

## **CHAPTER 20.**

# **ENVIRONMENTAL JUSTICE AND THE PROTECTION OF CHILDREN**

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### **20.1 INTRODUCTION**

This chapter focuses on the potential for racial and ethnic minorities, low income populations, or children to be disproportionately affected by project-related impacts. Normally an analysis of environmental justice is initiated by determining the presence and proximity of these segments of the population relative to the specific locations that would experience adverse impacts to the human environment. The situation on Guam is unique in this regard because racial or ethnic minority groups (as defined by the U.S.) comprise a majority of the Guam population, and the proportions of people living in poverty or who are under 18 years of age are also substantially higher than in the general U.S. population. The analysis is further complicated by the fact that Guam is a relatively small and isolated island, and certain types of impacts would be experienced island-wide. Accordingly, the analysis of environmental justice described in this chapter acknowledges the unique demographic characteristics of the island population and assumes that the project effects could disproportionately affect disadvantaged groups and children because they comprise relatively high proportions of the population. By the same logic, mitigation measures that would reduce the severity of any significant project impacts to a less than significant level would be expected to effectively mitigate the associated environmental justice impacts to a less than significant level.

For a description of the affected environment with respect to environmental justice, refer to Volume 2 Chapter 19 (Marine Corps Relocation – Guam). This chapter focuses on potential disproportionate impacts to racial minorities, low-income populations, and children from the construction and operation of utilities and roadways associated with the military buildup on Guam. For an analysis of potential island-wide impacts to these populations, see the socioeconomics chapter of this volume (Chapter 17).

### **20.2 ENVIRONMENTAL CONSEQUENCES**

#### **20.2.1 Approach to Analysis**

##### **20.2.1.1 Methodology**

Volume 4 of this EIS/OEIS examines the potential impacts that each alternative would potentially have on various environmental and human resources. Based on the conclusions reached in each resource chapter, the analysis of environmental justice sought to identify the adverse impacts that would disproportionately affect racial minorities, children, and/or low-income populations, based on the following assumptions.

- Environmental justice policies are intended to analyze disproportionate impacts of potentially harmful environmental impacts on minority or other special status populations. However, the island of Guam is unique in that the majority of the population is a racial or ethnic minority, and low-income and child populations also comprise a relatively large proportion of the population (compared to the U.S.). Consequently, in this analysis it is assumed that any adverse impact that would affect the island as a whole, and any localized adverse impact that would affect a particular concentration of special-status residents, would have a disproportionate effect in terms of environmental justice.
- The region of influence (ROI) is defined as the area in which the principal effects arising from the proposed construction of utilities and roadways are likely to occur. Those who may be affected by the

consequences of utilities and roadway construction and operation are often those who reside or otherwise occupy areas immediately adjacent to the project locations.

- Because the proposed actions are related either to construction or operations, impacts to the ROI would likely be either “spill over” effects that extend beyond an installation’s boundary line into the surrounding community, or impacts that directly affect minority populations in the ROI.

The analysis involved the application of three tiers of criteria to assess the environmental justice implications of each adverse effect identified in the relevant resource chapters:

- Tier 1: Are there any racial minorities, low-income, or children populations adjacent to the proposed action site?
- Tier 2: Are the applicable disadvantaged groups disproportionately affected by the negative environmental consequences of the proposed action(s)?
- Tier 3: Would the disproportionate adverse effects be significant?

#### 20.2.1.2 Determination of Significance

According to Section 1508.27 of the Council on Environmental Quality (CEQ) Regulations for Implementing National Environmental Policy Act (NEPA) (CEQ 1979), determining the level of significance of an environmental impact requires that both context and intensity be considered. These are defined in Section 1508.27 as follows:

- “Context. This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant”.
- “Intensity. This refers to the severity of the impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action. The following should be considered in evaluating intensity:
  - Impacts that may be both beneficial and adverse. A significant effect may exist even if the federal agency believes that on balance the effect would be beneficial.
  - The degree to which the proposed action affects public health or safety.
  - Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.
  - The degree to which the effects on the quality of the human environment are highly uncertain or involve unique or unknown risks.
  - The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.
  - Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.
  - The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.

- The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined critical under the Endangered Species Act of 1973.
- Whether the action threatens a violation of federal, state, or local law or requirements imposed for the protection of the environment”.

Federal Highway Administration Guidance for Preparing and Processing Environmental and Section 4(f) Documents (T6640.8A) addresses the assessment of roadway projects and their potential for disproportionately impacting any social group and mitigation measures to address those impacts. This document’s guidance has been followed to assess the roadway projects for the proposed alternatives relative to environmental justice.

#### 20.2.1.3 Issues Identified During Public Scoping Process

Issues related to environmental justice that were raised during the public scoping process are discussed in Volume 2 Chapter 19.

### 20.2.2 Power

As discussed in Chapter 3 Section 3.2.2 of this volume, the predicted population growth on Guam induced by the DoD buildup corresponds to increased demands on the electrical system from 4.93 MW (2010 initial) to 29.24 MW at the 2014 peak and 7.88 MW long-term (by 2019). Potential environmental justice impacts related to this increased demand would be associated with:

- Changes in air emissions
- Changes to electrical customer user fees
- Changes in the reliability of GPA’s power supply island-wide

These three areas are assessed below for each power alternative

#### 20.2.2.1 Interim Alternative 1 (Preferred Alternative)

Interim Alternative 1 would recondition existing combustion turbines and upgrade T&D systems and would not require new construction or enlargement of the existing footprint of the facility. This work would be undertaken by the GPA on its existing permitted facilities. Reconditioning would be made to existing permitted facilities at the Marbo, Yigo, Dededo No. 1, and Macheche combustion turbines. These combustion turbines are not currently being used up to permit limits. T&D system upgrades would be on existing above ground and underground transmission lines. This alternative supports Main Cantonment Alternatives 1 and 2 and Main Cantonment Alternatives 3 and 8 would require additional upgrades to the T&D system.

#### Changes in Air Emissions

Reconditioning existing CTs would result in bringing existing permitted CTs into operation that are not routinely used today (except for intermittent periods and emergencies). As discussed in Chapter 7 Section 2.3.2, this power alternative would not result in a need to change the existing permit because there would be no change in combustion turbine (CT) power capacity or associated air emissions. However, this alternative would result in more pollutants emitted into the air than experienced today simply because the CTs are currently off-line most of the time and not routinely emitting pollutants. The current air permits for these CTs allow for some level of pollutants to be emitted; these allowable levels are based on USEPA National Ambient Air Quality Standards (NAAQS). NAAQS protect public health, including the health of "sensitive" populations such as children, asthmatics, and the elderly. They also protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

Because the overall permitted capacity and the operational scheme for these combustion turbines would not change, the resulting potential air quality impact would remain the same as the current permitted conditions established previously during each facility permitting process, which are protective of human health and sensitive populations. Since the Interim Alternative 1 would not result in any increase of air emissions at these facilities under the permitted condition, utilization or reconditioning these permitted sources is in compliance with any applicable CAA air quality standards and would not result in significant air quality impacts.

*Tier 1: Are there any racial minorities, low-income, or children populations adjacent to the proposed action site?*

Dededo, Yigo, and Marbo all have a majority of racial/ethnic minorities compared to the U.S. average. These villages have similar poverty rates and percentages of children to other villages on Guam, but high poverty rates and percentages of children when compared to the U.S. average (U.S. Census 2000, CNMI Department of Commerce 2005).

*Tier 2: Are the applicable disadvantaged groups disproportionately affected by the negative environmental consequences of the proposed action(s)?*

The racial minorities that comprise the population of Guam would be disproportionately affected by an increase in air emissions. There would be no disproportionate impact to low-income populations or children.

*Tier 3: Would the disproportionate adverse effects be significant?*

Populations in areas near the CTs would be exposed to more air pollutants once the CTs are reconditioned and operational than they are today simply because the CTs are not operational today. However, because the overall permitted capacity and the operational scheme for these combustion turbines would not change from that planned for when the facilities were originally constructed and permitted, the resulting potential air quality impact would remain the same. The emissions would also not exceed NAAQS permit levels that are protective of human health and sensitive populations. It is also important to note that some areas in Guam immediately around power plants are not in attainment of NAAQS for sulfur dioxide; however, none of the CTs under this power alternative are associated with these sulfur dioxide non-attainment areas. Therefore, air emissions associated with Interim Alternative 1 would not have a significant adverse impact with regard to environmental justice or protection of children.

#### Changes to Electrical Customer Fees

As discussed in Chapter 17 Section 2.2.2, potential effects on electrical customers are unknown at this time. However, under power Interim Alternative 1, only existing power generation facilities owned and operated by GPA would be reconditioned and new T&D lines installed. Cost to bring these existing GPA assets into full service would be shared by all electrical customers, including DoD and the public. DoD as a new significant power customer would result in a cost share across a much larger user base than currently exists, and would likely result in unchanged or lower user fees for all power customers.

*Tier 1: Are there any racial minorities, low-income, or children populations adjacent to the proposed action site?*

Dededo, Yigo, and Marbo all have a majority of racial/ethnic minorities compared to the U.S. average. These villages have similar poverty rates and percentages of children to other villages on Guam, but high poverty rates and percentages of children when compared to the U.S. average (U.S. Census 2000, CNMI Department of Commerce 2005).

*Tier 2: Are the applicable disadvantaged groups disproportionately affected by the negative environmental consequences of the proposed action(s)?*

User fees are expected to remain unchanged or to be reduced for all power customers; therefore, there would be no disproportionate adverse impact to disadvantaged groups or children.

#### Changes to Power Supply Reliability

As discussed in Chapter 3 Section 3.2.2.1, reconditioning GPA's combustion turbines would increase the reliability of the island-wide power system and provide reliable sources of power generation to support the existing and future off-base populations during emergencies. Mitigation measures described in Chapter 3 Section 3.2.2.1 include efforts to jointly plan for system upgrades to ensure that the reliability of the island-wide power system is not degraded to the detriment of all users. Mitigation measures also include the availability of new 5 plus megawatt of capability at Marine Base Finegayan that could be used to peak shave power during daily high demand periods if requested by GPA. Mitigation measures also include the adaptive management procedures whereby phasing of construction efforts could be modified to mitigate any adverse impacts.

*Tier 1: Are there any racial minorities, low-income, or children populations adjacent to the proposed action site?*

Dededo, Yigo, and Marbo all have a majority of racial/ethnic minorities compared to the U.S. average. These villages have similar poverty rates and percentages of children to other villages on Guam, but high poverty rates and percentages of children when compared to the U.S. average (U.S. Census 2000, CNMI Department of Commerce 2005).

*Tier 2: Are the applicable disadvantaged groups disproportionately affected by the negative environmental consequences of the proposed action(s)?*

Interim Alternative 1 is expected to increase the reliability of the island-wide power system, which would be a beneficial effect on all segments of the population. There would be no disproportionate adverse impact to disadvantaged groups or children.

#### Potential Mitigation Measures

- Air Emissions. There would be no significant adverse air quality impacts to disadvantaged groups or children; therefore, no specific environmental justice mitigation measures are needed.
- User Fees. There would be no adverse impacts related to user fees and no corresponding adverse effects on disadvantaged groups or children; therefore, no specific environmental justice mitigation measures are needed.
- Power Supply Reliability. There would be no adverse impacts related to power supply reliability and no effect on disadvantaged groups or children; therefore, no specific environmental justice mitigation measures are needed.

#### 20.2.2.2 Interim Alternative 2

Interim Alternative 2 is a combination of reconditioning of existing permitted GPA facilities, an increase in operational hours for existing combustion turbines, and upgrades to existing T&D systems. Interim Alternative 2 would not require new construction or enlargement of the existing footprint of the facility. Reconditioning would be performed on the existing permitted GPA facilities at the Marbo, Yigo, and Dededo combustion turbines. This alternative supports Main Cantonment Alternatives 1 and 2 and Main Cantonment Alternatives 3 and 8 would require additional upgrades to the T&D system.

Upgrading existing facilities would increase capacity, which would have a beneficial environmental impact. All potential impacts associated with air emissions, user fees, and power system reliability would be the same for Interim Alternative 2 as described above for Interim Alternative 1; these impacts are therefore not repeated below. However, a possible adverse impact associated with Alternative 2 would be power interruptions that would occur should GPA have to utilize their interruptible power supply agreements with certain customers. This additional potential effect is evaluated below.

*Tier 1: Are there any racial minorities, low-income, or children populations adjacent to the proposed action site?*

Dededo, Yigo, and Marbo all have a majority of racial/ethnic minorities compared to the U.S. average. These villages have similar poverty rates and percentages of children to other villages on Guam, but high poverty rates and percentages of children when compared to the U.S. average (U.S. Census 2000, CNMI Department of Commerce 2005).

*Tier 2: Are the applicable disadvantaged groups disproportionately affected by the negative environmental consequences of the proposed action(s)?*

Based on the information in Volume 6, potential power interruptions would only affect GPA customers that have agreed to temporary interruptions and most likely have emergency backup facilities. These potential effects would not be significant and would not disproportionately affect disadvantaged groups or children.

#### Potential Mitigation Measures

There would be no disproportionate adverse impacts to disadvantaged groups or children; therefore, no mitigation measures are needed.

#### 20.2.2.3 Interim Alternative 3

Interim Alternative 3 is a combination of reconditioning existing GPA permitted facilities at Marbo, Yigo, and Dededo and upgrades to the DoD power plant at Orote. Upgrades would be made to existing T&D. The proposed reconditioning to the existing power generation facilities at Marbo, Yigo, and Dededo would not require new construction or enlargement of the existing footprint of the facility. For the Orote power plant, upgrades would include a new fuel storage facility to facilitate longer run times between refueling. This would disturb approximately 1 acre (4,047 square m). This alternative supports Main Cantonment Alternatives 1 and 2 and Main Cantonment Alternatives 3 and 8 would require additional upgrades to the T&D system.

Upgrading existing facilities would increase capacity, which would have a beneficial island-wide effect to the entire population. There would be no disproportionate adverse impact to disadvantaged groups or children. All potential impacts associated with air emissions, user fees, and power system reliability would be the same for Interim Alternative 3 as described above for Interim Alternative 1; these impacts are therefore not repeated here.

#### Potential Mitigation Measures

There would be no disproportionate adverse impacts to disadvantaged groups or children; therefore, no mitigation measures are needed.

#### **20.2.3 Potable Water**

### 20.2.3.1 Basic Alternative 1 (Preferred Alternative)

Basic Alternative 1 would consist of installation of up to 22 new potable water supply wells at Andersen Air Force Base (AFB), rehabilitation of existing wells, interconnection with the GWA water system, and associated T&D systems. A new 5 MG (19 ML) water storage tank would be constructed at ground level at Finegayan.

All work would occur on base. These actions would increase overall potable water availability, which would have a beneficial impact to the environment. However, they would generate construction-related noise and traffic that may adversely affect the villages of Dededo and Yigo, which lie adjacent to Andersen AFB.

*Tier 1: Are there any racial minorities, low-income, or children populations adjacent to the proposed action site?*

With 15% or less of their populations being Caucasian, Dededo and Yigo both have high levels of racial and ethnic minorities compared to the U.S. average. The poverty rates in Dededo and Yigo are similar to those of other villages on Guam, but higher than that of the U.S. average (U.S. Census 2000). Compared to CNMI and the U.S. average, Dededo and Yigo have high percentages of children (U.S. Census 2000).

*Tier 2: Are the applicable disadvantaged groups disproportionately affected by the negative environmental consequences of the proposed action(s)?*

Racial minorities and low-income populations living in Yigo and Dededo near Andersen AFB, as well as those living in proximity to Routes 1, 9, and 15 that provide access to Andersen AFB, may experience disproportionate noise and traffic impacts related to construction. There would be no disproportionate impact to children.

*Tier 3: Would the disproportionate adverse effects be significant?*

Heavy construction equipment would be used for at least 6-9 months during construction. This would generate some noise; however, Volume 6 Chapter 8 does not anticipate that the noise would be loud enough off base to be a significant effect to the surrounding community. Noise would also be generated by construction vehicles along Routes 9, 1 and 15, but with the implementation of mitigation measures in Volume 6 Chapter 8, the impact would be reduced to less than significant.

Construction-related travel and the transport of materials and equipment are anticipated to increase traffic along Routes 9, 1, and 15 that provide access to Andersen AFB. According to Volume 6 Chapter 4, implementation of the proposed actions would not increase traffic to the level of congestion by 2014. Therefore, the impact would be less than significant.

#### Potential Mitigation Measures

Implementation of construction noise reduction mitigation measures is specified in Volume 6 Chapter 8. There would be no other disproportionate adverse impacts to disadvantaged populations or children; therefore, no other mitigation measures are needed.

### 20.2.3.2 Basic Alternative 2

Basic Alternative 2 would consist of installation of up to 20 new potable water supply wells at Andersen AFB, up to 11 new potable water supply wells at Barrigada, rehabilitation of existing wells, interconnection with the GWA water system, associated transmission and distribution systems upgrades. Additionally, new water storage tanks would be constructed at ground level at Finegayan and Barrigada, respectively. Villages that lie adjacent to Andersen AFB are Dededo and Yigo; villages located adjacent

to Navy Barrigada include Barrigada and Mangilao.

New wells, rehabilitation of existing wells, transmission and distribution system upgrades, interconnection with GPA, and construction of the additional water storage tanks would increase overall potable water availability. This would have a beneficial impact to the environment. However, construction-related noise and traffic may have adverse impacts on the surrounding communities. Construction-related traffic on Routes 9, 1, and 15 may increase, as well as Routes 8, 16 and 15 that provide access to Navy Barrigada.

*Tier 1: Are there any racial minorities, low-income, or children populations adjacent to the proposed action site?*

With 15% or less of their populations being Caucasian, Dededo and Yigo both have high levels of racial and ethnic minorities relative to the U.S. average. The poverty rates in Dededo and Yigo are similar to those of other villages on Guam, but higher than the U.S. average (U.S. Census 2000). Compared to CNMI and the U.S. average, Dededo and Yigo have high percentages of children (U.S. Census 2000).

Barrigada and Mangilao also have high percentages of racial minorities compared to the U.S. average. Mangilao's poverty rate is consistent with that of other villages of Guam, while Barrigada's is slightly lower. However, both villages have higher poverty rates than the U.S. average (U.S. Census 2000). Barrigada and Mangilao have similar percentages of children, which is higher than those of both CNMI and the U.S. average. (U.S. Census 2000).

*Tier 2: Are the applicable disadvantaged groups disproportionately affected by the negative environmental consequences of the proposed action(s)?*

Racial minorities and low-income populations who live in proximity to the construction sites, and/or near Routes 9, 1, and 15 for Andersen AFB and Routes 8, 16, and 15 for Navy Barrigada would experience disproportionate construction-related noise and traffic impacts. There would be no disproportionate impact to children.

*Tier 3: Would the disproportionate adverse effects be significant?*

Heavy construction equipment would be used for at least 6-9 months during construction. This would generate some noise; however, Volume 6 Chapter 8 does not anticipate that the noise would be loud enough off base to be a significant effect to the surrounding community. Noise would also be generated by construction vehicles along Routes 9, 1 and 15 that provide access to Andersen AFB, and along Routes 8, 16, and 15 that provide access to Navy Barrigada. However, with the implementation of noise abatement measures in Volume 6 Chapter 8, the impact would be reduced to less than significant.

Construction-related travel and the transport of materials and equipment are anticipated to increase traffic along Routes 9, 1, and 15 that provide access to Andersen AFB, and along 8, 16, and 15 that provide access to Navy Barrigada. According to Chapter 4 (Roadway Transportation), implementation of the proposed actions would not increase traffic along Route 9, 1, and 15 in northern Guam to the level of congestion by 2014. Therefore, the impact would be less than significant.

However, with implementation of the proposed actions traffic along Routes 15 and 16 in central Guam that service Navy Barrigada are anticipated to increase to the level of congestion (Chapter 4 Roadway Transportation). Chapter 4 uses a volume to capacity ratio to determine the anticipated level of traffic congestion by 2014. If a volume to capacity ratio is greater than 1, the increased traffic is anticipated to reach a level that would cause congestion. The volume to capacity ratio of Routes 15 and 16 in central Guam are projected to be greater than 1 by 2014. Therefore, there would be a significant traffic impact

along these routes. However, with implementation of mitigation measures in Chapter 4, these impacts would be reduced to less than significant.

#### Potential Mitigation Measures

Implementation of construction-related noise abatement measures in Volume 6 Chapter 8. Implementation of traffic-reduction measures in Volume 6 Chapter 4. There would be no other disproportionate adverse impacts to disadvantaged populations or children; therefore, no other mitigation measures are needed.

### **20.2.4 Wastewater**

#### 20.2.4.1 Basic Alternative 1a (Preferred Alternative) and 1b

Basic Alternative 1 combines upgrade to the existing primary treatment facilities and expansion to secondary treatment at the Northern District Wastewater Treatment Plant (NDWWTP). Upon completion of the treatment facility upgrades/expansion, there would be beneficial impacts to the surrounding area due to increased sewer treatment capacity. The difference between Alternatives 1a and 1b is a requirement for a new sewer line from Barrigada housing to NDWWTP for Alternative 1b.

#### Potential Mitigation Measures

There would be no adverse impacts associated with Basic Alternative 1a that would disproportionately or adversely affect disadvantaged populations or children, and no mitigation measures are needed.

#### 20.2.4.2 Basic Alternative 1b

Under Basic Alternative 1b, the existing primary treatment system at NDWWTP would be refurbished and upgraded to accept additional wastewater flow and load from both central and northern Guam, and would include new sewer lines and lift pump stations to convey wastewater generated from Barrigada housing to the NDWWTP.

This alternative includes refurbishing primary treatment capability at NDWWTP and installing a collection system from Finegayan. It also includes installing a sewer collection system from Barrigada to NDWWTP. The Guam Water Authority (GWA) would upgrade the Hagatna primary treatment capability for induced civilian growth and construction workforce demand.

The proposed new sewer line would extend from NDWWTP adjacent to Route 25 and then south adjacent to Route 16 to Navy Barrigada. Upon completion of the sewer line, there would be beneficial impacts to the surrounding area due to increased sewer capacity. However, construction of the sewer line would result in a construction-related traffic increase along Routes 25 and 16 south toward Navy Barrigada. The roadways section in Volume 6 (Chapter 4) does not anticipate that traffic along Route 16 would reach the level of congestion by 2014 as a result of the proposed action; however, congestion along Route 25 would reach the level of congestion.

*Tier 1: Are there any racial minorities, low-income, or children populations adjacent to the proposed action site?*

The proposed construction of a new sewer line would affect the following villages along Routes 25: Barrigada, southern Dededo, and northern Mangilao. These villages have disproportionately high percentages of racial minorities, low-income populations, and children relative to the U.S. Their percentages of racial minorities, low-income populations, and children are generally similar to those of other villages on Guam.

*Tier 2: Are the applicable disadvantaged groups disproportionately affected by the negative environmental consequences of the proposed action(s)?*

The racial minorities and low-income populations that live adjacent to Route 25 near where the proposed new sewer line would be constructed would be disproportionately impacted by construction-related traffic due to their proximity to the proposed action location. There would be no disproportionate impact to children.

*Tier 3: Would the disproportionate adverse effects be significant?*

The roadways section in Volume 6 anticipates that the increase in construction-related traffic along Route 25 would reach congestion by 2014. Due to their proximity to the construction site, racial minorities and low-income populations living near Route 25 would be disproportionately adversely affected by the proposed sewer line construction. However, with implementation of the traffic mitigation measures in Volume 6 Chapter 4 that would reduce the level of congestion, the impact would be less than significant.

#### Potential Mitigation Measures

Implementation of construction-related traffic reduction measures as described in Volume 6 Chapter 4. There would be no other disproportionate adverse impacts to disadvantaged populations or children; therefore, no other mitigation measures are needed.

### **20.2.5 Solid Waste**

#### 20.2.5.1 Basic Alternative 1 (Preferred Alternative)

The Preferred Alternative for solid waste would be the continued use of the Navy Landfill at Apra Harbor until Layon Landfill is opened, which is scheduled for July 2011. No disproportionate adverse impacts are anticipated with this action.

#### Potential Mitigation Measures

There are no disproportionate impacts anticipated; therefore, mitigation measures are not needed.

### **20.2.6 Off Base Roadways**

The proposed action includes 43 Guam Road Network (GRN) off base roadway improvement projects. While descriptions of these individual projects can be found in Chapter 2 Section 2.5.2, the 43 GRN projects include six main types of roadway improvements:

- Intersection improvements
- Bridge replacements
- Pavement strengthening
- Relocation of Route 15
- Roadway widening
- Construction of a new road (Finegayan Connection)

#### 20.2.6.1 Alternative 1

The roadway projects for Alternative 1 include those listed in Chapter 2, Table 2.5-1, with the exception of GRN #47 through 49A, 63, and 74.

*Tier 1: Are there any racial minorities, low-income, or children populations adjacent to the proposed action site?*

Roadway projects would occur in all Guam villages except the southern villages of Yona, Agat, Talofof, Inarajan, Umatac, and Merizo (the access roads proposed in Umatac and Talofof are examined in Volume 2). There are racial minorities and low-income populations adjacent to the roadway project sites.

*Tier 2: Are the applicable disadvantaged groups disproportionately affected by the negative environmental consequences of the proposed action(s)?*

Populations of racial minorities and low-income persons in the study area are present in disproportionately higher numbers relative to the average U.S. population. The minorities and low-income populations living along the roadways that would be improved would experience disproportionately higher levels of construction-related traffic during roadway improvements due to their proximity to the project sites. These construction-related impacts include increased traffic, noise and air pollutant emissions typically associated with localized use of construction equipment and vehicles. These impacts would be temporary and mitigated by the proposed phased project schedule. When construction is complete, roadways would have increased capacity which would result in both greater traffic volumes and improved traffic flow. The improved roadway infrastructure would have a beneficial impact to the surrounding community by providing better traffic flow and safer travel. For these reasons, there would be no substantial negative environmental consequences to the racial minorities and low-income populations living near the roadway project areas. Therefore, tier 3 does not apply. There would be no disproportionate impact to children.

#### 20.2.6.2 Alternative 2 (Preferred Alternative)

The roadway projects for Alternative 2 include those listed in Chapter 2, Table 2.5-1, with the exception of GRN #47 through 49A, 63, and 74.

*Tier 1: Are there any racial minorities, low-income, or children populations adjacent to the proposed action site?*

Roadway projects would occur in all Guam villages except the southern villages of Yona, Agat, Talofof, Inarajan, Umatac, and Merizo (the access roads proposed in Umatac and Talofof are examined in Volume 2). There are racial minorities and low-income populations adjacent to the roadway project sites.

*Tier 2: Are the applicable disadvantaged groups disproportionately affected by the negative environmental consequences of the proposed action(s)?*

Populations of racial minorities and low-income persons in the study area are present in disproportionately higher numbers relative to the average U.S. population. The minorities and low-income populations living along the roadways that would be improved would experience disproportionately higher levels of construction-related traffic during roadway improvements due to their proximity to the project sites. These construction-related impacts include increased traffic, noise and air pollutant emissions typically associated with localized use of construction equipment and vehicles. These impacts would be temporary and mitigated by the proposed phased project schedule. When construction is complete, roadways would have increased capacity which would result in both greater traffic volumes and improved traffic flow. The improved roadway infrastructure would have a beneficial impact to the surrounding community by providing better traffic flow and safer travel. For these reasons, there would be no substantial negative environmental consequences to the racial minorities and low-income populations living near the roadway project areas. Therefore, tier 3 does not apply. There would be no disproportionate impact to children.

### 20.2.6.3 Alternative 3

The roadway projects for Alternative 3 include those listed in Chapter 2, Table 2.5-1, with the exception of GRN #20, 31, 124, and 49A.

*Tier 1: Are there any racial minorities, low-income, or children populations adjacent to the proposed action site?*

Roadway projects would occur in all Guam villages except the southern villages of Yona, Agat, Talofoto, Inarajan, Umatac, and Merizo (the access roads proposed in Umatac and Talofoto are examined in Volume 2). There are racial minorities and low-income populations adjacent to the roadway project sites.

*Tier 2: Are the applicable disadvantaged groups disproportionately affected by the negative environmental consequences of the proposed action(s)?*

Populations of racial minorities and low-income persons in the study area are present in disproportionately higher numbers relative to the average U.S. population. The minorities and low-income populations living along the roadways that would be improved would experience disproportionately higher levels of construction-related traffic during roadway improvements due to their proximity to the project sites. These construction-related impacts include increased traffic, noise and air pollutant emissions typically associated with localized use of construction equipment and vehicles. These impacts would be temporary and mitigated by the proposed phased project schedule. When construction is complete, roadways would have increased capacity which would result in both greater traffic volumes and improved traffic flow. The improved roadway infrastructure would have a beneficial impact to the surrounding community by providing better traffic flow and safer travel. For these reasons, there would be no substantial negative environmental consequences to the racial minorities and low-income populations living near the roadway project areas. Therefore, tier 3 does not apply. There would be no disproportionate impact to children.

### 20.2.6.4 Alternative 8

The roadway projects for Alternative 8 include those listed in Chapter 2, Table 2.5-1, with the exception of GRN #47, 48, 49, 63, and 74.

*Tier 1: Are there any racial minorities, low-income, or children populations adjacent to the proposed action site?*

Roadway projects would occur in all Guam villages except the southern villages of Yona, Agat, Talofoto, Inarajan, Umatac, and Merizo (the access roads proposed in Umatac and Talofoto are examined in Volume 2). There are racial minorities and low-income populations adjacent to the roadway project sites.

*Tier 2: Are the applicable disadvantaged groups disproportionately affected by the negative environmental consequences of the proposed action(s)?*

Populations of racial minorities and low-income persons in the study area are present in disproportionately higher numbers relative to the average U.S. population. The minorities and low-income populations living along the roadways that would be improved would experience disproportionately higher levels of construction-related traffic during roadway improvements due to their proximity to the project sites. These construction-related impacts include increased traffic, noise and air pollutant emissions typically associated with localized use of construction equipment and vehicles. These impacts would be temporary and mitigated by the proposed phased project schedule. When construction is complete, roadways would have increased capacity which would result in both greater traffic volumes

and improved traffic flow. The improved roadway infrastructure would have a beneficial impact to the surrounding community by providing better traffic flow and safer travel. For these reasons, there would be no substantial negative environmental consequences to the racial minorities and low-income populations living near the roadway project areas. Therefore, Tier 3 does not apply. There would be no disproportionate impact to children.

**20.2.7 No-Action Alternative**

Under the no-action alternative, no utility or roadway upgrades or improvements associated with the proposed actions would occur and existing operations at the proposed project areas would continue. There would be no noise or traffic impacts related to construction and no increase in military population. Anticipated beneficial effects of increased utility and roadway capacity would not be realized. The no-action alternative would have no adverse environmental justice impacts on the villages of Dededo, Barrigada, and Mangilao in particular or the island of Guam in general.

**20.2.8 Summary of Impacts**

This section summarizes the potential environmental justice impacts associated with the proposed action alternatives for each major component – power, potable water, wastewater, solid waste, and off-base roadways.

Table 20.2-1 summarizes the potential impacts of each interim power alternative. All alternatives would have the beneficial impact of increasing capacity. Each of the alternatives was evaluated for disproportionate environmental justice effects with regard to changes in air emissions, changes to electrical user fees, and changes in reliability of the island-wide power supply. As shown in the table, impacts related to air emissions would be less than significant, and no impacts would occur with regard to user fees or system reliability. No significant disproportionate adverse impacts to disadvantaged populations or children would occur under any of the alternatives.

**Table 20.2-1. Summary of Potential Impacts: Power Alternatives**

<i>Interim Alternative 1*</i>	<i>Interim Alternative 2</i>	<i>Interim Alternative 3</i>
LSI <ul style="list-style-type: none"> <li>Adverse but less than significant environmental justice impacts to disadvantaged groups related to air emissions.</li> </ul> NI <ul style="list-style-type: none"> <li>No environmental justice impacts to children related to air emissions.</li> </ul>	LSI <ul style="list-style-type: none"> <li>Adverse but less than significant environmental justice impacts to disadvantaged groups related to air emissions.</li> </ul> NI <ul style="list-style-type: none"> <li>No environmental justice impacts to children related to air emissions.</li> </ul>	LSI <ul style="list-style-type: none"> <li>Adverse but less than significant environmental justice impacts to disadvantaged groups related to air emissions.</li> </ul> NI <ul style="list-style-type: none"> <li>No environmental justice impacts to children related to air emissions.</li> </ul>
NI <ul style="list-style-type: none"> <li>No environmental justice impacts to disadvantaged groups or children related to electrical user fees.</li> </ul>	NI <ul style="list-style-type: none"> <li>No environmental justice impacts to disadvantaged groups or children related to electrical user fees.</li> </ul>	NI <ul style="list-style-type: none"> <li>No environmental justice impacts to disadvantaged groups or children related to electrical user fees.</li> </ul>
NI <ul style="list-style-type: none"> <li>No environmental justice impacts to disadvantaged groups or children related to electrical user fees.</li> </ul>	NI <ul style="list-style-type: none"> <li>No environmental justice impacts to disadvantaged groups or children related to electrical user fees.</li> </ul>	NI <ul style="list-style-type: none"> <li>No environmental justice impacts to disadvantaged groups or children related to electrical user fees.</li> <li></li> </ul>

<i>Interim Alternative 1*</i>	<i>Interim Alternative 2</i>	<i>Interim Alternative 3</i>
	NI <ul style="list-style-type: none"> <li>• No environmental justice impacts to disadvantaged groups or children related to power disruptions.</li> </ul>	

*Legend:* LSI = Less Than Significant Impact; NI = No Impact \* Preferred Alternative.

*Note:* Potential impacts under Long-term Alternatives 2 and 3 would be analyzed under future NEPA documentation; potential impacts listed herein are general and not final.

Table 20.2-2 summarizes the potential impacts of each potable water alternative. Under Alternative 1, noise impacts related to project construction would have a significant but mitigable disproportionate effect on minority and low-income populations living near the construction site. Construction-related traffic impacts would occur along Routes 9, 1, and 15, but increased traffic would not reach a level of congestion and therefore, would have a less than significant disproportionate effect on disadvantaged groups. No disproportionate effects on children would occur with regard to noise or traffic. Under Alternative 2, construction-related noise and traffic impacts would be the same as for Alternative 1, but Alternative 2 would also result in post-construction traffic impacts along Routes 15 and 16 that would be significant. These traffic impacts would represent a significant disproportionate impact on disadvantaged groups. However, implementation of mitigation measures in Chapter 4 of Volume 6 would reduce significant traffic congestion impacts along Routes 15 and 16 in central Guam to less than significant. No disproportionate effects on children would occur with regard to noise or traffic under Alternative 2.

**Table 20.2-2. Summary of Potential Impacts: Potable Water Alternatives**

<i>Basic Alternative 1</i>	<i>Basic Alternative 2</i>
Noise	
<p>SI-M</p> <ul style="list-style-type: none"> <li>Construction-related noise would have a disproportionate impact on racial minorities and low-income populations living near the construction area. However, with implementation of noise abatement measures in Chapter 8 of this volume, the impact would be reduced to less than significant. There would be no disproportionate impact to children.</li> </ul>	<p>SI-M</p> <ul style="list-style-type: none"> <li>Construction-related noise would have a disproportionate impact on racial minorities and low-income populations living near the construction area. However, with implementation of noise abatement measures in Chapter 8 of this volume, the impact would be reduced to less than significant. There would be no disproportionate impact to children.</li> </ul>
Traffic	
<p>LSI</p> <ul style="list-style-type: none"> <li>An increase in traffic along Routes 9, 1, and 15 in northern Guam would have less than significant impacts on racial minorities and low-income populations living near these roadways. There would be no disproportionate impact to children.</li> </ul>	<p>LSI</p> <ul style="list-style-type: none"> <li>An increase in traffic along Routes 9, 1, and 15 in northern Guam would have less than significant impacts on racial minorities and low-income populations living near these roadways. There would be no disproportionate impact to children.</li> </ul> <p>SI-M</p> <ul style="list-style-type: none"> <li>Chapter 4 (Roadways) anticipates that the traffic increase along Routes 15 and 16 in central Guam would reach the level of congestion, which would be a significant impact. This would disproportionately affect racial minorities and low-income populations that live along these routes. However, with implementation of the mitigation in the Chapter 4, the impact would be reduced to less than significant. There would be no disproportionate impact to children.</li> </ul>

*Legend:* LSI = Less Than Significant Impact, SI-M = Significant Impact Mitigable to Less Than Significant,  
 \* Preferred Alternative

Table 20.2-3 summarizes the potential impacts of each wastewater alternative. The upgrades proposed in Basic Alternatives 1a and 1b would not have any adverse environmental impacts. The roadways section in Volume 6 Chapter 4 anticipates that the increase in construction-related traffic along Route 25 would reach congestion by 2014. Due to their proximity to the construction site, racial minorities and low-income populations living near Route 25 would be disproportionately adversely affected by the proposed sewer line construction. However, with implementation of traffic-reduction mitigation measures in Volume 6 Chapter 4, the impacts would be reduced to less than significant. No disproportionate effects on children would occur under either alternative.

**Table 20.2-3. Summary of Potential Impacts: Wastewater Alternatives**

<i>Basic Alternative 1a*</i>	<i>Basic Alternative 1b</i>
NI <ul style="list-style-type: none"> <li>No disproportionate adverse impacts.</li> </ul>	SI-M <ul style="list-style-type: none"> <li>Mitigated traffic impact with implementation of construction-related traffic mitigation measures in Volume 6, Chapter 4</li> </ul>

*Legend:* SI-M = Significant Impact Mitigable to Less Than Significant, NI = No Impact. \* Preferred Alternative  
*Note:* Potential impacts under Long-term Alternatives 1-4 would be analyzed under future NEPA documentation; potential impacts listed herein are general and not final.

As shown in Table 20.2-4, no impacts associated with environmental justice or protection of children are anticipated under the Preferred Alternative for solid waste.

**Table 20.2-4. Summary of Potential Impacts: Solid Waste**

<i>Potentially Affected Resource</i>	<i>Preferred Alternative</i>
Environmental Justice and Protection of Children	NI

*Legend:* NI = No Impact.

Table 20.2-5 summarizes the potential impacts of each off-base roadway alternative. Proposed roadway projects include intersection improvements, bridge replacements, pavement strengthening, relocation of Route 15, roadway widening, and the construction of a new road (the Finegayan Connection). Roadway projects would occur in all Guam villages except the southern Guam villages of Yona, Agat, Talofofo, Inarajan, Umatac, and Merizo. While the racial minorities and low-income populations living near the roadway projects would experience disproportionate temporary traffic increases during the construction period, these impacts would be mitigated by the proposed phased project schedule. When construction is complete, the improved roadway infrastructure would have a beneficial impact to the surrounding community.

**Table 20.2-5. Summary of Roadway Project Impacts**

<i>Alternative 1</i>	<i>Alternative 2*</i>	<i>Alternative 3</i>	<i>Alternative 8</i>
<b>Construction</b>			
LSI <ul style="list-style-type: none"> <li>Less than significant impacts to disadvantaged groups related to temporary traffic, noise, and air quality impacts during construction.</li> </ul> NI <ul style="list-style-type: none"> <li>No disproportionate impacts to children</li> </ul>	<ul style="list-style-type: none"> <li>Same impacts as Alternative 1.</li> </ul>	<ul style="list-style-type: none"> <li>Same impacts as Alternative 1.</li> </ul>	<ul style="list-style-type: none"> <li>Same impacts as Alternative 1.</li> </ul>

<i>Alternative 1</i>	<i>Alternative 2*</i>	<i>Alternative 3</i>	<i>Alternative 8</i>
<b>Operation</b>			
BI • Beneficial impacts to disadvantaged groups due to improved, safer roadway infrastructure after construction is completed.  NI • No disproportionate impacts to children	• Same impacts as Alternative 1.	• Same impacts as Alternative 1.	• Same impacts as Alternative 1.

Legend: LSI = Less Than Significant Impact, NI = No Impact, BI = Beneficial Impact. \*Preferred Alternative

**20.2.9 Summary of Potential Mitigation Measures**

Table 20.2-6 summarizes potential mitigation measures for each component of the proposed action.

**Table 20.2-6. Summary of Potential Mitigation Measures**

<i>Power Alternatives</i>	<i>Potable Water Alternatives</i>	<i>Wastewater Alternatives</i>	<i>Solid Waste Alternatives</i>	<i>Off-Base Roadway Alternatives</i>
<b>Noise</b>				
• No mitigations needed.	• For Alternative 1 or 2, DoD would implement the mitigation measures in Volume 6, Chapter 8 of this EIS/OEIS.	• No mitigations needed.	• No mitigations needed.	• No mitigations needed.
<b>Traffic</b>				
• No mitigations needed.	• No mitigations needed for Alternative 1. • For Alternative 2, DoD would implement the mitigation measures in Volume 6, Chapter 8 of this EIS/OEIS.	• No mitigations needed for Alternative 1a. • For Alternative 1b, DoD would implement the mitigation measures in Volume 6, Chapter 4 of this EIS/OEIS.	• No mitigations needed.	• No mitigations needed.

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