



FY 2017 Secretary of Defense

Environmental Awards

Cultural Resources Management, Individual/Team
Mr. Thomas Edward Penders

Introduction

Mr. Thomas Edward Penders is the Cultural Resources Manager for the 45th Space Wing (45 SW), *The Premier Gateway to Space*. He supports mission related activities at Cape Canaveral Air Force Station (AFS), Patrick Air Force Base (AFB), Malabar Transmitter Annex (MTA), and the Jonathan Dickinson Missile Tracking Annex (JDMTA). These installations cover approximately 19,000 acres and represent one of the most significant historic and future aspects of the United States space program. Mr. Penders preserves and protects history while moving toward new and exciting space programs on the same properties.

Background

As 45 SW Cultural Resources Manager and Archaeologist, Mr. Penders conducts archaeological surveys, historic property surveys, and construction monitoring, as well as writing subsequent reports submitted to the State Historic Preservation Office



Mr. Thomas Penders

Mr. Penders is the Cultural Resources Manager for the 45th Space Wing. In this capacity, he oversees cultural resources at Cape Canaveral AFS, Patrick AFB, MTA, and JDMTA.

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(SHPO) per Section 106 of the National Historic Preservation Act (NHPA) and Archaeological Resources Protection Act (ARPA). Mr. Penders is the manager of over 500 cultural resources including archaeological sites (prehistoric and historic), historic missile sites, launch complexes, the Man in Space National Historic Landmark District, World War II resources, cemeteries, a lighthouse, and historic missiles. Also included in his area of expertise is managing fossil remains of extinct mammals known as megafauna. He regularly conducts Government-to-Government consultations with the federally recognized tribes regarding ARPA, Native American Graves Protection and Repatriation Act (NAGPRA), and Traditional Cultural Properties. Mr. Penders is actively involved in National Environmental Protection Act (NEPA) consultations which include assisting the 45 SW with Environmental Impact Statements, Environmental Assessments, and Environmental Baseline Survey documents. He consistently works five years ahead of proposed construction projects so there is always time to resolve issues without impacting schedules. Mr. Penders maintains his 40-hour Occupational Safety and Health Administration Hazardous Waste Operator certification which allows him to work on archaeological sites that contain contaminated soils and groundwater. Normally this would require contracting out specialists to work on these sites.

Summary of Accomplishments

Mr. Penders has over 32 years of experience in archaeology and is considered a subject matter expert on the prehistoric and historic periods of the Florida Space Coast. He uses his expertise to conduct most cultural resources surveys in-house, including six archaeological surveys which have saved the Air Force \$480,000 in contractor support. His surveys have paved the way for use of lands

identified in the 45 SW General Plan for future development while complying with federal regulations.

Mr. Penders completed in-house historic property surveys for MTA and JDMTA and completely assessed six historic launch complexes for National Register of Historic Places (NRHP) eligibility. His internal efforts equated to 200 facility surveys and assessments, saving the Air Force \$350,000 in contractor support.

In an effort to maximize available funds and ensure compliance with the NHPA, Mr. Penders initiated a six-year program to conduct high definition 3-D laser scanning of six launch complexes listed as National Historic Landmarks and launch-related facilities slated for demolition or reuse. The scanning surveys are the best available technology to preserve history. Scanning incurred a total cost of \$83,000, saving the Air Force \$80,000 per complex, for a total savings of \$480,000 versus completing costlier and more typical Historic American Building Surveys (HABS) or a Historic American Engineering Records (HAER). In addition, the projects are being used to track facility deterioration to ensure stabilization occurs in the most cost effective manner. Mr. Penders was the first person in Florida to obtain approval from the Florida SHPO for the use of laser scanning as an improved replacement for HABS or HAER as mitigation for demolition when used in conjunction with previously completed historic surveys. In response to his consultation packages, the Florida SHPO has acknowledged that Mr. Pender's are the best seen from anyone in the state.

Overall Cultural Resources Management

Mr. Penders understands that project funding and planning are essential to timely project completion, and seeks alternative approaches

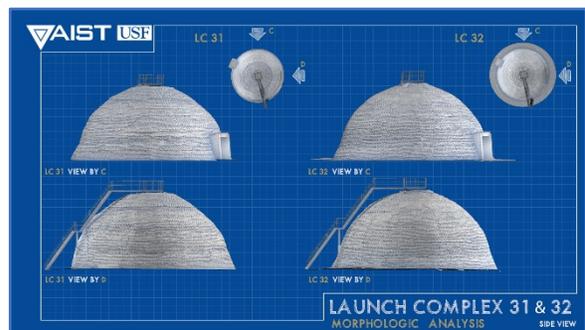
to enhance the Cultural Resources Management program while at the same time saving the Air Force money. Mr. Penders has developed an informal partnership with the University of Central Florida's Department of Anthropology to provide volunteers for no cost archaeological surveys, excavations, cemetery documentation, and artifact analysis. He has also developed a 10-year plan to assess NRHP eligible archaeological sites and provide comprehensive reports. The reports will be used to identify projects to mitigate potential site impacts in 20 years from projected sea level rise.



Examining a 1,000 Year-Old Artifact

Mr. Penders and a college student volunteer examine a 1,000-year-old artifact. The artifact was found at a prehistoric Native American archaeological site on Cape Canaveral AFS.

Mr. Penders established a partnership with the University of South Florida to use their high definition 3-D laser scanning capability. Digital documentation surveys use highly accurate terrestrial laser scanning and 3-D spatial technologies to record a representative assortment of historic structures for preservation planning and management, archiving, and education. These comprehensive methods engage public interest in Department of Defense (DoD) cultural resources.



Launch Complex Scanned 3D Views

Depicted here are Launch Complex 31/32 “beehive blockhouses.” These are the only two buildings of this type in the world and were documented by the University of South Florida using high definition 3D laser scanning. The scans were part of a five-year study of historic launch complex degradation on Cape Canaveral AFS.

All work conducted by Mr. Penders takes into consideration short-term and long-term development plans, mission impacts, and general operations such as building construction, maintenance, and repair. He has conducted and expedited surveys and consultations with the SHPO and National Park Service (NPS) for the reuse of historic launch complexes and related facilities for commercial and other DoD launch customers. Every project involving historic facilities is reviewed and monitored.

Rather than hire a contractor to develop the 45 SW Integrated Cultural Resources Management Plan, Mr. Penders wrote the current plan himself and updated the historic status of all facilities and archaeological sites evaluated up to fiscal year 2016. He is also responsible for annual updates. This initiative has saved \$85,000 in contractor support.

Mr. Penders is credited with finding paleontological sites containing fossil remains of extinct mammals known as megafauna outside of base property and has been used as an expert by NASA to identify fossil remains on their lands at the Kennedy Space Center. Mr. Penders established a partnership with the Department of

Anthropology at Florida State University to further investigate the potential for paleontological sites on 45 SW property. The paleo-environmental survey determined the potential for paleontological sites, researched age and environments over time, and tracked prehistoric land use. Efforts fine-tuned a predictive model for prehistoric archaeological site presence and the potential for sites dating from the Paleoindian Period through Malabar Period (11,000 BC to AD 1565). Continuing research has helped to identify and inform decisions on future land development.

Historic Buildings and Structures

Mr. Penders works closely with base civil engineers, as well as launch partners, to promote the reuse of historic facilities and ensure appropriate rehabilitation, maintenance, and repair in accordance with the Secretary of the Interior's Standards for historic properties. He collaborates with the project proponent and regulators to find common ground for historic facility use that keeps the historic character intact while using modern and cost effective materials.

Historic Cemeteries Preservation

The 45 SW is responsible for eight historic cemeteries at Cape Canaveral AFS that had suffered from years of neglect. Mr. Penders undertook a multi-disciplined approach to mitigate the adverse effect of demolition by neglect while ensuring compliance with federal preservation requirements. He hosted the Florida Public Archaeology Network's Cemetery Restoration and Preservation Training class on the methodology behind headstone cleaning and preservation. Mr. Penders undertook a project to improve and stabilize the cemeteries, which included marking unmarked graves with permanent grave markers, replacing fences, and repairing broken markers, ensuring compliance with the Florida Unmarked

Grave Law. His efforts resulted in Air Force cost savings of \$100,000 and mitigated demolition by neglect. The project also had a positive public impact. During the annual Descendants Day event, visiting families of those buried in the cemeteries expressed appreciation for the tremendous improvements.



Wilson Graves Before

Burnham Cemetery on Cape Canaveral AFS, eligible for the National Register of Historic Places, includes the remains of early American pioneers like the Wilson family. This photograph depicts years of historic grave marker neglect.



Wilson Graves After

This photo depicts the condition of the Wilson family grave markers after Mr. Penders implemented a stabilization plan at Burnham Cemetery. Mr. Penders conducts an annual cemetery inspection and grave marker cleaning program.

Archaeological Resources

During the accomplishment period, Mr. Penders conducted or oversaw archaeological resource surveys on 1,668 acres of Cape Canaveral AFS, Patrick AFB, MTA, and JDMTA. Of this total acreage, approximately half were determined as no further action regarding any NRHP eligible sites. As a result of the surveys, it was determined that approximately half of the

acreage and associated eligible sites required no further action under the NRHP.

Mr. Penders is considered one of a handful of specialists in aerospace archaeology in the United States. He has investigated three missile crash sites and one World War II airplane crash site on Cape Canaveral AFS. As a result, he has published professional journal articles and has presented at archaeological conferences. He is considered an expert on the Indian River Cultural Area and the Malabar Period. He is also author of a chapter of the book, *The Mississippian Period of Florida*.

Native American Program

Mr. Penders organized the repatriation of 59 Native American remains at Cape Canaveral AFS. A site was chosen that contains a previously recorded burial mound with human remains scattered throughout the archaeological site. Rather than risk exposing additional human remains, Mr. Penders created a modern mound that can be used for current and future repatriation. His work with the tribes was above and beyond the requirements under NAGPRA and improved relations with the federally recognized tribes. His trusted relationship with the tribes allowed him to conduct reburial of human remains.

Curation

Mr. Penders obtained a no cost curation facility with the NPS at Canaveral National Seashore via a memorandum of agreement. The memorandum ensures the Air Force is in compliance with federal regulations and resulted in \$6,000 in annual savings. At the same time over 3,000 artifacts are now properly curated and space is available for more. Mr. Penders conducts inspections of the building on a regular basis to ensure the collection maintains federal standards.

Per the terms of the memorandum, researchers and the public are not allowed access to the curation facility without approval. However, Mr. Penders maintains a database of the collection which is available to anyone interested in conducting research on the materials. Artifacts are also available for viewing by the public at outreach events.

Community Relations

Mr. Penders has deep roots in the community when it comes to cultural resources. He is the founder of Archaeologists for Autism, whose mission is to unlock the potential of children with developmental disabilities. The association sponsors an annual event where children with autism spectrum disorders and their families experience archaeology in a fun environment. Most of these children would



Burial Mounds

Mr. Penders created a NAGPRA repatriation mound (shown in the foreground) so there is no disturbance of prehistoric burial and scattered remains known to be at this site. The prehistoric Burns Burial Mound is located in the background.

not be able to experience archaeology without this event. Mr. Penders is supported in this effort by 45 SW military and civilian personnel as well as the base Air Force Space and Missile Museum. In the past two years, over 185 families from Florida and nearby states have attended the event.

Mr. Penders is the volunteer archaeological consultant for the Brevard County Environmentally Endangered Lands (EEL) Program. He conducts archaeological surveys on Brevard County lands and assists with their cultural resources management plans. His reports are used by the EEL Program for interpretive displays. For his work with the EEL Program, Mr. Penders received the Jefferson Award for Public Service, one of the highest National awards for volunteerism.

In the past two years, Mr. Penders has participated in the annual Space Coast Birding and Wildlife Festival, presented papers at the Brevard Museum of Science and History, St. Augustine Archaeological Association, Florida Anthropological Society annual meeting, and the annual meetings of the Southeastern Archaeological Conference. His presentations have focused on aerospace archaeology, general public education on the history of Cape Canaveral AFS, and technical applications for professional archaeologists.

Mr. Penders maintains affiliations with the Florida Anthropological Society, Society for American Archaeology, Society for Historic Archaeology, and the Southeastern Archaeological Conference. He was the past president of the Indian River Anthropological Society and has served as an advisor to the North Brevard Heritage Foundation and continues to serve as an advisor to the Cape Canaveral Lighthouse Foundation.

Through partnering with the University of South Florida high definition 3-D laser

scanning project, university students have received classroom and in-the-field training. Students are responsible for creating educational posters which have been provided to the 45 SW for use in the cultural resource program. The data has also been shared on YouTube and social media where the general public can take “fly through rides” of National Historic Landmark complexes without leaving their chairs. Educational videos were also created by University of South Florida students with the ultimate plan to develop a virtual tour through history of the historic launch complexes. Since the base is a secured facility it will allow the general public to have virtual visits to historic sites. In addition, data from the project to date was given to the National Archives and Records Management in Washington, DC.

Mr. Penders developed a relationship with the Underwater Archaeology Department of the Bureau of Archaeological Research and an Army Corps of Engineers contractor working on an underwater archaeological survey off the coast of Cape Canaveral AFS where he identified 1950s and 1960s rocket and missile crash sites. During the accomplishment period, one of the most significant shipwrecks in Florida history was found off the coast of Cape Canaveral AFS that will have significant historical implications for this region.

Mr. Penders has enhanced the general public’s opportunity at an unprecedented look into the history and prehistory of 45 SW lands and has made community involvement a top priority. He strives to exemplify the message that the DoD is a good steward of the past and committed to protecting national cultural assets.

Mission Enhancement

Mr. Penders assisted commercial launch partners with the identification and implementation of launch site reuse. Mr. Penders conducted archaeological and historic property surveys as well as fast-tracked consultation with regulators to ensure the Air Force and partners met timeline milestones without delays. The reuse of two launch complexes and surrounding lands by a commercial launch entity created a unique set of problems. The two complexes are associated with the early space program and the lands surrounding them contain previously recorded archaeological sites. The launch complexes as well as the historic and prehistoric archaeological sites required consultations to adequately address any current or future impacts. In addition, only preliminary development plans were available. The consultations required addressing current issues with a consideration of potential development within the lease area. Prior to working for the 45 SW, Mr. Penders worked in launch operations. He used this knowledge to address possible future needs. All this was accomplished within a very tight schedule to meet development milestones.

Cultural Resources Compliance

45 SW lands contain over 300 NRHP eligible historic properties, a National Historic Landmark district, and archaeological sites affiliated with three federally recognized tribes. In some cases, such as launch complexes and the Cape Canaveral Lighthouse, cultural resource concerns require interaction with multiple stakeholders, including the NPS, SHPOs, the Advisory Council on Historic Preservation, and federally recognized tribal governments. Mr. Penders maintains ongoing dialogues with all entities during the Section 106 process.

Mr. Penders reviews all Cape Canaveral AFS civil engineering office projects and identifies those that might require cultural resources management consultation or survey. He then determines whether or not projects need to be programmed for funding or if they can be conducted in-house using established partnerships.

In order to expedite internal and external consultation prior to initiation of undertakings, Mr. Penders reviews projects using a database he created specifically for the consultation process. The online database contains over 500 historical data records, Basic Information Guides, maps, historic photographs, and real property records. Projects are reviewed to determine if a facility is potentially NRHP eligible and in need of Section 106 consultation, or if the project area contains or has the potential to contain archaeological sites. A summary is supplied to federal and state parties for compliance with Section 106 requirements.

Mr. Penders has built and maintains relationships with the Florida Historical Society and Brevard County Historical Commission which enables access to archives and historic documents which increases the efficiency at which he can develop consultation packages.

Mr. Penders assisted with a beneficial agreement between Cape Canaveral Lighthouse Foundation and the 45 SW which improves public visibility via limited tours. The public can enjoy Wing cultural resources at no cost to the Air Force. The lighthouse averages 1,000 visitors a year, supporting DoD requirements to allow public access to cultural resources where feasible. Mr. Penders acts as an advisor to the Lighthouse Foundation and assists with proposed lighthouse development plans and cultural resources consultations.