



Draft

Environmental Impact Statement /  
Overseas Environmental Impact Statement

GUAM AND CNMI MILITARY RELOCATION

Relocating Marines from Okinawa,  
Visiting Aircraft Carrier Berthing, and  
Army Air and Missile Defense Task Force

**Volume 8: Additional Items Required by NEPA**

November 2009

Comments may be submitted to:

Joint Guam Program Office  
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# Guam and CNMI Military Relocation EIS/OEIS

## Volume 8: Additional Items Required by NEPA

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# **CHAPTER 1.**

## **INTRODUCTION**

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This volume is divided into seven chapters. Chapter 1 provides a brief introduction and lists the contents of subsequent chapters. Chapter 2 is titled Consistency with Other Federal, State, and Local Land Use Plans, Policies, and Controls and provides a summary table that identifies relevant plans, policies, and controls that apply to the proposed actions. Chapter 3 identifies required permits and approvals. Chapter 4 discusses the irreversible and irretrievable commitment of resources. Chapter 5 provides a discussion on the relationship between short-term use of the environment and long-term productivity; it is subdivided into resource categories. Chapter 6 addresses the goals of sustainability and smart growth. Chapter 7 provides the distribution list of agencies receiving this document, and Chapter 8 provides information on the individuals and organizations that prepared this document.

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## CHAPTER 2.

# CONSISTENCY WITH OTHER FEDERAL, STATE, AND LOCAL LAND USE PLANS, POLICIES, AND CONTROLS

A summary of the laws, implementing regulations, and Executive Orders (EOs) applicable to the proposed actions is provided below. The Description of Proposed Actions and Alternatives for each volume and the Guam Joint Military Master Plan have been developed to ensure consistency with land use guidelines for the project areas and with the objectives of federal, regional, state, and local land use plans, policies, and controls. Table 2.1-1 provides a summary of the status of compliance with relevant federal, state, and local plans, policies, and controls, and the agency responsible for enforcing the laws.

**Table 2.1-1. Status of Compliance with Relevant Plans, Policies, and Controls**

<i>Plans, Policies, and Controls</i>	<i>Responsible Agency</i>	<i>Status of Compliance</i>
National Environmental Policy Act (NEPA) of 1969 (42 U.S. Code [USC] §§ 4321, <i>et seq.</i> ), Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] §§ 1500-1508), and Navy Procedures for Implementing NEPA (32 CFR § 775)	Deputy Assistant Secretary of the Navy	This Environmental Impact Statement/ Overseas Environmental Impact Statement (EIS/OEIS) has been prepared in accordance with CEQ Regulations implementing NEPA and Navy NEPA procedures. Preparation of this EIS/OEIS and provisions for its public review are being conducted in compliance with NEPA.
EO 12114, <i>Environmental Effects Abroad of Major Federal Actions</i>	Action Proponents, (Marine Corps, Navy, Army)	This EIS/OEIS has been prepared in accordance with Navy procedures for implementing EO 12114 by addressing components of the proposed action beyond 12 nautical miles (22.2 kilometers) from shore.
Coastal Zone Management Act (16 CFR 1451 <i>et seq.</i> )	Guam Bureau of Statistics and Plans Commonwealth of the Northern Mariana Islands (CNMI) Coastal Resources Management Office	Concurrent with the EIS/OEIS Coastal Zone Management Act, consistency determination notices are being filed for the actions proposed on Guam and Tinian. Consistency determination is prepared and submitted by Navy seeking concurrence from Guam Bureau of Statistics and Plans and from CNMI Coastal Resources Management Office
Coastal Zone Management Regulations, (15 CFR 923), Subpart D – Boundaries, §33 Excluded Lands	National Oceanic and Atmospheric Administration (NOAA)	The boundary of a state's coastal zone must exclude lands owned, leased, held in trust or whose use is otherwise by law subject solely to the discretion of the federal government, its officers or agents.
Federal Water Pollution Control Act or Clean Water Act (§§ 401 and 404; 33 USC 1251 <i>et seq.</i> )	U.S. Environmental Protection Agency (USEPA), U.S. Army Corps of Engineers (USACE)	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with these Acts.
Rivers and Harbors Act (§ 10 33 USC 401 <i>et seq.</i> )	USACE	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with this Act.

**Table 2.1-1. Status of Compliance with Relevant Plans, Policies, and Controls**

<i>Plans, Policies, and Controls</i>	<i>Responsible Agency</i>	<i>Status of Compliance</i>
Marine Protection, Research and Sanctuary Act of 1972 (USC 1401-1445)	USEPA, USACE	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with this Act.
Clean Air Act (42 USC 7401 et seq.)	USEPA	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with this Act.
Air Pollution Control Act (Public Law [PL] 10-74): Chapter 49, Title 10 of the Guam Code Annotated (GCA)	Guam Environmental Protection Agency (GEPA) Air Pollution Control Program	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with these regulations.
EO 11990, <i>Protection of Wetlands</i>	Action Proponents, USACE	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with this Order.
Endangered Species Act (16 USC 1531 et seq.)	U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS)	Formal consultations with the responsible agencies are ongoing and proposed actions analyzed in this EIS/OEIS would be implemented in accordance with this Act.
Magnuson-Stevens Fishery Conservation and Management Act (16 USC 1801-1802)	NMFS	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with this Act.
Coral Reef Conservation Act of 2000 (16 USC 6401 et seq.) and Coral Reef Ecosystem Conservation Amendments Act of 2007	NOAA	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with these Acts.
EO 13089, <i>Coral Reef Protection</i>	NOAA, USACE	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with this Order.
Fish and Wildlife Coordination Act (16 USC 661-667e, as amended)	USFWS, NMFS	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with this Act.
Marine Mammal Protection Act (16 USC 1431 et seq. and 50 CFR Part 216)	NMFS	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with this Act.
EO 13186, <i>Responsibilities of Federal Agencies to Protect Migratory Birds</i>	USFWS	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with this Order.
Migratory Bird Treaty Act (16 USC 703-712)	USFWS	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with this Act.
Non-indigenous Aquatic Nuisance Prevention and Control Act of 1990 (16 USC 4701 et seq.)	USFWS, U.S. Coast Guard (USCG), NMFS, USEPA	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with this Act.
EO 13112, <i>Non-Native Species</i>	USFWS, NMFS, U.S. Department of Agriculture (USDA). Enforcement assistance from Guam Department of Agriculture	Coordination with USFWS and other agencies is ongoing and proposed actions would be in accordance with this EO. Compliance would be achieved in part by development and implementation of a comprehensive biosecurity plan.

**Table 2.1-1. Status of Compliance with Relevant Plans, Policies, and Controls**

<i>Plans, Policies, and Controls</i>	<i>Responsible Agency</i>	<i>Status of Compliance</i>
Brown Tree Snake Control and Eradication Act of 2004 (PL 108-384, 118 Statutes 2221-2226)	USFWS, NMFS, USDA, USGS, Office of Insular Affairs. Enforcement by Guam Department of Agriculture	Coordination with USFWS and other agencies is ongoing and proposed actions would be in accordance with this Act. Compliance would be achieved in part by development and implementation of a comprehensive biosecurity plan.
EO 12898, <i>Federal Actions to Address Environmental Justice in Minority Populations and Low- Income Populations</i>	Action Proponents	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with this Order.
EO 13045, <i>Protection of Children from Environmental Health Risks and Safety Risks</i>	Action Proponents	Children would be unaffected by the proposed actions so it is in full compliance with this Order.
1993 Memorandum of Understanding (MOU) among the Government of Guam, Air Force, Navy and the USFWS for the Establishment and Management of the Guam National Wildlife Refuge and 1994 Cooperative Agreement between the Navy, Air Force and the USFWS for the Establishment and Management of the Guam National Wildlife Refuge	USFWS, Air Force, Navy	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with this MOU.
National Historic Preservation Act (§ 106; 16 USC 470 et seq.)	Guam Historic Preservation Office, CNMI Historic Preservation Office	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with this Act.
EO 11593, <i>Protection and Enhancement of the Cultural Environment</i>	Action Proponents	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with this Order.
National Marine Sanctuaries Act (16 USC 1431 et seq.)	NOAA	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with this Act.
EO 13158, <i>Marine Protected Areas</i>	NMFS	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with this Order.
Military Munitions Response Program	Department of Defense (DoD)	DoD is currently establishing policy and guidance for munitions response actions under the Military Munitions Response Program. Key program drivers developed to date conclude that munitions response actions would be conducted under the process outlined in the National Contingency Plan (40 CFR 300) as authorized by the Comprehensive Environmental Response, Compensation, and Liability Act (42 USC 9605), as amended by Superfund Amendments and Reauthorization Act (PL 99-499).
33 CFR 334, Danger Zone and Restricted Area Regulations	USACE	Responsible for establishing, amending and disestablishing danger zones and restricted areas.

**Table 2.1-1. Status of Compliance with Relevant Plans, Policies, and Controls**

<i>Plans, Policies, and Controls</i>	<i>Responsible Agency</i>	<i>Status of Compliance</i>
Presidential Proclamation, Contiguous Zone of the United States, September 2, 1999	Government of Guam, CNMI	The proposed actions analyzed in this EIS/ OEIS would be implemented in accordance with this Proclamation.
Guam Public Law 20-147, as amended by Public Law 26-76	Guam Bureau of Statistics and Plans	It is the responsibility of the Guam Bureau of Statistics and Plans to undertake any planning activity that is not being carried out or that is not the function of another department. The Bureau has the legislative flexibility to appraise, coordinate, prepare and assist in the development of a wide range of plans, policies and studies that further economic, social, land use, environmental and infrastructure goals, priorities and planning activities.
Executive Order 78-37 (Government of Guam), Guam Land-Use Policies	Guam Bureau of Statistics and Plans	Implement policies from the Guam Comprehensive Development Plan.
Chapter 26 of Title 17 of the GCA: GEPA Guam Soil Erosion and Sediment Control Regulations	GEPA	Erosion and sediment control plans would be prepared as set forth in § 10109 of these regulations and submitted to the Agency in time to allow 14 working days review.
§ 5103(b)(6) and (7) of the Guam Water Quality Standards, relative to Specific Numerical Water Quality Criteria on Suspended Matters and Turbidity	GEPA	All earth moving activities in the Territory would be conducted in a manner that prevents accelerated land erosion, transportation of sediment to and along waterways, and siltation of rivers, estuaries and marine waters. All developers engaged in earth moving activities shall proceed in accordance with the erosion and sediment control plan specifications set forth under §10108 through §10113 of these regulations.
CNMI <i>Wastewater Treatment and Disposal Rules and Regulations</i>	CNMI Department of Environmental Quality (DEQ)	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with these rules and regulations.
Commonwealth Environmental Protection Act, § 3101	CNMI DEQ	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with this Act.
Comprehensive Environmental Response, Compensation, and Liability Act (42 USC 9601 et seq.)	USEPA	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with this Act.
Resource Conservation and Recovery Act (42 USC 6901 et seq.)	USEPA	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with this Act.
Farmland Protection Policy Act (7 USC 4201 et seq.)	USDA, Action Proponents	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with this Act.

**Table 2.1-1. Status of Compliance with Relevant Plans, Policies, and Controls**

<i>Plans, Policies, and Controls</i>	<i>Responsible Agency</i>	<i>Status of Compliance</i>
Toxic Substances Control Act (15 USC 2601 et seq.)	USEPA	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with this Act.
Oil Pollution Act (33 USC 2701 et seq.)	USEPA	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with this Act.
Pollution Prevention Act (42 USC 13101-13109)	USEPA	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with this Act.
Final Military Munitions Rule (40 CFR 266, Subpart M)	USEPA	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with this Rule.
Noise Control Act of 1972 (PL 92-574) and Amendments of 1978 (PL 95-609);	USEPA	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with this Act.
Title 10 GCA, Hazardous Waste Management Program	GEPA	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with this program.
CNMI Title 65 §65-50, <i>Hazardous Waste Management Regulations</i>	CNMI DEQ	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with these regulations.
Sikes Act of 1960	Action Proponents	Proposed actions would be in accordance with the integrated Natural Resource Management Plans that implement this Act.
Lacey Act Amendments of 1981	USDA Animal Plant Inspection Health Service (APHIS) Plant Protection and Quarantine (PPQ)	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with this Act.
Federal Aviation Administration Orders 7400.2G and 1050.1E. MOU	Federal Aviation Administration, DoD	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with this MOU.
Safe Drinking Water Act	USEPA	The proposed actions analyzed in this EIS/OEIS would be implemented in accordance with this Act.
Executive Order 2005-35 CNMI and Guam Stormwater Management Manual	CNMI DEQ	The planning, design and construction of all project actions would be in compliance with these regulations.

## 2.1 DOD LAND USE PLANNING

The Navy does not have zoning laws or codes, but there are ideal functional relationships among land uses that guide development. In general, the working zone that includes industrial, operational, and mission support functions are distinct from the living areas, such as housing and community support. A May 2008 land use plan for Navy Main Base, generated by Naval Facilities Engineering Command Marianas Asset Management Business Line, currently guides land use planning. The Regional Commander, in consultation with base planners, would direct future development to be consistent with the objectives of the land use plan.

Regional Shore Infrastructure Planning (RSIP) Plans have historically been the Navy master planning effort. The purpose of a RSIP Plan is to consolidate facility infrastructure, streamline business line operations, and reduce surplus or demolish redundant structures on a regional basis. Individual RSIP functional plans were prepared for different activities including administration, public works, public safety, ordnance, bachelor quarters, training, and waterfront. Each plan identified and analyzed facility consolidation opportunities and presented several possible scenarios for consolidation based on cost, facility requirements, and operational needs.

The Air Force has a system of strategic plans and master plans that serve the purpose of the Navy RSIP plans. Federal actions on federal lands/submerged lands are subject to Regional/Base Command approval, but are not required to conform with state/territory land use plans or zoning codes, laws, or policies. The proposed action alternatives of this EIS/OEIS have been developed in consultation with Base Command planners and approved by the Regional Commander.

Governing procedures for the use of training areas, ranges, and airspace operated and controlled by the Commander U.S. Naval Forces, Marianas, including instructions and procedures for the use of Guam and Tinian, are included in Commander Navy Region Marianas Instruction 3500.4, Marianas Training Handbook (DoD 2000). This guidance identifies specific land use constraints to enable protection of environmental resources during military training. In addition, specific regulations and information for use of units are provided to troops to protect the environment as part of the Range and Training Area Management procedures under Marine Corps Order P3550.10 (DoD 2000). All of the proposed actions would be in compliance with these regulations.

Construction on military bases is standardized and dictated by Unified Facility Code (UFC) documents that provide planning, design, construction, sustainment, restoration, and modernization criteria. They are applicable to military departments, defense agencies, and DoD field activities. They were relied upon in the development of project designs and would be incorporated into construction documents and permits, and operations and maintenance activities. The documents address issues such as design standards for wharves, the space allowance for an enlisted family, the amount of parking spaces permitted and the spatial configuration of those spaces, sustainable development, Low Impact Development, stormwater management, and the size of a swimming pool based on installation population. There is little flexibility in minimal design standards, but there is flexibility in site planning. Congressional appropriations require the incorporation of all relevant UFCs in design.

## **2.2 GUAM LAND USE PLANNING**

### **2.2.1 Land Use Management**

The Department of Land Management (DLM) is responsible for managing Guam's public lands. Its mandates include land use planning, maintaining legal documents on property, including deeds and survey maps, and guiding development through the zoning and building approval process. Federal lands are not subject to DLM management or control, but consistency with surrounding non-federal land uses is an important consideration for land use planning on federal and non-federal lands.

The DLM includes the Chamorro Land Trust Commission (CLTC) and Guam Ancestral Lands Commission (GALC). Other entities including the Department of Agriculture and Department of Parks and Recreation have land management functions specific to a land classification. The DLM provides administrative support to two important commissions that oversee zoning and seashore clearance permits, the Guam Land Use Commission (GLUC) and the Guam Seashore Protection Commission (GSPC).

Federal lands are not subject to DLM management or control, but consistency with surrounding non-federal land uses is an important consideration for land use planning on federal and non-federal lands.

### **2.2.2 Guam Land Use Plan**

Land use plans include goals, objectives and maps to guide future development and describe existing land uses at a point in time. Recognizing that community objectives and land use planning requirements change over time, plans are prepared to address development for a specific duration, such as five or ten years. The plans lay the foundation for zoning regulations. Federal lands are excluded from Guam land use planning unless there is anticipated release of federal lands. The Territory of Guam Master Plan that was prepared for the Territorial Planning Commission in 1966 is the adopted land use plan for Guam. Other plans have been developed such as the Guam Comprehensive Development Plan (1977) and *I Tano-ta* (Territorial Planning Council 1994). The 1977 Plan was valid for a planning period up to 2000 and the *I Tano-ta* was not adopted (Bureau of Statistics and Plans 2008). These plans provide valuable information on existing and planned land uses at points in time.

Although the 1966 land use plan is the official land use plan, it has limited utility when describing existing land use and describing trends for future development. The Guam Mapbook (Bureau of Statistics and Plans 2008) is based on aerial photography and general land uses can be discerned from the images such as:

- Residential neighborhoods
- Vacant lands – vegetated or disturbed
- Airports
- Roads

The Bureau of Statistics and Plans is preparing the *North and Central Guam Land Use Plan* (Bureau of Statistics and Plans 2009). A draft was provided by the Bureau of Statistics and Plans for reference in this EIS/OEIS.

Although the plan has not been finalized, the assumption in it represents the direction of the Government of Guam and the community with respect to guiding future land use development in the central and northern areas of Guam. The Guam Joint Military Master Plan is being developed to be consistent with existing land use plans and zoning regulations of Guam.

### **2.3 TINIAN LAND USE PLANNING**

There was no land use plan for Tinian available for use in this EIS/OEIS; however, one is being prepared by the Department of Public Lands. The Draft Plan is expected in 2009.

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## CHAPTER 3.

### REQUIRED PERMITS AND APPROVALS

#### 3.1 REQUIRED PERMITS AND APPROVALS

A list of federal and state permits that may be required for implementation of any of the alternatives is provided in Table 3.1-1.

**Table 3.1-1. Required Permits and Approvals**

<i>Regulatory Requirement</i>	<i>Permitting Agency</i>	<i>Permit Specifications</i>	<i>Additional Information</i>
5 Guam Code Annotated (GCA) § 63302	Guam Environmental Protection Agency (GEPA)	License required for cutting, removal or mutilation of live trees on public lands	Not applicable (NA)
5 GCA § 63601	GEPA	Permit required for takes of live coral from the area surrounding the Territory of Guam, extending from the shore of the island outwards to the 10 fathom contour	NA
10 GCA, § 74103	GEPA	Storage of gasoline or kerosene in quantities exceeding 50 gallons but not exceeding 500 gallons must be in underground storage tanks.	NA
10 GCA, § 47106(b)	GEPA	Unpermitted pollution of waters of the territory is prohibited	NA
10 GCA, §§ 76113(a) and (b)	GEPA	Permit required to own, install, or operate an underground storage tank	NA
10 GCA Chapter 45, Guam Environmental Protection Act	GEPA	Provides an integrated program of environmental protection to prevent environmental degradation of land, water, and air resources.	NA
10 GCA Chapter 47, Water Pollution Control Act	GEPA	Conserve water resources and protect, maintain and improve water quality.	NA
10 GCA Chapter 48, Toilet Facilities and Sewage Disposal	GEPA	Requires adequate toilet and sewage facilities for buildings.	NA
10 GCA Chapter 52, Water and Waste Water Operator's Mandatory Certification Act	GEPA	Conserve and protect water resources, prevent water pollution, and require certification of operating personnel for water systems and facilities.	NA
10 GCA Chapter 53, Safe Drinking Water Act	GEPA	Protect public water supplies from contamination, and provide safe drinking water for public consumption.	NA
10 GCA Chapter 53A, Guam Lead	GEPA	Prohibits use or sale of lead pipes, fittings and fixtures, allows right of entry	NA

**Table 3.1-1. Required Permits and Approvals**

<i>Regulatory Requirement</i>	<i>Permitting Agency</i>	<i>Permit Specifications</i>	<i>Additional Information</i>
Ban Act		for inspection, and requires certification of compliance for building construction and occupancy.	
21 GCA Real Property Chapter 63, Guam Territorial Seashore Protection Act of 1974		Protects and manages resources within the Guam Territorial Seashore Reserve.	NA
21 GCA Real Property Chapter 75, Chamorro Land Trust Commission	Chamorro Land Trust Commission	Establishes Chamorro Land Trust Commission to accept and manage Chamorro homelands, and establish residential, agricultural and commercial land distribution and economic assistance programs.	NA
21 GCA Real Property Chapter 80, Guam Ancestral Lands Commission	Guam Ancestral Lands Commission	Establishes Guam Ancestral Lands Commission to establish ancestral lands registries, establishing process for ancestral lands recordation and claims, and cedes certain lands to the Commission.	NA
22 Guam Administrative Rules (GAR) 10103, 10106, 10107	GEPA	Development or construction activities that involve clearing, grading, filling, excavating, and other earth-moving operations must follow an approved erosion control plan.	NA
22 GAR 11105(a)	GEPA	All wastewater facilities, public or private, are at all times under the direct supervision of an operator certified by the Administrator in a classification corresponding to the classification of the system or facilities supervised	NA
22 GAR 1127(e)	GEPA	Particulate matter emissions from fuel combustion must be controlled	NA
22 GAR 1128 (a), (b) and (d)	GEPA	Fugitive dust emissions must be controlled	NA
22 GAR 12105(j)	GEPA	No wastewater disposal system installations, constructions, repairs, or additions are made by the owner of the property without permit from the Agency	NA
22 GAR 20103, 20110	GEPA	Permit required to operate or modify a solid waste disposal facility	NA

**Table 3.1-1. Required Permits and Approvals**

<i>Regulatory Requirement</i>	<i>Permitting Agency</i>	<i>Permit Specifications</i>	<i>Additional Information</i>
22 GAR 5104(e)(2)	GEPA	All vessels exceeding 400 gross tons, that are berthed or docked in the waters of the Territory and without fully functional U.S. Coast Guard approved oil pollution prevention devices (for longer than 72 hours detention) must be completely encircled with flotation booms to contain any discharged oil.	NA
22 GAR 5104(h)	GEPA	Any petroleum storage facility containing petroleum products or hazardous substances not directly adjacent to navigable waters and below the Spill Prevention, Control and Counter-measure capacity requirements of 600 gallons must be provided with secondary containment to protect Guam's groundwater resources from potential threat from oil or hazardous substances discharges.	NA
22 GAR 7104	GEPA	Persons engaged in or intending to engage in well drilling must have a valid driller's license.	NA
22 GAR 7105(a), 7106(a), (b) and (j), and 7124(c)	GEPA	Land owners must obtain a valid well drilling permit and file a preliminary report to the Administrator prior to drilling commencement.	NA
22 GAR 7105(a), 7106(a), (b) and (j), and 7124(c)	GEPA	Owners of active existing wells must obtain a well operating permit.	NA
22 GAR 7105(a), 7106(a), (b) and (j), and 7124(c)	GEPA	Application for a new well operating permit must be filed with the Administrator.	NA
22 GAR 7127(b) through (d), and 7128(a), (b), and (i)	GEPA	Abandoned wells must meet destruction requirements. A well is considered abandoned if its use or maintenance is not in compliance with a valid operating permit or if it has not been used for a period of 12 consecutive months. All destroyed wells must be inspected during and after the sealing or filling operation by the Administrator or his authorized representative to insure that proper procedures have been carried out.	NA

**Table 3.1-1. Required Permits and Approvals**

<i>Regulatory Requirement</i>	<i>Permitting Agency</i>	<i>Permit Specifications</i>	<i>Additional Information</i>
22 GAR 7130(d)(1)	GEPA	Written Administrator approval is required prior to construction on, utilization of, operation on, or occupation of land, served or to be served by septic tank and leached field, sanitary sewer, stormwater disposal method, or liquid waste storage, disposal or treatment method, that is within the groundwater management protection zone and within a 1000-foot radius of any public utility potable water supply well.	NA
22 GAR 9105(a), 9108(a) and (b), and 9113(a) and (b)	GEPA	Federal facilities must have a valid underground injection control permit to operate a Class V underground injection well. These regulations apply to Class V injection wells only, including nonhazardous liquid waste disposal wells, community septic system wells, sand backfill wells, recharge wells, drainage wells, cooling water return flow wells, air conditioning return flow wells, salt water barrier wells, and subsidence control wells (not associated with oil and gas production).	NA
26 GAR 4601, 4603 and 4604	GEPA	Permit required to construct, reconstruct or alter any public swimming pool	NA
26 GAR 4601, 4603 and 4604	GEPA	Permit to operate required to operate or maintain a public swimming pool	NA
Title 65: Division of Environmental Quality, Chapter 60-65 Pesticide Regulations	CNMI DEQ	Establishes system of control over the importation, distribution, sale, and use of pesticides.	NA
Title 65: Division of Environmental Quality, Chapter 60-80 Solid Waste Management Regulations	CNMI DEQ	Establishes requirements and criteria for new and existing solid waste management activities and facilities.	NA
Title 65: Division of Environmental Quality, Chapter 60-10 Air Pollution Control Regulations	CNMI DEQ	Establishes minimum standards and requirements to ensure air resources are protected against pollution and do not constitute a health hazard.	NA
Title 65: Division of Environmental Quality, Chapter 60-120 Wastewater	CNMI DEQ	Establishes standards for wastewater disposal and treatment.	NA

**Table 3.1-1. Required Permits and Approvals**

<i>Regulatory Requirement</i>	<i>Permitting Agency</i>	<i>Permit Specifications</i>	<i>Additional Information</i>
Treatment and Disposal Rules and Regulations			
CNMI Water Quality Standards	CNMI DEQ	Establishes water quality standards for all Commonwealth waters and groundwater.	NA
40 Code of Federal regulations (CFR) Part 503 federal biosolids rule	U.S. Environmental Protection Agency (USEPA) Region 9	USEPA Region 9 tracks and enforces compliance with the self-implementing standards in 40 CFR 503, issues permits in some cases, and provides guidance and technical assistance. Wastewater treatment plants with influent flows over 1 million gallons per day must report to USEPA Region 9 on their biosolids use/disposal.	The biosolids program ensures that sewage sludge is of sufficient quality to protect public health and the environment. The program also promotes the beneficial reuse of biosolids.
Clean Air Act (CAA) Prevention of Significant Deterioration /New Source Review permit	GEPA/USEPA	Required for new major Prevention of Significant Deterioration source and major existing source modification with respect to attainment pollutants	The best available control technology would be required.
CAA Nonattainment New Source Review permit	GEPA/USEPA	Required for new major stationary source and major existing source modification with respect to nonattainment pollutants in a nonattainment area	The lowest-achievable emission rate technology and emission offsets would be required.
CAA Title V permit	GEPA/USEPA	Regulates air emissions from major stationary source and major source modification	Relevant emissions control technology would be required.
Clean Water Act (CWA) § 401	GEPA (Delegated authority from USEPA)	Regulates impacts of the placement of dredged or fill material on water quality	Permits for dredging activities issued by GEPA in conjunction with CWA Section 404 and Coastal Zone Consistency Determination.
CWA § 402	USEPA Region 9	The National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the U.S.	NA

**Table 3.1-1. Required Permits and Approvals**

<i>Regulatory Requirement</i>	<i>Permitting Agency</i>	<i>Permit Specifications</i>	<i>Additional Information</i>
CWA NPDES Program	GEPA (Delegated authority from USEPA)	General Permit for stormwater discharge from large and small construction activities. Requirements include a Notice of Intent, a Notice of Termination and a construction site Stormwater Pollution Prevention Plan. The existing Stormwater Pollution Prevention Plan for Stormwater Associated with Industrial Activities would have to be updated if either is implemented.	Required for projects that disturb greater than one acre of soil, including lay-down, ingress and egress area. Phase I regulates construction activity disturbing 5 or more acres of total land area and Phase II regulates “small” construction activity disturbing between 1 and 5 acres of total land area. The NPDES requirements for stormwater associated with industrial activities requires plan updating whenever there is a change in site conditions.
CWA Rivers and Harbors Act § 10	U.S. Army Corps of Engineers (USACE)	Regulates any work in navigable waters	Permits often issued in conjunction with Section 404 of CWA.
CWA § 404	USACE	Regulates discharge of dredged or fill material into waters and wetlands	Permits for the placement of dredged or fill material are often issued in conjunction with § 10 of the Rivers and Harbors Act.
Coastal Zone Management Act Federal Consistency Provisions (see Coastal Zone Management Act, Coastal Zone Management Regulations, and EO 78-37 in Table 2.1-1).	Coastal Resource Management Program and Guam Bureau of Statistics and Plans	Determination of consistency of federal actions with Guam Coastal Management Plan	Consistency determination is prepared and submitted by Navy seeking concurrence from Guam Bureau of Statistics and Plans.
Federal Aviation Administration (FAA) Order 7400.2G FAA Order 1050.1E	FAA	Special Use Airspace (SUA) required for the Marine’s ground firing ranges on Guam: either designated SUA, Restricted Area airspace or Controlled Firing Area required to overlay the Safety Danger Zones located at the proposed firing ranges on Guam.	Formal airspace proposal for SUA would be initiated by the Navy per FAA Order 7400.2G for new joint airspace and/or modifications to existing airspace.
Federal Air Quality Control Laws & 22 GAR 1101	GEPA	Air Permit to Construct is required to commence construction or modification of a stationary source	NA

**Table 3.1-1. Required Permits and Approvals**

<i>Regulatory Requirement</i>	<i>Permitting Agency</i>	<i>Permit Specifications</i>	<i>Additional Information</i>
Federal Air Quality Control Laws & 22 GAR 1101	GEPA	Air Permit to Operate is required to operate an air pollution stationary source	NA
Federal New Source Performance Standards, for Municipal Solid Waste Landfills, Regulated under CFR 60 Subpart www.	USEPA/GEPA	Regulations contain requirements for installing active gas collection systems if landfill size criteria are exceeded.	The Navy Sanitary Landfill and any new large landfill facilities would be subject to this regulation.
Marine Protection, Research and Sanctuaries Act § 103	USEPA in association with USACE	Regulates the transportation of dredged material for ocean disposal.	Permit requires full suite of physical, chemical and biological testing of sediment to determine suitability for ocean disposal at designated sites.
33 CFR 334, Danger Zone and Restricted Area Regulations	USACE	Responsible for establishing, amending and disestablishing danger zones and restricted areas.	NA
Resource Conservation and Recovery Act	USEPA	Regulates collection, storage, transport and disposal of hazardous and solid wastes.	Existing Resource Conservation and Recovery Act permit would need to be modified to accommodate increased handling of munitions.
Right-of-Way Permit	Guam Department of Public Works	Permit for construction in public right-of-way	NA
§ 401 Water Quality Certification	GEPA	401 WQC issuance identifies that construction or operation of a proposed project or facility would be conducted in a manner consistent with the Guam Water Quality Standards.	All federal permits for work in marine waters, rivers, streams and wetlands require 401 WQC.
Well Drilling Permit/Well Operating Permit	GEPA	Permit required to drill and operate water well	Well Drilling Permit required for exploratory and development work and a Well Operating Permit required for actual production and use of water resources. The Well Operating Permit is necessary to establish operating conditions such as allowable pumping rates, infrastructure requirements, long-term monitoring and inspections.

**Table 3.1-1. Required Permits and Approvals**

<i>Regulatory Requirement</i>	<i>Permitting Agency</i>	<i>Permit Specifications</i>	<i>Additional Information</i>
Title 22, Division 4, Chapter 23, Solid Waste Disposal	GEPA (Granted primacy by USEPA to administer requirements of 40 CFR Part 258 Subtitle D)	Permit required to place solid waste	Existing facilities require permit modifications for horizontal or vertical expansions.

### **3.1.1 Summary of Applicable Regulations to Protect Environmental Resources on Guam and Tinian**

This section provides a summary of the regulations that apply to protection of environmental resources. DoD-proposed actions would be implemented in accordance with all the applicable regulatory mandates. While some regulations require permits, as summarized in the above table, many serve only as guidance.

#### Federal Regulations

##### *Clean Air Act (CAA)*

The CAA defines the USEPA's responsibilities for protecting and improving the nation's air quality and the stratospheric ozone layer. Under the CAA, the USEPA sets limits on certain air pollutants, including setting limits on how much can be in the air anywhere in the United States. The CAA also gives USEPA the authority to limit emissions of air pollutants coming from sources like chemical plants, utilities, and steel mills.

##### *Clean Water Act (CWA)*

The purpose of the CWA is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." Under Section 404 of the CWA the U.S. Army Corps of Engineers (USACE) authorizes discharges of dredged or fill material in waters of the U.S. through a permit program.

##### *Coastal Zone Management Act*

The Coastal Zone Management Act establishes a federal-state partnership to provide for the comprehensive management of coastal resources. Coastal states and territories develop management programs based on enforceable policies and mechanisms to balance resource protection and coastal development needs.

##### *Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)*

Under CERCLA, as amended by the Superfund Amendments and Reauthorization Act, a hazardous substance is defined as one that poses a potential hazard to human health or the environment by virtue of its quantity, concentration, or physical/chemical characteristics. CERCLA has established a national process to identify, characterize, and clean-up hazardous waste sites.

##### *Department of Transportation Regulations*

Department of Transportation Hazardous Materials Regulations (*49 Code of Federal Regulations [CFR] 171*) require the implementation of various protective and preventative measures designed to promote the safe transportation of hazardous materials in commerce.

*Emergency Planning and Community Right-to-Know Act (EPCRA)*

The EPCRA requires businesses and governments to report their use of hazardous and toxic chemicals. EPCRA also requires that workers be trained as to safe chemical handling protocols and specific chemical hazards and controls for substances used in the workplace. In addition, EPCRA requires that state and local communities be prepared to respond to potential chemical accidents through the development of emergency response plans and other measures.

*Endangered Species Act 16 United States Code [USC] §1531 et seq.; 50 CFR Parts 17, Subpart I, and 50 CFR Part 402*

The Endangered Species Act of 1973 and subsequent amendments provide for the conservation of threatened and endangered species of animals and plants, and the habitats in which they are found.

*Federal Environmental Pesticide Control Act*

The Federal Environmental Pesticide Control Act enacted as Public Law 92-516, amended the Federal Insecticide, Fungicide, and Rodenticide Act, and provides controls for the sale, use, distribution, and application of pesticides through an administrative registration process.

*Federal Facilities Compliance Act*

The Federal Facilities Compliance Act, enacted as Public Law 102-386 provides that all federal agencies are subject to all substantive and procedural requirements of federal, state, and local solid and hazardous waste laws in the same manner as any private party.

*Federal Insecticide, Fungicide, and Rodenticide Act*

The Federal Insecticide, Fungicide, and Rodenticide Act provides pesticide regulations designed to protect applicators, consumers, and the environment.

*Fish and Wildlife Coordination Act (16 USC § 662)*

The Fish and Wildlife Coordination Act requires consideration of the effects of a proposed action on wetlands and areas affecting streams (including floodplains), as well as other protected habitats.

*Groundwater Rule (40 CFR Parts 9, 141 and 142)*

The Groundwater Rule provides for increased protection against microbial contamination. This is a risk-based rule that requires groundwater used by public drinking water systems be disinfected if indicator bacteria are detected in it.

*National Wildlife Refuge System Administration Act of 1966 (16 USC §§ 668dd-668ee)*

This Act provides for the administration and management of the national wildlife refuge system, including wildlife refuges, areas for the protection and conservation of fish and wildlife threatened with extinction, wildlife ranges, game ranges, wildlife management areas, and waterfowl production areas.

*Oil Pollution Act (OPA)*

The OPA requires oil storage facilities and vessels to develop plans describing how spills or releases would be addressed. Specifically, OPA requires that facilities prepare and implement spill prevention, control, and countermeasures plans and facility response plans. These plans specify how these facilities would assess and respond to spills/releases.

*Occupational Safety and Health Administration*

The Occupational Safety and Health Administration requirements are designed to protect workers and prevent workplace accidents, injuries, or illnesses.

*Pollution Prevention Act*

The Pollution Prevention Act focuses on pollution source(s) reduction and promotes the implementation of new and innovative practices to conserve and protect natural resources.

*Resource Conservation and Recovery Act (RCRA)*

RCRA requires that all hazardous waste be systematically tracked from cradle-to-grave. Furthermore, the RCRA Corrective Action Program compels responsible parties of active facilities to investigate and clean hazardous waste releases.

*Military Munitions Rule under RCRA*

The Military Munitions Rule identifies when conventional and chemical military munitions become RCRA hazardous waste.

*Rivers and Harbors Act*

Section 10 of the Rivers and Harbors Act requires approval from the USACE prior to placing obstructions or excavating and/or depositing materials in navigable waters.

*Safe Drinking Water Act*

The Safe Drinking Water Act regulates the nation's drinking water supplies by establishing standards for drinking water to protect against both naturally occurring and man-made contaminants. This act also seeks to prevent contamination of drinking water resources by establishing requirements under programs such as the underground injection control program.

*Ship-Borne Hazardous Substances Regulations*

The Ship-Borne Hazardous Substances Regulations are applicable to Navy activities "at sea", defined as beyond three nautical miles from shore, and govern the types of sewage, graywater, and oily waste discharge restrictions as a function of distance offshore or special area.

*Statement of Procedures on Floodplain Management and Wetlands Protection; 40 CFR Part 6, Appendix A.*

These procedures set forth U.S. Environmental Protection Agency (USEPA) policy and guidance for managing floodplains and protecting wetlands, as described in Executive Orders 11988 and 11990, respectively.

*Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (USTs)*

This regulation (40 CFR Chapter 1, Part 280) protects groundwater by establishing regulations and procedures for USTs that contain regulated substances such as petroleum products.

*Toxic Substance Control Act*

The Toxic Substances Control Act addresses concerns regarding chemical substances and mixtures whose manufacturing and use may pose an unreasonable risk of injury, adverse health, or adverse environmental consequences.

### *Underground Storage Tanks*

The UST regulations set forth various requirements to prevent unintended releases with double-walled tanks and associated piping, leak detection methods, inventory control procedures, and various other administrative and engineering design controls.

### Guam Regulations

#### *Guam Coastal Nonpoint Pollution Control Program (CNPCP) (pending)*

In 2009, the EPA and NOAA will likely approve the Guam CNPCP which lays out management measures for the control of non-point source from such areas as new urban development, stormwater, wetlands, roads, and bridges.

#### *Guam Environmental Protection Act*

Public Law 11-191 created the Guam Environmental Protection Agency (GEPA) in 1973, with responsibilities for comprehensive protection of Guam's land, water, and air.

#### *Guam Hazardous Waste Management Program (HWMP)*

The Guam HWMP requires the permitting of hazardous waste collection, treatment, storage, and disposal facilities. The Guam HWMP also mandates inspection, compliance monitoring, enforcement, and corrective action of all hazardous waste-related activities in Guam.

#### *Guam Primary Drinking Water Regulations*

Guam Safe Drinking Water Act, Title 10 GCA, Chapter 53, Section 53104 authorizes the GEPA to prescribe rules and regulations as may be necessary to implement the Safe Drinking Water Act.

#### *Guam Seashore Protection Act and Permit System*

The Guam Seashore Protection Act (21 GCA, Chapter 63) establishes the Guam Seashore Reserve and the Guam Seashore Protection Commission, that must review and act on any applications for development, including any dredging, within the reserve. The reserve includes all subtidal areas down to ten fathoms and extends inland to within 100 meters (amended to ten meters) of the mean high highwater mark.

#### *Guam Soil Erosion and Sedimentation Control Regulations/Permits*

Erosion Control Permits are issued by GEPA while the Department of Public Works issues Clearing and Grading Permits. For most clearing and/or grading permits there must be an accompanying Erosion Control Plan to protect water quality of the affected water resources, fresh or marine.

#### *Guam Water Quality Standards*

The Guam Water Quality Standards aim to conserve, protect, maintain, and improve the quality of Guam's waters.

#### *National Pollution Discharge Elimination System (NPDES)*

NPDES is a federal permit for all stormwater and other point source pollution discharges. GEPA assists in the administration of these permits and reviews and certifies (401 Water Quality Certification) the permit for compliance with all local regulations and policies and in accordance with the Guam Water Quality Standards.

*Pollution Discharge Permit*

For discharges similar to those covered by the NPDES permit, GEPA may require a Government of Guam Pollution Discharge Permit. This permit may be issued for any number of liquid, gaseous, solid, or thermal discharges to Territorial waters that fall below the minimum criteria defined in the federal Clean Water Act.

*Test Boring and Dewatering Permit*

Individuals conducting soil test boring and measurements activities may be required to obtain a GEPA Test Boring Permit. Test boring activities include drilling and excavations deeper than 6 feet (2 meters) deep for a number of soil and structural engineering analysis work. In addition, if the water table is encountered during excavation work for building foundations and similar construction activities, a Dewatering Permit may be required to control and treat water pumped from the excavation prior to final discharge. Dewatering permits may apply to dredging operations as well.

*CWA Section 401 Water Quality Certification*

GEPA Section 401 Water Quality Certification issuance identifies that construction or operation of a proposed project or facility would be conducted in a manner consistent with Guam Water Quality Standards.

Commonwealth of the Northern Mariana Islands Regulations*Wastewater Treatment and Disposal Rules and Regulations*

As groundwater aquifers on Tinian and Rota are vulnerable to contamination by substances introduced onto the soil surface, these regulations protect Class 1 Aquifer Recharge Areas.

*Earthmoving and Erosion Control Regulations*

These regulations establish a permit process for construction activities and identify investigations and studies that are required prior to construction and design, and standards for grading, filling, and clearing.

*Water Quality Standards*

The Commonwealth of the Northern Mariana Islands Department of Environmental Quality has established standards for water quality for all Commonwealth waters and groundwater in order to protect their use and value for commerce, propagation of fish and wildlife, recreational purposes, and public water supply use.

## CHAPTER 4.

# IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

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National Environmental Policy Act Section 101 2(c)(iv) requires a detailed statement on any irreversible and irretrievable commitments of resources that would be involved in the proposed action should it be implemented. Irreversible and irretrievable resource commitments are related to the use of non-renewable resources and the effects that the use of those resources have on future generations. Irreversible commitments of resources are those that cannot be reversed except over an extremely long period of time. These irreversible effects primarily result from destruction of a specific resource (e.g. energy and minerals) that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., extinction of a threatened or endangered species or the disturbance of a cultural site).

The proposed action would constitute an irreversible or irretrievable commitment of non-renewable or depletable resources, for the materials, time, money, and energy expended during activities implementing the proposed action. Under all alternatives, except for the no-action alternative, there would be irreversible and irretrievable commitments of resources. Particular irreversible and/or irretrievable impacts that would result are noted below.

Consumption of fossil fuels and energy would occur during construction and operation activities. Fossil fuels (gasoline and diesel oil) would be used to power construction equipment and vehicles. Electrical power would be used for lighting and operations. The energy consumed for project construction and operation represents a permanent and non-renewable commitment of these resources.

Materials for construction of new facilities and associated private-sector economic and population growth would be irretrievably committed for the life of the project. Use of these materials represents a further depletion of natural resources. Construction and maintenance activities are considered a long-term non-renewable investment of these resources.

Land that would be physically altered by construction would be committed to the new use for the foreseeable future and would represent a permanent commitment of the land for the life of the project to a developed use and would decrease the amount of open land available for other uses. Access to the acquired lands would be limited to authorized personnel.

The capital and labor required for construction would be an irreversible and irretrievable commitment of the following resources:

- Soil would be displaced by construction and training activities.
- Limited areas of coral reef habitat would be permanently loss as a result of dredging in Apra Harbor.
- Some terrestrial habitat for special status species would be permanently lost on Guam.
- Increases in vessel traffic in Apra Harbor would permanently impact marine biological resources.
- Certain archaeological sites, traditional cultural properties and historical buildings would be permanently removed or disturbed.
- Some wetlands could be permanently lost on Guam.

In addition to the resources expended during the construction and operation of the support facilities described above, there would be consumptive use of certain non-renewable energy resources required to operate dredge support systems, barges, tugs, trucks, pumps, and equipment. There would also be commitment of time and money to accomplish the disposal of dredged material. Time and money would be expended in the planning, testing, permitting, and implementation of dredged material disposal. Dredged material disposed of offshore would be irreversibly and irretrievably committed to the disposal process. Disposal of sediment not suitable for ocean disposal at upland sites would not necessarily be irretrievably and irreversibly committed to such use, as the material could be reused for various purposes.

## **CHAPTER 5.**

# **RELATIONSHIP BETWEEN SHORT-TERM USE OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY**

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National Environmental Policy Act Section 101 2(c)(iv) requires a detailed statement on the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity.

Short-term uses of the environment associated with the alternatives include changes to the physical environment and energy and utility use during the construction of facilities associated with all alternatives except for the no-action alternative. Construction would involve short-term increases in fugitive emissions and construction-generated noise and would increase the use of fossil fuels to power equipment. In addition, expenditures of public funds and the use of labor would be required.

Long-term changes would include the alterations to land use on both Guam and Tinian that would exist for the life of the new facilities and the alteration to the dredged depth of the turning basin and entrance channel and federal navigation channel in Apra Harbor that would remain as such from subsequent siltation and maintenance dredging.

There are numerous plans, procedures, protocols, regulations, and laws that have been established to protect human health and the environment. Compliance with these regulatory mandates by DoD and its contractors would reduce both short-term and long-term impacts.

### **5.1 GEOLOGICAL AND SOIL RESOURCES**

#### **5.1.1 Short-Term**

Short-term use of geological and soil resources would include temporary increases in localized erosion during the construction process.

#### **5.1.2 Long-Term**

Agriculturally productive soils would not be lost and the long-term productivity of these soils would be preserved. Topographic or landscape features would not be substantially changed by proposed construction activities. Areas containing karst geologic features such as Guam's unique karst caves and sinkholes would be avoided and preserved.

### **5.2 WATER RESOURCES**

#### **5.2.1 Short-Term**

Construction and operational activities associated with the proposed actions would result in the potential for a temporary increase in localized runoff and total suspended particulate matter in stormwater. To minimize these potential impacts, construction-specific best management practices (BMPs) would be implemented and mandates of pollution prevention regulations would be followed to reduce the associated potential for erosion, runoff, sedimentation, and associated water quality impacts

The act of offshore disposal of dredged material at a U.S. Environmental Protection Agency (USEPA)-approved Ocean Dredged Material Disposal Site would be a short-term use of the environment that would affect the water quality of the area at the time of disposal. The release of dredged material into the water

column during disposal events has been demonstrated to cause short-term changes in dissolved oxygen, pH and turbidity with ambient conditions returning shortly after disposal operation cease.

### **5.2.2 Long-Term**

With the implementation of BMPs, low-impact development actions and low impact development-comparable technologies, sustainable measures, and compliance with federal and Government of Guam guidelines, surface water quality on Guam and Tinian would be protected from impacts resulting from the proposed actions.

While long-term groundwater production rates would increase, implementation of sustainability practices would reduce the amount of groundwater needed, which would help minimize impacts to groundwater availability. The resulting total annual groundwater production would be less than the sustainable yield. Monitoring of groundwater chemistry and overlying sediments would ensure no harm to existing or beneficial use, and no damage to structures, utilities, or other facilities would result from potential soil settlement.

The dredging associated with the proposed actions would result in long-term productivity improvements in efficient utilization of existing and proposed assets at Apra Harbor, Guam in support of the mission of the U.S. Navy Pacific Fleet. Long-term changes affecting water resources would include the alteration to the dredged depth of Apra Harbor wharf berths, navigation channel and the creation of a turning basin that would remain subject to subsequent siltation and maintenance dredging.

## **5.3 AIR QUALITY**

### **5.3.1 Short-Term**

Short-term changes in air quality would result from construction activities that are predicted to run from 2011 through 2014. Construction of new facilities would result in short-term increases in air emissions, but these increases would not exceed the 250 tons per year (TPY) major source threshold established in the USEPA Prevention of Significant Deterioration (PSD) regulations. PSD regulations are chosen as an emission impact significance threshold for the purposes of this EIS/OEIS. Air permits for all potential existing major stationary source modifications would be obtained as required by law. The PSD regulations were established to ensure that air quality in attainment areas does not significantly deteriorate as a result of construction and operation of major stationary sources and to allow future industrial growth to occur. The potential air emissions for all action alternatives were considered to have a less than significant impact if emissions for regulated pollutants were below the 250 TPY threshold established under the PSD regulations. The emissions threshold was applied for all relevant emissions from the individual components of the proposed action and the cumulative effects of the entire action.

The short-term impacts from all individual components of the actions discussed in Volumes 2 to 6 were categorized as having a less than significant impact. However, if the emissions level from aggregated actions exceed 250 TPY level, a further impact concentration dispersion modeling was conducted to further demonstrate that there is no significant air quality impact would occur during the interim construction period with the comparison of either NAAQS or applicable impact significance levels.

Based on the results of the analyses, air emissions associated with construction are not expected to violate air quality regulations designed to protect human health and the environment and, therefore, would not degrade the short-term quality of air resources.

### **5.3.2 Long-Term**

Long-term operational emissions (2015 and after) from components of the proposed actions were evaluated to determine the significance of overall potential air emissions impacts using the impact thresholds described for short-term impacts. Operational emissions from both mobile and stationary sources were considered.

Mobile sources include aircraft, training vehicles, vessels, aircraft carriers, and off base and on base roadway vehicles. The predicted emissions or applicable pollutant concentrations indicate that the operation of these sources would have a less than significant impact.

Administration, maintenance, housing, and quality of life operations would receive power from stationary utility sources. However, potential long-term air quality impacts from the utility-associated actions cannot be evaluated given the limited design plan at the current planning stage but will be analyzed in the final design stage, if necessary.

Compliance with the regulatory requirements applicable to the two nonattainment areas on Guam would ensure that implementation of any of the action alternatives, in combination with past, present, and future actions, would not result in a new violation of existing National Ambient Air Quality Standards (NAAQS), nor contribute to an increase in the frequency or severity of violations of existing NAAQS, or delay the timely attainment of any NAAQS, interim milestones, or other milestones to achieve attainment. Based on the analyses performed for mobile sources, the combined impacts of air emissions due to the proposed actions are not expected to violate air quality regulations designed to protect human health and the environment and, therefore, would not degrade the long-term productivity of the air environment.

## **5.4 NOISE**

### **5.4.1 Short-Term**

Noise associated with construction activities would result in short-term increases in the ambient noise environment.

### **5.4.2 Long-Term**

Increases in noise sources associated with long-term operations would occur as a result of increased vehicular use, aircraft operations, vessel traffic and base operations. However, the long-term productivity of operations would not be affected by this increase in noise.

## **5.5 AIRSPACE**

### **5.5.1 Short-Term**

Airspace requirements for the proposed actions would have no impacts on the short-term use of existing airspace.

### **5.5.2 Long-Term**

The required consultation and review process with the Federal Aviation Administration (FAA) on all matters affecting airspace use would eliminate the possibility of direct adverse impacts on airspace use in the regions of influence. Activities would be wholly contained within the proposed Special Use Airspace (SUA). The required scheduling process for the SUA by the military would eliminate the potential for adverse cumulative impacts. Increased flights by military pilots operating outside the SUA would still follow FAA regulations, minimizing the potential for adverse cumulative airspace use impacts.

Individually, the proposed action would have no impact on airspace. Reduction to the amount of navigable airspace due to the establishment of new SUA for a ground firing range would be minimal and would not impact existing airspace use at either Andersen Air Force Base (AFB) or Antonio Borja Won Pat International Airport. There would be no requirement for changes to the existing arrivals and departures or flight paths within the Guam flying environment.

## **5.6 LAND AND SUBMERGED LAND USE**

### **5.6.1 Short-Term**

Construction staging areas for specific projects are assumed to be within the project footprint. Upland dewatering sites are considered temporary, but they may exist for an indeterminate amount of time and are considered a long-term impact on land use.

### **5.6.2 Long-Term**

The primary long-term land use impact is the federal acquisition of a large amount of non-federal land involving multiple land owners on Guam to support the Marine Corps. Access to the acquired land would be limited to authorized military personnel. The Army and Navy proposed actions do not require land acquisition. The proposed land uses on federal land are generally compatible with land use plans for adjacent property. The notable exception is live-fire training ranges being sited adjacent to land use plan-designated residential development. The impact is minimized through the retention of open space throughout most of the range area, as a result of the surface danger zones. There would be no submerged land acquired but access to submerged lands would be restricted throughout the year in the training range surface danger zones. Mitigation for the loss of submerged land access is the elimination of the west coast range alternative that would have had a greater impact on marine recreational activities. Compensatory financial mitigation is proposed to the land owners. The upland dewatering sites (maximum two sites required) would represent a long-term land use. Beneficial reuse of the existing stockpiled materials and future dredge spoils would minimize the land requirement.

On Tinian, the long-term land use impacts are associated with the new firing ranges that would 1) restrict access to the military lease area during training activities and 2) eliminate agricultural leases in the lease back area. Leases west of 8<sup>th</sup> Avenue and east of the Rifle Known Distance Range would be retained since they are outside of the surface danger zone. There would be an increased frequency of restricted public access to the military lease areas.

## **5.7 RECREATIONAL RESOURCES**

### **5.7.1 Short-Term**

Construction activities would result in short-term impacts involving traffic diversion and increased congestion on the roads. Short-term impacts may be mitigated by implementing BMPs.

### **5.7.2 Long-Term**

The number of recreational resources users on Guam—on installations and off base—would likely increase sharply over the course of the proposed actions. Increases in recreational resources use would likely occur at beaches and parks, scenic points, historic and cultural sites, dive spots, trails, day use resorts, golf courses, sailing venues, on installations and the rest of the island alike. Foreseeable impacts include inadequate or overcrowding of facilities, such as parking, picnic shelters, restrooms, showers, boat mooring facilities, etc. Moreover, an eroded sense of enjoyment due to increased competition for

opportunities among users would result at most recreational facilities (e.g., golf courses on installations, popular dive spots etc.). Lastly, an increase in the number of users would accelerate deterioration of existing facilities. Therefore, the long-term productivity of recreational resources would be compromised.

A long-term trade-off of the short-term impacts would be improvement of roadways for use by recreational resources users.

## **5.8 TERRESTRIAL BIOLOGICAL RESOURCES**

### **5.8.1 Short-Term**

Short term impacts would remove small amounts of primary limestone forest and ravine forest and would remove large areas of potential habitat for special-status species, including several federal, Guam, and Commonwealth of Northern Mariana Islands-listed species. However, besides the Tinian monarch, most project areas are unoccupied by special-status species at present.

### **5.8.2 Long-Term**

Long-term impacts would include noise impacts on special-status species and other factors that could reduce habitat quality, such as the potential for fire and spread of non-native species. These, as well as the short-term losses, would be balanced by the implementation of fire, biosecurity plans, and ungulate management plans and by restricting access to some sensitive habitat areas that are used for training. Restricted access would protect the species from potential poachers and prevent development of their habitat for the foreseeable future. Implementation of the plans should improve the overall quality of habitat over current conditions.

## **5.9 MARINE BIOLOGICAL RESOURCES**

### **5.9.1 Short-Term**

Short-term uses of the environment include in-water or nearshore land-based construction activities (e.g. dredging, new CVN wharf construction, wharf refurbishing and associated utilities) and in-water vessel movement that would affect marine biological resources through decreased water quality (i.e. increased turbidity, sediment deposition, increased potential for pollutants and debris in the water, and general affects on water chemistry), increased vessel strikes, and noise and in-water reverberations. These short-term uses of the environment would affect Endangered Species Act-listed species and sensitive management unit species present in the essential fish habitat of Apra Harbor and Guam.

### **5.9.2 Long-Term**

Long-term changes to the environment include changes in dredged depths in Apra Harbor, including: the federal navigation channel; aircraft carrier turning basin and new wharf; Inner Apra Harbor Entrance Channel; and Inner Apra Harbor Wharves (Sierra and Tango). New depths would remain as such and be subject to subsequent siltation and maintenance dredging. Additionally, long-term uses of the environment include in-water or nearshore land-based operational activities (e.g. increased frequency of Marine Expeditionary Unit ships and fueling vessel transport movement and CVN aircraft carrier visits in Apra Harbor), including recreation and recreational activities (specifically Haputo Ecological Reserve Area) that would affect marine biological resources through decreased water quality (i.e. increased ammonia nitrogen levels in wastewater discharges, increased turbidity, sediment deposition, increased potential for pollutants and debris in the water, and affects on water chemistry), increased vessel strikes, and noise and in-water reverberations. Lastly, there would be long-term uses of the coastal waters on the

east coasts of Guam and Tinian where the training ranges surface danger zones extend off-shore. These long-term uses of the environment would affect Endangered Species Act-listed species and sensitive management unit species present in the essential fish habitat of Apra Harbor and Guam, and possibly Tinian. Therefore, the long-term productivity of marine biological resources may be compromised.

## **5.10 CULTURAL RESOURCES**

### **5.10.1 Short-Term**

Short-term effects to the environment associated with the alternatives include temporary restriction from areas containing archaeological sites and the possibility of vandalism from the temporary increased use of an area.

### **5.10.2 Long-Term**

Long-term changes would include the direct loss and disturbance of archaeological sites and historic buildings on both Guam and Tinian from construction and demolition, and the long-term restriction from potential traditional cultural properties as a result of training and safety requirements relating to firing ranges. With the implementation of mitigation measures, there would be a long-term benefit from the increase in knowledge of the past and the distribution of this knowledge to the public. However, the long-term productivity of cultural resources may be compromised.

## **5.11 VISUAL RESOURCES**

### **5.11.1 Short-Term**

Short-term effects to the environment associated with the action alternatives include temporary revisions to visual resource areas by construction equipment.

### **5.11.2 Long-Term**

There are no projects adjacent to identified public viewsheds that would directly add to or cumulatively effect visual resources. However, there are numerous projects throughout north and central Guam that would potentially be adding new buildings, structures, and roadways to the landscapes in these areas. Essentially, over time, the visual environment in these areas would become less natural in appearance, more suburban-urban in context, and generally more cluttered overall. Therefore, the projects in north and central Guam, when combined with the various elements of the proposed actions would likely have an indirect negative impact on the visual resources in these areas.

## **5.12 TRANSPORTATION**

### **5.12.1 Short-Term**

#### **5.12.1.1 Onshore**

There would be substantial short-term effects on the environment during the construction of the many roadway improvement projects envisioned in the proposed actions. The proposed roadway and bridge improvements on Guam would occur throughout the island both on existing military property and off these properties. The temporary effects during the construction phase would include the disruptions of normal traffic patterns through re-routing and congestion.

#### 5.12.1.2 Offshore

Short-term uses of the environment that would affect navigation in Apra Harbor include restrictions to the movement of ships during the construction of the aircraft carrier pier for and the dredging of the federal navigation channel, turning basin, and pier area.

### 5.12.2 Long-Term

#### 5.12.2.1 Onshore

Following the construction phase, there would be long-term benefits to Guam from the proposed upgrading of numerous public roads and bridges throughout the island.

#### 5.12.2.2 Offshore

Long-term changes that would affect navigation in Apra Harbor include the new aircraft carrier pier that would be constructed adjacent to the entrance channel to Inner Apra Harbor. In addition, the newly dredged areas of the federal navigation channel, turning basin, and pier area would be subject to subsequent siltation and required maintenance dredging. Therefore, the long-term productivity of marine transportation may be improved.

## 5.13 UTILITIES

### 5.13.1 Short-Term

#### 5.13.1.1 Power

The proposed facilities for military relocation would require putting into service a Guam Power Authority (GPA) Combustion Turbine (CT), reconditioning four other existing GPA CTs, and upgrades to the existing transmission and distribution system on Guam. Establishing the power demand system for Navy requirements is not anticipated to affect the short-term productivity of the environment since there would be excess power supply of 4.91 megawatts in the peak buildup year of 2014. Volume 6, Section 3.2.2 details the demand and supply of power.

The transmission and distribution system would require replacement of existing lines that would become overloaded, installation of capacitor banks to support anticipated low voltage due to increased loads and upgrades at existing substations to increase capacity.

The transmission and distribution improvements would be along existing electrical easements and would entail replacing some existing overhead electrical lines with new underground electrical lines. The construction would require excavation for installation of the lines (approximately 4 feet (1 meter) deep) and would have impacts along the route.

Larger substation transformers would be installed near Andersen AFB and the Navy base to support increased loads in those areas. The transformers would be located at existing Guam Power Authority substation sites and are not expected to have a significant impact on the area. They would be physically larger, but would be installed near the current location to minimize impacts.

Provided all planned reconditioning of generating facilities and transmission and distribution improvements occur in a timely fashion, there would be no power shortfall.

#### 5.13.1.2 Potable Water

The proposed facilities for military relocation would require upgrades to the existing water production, treatment, storage, and distribution systems on Guam in order to meet additional potable water demands.

The proposed DoD water supply expansion includes development of up to 22 potable water wells at Andersen AFB and rehabilitation of the Navy Regional Medical Center wells. In order to meet the projected increase in demand on the Guam Waterworks Authority (GWA) water system, GWA would also need to expand their potable water supply through development of additional potable water wells. Existing DoD and GWA well production is currently approximately an average of 46 million gallons per day (mgd) (176 million liters per day [mld]). Expansion estimate for DoD average daily demand is 4.0 mgd (15.3 mld). The demand growth estimate for GWA is 12.5 mgd (48 mld). Total estimated ground water demand from the Northern Guam Lens Aquifer (DoD and GWA) is approximately 62.5 mgd (236 mld). This is below the estimated sustainable yield of the aquifer of 81 MGd (308 mld) and thus would not impact the short-term productivity of the environment. In the short-term, the GWA water system will be short of estimated demand driven by insufficient production wells and a higher than normal unaccounted for water percentage. There are several potential mitigations to this condition, among which are the transfer of excess water production from the DoD system to the GWA system, acceleration of the GWA program to find and correct system leaks, and water conservation initiatives by GWA.

#### 5.13.1.3 Wastewater

Refurbishment of the Northern District Wastewater Treatment Plant (NDWWTP) to its original design primary treatment, capacity and installation of secondary treatment would meet projected interim and year 2020 wastewater flows. No short-term use of the environment is required to accomplish the required refurbishment or installation of secondary treatment processes other than uses resulting from the procurement of construction materials or operation of construction tools and/or equipment.

#### 5.13.1.4 Solid Waste

The solid waste management alternative would not involve any change to existing facilities. The existing Navy sanitary landfill at Apra Harbor would continue to be utilized until the new public landfill at Layon is completed and open for use, which is anticipated to be by July 2011. At that time, DoD would take all their solid waste to the new Layon Landfill per the agreement with GovGuam. Implementing this solid waste alternative is not anticipated to affect the short-term productivity of the environment.

### 5.13.2 Long-Term

#### 5.13.2.1 Power

Long-term impacts would arise due to electrical utility upgrades that include the installation of underground electrical lines. Moving the lines from overhead to underground would reduce the impact of tropical storms on the electrical system (improve reliability). The existing substations for Andersen AFB and Orote would be larger but would be located at existing substations and would have a minimal impact. The transmission and distribution easements for electrical lines that currently exist would be used for the anticipated line upgrades. Therefore, the long-term productivity and reliability of power infrastructure may be improved.

#### 5.13.2.2 Potable Water

Including the proposed DoD expansion, the total planned well production from the Northern Guam Lens Aquifer (DoD and GWA) is 62.5 mgd (236 mld). The total sustainable yield estimate for the Northern Guam Lens Aquifer is 81 mgd (307 mld). Therefore, the increased demand on the potable water supply resulting from the proposed military relocation to Guam is consistent with the sustainable yield estimates.

In accordance with DoD Unified Facilities Criteria, DoD water demands used to develop the proposed DoD water supply were calculated assuming the maximum daily demand. However, the above numbers

were based on an approximation of the average daily demand for DoD. GWA estimates for the Guam civilian demand are based on average daily demand. With the estimated average daily demand of 62.5 MGd (236 mld) and the estimated sustainable yield of the northern Guam lens aquifer of 81 MGd (308 mld), the development of the proposed DoD water supply to support the military relocation is not expected to adversely impact the long-term productivity of the Northern Guam Lens Aquifer. Therefore, the long-term productivity of potable water infrastructure may not be compromised, and the overall reliability of the potable water system would be improved.

#### 5.13.2.3 Wastewater

Refurbishment of the NDWWTP to its original design capacity and installation of new secondary treatment plant processes would ensure that increased wastewater flows to the NDWWTP receive adequate treatment prior to discharge of the effluent via the ocean outfall. This improvement in treatment efficiency would be offset during the period of time after primary treatment plant refurbishment has been completed and higher flow rates to the plant begin, and prior to secondary treatment plant upgrades are completed. The net effect during this interim period of time would likely have a negative impact on a small area of the ocean. However, after secondary treatment plant upgrades are completed, there would be an overall positive on the long-term productivity of the environment due to a reduction in pollutants in the secondary treatment plant discharge as compared to the pollutant loading from the NDWWTP that occurs today.

#### 5.13.2.4 Solid Waste

The long-term solid waste management alternative would include utilizing the planned new Government of Guam landfill, which is currently being constructed.

### 5.14 SOCIOECONOMICS AND GENERAL SERVICES

#### 5.14.1 Short-Term

Short-term construction is expected to overlap with the arrival of Marine Corps personnel. This overlap, including the effects of spin-off economic growth in the private sector, would generate a Guam “boomtown” situation in that economic opportunities could be offset by rapid population growth, labor shortages, cost of living increases, intense temporary demands on general services, and strains on the quality of life for many residents. The end of this “boomtown” period would technically be an economic recession, though its effects would be dampened by the use of many temporary alien laborers who would return to their home counties. On Tinian, short-term impacts would be minimal.

#### 5.14.2 Long-Term

Long-term operations are expected to positively impact the Guam economy; although there may be some adjustment issues related to the tourism industry and military-civilian relations. Because of the increased permanent population, local government would have to increase its level of service in most agencies. Therefore, the long-term socioeconomic productivity may be improved on Guam. On Tinian, long-term impacts would be minimal.

### 5.15 HAZARDOUS MATERIALS AND WASTE

#### 5.15.1 Short-Term

The proposed actions would not result in any impacts that would pose short-term risks to the general public or the environment.

**5.15.2 Long-Term**

The proposed actions would result in the increased transportation, handling, use, and disposal of hazardous materials (e.g., petroleum, oils and lubricants/fuels) and hazardous wastes (pesticides, herbicides, solvents, lubricants, heavy metals, etc.). In addition, demolition of existing structures could result in the requirement to dispose of asbestos containing materials and/or lead based paint. However, there are numerous BMPs (see Volume 7) and SOPs that would minimize any potential long-term impacts. Therefore, as long as these hazardous substance BMPs and SOPs are modified and implemented as appropriate, long-term impacts would be minimal. As a result, the long-term environmental productivity may be improved.

**5.16 PUBLIC HEALTH AND SAFETY****5.16.1 Short-Term**

The proposed actions would not be expected to result in any impacts that would pose short-term risks to health, safety, or the general welfare of the public.

**5.16.2 Long-Term**

The proposed actions would not be expected to result in any impacts that would pose long-term risks to health, safety, or the general welfare of the public. Therefore, the long-term environmental productivity may be improved.

**5.17 ENVIRONMENTAL JUSTICE AND THE PROTECTION OF CHILDREN****5.17.1 Short-Term**

Environmental justice examines the potential for adverse impacts to disproportionately affect socially disadvantaged groups, including racial minorities, low-income populations, and children. Whether an action is short-term or long-term would not affect the disproportionate nature of an impact. Therefore, the relationship between short-term use of the environment and long-term productivity does not apply to environmental justice.

**5.17.2 Long-Term**

Environmental justice examines the potential for adverse impacts to disproportionately affect socially disadvantaged groups, including racial minorities, low-income populations, and children. Whether an action is short-term or long-term would not affect the disproportionate nature of an impact. Therefore, the relationship between short-term use of the environment and long-term productivity does not apply to environmental justice.

## CHAPTER 6.

# SUSTAINABILITY AND SMART GROWTH

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### 6.1 SUSTAINABILITY

#### 6.1.1 Overview

Sustainability and smart growth work to meet the needs of the present without compromising the ability of future generations to meet their own needs. In this case, it is an approach that ensures that our military maintains its mission, readiness, national defense, training and international defense commitments and quality of life for the military; including the ability to adjust to changing geo-political realities while encouraging local economic growth, preserving the environment, and working to improve the quality of life for Guam and CNMI residents and visitors.

In order to reduce environmental impact and address limited resources, the DoD, including the Navy and Marine Corps, have adopted guidance and policies that promote sustainable planning, design, development, and operations. The guidance and policies work to decrease energy use, minimize reliance on traditional fossil fuels, protect and conserve water, enhance indoor air quality, and reduce the environmental impact of materials use and disposal. It is the DoD's goal that proposed development would be sized, planned, and developed in a manner that is sustainable and works to preserve and protect limited resources.

By choosing sustainability and smart growth, the DoD can create development that is attractive, safe, and healthy for soldiers and their dependents; foster development and operations that meet mission requirements while encouraging social, civic, and physical activity; and work to protect the environment while stimulating economic growth throughout Guam and CNMI. Impacts on Guam's and CNMI's limited resources can also be reduced along with up front and operating/maintenance costs for the military over the life of the facilities.

#### 6.1.2 Laws, Requirements, and Guidance

A successful sustainability and smart growth approach for the DoD is based on federal, Navy, and Marine Corps policies and guidance. Under numerous laws and official policies and guidance, development and operations associated with the military build-up on Guam and CNMI are required to achieve varying degrees of energy efficiency, pollution reduction, transportation improvements, reduction in water demand, and a right sized footprint as it relates to various features of the project. The policies and guidance also require that new development be designed to meet U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) Silver Certification for New Construction (LEED-NC).

##### 6.1.2.1 Relevant Federal Policies, Laws

Relevant Federal policies and laws are:

- Energy Policy Act of 2005
- Memorandum of Understanding (MOU) for Federal Leadership in High Performance and Sustainable Buildings (Guiding Principles)
- Executive Order 13423 Strengthening Federal Environmental, Energy, and Transportation Management
- Energy Independence and Security Act of 2007

- National Defense Authorization Act 2007

6.1.2.2 Navy, Marine Corps, and Joint Region Marianas Policies and Guidance

Navy, Marine Corps, and Joint Region Marianas policies and guidance consist of:

- Engineering & Construction Bulletin 2008-01 Energy Policy Act of 2005 Implementation and USGBC LEED Certification
- UFC 1-900-01 Selection of Methods for the Reduction, Reuse, and Recycling of Demolition Waste
- Unified Facility Code (UFC) 3-210-10 Low Impact Development
- UFC 4-030-01 Sustainable Development
- Naval Base Guam Instruction 4100.1 Energy Management Program
- Naval Base Guam Instruction 11330.1 Water Conservation Program
- OPNAVINST 5090.1B, Chapter 14, Solid Waste Management and Resource Recovery Ashore.

Table 6.1-1 also provides a more detailed summary of relevant federal policies and guidance.

**Table 6.1-1. Summary of Federal Policies and Guidance**

	<i>Energy Policy Act of 2005</i>	<i>EO 13243</i>	<i>Federal Sustainable Performance MOU</i>	<i>DOE 10 CFR</i>
Water Efficiency	<ul style="list-style-type: none"> <li>• Apply water conservation technologies</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce water consumption intensity 2% annually through 2015 or by 16% by the end of 2015</li> </ul>	<ul style="list-style-type: none"> <li>• 20% less potable water than U.S. Environmental protection Agency (USEPA) -1992</li> <li>• Water efficient landscape and irrigation strategies</li> <li>• Reduce outdoor potable water use by 50%</li> </ul>	Not applicable (NA)
Renewable Energy	<ul style="list-style-type: none"> <li>• 3% renewable 2007-2009</li> <li>• 5% renewable 2010-2012</li> <li>• 7.5% renewable 2013 and continuing</li> <li>• Double credit for renewable produced on federal lands</li> </ul>	<ul style="list-style-type: none"> <li>• 50% renewable energy is from new renewable sources</li> <li>• Install renewable energy sources on agency</li> </ul>	NA	NA
Energy Efficiency	<ul style="list-style-type: none"> <li>• Energy Star/Federal Energy Management Program-recommended products required</li> <li>• 30% less energy consumption than American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) Standard 90.1 2004 baseline</li> <li>• Sustainability applied to site, design, and under construction</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce energy intensity by 3% annually through 2015 or by 30% by the end of 2015 compared to ASHRAE 90.1-2004 baseline</li> <li>• Earn Energy Star 7 targets</li> </ul>	NA	<ul style="list-style-type: none"> <li>• Meet Energy Star 7 targets</li> <li>• Reduce energy by 30% compared to ASHRAE 90.1-2004 baseline building</li> </ul>
Hydrochloro-fluorocarbon's Carbon	NA	<ul style="list-style-type: none"> <li>• Reduce greenhouse gas emission intensity 3% annually or 30% by the end of 2015</li> </ul>	NA	NA
Indoor Air Quality	NA	NA	<ul style="list-style-type: none"> <li>• ASHRAE standards 55-2004 and 62-2004</li> <li>• Moisture control preventing buildings damage and mold</li> <li>• Use low-emitting materials</li> <li>• Protect indoor air quality during construction</li> </ul>	NA

## 6.2 IMPLEMENTATION STRATEGIES AND OBJECTIVES

### 6.2.1 Navy Energy Policy

The Navy has already developed a five year energy plan that can be used by Naval Facilities Engineering Command Marianas to attain compliance with the Navy's energy and sustainability goals. These goals are designed to ensure that new facilities comply with legal mandates including:

- *Energy Intensity*. Reduce energy usage by 3% annually or 30% by 2015 relative to 2003.
- *Renewable energy*. Increase renewable electricity use 1.5% per year for a total of 25% of consumption from renewable sources by 2025 with 50% of the required renewable energy coming from new renewable sources that were acquired after January 1, 1999.
- *Water*. Reduce water consumption 2% per year (16% by 2015) relative to 2007.
- *Sustainable Buildings*. About 2% per year of existing facilities (15% by 2015), meet the Federal Leadership in High Performance and Sustainable Buildings MOU. The MOU includes reducing the energy cost 20% below 2003 standards, reducing indoor water use at least 20% below the baseline for the facility, and reducing outdoor water use for landscaping by 50% with respect to conventional vegetation.
- *New Facility Design*. Design all new facilities 30% more efficient than ASHRAE standard 90.1-2004.
- *New Facility Construction*. Construct new facilities to LEED Silver.
- *Metering*. Install remote readable electricity meters annually on 25% (all by 2012) of facilities consuming more than \$35,000 per year electricity. Meter additional facilities and utilities as practical based on business case analysis.
- *Energy Efficient Products*. Purchase energy efficient (USEPA energy star, and Federal Energy Management Program) products.
- *Leases and Services Contracts*. Include energy and water program requirements in leases & services contracts.

### 6.2.2 Master Planning and Design

A significant consideration and component of the master plan for the Guam and CNMI Military Relocation is the integration of sustainability and smart growth guidance, policies, practices, designs, systems, and operations and maintenance. To assess and quantify the results of potential sustainability and smart growth strategies and courses of action, the project planners would utilize the Sustainable Systems Integration Model (SSIM), a proprietary, multisystem planning, environmental, and economic evaluation tool. SSIM outputs would help guide master planning and design, and would work to support LEED and low impact development efforts with quantifiable information.

In order to populate and assess outputs of the SSIM, master planning smart growth and sustainability workshops were conducted on Guam in January of 2009 and Hawaii in March of 2009. Additional workshops would be conducted throughout 2009. Stakeholders participating to date have included federal representatives from Navy, Marine Corps, and U.S. Fish and Wildlife Service. Government of Guam agencies represented included Guam Environmental Protection Agency, Department of Land Management, and Bureau of Statistics and Planning. In addition, several consultants and the Guam Contractors Association provided additional expertise and local knowledge. While not in attendance to date, representatives from USEPA helped organize the charrettes and facilitated stakeholder conference calls.

Participants identified specific elements to be included in the concept sustainability effort for the military base build-up with a primary focus on the proposed Marine Cantonment area. Areas of focus and approaches for sustainability on Guam include:

- Water
  - *Water Conservation.* Identify and specify appropriate conservation fixtures and devices.
  - *Irrigation.* Eliminate use of irrigation systems and water use for landscaping. Meet water use reduction requirements as codified in the Energy Policy Act of 2005 or the Energy Independence and Security Act of 2007. Identify minimum areas requiring irrigation such as recreation fields and other special use areas and possibly outfit them with artificial turf.
  - *Grey Water Use.* Evaluate options for use of grey water for irrigation and toilet flushing. Rainwater Harvesting. Investigate harvesting, storage and distribution systems
  - *Stormwater Quality, Quantity, Infiltration and Groundwater Recharge.* Design the base storm drainage system in compliance with Low Impact Development UFC criteria and other modern storm water management features. Prepare a Low Impact Development manual for the program in compliance with laws, reduce water use by up to 20% inside buildings and 50% outside buildings.
- Energy
  - *Minimizing Energy Demand.* As codified under recent laws, reduce demand for energy by 30% by 2015, eliminate use of fossil fuels by 2050, and generate 5% of hot water needs from solar sources.
  - Identify and evaluate systems and elements that would minimize energy demand, meter all new buildings to monitor energy use, and use Energy Star fixtures.
  - *Onsite Energy Generation.* Evaluate options such as photovoltaic, solar water systems, renewable sources and district heating and cooling.
  - Reduce the heat island effect through the use of shading, light colors and reduction in impermeable surfaces.
- Transportation
  - *Bicycle and Pedestrian Oriented Site Planning.* Design the site to facilitate and encourage non-motor vehicle traffic.
  - *Internal Shuttle.* Include a clean fuel shuttle system for the site, addressing location and time based transportation requirements.
  - *Integrate On-Site Transportation with Off-Site Transportation.* Design on site transportation to conveniently connect with offsite high-capacity (non-individual motor vehicle) systems such as an off-site shuttle. Create denser neighborhoods within walking distance to service and work facilities.
- Waste Management
  - Establish an Integrated Waste Management Program to include all sites.
  - Recycle 50% of construction waste and reuse building materials.
  - Expand the existing Navy and Air Force Recycling Programs to include the new sites, to be coordinated with Government of Guam
  - Purchase materials with various percentages of recycled content.

### 6.2.3 Application of LEED Tools

The U.S. Green Building Council's LEED program is a tool to measure performance on various sustainability outcomes and to assist with meeting legal mandates outlined above. The Marine Corps is

required to pursue a LEED Silver rating for its new facilities on Guam. Silver certification is achieved by achieving a certain number of credits under the LEED rating system. For the cantonment, the Marine Corps and master planners are reviewing increased density of structures, mixed use building designs and service areas, facilities to increase walking, bike use, mass transit, and a reduction of accommodations for vehicles. Such actions work toward developing LEED-NC Campuses. Whereas LEED-NC is submitted on a single building by building basis, a LEED-NC Campus allows for the grouping of several facilities into a “campus” for submittal. Similar to the campus designation, the LEED-Neighborhood Development (ND) criteria is focused on a development area or neighborhood in achieving various credits. Where this is not feasible, facilities can still be submitted on an individual basis. LEED Silver credits are awarded if more than 50% of non-hazardous construction and demolition debris is recycled or salvaged and additional credit is given if 75% recycling rates are achieved. The master planners are working with the various DoD entities to apply LEED standards to their respective facilities and operations.

#### 6.2.3.1 LEED-NC for New Construction and Campuses

LEED-NC would be applied to individual buildings of the Guam development. LEED credits would be sought for energy efficiency, water use reduction, smart design of the facility and its location, improved indoor air quality, commissioning of the mechanical systems and efficiencies in operation and maintenance.

#### 6.2.3.2 LEED-ND for Neighborhood Development

The LEED-ND rating system is designed to certify exemplary development projects that perform well in terms of smart growth, new urbanism, and green buildings in a holistic neighborhood approach. The LEED-ND rating system is organized into three sections: smart location and linkage, neighborhood patterns and design, and green construction and technology.

LEED for Schools and LEED for Homes tools may be used for various aspects of this project where the LEED-NC and LEED-ND application may not be appropriate or beneficial to sustainability goals.

## CHAPTER 7.

### DISTRIBUTION LIST

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30th Guam Legislature, The Honorable Senator Frank F. Blas  
30th Guam Legislature, The Honorable Senator Edward J.B. Calvo  
30th Guam Legislature, The Honorable Senator Benjamin J.F. Cruz  
30th Guam Legislature, The Honorable Senator James V. Espaldon  
30th Guam Legislature, The Honorable Speaker Mark Forbes  
30th Guam Legislature, The Honorable Senator Judith P. Guthertz  
30th Guam Legislature, The Honorable Senator Tina Rose Muna-Barnes  
30th Guam Legislature, The Honorable Senator Adolpho B. Palacios Sr.  
30th Guam Legislature, The Honorable Senator Vincent C. Pangelinan  
30th Guam Legislature, The Honorable Senator Matt Rector  
30th Guam Legislature, The Honorable Senator Rory J. Respicio  
30th Guam Legislature, The Honorable Senator Telo Taitague  
30th Guam Legislature, The Honorable Senator Ray Tenorio  
30th Guam Legislature, The Honorable Senator Judith T. Won Pat  
Office of the Governor of Guam, The Honorable Governor Felix P. Camacho  
Office of the Lt. Governor of Guam, The Honorable Lt. Governor Dr. Mike W. Cruz  
Office of the Governor of Guam  
U.S. House of Representatives, The Honorable Congresswoman Madeleine Bordallo

##### Elected Officials – Guam (Local)

Mayor of Agana Heights, The Honorable Mayor Paul M. McDonald

Mayor of Agat, The Honorable Mayor Carol S. Tayama  
Mayor of Asan-Maina, The Honorable Mayor Vicente L. San Nicolas  
Mayor of Barrigada, The Honorable Mayor Jessie B. Pelican  
Mayor of Chalan Pago/Ordot, The Honorable Mayor Jessy C. Gogue  
Mayor of Dededo, The Honorable Mayor Melissa B. Savares  
Mayor of Hagatna, The Honorable Mayor John A. Cruz  
Mayor of Inarajan, The Honorable Mayor Franklin M. Taitague  
Mayor of Mangilao, The Honorable Mayor Nonito C. Blas  
Mayor of Merizo, The Honorable Mayor Ernest T. Chargualaf  
Mayor of Mongmong Toto Maite, The Honorable Mayor Andrew C. Villagomez  
Mayor of Piti, The Honorable Mayor Vicente D. Gumataotao  
Mayor of Santa Rita, The Honorable Mayor Dale E. Alvarez  
Mayor of Sinajana, The Honorable Mayor Roke B. Blas  
Mayor of Talofof, The Honorable Mayor Vicente S. Taitague  
Mayor of Tamuning, Tumon, Harmon, The Honorable Mayor Francisco C. Blas  
Mayor of Umatac, The Honorable Mayor Dean D. Sanchez  
Mayor of Yigo, The Honorable Mayor Robert Lizama  
Mayor of Yona, The Honorable Mayor Jose Terlaje  
Mayor's Council of Guam, Executive Director John F. Blas

Elected Officials – Commonwealth of Northern Mariana Islands (CNMI)

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CNMI Senate, The Honorable Senator Jude U. Hofschneider  
CNMI Senate, The Honorable Senator Paul A. Manglona  
CNMI Senate, The Honorable Senator Joseph M. Mendiola  
CNMI Senate, The Honorable Senator Felix T. Mendiola  
CNMI Senate, The Honorable Senator Maria T. Pangelinan  
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Elected Officials – CNMI (Local)

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Mayor of Rota, The Honorable Mayor Benjamin T. Manglona  
Mayor of Saipan, The Honorable Mayor Juan Tudela  
Mayor of Tinian and Aguiguan, The Honorable Mayor Francisco M. Borja  
Tinian Office of the Mayor

Federal Agencies

Department of Military Affairs/Guam Air National Guard  
Department of Military Affairs/Guam Army National Guard

Department of the Air Force  
Department of the Army  
Dept of Army, U.S. Army Engineer District, Honolulu, Regulatory Branch  
Federal Aviation Administration  
Federal Highway Administration  
Headquarters, Department of the Army  
Headquarters Marine Corps  
National Park Service  
Naval Facilities Engineering Command, Headquarters  
Naval Facilities Engineering Command, Pacific Region  
National Oceanic and Atmospheric Administration (NOAA)  
National Oceanic and Atmospheric Administration, Fisheries Service  
Natural Resources Conservation Service  
NOAA Fisheries, Pacific Islands Regional Office  
NOAA National Marine Fisheries - CNMI Office  
NOAA National Marine Fisheries - Guam Field Office  
NOAA National Marine Fisheries - Pacific Islands Regional Office  
Office of Insular Affairs  
U.S. Air Force, Andersen Development Office  
U.S. Air Force, Pacific  
U.S. Army Air and Missile Defense Command  
U.S. Army Corps of Engineers  
U.S. Army Installation Management Command  
U.S. Coast Guard  
U.S. Coast Guard, Marianas Section  
U.S. Department of Agriculture (USDA)  
USDA, Animal and Plant Health Inspection Services  
USDA, Animal Plant Inspection Health Service, Wildlife Services  
U.S. Department of Interior  
U.S. Department of Transportation, Federal Highway Administration  
U.S. Department of Transportation, Maritime Administration  
U.S. Environmental Protection Agency (USEPA), Region 9

USEPA, Pacific Islands Office, Region 9  
USEPA, Reg. 9, Environmental Review Office Communities and Ecosystems Division  
U.S. Fish and Wildlife Service (USFWS)  
USFWS, Pacific Islands Office  
USFWS, Pacific Islands Refuge Complex  
U.S. Marine Corps Forces, Pacific  
U.S. Navy, Chief of Naval Operations  
U.S. Navy Commander, Navy Region Marianas  
U.S. Navy Commander, Pacific Fleet  
U.S. Navy, Joint Guam Program Office  
U.S. Navy, Office of the Assistant Secretary

Guam Agencies

A.B. Won Pat International Airport, Guam  
Ancestral Lands Commission  
Bureau of Statistics and Plans, Guam Coastal Management Program  
Commission on Decolonization  
Community Right to Know Commission  
Department of Agriculture, Division of Aquatic and Wildlife Resources  
Department of Land Management  
Department of Parks and Recreation  
Department of Parks and Recreation, Historic Preservation Division  
Department of Public Works  
Guam Chamorro Land Trust Commission  
Guam Community College  
Guam Civilian/Military Task Force  
Guam Department of Chamorro Affairs  
Guam Economic Development and Commerce Authority  
Guam Environmental Protection Agency  
Guam Homeland Security, Office of Civil Defense  
Guam National Guard  
Guam State Historic Preservation Office

Guam Visitors Bureau  
Guam Waterworks Authority  
Nieves M. Flores Memorial Library  
Port Authority of Guam  
Robert Foster Kennedy Memorial Library University of Guam  
University of Guam  
University of Guam Marine Lab  
University of Guam Water and Environmental Research Institute  
Western Pacific Region Fisheries Management Council

CNMI Agencies

CNMI Coastal Resources Management Program  
CNMI Historic Preservation Office  
Department of Community and Cultural Affairs  
Department of Community and Cultural Affairs, Historic Preservation Office  
Department of Lands and Natural Resources  
Division of Fish & Wildlife  
Division of Environmental Quality  
Marianas Public Lands Authority  
Marianas Visitors Authority  
Office of Military Liaison and Veterans Affairs  
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Hawaii Agencies

Western Pacific Region Fisheries Management Council  
Office of Hawaiian Affairs

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Guam Interest Groups

Alupang Beach Club Inc, Parasailing Operation

AQUA Academy

Aqua World Marina

Atlantis Submarines

Atlantis Guam

Bailan Tasi Windsurfing

Cabras Marine Corp.

Commission on Decolonization

Coral Reef Marine Center

Fuetsan Famalao'an

Guam Chamber of Commerce

Guam Contractor's Association

Guam Diving Industry Association

Guam Fisherman's Cooperative

Guam Lagoon Scuba Diving

Guam Sailing Federation

Guam Tropical Dive Station

I Nasion Chamorro

Isla Jetski Club, Jet Ski Operations

Marianas Yacht Club

Micronesia Diving Association

Ocean Jet Club, Jet Ski Operations

Outrigger Guam Canoe Club

Perez Bros

Real World Diving

Scuba Company

Hawaii Interest Groups

Honolulu Japanese Chamber of Commerce

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Japanese Chamber of Commerce & Industry of Hawaii

The Chamber of Commerce of Hawaii

National/International Environmental Interest Groups

Earth Justice National Headquarters

Micronesia Nature Conservancy

Natural Resources Defense Council

Pacific Concerns Resource Centre

Sierra Club

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- Bureau of Statistics and Plans. 2009. Draft North and Central Guam Land Use Plan. In Association with Plan Rite and Sablan Environmental. Prepared for the Government of Guam Bureau of Statistics and Plans. January. Required Permits and Approvals.
- Department of Defense. 2000. Commander Navy Region Marianas Instruction 3500.4, Marianas Training Handbook. U.S. Pacific Command. Territorial Planning Commission. 1966. Territory of Guam Master Plan. January.
- Territorial Planning Council. 1994. I Tano' Ta, the Land Use Plan for Guam. Prepared by W.B. Flores & Associates/Strategic Planning Group Inc. Joint Venture.

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