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Subject: Data Quality Assessment of forensics in CA v. Kevin Cooper

Dear Mr. Hile,

As a chemist and Certified Quality Auditor (American Society for Quality #19856) I was retained by your office to conduct an independent quality assessment of relevant forensic testing in the case CA v. Kevin Cooper. It is my conclusion that incriminating items of forensic evidence lacked integrity, rendering the test results invalid. The available case records provide compelling indications of evidence tampering that should be evaluated through a carefully designed testing protocol, and through review of all additional relevant records from the government's files.

I have performed independent reviews of analytical work performed by government and commercial laboratories for more than 30 years, and for approximately the last 15 years, I have reviewed forensic work. In the course of reviews, I have identified and investigated fraudulent analytical work by both government and commercial laboratories. The forensic records in the Kevin Cooper case present compelling evidence of deliberate tampering on a disturbing scale.

In general, a data quality assessment is performed by reviewing and considering all the available contemporaneous records and documents that are relevant to a given item of evidence throughout its forensic life-cycle. The relevant period for an item of evidence in a forensic case can be lengthy; it begins when a given item is first identified, and it continues (for both the original item of evidence and for all its derived samples) through collection, packaging, transportation, storage, testing, reporting, until final disposition of the case. In accordance with consensus scientific standards, the records should provide a comprehensive audit trail that enables an independent party to review and evaluate the work that was performed.

Data quality assessments must always be performed in consideration of the intended use of the data. A set of data with quality control issues may nevertheless be of sufficient quality for use in making low-risk decisions. However, the same data set may be completely unsuitable for use in making high-risk decisions where a high degree of confidence is required.

During an independent data quality assessment, contemporaneous records are used to reconstruct the entire analytical process from evidence collection through results reporting. Three major areas are reviewed to determine whether a given test result is reliable for decision-making purposes:

evidence integrity; method validity; and performance reliability. Each of these factors is essential to the reliability of a forensic result.

First, the quality of every laboratory result is inherently limited by the quality of the evidence and its derived analytical samples. If the integrity of the evidence has been compromised, the test result may not be representative of the original evidence, and it may or may not be possible to recognize or remediate the problem. At any point in its life-cycle, evidence integrity may be deliberately compromised, or it may be inadvertently compromised through ignorance or incompetence. Deliberate contamination by a laboratory representative is an egregious act that is notoriously difficult to detect.

Second, it is the consensus of the scientific community that every test method must be validated prior to use for the analysis of unknown samples. Validation is a planned empirical testing scheme through which the performance characteristics of a method are determined and documented; it is used to determine whether a given method is capable of producing results that are appropriate for their intended use. Testimony regarding forensic results is only scientifically meaningful if the method has been validated, and shown to produce results that support the stated conclusions.

Finally, even if the integrity of the evidence has been protected, and even if the laboratory is using a validated method that has been shown to support the stated conclusions, the actual testing of the evidence must be reliably performed. In practice, this means that at the time of testing, the laboratory has a comprehensive and efficacious quality assurance program. There are many elements to such a program; they are designed to ensure that testing is performed by qualified personnel, equipment is appropriately calibrated and maintained, test reagents are of appropriate quality, and quality control practices are sufficient to prevent and to identify problems. It is a foundational quality assurance precept that the level of rigor and quality control necessary for a measurement should be commensurate with the importance of the decision(s) based on the result.

Forensic work in the subject case has been extensive. Many items of evidence have been collected, and key items of evidence have been tested by multiple analysts in multiple laboratories, beginning in 1983 and continuing through 2004.

In the decades since this casework began, scientific methods of testing body fluids have undergone dramatic improvements. Evidence that was originally tested in 1983 using comparatively primitive serological techniques has since been tested by sophisticated and validated DNA methods. The last three decades have also brought major quality assurance changes to forensics. Despite the fact that international quality standards have been published and used by testing laboratories since the late 1970s (Guide 25, *General Requirements for the Competence of Testing and Calibration Laboratories*), forensic laboratories in the United States have only recently begun implementing quality programs designed to comply with international standards.

The data quality assessment process in the subject case is complicated by the fact that the original work was performed more than 30 years ago, at a time when the San Bernardino County Sheriff's Department did not have a minimally effective quality assurance program to control and document evidence management and testing. Even in today's environment, when many forensic laboratories are attempting to comply with international quality standards and thus have extensive documentation of their work, it can be difficult or impossible to detect evidence of tampering. In the 1980s, forensic laboratories operated with such weak quality assurance and so little oversight that evidence tampering posed little if any risk of getting caught. The long time delay in the Cooper case has presented ample opportunity for records and evidence to be lost or destroyed, and for memories to fade.

The materials that served as the basis for my assessment include the records provided as electronic copies by your office. These records include hundreds of pages of bench notes, laboratory reports, transcripts of testimony, and correspondence, beginning in 1983. As we discussed, I focused my attention on items of evidence that were deemed material to the case, including:

A-41 "scraped blood sample from the north wall of the hallway, across from the door leading to the bathroom" collected on June 6, 1983 by D. Stockwell and P. Schechter

V-12 "one hand-rolled cigarette butt from the crevice in the front seat, passenger side" collected on June 11, 1983 by D. Stockwell and C. Ogino

V-17 "one filter cigarette butt recovered from the front passenger floor" collected on June 11, 1983 by D. Stockwell and C. Ogino

VV-2 known reference blood vial from Kevin Cooper

CC beige t-shirt (SBSO Item CC; DOJ item DOJ-6)

Records for each of the items of evidence were reviewed to evaluate whether they comprised a complete audit trail, and whether the records were internally consistent and compliant with relevant quality standards for conduct, documentation, and reporting of testing laboratory work. The audit trail was significantly incomplete, and the available records were seriously deficient. To the extent that the government's files include additional records regarding these key items of evidence, it is imperative that they be provided for review.

Over a period spanning many years, the available records provide incomplete or contradictory information regarding the origin and the existence of items of evidence. Evidence disappeared without a record of testing, and evidence was tested without a record of the results. The identification and collection of evidence was not contemporaneously documented, casting doubt on its origins. On repeated occasions, samples that had been reported as consumed during analysis were subsequently found and subject to additional testing; the condition of 'found' evidence was physically inconsistent with its previously reported condition (e.g. A-41, V-12, and V-17 which

purportedly linked Mr. Cooper to the crime scene and victims' vehicle). Even when test records were available, they were incomplete, and quality control practices were weak.

A clear lack of integrity for the sample identified as a known reference vial of Kevin Cooper's blood is of particular concern. A tube of Mr. Cooper's blood identified as VV-2 has been in the possession of the San Bernardino County Crime Laboratory since 1983, when it was repeatedly tested using serological methods. In 2004, a stain card prepared from the liquid VV-2 reference vial was sent to a commercial DNA laboratory for mitochondrial typing (records do not document who prepared this stain card from VV-2, or when it was prepared). The mitochondrial DNA testing consumed the remainder of the stain on the VV-2 card, and identified the fact that this purported reference sample actually contained a mixture of DNA from two or more persons.

The presence of at least two DNA profiles in Mr. Cooper's reference sample is an alarming finding. If the blood vial identified as VV-2 actually contained blood from more than one individual, it would clearly indicate evidence tampering. If Mr. Cooper's blood from the VV-2 vial had been used to contaminate evidence, a diminished volume of blood in the tube would have been evident. A second party's blood could have been intentionally added to the VV-2 vial in an attempt to hide the reduced volume in the tube.

It is my conclusion that the integrity of each of the identified items of evidence has been irreparably compromised in a manner that renders the associated analytical results unreliable and immaterial. The available records for the management, testing, and reporting of these items reveal a troubling pattern of serious gaps and omissions, fungible samples, and material inconsistencies. The observed facts are consistent with a concerted effort to tamper with evidence in a manner that would incriminate Kevin Cooper, and to hide evidence of the tampering.

Even at this late date, it may still be possible to identify tampering in this case. It is my opinion that a carefully designed testing protocol and a thorough review of all available files (including the government files that have not yet been released) may be able to conclusively demonstrate that critical items of evidence in this case have been tampered with, and the incriminating forensic results that were introduced at trial are invalid.

Should you have questions or need additional information, please do not hesitate to contact me.

Very truly yours,

Janine S. Arvizu
Certified Quality Auditor (ASQ#19856)