

CHAPTER 5.

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

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 8th 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.