliation should be conducted immediately in CER, and periodic audits should occur on a regular basis in the future.
- We strongly recommend improved physical security measures in CER.

### **C. The Property Room**

We have the following recommendations related to evidence tracking and storage by the Property Room.

- The Property Room should conduct an inventory and reconciliation immediately. Permanent staff should be hired to coordinate a complete annual inventory and reconciliation, as well as ongoing periodic audits.
- To develop an efficient evidence disposal program, HPD should increase Property Room staffing to include one supervisor and two clerks whose sole responsibility is evidence destruction. Timely destruction of property is a critical element of efficient property room management, as is the proper management of records.

- Because Property Room procedures are inconsistent and not clearly understood, managers must develop written policies and procedures for all property room operations. These policies and procedures must be understood by all employees and implemented in a uniform and consistent manner. HPD should authorize the hiring of one administrative manager to develop and update Property Room SOPs describing property room operations and proper procedures for submitting evidence to the Property Room. These SOPs should be available online so that all officers, investigators, and other HPD employees responsible for handling evidence can have easy access to the SOPs.
- HPD should allocate funding to provide Property Room personnel with basic and refresher training on proper evidence handling procedures. HPD should also provide funding for membership in appropriate property room trade associations.
- The Property Room storage facility is sorely in need of replacement with a modern, secure, climate-controlled warehouse large enough to accommodate all HPD evidence, to include forensic evidence, with room for expansion. HPD should vigorously pursue its plans to design and build an appropriate storage facility that can accommodate all property and evidence currently in HPD custody. The new facility should be large enough to accommodate all forensic evidence (controlled substance, biological, firearms, questioned documents, fingerprint) and non-forensic evidence and property. The design should include enough expansion space to satisfy HPD needs until 2027.
- Video and audio tapes that are currently stored in case files should be stored (under appropriate temperature and humidity conditions) as evidence in the Property Room.

#### **D. Recommendations for the Crime Lab**

The following recommendations are for the Crime Lab regarding forensic evidence collection, handling, and storage:

- The Crime Lab should be interacting more with investigators and patrol officers regarding evidence collection techniques, as well as successes or failures relating to evidence handling issues. Crime Lab personnel should be directly involved in the training of CSU investigators.
- The Firearms Section should develop policies and procedures governing the submission of all types of firearms evidence.

- HPD should hire an inventory management clerk to transport all firearms evidence between the Property Room and the Firearms Section, and the large amount of firearms evidence that is currently held in the Section vault should be moved to the Property Room. The current practice of using an examiner to transport evidence is an inefficient use of resources and has resulted in the accumulation of a large amount of evidence in the Firearms Section.
- The Crime Lab should consider having all questioned document evidence submitted to the Property Room in a manner consistent with other property submission requirements for laboratory evidence.

The Crime Lab and Property Room should work together to communicate (and develop, if necessary) consistent policies and procedures regarding the storage of biological evidence.

## Conclusion

Under its current leadership, the Crime Lab has steadily moved in the right direction over the past three and a half years. Our review of its current operations clearly demonstrates that the Crime Lab now bears little resemblance to the substantially dysfunctional institution that reached its nadir in the late 1990s and early 2000s. Our detailed recommendations are intended to help the Crime Lab improve further. As reflected by our observations and recommendations, there are challenges ahead for the Crime Lab and, in some areas, room for continued improvement. We offer these recommendations in the hope that they will be followed and that they will have a lasting and positive effect on the quality of the forensic science practiced at HPD.

Our most significant concern is that the increased funding and attention that has been central to the Crime Lab's recovery so far may be transitory. After the current spotlight on the Lab's push toward accreditation and on the results of this investigation fades in the near future, the City and HPD must sustain the effort and monitoring that are necessary to ensure that the Crime Lab remains able to perform consistently competent and reliable forensic science analysis. HPD and the City have seen all too clearly the dire consequences for the accuracy, integrity, fairness, and reputation of the criminal justice system when flawed scientific evidence is produced in the Crime Lab, as was the case in the Serology and DNA Sections for many years. Having seen the costs -- in money, turmoil, and injustice -- that a flawed Crime Lab can produce, HPD and the City must make sure that the needs of the Lab are never again ignored.