

## AFIP/OAFME TRACE MATERIALS ANALYSIS

## LABORATORY NOTES

AFIP #: 79C- $\phi$ 438

PAGE: |

LAB CONTROL #: 99- $\phi$ 9

NAME: Grant Graham

14 $\phi$ 3 26 Nov 99	Received three sets of slides contained in a heat sealed ziplock type bag from Susane Barrett/AFDIL. Bag is marked with AFDL case # 99C- $\phi$ 438 and slide code numbers: 45A, 46A, 48A, 51A, 52A, 55A, 56A, 58A, 62A, 63A, 75A, 76A, 91A, 93A, 94A, 98A, 1 $\phi$ 4A, 112A, 113A, 115A. The package also bears "SMB 11.24.99" written across the heat seal at the top. Bag opened along left side.
1447 26 Nov 99	Photography started.
1524 26 Nov 99	Three bundles of slide containers were photographed. One bundle of two containers marked respectively: 99C- $\phi$ 438-45A, 46A and 99C- $\phi$ 438-55A-56A. Both containers secured with evidence tape. One bundle of seven containers marked respectively: 99C- $\phi$ 438-115A; 99C- $\phi$ 438-112A; 99C- $\phi$ 438-1 $\phi$ 4A; 99C- $\phi$ 438-98A; 99C- $\phi$ 438-94A; 99C- $\phi$ 438-93A; 99C- $\phi$ 438-91A. All seven containers secured with evidence tape. One bundle of nine containers marked respectively: 99C- $\phi$ 438-113A; 99C- $\phi$ 438-52A; 99C- $\phi$ 438-51A; 99C- $\phi$ 438-48A; 99C- $\phi$ 438-76A; 99C- $\phi$ 438-75A; 99C- $\phi$ 438-63A; 99C- $\phi$ 438-62A; 99C- $\phi$ 438-58A. All nine containers secured with evidence tape.
17 $\phi$ 6 26 Nov 99	Initial photography complete. Evidence placed in evidence storage for safe keeping. All slide containers & slides marked via initials " <del>SG</del> ".
1357 29 Nov 99	Slide 99C- $\phi$ 438-46A: One human hair, medium blond in color, approximately 71mm long, maximum approximate shaft diameter = 83.3 $\mu$ m. Root present with root sheath, follicular tag and attached tissue indicating hair was forcibly removed. Fracture of root sheath noted perpendicular to length of shaft, located toward tip of root. Unknown adhering tissue and/or debris noted along hair shaft. Fractures noted adjacent to root tip perpendicular to length of shaft. Unknown tissue and/or debris observed adhering along length of shaft at various locations.
1613 29 Nov 99	Slide 99C- $\phi$ 438-45A: No human hairs present. No possible blood or other tissue present.
1619 29 Nov 99	Slide 99C- $\phi$ 438-55A: No human hairs present. Contains fiber bundles and non-human hairs. No possible blood or other tissue present.
1725 29 Nov 99	Slide 99C- $\phi$ 438-56A: No human hairs present. Contains one fiber & one hair of non-human origin. No possible blood or other tissue present.
	*

Exhibit #2

## AFIP/OAFME TRACE MATERIALS ANALYSIS

## LABORATORY NOTES

PAGE: 2

AFIP #: 99C- $\phi$ 438LAB CONTROL #: 99- $\phi$ 9

NAME: Grant Graham

174 $\phi$ 29 Nov 99	Evidence placed in evidence storage area for safekeeping.
$\phi$ 616 3 $\phi$ Nov 99	Slide 99C- $\phi$ 438-52A: Slide in poor condition with mounting medium (dried) on top of cover slip and scotch tape on two sides, holding the broken cover slip in place. Slide contains one human hair, with cuticle damage (splitting) noted along shaft. One broken section of the cover slip was observed to be under the main cover slip. To observe the hair root, a section of scotch tape was peeled back from the slide using a sterile scalpel. The root is present and bears tissue in the form of a follicular tag. Although the condition of the slide makes parts of the hair difficult to observe, there appears to be a red in color substance on the hair shaft that could be blood. Hair is $8\phi\mu\text{m}$ wide and approximately 54mm long; medium blond in color.
$\phi$ 725 3 $\phi$ Nov 99	Slide 99C- $\phi$ 438-113A: Slide contains one human hair with no root. Shaft bears tissue that appears to be blood. Shaft has a break along the length. One end of the hair is split & broken, the other end is broken. There is a red in color fiber present along the shaft of the hair. The hair is approximately $7\phi\mu\text{m}$ wide & approximately 82mm long; light blond in color.
$\phi$ 83 $\phi$ 3 $\phi$ Nov 99	Slide 99C- $\phi$ 438-48A: Contains one human hair with root and small follicular tag. Contains one fiber fragment located along shaft. Diameter = approximately $7\phi\mu\text{m}$ . Length = approximately 141mm; Color is light blond.
$\phi$ 952 3 $\phi$ Nov 99	Slide 99C- $\phi$ 438-51A: Contains three human hairs. Hairs have no roots. Hairs numbered 1, 2 & 3 for better identification. Hair #1 has broken ends and is approximately $73.5\mu\text{m}$ wide, 23mm long and is light blond to golden brown in color. Also has two crushed areas. Hair #2 has a rounded tip and broken end. Also bears tissue that appears to be blood as well as unknown debris. Approximately $83.3\mu\text{m}$ wide, approximately 17mm long, and is medium blond to medium golden brown in color. Has fiber fragment adhering along shaft. Hair #3 has cut ends, is approximately $78.4\mu\text{m}$ wide, approximately 24mm long and is medium blond to medium golden brown in color.
1 $\phi$ 42 3 $\phi$ Nov 99	Slide 99C- $\phi$ 438-76A: Contains fibers and non-human hairs. No possible blood or other tissue present.
1 $\phi$ 56 3 $\phi$ Nov 99	Slide 99C- $\phi$ 438-63A: Slide in poor condition due to mounting medium being on top of cover slip. Slide contains fragments of hairs and fibers, however the poor condition of the slide prevents sufficient clarity to determine if the hair fragments are of human origin. The fragments are primarily located around a blue "X" at the center area of the slide.

**AFIP/OAFME TRACE MATERIALS ANALYSIS  
LABORATORY NOTES**

AFIP #: 99C-φ438  
LAB CONTROL #: 99-φ9  
NAME: Grant Graham

PAGE: 3

11φ7 3φ Nov 99	Slide 99C-φ438-62A: Contains no human hairs. Contains fibers. No possible blood or other tissue present.
1126 3φ Nov 99	Slide 99C-φ438-75A: Contains 1 human hair with root & follicular tissue. Hair is approximately 132.3 μm wide, approximately 63mm long and medium blond to dark golden brown in color. Has splits along shaft & buckeling.
1139 3φ Nov 99	Slide 99C-φ438-58A: Contains two human hairs. Both have roots but no tissue. Hair not marked with red dot is dark golden brown in color; end is cut. The hair marked with a red dot has a slightly rounded tip. The hair marked with a red dot is approximately 102.9 μm wide and approximately 43 mm long. The other hair is approximately 73.5 μm wide & approximately 5mm long. For identification purposes, the hair not marked with a red dot is numbered "1" and the other hair is numbered "2."
12φ5 3φ Nov 99	Slide 99C-φ438-112A: Contains four human head hairs, two of which have been marked "1" & "2" for better identification. Hair marked "1" has a split end, has sustained crushing along the shaft and is broken at the other end. It is approximately 63.7 μm wide and light to medium blond in color. Hair marked "2" has a broken end, is approximately 63.7 μm wide, light blond in color. Other end of hair is observed to be in slide border. Hair marked with black "X" has a root present and adhering tissue, forcibly removed, is light blond in color and approximately 73.5 μm wide. Additional hair has no root, rounded tip and crushed end. It is located in the center of the slide area, is light blond <sup>Ⓟ</sup> in color and is approximately 73.5 μm wide. Length of the four hairs cannot be determined because the hairs are interwoven amongst each other, making length difficult to establish. Additionally, portions of the hairs extend into the opaque areas of the mounting medium edges.
1232 3φ Nov 99	Slide 99C-φ438-115A: Contains no human hairs. Contains fibers and non-human hairs (2). No possible blood or other tissue present.
1252 3φ Nov 99	Slide 99C-φ438-98A: Slide in poor condition due to mounting medium being on top of cover slip. Contains one human hair with root & associated follicular and sheath tissue. Root is elongated & forcibly removed. Virtually entire length of hair is encrusted with tissue that appears to be blood. Hair is approximately 63.7 μm wide. There is a red in color fiber wrapped around shaft. Due to poor condition of the slide, viewing for length measurement is hampered, but hair is greater than 12φmm in length. Color is medium blond.
	*

## AFIP/OAFME TRACE MATERIALS ANALYSIS

## LABORATORY NOTES

PAGE: 4

AFIP #: 99C- $\phi$ 438LAB CONTROL #: 99- $\phi$ 9

NAME: Grant Graham

1316 3 $\phi$ Nov 99	Slide 99C- $\phi$ 438-1 $\phi$ 4A: Contains two human hairs labeled 1&2 for further identification. Hair #1 has root with adhering follicular tissue. The hair is approximately 161.7 $\mu$ m wide and approximately 61 mm long. The hair is light blond to medium golden brown in color. Hair #2 has root with small amount of adhering tissue. The hair is approximately 137.2 $\mu$ m wide and approximately 51 mm long. The hair is medium blond to medium golden brown in color.
1334 3 $\phi$ Nov 99	Slide 99C- $\phi$ 438-93A: Contains one human hair with root but no tissue. Hair is approximately 73.5 $\mu$ m wide and 17 mm long. The color is light blond to medium golden brown. Tip of hair is rounded. Limb hair.
1342 3 $\phi$ Nov 99	Slide 99C- $\phi$ 438-94A: Contains fibers & non-human hairs.
1348 3 $\phi$ Nov 99	Slide 99C- $\phi$ 438-91A: Slide in poor condition due to mounting medium being atop of cover slip. Contains unknown debris & yellow fibrous material that has red in color substance adhering to it that could be blood. Fiber marked with black dot and "1" for better identification. Contains one human hair with root but no tissue. Hair is approx. 29.4 $\mu$ m wide, approx. 5 mm long.
1736 3 $\phi$ Nov 99	Slides 99C- $\phi$ 438-45A, 46A, 48A, 51A, 52A, 55A, 56A, 58A, 62A, 63A, 75A, 76A, 91A, 93A, 94A, 98A, 1 $\phi$ 4A, 112A, 113A, and 115A were sealed in their respective slide cases via evidence tape and released to Daniel E. Kite / AFDIL Analyst III in a sealed plastic bag.
14 $\phi$ 9 15 Dec 99	Received one (1) slide case marked "99C- $\phi$ 438-99A, 1 $\phi$ $\phi$ A." Slide case received from Suzanne M. Barritt / AFDIL Sup. Analyst sealed in plastic bag marked: "SMB 12.15.99 99C- $\phi$ 438-99A, 1 $\phi$ $\phi$ A." Slide case sealed with evidence tape. Slide case and plastic bag placed in FTMAL evidence storage locker #1 for safe keeping.
$\phi$ 93 $\phi$ 16 Dec 99	Retrieved slide case 99C- $\phi$ 438-99A, 1 $\phi$ $\phi$ A from FTMAL Storage Evidence Locker #1 to conduct overall photography of item. Photography completed at 1 $\phi$ 43 hours. Bag, case and slides initialed "SMB" and placed inside FTMAL Evidence Storage Locker #1.
$\phi$ 948 17 Dec 99	Retrieved slide case 99C- $\phi$ 438-99A, 1 $\phi$ $\phi$ A from FTMAL Evidence Storage Locker #1 to examine slides.
	*

## AFIP/OAFME TRACE MATERIALS ANALYSIS

## LABORATORY NOTES

PAGE: 5

AFIP #: 99C-ϕ438

LAB CONTROL #: 99-ϕ9

NAME: Grant Graham

ϕ951 17 Dec 99	Slide 99C-ϕ438-99A: Contains no human hairs. Contains manmade and animal hair fibers. Fibers of blue, green, yellow and purple colors can be seen in the slide. One animal hair fiber (wool) has a large amount of debris adhering to the shaft, some of which is red in color and could be blood. One area of the slide bears a green in color circle. Inside the green circle are green and yellow fibers that have a red in color substance adhering to their length that could be blood. Another area of the slide bears a black in color circle. The fibers inside the black circle have a red in color substance adhering along their length that could be blood. The green circle had been previously marked. The black circle was marked by me during examination.
12ϕ1 17 Dec 99	Slide 99C-ϕ438-1ϕϕA: Contains various fibers and non-human hairs. One area of slide bears a green circle. Inside the green circle are red, green, blue, yellow and transparent fibers that have red in color debris adhering along their length that could be blood. One yellow fiber has what appears to be a crushed area. Also, one animal hair (cat) is present that bears red in color debris that could be blood. Additional fibers that may bear blood are within a black circled area (made by me during examination). Black circle contains non-human hairs (cat & wool) that have adhering red substance that could be blood. Yellow, green and greenish-brown fibers are also in the black circle; these fibers also have adhering red substance that could be blood.
15ϕ7 17 Dec 99	Sealed Slide container 99C-ϕ438-99A-1ϕϕA with slides 99C-ϕ438-99A and 99C-ϕ438-1ϕϕA inside, inside original plastic bag with evidence tape. Tape marked with date, time, initials. Bag and contents placed into FTMAL evidence storage locker #1.
1543 4 Jan ϕϕ	Received three slide containers in a plastic bag labeled "99C-ϕ438-76A, 91A, 112A" from Suzanne Barritt / AFDIL. The bag contains three slide containers marked 99C-ϕ438-76A, 99C-ϕ438-91A and 99C-ϕ438-112A respectively. The items were received in good condition and placed in FTMAL evidence storage locker #1. The bag was marked with date, time and initials.
1532 7 Jan ϕϕ	Opened "1" slide containers 99C-ϕ438-76A & 99C-ϕ438-112A to photograph close-ups of the slides for ease in measuring. Photos completed at 1646. Slides placed in FTMAL evidence storage locker #1.

**AFIP/OAFME TRACE MATERIALS ANALYSIS**

**LABORATORY NOTES**

AFIP #: 99C-φ438

LAB CONTROL #: 99-φ9

NAME: Grant Graham

2 φ Jan φ φ φ 917	<p>A 5.5 times photographic enlargement of slide 99C-φ438-112A was obtained via an original 35mm color slide image utilizing a Fuji Pictostat. The resulting image was used to measure the hairs in Slide 99C-φ438-112A together with microscopic examination of the hairs. Length measurements (approximate) are as follows:</p> <ul style="list-style-type: none"> <li>- Hair #1: approx 3.1 cm</li> <li>- Hair #2: approx 6.1 cm</li> <li>- Hair #3: approx 2.7 cm</li> <li>- Hair #4: approx greater than 14.5 cm. A more accurate measurement could not be made due to close intermixing of hairs on slide.</li> </ul>
2 May φ φ φ 843	<p>By request of Dr. Holland (AFDIL) the top and bottom (underside) of slide 99C-φ438-63A was cleaned (mounting medium removed from outer surface) to facilitate better observation of the slide. Xylene on a sterile blood blotter pad was used to remove the mounting medium from the outer surface. The mounting medium inbetween the coverslip and slide was not disturbed. After cleaning, visibility of the slide was good. There are several fiber fragments visible and only one hair with root; no adhering tissue or possible blood visible. The hair is transparent with little pigment visible; scales are not visible. Tip is rounded &amp; root bulbous. Hair is approximately 7mm in length and 29.4 μm wide, approximately. Due to lack of observable characteristics it cannot be determined if the hair is of human or animal origin. (human?)</p>
8 Jun φ φ 1322	<p>Slides 99C-φ438-99A; 1φφA; 112A; 75A; 93A; 51A; 45A; 46A; 55A; 56A; 91A; 76A; 113A; 98A; 94A; 1φ4A; 63A; 52A; 58A; 48A; 115A and 62A were released to Suzanne M. Barritt (AFDIL) via DA Form 4137 (Evidence/Property Custody Document).</p>

AFIP #: AFDIL # 99C-0438 LABORATORY NOTES

LAB CONTROL #: 99-09

NAME: Grant Graham

10 July 00 1638	<p>Received the following items from Suzanne Barrett (AFDIL Tech Leader): Slide # 99C-0438-51A, Slide # 99C-0438-63A, and hair exemplars in sealed containers: 99C-0438-04A, 99C-0438-05A, 99C-0438-131A, 99C-0438-156A, 99C-0438-31A. The above items were received in a sealed plastic bag bearing the above mentioned item numbers and initials/date (SMB/7-15-00). The items were receipted for via DA Form 4137 and placed in FTMAL evidence storage locker #1. Also received was a letter and copy of laboratory notes from Brian M. Murtagh.</p>
9 Aug 00 1620	<p>Called Dr. Deforest/defense expert concerning item 99C-0438-63A, which I had previously reported as; could not be determined if human or animal because of lack of observable characteristics. Dr. Deforest suggested observing the hair with a polarizing microscope under crossed polars at 45° with a 1/4 wave plate.</p>
10 Aug 00 1604	<p>Called Dr. Deforest and discussed item 99C-0438-63A while observing the item as described in 9 Aug 00 entry. Under crossed polars with 1/4 wave plate the following observations were made and described to</p>
914-428-8649	<p>Dr. Deforest over the phone: 45°; orientation from top right to lower left of viewing area hair appears yellow in color. At root end the yellow is lighter, turns darker yellow in center area of hair shaft and turns white toward the tip. No scale pattern visible, however some scales are observed to protrude outward from the shaft, more so toward the tip than at the root end. Cuticle thickness appears thicker at center area of the hair shaft. Root is bulbous and slightly elongated at tip of bulb. At 45°; orientation from top left to lower right of viewing area the hair appears dark blue-black at the outer margin along the hair shaft, with a more blue-grey color in the center area of the hair shaft. Cuticle margin is readily observable along shaft to tip, but not in root area. Scales observed to protrude outward along shaft, more so toward tip. With crossed polars and no 1/4 wave plate the hair appears white in both orientations. At 180° horizontal it appears black at outer edges and blue in center area. No medulla is visible in any orientation. Based on the above information, my opinion as to the origin of the 63A hair has not changed.</p>
18 Aug 00 0716	<p>Reexamined 99C-0438-51A to determine which hair matches the hair described in a letter written by Mr. Brian M. Murtagh dated June 30 2000 and accompanying laboratory notes. Upon comparing morphological characteristics of the questioned hair described as E-5, described in the 30 June 00 letter by Murtagh and the copy of examination notes to the hairs on Slide 51A, the questioned hair is the hair mounted between two hairs as described by Murtagh in his letter and the examination notes. The questioned hair was labeled by myself as "2" with a red dot adjacent to the hair. The hairs described as known exemplars, which are on either side of the questioned hair, were labeled "1" &amp; "3" for ease in identifying the location of the hairs.</p>



AFIP #: AFDEL# 99C-0438

LABORATORY NOTES

LAB CONTROL #: 99-09

NAME: Grant Graham

18 Aug 08 1330	Initiated photography of items 99C-0438-04A, 05A, 131A, 151A, & 31. Completed 1448.
18 Aug 08 1640	Examined 99C-0438-156A labeled "Colette MacDonald, K-1 11:25 AM 9/17/74." to obtain samples suitable for DNA testing. Collected 5 hairs with roots. Roots appear elongated and also show signs of possible pitting in the root area. Additionally, tissue that could be blood is present on the root. The roots appear black in color. Entire sample had numerous areas of dried, dark red-brown in color debris adhering in clumps along the ends and shaft of the hairs. Hairs were blond in color. The 5 testing hairs were placed in a drugist fold and then into an envelope and sealed.
18 Aug 08 1640	Examined 99C-0438-04A labeled "Kristen MacDonald, NE 19." to obtain samples suitable for DNA testing. Collected 5 hairs with roots. Roots appear elongated and also show signs of possible pitting. Additionally tissue that could be blood is present on the root. Roots appear black in color. Hairs were blond in color. The 5 hairs were placed in a drugist fold and then into an envelope and sealed.
18 Aug 08 1716	Examined 99C-0438-131A labeled "Kimberly MacDonald, 11:20 AM 9/17/74, K-2. Collected 5 hairs with roots. Roots are dark with possible blood tissue adhering. Hairs were blond in color. The 5 hairs were placed in a drugist fold and then into an envelope and sealed.
20 Aug 08 0629	Examined 99C-0438-05A labeled "Known head hair of Helen Warkle Staerkley" to obtain samples suitable for DNA testing. Collected 5 hairs with roots, but little tissue present. Roots are bulbous and show no signs of being forcibly removed. Appear to be telogen hairs. The 5 hairs were placed in a drugist fold and then into an envelope and sealed. Hairs were brown in color.
20 Aug 08	Examined 99C-0438-31. Contained 3 slide containers each with one slide inside. containing hair or hairs. The slides were labeled with case # 99C-0438-51 and individually identified as "Item 1", "Item 2" and "Item 3" for better identification. Advised by Suzi Barritt/AFDIL no further examination is necessary.