



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



**Audit of Compliance with
Standards Governing Combined
DNA Index System Activities at
the Anne Arundel County Police
Department Crime Laboratory
Millersville, Maryland**

**AUDIT OF COMPLIANCE WITH STANDARDS GOVERNING
COMBINED DNA INDEX SYSTEM ACTIVITIES AT THE
ANNE ARUNDEL COUNTY
POLICE DEPARTMENT CRIME LABORATORY
MILLERSVILLE, MARYLAND**

EXECUTIVE SUMMARY

The Department of Justice Office of the Inspector General (OIG) has completed an audit of compliance with standards governing Combined DNA Index System (CODIS) activities at the Anne Arundel County Police Department Crime Laboratory (Laboratory) in Millersville, Maryland.

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.¹ The FBI's CODIS Unit manages CODIS and also 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 enables 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, contains DNA profiles uploaded by law enforcement agencies across the United States and is managed by the FBI. 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 and contains DNA profiles from local laboratories and state offenders. The Local DNA Index System (LDIS) is used by local laboratories.

Our audit generally covered the period from February 2012 through February 2017. The objectives of our audit were to determine if: (1) the Laboratory was in compliance with select NDIS Operational Procedures; (2) the Laboratory was in compliance with certain 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:

¹ DNA, or deoxyribonucleic acid, is hereditary material found in almost all organisms that contains encoded information necessary for building and maintaining an organism. More than 99 percent of human DNA is the same for all people. The differences found in the remaining less than 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.

- The Laboratory was in compliance with FBI NDIS Security Requirements requiring the encryption of all backup files, which is important for ensuring the security of sensitive DNA profile information. The Laboratory was in compliance with the remaining NDIS operational procedures we reviewed, such as providing up-to-date training for Laboratory personnel, maintenance of training and qualification records, physical security of CODIS, and timeliness of NDIS matches.
- The Laboratory was in compliance with the Quality Assurance Standards (QAS) we reviewed, to include: (1) physical security of the Laboratory, (2) the Laboratory's most recent internal and external QAS reviews, and (3) sample security and processing.
- We reviewed 100 of 646 forensic profiles that the Laboratory uploaded to NDIS as of February 22, 2017. All of the forensic profiles sampled were complete, accurate, and allowable for inclusion in NDIS.

While we found that the Laboratory complied with FBI NDIS Security Requirements for CODIS backups and contingency plans, the FBI acknowledged that those guidelines do not specify what constitutes an acceptable level of encryption or require that the laboratories consult the FBI regarding encryption capability prior to acquiring new hardware, such as servers and drives, and also that there has been an increase in the number of questions among laboratories regarding NDIS encryption policies. Therefore, we made one recommendation to the FBI to clarify NDIS Security Requirements for CODIS data backups and contingency plans regarding file security, specifically with regard to the encryption of CODIS data backups. Appendix 1 details our audit objectives, scope, and methodology and Appendix 2 describes the audit criteria. In addition, we requested a response to our draft audit report from the Laboratory and FBI, and their responses are attached in Appendix 3 and 4, respectively. Our analysis of both responses, as well as a summary of actions necessary to close the recommendations, is included in Appendix 5.

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The Department of Justice Office of the Inspector General (OIG) has completed an audit of compliance with standards governing Combined DNA Index System (CODIS) activities at the Anne Arundel County Police Department Crime Laboratory (Laboratory) in Millersville, Maryland. 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.² 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 covered the period from February 2015 through February 2017. The objectives of our audit were to determine if: (1) the Laboratory complied with select National DNA Index System (NDIS) Operational Procedures; (2) the Laboratory complied with certain 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 1 contains a detailed description of our audit objectives, scope, and methodology; and Appendix 2 contains the criteria used to conduct the audit.

Legal Foundation for CODIS

The FBI's CODIS program began 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 with subsequent amendments, has been codified in a federal statute (statute) providing the legal authority to establish and maintain NDIS.³

² 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.

³ 42 U.S.C.A. § 14132 (2006).

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.

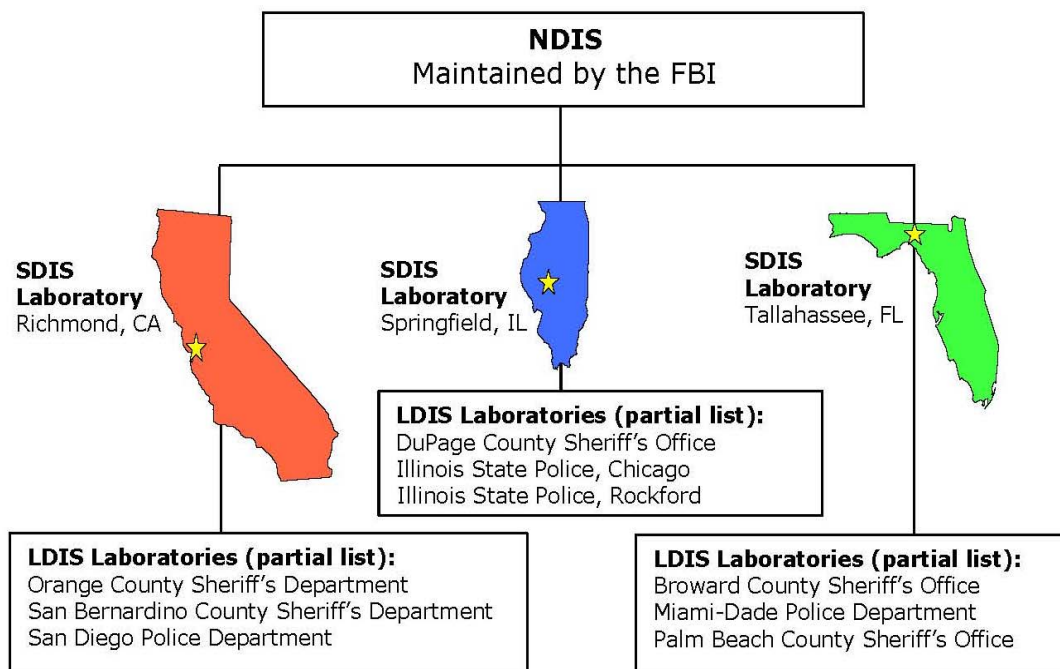
Allowable Disclosure of DNA Profiles

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 Architecture

The FBI implemented CODIS as a distributed database with hierarchical levels that enables federal, state, and local crime laboratories to compare DNA profiles electronically. CODIS consists of a hierarchy of three distinct levels: (1) NDIS, managed by the FBI as the nation's DNA database containing DNA profiles uploaded by participating states; (2) the State DNA Index System (SDIS), which serves 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), 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, the local laboratory in the Florida Department of Law Enforcement at Orlando, Florida, sends its profiles to the state laboratory in Tallahassee, Florida, 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 illustrates how the system hierarchy works.

Example of System Hierarchy within CODIS



National DNA Index System

NDIS, the highest level in the CODIS hierarchy, enables laboratories participating in the CODIS program to compare DNA profiles electronically 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. NDIS contains the following searchable indices:

- Convicted Offender Index contains profiles generated from persons convicted of qualifying offenses.⁴
- 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.⁵
- Detainee Index contains profiles from non-U.S. persons detained under the authority of the United States and required by law to provide a DNA sample for analysis and entry into NDIS.

⁴ The phrase "qualifying offenses" refers to state or federal crimes that require a person to provide a DNA sample in accordance with applicable laws.

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

- Multi-allelic Offender Index consists of profiles from offenders (arrestees, convicted offenders, detainees, or legal index specimens) having three or more alleles at two or more loci.
- Forensic Index contains DNA records originating from and associated with an evidence sample from a single source (or a fully deduced profile originating from a mixture) that was found at a crime scene.
- Forensic Mixture Index profiles originate from forensic samples that contain DNA contributed from more than one source attributable to a putative perpetrator(s).
- Forensic Partial Index consists of DNA profiles from forensic samples that do not contain the results for all 13 Original CODIS Core Loci and/or that may indicate a possibility of allelic dropout.
- Missing Person Index contains known DNA records of missing persons and deduced missing persons.
- Unidentified Human (Remains) Index holds profiles from unidentified living individuals and the remains of unidentified deceased individuals.⁶
- Relatives of Missing Person Index is comprised of DNA profiles generated from the biological relatives of individuals reported missing.
- Pedigree Tree Index consists of DNA records of biological relatives and spouses of missing persons that are associated with a pedigree tree.

Given the multiple indices, the main functions of CODIS 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. For instance, those persons may be identified through matches between the profiles in the Missing Person Index and the Unidentified Human (Remains) Index. In addition, the profiles within the Missing Person and Unidentified Human (Remains) Indices may be searched against the Forensic, Convicted Offender, Arrestee, Detainee, and Legal Indices to provide investigators with leads in solving missing and unidentified person cases.

⁶ 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.

State and Local DNA Index Systems

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 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.

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 quality 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 conclusive DNA information that resulted from a DNA analysis and may not be searched at NDIS.⁷ 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, may generate false positive leads, false negative comparisons, or lead to the identification of an incorrect sample. Further, 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 Operational Procedures and the profiles uploaded to CODIS are complete, accurate, and allowable for inclusion in NDIS.

Laboratory Information

The Anne Arundel County Police Department Crime Laboratory (Laboratory) is a local DNA Index System (LDIS) laboratory located in Millersville, Maryland. The laboratory has been processing DNA as a part of the CODIS program since 2002. The Anne Arundel County Police Department serves about 800,000 people in Anne Arundel County and Annapolis City.

In 2001, the American Society of Crime Laboratory Directors/ Laboratory Accreditation (ASCLD-LAB) first accredited the Anne Arundel County Police Department Crime Laboratory. The Laboratory is due for accreditation renewal in 2021.

⁷ A "locus" is a specific location of a gene on a chromosome. The plural form of locus is loci.

Compliance with Select NDIS Operational Procedures

The NDIS Operational Procedures Manual, which includes the NDIS Laboratories Participation Requirements, establishes the responsibilities and obligations of laboratories that participate in the CODIS program at the national level. The NDIS Operational Procedures Manual provides detailed instructions for laboratories to follow when performing certain procedures pertinent to NDIS.⁸

We found that the Laboratory complied with the other NDIS operational procedures we reviewed. Specifically:

- Each CODIS user used their own username and password to log-in to the client/workstation containing the CODIS software. Additionally, the CODIS servers/clients were set to lock the screen after 10 minutes of inactivity.
- We contacted the FBI to verify that all Laboratory CODIS users were up-to-date with training. All four CODIS users completed Annual NDIS training for 2017, and matched the list provided by the Laboratory.
- All Laboratory personnel read the NDIS Operational Procedures Manual and initialed and dated the front page before gaining access to the CODIS system. The NDIS Operational Procedures Manual was also available on the Criminal Justice Information System Shared Enterprise Network. Further, the CODIS Administrator required CODIS users to read and sign any subsequent revisions to the NDIS Operational Procedures Manual to attest understanding of changes.
- We selected and analyzed a sample of NDIS matches and found that the Laboratory requested confirmation of matches, confirmed matches, and reported matches to investigators in a timely manner.

While we determined that the Laboratory followed the FBI NDIS Security Requirements to encrypt all their backups of CODIS data, our audit found that the FBI should clarify its guidelines regarding data encryption. In general, the NDIS guidelines require laboratories to encrypt all of their backups of CODIS data. We determined that the Laboratory was following these guidelines in creating and maintaining their backups, but it had reported difficulties to the FBI's CODIS Help Desk with the anticipated installation of a new server. When the Laboratory contacted the CODIS Help Desk about encrypting its backup files for data stored on the new server, the CODIS Help Desk informed the Laboratory that the new server would not allow for the restoration of encrypted data from the backups created on the current server. The CODIS Help Desk proposed an alternate method that would allow the Laboratory to restore the older encrypted backups on the new server. At the time, however, the Laboratory believed that these backup files were not encrypted.

⁸ The NDIS operational procedures we reviewed are listed in Appendix 2 of this report.

We discussed with the FBI the Laboratory's belief that its backup files lacked encryption. FBI officials acknowledged that the NDIS guidelines do not specify what constitutes an acceptable level of encryption or require that the laboratories consult the FBI regarding encryption capability prior to acquiring new hardware, such as servers and drives. The FBI also noted that the method being used by the Laboratory meets the minimum requirements for CODIS backup files. FBI officials further stated that there has been an increase in the number of questions among laboratories regarding NDIS encryption policies.

While we found that the Laboratory complied with FBI NDIS Security Requirements for CODIS backups and contingency plans – which are vital to ensuring the security of the DNA profiles – the Laboratory was not aware that the method it used met the minimum requirements for encryption of its CODIS backups. We therefore recommend that the FBI clarify its guidelines regarding encryption.

Compliance with Certain Quality Assurance Standards

During our audit, we considered the Forensic QAS issued by the FBI.⁹ These standards describe the quality assurance requirements that the Laboratory must follow to ensure the quality and integrity of the data it produces. We found that the Laboratory complied with the QAS we reviewed, including: (1) the most recent internal and external QAS reviews; (2) separation of amplified DNA; and (3) physical security of the Laboratory. We also assessed the two most recent QAS reviews that the Laboratory underwent.¹⁰ The QAS we reviewed are listed in Appendix 2.

We found that the Laboratory complied with the Forensic QAS tested. Specifically:

- The QAS manual requires laboratories to undergo an annual review, including an audit conducted at least once every 2 years by an external agency. The Laboratory complied with this requirement by undergoing an internal audit in October 2015 and external audit in December of 2016.
- We examined the most recent external and internal QAS review reports for the Laboratory and found that neither reported any findings for the Laboratory.

⁹ Forensic Quality Assurance Standards refer to the Quality Assurance Standards for Forensic DNA Testing Laboratories, effective September 2011.

¹⁰ The QAS requires that laboratories undergo annual audits. Every other year, the QAS requires that the audit be performed by a team of qualified auditors from an external agency. The QAS does not require that such audits be performed in accordance with the Government Auditing Standards (GAS). Further, the Department of Justice Office of the Inspector General does not perform these audits. Therefore, we 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 we conduct in accordance with GAS.

- The Laboratory performs amplification in a separate room than the Polymerase Chain Reaction (PCR) setup, DNA extraction, and evidence examination, in compliance with the QAS.
- We toured the Laboratory and determined that entry to the Laboratory is controlled and secured to prevent unauthorized access. The public entrance requires a person to pass through two separate doors, both of which require a badge for access. Additionally, areas within the Laboratory are controlled with badges. Surveillance cameras monitor the Laboratory entrance and the interior of the Laboratory.
- We determined that the Laboratory maintains the integrity of forensic samples in accordance with the QAS. The Laboratory provides a unique identifier to each item of evidence and enters the identifier into its evidence tracking system to maintain a documented chain of custody record for all evidence.

Suitability of Forensic DNA Profiles in CODIS Databases

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. To test the completeness and accuracy of each profile, we established standards that require a DNA profile include each value returned at each locus for which the Laboratory obtained conclusive results, and that the values at each locus match those identified during analysis. We reviewed 100 of 646 forensic profiles that the Laboratory uploaded to NDIS as of February 22, 2017. We determined that all of the forensic profiles that we reviewed were complete, accurate, and allowable for inclusion in NDIS.

The FBI's NDIS Operational Procedures Manual establishes the DNA data acceptance standards by which laboratories must abide. The FBI also developed a flowchart to help laboratories determine what is allowable in the forensic index at NDIS. Laboratories are prohibited from uploading forensic profiles to NDIS that clearly match the DNA profile of the victim or another known person that is not a suspect. 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 is generally not a forensic unknown and would not be allowable for upload to NDIS. Appendix 2 details both of the standards we used to test profiles.

Conclusion

Through the course of our audit, we determined that the Laboratory complied with those portions of the QAS we reviewed and that each of the 100 DNA profiles we reviewed were complete, accurate, and allowable for inclusion in NDIS. We identified an issue with the FBI NDIS Security Requirements. Specifically, the FBI

NDIS guidelines for backing up CODIS data does not specify the level of encryption needed to comply with the NDIS guidelines. We make one recommendation to the FBI to clarify the guidance related to the encryption of backups.

Recommendation

We recommend that the FBI:

1. Clarify the guidance related to the encryption of CODIS data backups.

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 February 2012 through February 2017. The objectives of the audit were to determine if the: (1) Laboratory was in compliance with select National DNA Index System (NDIS) Operational Procedures; (2) Laboratory was in compliance with certain 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 QAS review reports and supporting documentation for corrective action taken, if any, to determine whether: (1) the Laboratory complied with the QAS, (2) repeat findings were identified, and (3) recommendations were adequately resolved.
- In accordance with the QAS, a Laboratory shall establish, follow, and maintain a documented quality system with procedures that address, at a minimum, a laboratory's quality assurance program, organization and management, personnel, facilities, evidence and sample control validation, analytical procedures, calibration and maintenance of equipment, proficiency testing, corrective action, review, Documentation and reports, safety, audits, and outsourcing. The QAS require that internal and external reviews be performed by personnel who have successfully completed the FBI's training course for conducting such reviews. We obtained evidence concerning: (1) the qualifications of the internal and external reviewers and (2) the independence of the external reviewers.
- 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 83 NDIS matches to determine whether they were resolved in a timely manner. The Laboratory provided the universe of 83 matches as of February 23, 2017. The sample was judgmentally selected to include case-to-case, case to arrestee, and case-to-offender matches. This non-statistical sample does not allow projection of the test results to all matches.
- 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 obtained an electronic file identifying the specimen identification numbers of 646 searchable forensic profiles the Laboratory uploaded to NDIS between February 22, 2012 and February 22, 2017. 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 employed a stratified sample design to select randomly a representative sample of profiles in our universe. 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 2 for detailed information on our audit criteria.

AUDIT CRITERIA

Our audit considered the NDIS Operational Procedures, QAS, and guidance issued by the FBI regarding forensic profile allowability in NDIS.¹¹ However, our audit 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 Operational Procedures

The NDIS Operational Procedures, which include the NDIS Participation Requirements, establish the responsibilities of the FBI and the NDIS participating laboratories. We focused our audit on the following NDIS requirements:

- NDIS Laboratories Procedures
- Quality Assurance Standards Audit Procedure
- NDIS Confirmation and Hit Dispositioning Procedure
- NDIS DNA Records Procedure
- DNA Data Acceptance Standards
- NDIS Searches Procedure
- NDIS Security Requirements

Quality Assurance Standards

The FBI issued two sets of QAS: (1) QAS for Forensic DNA Testing Laboratories, effective September 1, 2011 (Forensic QAS); and (2) QAS for DNA Databasing Laboratories, effective September 1, 2011 (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 reviewed the Laboratory's most recent annual external review and 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

¹¹ The FBI Flowchart is guidance issued to NDIS-participating laboratories separate from the NDIS Operational Procedures. The flowchart is contained in the 2013 CODIS Administrator's Handbook and has been provided to laboratories in forums such as CODIS conferences.

evidence. Where possible, the laboratory shall retain or return a portion of the evidence sample or extract.

- Sample Control (Offender QAS 7.1 and 7.2): The laboratory shall have and follow a documented sample inventory control system to ensure the integrity of the database and known samples. Where possible, the laboratory shall retain the database sample for retesting for quality assurance and sample confirmation purposes.
- 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(ies) 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.

OIG 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 Laboratory obtained conclusive 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.

ANNE ARUNDEL COUNTY POLICE DEPARTMENT CRIME LABORATORY RESPONSE TO THE DRAFT AUDIT REPORT



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Timothy J. Altomare
Chief of Police

July 24, 2017

John J. Manning
Regional Audit Manager
Washington Regional Audit Office
Office of the Inspector General
U.S. Department of Justice
1300 N. 17th Street, Suite 3400
Arlington, VA 22209

Dear Mr. Manning:

This letter is our official response to the OIG draft audit report concerning the Audit of Compliance with standards governing the COmbined DNA Index System (CODIS) database at the Anne Arundel County Police Department Crime Laboratory.

The draft report received on July 17, 2017 contained no recommendations relating to the laboratory's compliance with select NDIS Operational Procedures, certain Quality Assurance Standards (QAS) issued by the FBI, and the suitability of forensic DNA profiles entered into NDIS by the laboratory. Therefore, the laboratory has no comments regarding the audit report.

The Anne Arundel County Police Department Crime Laboratory's CODIS Unit appreciates the opportunity to participate in the OIG Audit.

Sincerely,

A handwritten signature in blue ink that reads "Ashley Hayes".

Ashley Hayes
CODIS Administrator

Nationally Accredited Law Enforcement Agency

**FEDERAL BUREAU OF INVESTIGATION
RESPONSE TO THE DRAFT AUDIT REPORT**



U.S. Department of Justice
Federal Bureau of Investigation

Washington, D.C. 20535-0001

August 17, 2017

John J. Manning, Regional Audit Manager
Washington Regional Audit Office
Office of the Inspector General
1300 N. 17th Street, Suite 3400
Arlington, VA 22209

Dear Mr. Manning:


Your memorandum, to Acting Director McCabe, forwarding the draft audit report for the Anne Arundel County Police Department Crime Laboratory, Millersville, Maryland ("Laboratory"), has been referred to me for response.

Your draft audit report contained one recommendation relating to the Laboratory's compliance with the FBI's Memorandum of Understanding and *Quality Assurance Standards for Forensic DNA Testing Laboratories*.

With respect to recommendation one relating to clarification of guidance for CODIS data backups, the FBI CODIS Unit is in the process of updating its guidance. Upon completion, the FBI CODIS Unit will provide that guidance to all NDIS Participating laboratories.

Thank you for sharing the draft audit report with us. If you have any questions, please feel free to contact me at (703) 632-8315.

Sincerely,


Richard E. Wilson
CODIS Unit Chief
Laboratory Division

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

The Department of Justice Office of the Inspector General (OIG) provided a draft of this audit report to Anne Arundel County Police Department Crime Laboratory (Laboratory) and Federal Bureau of Investigation (FBI) officials. We incorporated the Laboratory's response in Appendix 3 and the FBI's response in Appendix 4 of this final report. In response to our draft audit report, the FBI stated the actions it is taking to adequately address the recommendation, and as a result, the status of the audit report is resolved. The following provides the OIG analysis of the responses and summary of actions necessary to close the report.

Recommendation to the FBI:

1. Clarify the guidance related to the encryption of CODIS data backups.

Resolved. In its response, the FBI states that the OIG's draft audit report contains one recommendation relating to the Laboratory's compliance with the FBI's Memorandum of Understanding and Quality Assurance Standards for Forensic DNA Testing Laboratories. However, our recommendation was made to the FBI and relates to the clarification of the FBI NDIS Security Requirements.

The FBI did not state whether it agreed or disagreed with our recommendation. However, with regard to this recommendation, the FBI stated that it is in the process of updating its guidance for CODIS data backups and that upon completion, the FBI CODIS Unit will provide the guidance to all NDIS Participating laboratories. No action was needed by the Laboratory with regard to this recommendation and the Laboratory had no comment on the recommendation. This recommendation is resolved because we determined that the actions proposed by the FBI will adequately address our recommendation.

This recommendation can be closed when the OIG receives the FBI's updated NDIS Security Requirements clarifying guidance related to the encryption of CODIS data backups, as well as evidence that the guidance has been provided to all NDIS participating laboratories.

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