PACIFIC AIR FORCES

AIR FORCE INSTALLATION AND MISSION SUPPORT CENTER

AFIMSC PACIFIC PLANNING & PROGRAMMING – REMOTE PACIFIC LOCATIONS

ENVIRONMENTAL IMPACT STATEMENT FOR TACTICAL MULTI-MISSION OVER-THE-HORIZON RADAR TRANSMITTER FACILITY, BABELDAOB ISLAND, REPUBLIC OF PALAU

REVISED DRAFT

JULY 2023
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Tactical Multi-Mission Over-the-Horizon Radar Transmitter Facility
Babeldaob Island, Republic of Palau
Draft Environmental Impact Statement

Prepared pursuant to
Title 24 of the Palau National Code Annotated, the Environmental Quality Protection Act
Republic of Palau
Environmental Quality Protection Board

By the
United States Air Force
Pacific Air Forces, Air Force Installation and Mission Support Center

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26 July 2023
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1 Executive Summary

The U.S. Air Force (USAF) proposes to construct an air domain awareness system for the U.S. Pacific Air Forces (PACAF). The proposed project is the construction of an unmanned Tactical Multi-Mission Over-the-Horizon Radar (TACMOR) transmitter (Tx) facility in the Republic of Palau on Babeldaob (Babelthuap) Island within the state of Ngaraard.

1.1 Action Benefits

The action is needed to provide thousands of square miles of air domain awareness capability to improve the United States’ (U.S.’s) and its regional partners’ ability to monitor air traffic in the vicinity of Palau to enhance aviation safety and security. TACMOR is one of five critical investments to increase Joint Force air domain awareness in the region. Development and operation of this capability strengthens relationships with Allies and Partner Nations in the Pacific Theater. This project is also necessary to reinvigorate the U.S. Government’s Compact of Free Association relationship with the Republic of Palau. Construction of the TACMOR system would enable the U.S. Government to conserve or redirect manpower, fuel, and defense resources otherwise spent on ships and aircraft that have traditionally been used to monitor the regional air domain.

1.2 Action Location and Alternatives

The proposed project would be located on the eastern portion of a hilly, largely undeveloped 22-hectare area adjacent to the west coastline on the western slopes of Babeldaob Island, in the state of Ngaraard. The site shows limited recent human disturbance; a homestead with a small dryland taro field found in the easternmost portion of the site along with two residential buildings, and several outbuildings to the west of the taro field are the only development onsite.

Alternative locations for the Tx facility were considered but dismissed. The results of a radio frequency siting evaluation showed that the northern end of Babeldaob Island was the only location that met all the technical requirements for Tx facility site selection. Initially, three locations for the Tx site were considered on Babeldaob Island. Two of the potential sites comprise multiple owners, and the third site comprises mostly state-owned land with the remaining needed land owned by a single owner. During consultations between the U.S. Department of State and the Republic of Palau, representatives from the Republic of Palau selected the state-owned site as the preferred project site because there would be fewer impacts to private property owners. As a result of this consultation, the other sites were not evaluated further.

1.3 Action Details and Phasing

The TACMOR Tx facility project includes construction of an antenna area, a secure compound, a diagnostic antenna, and a Delta quasi-vertical incident sounder antenna. Development activities at the proposed project site would include construction of a paved access road from the Compact Road to provide access to the site, paved interior access roads, construction of multiple drainage basins, and installation of site security fencing and interior site fencing. Extensive grading would be required to prepare the Tx site for radar installation. Substantial amounts of excavated soils would result in a large volume of excess excavated material that would need to be disposed of at an offsite disposal site. Mechanically stabilized earth retaining walls would be used to level the site to the necessary
specifications. Areas that are graded would be stabilized by landscaping with either established grass, gravel, or pavement. Drainage outlets or spillways would be stabilized with rip rap.

The construction activities for the facility are expected to begin in 2023 and would last approximately 3 years. The construction would be completed in one phase, including site clearance, construction of a life support area, earthwork and soil disposal, site improvements, and construction of infrastructure, as needed.

1.4 Critical Utilities and Services

The operation of the proposed project would not use any local utilities. The facility has been designed to be unmanned aside from maintenance operations. If potable water is required, it will be delivered to the site. The compound would contain a lavatory with a toilet using non-potable water collected through a rainwater collection system. Sanitary wastewater generated by the staff operating and maintaining the facility would be handled by a new onsite sanitary septic system. Power would be supplied to the proposed project via onsite diesel generators. Onsite aboveground fuel storage tanks would be constructed to power the generators.

Solid waste generated during site preparation and construction of the proposed project would include nonhazardous construction wastes, such as excess concrete, containers, wooden scaffolding, and typical construction debris. Construction waste generation would be short-term, and the USAF would follow proper waste management protocols and procedures. It is anticipated that the Republic of Palau would allow the USAF to place nonhazardous construction waste generated from this project in the lined Koror Landfill or the new National Landfill on Babeldaob. Minor volumes of trash produced by facility staff, as well as any solid or liquid wastes generated during routine maintenance, would be collected, and disposed of appropriately offsite.

1.5 Impact Assessment

An environmental evaluation was conducted to identify potential effects that could result from implementation of the proposed project. In addition to consultations with appropriate Republic of Palau agencies and resource organizations, the assessment included the following:

- Detailed literature search regarding natural and cultural resources, especially sensitive species, of Palau
- Preliminary site visit in July 2018 and November 2019
- Detailed natural resources and cultural resources surveys
- Soil disposal site reconnaissance in 2020

The preliminary site visit provided an opportunity to collect relevant natural and cultural data and information about the conditions of the environment and resources at the proposed project site. The results helped focus subsequent data collection and evaluation activities necessary to characterize the site.
Environmental impacts resulting from construction and operation of the proposed project were identified. The findings, which take into account minimization measures and best management practices (BMPs), are summarized in Table 1-1.

Table 1-1
Summary of Potential Environmental Effects for Construction and Operation of the Proposed Tx Facility

<table>
<thead>
<tr>
<th>Potential Effect</th>
<th>Effect Duration</th>
<th>Anticipated Magnitude of Effect After Implementation of Minimization Measures/BMPs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Short-term</td>
<td>Long-term</td>
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<tr>
<td></td>
<td>Negligible</td>
<td>Minor</td>
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<tr>
<td>Change in Land Use</td>
<td>-</td>
<td>C</td>
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<tr>
<td>Air Emissions</td>
<td>C</td>
<td>O</td>
</tr>
<tr>
<td>Fugitive Dust</td>
<td>C</td>
<td>-</td>
</tr>
<tr>
<td>Increased Noise</td>
<td>C, O</td>
<td>-</td>
</tr>
<tr>
<td>Water Resources</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Erosion, Runoff, and Sedimentation</td>
<td>C, O</td>
<td>-</td>
</tr>
<tr>
<td>Solid and Sanitary Waste</td>
<td>C, O</td>
<td>-</td>
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<tr>
<td>Hazardous Materials Spills</td>
<td>C, O</td>
<td>-</td>
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<tr>
<td>Excavation, Fill Transport, and Changes in Topography</td>
<td>C</td>
<td>-</td>
</tr>
<tr>
<td>Terrestrial Habitat Loss</td>
<td>-</td>
<td>C</td>
</tr>
<tr>
<td>Terrestrial Wildlife Disturbance</td>
<td>C</td>
<td>C, O</td>
</tr>
<tr>
<td>Marine Wildlife Disturbance</td>
<td>C</td>
<td>-</td>
</tr>
<tr>
<td>Vegetation Loss</td>
<td>-</td>
<td>C</td>
</tr>
<tr>
<td>Protected Species Disturbance</td>
<td>C</td>
<td>C, O</td>
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<tr>
<td>Invasive Species Introduction</td>
<td>C</td>
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<tr>
<td>Traffic</td>
<td>C</td>
<td>O</td>
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<tr>
<td>Visual Setting</td>
<td>C</td>
<td>O</td>
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<tr>
<td>Community Disturbance</td>
<td>C</td>
<td>-</td>
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<tr>
<td>Employment and Housing</td>
<td>C</td>
<td>O</td>
</tr>
<tr>
<td>Cultural and Archaeological Effects</td>
<td>-</td>
<td>C</td>
</tr>
<tr>
<td>Human Health</td>
<td>C, O</td>
<td>-</td>
</tr>
<tr>
<td>Climate</td>
<td>-</td>
<td>O</td>
</tr>
</tbody>
</table>

C = construction-related effect
O = operation-related effect
1.6 Avoidance and Minimization

It is anticipated that most of the effects identified in Table 1-1 would be short-term in duration, ceasing with construction completion and commencement of facility operations. These potential impacts could also be mitigated as indicated in Table 1-2, using minimization, mitigation measures, or BMPs. Therefore, this Draft Environmental Impact Statement has preliminarily determined that the project will not result in any significant adverse impacts to the environment according to the significance criteria set forth in Title 24 Palau National Code Annotated (PCNA) Chapter 2401-61-06.
### Table 1-2
Summary of Avoidance, Minimization, and Mitigation Measures and BMPs for Effects on the Environment from the Proposed Tx Facility

<table>
<thead>
<tr>
<th>Resource</th>
<th>Impact</th>
<th>Mitigation/BMP Option</th>
<th>Mitigation Measure/BMP Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Species of Concern – Other Protected Wildlife</td>
<td>Disturbance of birds prior to and during vegetation clearing.</td>
<td>Wildlife clearing.</td>
<td>Biologists will help to avoid impacts during clearing activities by inspecting the site for any nesting birds or bats. All wildlife will be flushed to minimize impact. Biologists will communicate concerns and recommended actions to the onsite project manager.</td>
</tr>
<tr>
<td>Biological Resources – Vegetation</td>
<td>Loss of native trees and shrubs; loss of endemic, rare, endangered, or culturally important plants in project footprint.</td>
<td>Plant nurseries.</td>
<td>Establish nurseries on Babeldaob Island or at state botanical gardens where salvaged plants and propagules can be maintained for propagation and future conservation use; hire needed staff for each. Coordinate with Palau Bureau of Agriculture, BNM, and EQPB, as applicable.</td>
</tr>
<tr>
<td>Biological Resources – Vegetation</td>
<td>Loss of native trees and shrubs; loss of endemic, rare, endangered, or culturally important plants in project footprint.</td>
<td>Collect trees and shrubs.</td>
<td>Prior to clearing and construction, biologists would conduct a comprehensive survey to identify plants for salvage and transplant, including the collection of propagules (e.g., fruits and seeds) and/or cuttings of native trees and shrubs and endemic, rare, threatened, and endangered plants. Concurrently collect plants for BNM herbarium inventory and conduct surveys to mark trees for harvest.</td>
</tr>
<tr>
<td>Biological Resources – Biomass Management</td>
<td>Loss of native trees and shrubs; loss of endemic, rare, endangered, or culturally important plants in project footprint.</td>
<td>Survey and mark trees.</td>
<td>Prior to vegetation clearing, survey and mark all trees for lumber, firewood, or other uses. Prior to clearing, in coordination with the construction contractor, reconfirm the survey and mark all trees for lumber, firewood, or other uses, and review materials management plans for timber and compost access to community.</td>
</tr>
<tr>
<td>Biological Resources – Invasive Species</td>
<td>Introduction of invasive species.</td>
<td>Establish biosecurity Standard Operating Procedures (SOPs).</td>
<td>Establish SOPs on aspects of how USAF and the Republic of Palau’s civilian agencies work together regarding biosecurity inspection processes for all project-related activities, including delivery materials and work force.</td>
</tr>
<tr>
<td>Marine Biota and Habitats</td>
<td>Potential impact to marine resources by sedimentation from the construction and operation of the Tx facility.</td>
<td>Marine monitoring survey preconstruction.</td>
<td>Conduct a baseline marine resources survey to establish the quality and condition of marine resources in adjacent areas for the Tx site.</td>
</tr>
<tr>
<td>Resource</td>
<td>Impact</td>
<td>Mitigation/BMP Option</td>
<td>Mitigation Measure/BMP Activity</td>
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</tr>
<tr>
<td>Marine Biota and Habitats</td>
<td>Potential impact to marine resources by sedimentation from the</td>
<td>Marine monitoring survey post construction.</td>
<td>Conduct marine resource surveys during and after construction. One survey will be conducted during the construction period, after vegetation clearing and sometime during excavation and fill activities. A second survey will be conducted after construction is completed and disturbed areas have been revegetated.</td>
</tr>
<tr>
<td>Cultural and Archaeological</td>
<td>Adverse effects on archaeological resources and areas/materials of</td>
<td>Archaeological monitoring.</td>
<td>Implement Tx Archaeological Monitoring Plan. Requires qualified archaeologists to work under the direction of USAF project manager and coordinate with Republic of Palau Historic Preservation Office</td>
</tr>
<tr>
<td>Resources</td>
<td>cultural patrimony.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cultural and Archaeological</td>
<td>Adverse effects on archaeological resources and areas/materials of</td>
<td>Interpretive plan.</td>
<td>Seek input from local stakeholders (through a workshop, etc.) to develop an interpretive plan for stakeholder review. Implement final interpretive plan after approval. Products resulting from interpretive plan may consist of signage at publicly accessible locations, printed brochures, exhibits or other displays, and electronic products.</td>
</tr>
<tr>
<td>Resources</td>
<td>cultural patrimony.</td>
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<td>Resource</td>
<td>Impact</td>
<td>Mitigation/BMP Option</td>
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</tr>
<tr>
<td>Surface Water, Aquatic</td>
<td>Soil erosion caused by vegetation clearing, grading, excavation, and soil</td>
<td>Erosion control measures.</td>
<td></td>
</tr>
<tr>
<td>Habitats, and Biota</td>
<td>stockpiles.</td>
<td>Employ erosion control measures (e.g., silt fences, fiber rolls) as quickly as appropriate in all areas of soil disturbance, and especially in areas associated with onsite wetlands or drainages. Employ padding in stream channel below disturbance site to capture solids entering the stream; remove after construction activities are completed. Delay clearing and retain stabilizing vegetation on unstable soils and in areas with excessive slopes (e.g., 3:1 or greater) in project areas as long as possible. When feasible, schedule construction during dry season. Track weather conditions and adjust construction activity schedule to avoid oncoming periods of heavy precipitation. Avoid conducting clearing and grading activities in areas with steep slopes during rain events. Stabilize exposed soils, including soil stockpiles, with suitable vegetated (e.g., mulched plant debris) or textile ground cover. Limit spoil piles slopes to no more than 3:1. Cover all spoil and fill piles with geotextiles or other materials when not in use. Maintain vegetated filter strips and/or employ sediment traps in downslope areas and areas currently undergoing construction, especially along coastline; width of vegetated strips should increase with increasing slope steepness. Leave stumps and ground vegetation in areas where vegetation clearing but no soil disturbance is necessary. Develop stormwater management plan and erosion and sediment control plan and implement approved plans during all project phases. Actively monitor and adjust stormwater management plan requirements as needed to minimize impacts to waterbodies. Stabilize construction entrances and install perimeter controls and diversions to prevent movement of soils offsite. Install dikes, swales, and/or lined ditches to direct work-site runoff away from wetlands, streams, mangrove swamps, and coastlines, as applicable.</td>
<td></td>
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<tr>
<td>Resource</td>
<td>Impact</td>
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<td>Mitigation Measure/BMP Activity</td>
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</tr>
<tr>
<td><strong>Surface Water, Aquatic Habitats, and Biota (continued)</strong></td>
<td>Soil erosion caused by vegetation clearing, grading, excavation, and soil stockpiles.</td>
<td>Marine surveys and monitoring.</td>
<td>Perform marine surveys directly offshore of each site to form baseline. Continue monitoring marine environment during project development, particularly following heavy rains, to ensure stormwater and erosion controls are functioning properly.</td>
</tr>
<tr>
<td><strong>Soil Quality</strong></td>
<td>Topsoil loss from grading and excavation.</td>
<td>Soil salvaging.</td>
<td>Topsoil should be salvaged during site clearing and grading activities and reused for site reclamation.</td>
</tr>
<tr>
<td><strong>Air Quality</strong></td>
<td>Fugitive dust from clearing, grading, excavation, fill, soil stockpiling, vehicle traffic, and soil and fill transport.</td>
<td>Standard construction BMPs.</td>
<td>Apply dust control measures (e.g., watering) to areas immediately prior to and during clearing, excavation, and construction activities. Conduct watering on unpaved surfaces (e.g., access roads). Cover loads during vehicle transport of excavated soils or fill materials. Water excavated soils and newly delivered fill material before loading, unloading, filling, or grading. Cover stockpiled spoil and fill materials with tarpaulin or geotextiles when not in use, or periodically spray piles with water to form a crust on the outside of the piles. Limit operations when winds make fugitive dust control difficult. Revegetate or cover disturbed areas as soon as possible after disturbance.</td>
</tr>
<tr>
<td><strong>Air Quality</strong></td>
<td>Air emissions from construction equipment.</td>
<td>Standard construction BMPs.</td>
<td>Use equipment that is in compliance with Republic of Palau air emission standards and applicable USAF requirements and standards. Require routine maintenance of all vehicles and construction equipment to ensure efficient combustion and minimum emissions. Limit idling of diesel equipment, including generators, to no more than 15 minutes unless required for proper operation (e.g., trenching).</td>
</tr>
<tr>
<td><strong>Soil, Groundwater, Surface Water, Aquatic Habitats, and Biota</strong></td>
<td>Accidental release of fuels and other project-related liquids.</td>
<td>Lined catchment basins.</td>
<td>Provide lined catchment basins with secondary containment around fuel storage areas and vehicle refueling areas to capture accidental spills and leaks as required and where necessary under Republic of Palau regulations and requirements.</td>
</tr>
<tr>
<td>Resource</td>
<td>Impact</td>
<td>Mitigation/BMP Option</td>
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</tr>
<tr>
<td>Soil, Groundwater, Surface Water, Aquatic Habitats, and Biota (continued)</td>
<td>Accidental release of fuels and other project-related liquids.</td>
<td>Spill prevention and response plan.</td>
<td>Employ drip pans during refueling and under the fuel pump and valve mechanisms of any bulk fueling vehicles/storage tanks. Develop spill prevention and response plan. Immediately address spills and implement soil cleanup or removal, as necessary. Install runoff controls (e.g., contour berms, trenches) around vehicle service and refueling areas, chemical storage areas, and waste storage areas to further contain accidental releases. Locate storage areas for fuel and other project materials in upland areas and away from surface water drainage ways.</td>
</tr>
<tr>
<td>Wildlife</td>
<td>Temporary impacts to wildlife from construction equipment noise during clearing, grading, excavation, and construction.</td>
<td>Construction noise BMPs.</td>
<td>Require project equipment (e.g., excavators, compressors) to comply with Republic of Palau and applicable USAF noise requirements and standards. Conduct surveys for nesting activity prior to the initiation of clearing, grading, and construction activities. Coordinate with EQPB and BNM on scheduling initiation of project activities.</td>
</tr>
<tr>
<td>Surface and Groundwater</td>
<td>Impacts caused by sanitary and industrial wastes generated during all project phases.</td>
<td>Sanitary and industrial waste management plan.</td>
<td>Develop solid and industrial waste management plans and implement during all project phases; disposal must comply with Republic of Palau and applicable USAF requirements and standards for solid and industrial waste handling and disposal. Develop sanitary and industrial waste wastewater management plans and implement during all project phases; discharge and disposal of wastewater must comply with EQPB and applicable USAF requirements and standards.</td>
</tr>
<tr>
<td>Surface and Groundwater, Vegetation</td>
<td>Impacts to surface and groundwater or native vegetation caused by herbicide use for vegetation management during post-construction operation.</td>
<td>Use of herbicides.</td>
<td>Any herbicide use must comply with USAF and EQPB regulations and requirements. Apply herbicides in a manner that minimizes contact with surface water and groundwater and require application to be performed by certified pesticide applicators. Minimize use in areas with sandy soil. Minimize use in areas with erodible soil. Use short half-life herbicides to extent practicable.</td>
</tr>
<tr>
<td>Resource</td>
<td>Impact</td>
<td>Mitigation/BMP Option</td>
<td>Mitigation Measure/BMP Activity</td>
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<tr>
<td>Native Biota and Their Habitats</td>
<td>Potential introduction of invasive species via imported project materials (e.g., in fill, wood pallets, shipping containers) or workers from outside Palau.</td>
<td>Hazard Analysis-Critical Control Point evaluation.</td>
<td>Develop and implement a Hazard Analysis-Critical Control Point evaluation for all personnel and materials to be brought to the project site from other Palauan locations and especially from foreign locations such as Guam. The evaluation should comply with international standard ASTM E2590, <em>Standard Guide for Conducting Hazard Analysis-Critical Control Point Evaluations</em>.</td>
</tr>
<tr>
<td>Native Biota and Their Habitats</td>
<td>Introduction of invasive species from trucks and construction equipment entering and leaving the site.</td>
<td>Clean trucks and construction equipment.</td>
<td>Establish areas to conduct visual inspection and power wash trucks and equipment arriving at the project location or leaving the project site to remove seeds and propagules that may be adhering to tires and other equipment surfaces; dispose of collected seeds and propagules appropriately.</td>
</tr>
<tr>
<td>Native Biota and Their Habitats</td>
<td>Spread of coconut rhinoceros beetle to areas outside the project footprint through processing, distribution, and use of green waste.</td>
<td>Green waste management.</td>
<td>Process green waste, including the management of compost windrows, in a manner that limits propagation of invasive coconut rhinoceros beetle.</td>
</tr>
</tbody>
</table>

BNM = Belau National Museum  
EQPB = Environmental Quality Protection Board  
MOU = Memorandum of Understanding  
SOP = standard operating procedure
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<td>°F</td>
<td>degree(s) Fahrenheit</td>
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<td>AFI</td>
<td>Air Force Instruction</td>
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<td>BMP</td>
<td>best management practice</td>
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<td>BNM</td>
<td>Belau National Museum</td>
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<td>CoFA</td>
<td>Compact of Free Association</td>
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<td>DoD</td>
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<td>EA</td>
<td>environmental assessment</td>
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<td>Environmental Quality Protection Board</td>
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<td>GHz</td>
<td>gigahertz</td>
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<tr>
<td>ha</td>
<td>hectare(s)</td>
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<td>HACCP</td>
<td>hazard analysis critical control point</td>
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<tr>
<td>IUCN</td>
<td>International Union for Conservation of Nature</td>
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<td>life support area</td>
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<td>m³</td>
<td>cubic meter(s)</td>
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<td>Megahertz</td>
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<td>MOU</td>
<td>Memorandum of Understanding</td>
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<td>Mechanically stabilized earth</td>
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<td>Tactical Multi-Mission Over-the-Horizon Radar</td>
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<td>Tx</td>
<td>Transmitter</td>
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Introduction

This Environmental Impact Statement (EIS) has been prepared pursuant to Title 24 of the PNCA, the Environmental Quality Protection Act, to ensure that appropriate consideration of environmental consequences is provided in decision making and processing of permit applications. Additionally, this EIS complies with the various agreements between the United States (U.S.) and the Republic of Palau as discussed in Section 5.5. The U.S.’s relationship with the Republic of Palau is governed under the provisions of the Compact of Free Association (CoFA), which commits the U.S. to protect Palau militarily in return for allowing the U.S. to establish defense sites in Palau.

This EIS provides a general description of the proposed activities, describes the biological and physical features of the site, identifies existing land uses near or adjacent to the site, assesses anticipated impacts of the proposed activities at the site, discusses possible alternatives to the proposed site, and identifies proposed measures to minimize or mitigate project-related impacts.

4.1 Action Name, Background, and General Description

The proposed project is for the construction of a Tactical Multi-Mission Over-the-Horizon Radar (TACMOR) transmitter (Tx) facility in the Republic of Palau on the northern end of Babeldaob (Babelthuap) Island in the state of Ngaraard (shown on Figure 4-1).

Figure 4-1
Project Location
4.2 Action Purpose and Objectives

The purpose of the proposed project is to provide an air domain awareness system for the U.S. Pacific Air Forces (PACAF).

4.3 Profile of Action Proponent

The project proponent for the Proposed Action is the U.S. Air Force (USAF). The U.S.’s relationship with the Republic of Palau is governed under the provisions of the CoFA, which permits the U.S. to establish defense sites. Both parties agree that it is their policy to “promote efforts to prevent or eliminate damage to the environment and biosphere and to enrich understanding of the natural resources of Palau.”

4.4 Contact Details for Action Proponent

Contact details for the USAF project manager have been provided to the Environmental Quality Protection Board (EQPB) under separate cover.
5 Policy and Legal Framework

5.1 National, Regional, Provincial, or Customary Laws and Related Government Approvals

In 1981, the Republic of Palau enacted an Environmental Quality Protection Act, Title 24 of the PNCA, which established the EQPB. This EIS was prepared pursuant to Title 24 PNCA and the following applicable Chapter 2401 Regulations:

- Subsection 1, Earthmoving Regulations (August 2015)
- Subsection 11, Marine and Fresh Water Quality Regulations (February 2022)
- Subsection 13, Wastewater Treatment and Disposal Regulations (October 2019)
- Subsection 31, Solid Waste Management Regulations (August 2021)
- Subsection 33, Pesticide Regulations (October 2021)
- Subsection 51, Public Water Supply and Drinking Water Regulations (February 2021)
- Subsection 61, Environmental Assessment and Environmental Impact Statement Regulations (September 2020)
- Subsection 71, Air Pollution Control Regulations (October 2021)
- Subsection 81, Ozone Layer Protection Regulations (January 2013)

5.2 Multilateral Environmental Agreements

The U.S. has adopted the “Environmental Standard Operating Procedure for DoD Activities Conducted in the Republic of Palau,” dated 12 January 2023 (Department of the Navy, Joint Region Marianas 2023), which is applicable to the proposed project. The Environmental SOP was reviewed by the Republic of Palau and the U.S. Embassy.

5.3 Adopted National and State Plans and Policies

No adopted national or state plans or policies are applicable to the proposed project.

5.4 Health, Safety, Hazard, and Risk Management Standards

The proposed project would comply with the applicable Palau health, safety, hazard, and risk management standards included in the Chapter 2401 Regulations discussed in Section 5.1.

5.5 Current Agreements Between Republic of Palau and the Proponent

The U.S. has a CoFA with the Republic of Palau that requires compliance with environmental standards substantively similar to U.S. standards while operating in Palau. The CoFA also requires the U.S. to give the government of Palau the opportunity to provide input during the environmental review process. The CoFA was incorporated into U.S. Public Law 99-658 in 2018.

In addition to the CoFA, the following agreements with the Republic of Palau are also related to the proposed project (see Appendix A):
• Diplomatic Note between Republic of Palau and the U.S. dated 8 December 2017, regarding proof of land use rights

• Memoranda of Agreement between the Office of the Republic of Palau Vice President and the Bureau of Cultural and Historical Preservation on Behalf of the U.S. Department of Defense (DoD), dated 8 February 2018, 12 February 2018, and 2 December 2020

• Addendum to the Memorandum of Agreement between the Ministry of Public Infrastructure and Industries and the Bureau of Cultural and Historical Preservation/Palau Historic Preservation Office Regarding Construction of the TACMOR Facilities in the Republic of Palau, dated 9 November 2021

• Memorandum of Understanding (MOU) Between Ngaraard State Governor and the Ngaraard State Public Land Authority, signed March 2021 to document the approval of the USAF’s request to use Soil Disposal Area 1 (SD 1) during the Tx project construction; use of the site by the USAF’s contractor is pending an agreement between the contractor and the Ngaraard State Government

• Agreement Concerning Special Programs Related to the Entry into Force of the Compact of Free Association Between the Government of the United States and the Government of the Republic of Palau, dated 26 May 1989

In addition to Title 24 of the PNCA, the USAF considered the following applicable U.S. regulations, guidance, and compliance documents:


• National Historic Preservation Act regulations for undertakings outside of the United States (United States Code (U.S.C.) Title 54, 307101(e), formerly Section 402)

• DoD Instruction 4150.7-M, “Pest Management Training and Certification,” April 1997

• DoD Instruction 6050.05, “Hazard Communication (HAZCOM) Program,” 15 August 2006


• Air Force Instruction (AFI) 32-7020, “Environmental Restoration Program,” January 2023 guidance memorandum

• AFI 32-7091, “Environmental Management Outside the United States,” 13 November 2019

5.6 **Action Proponent’s Environmental Management and Compliance Record**

The USAF has worked collaboratively with the Republic of Palau on numerous projects that required environmental clearance and permitting in coordination with EQPB.
6 Action Description and Justification

6.1 Action Details

6.1.1 Project Location

The Republic of Palau comprises a curved archipelago of approximately 350 islands at the western edge of the Caroline Islands, in a cultural region known as Micronesia. The proposed project is estimated to require 22 hectares (ha) of land on Babeldaob Island in the state of Ngaraard at the northern end of the archipelago (Figure 4-1).

The proposed project would be on the eastern portion of a hilly, largely undeveloped 22-ha area on the western slopes of the island. The site is accessible by vehicle from the Compact Road, which runs along the eastern boundary of the site (Figure 6-1). There is a gravel drive from the Compact Road to the homestead, which consists of several residential structures and a large garden. Aside from this, the proposed project site shows limited signs of recent human disturbance. A small dryland taro field is located in the easternmost portion of the site, adjacent to the Compact Road. A relatively expansive savanna/grassland is located on the western portion of the site and extends westward to the coast. Elevations at the project site range from about 60 meters (m), which occurs at the northeast boundary of the project site, to 20 m. The central portion of the site slopes gradually from east to west-southwest on a plateau with steep slopes along the sea cliffs on the northern, western, and southern boundaries. The Pacific Ocean borders the project site to the west. The project site is not located within a known flood hazard area.

Figure 6-1
Proposed Location of the Tx Facility on Babeldaob Island, Palau
6.1.2 Capital Improvements

Capital improvements for the proposed project would include the construction of an unmanned TACMOR Tx facility as shown on Figure 6-2. The various components of the Tx facility include an antenna area, a secure compound, a diagnostic antenna, and a Delta quasi-vertical incident sounder (QVIS) antenna. Descriptions of the components are as follows:

- The antenna area is a level area, 40 m wide and 120 m long, that would be graded and backfilled as necessary to meet stringent antenna elevation tolerance requirements. This area would include approximately 12 main array antennas and two frequency management system antennas with concrete foundations installed within an earth mat, which would consist of gravel surrounded by a concrete header.

- The secure compound would consist of various portable buildings and Conex containers, including fuel tanks, generator sets, a break building to house a lunch area and lavatory, a refueling station, portable buildings, cooling pad, amplifiers, satellite dishes, and utility and telecommunication lines within the site. Concrete foundation slabs would be used, and the remaining area would consist of gravel.

- The Delta QVIS antenna would be constructed between the antenna array and the secure compound. The QVIS antenna area would include concrete foundations for the antennas and guy-wires with gravel surfaces elsewhere.
Development activities at the proposed project site would include constructing a paved access road from the Compact Road to provide access to the site and paved interior access roads, construction of multiple drainage basins, and installation site security fencing and interior site fencing. Extensive grading would be required to prepare the Tx site for radar installation. Substantial amounts of excavated soils, which is anticipated to be larger than imported materials, would result in a large volume of excess excavated material that would need to be disposed of at an offsite disposal site (soil disposal site alternatives are discussed in further detail in Section 6.6.1). Mechanically stabilized earth (MSE)
retaining walls would be used to level the site to the necessary specifications. Areas that are graded would be stabilized by landscaping with either established grass, gravel, or pavement, and drainage outlets or spillways would be stabilized with rip rap.

The design of the facility would conform to the criteria established in the Air Force Corporate Facilities Standards and Installation Facilities Standards but would not employ a standard facility design because there is no USAF standard facility design for this type of project.

### 6.1.3 Project Construction Phasing and Schedule

Project construction would be completed in one phase and the work would include site clearance, construction of a life support area (LSA), earthwork and soil disposal, site improvements, and construction of infrastructure, as needed. The infrastructure build activities for the facility are expected to begin in November 2023 and would last approximately 3 years.

Site clearance activities would include clearing and grubbing vegetation, removing existing structures including two septic tanks with leach fields, and removing foundations and underground utilities. Trees along the northern cliff area will be topped to support radar operations. Excavated material that is not needed for the project would be transported to the approved offsite disposal site.

Concurrent with clearing activities, the temporary LSA would be constructed onsite to house construction workers. As shown on Figure 6-3, the LSA would be comprised of construction offices, parking, staff housing, generators to provide electrical power, a saltwater reverse osmosis facility, potable water storage tanks, a wastewater treatment plant, a lavatory, a warehouse, workshops, and site fencing. The proposed layout of the LSA is included in Appendix B. All facilities would be temporary that will be removed at the end of construction. Temporary laydown, staging, and storage areas would also be established at this time.

Following site clearance, mass excavation of the project site, and subsequent fill to grade the project to subgrade conditions would occur. The large quantities of excavated material not needed for the project would be transported offsite to the offsite disposal site (SD 1). To ensure that finish grades are met, settlement monitoring of the mass fill area would be conducted. MSE walls would also be constructed to ready the project site for the next construction stage.

Following soil removal and MSE wall construction, the following features would be built or installed:

- Site access roads
- Site security and internal area fencing
- Foundations for the antennas
- Plumbing for lavatory
- Rainwater catchment system
- Septic tanks
- Leach fields
• Portable building and support equipment (e.g., generators, fuel tanks, amplifiers, satellite dishes, and Conex boxes/enclosures)

• Electrical conduits with conductors for power

• Empty conduit system for telecommunications and security

During the final stage, vertical construction of the Tx facility would occur. Various types of construction and delivery equipment would be used during this stage. The final grading and landscaping would also occur, as necessary.

6.2 Critical Utilities and Services – Wastewater

The design of the proposed project assumes that it would be an unmanned facility, except for occupancy for maintenance operations. The project would not include any guard houses or facilities for security personnel. The critical utility needs have been designed with these limited needs in mind.

There are two known septic tanks and leach fields located at the proposed project site associated with the residential buildings. These wastewater features will be demolished during site preparation. The secure compound would contain a lavatory with a toilet using non-potable water collected through a rainwater collection system. Sanitary wastewater generated by the staff operating and maintaining the facility would be handled by a new onsite sanitary septic system.
During construction, temporary employee housing and construction offices would be built. Lavatories would be constructed, and wastewater would be treated onsite. Treated wastewater would be held in a holding tank to be reused for onsite soil compaction activities and dust control, and any excess treated wastewater would be disposed of at the Malakal wastewater treatment plant via pump trucks. A permit issued by EQPB for construction of toilet facilities and wastewater disposal system would be required. The entire wastewater treatment system would be temporary and removed following construction.

6.3 Critical Utilities and Services – Potable Water Demand

The Tx site is in a remote location and has limited infrastructure with no water utilities. No known groundwater wells are installed on the proposed project site. A rain catchment system at the residential buildings is the primary source of potable water at the proposed project site.

During construction, temporary employee housing and construction offices would be built. Potable water would be provided to the LSA via a saltwater reverse osmosis facility using water from the Pacific Ocean and water would be stored in tanks. The potable water will be used on site to provide water for project personnel and soil compaction during construction. The daily water demand is approximately 6,000 gallons per day. To avoid coral ecosystems, the intake location would be approximately 3,000 feet from the coastline and outfall location is approximately 4,700 feet from the coastline. The saltwater reverse osmosis facility would discharge concentrated brine (50,000 milligrams per liter) into Pacific Ocean. The saltwater reverse osmosis facility would be disassembled after construction is completed. A point source discharge permit issued by EQPB would be required for the saltwater reverse osmosis facility, as shown in Appendix C.

6.4 Critical Utilities and Services – Electrical Power Demand

Electricity on Babeldaob Island is provided by a municipal generating facility employing diesel generators and solar panels and distributed island-wide via aboveground powerlines. At the proposed project site, the powerlines run more or less parallel to the Compact Road, and one pole-mounted transformer is present at the site.

There would be no effect to currently available electricity on Babeldaob, as all power would be supplied to the proposed project via four onsite diesel generators. One generator is 50 kVA and the other three are 20-kVA generators. Onsite aboveground storage tanks would be constructed to hold diesel to power the generators.

During construction, electrical power would be provided to the temporary employee housing and construction offices via two 100-kVA diesel generators. The second generator is used as a standby generator.

6.5 Critical Utilities and Services – Solid Waste

With no commercial activity in the project area, the main source of solid waste at the site is household trash and refuse generated at the two onsite residences and outbuildings and similar wastes generated by workers at the onsite taro fields. Household wastes are disposed of by island residents at the Ngaraard State Solid Waste dump or at EQPB-approved dumpsites. Recyclable materials, including household items, may be taken to the Ngaraard State Redemption Center. Hazardous wastes are subject to EQPB regulations.
Solid waste generated during site preparation and construction of the proposed project would include nonhazardous construction wastes, such as excess concrete, containers, wooden scaffolding, and typical construction debris. Construction waste generation would be short-term, and the USAF would follow proper waste management protocols and procedures. It is anticipated that the Republic of Palau would allow the USAF to place nonhazardous construction waste generated from this project in the lined Koror Landfill or the new National Landfill on Babeldaob.

Minor volumes of trash produced by facility staff, as well as any solid or liquid wastes generated during routine maintenance, would be collected, and disposed of appropriately offsite.

6.6 Analysis of Alternatives

6.6.1 Alternative Locations

**Tx Facility.** To operate correctly, an air domain awareness system requires a Tx facility to be sited at least 50 nautical miles from the radar receiver site. The receiver facility is planned to be constructed on the northeastern end of Angaur Island, in the state of Angaur. The USAF conducted a radio frequency siting evaluation to determine which alternative locations in Palau could support the technical specifications required for the Tx site. The results of the study showed that Babeldaob Island was the only location that met all the requirements, and because of this, alternative locations on other islands were not evaluated further.

Initially, three locations for the Tx site were considered on Babeldaob Island. Two of the potential sites comprised multiple owners, and the third site comprised mostly state-owned land with the remaining needed land owned by a single owner. During consultations between the U.S. Department of State and the Republic of Palau, representatives from the Republic of Palau selected the state-owned site as the preferred project site due to fewer impacts to private property owners.

**Soil Disposal.** The proposed project site for the Tx facility would require the removal of substantial amounts of soil and disposal offsite. The USAF, in coordination with the Ngaraard State Governor, identified potential soil disposal sites for further evaluation. Criteria for the nomination of sites included the following:

- Proximity to the proposed Tx project site
- Land topography
- Ease of access
- Existing environmental resources

Two potential sites were evaluated against these criteria.

SD 1 is a relatively flat 4-ha site located 1.5 kilometers (km) south of the Tx site on Ngaraard State public land (Figure 6-4). Access to the site would require construction of an approximately 300-m-long access road from the Compact Road, which would stay within the boundaries of the Ngaraard State public land boundaries. The parcel is largely savanna and has not been historically disturbed.
Figure 6-4
SD 1 Location, 1.5 km south of Proposed Tx Site

SD 2 is a relatively flat 2-ha parcel located 6 km south of the Tx site on three privately owned lots (Figure 6-5). Access to the site would be provided via an unpaved access road to the southern half of the site which is also shared by the Ngaraard State Landfill. The northern half of the site is undisturbed savanna grasslands, and the southern half of the site was leveled for use as a rock crusher plant and staging area in support of Compact Road construction in 2001.

Figure 6-5
SD 2 Location, 6 km south of Proposed Tx Site
Site assessments were conducted at both sites to determine how each site compared to the four criteria established for site selection. SD 1 was identified as the preferred site for soil disposal based on its proximity to the Tx site, its fairly level terrain, the fact that the site is comprised largely of savanna with only minor removal of forest habitat required for the access road, an absence of significant environmental and cultural resources, and its ownership by Ngaraard State, thus avoiding the need to utilize land from private property owner. The selection of SD 1 was endorsed in an MOU between the Ngaraard State Governor and the Ngaraard State Public Land Authority in March 2021 (Appendix A).

### 6.6.2 No Action Alternative

Under the No Action Alternative, PACAF would not construct the Tx facility on Babeldaob Island. As discussed in the previous section, no other locations met both the technical requirements and the Republic of Palau preferences for the Tx site; therefore, under the No Action Alternative, the U.S. Government would not be able to develop air domain awareness capabilities in the region. Without the system, the U.S. Government would be unable to conserve or redirect manpower, fuel, and defense resources otherwise spent on ships and aircraft traditionally used to monitor the regional air domain, nor would it have the ability to monitor air traffic in the vicinity of Palau to enhance aviation safety and security. Because the No Action Alternative would not meet the project need, it was not evaluated further.

### 6.7 Action Benefits

The action is needed to provide thousands of square miles of air domain awareness capability to improve U.S. and regional partners’ ability to monitor air traffic in the vicinity of Palau to enhance aviation safety and security. TACMOR is one of five critical investments to increase Joint Force air domain awareness in the region. Development and operation of this capability strengthens relationships with Allies and Partner Nations in the Pacific Theater. Construction of the TACMOR system would enable the U.S. Government to conserve or redirect manpower, fuel, and defense resources otherwise spent on ships and aircraft that have traditionally been used to monitor the regional air domain.

### 6.8 Cost-Benefit Analysis

The U.S. Government proposes to install the TACMOR radar system at two sites along the Palauan archipelago, to monitor air traffic in the vicinity of Palau. The radar system will provide Palau and the United States with greater air domain awareness for aviation safety and security. This project is essential to the well-being of the Republic of Palau’s air domain, as well as to the ability of the United States to maintain its defense of the Republic of Palau. The sites for TACMOR have been chosen with an eye on minimizing environmental impacts.

Although the project will result in short-term environmental costs (discussed in Section 8), such as impacts to vegetation, habitats, cultural, and archaeological resources, changes to the visual setting, potential for increased erosion, and removal of wetlands, there would also be a short-term benefit to the economy associated with the creation of construction jobs. Overall, the environmental costs of the project would be outweighed by the essential national defense capabilities that construction of the radar system would provide for both the Republic of Palau and the U.S. Government.
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7 Description of the Baseline Environment

This section provides a description of the existing conditions of the environmental resources that are relevant to the Proposed Action.

7.1 Climate

Palau’s climate can be described as a tropical moist climate. According to climate statistics maintained by the Republic of Palau, average temperatures in 2016 were 83.0 degrees Fahrenheit (°F) (Palau, 2018). This average is a 1.1°F increase from the annual average temperature of 81.9°F measured between 1971 and 2000 (NRCS, 2007). Annual rainfall averages 148 inches and is generally a product of convective uplift, which is typical to tropical climates and results in scattered showers of high intensity that last for short durations (NRCS, 2007). Overall, rainfall is highly variable throughout the islands of Palau (AGRoP, 2003). The proposed project site is located in an area where annual rainfall averages 148 inches (ANL, 2022). Water temperatures around the islands range from 78° to 82°F (AGRoP, 2003). Palau is located outside the main typhoon zone but experiences occasional typhoons. Between 1945 and 2013, a total of 20 storms classified by typhoon strength winds (64 knots or greater) passed within 200 nautical miles of the islands (Coral Reef Research Foundation, Palau, 2014). Annual wind speeds average 8.1 miles per hour from the northeast during winter months, with variability during all other seasons (NRCS, 2007).

7.2 Topography, Geology, and Soils

Project Site. The proposed Tx project site is hilly and largely undeveloped, with a maximum elevation of 52 m above sea level, which occurs at the northeast boundary of the Tx site. Steep slopes along the northern, western, and southern boundaries bound a relatively flat central portion of the site which slopes gradually from east to west-southwest (ANL, 2022).

Basalt soils of volcanic origin dominate the Tx site, overlying a base of hard basaltic rock. Gravely silt loam and silty clay loam of low fertility overlie volcanic bedrock (bedded tuff) in the central region and the thickly vegetated northern and southwestern regions of the Tx site. Silt loam dominates the southern and southwestern portions, overlying bedded tuff substratum. Soils in the western coastline area consists of organic residues of decaying mangrove vegetation (USAF, 2018).

Soil Disposal Site. Soils have not been evaluated for the SD 1 site; however, the terrain is relatively flat and has not been historically disturbed. The alignment of the proposed access road to SD 1 traverses west sloping terrain with slopes that vary from 12 to 30 degrees (ANL, 2020).

7.2.1 Contaminated Materials

Project Site. There are no known landfills located on or in the vicinity of the Tx site, no hazardous substances are known or suspected to have been released on the site, and site inspections did not identify any recognized environmental conditions or munitions and explosives of concern. Soil sampling and analysis of the project areas found elevated levels of arsenic, which can likely be attributed to elevated natural background levels of arsenic present in soil throughout the Republic of Palau (USAF, 2018; USAF, 2020).

Soil Disposal Site. SD 1 was not evaluated for contaminated materials. However, the lack of historic disturbance makes the presence of contaminants unlikely.
7.3 Land Tenure, Zoning, and Use

**Project Site.** The proposed Tx site encompasses three parcels or largely vacant land located in Chol, Ngaraard State. Two of the parcels are public land, and the third is privately owned. The privately owned parcel where much of the proposed Tx infrastructure would be located includes two residences, outbuildings, a subsistence garden, and vacant land. Land use on the site is largely limited to agriculture in the eastern portion of the site, which includes two taro fields and some cultivated coconut palm and fruit trees. There are several residential dwellings located to the north of the proposed Tx site, but no residences or other developments immediately to the south.

**Soil Disposal Site.** The proposed SD 1 site and associated access road is on one undeveloped, vacant parcel that is owned by Ngaraard State (ANL, 2020).

7.4 Water

**Project Site.** Water resources at the proposed project site are limited to a small surface stream draining a small onsite wetland (approximately 0.75 acres) and continuing through the southern forest portion of the site, a small, forested stream in the northern forest that drains to the mangrove forest at the northwestern portion of the site, and groundwater, which lies between 3 to 7 m below ground surface. Rainfall on Babeldaob Island averages approximately 375 cm (147 inches) annually. Water quality in the vicinity of the project is generally good with minimal pollution sources, largely limited to sediment runoff from the onsite gravel driveway and taro fields.

**Soil Disposal Site.** Three small streams that meander through the forested, sloped terrain were identified during the pedestrian surveys along the initially proposed SD 1 access road route. The streams flow south to north, are less than 1 m wide, and are incised about 1 m deep. A small wetland was also identified at SD 1 outside of the proposed soil disposal footprint and outside of the initially proposed haul route (ANL, 2020). Following the pedestrian surveys, an alternative access route was developed that should avoid most of these features.

7.5 Marine

**Project Site.** Site surveys offshore of the proposed Tx project site were conducted in September 2021 by the Palau International Coral Reef Center to identify baseline marine conditions adjacent to the site (Muller-Karanassos et al., 2021). The marine habitats offshore of the proposed Tx site consists primarily of lagoon and adjacent relatively shallow reef flats with interspersed seagrass beds, areas of open sandy bottom, and scattered corals (Colin, 2009; Muller-Karanassos et al., 2021). Mangrove forests occur along the western boundary of the site and are dominated by two mangrove species, *Sonneratia alba* (urur) and *Rhizophora mucronata* (tebechel), which occur along the outer margin of the forest. Inner mangrove forest trees include a number of mangrove species, including the threatened Indian mangrove, *Ceriops tagal* (biut), *Bruguiera gymnorrhiza* (kodenges), *Xylocarpus granatum* (medulokebong), and *Lumnitzera littorea* (mekekad).

**Soil Disposal Site.** SD 1 is located inland, thus no marine resources are present at the site.
7.5.1 Species of Concern – Marine Species and Habitats

**Project Site.** Among the five species of sea turtle that may occur in Palau, only the green turtle (*Chelonia mydas*) and the hawksbill turtle (*Eretmochelys imbricata*) are common, although other species are potentially present but uncommon. The largest nesting populations of hawksbill turtles in Palau occur in the Southern Lagoon area of Koror State, while green turtles generally nest on Helen Island and Merir Island in the remote southwest islands (Klain et al., 2007). Sea turtles require sandy beaches for nesting, and no such habitat occurs at the proposed Tx site.

The saltwater crocodile (*Crocodylus porosus*) may be found throughout the Republic of Palau, especially in mangrove habitat. This species has experienced a significant population decline and is listed as endangered under the U.S. Endangered Species Act. Surveys of coastal mangrove, waterways, and inland wetlands on Babeldaob Island were conducted on in 2003 (Brazaitis et al., 2009). When present, crocodiles were most abundant in mangrove habitat on Ngkekklau coast and the Airai coast, Tayo Bay and coast, and inland freshwater Ngardok Lake. The presence of crocodiles has not been observed adjacent to the Tx site. However, the threatened Indian mangrove, *Ceriops tagal* (*biut*), was observed in the mangrove forest at the Tx site.

The Dugong (*Dugong dugon*) is listed as vulnerable by the International Union for Conservation of Nature (IUCN), endangered under the U.S. Endangered Species Act, and is proposed as endangered by the government of Palau. This species inhabits seagrass beds where it feeds on vegetation; there are extensive seagrass beds in the western coast of Babeldaob. The occurrence of the Dugong in the vicinity of the Tx site is unknown. Several species of marine invertebrate are either IUCN-listed or proposed for listing by the government of Palau; however, only the fluted giant clam (*T. squamosa*) was observed occurring at the site during the 2021 baseline marine survey (Muller-Karanassos et al., 2021).

**Soil Disposal Site.** SD 1 is located inland, thus no marine resources of concern are present at the site.

7.6 Air

**Project Site.** Air quality at the proposed project site is very good due to few nearby emission sources, the geography and topography of the site, and regular ocean breezes that prevent air pollutants from concentrating and lingering. Air pollution sources include motor vehicle traffic associated with the onsite residences, taro fields, and passing by along the Compact Road, all of which are minor and intermittent sources of air emissions in the vicinity of the proposed Tx site.

**Soil Disposal Site.** Air pollution sources at the site SD 1 are associated with motor vehicle traffic on the Compact Road (located approximately 300 m to the east), which is minor and intermittent.

7.7 Noise

**Project Site.** Only minor sources of human-made noise occur at the proposed project site. These include the sound of occasional vehicle traffic on local roads and overflights of commercial and private aircraft. There are no stationary noise sources at the proposed Tx site. Bird songs and calls, wind, and waves breaking on adjacent shorelines are the primary natural background noises (ANL, 2022).

**Soil Disposal Site.** Noise at SD 1 is similar to the proposed project site. There are minor sources of human-made noise such as occasional overhead aircraft noise or traffic from the nearby Compact Road.
There are no stationary noise sources at the SD 1 site. Bird songs, bird calls, and wind are the primary natural background noises.

7.8 Aquatic and Terrestrial Plant Life

Project Site. Vegetation surveys were conducted in January 2019 at the proposed Tx site. The major plant communities at the proposed project site and the areas immediately surrounding it were surveyed using a pedestrian survey protocol. Plant species encountered during the surveys were recorded along with their relative abundance and status as endemic, rare, threatened, or endangered.

Over 198 species of plants were observed during surveys conducted in January 2019, 159 of which are native, and 2 have IUCN or Palau designations (ANL and BNM, 2020). Plant community types identified included native forest, agroforest, savanna and grassland, and freshwater marsh.

To the immediate north and within the project area is a steep slope of unbroken dense tropical hardwood forest. A steep forested slope also occurs at the southern edge of the project area. These tropical hardwood forests have a dense understory of shrubs, small trees, and vines. Overall, the forests along the northern boundary are less disturbed from human activities and exhibit higher biodiversity than the southern forest; more plant species were recorded from northern forest than from the southern forest (ANL and BNM, 2020). Trees recorded in these northern and southern hardwood forests included Campnosperma brevipetiolata (kelelacharm), Calophyllum inophyllum (btaches), Maranthes corymbose (bkau), and the endemic Fagraea ksid (ksid) and Ficus microcarpa (lulk) (ANL and BNM, 2020). Other large trees included Canarium hirsutum (mesecheus), Elaeocarpus joga (dekemerir), Ormosia calavensis (chedebungelked), Pterocarpus indicus (las), and Rhus taitensis (eues). The uncommon endemic understory trees Rauvolfia insularis (omechidel) and the native threatened Aglaia mariannensis (palauensis) were also found, and the palm Heterospathe elata (demailei) was common along steep rock slopes.

In addition to hardwood forests, mangrove forests occur along the coast adjacent to the Tx site and riparian forests occur along small streams within both the northern and southern forests of the site. In both riparian forests, the dominant upper story tree is Colona scabra (chuchab), and the palm, Heterospathe elata (demailei), is also common.

A freshwater swamp forest occurs in the western portion of the northern forest (ANL and BNM, 2020). The freshwater swamp forest is characterized by large trees of several species, such as the endemic Calophyllum pelewense (chesemolech), the native Campnosperma brevipetiolatum (kelelcharm), and Dolicichandra spathacea (rriu). Medium-sized trees include Cynometra ramiflora (ketenguit), Quassia indica (cheskeam), and Barringtonia racemosa (korges). The primary understory tree of the swamp forest is Hibiscus tiliaeus (chermall), while ground vegetation includes Phragmites karka (alkelsed), Alocasia macrorrhizos, the sedge Scirpodendron ghaeri (loloi), Donax canniformis (temring), and the vine, Derris trifoliata (kemokem).

An agroforest area occurs just west of the homestead and extends eastward to the Compact Road. A small number of fruit trees along with the coconut palm Cocos nucifera (lius) and Acacia auriculiformis are in this area. Two small fields of dryland taro, Colocasia esculenta (kukau), also occur in the area.

A savanna grassland comprises the central portion of the Tx site, extending from the homestead in the eastern portion of the site westward across most of the site to the forest along the western coast. The
vegetation in this savanna consists of grass, sedges, ferns, and some scattered shrubs and trees such as *Pandanus tectorius* (ongor), which occurs throughout the eastern and southeastern portions of the savanna, *Commersonia bartramia* (bebechelut), *Melochia compacta* (chermallucheang), *Morinda citrifolia* (ngel), and *Symplcos racemosa Roxb*. var. *palauensis* (chebtui). In general, these small trees and shrubs are more abundant in the western and southwestern portions of the savanna.

A small freshwater marsh occurs in the south-central portion of the savanna grassland and drains southwest to the southern forest. This marsh is dominated at its upper end by a dense stand of a large native perennial grass *Phragmites karka* covering approximately 200-square-meter (m²) area, while a smaller area (about 25 m²) in the lower end of the marsh is dominated by the herbaceous perennial *Hanguana malayana* (euais).

**Figure 7-1**
Vegetation Cover at Tx Site

**Soil Disposal Site.** A limited reconnaissance survey of the SD 1 site was conducted in 2020 to identify flora, fauna, and habitats present at the site. The site is primarily savanna with forested terrain just outside of the project footprint on the west, north, and east, as shown on Figure 7-2. The proposed access road is largely under forest canopy broken in the center by a narrow segment of savanna.

Savanna grasslands with associated scattered trees occur on volcanic soil substrates where the primary forest has been removed. The presence of highly eroded soils and chronic fires in the past have prevented reforestation on this savanna. Ground visibility in the savanna is about 20% with an
approximately 40-m-long section of dense, high *Dicranopteris linearis* (itouch) splitting the forest in the west half of the proposed access road, which reduces ground visibility to zero. Small tree and shrub species occur on the savanna grassland. They include *Pandanus tectorius* (ongor), which occurs throughout the savanna, *Commersonia bartramia* (bebechelut), *Melochia compacta* (chermallucheang), *Morinda citrifolia* (ngel), and small trees of *Symplocos racemosa* Roxb. var. *palauensis* (chebtui) and *Alphitonia carolinensis* (chelebiob). The endemic *Timonius mollis* was found along the site’s southeast drainage. The endemic shrub, *Hedyotis tomentosus* (leblebul), is found along the savanna boundary with the northeast forest. Grasses, sedges, and ferns are the dominant vegetation in the central and western portions of the savanna. Dominant grasses include *Eriachne pallescens* (in more eroded soil areas) and several species of *Ischaemum* and the fern *Nephrolepis biserrata* in areas with less eroded soils. The ferns *Dicranopteris linearis* (itouch), *Lycopodiella cernua* (olecheiulabeab), *Lindsaea ensifolia*, *Blechnum orientale* (klorouikl), and *Selaginella pseudo volkensii* were found by the southeast drainage (ANL, 2020).

The riparian forest terrain drains to the north and northwest. The associated wetland is dominated by large *Campnosperma brevipetiolata* (kelelacharm). The largest trees observed were the endemic *C. inophyllum* just above the stream running along the northeast and eastern portion of the riparian forest and a *C. hirsutum* along the northern forest. The forests outside the SD 1 boundary consist of an upper canopy of the endemic trees *Horsfieldia palauensis* (chersachel), *Syzygium mesekerrak* (mesekerrak), *Fagraea ksid* (ksid), and *Garcinia matsudai* (tilol). Native trees include the large *Canarium hirsutum* (mesecheues), *Calophyllum inophyllum* (btaches), *Maranthes corymbosa* (bkau), *Elaeocarpus joga* (dekemerir), *Pterocarpus indicus* (las), *Ormosia calavensis* (chedebsungelked), *Planchonella obovata* (chelangel), *Semecarpus venenosa* (tonget), *Rhus taitensis* (eues), *Cerbera manghas* (chemeridech), *Alphitonia carolinensis* (chelebiob), and stands of the palms *Heterospathe elata* (demaiel), *Pinanga insignis* (chebouch), and *Dracaena multiflora* (orredakl). The lower canopy trees include the endemic trees *Osmoxylon truncatum* (kesiamel), *Pandanus aimiriakensis* (chertochet), and *Timonius mollis*. Native trees in the lower canopy or understory include *Premna serratifolia* (chosm), *Eugenia reinwardtiana* (kesil), *Phaleria nisidai* (ongael), *Cynometra racemosa* (ketenguit), *Ixora casei* (kerdeu), *Mussaenda philippica* (cherecheroi), and *Callicarpa elegans* (keruiau). The secondary forest includes *Macaranga carolinensis* (bedel). The largest grass, *Bambusa vulgaris* (bamboo) and the herb *Alpinia pubiflora* (sul) and the saplings of these trees are present. Herbs include *Tacca palmata* and *Tacca leontopetaloides*. Orchids include the native *Nervilia platychila* and the endemic *Crepidium setipes*. The mangroves outside of the soil disposal footprint to the west consist of *Bruguiera gymnorrhiza* (kodenges), *Rhizophora* spp. (tebechel), and *Sonneratia alba* (urur) (ANL, 2020).
7.8.1 Species of Concern – Vegetation

**Project Site.** Two plant species listed by Palau as being of concern, rare, threatened, or endangered were found during the January 2019 surveys of the proposed Tx site (ANL and BNM, 2020). A single *Aglaia mariannensis* (*palauensis*) mesecheues tree was found in the northern forest, while Indian mangrove (*Ceriops tagal*) was found in the mangrove forests in the northwest and southwest portions of the site. However, neither of these were found within the Tx project construction footprint.

**Soil Disposal Site.** No vegetation species of concern were observed at SD 1 during the limited reconnaissance surveys (ANL, 2020).

### 7.9 Aquatic and Terrestrial Animal Life

**Project Site.** The proposed Tx site was surveyed for terrestrial vertebrate species in 2019, with a focus on the rare, threatened, and endangered species. The surveys looked for birds, bats, Micronesian megapode nests, and the Pandanus skink.

While a total of 28 bird species were identified during the avian surveys at the proposed Tx site, the bird community of the site was dominated by the following five species (ANL and BNM, 2020):

- Micronesian starling (the most frequently seen and heard species)
- Dusky white-eye
- Palau fruit dove
- Palau bush warbler
- White tern
Several bird species (such as the Rufous night-heron, Pacific reef heron, Palau nightjar, and great crested tern) were observed only as fly-bys or flyovers or only heard from well beyond the proposed Tx site.

**Soil Disposal Site.** A limited reconnaissance survey of the SD 1 site was conducted in 2020 to identify flora, fauna, and habitats present at the site. Over 17 species of birds were either heard or seen at or near the proposed site, mainly in the offsite forest habitats around the site periphery (ANL, 2020). Species observed included a group of over 30 endemic Palau swiftlets (*Aerodramus pelewensis*, chesisekiaid); the endemic subspecies of conservation concern, the Nicobar pigeon (*Caloenas nicobarica pelewensis*, laib); the endemic Palau fruit dove (*Ptilinopus pelewensis*, biib); and the threatened endemic subspecies, the Micronesian imperial pigeon (*Ducula oceanica monacha*, belochel). Other endemic forest birds heard or seen on site include the bush warbler (*Cettia annae*, wuul); the dusky white-eye (*Zosterops finshchii*, chetitalial); the Palau flycatcher (*Myiagra erythrops*, charmelachull) with a juvenile; the Micronesian myzomela (*Myzomela rubrata kobaysahii*, chesisebangiau); the Micronesian starling (*Aplonis opaca orii*, kiuid), the collared kingfisher (*Todiramphus chloris teraokai*, tengadidik), and the Palau fantail (*Rhipidura lepida*, melimdelebteb). Two endemic Palau owls (*Pyrroglaux podargina*, chesiuch), were heard in the morning, which is unusual, as the owl is usually active and vocal at night. The native Black Noddy (*Anous minutus*, bedaoch), the winter migrant whiskered tern (*Chlidonias hybrida*), the native white-tailed tropicbird (*Phaethon lepturus*), and the native white tern (*Gygis alba candida*, sechosech) were observed flying over the site crossing the forest and savanna. An unidentified hawk or osprey was observed circling the site. Several bats, *Pteropus pelewensis* (olik), were observed flying over the site (ANL, 2020).

**7.9.1 Species of Concern – Wildlife**

**Project Site.** Wildlife species of concern observed at the Tx site during the 2019 surveys included the two bat and nine bird species, as shown in Table 7-1 (ANL and BNM, 2020). A single Palau sheath-tailed bat was observed on one occasion during a morning avian survey, flying over the south-central savanna, and none were observed during the night surveys. The absence of this bat during all night surveys may have been due to strong and very gusty winds that occurred during all the night surveys. In contrast, the Palau fruit bat was observed during most of the field surveys, with individuals often observed flying across the savanna to and from the northern and southern forests, and a roost was observed in the forest north of the Tx footprint.

While the Pandanus skink has been reported on the southern portion of Babeldaob Island, the likelihood of finding this species on the Ngaraard Tx site is quite low. The habitat for this species is shaded Pandanus palms often along streams and swamps, and no such habitat occurs within the proposed Tx project footprint. However, more than 100 Pandanus palms in the savanna area of the site were surveyed, where the palms occur out in the open and in direct sun, and no Pandanus skinks were found.
### Table 7-1
Wildlife of Concern at and in the Vicinity of the Tx Site

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>IUCN Red List Status</th>
<th>Palau Status</th>
<th>U.S. Endangered Species Act Status</th>
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</thead>
<tbody>
<tr>
<td>Palau fruit dove</td>
<td>Ptilinopus pelewensis</td>
<td>LC</td>
<td>T</td>
<td>NL</td>
</tr>
<tr>
<td>Micronesian imperial pigeon</td>
<td>Ducula oceanica</td>
<td>NT</td>
<td>T</td>
<td>NL</td>
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<td>Caprimulgus phalaena</td>
<td>NT</td>
<td>T</td>
<td>NL</td>
</tr>
<tr>
<td>Palau owl</td>
<td>Pyrroglaux podargina</td>
<td>LC</td>
<td>T</td>
<td>NL</td>
</tr>
<tr>
<td>Palau kingfisher</td>
<td>Todiramphus pelewensis</td>
<td>NT</td>
<td>NL</td>
<td>NL</td>
</tr>
<tr>
<td>Morningbird</td>
<td>Pachycephala tenebrosa</td>
<td>LC</td>
<td>T</td>
<td>NL</td>
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<tr>
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<td>T</td>
<td>NL</td>
</tr>
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<td>Myiagra erythrops</td>
<td>LC</td>
<td>T</td>
<td>NL</td>
</tr>
<tr>
<td>Palau bush warbler</td>
<td>Horornis annae</td>
<td>LC</td>
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<td>NL</td>
</tr>
<tr>
<td>Pacific sheath-tailed bat</td>
<td>Emballonura semicaudata</td>
<td>E</td>
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<td>NL</td>
</tr>
<tr>
<td>Palau fruit bat</td>
<td>Pteropus pelewensis</td>
<td>NT</td>
<td>T</td>
<td>NL</td>
</tr>
</tbody>
</table>

E= Endangered  
LC= Least Concern  
NL= Not Listed  
NT= Near Threatened  
T= Threatened

**Soil Disposal Site.** Only a single wildlife species of concern was observed during the 2020 reconnaissance surveys, the Nicobar pigeon (*Caloenas nicobarica*), which is listed as near threatened on the IUCN Red List (ANL, 2020).

### 7.10 Human Communities

#### 7.10.1 Infrastructure and Traffic

**Project Site.** The only significant transportation infrastructure in the project area is the Compact Road, which runs along the eastern boundary of the project site and bisects the isthmus on which the project site is located (Figure 6-1). Traffic is generally light, with peak traffic occurring at the beginning and end of each workday (ANL, 2022).

**Soil Disposal Site.** SD 1 is located 1.5 km to the south of the proposed Tx site. There is no infrastructure at the site, with the exception of the Compact Road which is located east of the site. Traffic conditions near SD 1 are similar to those at the Tx site.

#### 7.10.2 Land Ownership

**Project Site.** The constitution and existing laws of the Republic of Palau gives ownership of resources and jurisdiction over internal lands to each of the 16 states of Palau (PECI, 2018). The Ngaraard State Government is the trustee of all public land of Ngaraard State. Any public lands associated with the
proposed project site would be leased from the appropriate state government. The U.S. Government has been granted land use rights for the proposed project site by the Republic of Palau in a Diplomatic Note (Appendix A), dated 8 December 2017, and the Republic of Palau has agreed to condemn the remaining property that is not secured via a lease. Table 7-2 lists the property parcels associated with the Tx site.

<table>
<thead>
<tr>
<th>Legal Description*</th>
<th>Approximate Size (m²)</th>
<th>General Shape</th>
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<tbody>
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<td>Irregular</td>
</tr>
<tr>
<td>007 E 11A</td>
<td>1,226</td>
<td>Triangle</td>
</tr>
<tr>
<td>008 E 01B</td>
<td>79,522</td>
<td>Irregular</td>
</tr>
</tbody>
</table>

* Legal description obtained from the project topographic survey (2018) (ANL, 2022)

Soil Disposal Site. The parcel that would be used for SD 1 and the proposed access road is owned by Ngaraard State. An MOU between the Ngaraard State Governor and the Ngaraard State Public Land Authority was signed March 2021 (Appendix A) to approve the use of SD 1 for soil disposal associated with the Tx project.

7.10.3 Visual Setting

Project Site. The proposed project site is located on the northern end of Babeldaob Island in a sparsely developed area in Ngaraard State. The topography surrounding the site is characterized by rolling hills and drop-offs to the ocean. The Compact Road runs north/south through Ngaraard, often along the crest of the hillsides, allowing some visibility of the proposed project site. The site is also visible from the area Urung Dock and areas near the Ngaraard State Government Office. There are limited views to the site from residences, the nearby resort, and Chol village to the north due to existing topography and thicker forested vegetation surrounding those features.

Soil Disposal Site. The proposed soil disposal site is located approximately 1.5 km south of the proposed project site. Visibility to the proposed soil disposal footprint is similar to the conditions described previously for the Tx site. The access road to SD 1 is proposed to past through steeper forested vegetation and visibility of the road would be obscured.

7.11 Local and National Economy

The 2020 population of Palau is estimated at approximately 21,685 (The World Factbook, 2020). Tourism is the main industry in Palau, while the public sector (state and national governments) employ the majority (about 70%) of salaried workers. As a result, civil servant salaries are the major income source for the general population of Palau (Sasakawa Peace Foundation, 2013). Average annual household income for Palau was estimated in 2014 at US$20,602 and average per capita income at US$6,968 (Palau, 2014).

The state of Ngaraard has five villages: Ngkeklau, Ulimang, Chelab, Ngebuked, and Chol. In 2005, the population of Ngaraard was 581 people in 120 households (KCN, 2017). The average household income on Babeldaob Island was estimated in 2005 at US$16,000, about 70% of that for Koror State at that time (about $23,000) (McGregor and Bishop, 2011).
7.12 Social/Cultural Resources and Heritage

Project Site. In accordance with the U.S. National Historic Preservation Act requirements (54 U.S.C. 307101(e), formerly Section 402), the USAF worked with the Palau Bureau of Cultural and Historical Preservation, which functions as the Palau Historic Preservation Office, to identify resources and determine minimization measures and BMPs. Cultural resources present at the Tx site are summarized in Table 7-3.

A known Traditional Palauan archaeological site (NA-3:1, Tund) considered eligible for the Palau National Register of Historic Places occupies a significant portion of the Tx project site. This site, previously documented during the Compact Road project in the 1990s, was recorded as a Traditional Palauan earthwork consisting of a crown surrounded by a ditch and six associated terraces. Site NA-3:1 is primarily a Pre-Contact crown, ditch, and terrace complex. Earthwork features are primarily located on the eastern side of the project area. World War II (WWII)-era Japanese defensive features are also present within the site boundary, primarily in the savanna. This site was considered eligible for the Palau National Register of Historic Places prior to fieldwork associated with the Tx project (ANL, 2022).

Cultural resources site surveys were conducted for the TACMOR project in 2019 to identify and document cultural resources visible on the surface at the Tx site. The surveys identified more Traditional Palauan and WWII-era resources within the project area, as well as more extensive terracing associated with NA-3:1 (Gerard-Little et al., 2019; Gerard-Little et al., 2021). Project surveys also identified a set of contiguous features that compose a new site (NA-3:20), which occupies the southern slope of the project area and extends eastward to the other side of the Compact Road. Site NA-3:20 is a complex of Traditional Palauan step terraces, stone and coral architecture, potential agricultural features, outdoor activity areas, and associated traditional pottery, which collectively compose a village. Preliminary analysis suggests that the village was inhabited circa 1,000 years ago, after the creation and primary use of Site NA-3:1 to the north. It is located to the south of the primary area of Tx facility construction on the heavily forested south slope of the project area (ANL, 2022).

Table 7-3
Summary of Cultural Resource Present at the Tx Project Site

<table>
<thead>
<tr>
<th>Type</th>
<th>Chronology</th>
<th>Summary of Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional Earthwork Terraces</td>
<td>Earthwork Era</td>
<td>Earthwork consisting of a crown surrounded by a ditch and six associated terraces</td>
</tr>
<tr>
<td>Japanese Defensive Feature</td>
<td>WWII</td>
<td>Slit trench 23.2 m in length with six firing positions (in poor condition)</td>
</tr>
<tr>
<td>Japanese Defensive Feature</td>
<td>WWII</td>
<td>Foxhole (poor condition)</td>
</tr>
<tr>
<td>Japanese Defensive Feature</td>
<td>WWII</td>
<td>Bivouac trench</td>
</tr>
<tr>
<td>Japanese Defensive Feature</td>
<td>WWII</td>
<td>Slit trench with four positions (poor condition)</td>
</tr>
<tr>
<td>Traditional Palauan Village</td>
<td>Transitional Era</td>
<td>Numerous earthwork terrace features, other stonework and agricultural features (NA-3:20)</td>
</tr>
<tr>
<td>Traditional Earthwork Terraces</td>
<td>Earthwork Era</td>
<td>Additional terraces associated with crown and ditch of NA-3:1</td>
</tr>
</tbody>
</table>
Soil Disposal Site. The SD 1 site contains one previously documented archaeological site, Site NA-3:15 (Olsudong et al., 2006; Wickler et al., 2005). Site NA-3:15 is a light traditional pottery scatter extending over 20 m² of the savanna. The approximately 10-millimeter-thick sherds were fired in a reduced atmosphere and display flanged and thickened rims, suggesting they date to later in Palau’s cultural sequence. Trowel probes suggest the scatter is not associated with a cultural deposit and may result from use of the area for collecting and gathering activities or may be a product of erosion from Ngerbailiang hill to the south. The terrain at the northeastern extent of the proposed access road, where it joins with the Compact Road, may be artificially leveled. Landscape modification is minimal. A potential flattened ridge and step-terrace is located adjacent to a stream just outside the parcel and to the north of the proposed access road, indicating the presence of landscape modification in the vicinity. The morphology and extent of modifications does not resemble traditional earthworks, and the presence of coconut trees in the forest suggest terrain modifications may be associated with German Era coconut plantations. Regardless, the modification to the terrain is so ephemeral and limited in scope that it cannot be recorded as an archaeological site (ANL, 2020).
8 Impact Assessment

The following sections describe the nature, magnitude, and duration of potential effects that may occur during the construction and operation of the proposed Tx facility. Where the anticipated impacts associated with soil disposal activities differ from those anticipated for the Tx facility, they are identified and discussed separately.

An action is considered to have significant environmental impacts if one or more of the significance criteria identified in Palau regulation Title 24 PCNA Chapter 2401-61-06 (September 2020) are applicable:

A. “Involves an irrevocable commitment to loss or destruction of any natural or cultural resource or any use within a historic or cultural site as designated by the Bureau of Cultural and Historical Preservation;

B. Any use of land or waters that have been or may be classified as a conservation area by the national and/or state governments;

C. Curtails the range of protected or beneficial uses of the environment;

D. Conflicts with the Republic of Palau long-term environmental policies or goals and guidelines as expressed in the Environmental Quality Protection Act and any revisions thereof and amendments thereto, any regulations promulgated thereunder, and relevant court decisions, and adopted National or State plans (including but not limited to, master plans, land use plans/zoning, designation of conservation areas, etc.);

E. Substantially affects the economic or social welfare of the community;

F. Substantially affects public health or safety;

G. Involves a substantial secondary impact, including, but not limited to, population changes or effects on public facilities or infrastructure;

H. Involves a substantial degradation of environmental quality or loss of biodiversity, whether genetic, species, and/or ecosystem;

I. Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions;

J. Substantially affects a rare, threatened or endangered species, or its habitat;

K. Detrimentally affects air or water quality or ambient noise levels;

L. Significantly affects an environmentally sensitive area including, but not limited to, flood plain, erosion prone area, geologically hazardous land, estuary, lagoon, reef area, mangrove swamp, fresh water, or marine waters; and/or

M. Creates a substantial demonstrable negative aesthetic effect.”
8.1 Potential Impacts of the Action on the Environment

8.1.1 Topography, Geology, and Soils

8.1.1.1 Topography and Soils

**Construction Effects**

**Project Site.** At the proposed project site, soils would be disturbed during grading and excavation, with permanent removal of some surface and subsurface soils. Existing topography at the Tx site would require extensive grading to prepare the site for the radar installation, resulting in substantial topographic changes. However, these changes would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06). Effects on topography are anticipated to be major. Areas of exposed soil at the construction site would be vulnerable to erosion during precipitation events. Standard construction BMPs would be employed to reduce the likelihood of erosion.

Accidental fuel spills and fluid leaks from construction equipment and bulk fuel storage tanks are possible at the proposed project site, as well as spills of other project-related liquids (e.g., lubricants, paints). Spills or leaks could result in localized soil contamination. Any accidental spill would be expected to be relatively small and primarily affect surface soils. The USAF would employ necessary minimization measures and BMPs to ensure spills are avoided and potential effects are minimized. Soil contamination would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06). Effects from contamination are anticipated to be negligible.

**Soil Disposal Site.** At the soil disposal site, soils would be disturbed for grading and construction of the proposed SD 1 access road, with permanent removal of some surface and subsurface soils. Existing topography at SD 1 would be altered by the addition of approximately 291,500 cubic meters (m³) of surplus soil and 49,600 m³ of basalt rock from the Tx site. The surplus soil and rock would be finished into a flat buildable area or, if the need for capacity drives the design, slopes would be built up, in a benched manner for stability, to higher elevations. Areas of exposed soil at the soil disposal site would be vulnerable to erosion during precipitation events. Standard construction BMPs would be employed to reduce the likelihood of erosion. These changes would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06). Effects on topography are anticipated to be major.

**Operational Effects**

Routine operations are not expected to result in effects on topography or soils. However, an increase in impervious surfaces associated with some of the project infrastructure may result in an increase in surface runoff to offsite areas, which could result in soil erosion. Soil erosion would not be considered
significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06). Standard BMPs will be employed to avoid runoff to the degree possible.

8.1.1.2 Solid Waste and Contaminated Materials

Construction Effects

Project Site. Solid waste generated during site preparation and construction at the proposed project site would include nonhazardous construction wastes, such as excess concrete, containers, wooden scaffolding, and typical construction debris. Construction waste generation would be short-term. Burning waste materials onsite would not be permitted because of the potential effects on local air quality. With implementation of waste management requirements and procedures, construction effects are anticipated to be negligible.

Hazardous waste is any material that meets the definition of hazardous waste as defined by Republic of Palau law, regulation, or permit conditions. Small amounts of hazardous wastes (e.g., waste oil and lubricant, paints, and solvents) would be generated during construction at the site, and these would be disposed of in accordance with all permit requirements.

Solid waste and hazardous waste generation would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06).

Soil Disposal Site. The soils that would be transported to the soil disposal site would not contain any contaminated materials, thus there would be no construction-related impacts at SD 1.

Operational Effects

Minor volumes of trash produced by facility staff during operation of the Tx facility, as well as any solid or liquid wastes generated during routine maintenance, would be collected and disposed of appropriately offsite. Accidental spills of project liquids such as fuel for generators and equipment lubricants could occur during routine maintenance activities, but such spills are expected to be unlikely, would be very small if they occur, and would be quickly addressed. In general, environmental effects from the generation of trash and solid and liquid wastes, as well as from accidental spills of project-related liquids, would be negligible. Therefore, solid waste and hazardous waste generation would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06).

8.1.2 Land Tenure, Zoning, and Use

Construction Effects

Project Site. Land use at the proposed project site would be converted from largely undeveloped land to a military land use hosting project infrastructure and roads. Portions of the agriculture areas to the east of the project footprint would be lost or reduced in size, and the onsite residences and outbuildings would be removed. The availability of surrounding lands to support local agriculture is not expected to be affected and the changes at the Tx site would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06).

Soil Disposal Site. Land at the soil disposal site would be altered by the importation of large quantities of soil for disposal. However, the SD 1 site would remain undeveloped, and the imported soil would be
revegetated and its use as undeveloped public land would remain unchanged and the changes at the SD 1 site would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06).

Operational Effects

There would be no operational effects on land use resulting from the proposed project.

8.1.3 Water

Construction Effects

Project Site. The small wetland (approximately 0.75 acre) in the west-central portion of the site would be permanently filled as part of the necessary site preparation for the Tx facility foundation. The loss of the wetland would be insignificant.

Precipitation events could result in erosion and runoff from areas with exposed soils (e.g., areas undergoing clearing and grading), especially during heavy rainfall events. These soils could be transported to adjacent waterways or downslope by overland flow and eventually to adjacent marine areas. However, any such events would be episodic (i.e., occur only during precipitation events) and short-term during the construction phase. With the implementation of appropriate erosion control measures, such as installing runoff controls and locating storage areas that are in upland areas away from surface water drainages (refer to minimization measures and BMPs in Section 10.0), erosion and sedimentation-related effects on water quality would be mostly avoided, and any effects would be negligible.

During construction, accidental fuel spills and fluid leaks from construction equipment and onsite bulk fuel storage tanks, as well as spills of other project-related liquids such as lubricants and paints could result in localized surface and groundwater contamination. However, any such accidental releases may be expected to be small and localized, given measures to minimize and avoid such accidental releases and quickly respond to an accidental spill. The potential for accidental spills would be small and are anticipated to have negligible effects on water quality.

Construction activities at the proposed project site are also expected to generate wastewater, including domestic wastewater (from restroom facilities) and construction wastewater (for example, de-watering of excavations or equipment washing). With proper management, the effect from this wastewater is expected to be negligible.

Overall, the effects on water resources at the Tx site would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06).

Soil Disposal Site. A small wetland and three small streams are present near the eastern portion of SD 1 and to the north of the proposed access road. The construction of the soil disposal site access road would avoid impacts to the streams and wetlands. The effects on water resources at the SD 1 site would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06). With proper design and implementation of erosion and runoff controls such as culverts, the impacts to water quality would be negligible. Measures would be implemented to reduce erosion and runoff to protect the forest habitats to the north and west. The use of BMPs would result in negligible impacts to water resources from soil disposal at SD 1.
Operational Effects

Sanitary wastewater generated by the staff operating the facility would be handled by an onsite sanitary septic system. A well-maintained system would have negligible effects on groundwater quality and the changes at the Tx site would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06).

8.1.4 Marine

Construction Effects

Project Site. The proposed location is coastal. Implementation of measures to control erosion and runoff would greatly reduce the likelihood of marine environments being affected by construction, and any construction effects would be localized, temporary, and negligible and the changes at the Tx site would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06).

Soil Disposal Site. The SD 1 site is located approximately 100 m from the coast. The slightly inland location of the site will minimize any effects on the marine environment and the changes at the SD 1 site would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06).

Operational Effects

There would be no anticipated effects on marine biota and habitats during the operation of the proposed Tx facility.

8.1.5 Air

Construction Effects

Project Site. Air quality could be affected by fugitive dust and emissions from construction equipment and project-related vehicle traffic. Fugitive dust would be generated during vegetation clearing, site grading, soil excavation, soil disposal, and fill activities. Fugitive dust may also be generated from uncovered soil and fill or disposal piles and from road surfaces during project-related vehicle traffic. The potential for fugitive dust generation will be greatest during the dry season and during the afternoons, when trade winds are most prevalent. The high and frequent rainfall in Palau would help minimize fugitive dust emission at the proposed project site. Overall, the potential for fugitive dust generation is expected to be periodic, short-term, and temporary and would cease with completion of all construction activities and revegetation of remaining areas of exposed soil. BMPs related to fugitive dust are further described in Section 10.

The exhaust from construction equipment, including diesel generators, throughout construction would affect air quality in the immediate vicinity of the proposed project site. Such emissions are mostly unavoidable but would be temporary, short-term, and localized, and they would cease upon completion of construction activities. In addition, regular strong winds at the site would quickly disperse any emissions. While air quality may be affected by vapors from fuels, paints, solvents, and other materials used in construction, any effects would be localized and temporary and would be quickly dispersed.
No health effects would be expected because of negligible air quality effects with the implementation of BMPs described in Section 10.

Overall, the effects on air quality at the Tx site would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06).

**Soil Disposal Site.** Air quality at SD 1 could be temporarily affected by soil transport and disposal activities. Fugitive dust would from uncovered soil and fill or disposal piles and from road surfaces during project-related vehicle traffic. The potential for fugitive dust generation will be greatest during the dry season and during the afternoons, when trade winds are most prevalent. The high and frequent rainfall in Palau would help minimize fugitive dust emission at the proposed project site. Overall, the potential for fugitive dust generation is expected to be periodic, short-term, and temporary and would cease with completion of all construction activities and revegetation of remaining areas of exposed soil and environmental effects would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06). BMPs related to fugitive dust are further described in Section 10.

**Operational Effects**

Operational air emissions would be generated by the diesel generators supplying power at the proposed Tx facility. These air emissions are anticipated to be small and would be quickly dispersed by the regular strong winds at the proposed project site. As a result, there would be negligible effects on air quality from routine operations and environmental effects would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06).

### 8.1.6 Noise

**Construction Effects**

**Project Site and Soil Disposal Site.** Noise levels during facility construction would attenuate quickly with distance from the generation source. Noise sources would include vehicle traffic, dump trucks hauling disposed soil, heavy construction equipment, diesel generators, power tools, and hand tools. Elevated noise levels would be temporary, confined to daylight working hours (up to 12 hours per day), and would cease at the end of each workday. The effects from noise would be temporary and minor according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06).

**Operational Effects**

Operational noise primarily from generators is expected to attenuate with distance from the source of the noise, and the site is located well away from any residences or businesses. Because generation of any operational noise would be regular (i.e., there would be no impulsive noise generation), local wildlife would likely habituate to operational noise relatively quickly. Thus, operational noise is not expected to disturb local residents or wildlife and result in negligible effects according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06).
8.1.7  Aquatic and Terrestrial Plant Life

Construction Effects

**Project Site.** Construction of the proposed Tx facility would require clearing and grading approximately 22 ha (54 acres) of habitat from within the facility footprint. Site clearing would impact a small amount of forest habitat along the northern and southern portions of the site and eliminate a small wetland (approximately 0.75 acres) and much of the grassland/savanna habitat from the central portion of the site. The plant communities in these areas and their associated wildlife habitat would be permanently lost.

Exposed soil areas during construction would increase the potential for erosion and runoff from the sites to habitats in downslope areas. This potential would be greatest along the northern and southern portions of the site, where vegetation clearing, and grading would occur in steep terrain. The use of standard erosion control BMPs would reduce the potential for impacts to habitat.

The saltwater reverse osmosis facility at the LSA would extract salt water from the Pacific Ocean. The location of the pipes for intake and outfall were sited to minimize impacts to coral ecosystems, including aquatic plants. Any impacts to aquatic plants would be temporary.

Overall, the effects on aquatic and terrestrial plant life at the Tx site would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06).

**Soil Disposal Site.** Construction of the access road to SD 1 would require the removal of a small amount of forest habitat and soil would be disposed of on savanna vegetation. The proposed haul route would avoid wetland areas. The plant communities in this area would be lost; however, revegetation of the disposed soil area would occur following soil disposal activities, resulting in moderate impacts to vegetation. These changes to vegetation would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06). A potential for erosion and runoff from the disposed soils into surrounding habitat is possible; however, the use of standard erosion control best management practices would reduce the potential for impacts to habitat.

Operational Effects

An increase in impervious surfaces related to project infrastructure would reduce available habitat and result in minor effects on terrestrial biota and habitats. However, these changes would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06).

8.1.7.1  Protected and Sensitive Plant Species

Construction Effects

**Project Site.** Only two sensitive plant species were identified at the Tx site, the mesecheues tree (*Aglaia mariannensis* [palauensis]) (listed as Vulnerable on the IUCN Red List), and the Indian mangrove (*Ceriops tagal*) (proposed for listing as Threatened on Palau’s Threatened and Endangered list) (ANL and BNM, 2020). Neither species occurs within areas of the site that would undergo clearing and grading or where infrastructure would be located. While these trees may be affected by soils eroding from construction areas and transported to down-gradient forests where these two species occur, the
magnitude and extent of such erosion is expected to be minor with implementation of erosion control measures. Thus, neither of these protected plant species are anticipated to be affected by construction of the Tx site.

**Soil Disposal Site.** No protected plant species were found at SD 1 during site reconnaissance surveys in 2020, therefore no impacts to sensitive plant species are expected to occur during soil disposal activities.

**Operational Effects**

There are no expected effects on biota with the implementation of construction and runoff mitigation measures.

### 8.1.7.2 Invasive and Pest Species

**Construction Effects**

**Project Site and Soil Disposal Site.** With implementation of Palau-required biosecurity control measures, the potential for project construction to introduce or spread invasive species is unlikely. Refer to Section 10 for details on biosecurity minimization measures and BMPs that will be implemented.

**Operational Effects**

Operation of the Tx facility is unlikely to contribute to the spread of invasive or pest species.

### 8.1.8 Aquatic and Terrestrial Animal Life

**Construction Effects**

**Project Site and Soil Disposal Site.** Wildlife in nearby areas could be affected by construction noise. Noise from vehicular traffic and construction equipment could temporarily disturb and displace some wildlife, including disrupting avian nesting and bat roosting in areas adjacent to the proposed project site. As construction-related noise would be temporary, habituation to anthropogenic noise by wildlife is likely for many species and affected species may be expected to return following cessation of construction activities. Therefore, the effects of noise on wildlife would be short-term and negligible.

The saltwater reverse osmosis facility at the LSA would extract salt water from the Pacific Ocean. The location of the pipes for intake and outfall were sited to minimize impacts to coral ecosystems, including aquatic animals. Any impacts to aquatic animals would be temporary.

Overall, the effects on aquatic and terrestrial animal life at the Tx site would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06).

**Operational Effects**

Terrestrial species, including bats and birds, may be affected during site operations. Tall antennae and guywires are a flight hazard for birds transiting the area, especially night flying birds, and may be hazards for bats. However, collisions with antennae or guywires are expected to be infrequent and impacts to bird and bat populations are anticipated to be negligible. Wildlife overflying the site may be exposed to radio frequencies between 1 and 35 MHz from the radar transmitter facility. Radio frequencies below 10-GHz (down to 1 MHz) penetrate skin and heat underlying tissues through energy absorption, with
greater depth of penetration into the tissue occurring with lower frequencies (WHO, 2020). Wildlife exposed to radar may exhibit behavioral responses such as avoidance. It is unlikely that the wildlife would be in contact with the radar emissions for a period of time long enough to incur tissue damage. See Section 8.1.9.3 for more information about radar frequencies and adverse health effects.

An increase in impervious surfaces related to project infrastructure would reduce available habitat and result in minor effects on terrestrial biota and habitats. However, the effects on aquatic and terrestrial animal life at the Tx site would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06).

8.1.8.1 Protected and Sensitive Animal Species

Construction Effects

Project Site. Nine protected bird species and two bat species were observed at the Tx site, and they would be affected by habitat loss and displacement. Population level effects are not expected to these species. Relatively few individuals of any of the protected or sensitive species occur within the project footprint, and all are highly mobile and could easily leave areas undergoing construction and move to nearby undisturbed areas. In addition, the amount of habitat that would be lost at the site is small compared to the amount of similar habitat present in surrounding areas. There is a potential for bat and bird mortality for species that are present onsite during construction.

Protected or sensitive species using areas adjacent to the site could also be disturbed by construction noise. As discussed earlier, construction noise would be temporary; while some species may avoid the area during construction, affected species would be expected to return to adjacent habitats following construction activities. Thus, any effects of noise are expected to be short-term and negligible.

Overall, the effects on protected and sensitive animal species at the Tx site would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06).

Soil Disposal Site. One protected bird species was observed at SD 1 during site reconnaissance, and it would be affected by habitat loss or alteration that would occur with soil disposal activities at the site. Population level effects are not expected to this species at the site. Relatively few individuals of the protected or sensitive species occur within the project footprint, and it is highly mobile and could easily leave areas undergoing construction and move to nearby undisturbed areas. In addition, the amount of habitat that would be lost at the site is small compared to the amount of similar habitat present in surrounding areas, and the area would be usable again by the species following the completion of soil disposal activities. There is a potential for bat and bird mortality for species that are present onsite during construction.

Noise impacts at SD 1 would be similar to those at the Tx site and are expected to be short-term and negligible.

Overall, the effects on protected and sensitive animal species at the SD 1 site would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06).

Operational Effects

Terrestrial species may be affected during site operations. Tall antennae and guywires are a flight hazard for birds transiting the area, especially night flying birds, and may be hazards for bats. Bird and bat
collisions with antennae or guywires are expected to be infrequent; however, the impact would most likely be fatal. Wildlife overflying the site may be exposed to radio frequencies between 1 and 35 MHz from the radar transmitter facility. RFs below 10 GHz (down to 1 MHz) penetrate skin and heat underlying tissues through energy absorption, with greater depth of penetration into the tissue occurring with lower frequencies (WHO, 2020). Wildlife exposed to radar may exhibit behavioral responses such as avoidance. It is unlikely that the wildlife would be in contact with the radar emissions for a period of time long enough to incur tissue damage. See Section 8.1.9.3 for more information about radar frequencies and adverse health effects. The operational effects on protected and sensitive animal species at the Tx site would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06).

8.1.9 Human Communities

8.1.9.1 Traffic

Construction Effects

Project Site and Soil Disposal Site. Local roads near the proposed project site may be expected to experience increased levels of daily vehicle traffic during project construction. Substantial amounts of soil would be hauled via dump truck from the Tx site to the soil disposal site, located 1.5 km away. The dump trucks would use the Compact Road during soil removal activities. It is expected that approximately 175 loads of soil would be hauled per day during the duration of soil removal activities (anticipated to last 200 days). Overall, the temporary and localized increases in vehicular traffic congestion and roadway damage may be expected on the Compact Road near the project and soil disposal sites resulting in major traffic impacts. However, the construction effects on traffic would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06).

Operational Effects

There would be a minimal increase in local traffic as operational staff travel to and from the site. The operations-related increases in local road traffic would be very small; therefore, effects on traffic volumes would be negligible and would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06).

8.1.9.2 Visual Effects

Construction Effects

Project Site. During construction activities, onsite vegetation will be removed, and construction of infrastructure will occur. The proposed project site is visible from some viewpoints along the Compact Road, Urung Dock, and near the Ngaraard State Government Office. The removal of vegetation and construction of site features will change the local visual setting, resulting in moderate visual effects. However, the visual effects at the Tx site would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06).

Soil Disposal Site. Onsite vegetation will be removed for the construction of the access road to the soil disposal site. Additionally, large quantities of soil will be placed on the savanna at SD 1, altering the landscape and potentially raising the elevation at the site up to 9 m high. However, following
revegetation of the project site, the landscape at the project site will mimic the rolling terrain of the surrounding area and visual effects are anticipated to be minor. However, the visual effects at SD 1 would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06).

**Operational Effects**

The development of the Tx facility would represent a change in visual setting from a largely undeveloped landscape with a few residential structures and agricultural fields to one with site infrastructure and maintained landscaping. The finished elevation of the project site is expected to be 9 m, as the project site will be leveled off to support radar installation. The final completed height of the QVIS antenna to be installed on the newly leveled site would be 22 m tall, with the other prominent vertical features being approximately 21 m tall, including a 21-m-tall MSE wall and 5-m-tall diagnostic antenna. The changes to the visual setting would be evident from various viewpoints near the project site including the Compact Road, Urung Dock, and near the Ngaraard State Government Office. However, there is limited residential areas in the vicinity of the Tx site. Therefore, changes to the visual setting are anticipated to be moderate. However, the overall visual effects would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06).

8.1.9.3 Human and Ecological Health

**Construction Effects**

Construction effects on human and ecological health are not expected to occur within the proposed project site. Increased levels of construction traffic on Babeldaob Island’s roadway network could create congestion and reduce safety on the local roadways, although the effects are anticipated to be minor and limited to work hours. Therefore, the construction traffic effects on human and ecological health would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06).

**Operational Effects**

The proposed project is a radar facility to be operated for the U.S. military. Radars generally operate at radio frequencies (RFs) between 300 megahertz (MHz) and 15 gigahertz (GHz). RFs below 10 GHz (down to 1 MHz) penetrate skin and heat underlying tissues through energy absorption, with greater depth of penetration into the tissue occurring with lower frequencies (WHO, 2020). In contrast, RFs above 10 GHz are absorbed at the skin surface and very little energy penetrates into the underlying tissues. The proposed TACMOR project will operate between 1 and 35 MHz as a frequency modulated continuous wave radar system. At present, there is no substantive evidence that adverse health effects, including cancer, can occur in people exposed to RF levels at or below the limits set by international standards (WHO, 2020). The TACMOR system should not result in any human health effects once certified for operation. Therefore, the effects on human and ecological health would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06).
8.1.10 Local and National Economy

Construction Effects

Project Site and Soil Disposal Site. During project construction, short-term increases in local economic activity may be expected, primarily from construction-related employment and an increased demand on support business such as restaurants and temporary housing. It is estimated that up to 140 workers may be employed at the site during construction. Efforts will be made to hire as many Palauan workers as possible, who come from various parts of Palau. Other workers would non-Palauan (e.g., USAF project personnel, specialized construction contractors from Guam and elsewhere). Overall, short-term, positive economic effects may be realized during project construction. Construction housing will be provided onsite at temporary construction worker housing and at a leased community center. Local Palauan workers would commute from their local domicile. Construction impacts to local housing are expected to be negligible.

Overall, the effects on the local and national economy would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06).

Operational Effects

Operation of the facility would have minor and positive effects on the local economy. Property owners would receive regular payment under the terms of the leases established with the USAF and the effects on the local and national economy would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06).

8.1.11 Cultural and Archaeological Resources

Construction Effects

Project Site. Cultural resources fieldwork identified and investigated features associated with two archaeological sites that overlap the Tx facility project area: NA-3:1 and NA-3:20. Earthwork terracing and Japanese WWII defensive features of Site NA-3:1 are located within the infrastructure and grading footprints of the Tx site, and terraces and other components of NA-3:20 may be impacted by the facility’s fence and associated security features.

Due to the large quantity of cut and fill that is planned for construction of the Tx site, some earthwork terrace features associated with Site NA-3:1 would be destroyed. Disturbance of soils associated with grading, excavation, filling, and construction would impact the morphology of the earthwork terraces and the archaeological data they contain. Site construction would also destroy three of the four WWII-era Japanese defensive features identified at NA-3:1.

Vegetation clearance associated with construction has the potential to damage earthwork terraces and underlying archaeological features through uprooting trees, construction vehicle traffic, and potential erosion. Depending on placement, construction of some project infrastructure could result in destruction of subsurface archaeological features present on the terraces (e.g., pits, hearths, pavings, post molds, and architecture). Because Site NA-3:20, which is a unique feature type in Palau, is downslope from where clearing, excavation, and grading may be expected to occur, some portions of the site would be vulnerable to damage from erosion and runoff during precipitation events without the implementation of erosion control practices.
All effected resources would be documented, cataloged, marked for avoidance, or if appropriate recovered, during pre-construction and construction of the proposed Tx facility as directed in the Archaeological Monitoring Plan. Refer to Section 10 for more details on minimization measures for effects on cultural and archaeological resources. The effects on cultural and archaeological resources would be moderate; however, they would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06).

**Soil Disposal Site.** Site reconnaissance at SD 1 identified one previously documented archaeological site, NA-3:15, within the fill footprint. The effects on cultural and archaeological resources at SD 1 would be minor because all such resources would be documented, cataloged, marked for avoidance, or if appropriate recovered, during pre-construction and construction of the proposed Tx facility as directed in the Archaeological Monitoring Plan. Therefore, the effects cultural and archaeological resources would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06). Refer to Section 10 for more details on minimization measures for effects on cultural and archaeological resources.

**Operational Effects.** Operation of the proposed Tx facility would not affect cultural or archaeological resources at the site.

8.2 **Potential Impacts of the Environment on the Action**

8.2.1 **Climate**

The proposed Tx site ranges in elevation from 60 m, which occurs at the northeast boundary of the project site, to 20 m and is bordered to the west by the Pacific Ocean. A coastal flood assessment was completed for nearby Angaur island to analyze coastal flood potential for the proposed TACMOR receiver site from coastal hazards, including waves, typhoon, tsunamis, and potential sea level rise due to climate change. Modeling results indicated that a proposed crest elevation of +4.0 m mean sea level would be sufficient to withstand a 500-year tsunami event. Extreme waves and sea level rise due to climate change are anticipated not to exceed +2.3 m mean sea level in crest elevation (NAVFAC, 2023). Given that the Tx site is located well above the potential climate related effects, it is anticipated that the impacts to proposed Tx site caused by coastal flooding and climate change would be negligible.

Overall, the effects of the environment on the action would not be considered significant according to Palau environmental significance criteria (Title 24 PCNA Chapter 2401-61-06).
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9 Cumulative Impacts

The proposed project is on hilly, largely undeveloped vacant land in an area of Ngaraard State that has remained mostly undeveloped since the construction of the current homestead on the site. No current or reasonably foreseeable future projects were identified near the Tx facility site. The Tx facility represents one component of the proposed TACMOR system. The receiver facility would be located on Angaur Island in the Republic of Palau, a substantial distance away and outside the region of influence of impacts caused by the proposed Tx facility. The necessary permit applications and development of an environmental assessment (EA) for the proposed receiver facility project will be prepared independently of this proposed project.

Given the lack of anticipated future development in the vicinity of the proposed project and the relatively minor overall environmental impact expected from the proposed project, cumulative environmental impacts are unlikely to occur.

9.1 Land Stability and Seascape Processes and Functions

Cumulative effects on land stability and seascape process and functions are unlikely to occur due to the lack of anticipated future development in the vicinity of the proposed project and the relatively minor overall environmental impact expected from the proposed project.

9.2 Natural Resource Quality and Availability

Cumulative effects on natural resource quality and availability are unlikely to occur due to the lack of anticipated future development in the vicinity of the proposed project and the relatively minor overall environmental impact expected from the proposed project.

9.3 Social and Community Dynamics

Cumulative effects on social and community dynamics are unlikely to occur due to the lack of anticipated future development in the vicinity of the proposed project and the relatively minor overall environmental impact expected from the proposed project.

9.4 Economic Conditions

Cumulative effects on economic conditions are unlikely to occur due to the lack of anticipated future development in the vicinity of the proposed project and the relatively minor overall environmental impact expected from the proposed project.
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10 Avoidance, Minimization, and Mitigation

Table 10-1 provides a summary of the environmental effects resulting from the proposed project and associated minimization and mitigation measures or BMPs. The USAF will work with its contractors to develop minimization measures, BMP monitoring, and environmental protection plans that will supplement the EQPB permit applications prior to construction. An onsite environmental manager will be present during construction to ensure that all minimization measures and BMPs are being adhered to.
### Table 10-1
Summary of Avoidance, Minimization, and Mitigation Measures and BMPs for Effects on the Environment from the Proposed Tx Facility

<table>
<thead>
<tr>
<th>Resource</th>
<th>Impact</th>
<th>Mitigation/BMP Option</th>
<th>Mitigation Measure/BMP Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Species of Concern – Other Protected Wildlife</td>
<td>Disturbance of birds prior to and during vegetation clearing.</td>
<td>Wildlife clearing.</td>
<td>Biologists will help to avoid impacts during clearing activities by inspecting the site for any nesting birds or bats. All wildlife will beflushed to minimize impact. Biologists will communicate concerns and recommended actions to the onsite project manager.</td>
</tr>
<tr>
<td>Biological Resources – Vegetation</td>
<td>Loss of native trees and shrubs; loss of endemic, rare, endangered, or culturally important plants in project footprint.</td>
<td>Plant nurseries.</td>
<td>Establish nurseries on Babeldaob Island or at State botanical gardens where salvaged plants and propagules can be maintained for propagation and future conservation use; hire needed staff for each. Coordinate with Palau Bureau of Agriculture, BNM, and EQPB, as applicable.</td>
</tr>
<tr>
<td>Biological Resources – Vegetation</td>
<td>Loss of native trees and shrubs; loss of endemic, rare, endangered, or culturally important plants in project footprint.</td>
<td>Collect trees and shrubs.</td>
<td>Prior to clearing and construction, conduct comprehensive survey to identify plants for salvage and transplant, including the collection of propagules (e.g., fruits and seeds) and/or cuttings of trees and shrubs and endemic, rare, threatened, and endangered plants. Concurrently collect plans for BNM herbarium inventory and conduct surveys to mark trees for harvest.</td>
</tr>
<tr>
<td>Biological Resources – Biomass Management</td>
<td>Loss of native trees and shrubs; loss of endemic, rare, endangered, or culturally important plants in project footprint.</td>
<td>Survey and mark trees.</td>
<td>Prior to vegetation clearing, survey and mark all trees for lumber, firewood, or other uses. Prior to clearing, in coordination with the construction contractor, reconfirm the survey and mark all trees for lumber, firewood, or other uses, and review materials management plans for timber and compost access to community.</td>
</tr>
<tr>
<td>Biological Resources – Invasive Species</td>
<td>Introduction of invasive species.</td>
<td>Establish biosecurity SOPs.</td>
<td>Establish SOPs on aspects of how USAF and the Republic of Palau’s civilian agencies work together regarding biosecurity inspection processes for all project-related activities, including delivery materials and work force.</td>
</tr>
<tr>
<td>Marine Biota and Habitats</td>
<td>Potential impact to marine resources by sedimentation from the construction and operation of the Tx facility.</td>
<td>Marine monitoring survey preconstruction.</td>
<td>Conduct a baseline marine resources survey to establish the quality and condition of marine resources in adjacent areas for the Tx site.</td>
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<td>Resource</td>
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<td>Mitigation/BMP Option</td>
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<tr>
<td>Marine Biota and Habitats</td>
<td>Potential impact to marine resources by sedimentation from the construction and operation of the Tx facility.</td>
<td>Marine monitoring survey post construction</td>
<td>Conduct marine resource surveys during and after construction. One survey will be conducted during the construction period, after vegetation clearing and sometime during excavation and fill activities. A second survey will be conducted after construction is completed and disturbed areas have been revegetated.</td>
</tr>
<tr>
<td>Cultural and Archaeological Resources</td>
<td>Adverse effects on archaeological resources and areas/materials of cultural patrimony.</td>
<td>Archaeological monitoring.</td>
<td>Implement Tx Archaeological Monitoring Plan. Requires qualified archaeologists to work under the direction of USAF project manager and coordinate with Republic of Palau Historic Preservation Office.</td>
</tr>
<tr>
<td>Cultural and Archaeological Resources</td>
<td>Adverse effects on archaeological resources and areas/materials of cultural patrimony.</td>
<td>Interpretive plan.</td>
<td>Seek input from local stakeholders (workshop, etc.) to develop an interpretive plan for stakeholder review. Implement final interpretive plan after approval. Products resulting from interpretive plan may consist of signage at publicly accessible locations, printed brochures, exhibits or other displays, and electronic products.</td>
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<td>Resource</td>
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<tr>
<td>Surface Water, Aquatic Habitats, and Biota</td>
<td>Soil erosion caused by vegetation clearing, grading, and excavation, and soil stockpiles.</td>
<td>Erosion control measures. Employ erosion control measures (e.g., silt fences, fiber rolls) as quickly as appropriate in all areas of soil disturbance, and especially in areas associated with onsite wetlands or drainages. Employ padding in stream channel below disturbance site to capture solids entering the stream; remove after construction activities are completed. Delay clearing and retain stabilizing vegetation on unstable soils and in areas with excessive slopes (e.g., 3:1 or greater) in project areas as long as possible. When feasible, schedule construction during dry season. Track weather conditions and adjust construction activity schedule to avoid oncoming periods of heavy precipitation. Avoid conducting clearing and grading activities in areas with steep slopes during rain events. Stabilize exposed soils, including soil stockpiles, with suitable vegetated (e.g., mulched plant debris) or textile ground cover. Limit spoil piles slopes to no more than 3:1. Cover all spoil and fill piles with geotextiles or other materials when not in use. Maintain vegetated filter strips and/or employ sediment traps in downslope areas and areas currently undergoing construction, especially along coastline; width of vegetated strips should increase with increasing slope steepness. Leave stumps and ground vegetation in areas where vegetation clearing but no soil disturbance is necessary. Develop Stormwater Management Plan and Erosion and Sediment Control Plan and implement approved plans during all project phases. Actively monitor and adjust Stormwater Management Plan requirements as needed to minimize impacts to waterbodies. Stabilize construction entrances and install perimeter controls and diversions to prevent movement of soils offsite. Install dikes, swales, and/or lined ditches to direct work-site runoff away from wetlands, streams, mangrove swamps, and coastlines, as applicable.</td>
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<td>Resource</td>
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<tr>
<td>Surface Water, Aquatic Habitats, and Biota</td>
<td>Soil erosion caused by vegetation clearing, grading, and excavation, and soil stockpiles.</td>
<td>Marine surveys and monitoring.</td>
<td>Perform marine surveys directly offshore of each site to form baseline. Continue monitoring marine environment during project development, particularly following heavy rains, to ensure stormwater and erosion controls are functioning properly.</td>
</tr>
<tr>
<td>Soil Quality</td>
<td>Topsoil loss from grading and excavation.</td>
<td>Soil salvaging.</td>
<td>Topsoil should be salvaged during site clearing and grading activities and reused for site reclamation.</td>
</tr>
<tr>
<td>Air Quality</td>
<td>Fugitive dust from clearing, grading, excavation, fill, soil stockpiling, vehicle traffic, and soil and fill transport.</td>
<td>Standard construction BMPs.</td>
<td>Apply dust control measures (e.g., watering) to areas immediately prior to and during clearing, excavation, and construction activities.</td>
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<td>Conduct watering on unpaved surfaces (e.g., access roads).</td>
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<td>Cover loads during vehicle transport of excavated soils or fill materials.</td>
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<td>Water excavated soils and newly delivered fill material before loading, unloading, filling, or grading.</td>
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<td>Cover stockpiled spoil and fill materials with tarpaulin or geotextiles when not in use, or periodically spray piles with water to form a crust on the outside of the piles.</td>
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<td>Limit operations when winds make fugitive dust control difficult.</td>
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<td>Revegetate or cover disturbed areas as soon as possible after disturbance.</td>
</tr>
<tr>
<td>Air Quality</td>
<td>Air emissions from construction equipment.</td>
<td>Standard construction BMPs.</td>
<td>Use equipment that is in compliance with Republic of Palau air emission standards and applicable USAF requirements and standards.</td>
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<td>Require routine maintenance of all vehicles and construction equipment to ensure efficient combustion and minimum emissions.</td>
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<td>Limit idling of diesel equipment, including generators, to no more than 15 minutes unless required for proper operation (e.g., trenching).</td>
</tr>
<tr>
<td>Soil, Groundwater, Surface Water, Aquatic Habitats, and Biota</td>
<td>Accidental release of fuels and other project-related liquids.</td>
<td>Lined catchment basins.</td>
<td>Provide lined catchment basins with secondary containment around fuel storage areas and vehicle refueling areas to capture accidental spills and leaks as required and where necessary under Republic of Palau regulations and requirements.</td>
</tr>
<tr>
<td>Resource</td>
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<td>Mitigation Measure/BMP Activity</td>
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</tr>
<tr>
<td>Soil, Groundwater, Surface Water, Aquatic Habitats, and Biota (continued)</td>
<td>Accidental release of fuels and other project-related liquids.</td>
<td>Spill prevention and response plan.</td>
<td>Employ drip pans during refueling and under fuel pump and valve mechanisms of any bulk fueling vehicles/storage tanks. Develop spill prevention and response plan. Immediately address spills and implement soil cleanup or removal, as necessary. Install runoff controls (e.g., contour berms, trenches) around vehicle service and refueling areas, chemical storage areas, and waste storage areas to further contain accidental releases. Locate storage areas for fuel and other project materials in upland areas and away from surface water drainage ways.</td>
</tr>
<tr>
<td>Wildlife</td>
<td>Temporary impacts to wildlife from construction equipment noise during clearing, grading, excavation, and construction.</td>
<td>Construction noise BMPs.</td>
<td>Require project equipment (e.g., excavators, compressors) to comply with Republic of Palau and applicable USAF noise requirements and standards. Conduct surveys for nesting activity prior to the initiation of clearing, grading, and construction activities. Coordinate with EQPB and BNM on scheduling initiation of project activities.</td>
</tr>
<tr>
<td>Surface and Groundwater</td>
<td>Impacts caused by sanitary and industrial wastes generated during all project phases.</td>
<td>Sanitary and industrial waste management plan.</td>
<td>Develop solid and industrial waste management plans and implement during all project phases; disposal must comply with Republic of Palau and applicable USAF requirements and standards for wastewater handling and disposal. Develop sanitary and industrial waste wastewater management plans and implement during all project phases; discharge and disposal of wastewater must comply with EQPB and applicable USAF requirements and standards.</td>
</tr>
<tr>
<td>Resource</td>
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</tr>
<tr>
<td>Surface and Groundwater, Vegetation</td>
<td>Impacts to surface and groundwater or native vegetation caused by herbicide use for vegetation management during post-construction operation.</td>
<td>Use of herbicides.</td>
<td>Any herbicide use must comply with USAF and EQPB regulations and requirements. Apply herbicides in a manner that minimizes contact with surface water and groundwater and require application to be performed by certified pesticide applicators. Minimize use in areas with sandy soil. Minimize use in areas with erodible soil. Use short half-life herbicides to extent practicable.</td>
</tr>
<tr>
<td>Native Biota and Their Habitats</td>
<td>Potential introduction of invasive species via imported project materials (e.g., in fill, wood pallets, shipping containers) or workers from outside Palau.</td>
<td>Hazard Analysis-Critical Control Point evaluation.</td>
<td>Develop and implement a hazard analysis critical control point evaluation for all personnel and materials to be brought to the project site from other Palauan locations and especially from foreign locations such as Guam. The evaluation should comply with international standard ASTM E2590, Standard Guide for Conducting Hazard Analysis-Critical Control Point Evaluations.</td>
</tr>
<tr>
<td>Native Biota and Their Habitats</td>
<td>Introduction of invasive species from trucks and construction equipment entering and leaving the site.</td>
<td>Clean trucks and construction equipment.</td>
<td>Establish areas to conduct visual inspection and power wash trucks and equipment arriving at the project location or leaving the project site to remove seeds and propagules that may be adhering to tires and other equipment surfaces; dispose of collected seeds and propagules appropriately.</td>
</tr>
<tr>
<td>Native Biota and Their Habitats</td>
<td>Spread of coconut rhinoceros beetle to areas outside the project footprint through processing, distribution, and use of green waste.</td>
<td>Green waste management.</td>
<td>Process green waste, including the management of compost windrows, in a manner that limits propagation of invasive coconut rhinoceros beetle.</td>
</tr>
</tbody>
</table>
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11 Local Community, Land/Resource Owner, and Wider Stakeholder Consultation

11.1 Identification of Local Community, Land/Resource Owners, and Other Stakeholders

The U.S. Government consulted with the Republic of Palau early in project planning to identify project stakeholders, including local landowners and potentially affected communities near the project sites. As discussed in Section 6.6, project locations and footprints were modified to avoid direct impacts to private landowners where possible.

11.2 Meetings, Workshops, or Other Consultation Held to Date or To Be Held in the Future

The Republic of Palau received the proposal from the U.S. Government for the TACMOR project on July 18, 2017, and subsequently held numerous meetings with national leadership including the Olbiil Era Kelulau, the executive branch, state governors, state speakers, traditional leaders, respective landowners, and stakeholders. Following these discussions, the Republic of Palau’s technical team met with the U.S. Government representatives on August 16, 2017. At this meeting, the Republic of Palau relayed all issues and concerns expressed by the previously referenced Palauan stakeholders. On August 17, 2017, the two technical teams met at the working level to discuss these issues more in depth.

11.3 Outcomes of Consultation

As a result of the numerous meetings, representatives of the Republic of Palau and the U.S. Government narrowed down the scope of the necessary remaining details, which have subsequently been addressed since that time.

11.4 Proposal for Addressing Issues and Concerns Raised

Concerns raised were addressed through ongoing discussions between the Republic of Palau and the U.S. Government during project development. Any additional concerns that may be raised during the Draft EIS review process will be addressed by the U.S. Government in the Final EIS.

11.5 Approval Letter from Governor

The U.S. Government has been coordinating closely with the Republic of Palau’s national leadership, the executive branch, Ngaraard State Governor and state speakers, traditional leaders, landowners, and stakeholders regarding the proposed Tx facility project for many years, including during project siting and alternatives discussions in July and August 2017. In addition to the CoFA, the U.S. Government has been granted land use rights for the proposed project site by the Republic of Palau through a Diplomatic Note (Appendix A), dated 8 December 2017. Subsequently, the Ngaraard State Governor signed a MOU with the Ngaraard State Public Land Authority in March 2021 to approve the USAF’s request to use SD 1 during the Tx project construction. Use of the site by the USAF’s contractor is pending an agreement between the contractor and the Ngaraard State Government.
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12 Conclusions and Recommendations

The potential environmental and socioeconomic effects of the proposed TACMOR Tx facility were identified in Section 8, and associated mitigation measures and BMPs were summarized in Section 10. Most of these effects would be short-term in duration, ceasing with completion of construction and the commencement of facility operations. In accordance with the provisions set forth in Title 24 PNCA, this Draft EIS has preliminarily determined that the project will not result in any significant adverse impacts to the environment.
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13 Disclosure of Consultants

This EIS was prepared by the individuals listed in Table 13-1 under contract between the applicant (USAF) and Jacobs, an international engineering and environmental consulting firm. The preparation of this document was conducted by Environmental Professionals as defined in Title 24 PCNA Chapter 2401-61-03, on behalf of the applicant.

Table 13-1
List of Preparers

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
<th>Education</th>
<th>Years of Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laura Dreher</td>
<td>Document Lead Author</td>
<td>B.S., Civil Engineering</td>
<td>22</td>
</tr>
<tr>
<td>Sarah Jarzombek</td>
<td>Document Support</td>
<td>B.S., Wildlife and Fisheries</td>
<td>1</td>
</tr>
<tr>
<td>Michelle Rau</td>
<td>Project Manager, Lead Technical Reviewer</td>
<td>M.S., Business Administration</td>
<td>25</td>
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<tr>
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<td>B.S., Ecology and Evolutionary Biology</td>
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<tr>
<td>Karen Sanders</td>
<td>Technical Editor</td>
<td>J.D., Law</td>
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<td>B.A., Anthropology</td>
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14 References


15 Appendices
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Appendix A
Land Use Rights and Agreements between the United States and Republic of Palau
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Note No. 109/MSUS/2017

The Ministry of State of the Republic of Palau presents its compliments to the Embassy of the United States of America in the Republic of Palau and submits this addendum to Note No. 101/MSUS/2017, dated November 8, 2017. The Ministry is pleased to submit the following:

Amended map of Babeldaob (Ngaraard) Defense site, updating Document Related to the Designation of Additional Defense Sites Under Section 322(b) and the Agreement Regarding Military Use and Operating Rights of the U.S. Government in Palau, TAB 1; and

Amended map of Angaur Defense Site, updating Document Related to the Designation of Additional Defense Sites Under Section 322(b) and the Agreement Regarding Military Use and Operating Rights of the U.S. Government in Palau, TAB 2.

At this time, the Ministry of State is honored to welcome any relevant representatives of the United States to begin site preparation and survey activities 30 days after the acceptance of updated Tabs 1 and 2, pursuant to the agreement reached between the parties during the October 28 follow-up to the 2017 Joint Committee Meeting. The Ministry considers this invitation to begin any time on or after January 15, 2018.

The Ministry looks forward to submitting any appropriate updates to Tabs 3-7 of Document Related to the Designation of Additional Defense Sites Under Section 322(b) and the Agreement Regarding Military Use and Operating Rights of the U.S. Government in Palau as they become available, and trusts that any delays related to Tabs 3-7 will not delay preparatory and survey activities relating to the sites defined in Tabs 1 and 2.

The Ministry of State of the Republic of Palau avails itself of this opportunity to renew to the Embassy of the United States of America the assurances of its highest consideration.

The National Capitol, REPUBLIC OF PALAU

December 8, 2017
Azimuth = 296 degrees
Total Area (Fenceline) = 34.3 Acres
138819 Sq Meters
6 meter buffer between fenceline various zones
(support area, Radar array and etc)

Legend
- Ngaraad Cadastral Plot
- Fenceline
- Radar Ground Plane
- Keep Out Area
- Support Area

100 Meters X 45 Meters
100 Meters X 70 Meters
200 Meters
377 Meters
260 Meters
260 Meters
173 Meters
173 Meters
173 Meters
173 Meters
173 Meters
N:296 degrees
Total Area (Fenceline) = 49.53 Acres
200,641 Sq Meters
6 meter buffer between fenceline various zones (support area, Radar array and etc.)
MEMORANDUM OF AGREEMENT BETWEEN
THE OFFICE OF THE VICE PRESIDENT REPRESENTED BY VICE PRESIDENT
RAYNO LD B. OILOUCH (APPLICANT) AND BUREAU OF CULTURAL AND
HISTORICAL PRESERVATION/PALAU HISTORIC PRESERVATION OFFICE
(BCHP) REGARDING THE TEST PITS EXCAVATION FOR US DEPARTMENT OF
DEFENSE PROJECT AT CHOL AREA, NGARAARD STATE,
REPUBLIC OF PALAU

WHEREAS, On January 23, 2018 a consultation meeting between the applicant contact person
and BCHP took place at ROP Vice President Office and all requirements where addressed
including Section 106 Process of the US National Historic Preservation Act of 1966 as amended
since it is a US Federal Agency Project, Department of Defense; and

WHEREAS, On January 29, 2018, another consultation took place at the ROP Vice President
Office with the presence of the applicant, EQPB representatives, President Office representative,
and BCHP staff to conduct a joint understanding and all requirements for the permitting process;
and

WHEREAS, The Office of the Vice president (applicant) has filed an application for a Historic
Clearance on January 30, 2018 to conduct test pits excavation for the US Department of Defense
Project on an area in Chol, Ngaraard State; and

WHEREAS, the BCHP staff reviewed archival materials and went to visit the propose project
area and found that it is within site B:NA-3:1 called, “Mellii”; and

WHEREAS, the Site is a Terrace Set containing crown, ditches, and terraces that occupies a
savanna area southwest of the modern settlement of Chol; and

WHEREAS, on January 31, 2018, a joint site inspection including applicant contact, US DoD
representatives, EQPB representatives, and BCHP staff met at the project site and decided to
issue a phase I permit only to TP-1, TP-2, TP-3, and TP-4 on the savanna area since the
impact of the access road has no adverse effect while the remaining TP will wait for the access
road map to be assessed and an amendment will be done to this MOA to cover the rest of the TP;
and

WHEREAS, the proposed project have effect to historical site B:NA-3:1 and therefore, a
Professional Archaeologist who has established a credentials with the Bureau of Cultural and
Historical Preservation must be hired to be part of the actual excavation of the units to monitor,
map, and document all the units profile and any other artifacts and or human remains unearthed
during the excavation; and

Omekeerreuw, Omecheliuw, Mengeluolu, e Klekar a Ibetel a Cherechar er a Belau

BCHP Initial: [Signature]
WHEREAS, a professional archaeological data recovery report of all the test units shall be provided to BCHP for references; and

WHEREAS, pursuant to Title 19 of PNC Chapter 1 and BCHP regulations, Bureau of Cultural and Historical Preservation (BCHP) is responsible for the protection and preservation of historic properties and maintaining a cultural and historical database for the whole Palau was consulted by the applicant; and

NOW THEREFORE, The Office of the Vice President represented by Vice President Raynold B. Oilouch (applicant) and Bureau of Cultural and Historical Preservation/Palau Historic Preservation Office has taken into consideration the effect of the project to cultural and historic property and to satisfy Title 19 Chapter 1 of PNC, BCHP regulations, and Section 106 of the US National Historic Preservation Act of 1966 as Amended through the following stipulations to ensure that all the cultural and historical properties on the area are not needlessly disturbed, altered, and or destroyed without proper documentation, preservation, and or protection.

STIPULATIONS

1. The Office of the Vice President (applicant) shall ensure that all activities of the project must follow exactly what was stated in the project proposal and all measures within this MOA and its attachment and all official letters and consultations that were agreed upon between applicant representatives and BCHP.

2. The Office of the Vice President (applicant) shall ensure that a Professional Archaeologist who has established credentials with BCHP to conduct archaeological work in Palau, be hired to conduct a Data Recovery to fully document all the significant cultural and historical properties within the permitted TP (TP-1, TP-2, TP-3, and TP-4).

3. The Office of the Vice President (applicant) shall ensure that the Professional Archaeologist must conduct all necessary means to fully document everything in detail of the overall landscape to satisfy the Data Recovery Report.

4. The Office of the Vice President (applicant) shall ensure that a full Data Recovery Report that includes an introduction of the Project, location, project design, background history and usage of the area including previous archaeological work in the area, type and scope of archaeological work to be conducted, maps and photos of features, location map of all excavations and test pits, profile map of each test pits, oral history of the area, and recommendations of all features in relation to the Palau National Register of Historic Places Criteria.

5. The Office of the Vice President (applicant) shall ensure that 3 professional bound copies and 1 electronic copy of the complete Final Archaeological Data Recovery Report of Air Domain Awareness project must be submitted to BCHP.

Omeokerreu, Omecheliu, Mengeluolu, e Klekar a Ibetel a Cherechar er a Belau

BCHP Initial: [Signature]
6. The Office of the Vice President (applicant) shall ensure that all activities of the Air Domain Awareness project must stay within the proximity of the project.

7. The Office of the Vice President (applicant) shall report to BCHP for consultation on any changes to the proposed project plan that is not stated within the proposal before any action is taken.

8. The Office of the Vice President (applicant) shall ensure that any unusual find or human remain encountered or unearthed during the actual earthmoving and construction, the activities must stop and the Bureau of Cultural and Historical Preservation must be notified for assessment.

9. BCHP staff shall conduct monitoring of the project on a systematic basis to ensure all stipulations and requirements are followed during the course of the project.

10. Should any of the signatories find that any part of this MOA cannot be met or find it necessary to make amendment, that signatory shall initiate a consultation with other signatory. The amendment of this MOA shall follow the same process as the execution of this MOA.

The execution of this MOA and implementation of its term of reference as evidence that Mr. Raynold B. Oilouch, ROP Vice President (applicant) has afforded Bureau of Cultural and Historical Preservation/Palau Historic Preservation Office an opportunity to comment on a study of the project area and its effects on a cultural and historical property and has taken into account the effect of the undertaking on historic property.

Air Domain Awareness
Mr. Raynold B. Oilouch, ROP Vice President (Applicant)

[Signature]
Mr. Raynold B. Oilouch
ROP Vice President
Koror, republic of Palau 96940

[Date]

Bureau of Cultural and Historical Preservation/Palau Historic Preservation Office

[Signature]
Sunny O. Ngirmang
Director/HPO

[Date]
First Original Attachment part of the proposed DoD Air Domain Awareness Project MOA in Ngaraard State

Agreement between the Office of the Vice President of the Republic of Palau represented by Vice President Raynold B. Oilouch (Applicant) and Bureau of Cultural and Historical Preservation (BCHP) regarding the Data Recovery work of the proposed DoD Air Domain Awareness Project at Chol, Ngaraard State, Republic of Palau

“Listing of all activities that shall be perform by a Professional Archaeologist to complete the data recovery work of the DoD Air Domain Awareness Project in Chol at Ngaraard State”

1. Must identify all features, artifacts, and or human remains encountered, unearthed, or exposed during the actual proposed project is conducted.

2. Must fully document all the features, artifacts, and or human remains on the proposed project area.
   - Identify all features, artifacts, and or human remains
   - Give feature number for each features, artifacts, and or human remains
   -Detail Mapping of each individual features, artifacts, human remains, and test units.
   -Detail Mapping for all features, artifacts, human remains, and test units in relative to one another and its topographic (Map of all features and its topography)
   - Photograph of all features, artifacts, human remains, and test units
   - GPS coordinates of all features, artifacts, human remains, and test units
   -Detail description of each individual features, artifacts, human remains, and test unit including its location, name, usage, design, construction, condition, and its environment and topographic
   - Map and photograph detail profile of all sided of all test units
   - Map and photograph all artifacts and or human remains that are exposed during the excavation of the test units.

Omekerevu, Omechelu, Mengeluolu, e Klekar a Mekreos el Ibetel a Cherecharer a Belau
3. Must provide an overview of the proposed DoD Air Domain Awareness Project.

4. Must provide a historical background of the entire area; usage over the years.

5. Must identify if there is, an existence of both pre-contact period (Traditional) and contact period and its significance.

6. Must collect all relevant oral history regarding the area.

8. Must provide an overall context base on the assessment and the existence of all features relative to one another as well as other features outside the project area but provide a relationship to one another.

9. Must ensure that any human remains encountered during the field work must be treated with respect and be carefully documented in detail. It shall be reported to BCHP for consultation and the BCHP regulation entitled; “Regulations Regarding the treatment and Disposition of Human Remains and Burial Furnishing” and “Agreement for the Disposition of Human Remains” must be followed. It shall be noted that all remains found in the Republic of Palau are considered Palauan until proven otherwise.

10. BCHP staff shall conduct a systematic monitoring of the proposed project to ensure all conditions and stipulations are followed.

11. This Agreement shall serve as the first original attachment to the MOA of the DoD Air Domain Awareness Project that is signed between the Office of the Vice President of the Republic of Palau represented by Vice President Raynold B. Oilouch (applicant) and BCHP.

DoD Domain Awareness Project
Office of the Vice President of the Republic of Palau (Applicant)

[Signature]
Mr. Raynold B. Oilouch
Vice President
Republic of Palau

Date: 2/12/18

Bureau of Cultural and Historical Preservation
Ministry of Community and Cultural Affairs

[Signature]
Ms. Sunny O. Ngirmang
Director/HPO
BCHP

Date: 2/12/18

Omeherreu, Omecheliu, Mengeluolu, e Klekar a Mekreos el Ibetel a Cherecharer a Belau
MEMORANDUM OF AGREEMENT (MOA)

between

Ngaraard State

and

Belau National Museum

I. BACKGROUND
The Belau National Museum is under contract with Argonne National Laboratory to implement a mitigation plan for the TACMor radar program in Ngaraard State. One of the mitigation measures is to construct and operate a greenhouse for the transfer of important and valued plants before clearing the site. The greenhouse will be constructed at Ngaraard State.

II. PURPOSE & SCOPE
The purpose of this MOA is to clearly identify the roles and responsibilities of each party in regards to the construction and operations of the greenhouse.

III. NGARAARD STATE RESPONSIBILITIES
Ngaraard State agrees to:
- Construct a State Nursery
- Designate or hire a nursery manager to implement key activities
- Participate in a Nursery Manager Training with BNM staff
- Coordinate with the Contractor and BNM staff during transfer of plants from the TACMor site to the nursery
- Provide quarterly report on inventory at nursery and transfer activities
- Provide an annual budget for Argonne National Laboratory for operation of the greenhouse for the TACMor radar program.

IV. BELAU NATIONAL MUSEUM (BNM) RESPONSIBILITIES
BNM agrees to:
- Provide initial funding support of the amount of $6,900.00 to support this project.
- Provide at least one technical training and ongoing technical support to Ngaraard State as deemed appropriate by BNM Director.

V. IT IS MUTUALLY UNDERSTOOD AND AGREED BY AND BETWEEN THE PARTIES THAT:
Modifications to this agreement shall be made by mutual consent of the parties through the issuance of a written modification, signed and dated by both Parties, prior to any changes being performed.
Both parties agree to be reasonable, flexible and accountable and will work together in a spirit of cooperation.

VI. FUNDING
Upon the signing of this MOA, BNM will transfer funds of the amount of $6,900.00 to Ngaraard State upon receipt from Argonne National Laboratory. This transfer of funds will be handled in accordance with applicable laws, regulations, and procedures of the Republic of Palau.

VII. EFFECTIVE DATE AND SIGNATURE
This MOA will be deemed effective at the date of signing by both parties and will remain in effect for a duration of 2 years.

Benjamin Iskawa
Governor
Ngaraard State
day of December 2020

Olympia Morei-Remehgesau
Director
Belau National Museum
day of December 2020
ADDENDUM TO THE
MEMORANDUM OF AGREEMENT BETWEEN THE MINISTRY OF PUBLIC INFRASTRUCTURE AND INDUSTRIES AND THE BUREAU OF CULTURAL AND HISTORICAL PRESERVATION/PALAU HISTORIC PRESERVATION OFFICE REGARDING CONSTRUCTION OF THE TACMOR FACILITIES IN THE REPUBLIC OF PALAU

WHEREAS, the President designated the Ministry of Public Infrastructure & Industries to assumed the role of the TACMOR Project Applicant on behalf of the United States Air Force (hereafter referred to as “USAF”) that was formerly carried out by the Office of the Vice President of the Republic of Palau; and

WHEREAS, on August 18, 2021 the TACMOR team and the Bureau reviewed the technical findings overview on the Air Force Installation and Mission Support (reference AFIMSC Det 2/CEV) and 100% submittal of the Sensitivity Map of the Tx and Rx General Site Plan dated June 18, 2021; and

WHEREAS, due to the Cultural Sensitivity Areas located in the Tx site, it was agreed that a Monitoring Plan and a Data Recovery Plan is modified and finalized and to be the attachment to the final report to be submitted to the Bureau; and

WHEREAS, a Monitoring Plan for the Rx site be drafted to be the attachment to the final report to cover the possibility or inadvertent discovery of human remains and other cultural materials; and

WHEREAS, on September 17, 2021 the Bureau received electronic and hard copy submittal of the Final Report of the Cultural Resources Investigations to Support Construction of Air Domain Awareness Radar Facilities in the Republic of Palau prepared by Argonne National Laboratory and the “strawman” MOA with two attachments as Appendix C (1) Monitoring – Archaeological Monitoring, Ngaraad, Republic of Palau Monitoring Plan (reference date September 2021) prepared for USAF (ref. AFIMSC Det 2/CEV) and (2) Archaeological Monitoring, Angaur.

Omekerreou, Omcheliu, Mengaluolu, e Kleker a ibetel a Chararchar or a Balau

BCHP Initial: ___
Republic of Palau Monitoring Plan (reference date September 2021) prepared for USAF (ref. AFIMSC Det 2/CEV); and

WHEREAS, on October 12, 2021 a consultation meeting between the Ministry of Public Infrastructure and Industries represented by Minister Charles Obichang and the Minister of Human Resources, Culture, Tourism, and Development represented by Minister Ngiraielas Tmetuchl with key staff and agreed that the Original MOA dated February 09, 2018 sign by the former ROP Vice President Mr. Raynold B. Oilouch will remain and that a second addendum be drafted to address the construction phase of the TACMOR project; and

WHEREAS, this addendum will concur the Construction Phase of the TACMOR Tx Site in Chol at Ngaraoa State and the Rx Site in Angaur State following all conditions stipulated in this second addendum and the original MOA signed and approved on February 09, 2018 will remain in effect; and

WHEREAS, the Bureau is empowered to conduct active and passive monitoring during the Construction Phase and require reporting from the TACMOR team concerning the stipulated conditions and intervene pursuant to applicable laws and regulations;

NOW THEREFORE, the Ministry of Public Infrastructure and Industries represented by Minister Charles Obichang as applicant and the Bureau of Cultural and Historical Preservation/Palau Historic Preservation Office have agreed to everything on the proposed undertaking through the following stipulations.

STIPULATIONS

1. The Ministry of Public Infrastructure and Industries as Applicant shall ensure that all activities must follow all stipulations and conditions stated in this 2nd Addendum and the original MOA that was signed and approved on February 09, 2018 as well as the Monitoring Plan for both Tx (Monitoring – Archaeological Monitoring, Ngaraoa State, Republic of Palau, September 2021) and Rx (Archaeological Monitoring, Angaur, Republic of Palau, September 2021) sites that will be original attachment of this 2nd Addendum.

2. The Ministry of Public Infrastructure and Industries as Applicant shall ensure that the undertaking of the TACMOR facilities must follow what was stated in the proposed General Site Plans dated June 18, 2021.

3. The Ministry of Public Infrastructure and Industries as Applicant shall ensure that a professional archaeologist who meet the Secretary of the Interior Standard must be present as required at all times during the actual construction phase for monitoring outlined on the Monitoring Plans for the Tx and Rx facilities.

4. The Ministry of Public Infrastructure and Industries as Applicant shall ensure that an interpretive plan for both Tx and Rx sites will be developed as part of the mitigation.

5. The Ministry of Public Infrastructure and Industries as Applicant shall inform BCHP on the exact dates of the actual construction to begin.

Omekkerre, Omechellu, Mangelolu, e Kleker e Ibetel e Cherochar or a Belau

BCHP Initial:_____

6. The Ministry of Public Infrastructure and Industries as Applicant shall ensure that any unusual find or human remains unearthed, encountered, or exposed during the actual construction work; the work on that particular area must stop and be reported to BCHP for assessment.

7. The Ministry of Public Infrastructure and Industries as Applicant shall understand that if any of the stipulations and or conditions are not followed, BCHP will stop the project and assess the situation before proceeding. Applicant will bear all the violations of any unnecessary undertakings that is not covered by this 2nd Addendum and the original MOA.

8. BCHP must conduct monitoring of the project on systematic intervals to ensure all stipulations and conditions are met.

9. Should any of the signatories find that any part of this second addendum to the original MOA cannot be met or find it necessary to make amendments, that signatory shall initiate the consultation with the other signatory. The amendment of this 2nd Addendum shall follow the same process of its execution.

The execution of this 2nd Addendum and its implementation of its terms of reference as evidence that Minister Charles Obichang, Minister of the Ministry of Public Infrastructure and Industries has afforded the Bureau of Cultural and Historical Preservation/Palau Historic Preservation Office an opportunity to comment on the undertaking and its effect on cultural and historical property and has taken into account the effect of the undertaking on historic property.

Ministry of Public Infrastructure and Industries
Represented by Minister Charles Obichang (Applicant)

[Signature]

Minister Charles Obichang
Applicant
Air Doman Awareness (USAF)

Approved by:
Bureau of Cultural and Historical Preservation/Palau Historic Preservation Office
Ministry of Human Resources, Culture, Tourism, and Development

[Signature]

Minister Ngirabelas Tmetuchl

[Date]

Attachment I: Letter from President to MPII Minister

Omskarrou, Omechelu, Mengalolu, e Kleskar a Ibatel a Cherechar er a Belau

BCHP Initial: _____
Attachment II: Archaeological Monitoring, Ngaraard State, Republic of Palau, September 2021

Attachment III: Archaeological Monitoring, Angaur, Republic of Palau, September 2021
MEMORANDUM OF UNDERSTANDING
BETWEEN NGARAARD STATE GOVERNOR BENJAMIN ISKAWA
AND THE NGARAARD STATE PUBLIC LAND AUTHORITY

1. General

   a. This memorandum of understanding is entered into by Governor Benjamin Iskawa located at PO Box 6026, Ngaraard State, Palau 96940, and Chairman Robert Tutii of the Ngaraard State Public Land Authority located at PO Box 6026, Ngaraard State, Palau 96940.

   b. The purpose of this Agreement, hereinafter referred to as the MOU, is to approve the request made by the US Air Force, in their December 7, 2020 letter to Governor Iskawa (Attachment 1) for consideration of the referenced public land parcel, in Elab Hamlet, identified as Soil Disposal Area 1 (SD1) for potential use by the TACMOR Project Construction Contractor, during the Transmit (TX) Site project construction (Attachment 2: SD1 Location Map).

2. Background

   a. During the design of the TACMOR Project, the requirement for off-site soil disposal areas, resulting from TX site excavation of a substantial amount of soil, was identified.

   b. The TACMOR project team, working with the Ngaraard State Governor, nominated several areas of Ngaraard State public land for consideration as potential soil disposal sites. Criteria for the nomination of sites included 1) proximity to the TX project site, 2) land topography, 3) ease of access, and 4) existing environmental resources. (Attachment 3: Letter Report on Ngaraard State Lands)

   c. The site identified as “SD1” was considered most favorable given it met the aforementioned criteria areas. In addition, site “SD1” has other favorable conditions including 1) level elevations and 2) absence of significant environmental and cultural resources.

3. Agreement

   a. It is agreed by the parties to give favorable consideration for the use of state public land, identified as SD1, located in Elab Hamlet, for the disposal of excess soil from the TACMOR Project TX Site.

   b. It is understood use of the site will be available to the construction contractor as an option and at their discretion. Use of the site would be pending an agreement between the contractor and Ngaraard State Government.

   c. It is understood certain improvements to the land area will include construction of an access roadway, for ingress and egress to the disposal site, from the Palau Compact Road highway. All activities will be conducted by the construction contractor and subject to the laws and regulations of the Republic of Palau.

4. Agreement Termination
Termination of this agreement may be effected by either party to the MOU upon 30 day written notice to the other party.

Both parties have read and agree to comply with all terms and provisions of this MOU.

Governor Benjamin Iskawa

Date

Chairman Robert Tutii, NSPLA

Date

Attachment 1: US Air Force letter of request to Governor Iskawa
Attachment 2: SD1 Location Map
Attachment 3: Letter Report on Ngaraard State Lands
Appendix B
Proposed Layout of Life Support Area
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Appendix C
Saltwater Reverse Osmosis Permit Application
1. **Outfall Location:** For each outfall, list the latitude and longitude to the nearest 15 seconds, and the name of the receiving water(s). Attach a USGS topographic map to the application showing the facility boundaries, outfall number and location, map scale, meridian arrow showing north, all surface water bodies, currents, and for tidal waters the direction of ebb and flow tides. You should name all waters to which the discharge is made and which flow into significant receiving waters. For example, if the discharge is made to a ditch which flows to/into an unnamed tributary which in turn flows to a river and into the lagoon, you should provide the name (or description if no name is available) of the ditch, the tributary, river and lagoon.

<table>
<thead>
<tr>
<th>Outfall Number (list)</th>
<th>Latitude</th>
<th>Longitude</th>
<th>Receiving Water (name)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Deg</td>
<td>Min</td>
<td>Sec</td>
</tr>
<tr>
<td>1</td>
<td>7</td>
<td>39</td>
<td>45.80</td>
</tr>
</tbody>
</table>

2. **Discharge Date:** Provide the date when you expect to begin discharging. If your facility already has an existing discharge, provide the date when the discharge began.

   May 2023

3. **Flows, Sources of Pollution, and Treatment Technologies:** List all outfalls and for each outfall, provide a description of (1) All operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and stormwater runoff; (2) The average flow contributed by each operation; and (3) The treatment received by the wastewater. You should describe the treatment in either a narrative form or list the proper code for the treatment unit from the list provided in Table 1. Also describe the ultimate disposal of any solid or liquid wastes not discharged. Continue on additional sheets if necessary.

<table>
<thead>
<tr>
<th>Outfall Number</th>
<th>1. Operations Contributing Flow (list)</th>
<th>2. Average Flow (include units)</th>
<th>3. Treatment (Description or List Codes from Table 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Reverse Osmosis/Desal</td>
<td>5.83 cu. M/hr</td>
<td>Outfall Dispersal</td>
</tr>
</tbody>
</table>
Part II - Point Source Pollutant Discharge

4. Water Flow Line Drawing: Attach a line drawing showing the water flow through the facility from intake to discharge. An example of an acceptable line drawing is provided in Figure 1. Indicate all sources of intake water, operations contributing wastewater to the effluent, including process and production areas, sanitary flows, cooling water and stormwater runoff, and treatment units labeled to correspond to the more detailed descriptions provided in Item No. 3 above. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units and outfalls. Show all significant losses of water to production, atmosphere and discharge. If a water balance cannot be determined (e.g., for certain mining activities) provide a pictorial description of the nature and amount of any sources of water and any collection and treatment measures.

5. Intermittent or Seasonal Discharges: Except for stormwater runoff, leaks, or spills, will any of the discharges described in Item No. 3 be intermittent or seasonal?

☐ No (Go to Item No. 6)  ☑ Yes (Complete the following table. Fill in each applicable column. A discharge is intermittent if it occurs with interruptions during the operating hours of the facility. A discharge is seasonal if it occurs during certain parts of the year. The reported flow rate is the highest daily value. Maximum total volume means the total volume of any one discharge within 24 hours.)

<table>
<thead>
<tr>
<th>Outfall Number</th>
<th>Frequency</th>
<th>Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Days per Week (specify average)</td>
<td>Months per Year (specify average)</td>
</tr>
<tr>
<td>1</td>
<td>7</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Unit Specs: Conc Flow 5.83 cuM/h
Water Yield: 2.5 cuM/h
6. **Discharge Pollutants (Table 2)**: Provide an estimated daily maximum and average (both concentration and total mass) for the pollutants identified in Table 2. Data for all pollutants in Group A for all outfalls must be submitted. Data for pollutants in Group B for all outfalls should be reported only for pollutants that you believe will be present. Base your determination of whether a pollutant is or will be present in your discharge on your knowledge of the facility’s raw materials, maintenance chemicals, intermediate and final products, and any analysis of your effluent or of any similar effluent. If data from sampling and analysis is available, then this data should be reported. Indicate the source of the data, such as (1) Engineering study for your facility, (2) Actual data from pilot studies, (3) Estimates from other engineering studies, (4) Data from your plant or other similar plants, (5) Best professional judgment, or (6) Others. Data for each outfall should be on a separate page. Attach additional sheets of paper if necessary.

<table>
<thead>
<tr>
<th>1. Pollutant</th>
<th>2. Maximum Daily Value (include units)</th>
<th>3. Average Daily Value (include units)</th>
<th>4. Source of Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concentrated Brine (TDS)</td>
<td>50,000 mg/l</td>
<td>50,000 mg/l</td>
<td>RO Plant Specifications</td>
</tr>
</tbody>
</table>
7. Discharge Pollutants (Table 3): Use the space below to list any of the pollutants identified in Table 3 that you know or have reason to believe are or will be discharged from any outfall. For every pollutant you list, briefly describe the reason you believe it will be present. You do not have to provide data on concentrations.

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Reason for Discharge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concentrated Brine</td>
<td>Workers camp/compaction activities require desalinated potable water as municipal water system cannot sufficiently accommodate project potable water demand. There are no nearby streams in the area, therefore ocean water is the only available water source. Temporary use of Reverse Osmosis/desalination plant will be used on site to provide water for project personnel and soil compaction during construction.</td>
</tr>
</tbody>
</table>

8. Engineering Report on Wastewater Treatment: If there is any technical evaluation concerning your wastewater treatment, including engineering reports or pilot plant studies, check the appropriate box below:

☑ Report Available
☐ No Report

9. Provide the name and location of any existing plant(s) which, to the best of your knowledge, resembles this production facility with respect to production processes, wastewater constituents, or wastewater treatments.

<table>
<thead>
<tr>
<th>Name</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peleliu Reverse Osmosis Plant</td>
<td>Peleliu Island</td>
</tr>
</tbody>
</table>
10. Use the space below to expand upon any of the above questions or to bring to the attention of the application reviewer any other information you feel should be considered in establishing permit limitations for the proposed facility. Attach additional sheets if necessary.

Daily water demand for on-site personnel is approximately 6,000 gallons per day.

Total potable water storage capacity on-site is 3,960 gallons (15 cuM). After initial fill up of water tanks, RO/desalination plant will run intermittently to keep tanks topped off.

This proposed discharge activity will terminate at the end of the project. All materials related to this activity will then be removed from the reef flat.

11. Certification: I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

<table>
<thead>
<tr>
<th>Name and Official Title (Type or Print)</th>
<th>Phone No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signature</td>
<td>Date Signed</td>
</tr>
</tbody>
</table>
Outfall (Pacific Ocean)  
7° 39’ 45.80”N, 134° 37’ 10.42”E

Intake Water (Pacific Ocean)  
7° 39’ 49.68”N, 134° 37’ 25.69”E

Reverse Osmosis/Desalination Plant

Desalinated Potable Water

Water System Utilization Rate: 28 – 35%

FIGURE 2
WATER FLOW DIAGRAM