



**AUDIT OF COMPLIANCE WITH STANDARDS GOVERNING
COMBINED DNA INDEX SYSTEM ACTIVITIES AT THE
TENNESSEE BUREAU OF INVESTIGATION
MEMPHIS REGIONAL CRIME LABORATORY
MEMPHIS, TENNESSEE**

U.S. Department of Justice
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Audit Division

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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 Tennessee Bureau of Investigation, Memphis Regional 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.¹ 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 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 compare electronically 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

¹ 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.

database and contains DNA profiles from local laboratories and state offenders. The Local DNA Index System (LDIS) is used by local laboratories.

OIG Audit Objectives

Our audit generally covered the period from March 2009 through February 2011. However, our sample of forensic profiles selected for review was from the Laboratory's entire universe of forensic profiles. The objectives of our audit were to determine if: (1) the Tennessee Bureau of Investigation, Memphis Regional 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 NDIS participation requirements tested except that it was not storing a copy of the CODIS database backup off-site in a lockable container on a monthly basis and it did not provide documentation during our audit that it responded to a request from another laboratory to confirm an NDIS match. The laboratory was in compliance with the remaining NDIS participation requirements reviewed. The Laboratory should ensure its written procedures address NDIS participation requirements pertaining to safeguarding CODIS data.
- The Laboratory complied with the Forensic QAS tested. Specifically, we found that the Laboratory complied with the FBI's QAS with respect to QAS reviews, laboratory security, protection of the integrity of evidence, separation of known and unknown samples, and the retention of samples and extracts after analysis.
- We reviewed 100 of the 603 forensic profiles the Laboratory had uploaded to NDIS as of February 2, 2011. Of the 100 forensic profiles sampled, 4 were unallowable for upload to NDIS. The unallowable profiles either belonged to a victim, were taken from the suspect's person, or could not be connected to evidence found at the crime scene. The CODIS Administrator removed the four profiles from NDIS during our on-site work. The remaining 96 profiles we reviewed were complete, accurate, and allowable for inclusion in NDIS. Four unallowable profiles were processed by the Laboratory in 2007 and earlier; therefore it appears the Laboratory has improved its procedures for ensuring that allowable profiles are uploaded to NDIS.

We made two recommendations to address the Laboratory's compliance with standards governing CODIS activities, which are discussed in detail in the Findings and Recommendations 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. In addition, we requested a written response to a draft of our report from the FBI and the Laboratory. In its response, the Laboratory agreed that it should be storing a monthly backup copy of the CODIS database in an off-site lockable container and provided us a copy of a form that it will use to track future compliance with this NDIS requirement. The Laboratory also provided a copy of an e-mail response to another laboratory regarding a match confirmation request. The e-mail was not available to us during the audit, and the CODIS Administrator obtained it from the initiating laboratory after we completed our audit. The FBI agreed with the corrective actions taken by the Laboratory.

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INTRODUCTION

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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.¹ 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

We conducted our audit from March 2009 through February 2011. However, our sample of forensic profiles selected for review was from the Laboratory's entire universe of forensic profiles. The objectives of our audit were to determine if: (1) the Tennessee Bureau of Investigation, Memphis Regional 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; and Appendix II contains the criteria used to conduct our 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

¹ 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.

subsequent amendments, has been codified in a federal statute (Statute) providing the legal authority to establish and maintain NDIS.²

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 the 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.

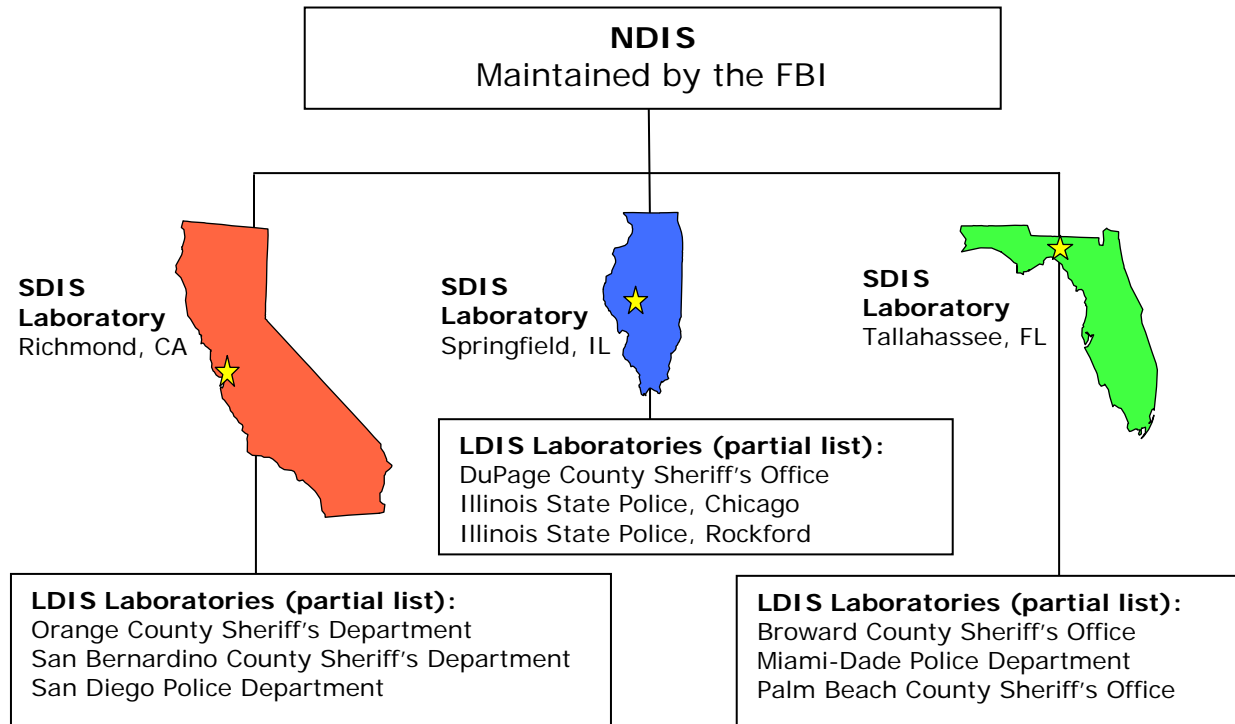
CODIS Structure

The FBI implemented CODIS as a distributed database with hierarchical levels that 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

² 42 U.S.C.A. § 14132 (2006).

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 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 electronically 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. NDIS contains the following eight searchable indices:

- Convicted Offender Index contains profiles generated from persons convicted of qualifying offenses.³
- 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.⁴
- 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.
- Forensic Index profiles originate from, and are associated with, evidence found at crime scenes.
- Missing Person Index contains known DNA profiles of missing persons and deduced missing persons.
- Unidentified Human (Remains) Index holds profiles from unidentified living individuals and the remains of unidentified deceased individuals.⁵
- Relatives of Missing Person Index is comprised of DNA profiles generated from the biological relatives of individuals reported missing.

Given these multiple databases, 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

³ The phrase "qualifying offenses" refers to local, state, or federal crimes that require a person to provide a DNA sample in accordance with applicable laws.

⁴ 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.

⁵ 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.

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 vetted against the Forensic, Convicted Offender, Arrestee, Detainee, and Legal Indices to provide investigators with leads in solving missing and unidentified person cases.

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 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.

CODIS becomes more useful as the quantity of DNA profiles in the system increases because the potential for additional leads rises. However, 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.⁶ The probability of a false match among DNA profiles is reduced as the completeness of a profile increases. Inaccurate

⁶ A "locus" is a specific location on a chromosome. The plural form of locus is loci.

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. 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 participation requirements and the profiles uploaded to CODIS are complete, accurate, and allowable for inclusion in NDIS.

Laboratory Information

The Tennessee Bureau of Investigation, Memphis Regional Crime Laboratory participates in the CODIS program as an LDIS laboratory. The Laboratory opened in January 2002 and immediately began using DNA to process criminal cases and upload profiles to SDIS. The Laboratory performs analysis on forensic samples only and has not outsourced the analysis of forensic samples within the past 2 years. The American Society of Crime Laboratory Directors/Laboratory Accreditation Board first accredited the Laboratory in April 2005 and reaccredited it in December 2009 for a period of 5 years.

FINDINGS AND RECOMMENDATIONS

I. Compliance with NDIS Participation Requirements

The Laboratory complied with NDIS participation requirements tested except that it was not storing a copy of the CODIS database backup at an off-site location and in a lockable container on a monthly basis, and did not provide documentation during our audit that it had responded to a request from another laboratory to confirm an NDIS match.

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 did not store a backup copy of the CODIS database in an off-site lockable container each month and it did not provide documentation during our audit that it responded to a match confirmation request from another laboratory. The Laboratory complied with other NDIS participation requirements we tested. The results of our audit are described in more detail below.

Measures to Safeguard CODIS

We interviewed the CODIS Administrator and conducted a walk-through tour of the Laboratory. We identified no significant concerns regarding the Laboratory's procedures for securing the CODIS server or the Laboratory's facilities. However, the CODIS Administrator was not aware of the NDIS requirement to store monthly a copy of the CODIS database backup at an off-site location and in a lockable container. During our audit work, the CODIS Administrator contacted the State CODIS Administrator who agreed to receive and securely store monthly a copy of the Laboratory's CODIS database backup. The Laboratory should ensure its written procedures address NDIS participation requirements pertaining to safeguarding CODIS data.

NDIS Matches

NDIS offender match procedures require casework laboratories to initiate the match process for offender candidate matches. Offender laboratories should respond to the casework laboratory within 30 business days of receipt of the request. In two of the four offender matches we reviewed, there was no record in the case folder that the Laboratory had requested confirmation of the match. The CODIS Administrator could not explain why there was no record of the confirmation request in the case folder. However, in both instances, the offender laboratory confirmed the match within 30 business days of the National Match Detail Report. The CODIS Administrator told us that he began using a "CODIS Match Confirmation Process" checklist on or about July 2010 that tracks the match process from the "CODIS Match Date" to the date the "Submitting Agency Informed/Out of State Lab Informed," and that he would ensure that a record of the confirmation request was included in the case file in the future.

NDIS forensic match procedures permit either of the casework laboratories to initiate the forensic match process and that the responding laboratory should make a good faith effort to respond to the initiating casework laboratory within 30 business days of receipt of the request. In one forensic match we reviewed, the CODIS Administrator did not provide documentation during the audit of his confirmation response to the initiating casework laboratory. This occurred because another laboratory identified a suspect who matched the forensic profile and notified both the initiating laboratory and the Memphis Laboratory. The CODIS Administrator at the Memphis Laboratory believed he did not need to respond to the initiating casework laboratory's request for confirmation. However, NDIS match procedures require that a laboratory respond to confirmation requests. Subsequent to our audit, the CODIS Administrator provided a copy of an e-mail showing he responded to the initiating laboratory's confirmation request. The CODIS Administrator obtained the e-mail from the initiating laboratory after we completed our audit work.

We have established a 2-week standard in order to assess a laboratory's timely notification of investigators.⁷ From June 2003 to October 2010, the Laboratory had 32 NDIS matches. We initially reviewed five of these matches and found that for one match confirmed on June 4, 2010, the Laboratory informed investigators of the match 25 business days after the confirmation. The CODIS Administrator could not explain the delay. To determine whether this delay was an anomaly, we selected three additional NDIS matches to determine if there were other instances when investigators

⁷ See Appendix II for an explanation of this OIG standard.

were not notified of confirmed matches in a timely manner. The Laboratory notified investigators timely in all three additional matches tested. As a result, we concluded that the Laboratory generally notified investigators of CODIS matches in a timely manner and make no recommendation regarding the timely notification of investigators.

We found that the Laboratory complied with the other NDIS participation requirements we reviewed, as described below.

- 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.
- We verified with the FBI that all Laboratory CODIS users have completed the 2011 DNA Records Acceptable at NDIS training.
- 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 determined the Laboratory complied with NDIS requirements regarding the maintenance of personnel records.

Conclusion

The Laboratory was in compliance with NDIS participation requirements tested except that it was not storing a backup copy of the CODIS database in an off-site lockable container on a monthly basis and did not provide documentation during our audit that it had responded to a request from another laboratory for confirmation of an NDIS match.

Recommendations

We recommend that the FBI:

1. Ensure that the Laboratory stores a monthly backup copy of the CODIS database in an off-site lockable container.
2. Ensure that the Laboratory responds to requests for NDIS match confirmations.

II. Compliance with Quality Assurance Standards

The Laboratory complied with the Forensic QAS we reviewed. Specifically, we found that the Laboratory complied with the FBI's QAS with respect to QAS reviews, laboratory security, protection of the integrity of evidence, separation of known and unknown samples, and the retention of samples and extracts after analysis.

During our audit, we considered the Forensic QAS issued by the FBI.⁸ 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.⁹ The QAS we reviewed are listed in Appendix II.

Results of the OIG Audit

We found that the Laboratory complied with the Forensic QAS tested. Specifically, we found that the Laboratory complied with the FBI's QAS with respect to QAS reviews, laboratory security, protection of the integrity of evidence, separation of known and unknown samples, and the retention of samples and extracts after analysis. These results are described in more detail as follows.

- We determined the Laboratory underwent a QAS review during each of the last 2 calendar years as required by the QAS for laboratory reviews. The Laboratory underwent a QAS review by internal reviewers in November 2009 and by external reviewers in May 2010.
- We reviewed the most recent QAS review reports provided by the CODIS Administrator and determined that the FBI's QAS Review Document was used to conduct the most recent external and internal reviews. The FBI confirmed that the QAS reviewers for both reviews

⁸ Forensic Quality Assurance Standards refer to the Quality Assurance Standards for Forensic DNA Testing Laboratories, effective July 1, 2009.

⁹ The QAS require that laboratories undergo annual audits. Every other year, the QAS require 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.

had successfully completed the FBI QAS Review training course. There were three findings in the last external review report and no findings in the last internal review report. According to the last external review report: (1) the Laboratory did not have and follow a documented policy for monitoring contamination; (2) the Laboratory had not defined the requirements for performance checks after repair, service, or calibration of equipment; and (3) there was no documentation to indicate that the laboratory used the date received, assigned date, submitted date, or due date as the date the proficiency test is performed. The three findings required modifications to the state laboratory policies. The Laboratory System's Technical Manager made the required changes to the state policies. These changes were reviewed and approved by the Regional Laboratory Supervisor, the Quality Assurance Manager, and the Assistant Director for Laboratory Services. We also reviewed these changes to the state's laboratory policies and determined that the changes appeared adequate to address the QAS review findings. The state's CODIS Administrator forwarded the Laboratory's most recent external QAS Review Report to the FBI before the end of an extension period authorized by the FBI.

- We asked the QAS reviewer who conducted the most recent external QAS review to certify that she had no impairments to her independence. She 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 toured the Laboratory building 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 Regional Laboratory Supervisor and determined that the Laboratory had not outsourced the analysis of DNA samples within the prior 2 years.

Conclusion

We determined that the Laboratory complied with the Forensic QAS we reviewed, including laboratory security, protecting the integrity of evidence, separation of known and unknown samples, the retention of samples and extracts after analysis, as well as compliance with QAS reviews. We made no recommendations concerning our review of Quality Assurance Standards.

III. Suitability of Forensic DNA Profiles in CODIS Databases

Of the 100 forensic profiles sampled, we found 4 were unallowable for upload to NDIS. The unallowable profiles either belonged to a victim, were taken from the suspect's person, or could not be connected to evidence found at the crime scene. The CODIS Administrator removed the four profiles from NDIS, while we were on site. The remaining 96 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.¹⁰ 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. Our standards are described in more detail in Appendix II of this report.

The FBI's NDIS operational procedures establish the DNA data acceptance standards by which laboratories must abide. The FBI also developed a flowchart as guidance for the laboratories for determining 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 who 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. The NDIS procedures we reviewed are listed in Appendix II of this report.

¹⁰ 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.

Results of the OIG Audit

We selected a sample of 100 profiles out of the 603 forensic profiles the Laboratory had uploaded to NDIS as of February 2, 2011. Of the 100 forensic profiles sampled, we found 4 were unallowable for upload to NDIS. One of the unallowable profiles belonged to a victim, two were taken from the suspect's person, and one profile was not collected from evidence found at the crime scene. The CODIS Administrator removed these four profiles from NDIS during our audit work. The remaining 96 profiles sampled were complete, accurate, and allowable for inclusion in NDIS. The specific exceptions are explained in more detail below.

OIG Sample Number CA-13

Sample Number CA-13 was taken from a pair of blue jeans belonging to a suspect in a rape and stabbing. The investigators believed the blue jeans may have contained the victim's blood tying the suspect to the crime. However, the blue jeans were not obtained from the crime scene but directly from a suspect during the investigation. Because the sample was seized from the suspect's person and therefore was not a forensic unknown, the resulting profile was not eligible for upload to NDIS. The CODIS Administrator could not explain this submission error and removed the profile from CODIS during our audit work. The Laboratory processed this case in February 2005.

OIG Sample Number CA-23

Sample Number CA-23 was taken from a jacket belonging to the suspect in a murder. The investigators believed the jacket may have contained the victim's blood. However, the jacket was not obtained from the crime scene but directly from the suspect at the city jail. Because the sample was seized from the suspect's person it was not a forensic unknown and therefore not eligible for upload to NDIS. The CODIS Administrator could not explain this submission error and removed the profile from CODIS during our audit work. The Laboratory processed this case in March 2007.

OIG Sample Number CA-24

Sample Number CA-24 was taken from a pair of stained boxer shorts found in a hotel room where the suspects were apprehended. The victim was a state trooper who was shot and killed during a traffic stop. Although the investigators found these shorts during their investigation, the shorts were not obtained from the crime scene and the resulting profile was not eligible for upload to NDIS. The CODIS Administrator could not explain this

submission error and removed the profile from CODIS during our audit work. The Laboratory processed this case in June 2007.

OIG Sample Number CA-55

Prior to our review of the case file, the CODIS Administrator identified Sample Number CA-55 as belonging to the victim in the crime and removed the profile from CODIS. The sample was taken from a white t-shirt stained with blood found a short distance from the murdered victim's vehicle. The vehicle was located near the suspect's house and the investigators believed the t-shirt belonged to the perpetrator. However, according to the case file, the DNA profile matched the victim's standard and was ineligible for upload to NDIS. The Laboratory processed this case in December 2003.

The Laboratory processed the four unallowable profiles discussed above in 2007 or earlier. Of our sample of 100 profiles tested, the Laboratory processed 47 profiles after 2007 and we found no unallowables among those more-recently processed profiles. While the Laboratory could not provide explanations for the unallowable profiles, it appears from our post-2007 sample that the Laboratory is no longer uploading unallowable profiles.

Conclusion

Of the 100 forensic profiles tested, 4 profiles were ineligible for upload to NDIS. The remaining 96 profiles were complete, accurate, and allowable for inclusion in NDIS. Of the four ineligible profiles, the Laboratory processed two of these cases more than 6 years ago and the other two cases 4 years ago. Because our sample did not reflect errors in the Laboratory's analysis of samples from the last 4 years, it appears the Laboratory is now ensuring that only allowable profiles are uploaded to NDIS. Consequently, we made no recommendations concerning our review of forensic DNA profiles.

APPENDIX I

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 March 2009 through February 2011. However, our sample of forensic profiles selected for review was from the Laboratory's entire universe of forensic profiles. 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 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: (a) the Laboratory complied with the QAS, (b) repeat findings were identified, and (c) recommendations were adequately resolved.

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 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 review to determine if

the Laboratory complied with the QAS.¹¹ 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.
- Reviewed the Laboratory's written policies and procedures related to conducting internal reviews, resolving review findings, and resolving matches among DNA profiles in NDIS.
- Reviewed supporting documentation for 8 of 32 NDIS matches to determine whether they were resolved in a timely manner. The Laboratory provided the universe of NDIS matches as of February 16, 2011. The sample was judgmentally selected to include both case-to-case 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.

Working in conjunction with the contractor used by the FBI to maintain NDIS and the CODIS software, we obtained an electronic file identifying the 603 forensic profiles the Laboratory had uploaded to NDIS as of

¹¹ We also considered the results of the Laboratory's internal laboratory review, but could not rely on the results of that review 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.

February 2, 2011. 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, because 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 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 requirements.

- DNA Data Acceptance Standards
- DNA Data Accepted at NDIS
- QAS Reviews
- 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
- The FBI Flowchart: A Guide to Determining What is Allowable in the Forensic Index at NDIS¹²

¹² The FBI Flowchart is guidance issued to NDIS-participating laboratories separate from the MOU and NDIS operational procedures. The flowchart is contained in the 2010 CODIS Administrator's Handbook and has been provided to laboratories in forums such as CODIS conferences.

Quality Assurance Standards

The FBI issued two sets of 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 the 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 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 Quality Control 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 to 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 to 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.

APPENDIX III

FEDERAL BUREAU OF INVESTIGATION RESPONSE

U. S. Department of Justice
Federal Bureau of Investigation
Washington D. C. 20535-0001

June 15, 2011

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

Dear Mr. Polk:

Your memorandum to Director Mueller forwarding the draft audit report for the Tennessee Bureau of Investigation Memphis Regional Crime Laboratory, Memphis, Tennessee (Laboratory), has been referred to me for response.

As you are aware, your draft audit report contained two recommendations relating to the Laboratory's compliance with the FBI's Memorandum of Understanding for Participation in the National DNA Index System (NDIS) and *Quality Assurance Standards for Forensic DNA Testing Laboratories*.

With respect to recommendation one relating to the storage of a copy of the CODIS database backup at an off-site, the CODIS Unit has reviewed the Laboratory's form for documenting the monthly transfer of the backup tapes. The form will complement the Laboratory's security section of its operating procedures. The CODIS Unit supports closure of this recommendation.

With respect to recommendation two relating to the timely response to requests for NDIS match confirmation, the Laboratory has now provided documentation to prove that it was in contact with the laboratories involved in the forensic matches. The CODIS Unit believes that the Laboratory is now familiar with what is required for confirming matches. The CODIS Unit supports closure of this recommendation.

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) 632-8302.

Sincerely,

/s/

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

APPENDIX IV

TENNESSEE BUREAU OF INVESTIGATION MEMPHIS REGIONAL CRIME LABORATORY RESPONSE

TENNESSEE BUREAU OF INVESTIGATION

6325 Haley Rd.
Memphis, Tennessee 38134
(901) 379-3400
Facsimile (901) 372-5963

June 13, 2011

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

Dear Mr. Polk,

Please find below comments and attachments from the Tennessee Bureau of Investigation, Memphis Regional Crime Laboratory, regarding the OIG draft audit report on the Compliance with Standards Governing Combined DNA Index System Activities, specifically the Findings and Recommendations on pp. 7-9 of the draft report.

I. Compliance with NDIS Participation Requirements

“The Laboratory complied with NDIS participation requirements tested except that it was not storing a copy of the CODIS database backup at an off-site location and in a lockable container on a monthly basis, and did not respond to a request from another laboratory for confirmation of an NDIS match.”

Regarding the first finding that no CODIS backup copy was being stored off-site, TBI concedes this shortcoming. Although TBI’s CODIS protocol specifies that a backup tape will be sent to another TBI lab on a monthly basis (refer to the attached p. 2/6 of the Security section of the TBI CODIS Protocol), this policy was missed by oversight in the Memphis lab during the abrupt transition from the previous CODIS Administrator. To ensure that this lapse does not occur again, TBI has created a form for documenting the monthly transfer of the backup tapes between labs (please see form attached).

Regarding the second finding that a confirmation request from another state was disregarded, a series of email communications with the three involved labs has been attached. The emails show that this string of cases involving a common perpetrator had previously been settled between the three labs before TBI's hit occurred. All three administrators –

Names redacted.

Names redacted.

– acknowledge in their communications the prior hits between the three states. Name redacted. states that her lab's profile matched the standard of a known suspect in the case. From these communications, TBI inferred that all parties had adequate information to resolve their respective cases prior to the TBI hit.

Regardless, the dialogues show that each laboratory involved in the hit was responded to. Michigan State Police requested additional case information, and it was provided. Virginia DFS was informed that the Tennessee case was unsolved; TBI was negligent in exchanging case information, primarily out of the mistaken idea that the phrase "match confirmation process" referred to verification of data and exchange of personal information in the context of *offenders* only.

According to the NDIS Confirm an Interstate Candidate Match Operational Procedures, section 4.3.3, "if one or more of the cases have been solved and the laboratories exchange this information, it may not be necessary to proceed with the confirmation process." Also, section 4.3.5 states that, "for a solved case matching an unsolved case, the laboratory responsible for the solved case is providing the information relating to a putative perpetrator." These guidelines were factors in the confusion and decision that information did not need to be exchanged.

In full disclosure, most of the documented communication stemming from this forensic hit was not available for review at the time that the auditors were on site and had to be obtained through the other labs after the audit. This lack of documentation surely led the auditors to conclude that minimal effort had been made by TBI to resolve or respond to the hits.

TBI appreciates the opportunity to respond to the OIG draft audit report. If I can be of any further assistance, please do not hesitate to contact me at 901-379-3455.

Sincerely,

/s/

Loren James
Special Agent Forensic Scientist
Local CODIS Administrator

Enclosure

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

The OIG provided a draft of this audit report to both the FBI and the Memphis Regional Crime Laboratory. The FBI's response is incorporated in Appendix III of this final report. The Memphis Regional Crime Laboratory's response is incorporated in Appendix IV of this report. The following provides the OIG analysis of the responses and summary of actions taken to close the report.

Summary of Actions Taken to Close Report

1. **Closed.** The Laboratory agreed that it should be storing a monthly backup copy of the CODIS database in an off-site lockable container. The Laboratory identified a protocol that it had in place at the time of our audit, which addressed this NDIS requirement. The CODIS Administrator told us that he was not aware of this protocol. The Laboratory's response to the draft report states that in response to the audit the Laboratory has established a form to track future compliance with this NDIS requirement. Based on this corrective action, the FBI and the Laboratory requested that we close this recommendation. This recommendation is closed based on steps the Laboratory took to ensure it stores a monthly backup copy of the CODIS database in an off-site lockable container.
2. **Closed.** During our on-site review of the Laboratory's files, we found no documentation showing that the CODIS Administrator responded to an initiating laboratory's confirmation request. We recommended that the FBI ensure the Laboratory responds to requests for NDIS match confirmations. Along with its response to the draft report, the Laboratory provided documentation showing the CODIS Administrator responded timely via an e-mail to the initiating laboratory's confirmation request. This documentation was not available to us during the audit, and the CODIS Administrator obtained it from the initiating laboratory after we completed our work. This recommendation is closed based on documentation provided subsequent to the audit showing the Laboratory responded to match confirmation requests.