

IN THE UNITED STATES DISTRICT COURT  
FOR THE WESTERN DISTRICT OF TEXAS  
SAN ANTONIO DIVISION

JOHN A. PATTERSON, et al.,	)	
	)	
Plaintiffs,	)	
	)	
v.	)	No. 5:17-CV-00467
	)	
DEFENSE POW/MIA ACCOUNTING	)	
AGENCY, et al.,	)	
	)	
Defendants.	)	

**DEFENDANTS’ DISCLOSURE OF EXPERT TESTIMONY**

Pursuant, Defendants, by and through counsel, hereby disclose expert testimony of Dr. Gregory Kupsky, Dr. Paul Emanovsy, Dr. Calvin Shiroma, and Dr. Timothy McMahon pursuant to Federal Rule of Civil Procedure 26(a)(2)(C). The subject matter of the expert witnesses’ testimony, as well as a statement of the facts and opinions about which they are expected to testify, are set forth below.

**Dr. Gregory J. Kupsky**

1. Dr. Gregory J. Kupsky currently is a historian in DPAA’s Indo-Pacific Directorate, and has served in that position since January 2017. He is responsible for overseeing Directorate research for Family Update conferences, and he is responsible for all research and casework on missing servicemembers from the Philippines. He also conducts archival research in the Washington, D.C. area to support DPAA’s Hawaii-based operations. Dr. Kupsky has been employed by DPAA or one of its predecessor organizations, the Joint POW/MIA Accounting Command (JPAC) since May 2011. He served as a historian for JPAC from May 2011 to July

2014, and was the research lead for the Philippines, making numerous trips to the Philippines to coordinate with government officials, conduct research and witness interviews, and survey possible burial and aircraft crash sites, along with investigations and trips to other countries. From July 2014 to October 2015, he served as the JPAC WWII Division Supervisor, overseeing research, interviews, field investigations, and reporting on the search for over 73,000 missing World War II servicemembers worldwide. From October 2015 to December 2016, he served as Case Support Manager for DPAA, overseeing a disinterment program aimed at identifying unknown from the Pacific and China-Burma-India Theaters of World War II, along with setting and enforcing research standards, processes, and formats for the multidisciplinary teams.

2. Dr. Kupsky received a Ph.D in Modern U.S. History from The Ohio State University in 2010, an M.A. in U.S. History from The University of Tennessee-Knoxville in 2004, and a B.A. with Honors in History from Knox College in 2002. In February 2010, Dr. Kupsky was selected for a research fellowship by the Oak Ridge Institute for Science and Education (ORISE), and served with JPAC in Hawaii from April 2010 to May 2011, writing an in-depth study of the Philippines and proposing strategies for recovering remains of missing U.S. service members from World War II from that country. He has received numerous awards, is a member of several professional organizations for historians, has published several articles including in peer-reviewed journals, and has made numerous presentations to professional audiences, all of which are reflected in his curriculum vitae.

3. Given his knowledge and experience, Dr. Kupsky will testify generally about the Defense POW/MIA Accounting Agency's (DPAA) efforts to recover and identify remains of World War II servicemembers from the Philippines. He will also testify generally about the Department of Defense's (DoD) standards for disinterment from permanent U.S. military cemeteries and

DPAA's process for making recommendations regarding such disinterments. He will testify specifically about the records and historical evidence relevant to the servicemembers and graves at issue in this case. Dr. Kupsky will rely on his participation in the disinterment process, his years of experience in Philippines casework, his research on graves registration practices in the Philippines both in 1942-1943 and after the war, his knowledge of the relevant cases, his review of Plaintiffs' expert reports, and his review of documents produced in discovery in this case, including individual deceased personnel files (IDPFs) and unknown files.

4. More specifically, Dr. Kupsky is expected to testify about the following areas:
  - a) The historical record of DoD's actions with regard to recovery and identification of each servicemember and grave at issue in this case.
  - b) The available information related to the unaccounted-for servicemembers Plaintiffs have identified as their relatives: First Lieutenant (1LT) Alexander Nininger, Brigadier General (BG) Guy Fort, Colonel (COL) Loren Stewart, Technician (TEC4) Lloyd Bruntmyer, Private First Class (PFC) David Hansen, and/or Private (PVT) Robert Morgan.
  - c) The historical evidence supporting DoD's decision to deny Plaintiff John Patterson's request to disinter Manila American Cemetery Grave J-7-20 for comparison to First Lieutenant (1LT) Alexander Nininger in 2016, and the current status of DPAA's research regarding 1LT Nininger and regarding the remains in Grave J-7-20.
  - d) The current status of DPAA's research regarding Brigadier General (BG) Guy Fort and regarding the remains in Manila American Cemetery Grave L-8-113.
  - e) The current status of DPAA's research regarding Colonel (COL) Loren Stewart and regarding the remains in Manila American Cemetery Grave N-15-19.
  - f) The role of historical research in disinterment decisions regarding Cabanatuan common graves.
  - g) The historical evidence supporting DoD's decisions to disinter remains associated with Cabanatuan Common Graves 704, 717 and 822. the personnel files and medical records
  - h) The basis for DPAA's decision to hold its recommendation regarding disinterment of remains associated with Cabanatuan Common Grave 407 pending DoD's receipt of additional family reference samples.

- i) DPAA's ongoing research to identify unaccounted-for servicemembers, including the servicemembers at issue in this case.

5. The following is a summary of the most relevant facts Dr. Kupsky will rely upon:

### **Disinterment Research**

- a) DPAA's standard procedure for disinterment research is to compile a "short list" of candidates for each unknown set of remains. Historians compile a candidate list, conducting historical analysis to identify possible candidates based on the location from which the remains were recovered, known circumstances of the loss, and information about how the remains were processed over the years.
- b) A DPAA anthropologist and odontologist then go through the candidate list, comparing the personnel files and medical records of the candidates—if available—to the X-file. Scientific and medical records, such as dental records, are evidence that may rule out certain candidates.
- c) The "short list" of final candidates based on historical analysis and scientific evidence is used by DPAA in making its recommendation for or against a specific disinterment, and it is also used to guide the Service Casualty Offices in requesting DNA family reference samples to support a disinterment.
- d) Servicemembers who are mentioned in an X-file or other associated historical records are weighed seriously as potential candidates and are often prominent on the "short list." But mere mention in the records is insufficient to propose disinterment because all candidates need to be considered. After all, postwar investigators made those initial associations but ruled them out, often for valid reasons. Many disinterments have occurred in which an unknown was identified as someone other than the individual(s) mentioned in the file.
- e) DPAA's analytic process does not rely on one-to-one comparison of just one servicemember to one set of unidentified remains, nor does it contemplate disinterment to provide negative proof that a specific set of remains is not a specific servicemember. Either approach would be inefficient and counter-productive. To serve the agency's mission to provide the fullest possible accounting for unidentified remains, DPAA only recommends disinterment when it has a reliable list of candidates based on historical and scientific evidence and when DoD has received sufficient DNA family reference samples or other medical means of identification to support the identification effort once disinterment occurs.

### **Search for 1LT Nininger**

- f) *Potential Relationship to X-1130 Manila #2.* The association to X-1130 is based on the statement of COL George Clarke, 57th Infantry commander, that 1LT Nininger was buried "in grave No. 9 behind the South wall of the Abucay church." While multiple witnesses agree that he was buried in the church yard, the specificity of

Grave 9 comes only from COL Clarke, who had departed Bataan before the burials occurred and has been shown to have given false information to other families. The original disinterment record makes clear that X-1130 was taken from Grave 9 of the Abucay *village* cemetery, an entirely different location from the church cemetery; the way the cemetery is identified is consistent with other remains taken from the village cemetery. This discrepancy, along with the height comparison and that the remains were “probably mongoloid,” were likely the key reasons why the Office of the Quartermaster General rejected the association in 1949 and 1950. DPAA reviewed this association again in 2015, and recommended against disinterment on similar grounds.

- g) *Prospects for Resolving 1LT Nininger*. DPAA is conducting a comprehensive study of remains recovered from the Abucay area, the temporary cemeteries on Bataan, and the missing individuals who may be associated. This requires the ordering and examination of thousands of personnel files to reconstruct Bataan cemetery maps. The goal is to determine burial patterns in those cemeteries to support the drafting of short lists for recovered unknowns. Because there is evidence that 57th Infantry officers killed on the same date as 1LT Nininger were reburied in other temporary cemeteries, DPAA considers this the best avenue for finding the remains of 1LT Nininger and others killed in the Abucay area.
- h) *Prospects for Disinterment of X-1130 Manila #2*. The comprehensive cemetery study also includes the reconstruction of the “Soldiers’ Row” of the Abucay village cemetery, from which X-1130 was recovered. Once complete, a plot map of that burial area will allow the creation of short lists to support the case for disinterment of associated unknowns, including X-1130.

### **Search for BG Fort**

- i) *Potential Relationship to X-618 Leyte #1*. The association of X-618 to BG Fort rests solely on the secondhand testimony of Ignacio Cruz, governor of the province where the remains were recovered in July 1947. While a POW, Governor Cruz heard that the Japanese took BG Fort to the town of Dansalan in September, 1942, but subsequently flew him to Cagayan (the recovery area of X-618). Different witnesses told Governor Cruz of the execution and/or burial of “an American officer,” “an American,” “an important officer,” or “a big American” in the vicinity of the X-618 recovery. Only one individual, “a Filipino soldier whose name [he] cannot now remember,” named the victim as BG Fort. As a result, Governor Cruz referred to X-618 as “the *supposed* remains of Gen. Guy O. Fort” (emphasis added). Multiple records agree with Governor Cruz that the Japanese brought BG Fort to Dansalan around October 1942 to order the surrender of guerrillas in the area. When BG Fort refused, he was executed.
- j) Beginning in June 1948—nearly a year after the recovery of X-618—U.S. Army investigators conducted interrogations for the war crimes trial of Lt Col Yoshinari Tanaka, commander of the Japanese garrison in Dansalan. Tanaka and three other Japanese officers all testified that they executed BG Fort in the vicinity of Dansalan,

approximately 45 miles from Cagayan. Not surprisingly, the Japanese officers gave conflicting testimony about who ordered the execution, but were consistent in locating the execution in Dansalan. It is unlikely that they would falsely claim responsibility for his execution while being investigated for war crimes. Guerrilla intelligence reports and Filipino civilians also pointed to Dansalan as the site of the execution.

- k) While the July 1947 recovery team had associated X-618 with BG Fort based on Governor Cruz's testimony, after the Tanaka investigation the American Graves Registration Service (AGRS) concluded in June 1949 that BG Fort "was executed by the Japanese on 11 November 1942 in or around the vicinity of the City of Dansalan." In its final assessment of X-618 in September 1949, the Office of the Quartermaster General noted further that teeth present in X-618 were recorded as extractions on BG Fort's dental chart.
- l) *Prospects for Resolving BG Fort*. DPAA is examining unknowns recovered from the Dansalan area for potential association with Brig Gen Fort.
- m) *Prospects for Disinterment of X-618 Leyte #1*. X-618 presents several difficulties in building a short list. Prisoners from the Dansalan area, including BG Fort, moved through Cagayan in July-August 1942 on their way to Malaybalay POW camp, but there is no record of any POW being held there beyond that point, and only Brig Gen Fort was brought back to Dansalan in late October. There is thus a distinct possibility that X-618 is associated with a guerrilla or a civilian, and could be either American or Filipino, in which case records are extremely sparse or nonexistent.

### **Search for COL Stewart**

- n) *Potential Relationship to X-3629 Manila #2*. The basis for associating X-3629 to COL Stewart is a December 1946 statement by Ruben Caragay, resident of Abucay. He told an Army team that he saw members of the Philippine Scouts' 57th Infantry Regiment "carrying [a] deceased American" and "they said the deceased is an American Colonel." The team's report states that the remains are those of "STUART, Colonel 57th Inf." Master Sergeant Abie Abraham, who headed recovery efforts in the area, explained in 1981 that he drew this tentative association based on the fact that COL Stewart (misspelled in 1946) was the only Colonel missing near Abucay. It is true that no other Colonels are missing from the area, and there is no serviceman named "Stuart" missing from the area. COL Stewart was determined to be non-recoverable in April 1950.
- o) Incomplete recordkeeping makes it difficult to reconstruct exact times and places of individual losses near Abucay in January 1942. Based on unit and date of death, between 100 and 350 Americans and Philippine Scouts may have died in the vicinity of Abucay Hacienda, along with an unknown number of Philippine Army enlisted men. Between 90 and 320 unresolved Americans and Philippine Scouts are associated with the battle.

- p) Recently, DPAA created a short list of 21 officers who died in the area on the possibility that Mr. Caragay was correct in recalling that a U.S. officer was buried there but wrong about the officer's rank. COL Stewart was included as a candidate on the basis of historical analysis. However, analysis of personnel and medical records by DPAA's anthropologist and odontologist led to exclusion of nineteen individuals, including 1LT Nininger and COL Stewart, leaving two other candidates.
- q) *Prospects for resolving COL Stewart.* DPAA is conducting a comprehensive study of remains recovered from the Abucay area, the temporary cemeteries on Bataan, and the missing individuals who may be associated. The intent is to disinter additional unknowns to resolve as many of the Bataan missing as possible, to include COL Stewart.
- r) *Prospects for disinterring X-3629.* DPAA is pursuing DNA reference samples for the remaining candidates on the short list to support a recommendation for the disinterment of X-3629.

### **Cabanatuan Common Graves**

- s) At Cabanatuan POW Camp #1, fellow POWs buried their comrades who died during roughly the same 24 hour period in a common grave. Efforts to document these burials were initially spotty and hindered by the Imperial Japanese.
- t) After the war, AGRS began disinterring remains from the common graves and reintering those that were not immediately identified at U.S. Armed Forces Manila #2 Cemetery. In the fall of 1947 the remains were disinterred again and moved to an AGRS Mausoleum for examination. Many remains deteriorated from remaining in wet ground for several years and from being repeatedly handled. A review conducted in 1951 concluded that the various well-intentioned identification efforts had left the remains "jumbled beyond belief." In January 1952, DoD concluded that the unknown remains were unidentifiable and should be buried at Manila American Cemetery.
- u) DPAA has an ongoing project to account for the unidentified service members who died at Camp Cabanatuan. It began around 2004 with historical research and assessment of all available documentation, and a sustained disinterment effort began in 2015. The project seeks to disinter at one time all unidentified remains associated with one Cabanatuan grave, with allowances for demonstrated discrepancies in grave and date associations. Analyzing each grave in turn allows DPAA to ensure that historical and scientific evidence and DNA family reference sample collection efforts are adequate to support identification after disinterment.
- v) DPAA's current identification effort must contend with numerous factors inhibiting identification. Among these are: (1) the primary record regarding the original burials is Captain Robert Conn's "Death Report, Cabanatuan," which is incomplete and potentially inaccurate; (2) the initial AGRS disinterments may not have precisely conformed to the graves as they were originally dug; (3) early identifications by dog tags or other personal items (whether at the time of initial burial or at the initial

disinterment) may have been inaccurate (e.g., because the service member was holding the item for someone else); (4) remains from a common grave were likely to be inherently commingled when initially recovered; (5) repeated handling before final burial in 1952 likely led to additional commingling, and may have caused commingling of remains drawn from different common graves; (6) records indicate that, by 1952, remains had significantly deteriorated due to burial conditions and repeated handling.

- w) As a result of any number of these factors, during this project DPAA has found individuals in common graves other than those suggested by the records, and has found a substantial amount of commingling to have occurred, including mixing of resolved and unresolved individuals.
- x) In its systematic approach to this project, DPAA recommended and recently received approval to disinter remains associated with Cabanatuan Common Graves 704 and 822, among others. DPAA makes such recommendations only when the historical and scientific evidence is complete and sufficient DNA family reference samples or other medical means of identification have been received. Because the threshold for family reference samples has not yet been met, DPAA has not yet finalized its recommendation for Cabanatuan Common Grave 407.

6. Based on his knowledge and experience, Dr. Kupsky is expected to offer opinion on the following:

- a) Whether the remains of First Lieutenant (1LT) Alexander Nininger, Brigadier General (BG) Guy Fort, Colonel (COL) Loren Stewart, Technician (TEC4) Lloyd Bruntmyer, Private First Class (PFC) David Hansen, and/or Private (PVT) Robert Morgan have been identified.
- b) Whether the remains designated as Manila #2 X-1130, which are currently buried in Manila American Cemetery Grave J-7-20, are likely those of 1LT Nininger.
- c) Whether the remains designated as Leyte #1 X-618, which are currently buried in Manila American Cemetery Grave L-8-113, are likely those of BG Fort.
- d) Whether the remains designated as Manila #2 X-3629, which are currently buried in Manila American Cemetery Grave N-15-19, are likely those of COL Stewart.
- e) Whether historical records associating a servicemember with a specific common grave from Cabanatuan POW Camp No. 1 are sufficient to identify the current location of the servicemember's remains with certainty.
- f) Whether historical records associating a servicemember with a specific common grave from Cabanatuan POW Camp No. 1 are sufficient to identify a servicemember's remains.

- g) Whether DoD's procedures for compiling and weighing historical research in its program for disinterring and identifying unaccounted for servicemembers are appropriate, including whether they are efficient and reliable.
- h) The harm that a court-ordered disinterment of remains that did not meet DoD's disinterment standards would cause to DPAA's performance of its mission.
- i) The qualifications, findings and conclusions of Plaintiffs' experts, John Eakin and Cdr. (Ret.) Renee Richardson.

**Dr. Paul D. Emanovsky**

7. Dr. Paul D. Emanovsky currently is a supervisory forensic anthropologist in DPAA's Scientific Analysis Directorate, and has served in that position since 2014. Dr. Emanovsky is responsible for "Special Projects", to include management of the Scientific Analysis Directorate's portion of the disinterment program. He also conducts scientific analysis of human remains, and leads recoveries of remains from aircraft crash and battlefield burial sites. Dr. Emanovsky has been employed by DPAA or its predecessors, the Joint POW/MIA Accounting Command (JPAC) and the Central Identification Laboratory-Hawaii (CILHI) since 2002. First as an Oak Ridge Science and Education (ORISE) Fellow, he was forensic anthropologist and archeologist/analyst, then in 2005 he was hired as a federal (GS-13) forensic anthropologist and finally in 2014 was promoted to his current position of supervisory forensic anthropologist.

8. Dr. Emanovsky received a Ph.D in Anthropology in 2010. That same year he was promoted to "Fellow" of the Anthropology section of the American Academy of Forensic Sciences, and in 2018 he was elected section secretary. In 2016, Dr. Emanovsky became a Diplomate of the American Board of Forensic Anthropology (ABFA), the penultimate credential for forensic anthropology. In 2018, he was elected onto the Board of Directors of the ABFA. Dr. Emanovsky is a member of the anthropology subcommittee of the Organization of Scientific Area Committees (OSAC) administered by NIST to create national standards for forensic

science. Dr. Emanovsky has presented on numerous topics related to forensic anthropology and is an associate editor of the journal *Forensic Anthropology*.

9. Given his knowledge and experience, Dr. Emanovsky will testify generally about the DPAA's efforts to recover and identify remains of World War II servicemembers from the Philippines. He will also testify generally about the DoD's standards for disinterment from permanent U.S. military cemeteries and DPAA's process for making recommendations regarding such disinterments. He will testify specifically about the records and physical evidence relevant to the servicemembers and graves at issue in this case. Dr. Emanovsky will rely on his participation in the disinterment process, his years of experience in past conflict accounting and human identification, his research on human biological variation, his knowledge of the relevant cases, his review of Plaintiffs' expert reports, and his review of documents produced in discovery in this case, including individual deceased personnel files (IDPFs) and unknown files.

10. More specifically, Dr. Emanovsky is expected to testify about the following areas:

- a) Historical and current methods for estimating various aspects of the biological profile (including, among other things, stature, age, sex, and ancestry) and their reliability.
- b) The available physical information related to the unaccounted-for servicemembers Plaintiffs have identified as their relatives: 1LT Nininger, BG Fort, COL Stewart, TEC4 Bruntmyer, PFC Hansen, and/or PVT Morgan.
- c) The current status of DPAA's research regarding 1LT Nininger and regarding the remains in Grave J-7-20.
- d) The current status of DPAA's research regarding BG Fort and regarding the remains in Manila American Cemetery Grave L-8-113.
- e) The current status of DPAA's research regarding COL Stewart and regarding the remains in Manila American Cemetery Grave N-15-19.
- f) The role of anthropological research in disinterment decisions regarding Cabanatuan common graves.

- g) The role of anthropological examination, such as determination of biological profiles and detection and rectification of commingling in DPAA's post-disinterment identification effort, including specifically Cabanatuan Common Grave 717.
11. The following is a summary of the most relevant facts Dr. Emanovsky will rely upon:
- a) The records for the remains designated as Manila #2 X-1130, Manila #2 X-3629, and Leyte #1 X-618.
  - b) The personnel and medical records for 1LT Nininger, BG Fort, COL Stewart, TEC4 Bruntmyer, PFC Hansen, PVT Kelder and/or PVT Morgan.
  - c) The personnel and medical records for the candidates for comparison to Manila #2 X-1130, Manila #2 X-3629, and Leyte #1 X-618.
12. Based on his knowledge and experience, Dr. Emanovsky is expected to offer opinion on the following:
- a) Whether the remains of 1LT Nininger, BG Fort, COL Stewart, TEC4 Bruntmyer, PFC Hansen, and/or PVT Morgan have been identified.
  - b) Whether the remains designated as Manila #2 X-1130, which are currently buried in Manila American Cemetery Grave J-7-20, are likely those of 1LT Nininger.
  - c) Whether the remains designated as Leyte #1 X-618, which are currently buried in Manila American Cemetery Grave L-8-113, are likely those of BG Fort.
  - d) Whether the remains designated as Manila #2 X-3629, which are currently buried in Manila American Cemetery Grave N-15-19, are likely those of COL Stewart.
  - e) Whether DoD's standard for disinterment of Manila American Cemetery Graves J-7-20, L-8-113, and/or N-15-19 has been met.
  - f) Whether DoD's procedures for compiling and weighing anthropological research in its program for disinterring and identifying unaccounted for servicemembers are appropriate, including whether they are efficient and reliable.
  - g) The harm that a court-ordered disinterment of remains that did not meet DoD's disinterment standards would cause to DPAA's performance of its mission.
  - h) The qualifications, findings and conclusions of Plaintiffs' experts, John Eakin, Jonathan Davoren, and Cdr. (Ret.) Renee Richardson.

**Dr. Calvin Y. Shiroma**

13. Dr. Calvin Y. Shiroma DMD, MAGD, ABGD is currently is the Laboratory Manager for the Odontology Section of DPAA's Scientific Analysis Directorate, and has served in that position since 2009. He also conducts scientific analysis, and field/joint forensic reviews of human dental remains, and authors and peer reviews the odontology portions of disinterment memoranda. Dr. Shiroma has been employed by DPAA or JPAC since 2008, and prior to that he served as an Active Duty Forensic Odontologist for three years at Central Identification Laboratory-Hawaii (CILHI).

14. Dr. Shiroma received his DMD in 1985 and is a retired US Army Dental Officer (Colonel) who served in multiple duty stations. Dr. Shiroma is a Member of the Academy of General Dentistry and American Society of Forensic Odontology, and is a Fellow of the Odontology section of the American Academy of Forensic Science.

15. Dr. Shiroma has published extensively on past conflict accounting forensic odontology and human identification. His board certifications include Masters Academy of General Dentistry (MAGD) and American Board of General Dentistry (ABGD)

16. Given his knowledge and experience, Dr. Shiroma will testify generally about the DPAA's efforts to recover and identify remains of World War II servicemembers from the Philippines. He will also testify generally about the DoD's standards for disinterment from permanent U.S. military cemeteries and DPAA's process for making recommendations regarding such disinterments. He will testify specifically about the personnel and medical record evidence relevant to the servicemembers and graves at issue in this case. Dr. Shiroma will rely on his participation in the disinterment process, his years of experience in forensic odontology and human identification, his research on human dental remains and dental treatment procedures, his

knowledge of the relevant cases, his review of Plaintiffs' expert reports, and his review of documents produced in discovery in this case, including individual deceased personnel files (IDPFs) and unknown files.

17. More specifically, Dr. Shiroma is expected to testify about the following areas:
  - a) Historical and current methods for comparing dental records and their reliability.
  - b) The available physical information related to the unaccounted-for servicemembers Plaintiffs have identified as their relatives: 1LT Nininger, BG Fort, COL Stewart, TEC4 Bruntmyer, PFC Hansen, and/or PVT Morgan.
  - c) The current status of DPAA's research regarding BG Fort and regarding the remains in Manila American Cemetery Grave L-8-113.
  - d) The current status of DPAA's research regarding COL Stewart and regarding the remains in Manila American Cemetery Grave N-15-19.
  - e) The role of odontological research in disinterment decisions regarding Cabanatuan common graves.
  - f) The role of odontological examination in DPAA's post-disinterment identification effort, including specifically Cabanatuan Common Grave 717.
18. The following is a summary of the most relevant facts Dr. Shiroma will address:
  - a) The dental records for the remains designated as Manila #2 X-1130, Manila #2 X-3629, and Leyte #1 X-618.
  - b) The dental records for 1LT Nininger, BG Fort, COL Stewart, TEC4 Bruntmyer, PFC Hansen, PVT Kelder, and/or PVT Morgan.
  - c) The dental records for the candidates for comparison to Manila #2 X-1130, Manila #2 X-3629, and Leyte #1 X-618.
19. Based on his knowledge and experience, Dr. Siroma is expected to offer opinion on the following:
  - a) Whether the remains of 1LT Nininger, BG Fort, COL Stewart, TEC4 Bruntmyer, PFC Hansen, and/or PVT Morgan have been identified.
  - b) Whether the remains designated as Leyte #1 X-618, which are currently buried in Manila American Cemetery Grave L-8-113, are likely those of BG Fort.

- c) Whether the remains designated as Manila #2 X-3629, which are currently buried in Manila American Cemetery Grave N-15-19, are likely those of COL Stewart.
- d) Whether DoD's standard for disinterment of Manila American Cemetery Graves J-7-20, L-8-113, and/or N-15-19 has been met.
- e) Whether DoD's procedures for compiling and weighing odontological research in its program for disinterring and identifying unaccounted for servicemembers are appropriate, including whether they are efficient and reliable.
- f) The harm that a court-ordered disinterment of remains that did not meet DoD's disinterment standards would cause to DPAA's performance of its mission.
- g) The qualifications, findings and conclusions of Plaintiffs' experts, John Eakin, Jonathan Davoren, and Cdr. (Ret.) Renee Richardson.

**Dr. Timothy P. McMahon**

20. Dr. Timothy P. McMahon currently is the Director of DoD DNA Operations for the Armed Forces Medical Examiner System (AFMES). From October of 2016 until selected for his current position in April of 2017, Dr. McMahon served as the Director of the Armed Forces DNA Identification Laboratory (AFDIL), a section of DoD DNA Operations. From 2012 to 2016, he served as Director of Forensic Services within AFDIL.

21. Dr. McMahon is a Forensic Specialist with over 16 years of specialized experience in overseeing receipt, forensic analysis, forensic research and return of physical evidence associated with criminal investigations and has over 26 years of biology, biochemistry and molecular biology experience. He received a PhD in Biomedical Sciences from the School of Public Health at the University of Albany, New York in 2001. His graduate studies and post-doctoral research were performed in the division of Infectious Disease and Immunology at the New York State Department of Health. From 2002 to 2007, he worked for the American Registry of Pathology as a contractor supporting AFDIL and AFMES. From 2007 to 2012, Dr. McMahon worked for Applied Biosystems where he was responsible for developing an organization to help create new

DNA forensic laboratories and aided established government crime laboratories with implementing new automated and manual forensic technologies.

22. Dr. McMahon currently is responsible for managing 150 contract scientist and support staff in meeting DoD mission requirements of performing DNA sequencing and testing on human remains for the AFMES and the Defense POW/MIA Accounting Agency (DPAA), criminal paternity testing for military investigative organizations, sample switches for military treatment facilities, and other Government, State or Local agencies as dictated. This includes serving as the AFMES subject matter expert on DNA, molecular biology, virology, biochemistry, genetics, DNA forensic applications, emerging technologies & research initiatives, and laboratory design & management. Dr. McMahon is also responsible for guiding DoD DNA Operations in its development of new testing technologies, for developing and implementing growth plans to meet AFMES and DPAA needs, and for serving as a DoD subject matter expert in DNA human remains testing.

23. In each of his positions with AFMES since 2012, Dr. McMahon has been involved in and responsible for all DNA testing performed on samples provided by DPAA in its efforts to account for servicemembers from World War II and other conflicts; DNA testing provided by AFMES to account for servicemembers from current day losses; and overseeing research initiatives for developing novel forensic DNA testing procedures to meet mission requirements. This includes testing on numerous remains from World War II, including Cabanatuan POW Camp No. 1 and other remains that passed through the Manila Mausoleum before burial as unknowns at Manila American Cemetery, as well as remains from Korea, Vietnam, and Cold War losses.

24. Given his knowledge and experience, Dr. McMahon will testify generally about AFDIL, the only DoD forensic DNA testing laboratory for the identification of human remains, including its organization, operation, and credentials. He will also testify generally about DNA testing, including the challenges of testing aged and/or challenged human remains.

25. More specifically, Dr. McMahon is expected to testify about the following areas:

- a) DNA extraction and testing of aged remains, including alternative testing methods and the strengths and weaknesses of each type.
- b) AFDIL's specialized tools and experience with DNA extraction and testing of aged remains.
- c) AFDIL's family reference sample database, including the particular samples relevant to this case.
- d) AFDIL's past accounting program and its procedures, safeguards, and results.
- e) AFDIL's testing of samples from remains associated with Cabanatuan Common Grave 717 and other Cabanatuan Common Graves that have been disinterred.
- f) AFMES's statutory identification authority for remains from the past conflicts accounting program.
- g) The comparison between AFDIL's capabilities and those of other laboratories, such as Bode Cellmark Forensics.

26. The following is a summary of the most relevant facts Dr. McMahon will rely upon:

#### **DNA Testing**

- a) All human cells with a nucleus contain two types of DNA: 1) nuclear DNA, which is found within the nucleus of the cell; and 2) mitochondrial DNA (mtDNA), which is found within the mitochondria of the cell. Both of these types of DNA can be utilized for human identification and forensic testing.
- b) Nuclear DNA, which is found as a single copy within all nucleated cells, is what is most commonly used for human identification and forensic DNA testing of modern DNA criminal samples. Nuclear DNA is made up of 23 pairs of chromosomes (22 pairs of autosomes and one pair of sex chromosomes) for a total of 46 individual chromosomes. There are two types of DNA test that can be performed on nuclear DNA: autosomal short tandem repeat (auSTR) and Y chromosomal short tandem repeat (Y-STR).

- c) Autosomal STR testing uses specific, well defined locations (or loci), which are found throughout the 22 pairs of autosomal chromosomes and the sex determining chromosome pair (the X and the Y). Each locus consists of a short sequence, commonly referred to as an autosomal short tandem repeat (auSTR), and the quantity of these repeats determines the specific 'numerical value' associated with each locus. The 'numerical values' for each locus are combined to make up your 'STR profile'. You will always share half of your numerical values with your biological mother and half with your biological father, but you may not necessarily share any numerical values with your siblings.
- d) Y-STR analysis is only possible on male individuals, as it is an analysis of locations (or loci) on the Y-chromosome. The 23rd chromosome pair is responsible for determining the sex of an individual, with women having two X chromosomes (XX) and males having one X chromosome, which is donated from the mother, and one Y chromosome, which is donated from the father (XY). Y chromosomal DNA is passed from father to son thru the paternal lineage. It is extremely stable, does not change from generation to generation, and is rich in well-defined short tandem repeats. Although Y-DNA is not unique to a specific person—as all individuals in a family's paternal lineage share it—it is useful since any male of the paternal lineage can serve as a reference.
- e) Mitochondrial DNA (mtDNA) is located in the mitochondria of the cell, and within a single cell hundreds to thousands of mtDNA molecules can be found. MtDNA is only transmitted through the maternal line. This sharing among a maternal lineage makes it extremely useful when dealing with cases where viable nuclear DNA references are unavailable. For example, a maternal fourth cousin will still have the same mtDNA profile as a sibling, making this type of testing invaluable as the cases extend further back in time. Even after many years, during which time all DNA degrades to some extent, mtDNA can be found in very small fragments of biological material. If it is of sufficient quality, it can be tested and a sequence can be generated. MtDNA testing is different from nuclear DNA testing in that, instead of determining the numerical value at a specific location, the testing determines the individual's DNA base composition within a set region. When an individual's base composition is compared to a set reference, the base differences or 'polymorphisms' make up an individual's mito-type.
- f) When extracting DNA from a DPAA sample, AFDIL recovers all human and non-human (bacterial etc.) DNA. With highly degraded or chemically modified samples, the amount of bacterial DNA far exceeds the amount of human DNA. Current Next Generation Sequencing (NGS) methods allowed for the recovery of human DNA, but it was lost in the amount of bacterial DNA that was co-sequenced. To enrich for the human DNA, AFDIL developed probes or baits to capture the human mitochondrial DNA. The human mtDNA specific baits developed by AFDIL for this method, allowed AFDIL to capture and enrich for the human mtDNA over the bacterial DNA. The NGS mtDNA capture method is not a commercially available method, but is a method solely developed by AFDIL to assist with obtaining DNA results from highly degraded samples. Although initially developed for chemically modified samples,

this method has also been used with highly degraded samples from Vietnam, World War II and Korea.

- g) The NGS mtDNA capture assay sequences the whole mtDNA genome, which allows individuals who share a common mtDNA control region sequence to be segregated. AFDIL's traditional mtDNA sequencing method, known as Sanger Sequencing only looks at the mtDNA control region. The mtDNA control region is only approximately 1200 base-pairs out of the full 16,569 base-pairs. The mtDNA control region has been used since 1991 to assist in the identification process as it has a high degree of variation between individuals, however, its weakness is that there are common sequences among the different populations. For example, about 7.7% of all Caucasians share a common mtDNA control region sequence, but about 80% of all Caucasian mtDNA control region sequences occur less than 0.5% of the time in the population. The NGS mtDNA capture assay allows for the sequencing of the whole mtDNA genome and where individuals may have a common mtDNA control region sequence, they differ across the whole genome.
- h) All three types of DNA tests can be used to aid in the identification of missing service members. All of the DNA information can be used to calculate a combined likelihood statistic. The likelihood statistic assesses the evidential support for the identification hypothesis that the DNA from the unknown sample is biologically related to the associated references (auSTR, Y-STR and mtDNA).
- i) Different DNA testing methods have different strengths and weaknesses when testing highly degraded samples and their use in the human remains identification process. For example, in criminal DNA forensic cases, where the goal is to identify an unknown individual from among the world's population (~7 billion people), then autosomal STR's (nuclear DNA) from a direct reference may prove to be the most definitive method, as it is an exact match to the suspected individual. However, for identifications involving missing individuals in closed populations (specific loss incident), the combination of mtDNA and/or Y-STR and/or auSTR testing can be the most effective method. MtDNA testing also is highly effective in compromised skeletal cases—such as aged remains and remains degraded by environmental conditions—because of its durability and high-copy number per sample. Additionally, mtDNA is key in situations where autosomal (auSTR) or paternal (Y-STR) reference samples may be difficult to obtain.
- j) The biggest challenge to obtaining results from aged remains is DNA degradation both from the environment (acidic soil, temperature, humidity) and post mortem effects (fire, chemical treatment, and time). As a result, the samples received by AFDIL's past accounting section that have not been chemically treated have an average mtDNA size between 100 and 300 base pairs and an average nuclear DNA size between 100 and 400 base-pairs. For remains that have been chemically treated, including many remains coming from Manila American Cemetery, the average size is significantly smaller. Modern DNA samples that have not been degraded generally have sizes greater than 400 base pairs. To counteract the effects of degradation, laboratories need the flexibility to employ a variety of testing strategies.

- k) An additional challenge is finding appropriate references for the missing service members. Some service members have no apparent living relatives. Many others have no autosomal references (mother, father, brother, sister, children), but do have a maternal or paternal reference. Thus, the use of lineage markers (mtDNA and Y-STR) as well as auSTR opens up the number of viable references and increases the chance of success. The farther afield one goes for references, however, the more references may be needed. For example, cousins only share about 12.5% of the DNA with each other, so due to inheritance patterns, it would take more than two references from both the paternal and maternal side to develop a sufficient reference. Locating so many relatives becomes progressively more difficult as time passes.

### **The Armed Forces DNA Identification Laboratory (AFDIL)**

- l) The Armed Forces DNA Identification Laboratory (AFDIL) was established in 1991 as the only DoD forensic DNA testing laboratory for the identification of human remains. AFDIL's present day accounting and past accounting sections provide the DoD and other federal and international agencies with human identification DNA testing support in the areas of personnel accounting, national security, law enforcement, humanitarian missions, and defense. The primary missions of AFDIL are to provide: (1) forensic DNA testing of remains and other biological evidence in support of identification efforts through its past accounting section, which supports the DPAA, as well as its present day accounting section, which supports the Office of the Armed Forces Medical Examiner; (2) to create a conflict-specific mitochondrial DNA (mtDNA), autosomal short tandem repeat (auSTR), and Y chromosome short tandem repeat (Y-STR) family reference database for use in the past accounting identification process; (3) to modify or create new methods to increase the present and past accounting sample success rates; and (4) to provide worldwide consultation, research, and education services in the field of forensic DNA to the DoD and other agencies.
- m) AFDIL is comprised of six sections:

Current Day Operations: Works directly with the Office of the Armed Forces Medical Examiner system to assist with human remains DNA testing for the identification of service members killed in current theaters of operation or training mishaps, and to assist military criminal investigative organizations with criminal paternity or kinship analysis cases. The section leads with nuclear DNA testing as we have direct references in the form of a DNA reference card.

Past Accounting Operations: Works directly with the DPAA and the AFMES to perform mtDNA (control region and whole genome) sequencing (Sanger and NGS), auSTR, and Y-STR testing on specimen samples submitted from WWII, Korea, Vietnam, and the Cold War. This section utilizes a team approach for efficiency and allows the greatest flexibility to meet changing DPAA requirements.

Family Reference Specimen-Laboratory Automation: Works directly with the service causality offices and the past accounting section to process all of the family

references that are submitted for inclusion in AFDIL Family Reference Database. This database is an internal database that is protected by HIPAA and only AFDIL scientist have access to. The family reference database is used by the past accounting section to compare the results generated from unknown specimens to the FRS specific conflict or person.

Emerging Technology: Responsible for developing the new methods that are currently not commercially available but are needed to handle the highly degraded samples processed by AFDIL. These include the demineralization buffer that is used by most laboratories now and most recently the Next Generation mtDNA Capture assay.

Validation and Quality Control: AFDIL employs both commercially available reagents as well as reagents that are generated in house. All of these reagents must meet defined validated procedures and accreditation requirements. This section is responsible for performing all of the validation, performance checks, and quality control of the instruments and reagents used by the casework sections.

Quality Management and Training and Education: This section is responsible for the training of all scientists to meet accreditation requirements, maintenance of AFDIL's accreditation, and the management of all proficiency tests assigned to qualified scientists.

- n) In 1998, AFDIL received its American Society of Crime Laboratory Directors - Laboratory Accreditation Board (ASCLD) and Federal Bureau of Investigation-Quality Assurance Standards (FBI-QAS) accreditation in Biology for nuclear and mitochondrial DNA testing and has been accredited continuously since 1998. AFDIL was one of the first laboratories accredited by ASCLD for mtDNA testing. In 2014, AFDIL successfully underwent reaccreditation from the ASCLD-Legacy program to the American Society of Crime Laboratory Directors - Laboratory Accreditation Board (ASCLD-LAB) International Program, which found AFDIL to be in compliance with the International Organization of Standardization (ISO) 17025, ASCLD-LAB Forensic Requirements, and the Federal Bureau of Investigations Quality Assurance Standards (FBI-QAS) for Accreditation. AFDIL has maintained its accreditation through each interim review process. ASCLD-LAB has now been acquired by the ANSI-ASQ National Accreditation Board (ANAB), and AFDIL is in the process of renewing its accreditation through ANAB.

### **Family Reference Samples**

- o) AFDIL maintains a collection of family reference samples to support comparison of DNA testing results from unidentified remains. Collection began in 1991, focused on family members associated with Vietnam losses, and in 1995 expanded to include family members associated with Korean War losses. After Congress provided additional funding to the service causality offices in 2010, DoD has engaged in a substantial push to gather all references for losses associated with World War II, Korean War, Vietnam War, and Cold War. Due to this collection effort, AFDIL

currently has 92% coverage for Korean War missing service members; 85% for the Cold War, 85% for the Vietnam War, and 6% for World War II.

- p) AFDIL receives and processes all family reference samples and maintains the family reference database. The service casualty offices are responsible for identifying suitable family references and sending the DNA collection kit to the family. AFDIL is actively asking that at a minimum, two maternal (mtDNA testing), two paternal (Y-STR Testing) and two autosomal (auSTR testing) references be collected when possible.
- q) AFDIL's family reference database is protected under the Privacy Act and Health Information Portability and Accountability Act (HIPAA). The database is only accessible by AFDIL scientists who have been approved to do comparison reports. It is not accessible to any outside individuals, including other DoD components.
- r) As of August 30, 2018, records indicate that AFDIL's family reference sample database includes the following samples relevant to the service members and remains at issue in this case:
- For 1LT Nininger: maternal niece and maternal nephew references, which permit mtDNA testing.
  - For BG Fort: two paternal granddaughter references, which permit auSTR testing.
  - For COL Stewart: one paternal grandson reference, which permits auSTR and Y-STR testing.
  - For TEC4 Bruntmyer: references to support mtDNA, auSTR, and Y-STR testing; also at least one type of FRS for six of the nine other servicemembers associated with Common Grave 704.
  - For PFC Hansen: paternal niece and paternal grandniece references, which are viable references for mtDNA or Y-STR; nor are these references ideal for auSTR testing due to genetic distance from servicemember; also at least one type of FRS for eight out of the twenty-five other service members associated with Common Grave 407.
  - For PVT Morgan: references to support mtDNA, auSTR, and Y-STR testing; also at least one type of FRS for three of the four other service members associated with Common Grave 822.

#### **AFDIL's Development of DNA Testing Methods and Tools**

- s) AFDIL has a demonstrated record of developing methods to meet the needs of the AFMES and DPAA and is considered a world leader in human remains DNA testing. AFDIL monitors success rates for testing and currently has a greater than 90% success rate for obtaining an mtDNA Sanger sequencing result from non-chemically

treated specimens, a greater than 55% success rate for auSTR and YSTR testing, and about a 47 success rate for NGS mtDNA results from chemically modified samples and highly degraded samples. Through monitoring, AFDIL has worked with DPAA to identify strategic sampling (specific bones) from chemically treated samples that increase success rates to 60% or higher. To consistently achieve these success rates, AFDIL extensively tests samples with in-depth troubleshooting to make them work and to develop innovative solutions.

- t) AFDIL developed and implemented in 1998 mtDNA mini-primer-sets and currently to its knowledge is the only laboratory that uses mini-primer-sets. The advantage is that the amplicon size is approximately half the size of mtDNA primer-sets that all other laboratories use. The drawback is that it is labor intensive and prone to contamination if appropriate procedures are not adhered to. Having the ability to use primer-sets and mini-primer sets increases the chance of success for specimens associated with DPAA. Currently, about 65% of all non-chemically treated DPAA specimens require mini-primer-sets to obtain results.
- u) In 2006, AFDIL developed advances, including the demineralization buffer, which have reduced the needed sample size from 2.5 g of bone to 0.2 g of bone and allowed for the complete digestion of the bone, which made it possible to recover what little nuclear DNA was present and to perform auSTR and Y-STR testing. The previous extraction method used by all forensic laboratories failed to release enough usable nuclear DNA for testing of highly degraded samples. These advances also allowed for submission of smaller bones that could not be visually distinguished as human. AFDIL developed and implemented a 12s rRNA test to determine if a bone extract was human or non-human, which allows AFDIL to stop testing non-human samples and focus on human samples.
- v) In 2007, AFDIL was part of the developmental validation and one of the first laboratories to utilize MiniFiler, the first commercial STR system to target degraded samples. And in 2013, AFDIL forensically validated a low copy Y-STR testing method that increased success rates with degraded samples.

In 2015-2016, AFDIL developed and forensically validated the Next Generation Sequencing (NGS) mtDNA Capture Assay and custom analysis software for analyzing NGS-derived mtDNA sequencing data. AFDIL was the first, and currently the only, DNA forensic testing laboratory in the United States with a forensically validated NGS sequencing method. This method was validated to meet the FBI's Quality assurance and ISO-17025 forensic laboratory standards and has passed two external accreditation reviews. This grew out of AFDIL's longstanding effort to meet the need to identify approximately 850 sets of remains that at the end of the Korean War that were treated with chemical agents (formaldehyde) to preserve the remains (known as the "Korean Punchbowl" remains). Conventional mtDNA Sanger sequencing methods worked less than 5% of the time for these specimens. AFDIL began successfully using this new sequencing method on Korean Punchbowl samples in March of 2016. AFDIL to date has processed more than 750 samples using its NGS mtDNA capture assay, which has led to more than 60 new identifications.

- w) Currently, AFDIL is the only forensic laboratory with a forensically validated NGS mtDNA testing method for highly degraded samples. This method was externally reviewed by an audit team in 2016 with no findings of any deficiencies. For disinterments associated with World War II sites like Cabanatuan, where the remains were chemically treated before final burial, and for highly degraded samples from Vietnam where traditional methods do not work, the NGS mtDNA capture assay is frequently the only method that will work.
- x) AFDIL, as part of a multi-laboratory team, performed the National DNA Index System (NDIS) testing on commercially available NGS forensic panels (auSTR, Y-STR, Ancestry SNPs, Phenotypic SNPs). The results from this testing were summarized, written up and submitted to the NDIS committee in late 2017, and are currently undergoing the review process. The team observed that the commercially available kits worked well for modern high copy criminal casework samples, but are not optimal for low copy or degraded samples. AFDIL does not find the commercially available kits useful for the past accounting mission.

#### **AFDIL's Past Accounting Program Procedures**

- y) Once samples are received by AFDIL for processing from the DPAA laboratory, the skeletal elements or biological material is signed over to an evidence custodian who photo-documents the remains and enters the information into the laboratory's information management system.
- z) The Technical Leader assigns samples to a team and the evidence custodian signs the specimens over to a DNA analyst for processing. Case samples are processed on a rolling basis, in the order they are received, unless the DPAA laboratory changes the priority of a specific sample. AFDIL has approximately 600 samples in progress at any one time.
- aa) The samples are cleaned, ground into a powder, and the powder is dissolved, which release all nuclear and mitochondrial DNA into a solution, include the endogenous human DNA along with all bacterial DNA and that of other organisms in the sample.
- bb) The DNA is then purified, concentrated and analyzed using mtDNA Sanger or NGS sequencing and/or Y-STR and/or auSTR testing methods. In 2013, success rates for mtDNA testing were 90%, but for STR testing were about 25% using organic purification methods. AFDIL looked at many different purification methods and identified a post PCR amplification purification kit that was shown to remove downstream inhibitors to sequencing. AFDIL forensically validated this kit for extract purification, which increased STR success rates to over 50%. AFDIL monitors results success rates and the current technological advancements and, through biweekly scientific meetings, establishes the requirements for developing, testing, validating and implementing technologies that will keep success rates high.
- cc) Each specimen is processed in duplicate, and the final results have to match in order for DNA results to be reported. This is a key aspect of AFDIL's quality assurance

measures and was supported by the Defense Science Board 1995. The average turn-around-time for processing a sample in duplicate (from extraction to DNA summary report) is approximately 85 days.

- dd) AFDIL performs two independent DNA analyses from the same skeletal specimens tested, using overlapping sequencing products, and dedicated separate laboratory rooms. When processing specimens in duplicate, each sample is extracted twice and processed to completion with the appropriate testing methods. To report out the duplicate extracts, the results between the individual extracts need to be consistent with one another; if the results are not consistent the samples are reported as “inconclusive.” This differs dramatically from how modern criminal casework is processed at commercial, state and local laboratories, where a single extraction and analysis is sufficient to report out a result. Due to the low quality of the samples AFDIL receives, it is very easy to amplify a modern contaminant over the low quality authentic DNA; and it’s why reproducibility of results are essential.
- ee) Based on the nature and the samples being tested and the maturity of the mtDNA family reference database, all samples are processed initially for mtDNA to gauge the quality of the sample and to allow AFDIL and DPAA scientists to segregate samples by mtDNA sequence. Once mtDNA control region profiles are obtained, and if paternal and/or nuclear references are available, Y- STR and auSTR testing is performed to help segregate samples with common mtDNA sequences or to aid further statistical relevance to the initial mtDNA results. When testing is complete, all of the DNA information (mtDNA and/or Y-STR/ and/or auSTR) can be used to calculate a combined likelihood statistic. The likelihood statistic assesses the evidential support for the identification hypothesis that the DNA from the unknown sample is biologically related to the associated references (auSTR, Y-STR and mtDNA). However, if references supporting auSTR and/or Y-STR testing are not currently available for missing service members or if such testing did not provide reportable results, AFDIL can perform whole genome mtDNA sequencing. Having a multifaceted approach with a variety of robust, reproducible, reliable testing procedures allows AFDIL to adapt to any casework scenarios presented by the samples and/or family references.
- ff) The entire testing procedure is carried out in the “blind”; this means that AFDIL DNA analysts do not know the potential identity of the individual for the specimen being tested. Analysts are informed of the conflict (i.e. Vietnam, Korea, or World War II), and where the remains were found, as environmental conditions specific to loss location will play a role in the extraction and DNA process.
- gg) The DNA results, when appropriate, are compared to the family reference database and these results are reported back to the DPAA Laboratory. The report is known as a “Believe to Be” report and follows established FBI-QAS requirements. In about 80% of all identification made by the DPAA, AFDIL’s DNA results are used to support the identification.

### **Cabanatuan Common Grave 717**

hh) DPAA disinterred ten sets of unknown remains associated with Cabanatuan Common Grave 717 in 2014. DPAA later procured the disinterment of three more sets of remains associated with this common grave, and is still seeking approval to disinter one additional set of identified remains associated with this common grave. DPAA has submitted more than 250 samples to AFDIL from these remains, and AFDIL has completed about 375 tests, including mtDNA Sanger, mtDNA NGS, auSTR, and Y-STR. Testing remains ongoing, with about eight samples still in process.

### **Bode Cellmark Forensics**

- ii) Bode Cellmark Forensics (Bode) is a DNA testing laboratory located in Lorton, Virginia. Both AFDIL and Bode are accredited under the same standard—the ASCLD/LAB-International accreditation. But that does not mean that Bode has the same tools available, the relevant experience, or appropriate procedures for dealing with aged remains such as those at issue in this case.
- jj) To compare laboratories on the basis of metrics such as success rate, one must ensure that they involve comparable types of samples (e.g., highly degraded samples versus contemporary criminal casework).
- kk) Dr. Davoren’s report states that “Bode has tested and obtained DNA testing results from other WW2 remains buried in Europe.” This refers to testing Bode did for Private First Class (PFC) Lawrence Gordon, a Canadian citizen fighting with the U.S. Army in France. An independent researcher, Jed Henry, provided historical research that led to the disinterment of remains from a German cemetery in France that were subsequently identified as PFC Gordon. Mr. Henry reported that he obtained permission to disinter the remains from the French and German governments. He also reported that France’s national crime lab, L’Institut National de Police Scientifique (INPS) obtained a mtDNA profile from a tooth sample that matched that of PFC Gordon’s maternal nephews. He reported that INPS sent additional samples to Bode and the University of Wisconsin, which obtained mtDNA sequences that were consistent with INPS’s findings. Bode also obtained a nuclear DNA profile from the sample which it successfully compared to eight of PFC Gordon’s maternal nephews. After Bode and the University of Wisconsin provided their reports to DoD in 2014, AFDIL reviewed the material and concluded that the reported statistics were consistent with the DNA results.
- ll) Dr. Davoren’s report states that “Bode has tested and obtained DNA testing results from . . . some remains from a tropical island.” This refers to testing Bode did on certain remains recovered from Betio Island in the Tarawa Atoll in 2015. The island is the site of a four day battle in November 1943, for which hundreds of U.S. casualties remain unaccounted for. The battlefield burials involved little recordkeeping or markers, and Japanese soldiers and Korean laborers were sometime intermingled with U.S. casualties. Subsequent construction without recordkeeping further obscured burials. DoD has made periodic efforts to recover remains from the

Tarawa Atoll. In June 2015, History Flight, Inc., an independent research organization, conducted excavations on Betio Island and recovered approximately thirty-five sets of remains from a single site. An unspecified number of these remains were provided to Bode to conduct testing.

mm) In 2015, History Flight, Inc., turned over material evidence and about thirty-five sets of remains to the DPAA laboratory. It also provided Bode's testing results for one set of remains. AFDIL subsequently tested all of the remains with a high success rate. For remains from Betio Island, AFDIL's rate of successful testing is higher than 90%.

27. Based on his knowledge and experience, Dr. McMahon is expected to offer opinion on the following:

- a) How the likely condition of the remains at issue here would impact DNA testing efforts.
- b) How the available family reference samples for the servicemembers Plaintiffs hope to identify would impact DNA testing efforts.
- c) Whether DNA testing is sufficient, standing alone, for identification.
- d) Whether AFDIL has the capacity and capability to complete the DNA testing necessary to assist DPAA in its mission to account for unaccounted for servicemembers from past conflicts.
- e) Whether AFDIL's current methods are deficient.
- f) Whether Bode has demonstrated that it has the capacity to complete DNA testing of the remains at issue in this case.
- g) That Bode's track record with regard to the PFC Gordon and Tarawa remains does not support the conclusion that they have the capability to reliably obtain results from aged remains from Pacific islands.
- h) Whether DNA testing by Bode is likely to advance DoD's identification efforts.
- i) The harm that unsuccessful or mishandled testing by Bode could do to DoD's identification efforts.
- j) The findings and conclusions of Plaintiffs' experts, Jon Davoren, Adrienne Borges, John Eakin and Cdr. (Ret.) Renee Richardson.

28. Defendants reserve the right to supplement these disclosures as additional information becomes available through the discovery process or otherwise becomes known to Defendants, or as otherwise appropriate.

Dated: August 31, 2018

Respectfully submitted,

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**CERTIFICATE OF SERVICE**

I hereby certify that on this 31st day of August, 2018, I electronically filed the foregoing with the Clerk of Court using the CM/ECF system which will send notification of such filing to the following:

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