



**COMPLIANCE WITH STANDARDS GOVERNING  
COMBINED DNA INDEX SYSTEM ACTIVITIES AT THE  
ARKANSAS STATE CRIME LABORATORY  
LITTLE ROCK, ARKANSAS**

U.S. Department of Justice  
Office of the Inspector General  
Audit Division

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# COMBINED DNA INDEX SYSTEM ACTIVITIES AT THE ARKANSAS STATE CRIME LABORATORY LITTLE ROCK, ARKANSAS

## EXECUTIVE SUMMARY

The Department of Justice Office of the Inspector General (OIG), Audit Division, has completed an audit of compliance with standards governing Combined DNA Index System (CODIS) activities at the Arkansas State Crime Laboratory (Laboratory).

### Background

The Federal Bureau of Investigation's (FBI) CODIS program combines forensic science and computer technology to provide an investigative tool to federal, state, and local crime laboratories in the United States, as well as those from select international law enforcement agencies. The CODIS program allows these crime laboratories to compare and match DNA profiles electronically to assist law enforcement in solving crimes and identifying missing or unidentified persons.<sup>1</sup> The FBI's CODIS Unit manages CODIS, as well as develops, supports, and provides the program to crime laboratories to foster the exchange and comparison of forensic DNA evidence.

The FBI implemented CODIS as a distributed database with hierarchical levels that enable federal, state, and local crime laboratories to compare DNA profiles electronically. The hierarchy consists of three distinct levels that flow upward from the local level to the state level and then, if allowable, the national level. The National DNA Index System (NDIS), the highest level in the hierarchy, is managed by the FBI as the nation's DNA database containing DNA profiles uploaded by law enforcement agencies across the United States. NDIS enables the laboratories participating in the CODIS program to electronically compare DNA profiles on a national level. The State DNA Index System (SDIS) is used at the state level to serve as a state's DNA database containing DNA profiles from local laboratories and

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<sup>1</sup> DNA, or deoxyribonucleic acid, is genetic material found in almost all living cells that contains encoded information necessary for building and maintaining life. Approximately 99.9-percent of human DNA is the same for all people. The differences found in the remaining 0.1-percent allow scientists to develop a unique set of DNA identification characteristics (a DNA profile) for an individual by analyzing a specimen containing DNA.

state offenders. The Local DNA Index System (LDIS) is used by local laboratories.

## **OIG Audit Objectives**

Our audit generally covered the period from August 2008 through July 2010. The objectives of our audit were to determine if: (1) the Arkansas State Crime Laboratory was in compliance with the NDIS participation requirements; (2) the Laboratory was in compliance with the Quality Assurance Standards (QAS) issued by the FBI; and (3) the Laboratory's forensic DNA profiles in CODIS databases were complete, accurate, and allowable for inclusion in NDIS.

Our review determined the following.

- The Laboratory complied with the NDIS participation requirements we reviewed.
- The Laboratory complied with the Quality Assurance Standards we reviewed.
- We reviewed 100 of the 3,899 forensic profiles the Laboratory had uploaded to NDIS as of June 22, 2010. Of the 100 forensic profiles sampled, 2 were unallowable for upload to NDIS. Both profiles were from items taken directly from suspects. The CODIS Administrator removed both profiles from NDIS during the audit. After those profiles were uploaded, the Laboratory implemented controls to prevent known suspect profiles from being uploaded into NDIS. The remaining 98 profiles we reviewed were complete, accurate, and allowable for inclusion in NDIS.

The results of our audit are discussed in detail in the Findings section of the report. Our audit objectives, scope, and methodology are detailed in Appendix I of the report and the audit criteria are detailed in Appendix II.

We discussed the results of our audit with Laboratory officials and have included their comments in the report as applicable.

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# INTRODUCTION

The Department of Justice Office of the Inspector General, Audit Division, has completed an audit of compliance with standards governing Combined DNA Index System (CODIS) activities at the Arkansas State Crime Laboratory (Laboratory).

## Background

The Federal Bureau of Investigation's (FBI) CODIS provides an investigative tool to federal, state, and local crime laboratories in the United States using forensic science and computer technology. The CODIS program allows these laboratories to compare and match DNA profiles electronically, thereby assisting law enforcement in solving crimes and identifying missing or unidentified persons.<sup>2</sup> The FBI's CODIS Unit manages CODIS and is responsible for its use in fostering the exchange and comparison of forensic DNA evidence.

## OIG Audit Objectives

Our audit generally covered the period from August 2008 through July 2010. The objectives of our audit were to determine if: (1) the Arkansas State Crime Laboratory was in compliance with the National DNA Index System (NDIS) participation requirements; (2) the Laboratory was in compliance with the Quality Assurance Standards (QAS) issued by the FBI; and (3) the Laboratory's forensic DNA profiles in CODIS databases were complete, accurate, and allowable for inclusion in NDIS. Appendix I contains a detailed description of our audit objectives, scope, and methodology, while the criteria used to conduct our audit are presented in Appendix II.

## Legal Foundation for CODIS

The FBI began the CODIS program as a pilot project in 1990. The DNA Identification Act of 1994 (Act) authorized the FBI to establish a national index of DNA profiles for law enforcement purposes. The Act, along

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<sup>2</sup> DNA, or deoxyribonucleic acid, is genetic material found in almost all living cells that contains encoded information necessary for building and maintaining life. Approximately 99.9-percent of human DNA is the same for all people. The differences found in the remaining 0.1-percent allow scientists to develop a unique set of DNA identification characteristics (a DNA profile) for an individual by analyzing a specimen containing DNA.

with subsequent amendments, has been codified in a federal statute (Statute) providing the legal authority to establish and maintain NDIS.<sup>3</sup>

#### *Allowable DNA Profiles*

The Statute authorizes NDIS to contain the DNA identification records of persons convicted of crimes, persons who have been charged in an indictment or information with a crime, and other persons whose DNA samples are collected under applicable legal authorities. Samples voluntarily submitted solely for elimination purposes are not authorized for inclusion in NDIS. The Statute also authorizes NDIS to include analysis of DNA samples recovered from crime scenes or from unidentified human remains, as well as those voluntarily contributed from relatives of missing persons.

#### *Allowable Disclosure of DNA Profiles*

The Statute requires that NDIS only include DNA information that is based on analyses performed by or on behalf of a criminal justice agency – or the U.S. Department of Defense – in accordance with QAS issued by the FBI. The DNA information in the index is authorized to be disclosed only: (1) to criminal justice agencies for law enforcement identification purposes; (2) in judicial proceedings, if otherwise admissible pursuant to applicable statutes or rules; (3) for criminal defense purposes, to a defendant who shall have access to samples and analyses performed in connection with the case in which the defendant is charged; or (4) if personally identifiable information (PII) is removed for a population statistics database, for identification research and protocol development purposes, or for quality control purposes.

### **CODIS Structure**

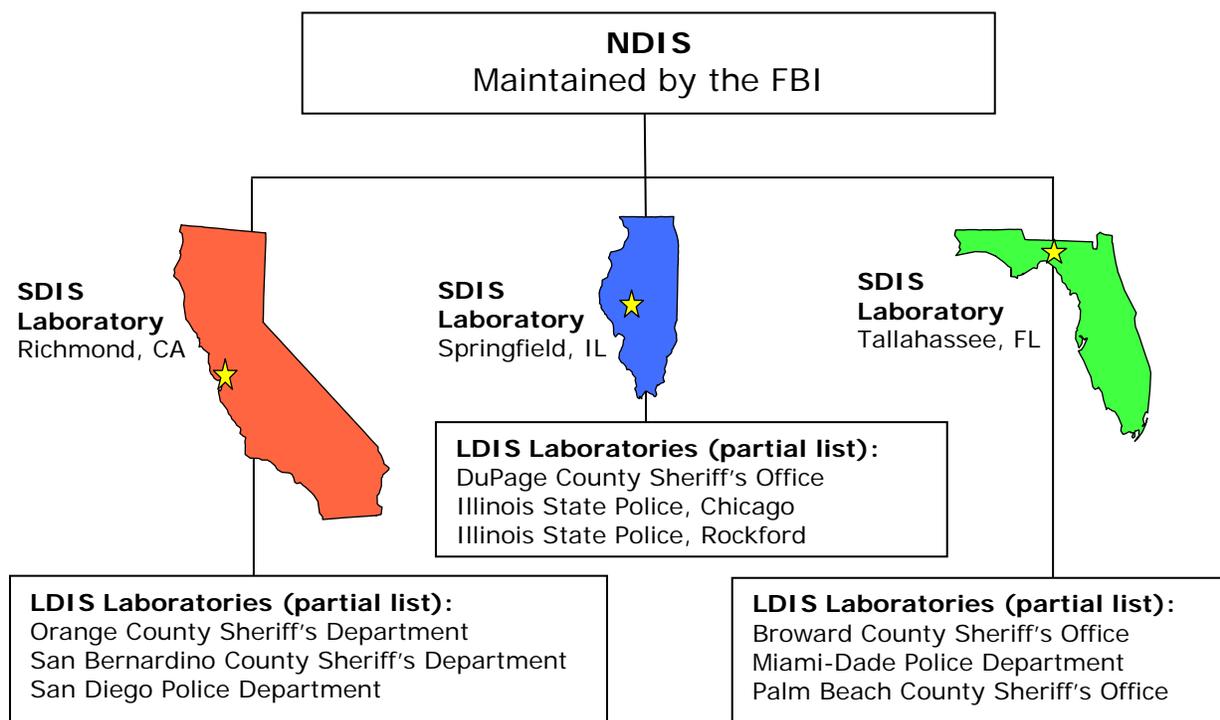
The FBI implemented CODIS as a distributed database with hierarchical levels that enable federal, state, and local crime laboratories to compare DNA profiles electronically. CODIS consists of a hierarchy of three distinct levels: (1) NDIS is managed by the FBI as the nation's DNA database containing DNA profiles uploaded by participating states, (2) the State DNA Index System (SDIS) is used at the state level to serve as a state's DNA database containing DNA profiles from local laboratories within the state and state offenders, and (3) the Local DNA Index System (LDIS) is used by local laboratories. DNA profiles originate at the local level and then flow upward to the state and, if allowable, national level. For example,

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<sup>3</sup> 42 U.S.C.A. § 14132 (2006).

the local laboratory in the Palm Beach County, Florida, Sheriff's Office sends its profiles to the state laboratory in Tallahassee, which then uploads the profiles to NDIS. Each state participating in CODIS has one designated SDIS laboratory. The SDIS laboratory maintains its own database and is responsible for overseeing NDIS issues for all CODIS-participating laboratories within the state. The graphic below presents an example of how the system hierarchy works.

### Example of System Hierarchy within CODIS



NDIS is the highest level in the CODIS hierarchy and enables the laboratories participating in the CODIS program to electronically compare DNA profiles on a national level. NDIS does not contain names or other PII about the profiles. Therefore, matches are resolved through a system of laboratory-to-laboratory contacts. Within NDIS are seven searchable indices discussed below.

- Convicted Offender Index contains profiles generated from persons convicted of qualifying offenses.<sup>4</sup>

<sup>4</sup> The phrase "qualifying offenses" is used here to refer to local, state, or federal crimes that require a person to provide a DNA sample in accordance with applicable laws.

- Arrestee Index is comprised of profiles developed from persons who have been arrested, indicted, or charged in an information with a crime.
- Legal Index consists of profiles that are produced from DNA samples collected from persons under other applicable legal authorities.<sup>5</sup>
- Forensic Index profiles originate from, and are associated with, evidence found at crime scenes.
- Missing Person Index contains known DNA profile of missing persons and deduced missing persons.
- Unidentified Human (Remains) Index holds profiles from unidentified living individuals and the remains of unidentified deceased individuals.<sup>6</sup>
- Relatives of Missing Person Index is comprised of DNA profiles generated from the biological relatives of individuals reported missing.

Although CODIS is comprised of multiple indices or databases, the two main functions of the system are to: (1) generate investigative leads that may help in solving crimes and (2) identify missing and unidentified persons.

The Forensic Index generates investigative leads in CODIS that may help solve crimes. Investigative leads may be generated through matches between the Forensic Index and other indices in the system, including the Convicted Offender, Arrestee, and Legal Indices. These matches may provide investigators with the identity of suspected perpetrators. CODIS also links crime scenes through matches between Forensic Index profiles, potentially identifying serial offenders.

In addition to generating investigative leads, CODIS furthers the objectives of the FBI's National Missing Person DNA Database program through its ability to identify missing and unidentified individuals. Those

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<sup>5</sup> An example of a Legal Index profile is one from a person found not guilty by reason of insanity who is required by the relevant state law to provide a DNA sample.

<sup>6</sup> An example of an Unidentified Human (Remains) Index profile from a living person is a profile from a child or other individual, who cannot or refuses to identify themselves.

persons may be identified through matches between indices in CODIS, such as through matches between the profiles in the Missing Persons Index and the Unidentified Human (Remains) Index. Identifications may also be generated through matches between the Unidentified Human (Remains) Index and the Relatives of Missing Persons Index. The profiles within the Missing Persons and Unidentified Human (Remains) Indices may also be vetted against the Forensic, Convicted Offender, Arrestee, and Legal Indices to provide investigators with leads in solving missing and unidentified persons cases.

### *State and Local DNA Index System*

The FBI provides CODIS software free of charge to any state or local law enforcement laboratory performing DNA analysis. Laboratories are able to use the CODIS software to upload profiles to NDIS. However, before a laboratory is allowed to participate at the national level and upload DNA profiles to NDIS, a Memorandum of Understanding (MOU) must be signed between the FBI and the applicable state's SDIS laboratory. The MOU defines the responsibilities of each party, includes a sublicense for the use of CODIS software, and delineates the standards laboratories must meet in order to utilize NDIS. Although officials from LDIS laboratories do not sign an MOU, LDIS laboratories that upload DNA profiles to an SDIS laboratory are required to adhere to the MOU signed by the SDIS laboratory.

States are authorized to upload DNA profiles to NDIS based on local, state, and federal laws, as well as NDIS regulations. However, states or localities may maintain NDIS-restricted profiles in SDIS or LDIS. For instance, a local law may allow for the collection and maintenance of a victim profile at LDIS but NDIS regulations do not authorize the upload of that profile to the national level.

The utility of CODIS relies upon the completeness, accuracy, and quantity of profiles that laboratories upload to the system. Incomplete CODIS profiles are those for which the required number of core loci were not tested or do not contain all of the DNA information that resulted from a DNA analysis and may not be searched at NDIS. The probability of a false match among DNA profiles is reduced as the completeness of a profile increases. Inaccurate profiles, which contain incorrect DNA information or an incorrect specimen number, may generate false positive leads, false negative comparisons, or lead to the misidentification of a sample. CODIS becomes more useful as the quantity of DNA profiles in the system increases because the potential for additional leads rises. However, laws and regulations exclude certain types of profiles from being uploaded to CODIS to prevent

violations to an individual's privacy and foster the public's confidence in CODIS. Therefore, it is the responsibility of the Laboratory to ensure that it is adhering to the NDIS participation requirements and the profiles uploaded to CODIS are complete, accurate, and allowable for inclusion in NDIS.

### **Laboratory Information**

The Arkansas State Crime Laboratory participates in CODIS as a State DNA Index System laboratory. The Laboratory began using DNA to process criminal cases in 1996 and started uploading profiles to NDIS in 1998. The Laboratory performs analysis on both convicted offender and forensic samples. From 2006 through 2010, the Laboratory outsourced the analysis of approximately 2,400 forensic samples. The Laboratory was first accredited by the American Society of Crime Laboratory Directors/Laboratory Accreditation Board (ASCLD/LAB) in 2004 and was reaccredited by ASCLD/LAB in December 2009 for a period of 5 years.

# **FINDINGS AND RECOMMENDATIONS**

## **I. Compliance with NDIS Participation Requirements**

The Laboratory complied with the NDIS participation requirements we reviewed.

The NDIS participation requirements, which consist of the MOU and the NDIS Procedure Manual, establish the responsibilities and obligations of laboratories that participate in the CODIS program at the national level. The MOU describes the CODIS-related responsibilities of both the Laboratory and the FBI. The NDIS Procedure Manual is comprised of the NDIS operational procedures and provides detailed instructions for laboratories to follow when performing certain procedures pertinent to NDIS. The NDIS participation requirements we reviewed are listed in Appendix II of this report.

### **Results of the OIG Audit**

We found that the Laboratory complied with the NDIS participation requirements we reviewed. The results of our audit are described in more detail below.

- We interviewed the CODIS Administrator and conducted a walk-through tour of the building and the Laboratory. We identified no material concerns regarding the Laboratory's procedures for securing the CODIS server or the Laboratory's facilities.
- We interviewed the CODIS Administrator and reviewed documents to determine that the Laboratory provided appropriate personnel with copies of the NDIS procedures manual. We interviewed two CODIS users and determined that they both understood NDIS procedures and could access the procedures on the FBI's Criminal Justice Information System Wide Area Network (CJIS/WAN).
- We reviewed certificates of completion for the CODIS users. All had completed the DNA Records Acceptable at NDIS training accessible on the CJIS/WAN during the last 2 years.
- For each CODIS user, the Laboratory is required to send certain background and security information to the FBI. We verified that the Laboratory submitted the required information to the FBI.

- We interviewed the CODIS Administrator and determined the Laboratory complied with NDIS requirements regarding maintenance of personnel records.
- We reviewed a sample of NDIS matches and determined that each match was confirmed timely and that, when applicable, the investigators were notified timely.
- We reviewed the Laboratory's procedures for expunging or administratively removing profiles from the CODIS database and determined that the procedures were adequate and consistent with the FBI's requirements. The Laboratory had no requests for expungement or administrative removal.

## **Conclusion**

We made no recommendations concerning our review of NDIS participation requirements.

## II. Compliance with the Quality Assurance Standards

The Laboratory complied with the Forensic and Offender QAS we reviewed.

During our audit, we considered the Forensic and Offender QAS issued by the FBI.<sup>7</sup> These standards describe the quality assurance requirements that the Laboratory must follow to ensure the quality and integrity of the data it produces. We also assessed the two most recent QAS reviews that the laboratory underwent.<sup>8</sup> The QAS we reviewed are listed in Appendix II.

### Results of the OIG Audit

We found that the Laboratory complied with the Forensic and Offender QAS we reviewed. The results of our audit are described in more detail below.

- We determined the Laboratory underwent a QAS review during each of the last two calendar years as required by the QAS for laboratory reviews. The Laboratory underwent a QAS review by internal reviewers in October 2008 and by external reviewers in September 2009.
- We reviewed the most recent QAS review reports provided by the CODIS Administrator. The FBI's QAS Review Document was used to conduct the most recent external and internal reviews. The FBI confirmed that at least one of the QAS reviewers for both reviews had successfully completed the FBI QAS Review training course. There were two findings in the external DNA Databasing Review Report and one finding in the external Forensic DNA Testing Review Report. The

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<sup>7</sup> Forensic Quality Assurance Standards refers to the Quality Assurance Standards for Forensic DNA Testing Laboratories, effective July 1, 2009. Offender Quality Assurance Standards refers to the Quality Assurance Standards for Convicted Offender DNA Databasing Laboratories, effective July 1, 2009.

<sup>8</sup> The QAS require that laboratories undergo annual audits. Every other year, the QAS requires that the audit be performed by an external agency that performs DNA identification analysis and is independent of the laboratory being reviewed. These audits are not required by the QAS to be performed in accordance with the *Government Auditing Standards* (GAS) and are not performed by the Department of Justice Office of the Inspector General. Therefore, we will refer to the QAS audits as reviews (either an internal laboratory review or an external laboratory review, as applicable) to avoid confusion with our audits that are conducted in accordance with GAS.

Laboratory provided the most recent QAS Review Reports to the FBI within the required 30 days. During our audit, we reviewed the corrective actions and determined that the Laboratory had taken appropriate actions. The internal QAS review did not identify any findings of non-compliance with the QAS.

- We asked the QAS reviewers who conducted the most recent external QAS reviews to certify that they had no impairments to their independence. The QAS reviewers provided us with this certification.
- We toured the Laboratory building and interviewed the CODIS Administrator to determine that the facility appeared to have adequate physical access controls in place.
- We interviewed the CODIS Administrator and reviewed policies to determine that the Laboratory appeared to have adequate procedures in place to ensure the integrity of physical evidence.
- We interviewed the CODIS Administrator and reviewed policies and practices to determine that the Laboratory's policies and practices regarding the separation of known and unknown samples during the analysis process appeared to be adequate.
- We interviewed the CODIS Administrator and toured the Laboratory to determine that the Laboratory appeared to be in compliance with forensic standards governing the retention of samples and extracts after analysis.
- We interviewed the Laboratory's DNA Technical Leader (Training) and reviewed documentation to determine that the Laboratory outsourced DNA samples for analysis. We verified the contractor had undergone a QAS audit before the contract began and that the Laboratory had reviewed the quality of the contractor's work in accordance with the FBI's QAS.
- We interviewed the CODIS Administrator and reviewed documentation to determine that the Laboratory reviews 100 percent of the outsourced work performed by the contractor, which includes an analyst review of raw data in Genotyper and Genescan printouts.
- We interviewed the Laboratory's DNA Technical Leader (Training) and reviewed documentation to determine that the Laboratory had

conducted five site visits of the outsourced Laboratory within the last 4 years.

### **Conclusion**

We made no recommendations concerning our review of the Laboratory's adherence to the QAS.

### **III. Suitability of Forensic DNA Profiles in CODIS Databases**

Of the 100 forensic profiles sampled, 2 were unallowable for upload to NDIS. Both profiles were from items taken directly from suspects. The CODIS Administrator removed both profiles from NDIS during the audit. After those profiles were uploaded, the Laboratory implemented controls to prevent known suspect profiles from being uploaded into NDIS. The remaining profiles we reviewed were complete, accurate, and allowable for inclusion in NDIS.

We reviewed a sample of the Laboratory's forensic DNA profiles to determine whether each profile was complete, accurate, and allowable for inclusion in NDIS.<sup>9</sup> To test the completeness and accuracy of each profile, we established standards that require a profile include all the loci for which the analyst obtained results, and that the values at each locus match those identified during analysis.<sup>10</sup> Our standards are described in more detail in Appendix II of this report.

The NDIS operational procedures establish the DNA data acceptance standards by which laboratories must abide. These procedures prohibit a laboratory from uploading forensic profiles to NDIS that clearly match the DNA profile of the victim or another known person who is not the putative perpetrator. A profile at NDIS that matches a suspect may be allowable if the contributor is unknown at the time of collection; however, NDIS guidelines prohibit profiles that match a suspect if that profile could reasonably have been expected to be on an item at the crime scene or part of the crime scene independent of the crime. For instance, a profile from an item seized from the suspect's person, such as a shirt, or that was in the possession of the suspect when collected would not be allowed for upload to NDIS. The NDIS procedures we reviewed are listed in Appendix II of this report.

#### **Results of the OIG Audit**

We selected a random sample of 100 profiles out of the 3,899 forensic profiles the Laboratory had uploaded to NDIS as of June 22, 2010. Of the 100 forensic profiles sampled, 2 were unallowable for upload to NDIS. The

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<sup>9</sup> When a laboratory's universe of DNA profiles in NDIS exceeds 1,500, our sample is taken from SDIS rather than directly from NDIS. See Appendix I for further description of the sample selection.

<sup>10</sup> A "locus" is a specific location on a chromosome. The plural form of locus is loci.

remaining profiles sampled were complete, accurate, and allowable for inclusion in NDIS. The specific exceptions are explained in more detail below.

#### *OIG Sample Number CA-02*

Sample CA-02 was taken from a cigarette butt that was submitted to the Laboratory in 2005 as a known sample by the investigating officer without clearly labeling it as such. During processing, the analyst mistakenly thought the sample came from the crime scene when in fact the sample was collected from the suspect during the investigation. This error was not detected during the technical review. The profile was then entered into CODIS in September 2005 as a forensic unknown. According to the Laboratory Director, the Laboratory modified the *Forensic DNA Case Review* sheet in 2007 to require the Technical Reviewer to determine if the appropriate specimen category and sample indicated on the CODIS Entry form was correct. The profile was removed from NDIS by the CODIS Administrator during our audit.

#### *OIG Sample Number CA-15*

Sample CA-15 was taken from clothing obtained from the suspect. The investigator wanted to determine if blood on the clothing belonged to the victim. Although the Evidence Submission form identified the clothing as belonging to a suspect, the form the Laboratory serologist furnished the DNA section did not indicate this. The resulting DNA profile excluded the victim. The analyst mistakenly thought the sample came from crime scene evidence and uploaded the profile into CODIS October 2003 as a forensic unknown. According to the Laboratory Director, the new *Forensic DNA Case Review* sheet discussed above, along with the Laboratory's new electronic information system, implemented in 2006, should prevent such errors in the future. The system makes all submissions, results, and all case file information readily available to all DNA analysts. The profile was removed from NDIS by the CODIS Administrator during our audit.

### **Conclusion**

The Laboratory has taken corrective action with respect to both unallowable profiles. Given the small number of errors and the Laboratory's corrective actions, we made no recommendations concerning our review of forensic DNA profiles.

### OBJECTIVES, SCOPE, AND METHODOLOGY

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Our audit generally covered the period from August 2008 through July 2010. The objectives of the audit were to determine if the: (1) Laboratory was in compliance with the NDIS participation requirements; (2) Laboratory was in compliance with the Quality Assurance Standards (QAS) issued by the FBI; and (3) Laboratory's forensic DNA profiles in CODIS databases were complete, accurate, and allowable for inclusion in NDIS. To accomplish the objectives of the audit, we:

- Examined internal and external Laboratory review reports and supporting documentation for corrective action taken, if any, to determine: (a) if the Laboratory complied with the QAS, (b) whether repeat findings were identified, and (c) whether recommendations were adequately resolved.<sup>11</sup>

In accordance with the QAS, the internal and external laboratory review procedures are to address, at a minimum, a laboratory's quality assurance program, organization and management, personnel qualifications, facilities, evidence control, validation of methods and procedures, analytical procedures, calibration and maintenance of instruments and equipment, proficiency testing of analysts, corrective action for discrepancies and errors, review of case files, reports, safety, and previous audits. The QAS require that internal and external reviews

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<sup>11</sup> The QAS require that laboratories undergo annual audits. Every other year, the QAS requires that the audit be performed by an external agency that performs DNA identification analysis and is independent of the laboratory being reviewed. These audits are not required by the QAS to be performed in accordance with the *Government Auditing Standards* (GAS) and are not performed by the Department of Justice Office of the Inspector General. Therefore, we will refer to the QAS audits as reviews (either an internal laboratory review or an external laboratory review, as applicable) to avoid confusion with our audits that are conducted in accordance with GAS.

be performed by personnel who have successfully completed the FBI's training course for conducting such reviews.

As permitted by GAS 7.42 (2007 revision), we generally relied on the results of the Laboratory's external laboratory reviews to determine if the Laboratory complied with the QAS.<sup>12</sup> In order to rely on the work of non-auditors, GAS requires that we perform procedures to obtain sufficient evidence that the work can be relied upon. Therefore, we: (1) obtained evidence concerning the qualifications and independence of the individuals who conducted the review and (2) determined that the scope, quality, and timing of the audit work performed was adequate for reliance in the context of the current audit objectives by reviewing the evaluation procedure guide and resultant findings to understand the methods and significant assumptions used by the individuals conducting the reviews. Based on this work, we determined that we could rely on the results of the Laboratory's external laboratory review.

- Interviewed Laboratory officials to identify management controls, Laboratory operational policies and procedures, Laboratory certifications or accreditations, and analytical information related to DNA profiles.
- Toured the Laboratory to observe facility security measures as well as the procedures and controls related to the receipt, processing, analyzing, and storage of forensic evidence and convicted offender DNA samples.
- Reviewed the Laboratory's written policies and procedures related to conducting internal reviews, resolving review findings, expunging DNA profiles from NDIS, and resolving matches among DNA profiles in NDIS.
- Reviewed supporting documentation for 10 of 300 NDIS matches to determine whether they were resolved in a timely manner. The Laboratory provided the universe of NDIS case to offender matches as of June 30, 2010 and case to case matches as of July 13, 2010. The sample was judgmentally selected to include both case-to-case and

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<sup>12</sup> We also considered the results of the Laboratory's internal laboratory review, but could not rely on it because it was not performed by personnel independent of the Laboratory. Further, as noted in Appendix II, we performed audit testing to verify Laboratory compliance with specific Quality Assurance Standards that have a substantial effect on the integrity of the DNA profiles uploaded to NDIS.

case-to-offender matches. This non-statistical sample does not allow projection of the test results to all matches.

- Reviewed supporting documentation to determine whether the Laboratory provided adequate vendor oversight.

Reviewed the case files for selected forensic DNA profiles to determine if the profiles were developed in accordance with the Forensic QAS and were complete, accurate, and allowable for inclusion in NDIS.

- We were unable to obtain the forensic profile information directly from NDIS because of the large number of profiles involved and because FBI management controls at the NDIS level prohibit the dissemination of information in an electronic format. Therefore, working in conjunction with the contractor used by the FBI to maintain NDIS and the CODIS software, the Laboratory provided us with an electronic file identifying the 3,899 Short Tandem Repeat forensic profiles the Laboratory had uploaded to NDIS as of June 23, 2010. We verified that the total number of the Laboratory's profiles in SDIS that were designated as processed by NDIS agreed with the total number of the Laboratory's profiles in NDIS for a given specimen category as of the same date. Since the total numbers agreed, and NDIS contains profiles uploaded from SDIS, we considered this universe of SDIS profiles to be representative of the Laboratory's profiles contained in NDIS. We limited our review to a sample of 100 profiles. This sample size was determined judgmentally because preliminary audit work determined that risk was not unacceptably high.
- Using the judgmentally-determined sample size, we randomly selected a representative sample of labels associated with specific profiles in our universe to reduce the effect of any patterns in the list of profiles provided to us. However, since the sample size was judgmentally determined, the results obtained from testing this limited sample of profiles may not be projected to the universe of profiles from which the sample was selected.

The objectives of our audit concerned the Laboratory's compliance with required standards and the related internal controls. Accordingly, we did not attach a separate statement on compliance with laws and regulations or a statement on internal controls to this report. See Appendix II for detailed information on our audit criteria.

### AUDIT CRITERIA

In conducting our audit, we considered the NDIS participation requirements and the Quality Assurance Standards (QAS). However, we did not test for compliance with elements that were not applicable to the Laboratory. In addition, we established standards to test the completeness and accuracy of DNA profiles as well as the timely notification of DNA profile matches to law enforcement.

#### **NDIS Participation Requirements**

The NDIS participation requirements, which consist of the Memorandum of Understanding (MOU) and the NDIS operational procedures, establish the responsibilities and obligations of laboratories that participate in NDIS. The MOU requires that NDIS participants comply with federal legislation and the QAS, as well as NDIS-specific requirements accompanying the MOU in the form of appendices. We focused our audit on specific sections of the following NDIS operational procedures.

- DNA Data Acceptance Standards
- DNA Data Accepted at NDIS
- Quality Assurance Standards (QAS) Audits
- NDIS DNA Autosearches
- Confirm an Interstate Candidate Match
- General Responsibilities
- Initiate and Maintain a Laboratory's Participation in NDIS
- Security Requirements
- CODIS Users
- CODIS Administrator Responsibilities
- Access to, and Disclosure of, DNA Records and Samples
- Upload of DNA Records
- Expunge a DNA Record

## Quality Assurance Standards

The FBI issued two sets of Quality Assurance Standards (QAS): QAS for Forensic DNA Testing Laboratories, effective July 1, 2009 (Forensic QAS); and QAS for DNA Databasing Laboratories, effective July 1, 2009 (Offender QAS). The Forensic QAS and the Offender QAS describe the quality assurance requirements that the Laboratory should follow to ensure the quality and integrity of the data it produces.

For our audit, we generally relied on the reported results of the Laboratory's most recent annual external review to determine if the Laboratory was in compliance with the QAS. Additionally, we performed audit work to verify that the Laboratory was in compliance with the QAS listed below because they have a substantial effect on the integrity of the DNA profiles uploaded to NDIS.

- Facilities (Forensic QAS and Offender QAS 6.1): The laboratory shall have a facility that is designed to ensure the integrity of the analyses and the evidence.
- Evidence Control (Forensic QAS 7.1): The laboratory shall have and follow a documented evidence control system to ensure the integrity of physical evidence. Where possible, the laboratory shall retain or return a portion of the evidence sample or extract.
- Sample Control (Offender QAS 7.1): The laboratory shall have and follow a documented sample inventory control system to ensure the integrity of database and known samples.
- Analytical Procedures (Forensic QAS and Offender QAS 9.5): The laboratory shall monitor the analytical procedures using [appropriate] controls and standards.
- Review (Forensic QAS 12.1): The laboratory shall conduct administrative and technical reviews of all case files and reports to ensure conclusions and supporting data are reasonable and within the constraints of scientific knowledge.

(Offender QAS Standard 12.1): The laboratory shall have and follow written procedures for reviewing DNA records and DNA database information, including the resolution of database matches.

- Reviews (Forensic QAS and Offender QAS 15.1 and 15.2): The laboratory shall be audited annually in accordance with the QAS. The annual audits shall occur every calendar year and shall be at least 6 months and no more than 18 months apart.

At least once every 2 years, an external audit shall be conducted by an audit team comprised of qualified auditors from a second agency and having at least one team member who is or has been previously qualified in the laboratory's current DNA technologies and platform.

- Outsourcing (Forensic QAS and Offender QAS Standard 17.1): A vendor laboratory performing forensic and database DNA analysis shall comply with these Standards and the accreditation requirements of federal law.

Forensic QAS 17.4: An NDIS participating laboratory shall have and follow a procedure to verify the integrity of the DNA data received through the performance of the technical review of DNA data from a vendor laboratory.

Offender QAS Standard 17.4: An NDIS participating laboratory shall have, follow and document appropriate quality assurance procedures to verify the integrity of the data received from the vendor laboratory including, but not limited to, the following: Random reanalysis of database, known or casework reference samples; Inclusion of QC samples; Performance of an on-site visit by an NDIS participating laboratory or multi-laboratory system outsourcing DNA sample(s) to a vendor laboratory or accepting ownership of DNA data from a vendor laboratory.

## **Office of the Inspector General Standards**

We established standards to test the completeness and accuracy of DNA profiles as well as the timely notification of law enforcement when DNA profile matches occur in NDIS. Our standards are listed below.

- Completeness of DNA Profiles: A profile must include each value returned at each locus for which the analyst obtained results. Our rationale for this standard is that the probability of a false match among DNA profiles is reduced as the number of loci included in a profile increases. A false match would require the unnecessary use of laboratory resources to refute the match.
- Accuracy of DNA Profiles: The values at each locus of a profile must match those identified during analysis. Our rationale for this standard

is that inaccurate profiles may: (1) preclude DNA profiles from being matched and, therefore, the potential to link convicted offenders to a crime or to link previously unrelated crimes to each other may be lost; or (2) result in a false match that would require the unnecessary use of laboratory resources to refute the match.

- Timely Notification of Law Enforcement When DNA Profile Matches Occur in NDIS: Laboratories should notify law enforcement personnel of NDIS matches within 2 weeks of the match confirmation date, unless there are extenuating circumstances. Our rationale for this standard is that untimely notification of law enforcement personnel may result in the suspected perpetrator committing additional, and possibly more egregious, crimes if the individual is not deceased or already incarcerated for the commission of other crimes.

FEDERAL BUREAU OF INVESTIGATION RESPONSE

U.S. Department of Justice

Federal Bureau of Investigation

Washington D.C. 20535-0001

September 28, 2010

Ferris B. Polk  
Regional Audit Manager  
Atlanta Regional Audit Office  
Office of the Inspector General  
75 Spring Street  
Atlanta, GA 30303

Dear Mr. Polk:

Your memorandum to Director Mueller forwarding the draft audit report for the Arkansas State Crime Laboratory, Little Rock, Arkansas, has been referred to me for response.

Your draft report contained no recommendations relating to the Laboratory's compliance with the FBI's Memorandum of Understanding and *Quality Assurance Standards for DNA Testing Laboratories and Quality Assurance Standards for DNA Databasing Laboratories*. The CODIS Unit reviewed the draft report and since it appears that the Laboratory is in compliance with NDIS participation requirements, the CODIS Unit has no comments to provide to the draft report.

Thank you for sharing the draft audit report with us. If you have any questions, please feel free to contact Jennifer C. Luttman, Chief of the CODIS Unit, at (703) 632-8315.

Sincerely,

/s/

Alice R. Isenberg, Ph.D  
Section Chief  
Biometrics Analysis Section  
FBI Laboratory

## ARKANSAS STATE CRIME LABORATORY RESPONSE

### ARKANSAS STATE CRIME LABORATORY



September 23, 2010

Mr. Ferris B. Polk  
Regional Audit Manager  
U.S. Department of Justice  
Office of the Inspector General  
75 Spring Street, Suite 1130  
Atlanta, GA 30303

Dear Mr. Polk:

I have reviewed the OIG draft audit report covering the period from August 2008 through July 2010 conducted at our Little Rock, Arkansas laboratory.

Based on my review of the document, the laboratory was found to be in compliance with the NDIS participation requirements and the Quality Assurance Standards (both Forensic and Offender).

The review of the suitability of Forensic DNA profiles in CODIS revealed 2 (two) samples that were unallowable and thus were removed from NDIS.

I agree with the draft audit report as written and extend my appreciation to the OIG for devoting time for this audit process.

Sincerely,

/S/

Kermit B. Channell II  
Executive Director

cc: Paula Pagano, FBI

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Fax 501-227-0713 Fax 501-221-1653  
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Laboratory Services Medical Examiner

**OFFICE OF THE INSPECTOR GENERAL  
ANALYSIS AND SUMMARY OF ACTIONS NECESSARY  
TO CLOSE REPORT**

The OIG provided a draft of this audit report to the Federal Bureau of Investigation (FBI) and to the Director, Arkansas State Crime Laboratory. The FBI's comments are incorporated as Appendix III of this final report. The Laboratory Director's comments are incorporated in Appendix IV of this final report. This report contains no recommendations and is issued closed.