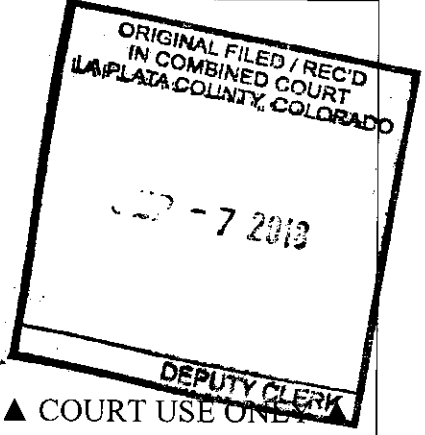


<b>DISTRICT COURT, LA PLATA COUNTY, COLORADO</b> Court Address: 1060 E. Second Ave., Durango, CO 81301 Phone Number: (970) 247-2304	
<b>Plaintiff: PEOPLE OF THE STATE OF COLORADO</b>  v.  <b>Defendant: MARK ALLEN REDWINE</b>	
Christian Champagne - District Attorney, #36833 Matthew Durkin, Special Deputy District Attorney, #28615 Fred Johnson, Special Deputy District Attorney, #42479 P.O. Drawer 3455, Durango, Colorado 81302 Phone Number: (970) 247-8850 Fax Number: (970) 259-0200	Case Number: 17 CR 343
<b>PEOPLE'S RESPONSE TO MOTION FOR ORDER REGARDING OBSOLETE RESULTS NECESSITATING "DESTRUCTIVE" RETESTING OF "ALL ORIGINAL SAMPLES" [D-15] [PUBLIC ACCESS]</b>	

COME NOW the People, by and through Christian Champagne, District Attorney in and for the Sixth Judicial District of the State of Colorado, and responds the defendant's request for disclosure as to the need for retesting:

1. To be very clear, the People's use of the term "obsolete" in its Second Response to Motion to Prohibit Consumptive Testing (D-6) and Notice of Consumptive Testing, was an inartful effort to use one word to explain a very complicated issue related to the CBI's continual process improvement efforts related to forensic analysis in this case. At this point, there does not appear to be a need to do consumptive testing on DNA items found within the defendant's home. However, the People agree that greater notice of any potential consumptive testing is necessary and would provide at least 14 days notice of any consumptive testing pursuant to section 16-3-309, C.R.S.
2. The People submit the following factual background to the Court related to the CBI forensic analysis in this case and developments since the initial testing was begun in 2012.
3. The Colorado Bureau of Investigation received the first request to conduct forensic analysis in the investigation of Mark Redwine on December 5, 2012. The request was to process various items of evidence collected from Mr. Redwine's home, including CBI items 1 - 6, that were sets of swabs taken from Mr. Redwine's living room. CBI items 7 - 10 were known samples (buccal swabs) from four individuals, including Elaine

Redwine, David Stone, Cory Redwine, and Mark Redwine. The People requested DNA analysis of these 10 items.

4. The CBI received a second submission on December 12, 2012, for three items for secondary standard analysis from Dylan Redwine. These items are CBI items 11 – 13.
5. On December 27, 2012, then CBI Analyst Rebecca Strub issued a Laboratory Report related to its findings on all of these items. The Laboratory Report summarizes the analysis conducted for these items related to serology and DNA analysis to include statistical analysis. This report was discovered (Bates 1810 – 1812).
6. The DNA analysis conducted in 2012, reflected in the Laboratory Report, used the Identifiler Plus kit, finding specific data related to 15 loci. Use of the Identifiler Plus kit was standard practice at the CBI in December 2012, and was an accepted technology by the National DNA Index System (NDIS) administered by the Federal Bureau of Investigation (FBI). Critically, use of an accepted technology such as Identifiler Plus by the CBI ensured that its DNA results could be uploaded into the Combined DNA Index System (CODIS) owned and operated by the FBI. The Identifiler Plus system is commonly known as the chemistry underlying DNA analysis. The testing was conducted pursuant to the CBI Forensic Laboratory Casework DNA Analysis SOP, Version 4.3 March 2011. (See Exhibit 1: CBI Forensic Laboratory Casework DNA Analysis SOP, Version 4.3 March 2011).
7. The statistics reflected in the December 27, 2012, Laboratory Report were generated by PopStats, a program owned and operated by the FBI, as part of CODIS. In 2012, at the time the report was generated, the statistics contained in the Laboratory Report reflected the standard practice of the CBI. PopStats calculates a statistic called the Combined Probability of Inclusion (CPI). The CPI is a statistic indicating the probability that a certain individual is included in the DNA mixture.
8. In 2014, the CBI updated its Forensic Laboratory Casework DNA Analysis SOP, Version 4.3 to the Discipline Operating Manual (DOM) 10-12. This update better described the interpretation of DNA mixtures using the CPI statistic and remained consistent with previous CBI SOP's and interpretation. Specifically, there is no mention of mixtures containing related individuals. (See Exhibit 2: DNA 10-12 Interpretation of Autosomal Casework Samples – 2014, p. 20).
9. In 2015, *Advanced Topics in Forensic DNA Typing: Interpretation* was published by John M. Butler. This particular treatise recommended that forensic laboratories make changes to their interpretation of complex DNA mixtures of related individuals, such as the CPI statistical results reflected in the Laboratory Report. Essentially, Dr. Butler recommended moving to a different statistical analysis, one that incorporates analysis including likelihood ratios and probabilistic genotyping. (See Exhibit 3: *Advanced Topics in Forensic DNA Typing: Interpretation*, p. 336-337).

10. In March 2016, the CBI ceased using the CPI calculation for complex mixtures with related individuals. In response to Dr. Butler's publication, movement within the forensic DNA community towards probabilistic genotyping, and consensus within the DNA community that the CPI statistic may not be appropriate for related mixtures, CBI implemented CBI DOM 10-12 (2016). Specifically DOM 10-12 Section (H)(1)(d) states that "indistinguishable mixtures of closely related individuals will be reported as inconclusive, given a statistical analysis is not possible to support the inclusion." (See Exhibit 4: DNA 10-12 Interpretation of Autosomal Casework Samples – 2016, p. 34)
11. The CBI continues to utilize CPI statistics where appropriate.
12. In 2016, with a deadline of January 1, 2017, the FBI mandated that NDIS participating laboratories, like the CBI, expand its DNA analysis to include more loci than the 15 included in Identifiler Plus. (See Exhibit 5: National Index System (NDIS) Operational Procedures Manual, FBI Laboratory Version 7, Effective June 1, 2018; See also Exhibit 6: Planned Process and Timeline for Additional CODIS Core Loci)
13. This new mandate required the CBI to change its DNA kits, and the underlying chemistry discussed above, to GlobalFiler which includes 24 loci (the original 15 Identifiler Plus loci with an additional 7 new loci). GlobalFiler is an approved kit for CBI's continued inclusion in CODIS and has been utilized by the CBI since January 1, 2017. (See Exhibit 7: NDIS Operational Procedures Manual, Appendix E, PCR STR Kits Accepted at NDIS).
14. In June 2017, the CBI began its validation of statistical interpretations of complex mixtures including those of related individuals to likelihood ratios and probabilistic genotyping using a program called STRmix. This validation is anticipated to be completed in September 2018. STRmix is a probabilistic genotyping software that will better analyze DNA profiles of complex mixtures including related individuals and perform statistical analysis on those profiles.
15. CBI is currently in the midst of analyzing items 1, 3, 5, 6, 7, 8, 9, 10, and 13 in the GlobalFiler kit, thus providing additional loci for these samples for probabilistic genotyping using STRmix. This testing was not consumptive and the CBI, as of today's date, has no reason to conduct any consumptive testing. Defense samples (portions of original items) of CBI items 1 – 10 and 13 remain for independent testing; these samples are retained in CBI DNA Packet 1.
16. The CBI has not yet generated an updated Laboratory Report reflecting chemistry analysis using GlobalFiler. The CBI is waiting to complete additional statistical reports using STRmix for the most accurate statistical analysis once the validation is complete, new procedures are written, and analysts have been competency tested. The validation process of STRmix is similar to the validations conducted by the CBI anytime it brings

on new technology. All of the CBI's findings will be summarized in its forthcoming Laboratory Report which will be discovered to the defense team as part of discovery.

17. The defense motion poses a number of questions which the People, after consulting with the CBI, answer as follows.
18. *What specific results in this case are now considered obsolete?* As of today's date, the statistical analysis of items of 1, 3, 5 and 6, in accordance with developing technology for complex mixtures containing related family members, are being reanalyzed to comport with current national best practice. The CBI does not agree with the use of the term "obsolete" related to these results – rather, the CBI is implementing new and evolving technology to ensure quality DNA results.
19. *What formerly employed DNA instruments have been enhanced?* No formerly employed DNA instruments have been enhanced. The CBI continues to use the same instrumentation as used for the analysis in this case in 2012.
20. *What formerly employed DNA instruments are now obsolete?* No formerly employed DNA instruments are now obsolete as the same instrumentation continues to be used by the CBI.
21. *What formerly employed processes have been enhanced?* The DNA technology (chemistry) has been changed to the GlobalFiler kit allowing for the identification of more loci. The new statistical approach of likelihood ratios and probabilistic genotyping, rather than CPI, will be enhanced.
22. *What formerly employed processes are now obsolete?* None. The CBI's technology is ever evolving. With respect to this specific case and the analysis conducted, the DNA technology (chemistry) has been changed to the GlobalFiler kit allowing for the identification of more loci. The new statistical approach of likelihood ratios and probabilistic genotyping, rather than CPI, will be enhanced.
23. *What formerly employed software has been enhanced?* The CBI will continue to utilize PopStats when appropriate, but will incorporate STRmix after successful validation. The CBI makes routine version upgrades of software utilized by its forensic laboratories.
24. *What formerly employed software has been rendered obsolete?* None.
25. *What or whom is the source of the prosecution's information?* Sarah Miller, DNA Program Manager, Forensic Services Division, CBI; Kathleen Fetherston, Assistant Director, Forensic Services Division, CBI.

Wherefore, the People offer this response to the relief requested by Defendant.

Respectfully submitted this September 7, 2018.

CHRISTIAN CHAMPAGNE  
DISTRICT ATTORNEY  
6<sup>th</sup> JUDICIAL DISTRICT

/s/ Matthew Durkin  
Matthew Durkin ##28615  
Special Deputy District Attorney

#### **CERTIFICATE OF SERVICE**

I hereby certify that on September 7, 2018, I delivered a true and correct copy of the foregoing to the parties of record via e-service.

/s/ Christian Champagne

Christian Champagne