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Supplemental Forensic Case Report
May 23, 2008

To:
Donald Horgan
523 Octavia Street
San Francisco, CA 94102

BODE Case #: 2S04-114
Agency ID #: 1993-WVS-05716; 93-05-0666

List of Evidence Received on August 15, 2007 for possible DNA analysis:

<u>BODE Sample #</u>	<u>Description</u>
2S04-114-46	Labeled as "HEAD HAIR SAMPLE FROM TERRY HOBBS"

See Appendix A for additional items of evidence received.

The mtDNA sequences reported in this case were determined by procedures that have been validated according to standards established by the Scientific Working Group on DNA Analysis Methods (SWGDM) and adopted as Federal Standards.

RESULTS:

1. An mtDNA sequence was obtained from reference item 2S04-114-46 (Terry Hobbs) and was compared to results obtained from the evidence items reported on December 30, 2005.

mtDNA sequences were obtained from the three hairs tested from item 2S04-114-46. All three hairs displayed the same mtDNA sequence except for position 16093. The three hairs tested displayed varying degrees of either a C or T at this position, indicating the existence of heteroplasmy. Heteroplasmy within hairs is a well documented phenomenon. The mtDNA sequences obtained from 2S04-114-46 are **CONSISTENT** with the mtDNA sequence from evidence item 2S04-114-03Aa; therefore Terry Hobbs **CANNOT BE EXCLUDED** as the contributor of evidence item 2S04-114-03Aa.

The mtDNA population database of the Scientific Working Group on DNA Analysis and Methods (SWGDM) has been searched for the mtDNA sequence obtained from item 2S04-114-03Aa. The number of observations of these mtDNA sequences in the (SWGDM) database is as follows:

Database	No. of observations
African American	4 in 1764
Caucasian	0 in 694
Hispanic	0 in 163
Asian	1 in 1634
Native American	0 in 228
Total	5 in 4483

See Table 1 for a summary of mtDNA sequences reported for reference sample 2S04-114-46 and evidence sample 2S04-114-03Aa. See Appendix B for results obtained for the evidence items reported on December 30, 2005.

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2. The mtDNA sequences obtained from the following evidence items are not consistent with reference item 2S04-114-46:

- 2S04-114-03B
- 2S04-114-08A
- 2S04-114-08Ba
- 2S04-114-08Bb
- 2S04-114-11B
- 2S04-114-11C
- 2S04-114-11P
- 2S04-114-11Q
- 2S04-114-11V
- 2S04-114-11Z
- 2S04-114-14
- 2S04-114-15
- 2S04-114-17
- 2S04-114-18A
- 2S04-114-18B
- 2S04-114-18C
- 2S04-114-18D
- 2S04-114-18E
- 2S04-114-18F
- 2S04-114-18H
- 2S04-114-18I
- 2S04-114-20B
- 2S04-114-21A
- 2S04-114-21B

The individual associated with 2S04-114-46 (Hobbs) can be excluded as a source of the items listed above.

3. The mtDNA sequences obtained from 2S04-114-23 and 2S04-114-27 are not consistent with reference item 2S04-114-46 due to one and two polymorphic differences, respectively. However, in standard reporting practice three differences are required for an exclusion. Therefore, this comparison is considered inconclusive.

Notes:

1. Mitochondrial DNA (mtDNA) is found in sub-cellular organelles called mitochondria. A specific, non-coding region of the mitochondrial genome called the D-loop, or hyper-variable control region, is known to have variability within the human population. Multiple copies of this region of mtDNA are generated using the polymerase chain reaction (PCR). The base composition, or sequence, is then determined using automated DNA sequencing.
2. Three extractions were performed on 2S04-114-46. The common sequence from all three extractions was reported.
3. A supplemental mtDNA case report was issued due to request for additional testing. Please refer to reports dated: April 10, 2008, March 7, 2008, September 27, 2007, January 2, 2007, and December 30, 2005 for complete lists of items received/tested.
4. The submitted evidence will be retained at Bode until notified by client.

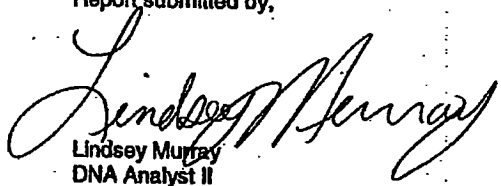
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Report submitted by,


Lindsey Murray
DNA Analyst II

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Table 1. mtDNA sequence for reference item 2S04-114-46 (Terry Hobbs) and evidence item 2S04-114-03Aa (Hair from ligature (Moore)).

2S04-114-46 Reference Sample from Terry Hobbs	16093 N (C/T)* 16221 T Confirmed Region: 16024-16365	263 G 309.1 C 315.1 C Confirmed Region: 73-340
2S04-114-03Aa Hair from ligature (Moore)	16221 T Confirmed Region: 15998-16390	263 G 309.1 C 315.1 C Confirmed Region: 35-361

* Indicates possible heteroplasmy (see notation 'e' below).

The following notations may apply:

- Transition or transversion polymorphisms as compared to a standard sequence (Anderson, et al. 1981. *Nature* 290:457-465) are designated by the appropriate letter (base).
- A deletion is designated by a "D".
- An insertion is designated a ".1" for a one base insertion, and a ".2" for a two base insertion.

Note: Polycytosine stretches are often difficult to interpret. A possible cause may be the presence of a mixture of length variants in the mtDNA of an individual. A predominant length species is often apparent; however, the frequency of a particular length species cannot be determined accurately and may vary between maternal relatives. The sequence reported for Hypervariable Region 1 represents the first 10 cytosines observed, beginning at position 16184. The sequence reported for Hypervariable Region 2 represents the number of confirmed cytosines present in the predominant base sequence. When no predominant base sequence is observed, the insertions that could not be confirmed are designated by a "N".

- A position that could not be confirmed is designated by a "N".
- Heteroplasmy is a situation where two base peaks are observed at the same position. This indicates the presence of two different mitotypes. Heteroplasmies are common in the human population and can vary from tissue to tissue, with hair samples demonstrating greater heteroplasmic potential than other tissues such as blood and/or buccal samples. Since heteroplasmies do not always occur with the same frequency from generation to generation, and from tissue sample to tissue sample, the presence or absence of a heteroplasmy does not constitute an exclusion. An inclusion is warranted as long as the sample being compared has either peak, or both peaks, at the corresponding position/s.

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Appendix A: Additional items of evidence received
List of evidence received on July 7, 2004 for DNA Analysis:

Bode #	Item ID	Description
2S04-114-01	93-05716 FP2	Labeled as "Left hand nail scrapings from M. Moore."
2S04-114-02	93-05716 FP3	Labeled as "Right hand nail scrapings from M. Moore."
2S04-114-03	93-05716 FP6	Labeled as "Hair from M. Moore ligature."
2S04-114-03A		Slide with two hairs (-03Aa and -03Ab).
2S04-114-03B		Slide with one hair.
2S04-114-04	93-05716 FP6-Q39	Labeled as "Possible tissue from ligature from M. Moore."
2S04-114-05	93-05716 Q1 - Q4	Labeled as "Swabs from M. Moore."
2S04-114-05A		Three "oral" swabs.
2S04-114-05B		Three "rectal" swabs.
2S04-114-05C		Two "nasal" swabs.
2S04-114-05D		Two "penile" swabs.
2S04-114-06	93-05717 FP3	Labeled as "Left hand nail scrapings from S. Branch."
2S04-114-07	93-05717 FP4	Labeled as "Right hand nail scrapings from S. Branch."
2S04-114-08	93-05717 FP5	Labeled as "Two dark Caucasian hairs from S. Branch."
2S04-114-08A		Slide with one hair.
2S04-114-08B		Slide with two hairs (-08Ba and -08Bb).
2S04-114-09	93-05717 FP6	Labeled as "Hair from ligature from S. Branch (skin, tissue, hair from ligature)."
2S04-114-10	93-05717 K1, Q1 - Q4	Labeled as "Blood sample and swabs from S. Branch."
2S04-114-10A		Stained string.
2S04-114-10B		Three "oral" swabs.
2S04-114-10C		Three "rectal" swabs.
2S04-114-10D		Three "nasal" swabs.
2S04-114-10E		Two "penile" swabs.
2S04-114-11	93-05718 FP3	Labeled as "Hair found on C. Byers's body."
2S04-114-11A through -11Z		Slide with 26 hairs (-11A through -11Z).
2S04-114-12	93-05718 FP4	Labeled as "Left hand nail scrapings from C. Byers."
2S04-114-13	93-05718 FP5	Labeled as "Right hand nail scrapings from C. Byers."
2S04-114-14	93-05718 FP6	Labeled as "Hair from lower body of C. Byers."
2S04-114-15	93-05718 FP8	Labeled as "Hair from C. Byers ligature."
2S04-114-16	93-05718 Q4	Labeled as "Possible tissue from C. Byers ligature (skin, tissue, hair from ligature)."
2S04-114-17	93-05718 FP9	Labeled as "Hair from perineum of C. Byers ligature."
2S04-114-18	93-05718 FP10	Labeled as "Negroid hair from white sheet." [slide with 9 hairs]
2S04-114-18A		Hair from sheet, described as "Negroid hair frag."
2S04-114-18B		Hair from sheet.
2S04-114-18C		Hair from sheet.
2S04-114-18D		Hair from sheet.
2S04-114-18E		Hair from sheet.
2S04-114-18F		Hair from sheet.
2S04-114-18G		Hair from sheet, described as "animal hair."
2S04-114-18H		Hair from sheet.
2S04-114-18I		Hair from sheet.

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Appendix A: Additional items of evidence received

List of Evidence received July 7, 2004 for DNA analysis (cont.)

2S04-114-19	93-05718 Q1-Q3	Labeled as "Swabs from C. Byers
2S04-114-19A		Three "oral" swabs.
2S04-114-19B		Three "rectal" swabs.
2S04-114-19C		Three "nasal" swabs.
2S04-114-20	93-05716 E3	Labeled as "Hair from E3."
2S04-114-20		Slide with two hairs (-20A and -20B).
2S04-114-21	93-05716 E5	Labeled as "Hair from scout cap."
2S04-114-21		Slide with two hairs (-21A and -21B).
2S04-114-22	93-05716 E126	Labeled as "Hair from knife."
	93-05717 E127	
2S04-114-23	LS1-QH	Labeled as "Hair from tree stump."
2S04-114-24		Slide with two hairs (-24A and -24B).
2S04-114-25	93-05716 E3 Q10	Labeled as "Cutting from blue pants."
2S04-114-26	93-05716 E7 Q6	Labeled as "Cutting from jeans."
2S04-114-27	93-05717 FP7	Labeled as "Dyed hair from white sheet used to cover S. Branch."
2S04-114-28	93-05716 E27	Labeled as "Hair from knife."
2S04-114-29	93-05716 E28	Labeled as "Hair from butterfly knife."
2S04-114-30	93-05716 E134	Labeled as "Hair from knife."
2S04-114-31	93-05716 E178	Labeled as "Kershaw folding knife."
2S04-114-32	93-05716 E1A	Labeled as "Bag of clothing."
2S04-114-32A		Pair of white socks.
2S04-114-32B		Leather (or vinyl) pull tab of unknown origin.
2S04-114-32C		Plastic bag "Time Saver."
2S04-114-32D		Tan button down shirt.
2S04-114-32E		Black thermal shirt.
2S04-114-32F		Cargo style jeans.
2S04-114-32G		One "BIC" disposable razor.
2S04-114-32H		One "BIC" disposable razor.
2S04-114-33	93-05718 FP8 L1	Labeled as "Ligature between L-leg and L-wrist and R-leg and R-wrist [Byers]."
2S04-114-33A		Left side.
2S04-114-33B		Right side.
2S04-114-34	93-05717 FP6 L2	Labeled as "Ligature between ankles and wrist, L-leg, L-wrist, R-leg, R-wrist [Branch]."
2S04-114-34A		Left side.
2S04-114-34B		Right side.
2S04-114-35	93-05717 FP6 L3	Labeled as "Ligature, L-leg, L-wrist, R-leg, R-wrist [Moore]."
2S04-114-35A		Left side.
2S04-114-35B		Right side.
2S04-114-36	93-05716 E17	Labeled as "Three tree branches."

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Appendix A: Additional Items of evidence received (cont.)

List of evidence received on October 12, 2006 for DNA analysis:

<u>BODE #</u>	<u>Item ID</u>	<u>Description</u>
2S04-114-37	N/A	Reference buccal swabs (ECHOLS)
2S04-114-38	N/A	Reference buccal swabs (MISSKELLEY)
2S04-114-39	N/A	Reference buccal swabs (BALDWIN)

List of Evidence Received on April 5, 2007 for possible mitochondrial DNA analysis:

<u>BODE Sample #</u>	<u>Agency ID</u>	<u>Description</u>
2S04-114-40	93-05716/ME-329-93	Labeled as "Pulled Hair Sample James M. Moore"
2S04-114-41	93-05716/ME-329-93	Labeled as "Dried Bld Sample James M. Moore"
2S04-114-42	93-05717/ME-330-93	Labeled as "Pulled Hair Sample Steve Branch"
2S04-114-43	93-05717/ME-330-93	Labeled as "Dried Blood Sample Steve Branch"
2S04-114-44	93-05718/ME-331-93	Labeled as "Pulled Hair Sample Christopher Byers"
2S04-114-45	93-05718/ME-331-93	Labeled as "Dried Blood Sample Christopher Byers"

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Appendix B: Mitochondrial DNA Sequence Results reported on December 30, 2005.

<p>2S04-114-03Aa Hair from ligature (Moore)</p>	<p>16221 T</p> <p>Confirmed Region: 15998-16390</p>	<p>263 G 309.1 C 315.1 C</p> <p>Confirmed Region: 35-361</p>
<p>2S04-114-03B Hair from ligature (Moore)</p>	<p>16069 T 16126 C 16193 T 16195 C 16242 A 16357 C</p> <p>Confirmed Region: 15998-16390</p>	<p>73 G 150 T 152 C 263 G 295 T 309.1 C 315.1 C</p> <p>Confirmed Region: 35-361</p>
<p>2S04-114-08A Hair (Branch)</p>	<p>16069 T 16126 C 16145 A 16186 T 16231 C 16261 T</p> <p>Confirmed Region: 15998-16390</p>	<p>73 G 75 A 150 T 152 C 195 C 215 G 263 G 295 T 309.1 C 315.1 C 319 C</p> <p>Confirmed Region: 35-361</p>
<p>2S04-114-08Ba Hair (Branch)</p>	<p>16069 T 16126 C 16145 A 16186 T 16231 C 16261 T</p> <p>Confirmed Region: 15998-16390</p>	<p>73 G 75 A 150 T 152 C 195 C 215 G 263 G 295 T 309.1 C 315.1 C 319 C</p> <p>Confirmed Region: 35-361</p>

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Appendix B: Mitochondrial DNA Sequence Results reported on December 30, 2005 (cont).

<p>2S04-114-08Bb</p> <p>Hair (Branch)</p>	<p>16069 T 16126 C 16145 A 16186 T 16231 C 16261 T</p> <p>Confirmed Region: 15998-16390</p>	<p>73 G 75 A 150 T 152 C 195 C 215 G 263 G 295 T 309.1 C 315.1 C 319 C</p> <p>Confirmed Region: 35-361</p>
<p>2S04-114-11B</p> <p>Hair from body (Byers)</p>	<p>16069 T 16126 C 16145 A 16172 C 16222 T 16261 T</p> <p>Confirmed Region: 15998-16390</p>	<p>73 G 242 T 263 G 295 T 315.1 C</p> <p>Confirmed Region: 49-361</p>
<p>2S04-114-11C</p> <p>Hair from body (Byers)</p>	<p>16069 T 16126 C 16145 A 16172 C 16222 T 16261 T</p> <p>Confirmed Region: 15998-16390</p>	<p>73 G 242 T 263 G 295 T 315.1 C</p> <p>Confirmed Region: 35-361</p>
<p>2S04-114-11P</p> <p>Hair from body (Byers)</p>	<p>16069 T 16126 C 16145 A 16172 C 16222 T 16261 T</p> <p>Confirmed Region: 15998-16390</p>	<p>73 G 242 T 263 G 295 T 315.1 C</p> <p>Confirmed Region: 35-361</p>
<p>2S04-114-11Q</p> <p>Hair from body (Byers)</p>	<p>16069 T 16126 C 16145 A 16172 C 16222 T 16261 T</p> <p>Confirmed Region: 15998-16390</p>	<p>73 G 242 T 263 G 295 T 315.1 C</p> <p>Confirmed Region: 49-361</p>

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Appendix B: Mitochondrial DNA Sequence Results reported on December 30, 2005 (cont).

2S04-114-11V Hair from body (Byers)	16069 T 16126 C 16145 A 16172 C 16222 T 16261 T Confirmed Region: 15998-16390	73 G 242 T 263 G 295 T 315.1 C Confirmed Region: 35-361
2S04-114-11Z Hair from body (Byers)	16069 T 16126 C 16145 A 16172 C 16222 T 16261 T Confirmed Region: 15998-16390	73 G 242 T 263 G 295 T 315.1 C Confirmed Region: 35-361
2S04-114-14 Hair from lower body (Byers)	16069 T 16126 C 16145 A 16172 C 16222 T 16261 T Confirmed Region: 15998-16390	73 G 242 T 263 G 295 T 315.1 C Confirmed Region: 49-361
2S04-114-15 Hair from ligature (Byers)	16093 C 16192 T 16256 T 16262 T 16270 T Confirmed Region: 15998-16390	73 G 263 G 315.1 C Confirmed Region: 35-361
2S04-114-17 Hair from perineum (Byers)	16222 T 16261 T Confirmed Region: 16210-16390	Not Analyzed

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Appendix B: Mitochondrial DNA Sequence Results reported on December 30, 2005 (cont).

<p>2S04-114-18A Negroid hair from sheet</p>	<p>16129 A 16183 D 16189 A 16215 G 16223 T 16278 T 16294 T 16311 C 16360 T</p> <p>Confirmed Region: 15998-16390</p>	<p>73 G 151 T 152 C 182 T 186 A 189 C 247 A 263 G 315.1 C 316 A</p> <p>Confirmed Region: 35-361</p>
<p>2S04-114-18B Hair from sheet</p>	<p>16069 T 16126 C 16145 A 16172 C 16222 T 16261 T</p> <p>Confirmed Region: 15998-16390</p>	<p>73 G 242 T 263 G 295 T 315.1 C</p> <p>Confirmed Region: 35-361</p>
<p>2S04-114-18C Hair from sheet</p>	<p>16069 T 16126 C 16145 A 16172 C 16222 T 16261 T</p> <p>Confirmed Region: 15998-16390</p>	<p>73 G 242 T 263 G 295 T 315.1 C</p> <p>Confirmed Region: 35-361</p>
<p>2S04-114-18D Hair from sheet</p>	<p>16069 T 16126 C 16145 A 16172 C 16222 T 16261 T</p> <p>Confirmed Region: 15998-16390</p>	<p>73 G 242 T 263 G 295 T 315.1 C</p> <p>Confirmed Region: 35-361</p>
<p>2S04-114-18E Hair from sheet</p>	<p>16069 T 16126 C 16145 A 16172 C 16222 T 16261 T</p> <p>Confirmed Region: 15998-16390</p>	<p>73 G 242 T 263 G 295 T 315.1 C</p> <p>Confirmed Region: 35-361</p>

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Appendix B: Mitochondrial DNA Sequence Results reported on December 30, 2005 (cont).

2S04-114-18F Hair from sheet	16069 T 16126 C 16145 A 16172 C 16222 T 16261 T Confirmed Region: 15998-16390	73 G 242 T 263 G 295 T 315.1 C Confirmed Region: 35-361
2S04-114-18H Hair from sheet	16069 T 16126 C 16145 A 16172 C 16222 T 16261 T Confirmed Region: 15998-16390	73 G 242 T 263 G 295 T 315.1 C Confirmed Region: 49-361
2S04-114-18I Hair from sheet	16069 T 16126 C 16145 A 16172 C 16222 T 16261 T Confirmed Region: 15998-16390	73 G 242 T 263 G 295 T 315.1 C Confirmed Region: 35-361
2S04-114-20B Hair from E3	16069 T 16126 C 16145 A 16172 C 16222 T 16261 T Confirmed Region: 15998-16390	73 G 242 T 263 G 295 T 315.1 C Confirmed Region: 49-361
2S04-114-21A Hair from scout cap	16069 T 16126 C 16193 T 16195 C 16242 A 16357 C Confirmed Region: 16009-16390	73 G 150 T 152 C 263 G 295 T 309.1 C 315.1 C Confirmed Region: 35-361

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Appendix B: Mitochondrial DNA Sequence Results reported on December 30, 2005 (cont).

2S04-114-21B Hair from scout cap	16223 T 16278 T 16362 C Confirmed Region: 16210-16390	 Not Reported
2S04-114-23 Hair from scout cap	Anderson Confirmed Region: 16009-16390	263 G 309.1 C 315.1 C Confirmed Region: 35-361
2S04-114-27 Dyed hair from white sheet (Branch)	16261 T Confirmed Region: 15998-16390	263 G 309.1 C 315.1 C Confirmed Region: 49-361

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