

5. Cumulative and Other Effects

5.1 Definition of Cumulative Effects

CEQ defines cumulative impacts as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.” Informed decisionmaking is served by consideration of cumulative impacts resulting from projects that are proposed, under construction, recently completed, or anticipated to be implemented in the reasonably foreseeable future.

CEQ guidance in considering cumulative effects states that the first steps in assessing cumulative effects involve defining the scope of the other actions and their interrelationship with a proposed action. The scope must consider other projects whose effects coincide with the location and timetable of a proposed action and other actions. Cumulative effects analyses must also evaluate the nature of interactions among these actions (CEQ 1997).

To identify cumulative effects, the analysis needs to address two fundamental questions:

1. Does a relationship exist such that affected resource areas of the Proposed Action or alternatives might interact with the affected resource areas of past, present, or reasonably foreseeable actions?
2. If such a relationship exists, then does an EA or EIS reveal any potentially significant effects not identified when the Proposed Action is considered alone?

Section 5.2 presents those actions or projects that are temporally or geographically related to the Proposed Action and, as such, have the potential to result in cumulative impacts. The cumulative impacts analysis in **Section 5.3** discusses the potential cumulative impacts of these actions, some of which are in early planning stages. The cumulative impact assessment is based on available information at the time of development of this EIS and might not include potential mitigation measures for these actions.

5.2 Past, Present, and Reasonably Foreseeable Future Actions

A cumulative project list was developed to identify projects on Saipan, Tinian, or in the region in general, based on readily available information. The projects list is provided in **Table 5.2-1**. The most substantial projects from the cumulative projects list include the Establishment and Operation of an ISR/Strike Capability Project on Andersen AFB; the Guam and the MIRC improvements; the Guam and CNMI Military Relocation; the Mariana Islands Training and Testing (MITT); improvements at the GSN, TNI, and Tinian harbor; and other local development projects on each island. Each of these projects either had master plans or NEPA documents prepared describing the proposed actions. A brief description of these projects is provided below.

5.2.1 DOD-Related Development in the Region

Mariana Island Range Complex, Department of the Navy, 2010. This project consists of military training and RDT&E training activities within the Mariana Islands (DON 2010a). An EIS/OEIS was prepared for the MIRC by the DON and a ROD was issued in 2010. The MIRC consists of the ranges, airspace, and ocean areas surrounding the ranges that make up the Study Area. The MIRC and the Study Area are the same geographical areas. The study area described in the MIRC EIS/OEIS does not include the sovereign territory (including waters out to 12 NM) of the Federated States of Micronesia.

1 **Table 5.2-1. List of Past, Present, and Reasonably Foreseeable Future Actions**

Lead Agency or Proponent	Project Name/ Location	Area of Interest	Construction Year	Status	Description	Timeframe*	Reason for Dismissal
DOD-Related Regional Projects							
U.S. Forces Japan (USFJ)	Guam Aviation Training Relocation (GATR)	Region	TBD	TBD.	GATR being conducted in the MIRC as part of USFJ Transformation & Realignment Operations.	P	Currently training levels are contained within the MIRC EIS.
Department of Navy (DON)/Naval Facilities Engineering Command, Pacific (NAVFAC PAC)	Mariana Island Range Complex	Region	2011	FEIS May 2010.	Covers proposed action and alternatives for continued use of the MIRC.	P	Retained.
DON/JGPO	Guam and CNMI Military Relocation	Region	TBD	FEIS July 2010 ROD for Marine relocation to Guam, training on Tinian, and AMDTF construction and operations, September 2010. Decision deferred on CVN and Live Fire Training Ranges on Guam.	Relocation of Marines from Okinawa. Project notionally includes infrastructure construction, beddown, and training of personnel on Guam; training activities on Tinian; CVN Berthing on Guam; and the location and operation of an Army Ballistic Missile Defense System on Guam.	P – Note: SEIS for Live Fire Training Range on Guam NOA to be completed in accordance with 9th Circuit Court decision.	Retained.
USAF/36 WG PACAF	ISR/Strike	Region	2007–2016	ROD signed 2007.	Basing of four unmanned aerial reconnaissance aircraft and 12 refueling aircraft at Andersen AFB and accommodating 48 fighter and six bomber aircraft on a rotational basis. An additional 2,400 personnel would be based at Andersen AFB.	P	Retained.
DON/U.S. Pacific Fleet	Mariana Islands Training and Testing (MITT)	Region	TBD	NOI released September 2011.	Conduct military training and testing activities within the MITT Study Area.	RF	Retained.
Naval Air Warfare (NAVAIR) beddown of Broad Area Maritime Surveillance (BAMS)	Proposed BAMS Beddown at Andersen AFB	Region	2013–2015	TBD.	Construction of an additional hangar and the beddown of up to 22 BAMS aircraft at Andersen AFB. BAMS Training is covered in the MIRC.	RF	Retained.
Other Regional Projects							
U.S. Congress	Marianas Trench National Marine Monument Visitor Center	Region	TBD	Unsigned.	A bill was introduced in March 2011 to authorize the Secretary of the Interior to establish and operate a visitor facility to fulfill the purposes of the Marianas Trench Marine National Monument. As of September 2011, the bill has been referred to Subcommittee on Fisheries, Wildlife, Oceans, and Insular Affairs. (H.R. 1207 2012)	RF	This is a plan or policy, not development.

Lead Agency or Proponent	Project Name/ Location	Area of Interest	Construction Year	Status	Description	Timeframe*	Reason for Dismissal
Other Regional Projects (continued)							
U.S. Department of Homeland Security	Russian Visa Waiver Program	Region	N/A	Program has been approved and is in progress.	A program was approved to allow tourists from Russia to visit Guam without travel visas. An increase in tourism is expected across the Marianas and an increased visitor market is expected. (Guam PDN 2012)	P	This is a plan or policy and not specific development.
CNMI Government-DPW	Primary and Secondary Road Resurfacing and Hazard Elimination	Regional-Saipan and Tinian (Discussed under each island)	Unknown	Unknown.	This includes the construction, resurfacing, and repaving of primary and secondary roads that are in dire need of repair and rehabilitation. This project will also allow for the elimination of hazard materials, rights-of-way, debris, some curb and gutters, and other hazardous and safety problems. (CNMI Department of Commerce 2009)	RF	Retained.
Saipan Projects							
CNMI Government	Legalization of Casino Gaming	Saipan	N/A	Unsigned.	As of 21 December 2011, a bill is being reviewed by the CNMI government that would permit casino gaming in Saipan (Saipan Tribune 2011c).	RF	This is a plan or policy, not development.
CNMI Government-CUC and DOI	Geothermal Power Development	Saipan	2012–2020	Exploratory drilling has commenced.	An Australian energy company was awarded a concession by CUC for geothermal power development and would sell electricity to the transmission grid. Drilling will occur first to confirm geothermal activity and flow (Proactive Investors 2012).	P	Retained.
CNMI Government-CUC	Solar Power Development	Saipan	2012–2020	One contract awarded to Chinese solar development company.	Two solar energy proposals are being reviewed and will be awarded contracts. The two projects are expected to produce an additional 15 to 20 MW for Saipan's power grid (Saipan Tribune 2012)	P	Retained.
CNMI Government-DPW	Saipan Water System Improvements	Saipan	2012–2020	U.S. Public Health Service is upgrading system.	Designed to meet a USEPA stipulated order, this project will provide focus and direction to meet CWA and SDWA requirements in Saipan on the existing water quality outputs. (CNMI Department of Commerce 2009)	P	Retained.
CNMI Government-CPA	GSN Public Announcement System	Saipan	2012	Underway.	GSN currently has a public announcement system that does not work. The airport needs a new public announcement system to meet emergencies and general call announcements. (CNMI Department of Commerce 2009)	P	Retained.
CNMI Government-DPW	Water/Waste Water System for Saipan	Saipan	2012–2020	Underway.	This is a U.S. Federal Court ordered project. The existing waste water / sewer system needs major rehabilitation and USEPA compliance upgrades. (CNMI Department of Commerce 2009)	P	Retained.

Lead Agency or Proponent	Project Name/ Location	Area of Interest	Construction Year	Status	Description	Timeframe*	Reason for Dismissal
Saipan Projects (continued)							
CNMI Government-DPW	Replace Traffic Lighting System, Saipan	Saipan	2012–2015	Underway.	The existing traffic lighting system on Saipan is old and sometimes works intermittently. This project aims to correct deficiencies and add safety to traffic flow. (CNMI Department of Commerce 2009)	P	Retained.
CNMI Government-CPA	GSN Fuel Storage Facility	Saipan	2012	Currently unfunded.	GSN is the largest of the CNMI and has the capability to refuel large aircraft. The need for expanding the fuel farm facility is to help provide an opportunity for competition and lower prices to help stimulate more international air service and tourism as requested by airlines. (CNMI Department of Commerce 2009)	RF	Retained.
CNMI Government-CHC	Improvement of CHC	Saipan	2012	Underway.	This project is to repair, improve and upgrade the main and auxiliary medical facilities in Saipan. (CNMI Department of Commerce 2009)	P	Retained.
Tinian Projects							
CNMI Government-CPA	ILS for TNI	Tinian	2012	Canceled.	The Municipality of Tinian believes that an ILS is necessary to bring more tourists to the island and remove a level of danger for large aircraft. “The funds are there. Need to expedite the process.” (CNMI Department of Commerce 2009)	RF	This project has been cancelled because a GPS system is scheduled to be installed in 2013.
CNMI Government-CPA	TNI Fuel Farm	Tinian	2012–2020	Currently unfunded.	In order to be a “complete” facility that can accommodate various types of aircraft flying direct from Asia, TNI will need refueling capability. (CNMI Department of Commerce 2009)	RF	Retained.
CNMI Government-CPA	Tinian Seaport Rehabilitation	Tinian	2012–2020	Currently unfunded.	Repairing the seawall is critical to maintaining the long-term continuous and safe use of the port. This project will require planning, environmental studies and construction. (CNMI Department of Commerce 2009)	RF	Retained.
CNMI Government-CPA	Tinian Seaport Rehabilitation – Dredging	Tinian	2015–2020	Currently unfunded.	Currently the waterway has a 28-foot draft which is sufficient to meet the local needs. This dredging project has been separated from the other aspects of the Tinian Seaport Rehabilitation because any dredging beyond 28 feet is required by the military, not the CNMI/Tinian needs. (CNMI Department of Commerce 2009)	RF	Retained.
Private Developers	Casino Resort Development	Tinian	TBD	TBD.	Proposed development of a casino resort by Neo Gold Wings and Marianas Resort Development Co. (MRDC) (Saipan Tribune 2011b). There are five gaming licenses that are available for the Island of Tinian. One license is currently issued to the Tinian Dynasty. The other four licenses are available; two are planned for Neo Gold Wings and MRDC.	RF	Retained.

*Timeframe Key: RC = Recently Completed; P = Present; RF = Reasonably Foreseeable

1 The proposed action would result in critical enhancements to increase training capabilities (especially in
 2 the undersea and air warfare areas) that are necessary if the military services are to maintain a state of
 3 military readiness commensurate with the national defense mission. The proposed action primarily
 4 focuses on the development and improvement of existing training capabilities in the MIRC, and would
 5 not include any military construction projects. However, the proposed action does not involve extensive
 6 changes to the MIRC facilities, activities, or training capabilities, nor does it involve an expansion of the
 7 existing MIRC property or airspace requirements. It does not involve the redeployment of Marine Corps
 8 or Air Force personnel or assets, carrier berthing capability, or deployment of strategic missile defense
 9 assets to the Marianas.

10 Governing procedures for the use of training areas, ranges, and airspace operated and controlled by the
 11 Commander U.S. Naval Forces, Marianas (such as instructions and procedures for the use of Guam,
 12 Saipan, Tinian, Rota and FDM) are included in Commander Navy Region Marianas Instruction 3500.4
 13 (Marianas Training Handbook). This guidance identifies specific land use constraints to enable protection
 14 of environmental resources during military training in the MIRC. These procedures would continue to be
 15 followed. Modification and augmentations of these procedures are being discussed among stakeholders.
 16 No new types of training would be required that would warrant new procedures in the MIRC EIS/OEIS
 17 (DON 2010b).

18 In summary, the MIRC ROD establishes the MIRC and the training that occurs jointly within the MIRC.
 19 Training that occurs within the MIRC includes those exercises that would initiate at the airport or airports
 20 being proposed for improvements within this Divert EIS.

21 ***Guam and CNMI Military Relocation, DON, 2010.*** This project includes the relocation of Marines from
 22 Okinawa. An EIS was prepared by the DON and Joint Guam Program Office (JGPO) and a ROD was
 23 issued in 2010 (DON 2010b). This relocation is proposed to occur during the same timeframe as a
 24 proposed wharf construction in Guam's Apra Harbor to support U.S. Navy transiting nuclear aircraft
 25 carriers. A U.S. Army Air and Missile Defense Task Force (AMDTF) is also proposed for Guam to
 26 protect against the threat of harm from ballistic missile attacks. The main components of the proposed
 27 actions are as follows:

28 • ***Marine Corps Relocation***

- 29 ○ Develop and construct facilities and infrastructure to support approximately
 30 8,600 Marines and their 9,000 dependents relocated from Okinawa (Japan) to Guam.
- 31 ○ Develop and construct facilities and infrastructure to support training and operations on
 32 Guam and Tinian for the relocated Marines.

33 • ***Navy Apra Harbor***

- 34 ○ Construct a new deep-draft wharf with shoreside infrastructure improvements creating
 35 the capability in Apra Harbor, Guam, to support a transient nuclear-powered aircraft
 36 carrier.

37 • ***Army AMDTF***

- 38 ○ Develop facilities and infrastructure on Guam to support relocating approximately
 39 600 military personnel and their 900 dependents to establish and operate an AMDTF.

40 • ***Utilities***

- 41 ○ Alternatives to accommodate the increase demand on existing utilities and roadway
 42 infrastructure are considered.

1 **Establishment and Operation of an ISR/Strike Capability, Andersen AFB, Guam, Department of the**
2 **Air Force, 2006.** This project includes the establishment of an ISR/Strike operational capability in the
3 Western Pacific, in four phases, over an approximate 16-year period beginning in fiscal year 2007. The
4 ISR/Strike capability would consist of fighter, aerial refueling, bomber, unmanned aerial vehicle aircraft,
5 and support personnel. The ISR/Strike EIS was finalized in 2006 and a ROD was issued in January 2007
6 (USAF 2006).

7 Andersen AFB was identified as the installation best suited to host the ISR/Strike capability. The average
8 airfield operations would increase from 235 to 297 as a result of the action. The increase in aircraft
9 events into and out of Andersen AFB requires improved range infrastructure to accommodate this
10 increased training tempo, newer aircraft, and weapon systems commensurate with ISR/Strike force
11 structure. There would be increased activity on all the current training areas supporting Air Force
12 activities. Land acquisition is not proposed.

13 There would be construction to support approximately 3,000 additional personnel, including 190 family
14 housing units. The Air Force would beddown and operate two squadrons and three training programs at
15 Northwest Field, concurrent with ISR/Strike capability (addressed in a separate environmental
16 assessment).

17 As part of the ISR/Strike mitigation plan, a new Habitat Management Unit of 148 acres (60 hectares)
18 would be established as a mitigation measure for impacts on biological resources. This mitigation plan
19 would include the following:

- 20 • Development of an ungulate control plan
- 21 • Ungulate exclusion fencing
- 22 • Funding for a full-time wildlife management specialist position
- 23 • Planting of trees that are important to the Mariana fruit bat or the Marianna crow
- 24 • A noise study.

25 The Air Force was able to address the cumulative impacts of establishing an ISR/Strike Capability in their
26 EIS (USAF 2006) relative to a host of other cumulative projects identified.

27 The ISR/Strike ROD establishes the strike group, including 12 aerial refueling tankers, and beddown
28 aircraft at Andersen AFB which would be used during Divert activities and exercises.

29 **Mariana Island Testing and Training (MITT), Department of the Navy, U.S. Pacific Fleet, Undated.**

30 This proposed project includes conducting military training and testing activities within the MITT Study
31 Area. The training is needed to meet the U.S. Navy's statutory responsibilities described in
32 Title 10 U.S.C. § 5062 to achieve and maintain military readiness. The EIS/OEIS is being prepared to
33 renew current regulatory permits and authorizations. The MITT Study Area includes the training and
34 testing locations in the western Pacific, including the existing MIRC area, the high seas, and Apra Harbor.

35 **Proposed Broad Area Maritime Surveillance (BAMS) Beddown, USAF, 36WG, Undated.** This
36 proposed project includes the construction of an additional hangar and the beddown of up to 22 BAMS
37 aircraft at Andersen AFB. The facilities (hangars) for the BAMS would be adjacent to the Global Hawk
38 hangars. BAMS Training is covered in the MIRC EIS/OEIS.

1 5.2.2 Other Local and Regional Development

2 5.2.2.1 Saipan

3 **Road Resurfacing and Hazard Elimination.** This includes the construction, resurfacing, and repaving of
 4 primary and secondary roads that are in dire need of repair and rehabilitation. This project will also allow
 5 for the elimination of hazard materials, rights-of-ways, debris, some curb and gutters, and other hazardous
 6 and safety problems. This project will also allow for the purchase of additional road signs, street
 7 markings, reflectors, school and pedestrian crossing markings, and other road safety features. Saipan has
 8 the largest amount of existing roadway infrastructure among the three islands within the CNMI. The draft
 9 2008 CNMI Highway Comprehensive Master Plan identifies two short-term goals of (1) implementing a
 10 Roadway Pavement and Delineation Maintenance and Improvement Program and (2) Roadway
 11 Classifications.

12 On Saipan, the following long-range projects are recommended:

- 13 • Construct new bridge and connection along Route 36
- 14 • Upgrade and pave Lau Lau Road to Kagman
- 15 • Realign Texas Road and modify Middle Road and Monsignor Guerrero to a 4-leg intersection
- 16 • Realign Micro Beach Road between Beach Road and Middle Road. Widen roadway to provide a
 17 third lane that would become a westbound left-turn lane, and add bike lanes. Add pedestrian
 18 pathway to Micro Beach Road
- 19 • Widen Beach Road from Quartermaster Road to Gualo Rai Road
- 20 • Construct pedestrian facilities and bike lanes on Middle Road
- 21 • Upgrade drainage along Chalan Monsignor Guerrero near Chalan Tun Herman Pan Road
- 22 • Widen Beach Road from Chalan Monsignor Guerrero to Afetna and install two-way left-turn lane
 23 in median (CNMI Department of Commerce 2009).

24 **Geothermal Power Development.** An Australian energy company was awarded a concession by CUC for
 25 geothermal power development and would sell electricity to the transmission grid. Drilling will occur
 26 first to confirm geothermal activity and flow. If geothermal activity is satisfactorily confirmed, additional
 27 geological and feasibility studies will be performed. Locations for the studies have not yet been
 28 identified. Funding has been secured from the U.S. Government for the geothermal exploration
 29 (Proactive Investors 2012).

30 **Solar Power Development.** Two solar energy proposals are being reviewed and will be awarded
 31 contracts. Once awarded, the two projects are expected to produce an additional 15 to 20 MW for
 32 Saipan's power grid. One contract has been awarded to a Chinese solar development company. No
 33 additional details on the second contract or locations for development are available (Saipan Tribune
 34 2012).

35 **Saipan Water System Improvements.** Designed to meet an USEPA stipulated order, this project will
 36 provide focus and direction to meet CWA and SDWA requirements on Saipan on the existing water
 37 quality (CNMI Department of Commerce 2009).

38 **GSN Public Announcement System.** GSN currently has a public announcement system that does not
 39 work. The lack of the system inhibits the airport's ability to communicate with passengers and employees

1 both on a daily basis and emergency situations. An emergency announcement system is needed to meet
2 FAA standards. This project recently received \$1 million in grant funding (CNMI Department of
3 Commerce 2009).

4 **Water/Wastewater System.** This is a U.S. Federal Court-ordered project. The existing wastewater/sewer
5 system needs major rehabilitation and USEPA compliance upgrades; water quality also needs to be
6 improved. The current water quality is unacceptable and the CNMI is subject to fines if it does not start
7 the process of compliance. An EA has not yet been completed for this project (CNMI Department of
8 Commerce 2009).

9 **Replace Traffic Lighting System.** The existing traffic lighting system on Saipan is antiquated and
10 sometimes works intermittently. In the past, it has been a source of concern for the safety of the public
11 and pedestrians. Due to the corrosive nature of island air, the internal components of the traffic system
12 are subject to accelerated deterioration. This project aims to correct deficiencies and add safety to traffic
13 flow (CNMI Department of Commerce 2009).

14 **GSN Fuel Facility Expansion.** GSN is the largest of the CNMI and does have the capability to refuel
15 large aircraft. Expanding the fuel farm facility would help provide an opportunity for competition and
16 lower prices to help stimulate more international air service and tourism as requested by airlines
17 (CNMI Department of Commerce 2009).

18 **Improve the Commonwealth Health Center.** This project is to repair, improve, and upgrade the main
19 and auxiliary medical facilities on Saipan. The CHC facility on Saipan is the state's primary caregiving
20 facility for citizens, tourists, and other visitors to the CNMI. The facilities need to be repaired and
21 upgraded in order to accommodate the needs of the medical community. This upgrade will not only add
22 value to the building, but also improve the equipment, medical infrastructure, and other related needs of
23 the operation (CNMI Department of Commerce 2009).

24 5.2.2.2 Tinian

25 **Road Resurfacing and Hazard Elimination.** This includes the construction, resurfacing, and repaving of
26 primary and secondary roads that are in dire need of repair and rehabilitation. This project will also allow
27 for the elimination of hazard materials, rights-of-ways, debris, some curb and gutters, and other hazardous
28 and safety problems. This project will also allow for the purchase of additional roads signs, street
29 markings, reflectors, school and pedestrian crossing markings, and other road safety features. The draft
30 2008 CNMI Highway Comprehensive Master Plan provides a full analysis of recommended
31 improvements and cost/benefit analysis. The plan identifies two short-term goals of (1) implementing a
32 Roadway Pavement and Delineation Maintenance and Improvement Program and (2) Roadway
33 Classifications.

34 The following long-term projects are identified for Tinian:

- 35 • Upgrade and pave roadways and construct pedestrian facilities in San Jose Village
- 36 • Upgrade and improve Broadway from Route 201 south to Limestone Forest Trail (CNMI
37 Department of Commerce 2009).

38 **TNI Fuel Farm.** In order to be a "complete" facility that can accommodate various types of aircraft
39 flying direct from Asia, TNI will need refueling capability. Having a facility on Tinian will also
40 potentially help reduce the cost of aviation fuel, facilitating travel (CNMI Department of Commerce
41 2009).

1 **Tinian Seaport Rehabilitation.** The Tinian seaport is critical to Tinian. The existing breakwater was
2 built after World War II and has deteriorated over time. It does not protect the harbor from large swells
3 and storm damage to dock facilities. In its current state, a large storm could destroy the existing seawall
4 and will add additional cost to dredge the harbor repeatedly. Repairing the seawall is critical to
5 maintaining the long-term continuous and safe use of the port. This project will require planning,
6 environmental studies, and construction. A continuing decline in the current state of the seawall will
7 cause more economic damage to the island. A state of emergency was declared for the harbor in 2007
8 when part of Tinian transportation infrastructure nearly collapsed due to severe storm damage and failure
9 to repair damages immediately (CNMI Department of Commerce 2009).

10 **Tinian Seaport Rehabilitation- Dredging.** The Tinian Seaport serves as the major mode of transportation
11 of goods and services for Tinian. The port will also be the main conduit to move heavy equipment and
12 military goods into Tinian if DOD uses Tinian for military training exercises. Currently the waterway has
13 a 28-foot draft which is sufficient to meet the local needs. This dredging project has been separated from
14 the other aspects of the Tinian Seaport Rehabilitation because any dredging beyond 28 feet is required by
15 the military, not the CNMI/Tinian needs. This project requires a plethora of planning and environmental
16 studies and has a level of high costs. However, it is critical to every aspect of this island's economy
17 (CNMI Department of Commerce 2009).

18 **Casino Resort Development.** There are five gaming licenses that are available for the Island of Tinian.
19 One license is currently issued to the Tinian Dynasty, the existing hotel casino. The other four licenses
20 are available and tentatively proposed and planned for development, but on hold due to immigration
21 changes and downturn of the economy. Two projects are specifically planned, including the development
22 of casino resorts by Neo Gold Wings and Marianas Resort Development Co. (MRDC). MRDC plans to
23 lease 337 acres (136.5 hectares) of public land on Tinian to build the \$300-million Matua Bay Casino
24 Resort on Tinian, which includes an 18-hole championship golf course and hotel casino (Saipan Tribune
25 2011b). Phase I of MRDC's project will be completed after an initial investment of more than
26 \$170 million. It will involve the construction of a 300-room hotel casino, with 100 full suites and
27 200 junior suites, four full-service restaurants, a spa, wedding chapel, shopping arcade, and a convention
28 facility that will accommodate 600 people. The initial phase, expected to take 16 to 24 months, will also
29 culminate in a completion of an 18-hole championship golf course, the first on the Island of Tinian.
30 Phase II of the project will involve the construction of luxury bungalows and additional rooms at the hotel
31 casino (Saipan Tribune 2007). Details of the Neo Gold Wings development are not yet developed or
32 released.

33 5.3 Cumulative Effects Analysis

34 5.3.1 Noise

35 Short- and long-term, minor to moderate, adverse, cumulative impacts on the noise environment would be
36 expected.

37 This EIS addresses the ground movements and immediate approaches and departures at the airport
38 alternative locations during unit-level training and exercises. Actual air warfare and air logistics training
39 (i.e., above 10,000 feet) are addressed by the MIRC EIS, for which a ROD was issued. This EIS does not
40 propose or analyze increased air operations beyond what is addressed by the MIRC EIS (DON 2010). In
41 addition, this EIS addresses the potential increase in civilian operations from the airfield improvements
42 that would occur under the alternatives. As discussed in **Sections 4.1.1.2** and **4.1.2.2**, the aircraft
43 operations under the Baseline Scenario were increased by 15 percent to account for this potential increase.
44 Therefore, no cumulative impacts would be expected on the noise environment due to the air operations
45 discussed in this EIS and the MIRC EIS.

1 The ISR/Strike EIS establishes the strike group, including 12 aerial refueling tankers, and beddown
2 aircraft at Andersen AFB that would be used during divert activities and exercises. Since the aircraft
3 analyzed in the ISR/Strike EIS would be used during divert exercises, there would be no cumulative
4 impacts on the noise environment from air operations of these aircraft.

5 5.3.1.1 Alternative 1 – GSN (Preferred Alternative)

6 Short-term, minor to moderate, adverse, cumulative noise impacts could occur. Numerous construction
7 projects are proposed on Saipan. At this time, many of these projects do not have definitive locations or
8 construction dates. Under Alternative 1, vehicle traffic would increase on a short-term basis during
9 construction activities and on a long-term, periodic basis with the delivery of fuel. Fuel truck deliveries
10 would occur during a 14-day period initially and then throughout the 8 weeks of anticipated operations
11 each year. The additional truck traffic would use existing roadways commonly used by similar delivery
12 trucks on each island. The increase of roadway vehicles as compared to existing average daily traffic on
13 these roadways would not present a significant increase in current noise levels. However, the increase of
14 traffic analyzed in this EIS combined with construction vehicles from potential projects on Saipan could
15 result in periodic minor to moderate, adverse, cumulative impacts on the noise environment, depending
16 on the location of the site and the construction date.

17 In the Feasibility Assessment for the Establishment of Special Use Airspace for Marine Corps Training
18 Activities on the islands of Guam, Tinian, and Pagan, October 2011, one of alternatives includes the
19 construction of four firing ranges on the northern end of Tinian. The proposed ranges would affect GSN
20 aircraft approach procedures. This could impact noise levels around the airport since aircraft arriving at
21 GSN could be required fly at different elevations if the approach procedures were changed.

22 5.3.1.2 Alternative 2 – TNI

23 Short-term, minor to major, adverse cumulative noise impacts could occur. Numerous construction
24 projects are proposed on Tinian. At this time, many of these projects do not have definitive locations or
25 construction dates. Under Alternative 2, vehicle traffic would increase on a short-term basis during
26 construction activities and on a long-term, periodic basis with the delivery of fuel. Fuel truck deliveries
27 would occur during a 14-day period initially and then throughout the 8 weeks of anticipated operations
28 each year. The additional truck traffic would use existing roadways commonly used by similar delivery
29 trucks on each island. The increase of roadway vehicles as compared to existing average daily traffic on
30 these roadways would not present a significant increase in current noise levels. However, the increase of
31 traffic analyzed in this EIS combined with construction vehicles from potential projects on Tinian could
32 result in periodic minor to moderate, adverse, cumulative impacts on the noise environment, depending
33 on the location of the site and the construction date.

34 Intermittent, long-term, moderate, adverse cumulative impacts on noise could occur. In the JGPO EIS,
35 the proposed military aircraft operations were compared to the number of existing operations at TNI. The
36 JGPO EIS listed a range of percentage increases under that proposed action, with the greatest increase at
37 14 percent with the CH-46; it was stated that the noise impacts would be less than significant under this
38 scenario. An analysis of the increase in DNL noise contours at TNI was not completed for the JGPO EIS.
39 The increase in aircraft operations discussed in the JGPO EIS combined with increase in aircraft
40 operations discussed in this EIS would increase noise levels around TNI if both projects were
41 implemented. In addition, military training from these projects would occur at the same time. Therefore,
42 adverse cumulative impacts on the noise environment from military training would be expected to be
43 periodic and moderate.

1 The JGPO EIS shows small arms range noise contours in the Leaseback Area, which is north of TNI.
2 Under Alternative 2–Medium and High Scenarios in this EIS, the noise contours at TNI would overlap
3 with the small arms range noise contours shown in the JGPO EIS. This overlap would occur north of TNI
4 in the Leaseback Area, which is military property. Consequently, noise-sensitive populations would not
5 be impacted in this region.

6 Two casino resorts are planned on land leased to Neo Gold Wings and MRDC. Property leased to Neo
7 Gold Wings is southeast of TNI and property leased to MRDC is directly south of TNI. Under
8 Alternative 2–Medium Scenario, both of these properties are within the 65 and 70 dBA DNL noise
9 contours. Under Alternative 2–High Scenario, these properties are within the 65 to 80 dBA DNL noise
10 contours. USAF guidelines do not recommend constructing resorts within the 75 to 80+ dBA DNL noise
11 contours. Within the 65 to 74 dBA DNL noise contours, resorts are generally considered compatible but
12 with restrictions.

13 5.3.2 Air Quality

14 Short- and long-term, minor, adverse cumulative impacts on local and regional air quality would be
15 anticipated from implementation of the Proposed Action. Cumulative impacts from proposed airfield
16 operations were already analyzed in the ISR/Strike EIS and the MIRC EIS

17 5.3.2.1 Alternative 1 – GSN (Preferred Alternative)

18 Saipan is within the CNMI and is designated as attainment/unclassifiable for all criteria pollutants. All
19 proposed construction projects under Alternative 1 would have short-term, minor, adverse cumulative
20 impacts on local and regional air quality. Ongoing or reasonably foreseeable projects that would generate
21 air emissions during construction include the primary and secondary road resurfacing and hazard
22 elimination, water system improvements, water/wastewater system, airport fuel storage facility, and
23 Commonwealth Health Center improvements would generate criteria air pollutant emissions. Even if
24 construction activities from these other regional actions were to occur at the same time as Alternative 1,
25 no significant cumulative impacts on local and regional air quality would occur.

26 All proposed operational actions under Alternative 1 would have periodic, minor, adverse cumulative
27 impacts on local and regional air quality. Ongoing or reasonably foreseeable projects that would result in
28 new sources of air emissions during the operation phase of Alternative 1 include the water/wastewater
29 system (process emissions) and the airport fuel storage facility (process emissions). Even if
30 operational activities from these other regional actions were to occur at the same time as Alternative 1, no
31 significant cumulative impacts on local and regional air quality could occur.

32 5.3.2.2 Alternative 2 – TNI

33 Tinian is within the CNMI and is designated as attainment/unclassifiable for all criteria pollutants. All
34 proposed construction projects under Alternative 2 would have short-term, minor, adverse cumulative
35 impacts on local and regional air quality. Ongoing or reasonably foreseeable projects that would generate
36 air emissions during construction include primary and secondary road resurfacing and hazard elimination,
37 airport fuel farm, and casino resort development. Even if construction activities from these other regional
38 actions were to occur at the same time as Alternative 2, no significant cumulative impacts on local and
39 regional air quality would occur.

40 All proposed operational actions under Alternative 2 would have periodic, minor, adverse cumulative
41 impacts on local and regional air quality. Ongoing or reasonably foreseeable projects that would result in
42 new sources of air emissions during the operational phase of Alternative 2 include the Guam and CNMI

1 Military Relocation EIS military training (firing ranges, off-road vehicle emissions), airport fuel farm
 2 (process emissions), and casino resort development (process emissions). Even if operational activities
 3 from these other regional actions were to occur at the same time as Alternative 2, no significant
 4 cumulative impacts on local and regional air quality could occur.

5 **5.3.3 Airspace Management and Airfield Operations**

6 Minor to moderate, adverse, cumulative impacts would be expected on airspace and airfield operations
 7 from the proposed action. For this analysis, elements of the proposed action—including runway
 8 dimensions, aircraft parking apron size, airfield hours of operations, IFR capabilities, hazardous cargo
 9 areas, arm/de-arm pads, aircraft refueling capabilities, munitions storage area, arresting systems, ATC
 10 services, and CPA services—were considered in relation to other past, present, and reasonably
 11 foreseeable future actions. Past and present actions on Saipan and Tinian were included in the description
 12 of the existing environment and the potential effects of implementing the proposed action and alternatives
 13 are discussed in **Section 4.3**.

14 This section concentrates on the potential for cumulative impacts on airspace and airfield operations as a
 15 result of the proposed action when implemented along with reasonably foreseeable future actions.
 16 **Table 5.3-1** identifies the reasonably foreseeable future actions that could affect airspace and airfields on
 17 Saipan and Tinian. A discussion of the potential cumulative effects associated with each alternative
 18 follows.

19 **Table 5.3-1. Reasonably Foreseeable Future Actions that Impact Airspace and Airfields**

Project	Description
NAVAIR Proposed BAMS Beddown at Andersen AFB	Construction of an additional hangar and the beddown of up to 22 BAMS aircraft at Andersen AFB. BAMS Training is covered in the MIRC.
CNMI Government - CPA GSN Fuel Storage Facility	GSN is the largest of the CNMI and does have the capability to refuel large aircraft. The need for expanding the fuel farm facility is to provide an opportunity for competition and lower prices to help stimulate more air international air service and tourism as requested by the airlines.
CNMI Government - CPA ILS for TNI	The Municipality of Tinian believes that an ILS is necessary to bring more tourists to the island and remove a level of danger for large aircraft. Larger international aircraft require the ILS. The funds for this project have been set aside by the Tinian Mayor's office.
CNMI Government - CPA TNI Fuel Farm	In order to accommodate various types of aircraft flying directly from Asia, TNI will need refueling capability. Having a fuel farm facility on Tinian will also potentially help reduce the cost of aviation fuel, facilitating travel.

20 **5.3.3.1 Alternative 1 – GSN (Preferred Alternative)**

21 Under Alternative 1, each proposed construction and implementation activity has a short-term, minor to
 22 moderate, direct, adverse impact on airspace and airport operations as a result of temporary airfield
 23 obstructions or from possible airspace obstruction. Long-term, direct, moderate, beneficial impacts on the
 24 airspace and airfield would be expected from implementation of the jet fuel receiving, storage, and
 25 distribution system.

1 Direct impacts on airfield operations from construction would be short-term, with the location changing
2 within the construction footprint throughout the construction activities. Simultaneous construction
3 activities by DOD, as a part of the proposed action and by the CPA to improve fuel storage and dispersing
4

5 facilities, could result in short-term, moderate impacts on airfield operations. Adequate planning and
6 coordination between the construction activity and CPA would reduce most moderate, adverse impacts to
7 a minor level. Resulting facilities (e.g., hangar, fuel tanks) would require evaluation under the
8 requirements of FAR Part 77 and subsequent possible modification of approach procedures to address
9 obstacle clearance. Fuel capacity requirements driving the size of the fuel tanks for multiple actions
10 could affect required procedure modification.

11 Long-term, direct, moderate, adverse cumulative impacts on airspace and airfield operations would be
12 expected from implementation of the Proposed Action. In the Feasibility Assessment for the
13 Establishment of Special Use Airspace for Marine Corps Training Activities on the islands of Guam,
14 Tinian, and Pagan, October 2011, one of alternatives includes the construction of four firing ranges on the
15 northern end of Tinian. The proposed ranges would affect GSN aircraft approach procedures, which
16 could increase potential delays to commercial air traffic and would require increased ATC support to
17 maintain requirements of the existing airspace parameters. Adverse impacts would be minimized and
18 manageable through close coordination between military trainers, CPA, and ATC; restructured airspace to
19 address overlap of controls on airspace by the various activities; and the installation of radar capabilities
20 on Tinian. Without restructured airspace, increased NAVAIDs and local ATC presence, moderately
21 adverse cumulative impacts on civilian aviation could occur as a result of this increased military air traffic
22 in the area.

23 5.3.3.2 Alternative 2 – TNI

24 Cumulative impacts from the proposed action's construction activities on Tinian would be similar to
25 those identified for Alternative 1 – GSN. Short- and long-term, direct, minor to moderate, adverse
26 cumulative impacts on airspace and airfield operations would be expected. Several construction projects
27 are planned for Tinian, such as Marines Corps relocation, casino resort development, and defense training
28 (which would require clearing, construction, and live-fire ranges); however, construction activities would
29 have a minor to moderate impact on TNI air operations because only small commuter aircraft operate out
30 of TNI. Additionally, flexibility in timing of commuter flights and the ability to establish routine timing
31 for the commuter flights, in close coordination with the construction planners, would reduce potential
32 impacts.

33 In the Feasibility Assessment for the Establishment of Special Use Airspace for Marine Corps Training
34 Activities on the islands of Guam, Tinian, and Pagan, October 2011, one of alternatives includes the
35 construction of four firing ranges on the northern end of Tinian. The proposed ranges would affect GSN
36 aircraft approach procedures which could increase potential delays to commercial air traffic and would
37 require increased ATC support to maintain requirements of the existing airspace parameters. Adverse
38 impacts would be minimized and manageable through close coordination between military trainers, CPA,
39 and ATC; restructured airspace to address overlap of controls on airspace by the various activities; and
40 with the installation of radar capabilities on Tinian. Without restructured airspace, increased NAVAIDs
41 and local ATC presence, moderately adverse cumulative impacts on civilian aviation could occur as a
42 result of this increased military air traffic in the area.

1 **5.3.4 Geological Resources and Soils**

2 **5.3.4.1 Alternative 1 – GSN (Preferred Alternative)**

3 Individually, all construction and utility installation activities could have short-term, negligible to minor,
4 adverse impacts as a result of vegetation removal, compaction of surrounding soils, and increased soil
5 erosion and sedimentation. Cumulatively, impacts on geological resources would be expected to be
6 short- and long-term, minor to moderate, and adverse. Direct impacts on topography, geology, and soils
7 from construction would be localized to the site that is being developed. Implementation of erosion- and
8 sediment-control BMPs would be expected to limit potentially adverse, cumulative impacts. All new
9 facilities would be designed in accordance with the CNMI’s Building Safety Code, which would
10 cumulatively reduce potential for adverse impacts following a seismic event or during a typhoon.

11 Soil surveys should be conducted prior to any ground-disturbing activities. Prior to construction activities
12 in areas of possible contamination, soils would be sampled to determine the extent of contamination, and
13 remediated in accordance with laws and regulations. If results of the sampling indicated the presence of
14 contamination, remediation efforts would take place prior to commencement of construction activities.
15 The handling, storage, transportation, and disposal of hazardous substances would be conducted in
16 accordance with applicable laws and regulations. Long-term, beneficial, cumulative impacts would occur
17 from the removal of contaminated soils.

18 **5.3.4.2 Alternative 2 – TNI**

19 Cumulatively, impacts on geological resources would be expected to be short- and long-term, minor to
20 moderate, and adverse. Cumulative impacts under Alternative 2 would be similar to, but greater than,
21 those described for Alternative 1 as more land would likely be disturbed as a result of Marines Corps
22 relocation, casino resort development, and defense training, which require clearing, construction
23 (introduction of impervious surfaces), and live-fire ranges. Live-fire ranges would probably involve
24 grading so an appropriate line-of-sight could be obtained, and soil could be excavated for installation of
25 stationary and moving targets. Grading and compaction of soil would result in disturbance of soil
26 structure, resulting in increased storm water runoff and erosion and sedimentation.

27 **5.3.5 Water Resources**

28 **5.3.5.1 Alternative 1 – GSN (Preferred Alternative)**

29 Short-term, minor, adverse, cumulative impacts on the water resources of Saipan could occur from
30 earth-disturbing construction activities from Alternative 1 and other past, present, and reasonably
31 foreseeable actions. An increase in earth-disturbing activities would increase potential for soil erosion
32 and sedimentation within fresh water bodies and nearshore waters on Saipan. Implementation of soil
33 erosion and sedimentation controls and storm water pollution prevention at construction sites would
34 minimize the potential for adverse impacts from individual construction sites and, therefore, reduce
35 potential cumulative impacts on water resources.

36 Long-term, minor to moderate, cumulative, adverse impacts on groundwater could occur from the overall
37 increases in impervious surfaces on Saipan from the Proposed Action and other past, present, and
38 reasonably foreseeable actions. Alternative 1 could result in the addition of 2,392,200 ft² (54.9 acres) of
39 impervious surfaces. Additional proposed future construction projects on Saipan, including the GSN fuel
40 facility expansion and road construction and resurfacing on the island, would result in additional
41 impervious surfaces on the island and the increased prevention of rainwater infiltration into the
42 underlying aquifer. In addition, construction activities could introduce pollutants into the underlying

1 aquifer due to accidental spills of petroleum or other pollutants. Adherence to Section 438 of the EISA
2 and the CNMI DEQ/Guam Stormwater Management Manual would help mitigate these cumulative
3 adverse impacts on groundwater supply and quality.

4 5.3.5.2 Alternative 2 – TNI

5 Short-term, minor, adverse, cumulative impacts on water resources at Tinian could occur from
6 earth-disturbing construction activities from Alternative 2 and other past, present, and reasonably
7 foreseeable actions. An increase in earth-disturbing activities would increase potential for soil erosion
8 and sedimentation within fresh water bodies and nearshore waters on Tinian. Implementation of soil
9 erosion and sedimentation controls and storm water pollution prevention at construction sites would
10 minimize the potential for adverse impacts from individual construction sites and, therefore, reduce
11 potential cumulative impacts on water resources.

12 Long-term, moderate, cumulative, adverse impacts on groundwater could occur from the overall increases
13 in impervious surfaces on Tinian. Alternative 2 would result in the addition of 4,090,800 ft² (93.9 acres)
14 of impervious surfaces. Additional proposed future construction projects on Tinian, including the TNI
15 fuel farm, road construction and resurfacing, and casino resort development on the island, would result in
16 additional impervious surfaces on Tinian and the increased prevention of rainwater infiltration into the
17 underlying aquifer. In addition, construction activities could introduce pollutants into the underlying
18 aquifer due to accidental spills of petroleum or other pollutants. Adherence to Section 438 of the EISA
19 and the CNMI DEQ/Guam Stormwater Management Manual would help mitigate these cumulative
20 adverse impacts on groundwater supply and quality.

21 5.3.6 Terrestrial Biological Resources

22 5.3.6.1 Alternative 1 – GSN (Preferred Alternative)

23 No cumulative impacts on vegetation would be expected. Other projects are ongoing or reasonably
24 foreseeable on Saipan. There could be some overlap in the schedules of construction activities for
25 Alternative 1 and those of other planned construction projects. Impacts on vegetation associated with
26 other projects could occur. However, Alternative 1 is not expected to impact native vegetation, and,
27 therefore, would not contribute to cumulative impacts on vegetation at GSN.

28 Short- and long-term, minor, adverse, cumulative impacts on wildlife and threatened and endangered
29 species could occur. If construction projects overlap, this could also result in increased ambient noise
30 levels. Wildlife could be permanently displaced from the areas and temporarily dispersed from areas
31 adjacent to the project areas during periods of construction activities. Nightingale reed warbler habitat
32 and potentially reed warbler territories would be affected by Alternative 1. Impacts will be determined
33 based on ongoing surveys and consultation with USFWS, but loss of nightingale reed warbler habitat is
34 anticipated. Other ongoing and reasonably foreseeable projects on Saipan might also result in loss of
35 tangantangan and other suitable nightingale reed warbler, which would have a long-term, adverse,
36 cumulative impact. However, mitigation would be implemented for loss of any active nightingale reed
37 warbler territories determined to occur in the Project Area; therefore, Alternative 1 would be expected to
38 have a minor contribution to cumulative impacts on nightingale reed warblers.

39 5.3.6.2 Alternative 2 – TNI

40 No cumulative impacts on vegetation would be expected. Other projects are ongoing or reasonably
41 foreseeable on Tinian. There could be some overlap in the schedules of construction activities for
42 Alternative 2 and those of other planned construction projects. Impacts on vegetation associated with

1 other projects could occur. However, Alternative 2 is not expected to impact native vegetation, and,
2 therefore, would not contribute to cumulative impacts on vegetation at TNI.

3 Short- and long-term, minor, adverse, cumulative impacts on wildlife could occur. If construction
4 projects overlap, this could also result in increased ambient noise levels. Wildlife could be permanently
5 displaced from the areas and temporarily dispersed from areas adjacent to the project areas during periods
6 of construction activities. There are no known threatened and endangered species on Tinian. Although
7 growth and development can be expected to continue outside of the airport and within the surrounding
8 natural areas, cumulative adverse impacts on these resources would not be expected. Alternative 2 would
9 not contribute to cumulative impacts on threatened and endangered species when combined with other
10 projects.

11 5.3.7 Marine Biological Resources

12 5.3.7.1 Alternative 1 – GSN (Preferred Alternative)

13 **Sea Turtles.** Intermittent, short-term, negligible, adverse cumulative impacts on sea turtles would occur
14 under Alternative 1. Some of the DOD redevelopment projects in the region could result in increases in
15 noise from low-flying aircraft or other training activities. These include activities associated with MIRC,
16 operation of ISR/Strike Capability, and MITT activities. While these activities have the potential to result
17 in an increase in noise over the nearshore waters and beaches of Saipan, this impact is expected to be
18 negligible. As with the noise associated with take-offs and landings under Alternative 1, it is unlikely that
19 low-flying aircraft associated with these projects would result in more than a negligible increase in noise
20 over the beaches where sea turtles nest in Saipan. As such, Alternative 1 would have a negligible
21 contribution to cumulative impacts.

22 **Marine Mammals.** Intermittent, short-term, negligible, adverse cumulative impacts on marine mammals
23 would occur under Alternative 1. Some of the DOD redevelopment projects in the region could result in
24 increases in noise from low-flying aircraft or other training activities. These include activities associated
25 with MIRC, operation of ISR/Strike Capability, and MITT activities. While these activities have the
26 potential to result in an increase in noise over the nearshore waters Saipan, this impact is expected to be
27 negligible. It is extremely unlikely that individual animals would be repeatedly exposed to low-altitude
28 overflights. As such, Alternative 1 would have a negligible contribution on cumulative impacts.

29 5.3.7.2 Alternative 2 – TNI

30 **Sea Turtles.** Intermittent short-term, negligible, adverse cumulative impacts on sea turtles would occur
31 under Alternative 2. Some of the DOD redevelopment projects in the region could result in increases in
32 noise from low-flying aircraft or other training activities. These include activities associated with MIRC,
33 operation of ISR/Strike Capability, and MITT activities. Additionally, Tinian seaport redevelopment
34 could result in an increase in noise in the immediate beaches and nearshore waters. While these activities
35 have the potential to result in an increase in noise over the nearshore waters and beaches of Tinian, this
36 impact is expected to be negligible. The largest concentration of sea turtles occurs at Tinian Harbor;
37 however, Alternative 2 is not expected to result in an increase in noise at Tinian Harbor. As such,
38 Alternative 2 would have a negligible contribution to cumulative impacts.

39 **Marine Mammals.** Intermittent, short-term, negligible, adverse cumulative impacts on marine mammals
40 would occur under Alternative 2. Some of the DOD redevelopment projects in the region could result in
41 increases in noise from low-flying aircraft or other training activities. These include activities associated
42 with MIRC, operation of ISR/Strike Capability, and MITT activities. Additionally, Tinian seaport
43 redevelopment and dredging could result in an increase in noise in the immediate beaches and nearshore

1 waters. It is extremely unlikely that individual animals would be repeatedly exposed to low-altitude
2 overflights of this project, the DOD redevelopment projects, and the noise associated with Tinian seaport
3 redevelopment. As such, Alternative 2 would have a negligible contribution to cumulative impacts.

4 5.3.8 Cultural Resources

5 Evaluation of cumulative impacts on cultural resources involves consideration of NRHP-eligible or listed
6 resources' response to change and capacity to withstand stress; determination of stresses that would be
7 placed on such resources by the proposed construction and implementation activities; and comparison of
8 these impacts to a baseline condition assessment of those resources (i.e., their current condition). As
9 presented in **Section 3.8**, cultural resources within the study area consist of prehistoric and historic
10 archaeological sites, historic engineering features, and historic architecture. It is therefore pertinent to
11 discuss, in a general way, the relative susceptibility of these types of resources to change and their
12 capacity to withstand stress. While all of these resource types are susceptible to destruction during
13 construction, their susceptibility to indirect and long-term impacts differ considerably. While the specific
14 processes of site transformation over time are debated by archaeologists, for conservation and
15 preservation purposes, archaeological sites can be thought of as high-entropy, low-energy structures
16 compared to low-entropy, high-energy structures, such as standing historic architecture. Therefore,
17 archaeological sites are relatively stable in the absence of direct disturbance whereas standing structures
18 are less so.

19 Most of the long-term impacts on cultural resources from the proposed divert activities would result from
20 increased use of the study area during training exercises as emergencies requiring actual diversion of
21 personnel and equipment would, by definition, be rare. Nevertheless, in both cases, long-term impacts on
22 historic fabric could develop from increased numbers of take-offs and landings by aircraft; increased
23 ground vehicular traffic, especially between fuel ports and the airfields; and increased numbers of military
24 and civilian personnel living and working in the study area during divert activities and training exercises.

25 5.3.8.1 Alternative 1 – GSN (Preferred Alternative)

26 Cumulative impacts on prehistoric archaeological sites are not expected. There are no known
27 NRHP-eligible, pre-contact archaeological sites in the study area that are threatened directly by
28 construction-phase activities, and none are likely to exist given the tremendous amount of disturbance that
29 occurred in the area as a result of World War II and subsequent construction at the airport. However, any
30 as yet unknown pre-contact archaeological sites that might exist in the study area are unlikely to be
31 threatened over time by the types of secondary effects that would be expected from implementation of
32 Alternative 1.

33 Alternative 1 could contribute to long-term, indirect, adverse cumulative impacts on historical resources
34 associated with the Japanese and U.S. occupations prior to, during, and immediately following WWII.
35 Most of the historic structures in the Isley/Aslito field historic district and landmark are far enough away
36 from the divert activity and training exercise areas proposed under Alternative 1 that long-term,
37 cumulative impacts on these structures are expected to be minimal. There are, however, two exceptions:
38 (1) the proposed parking aprons along the north side of GSN's runways, and (2) the proposed BEAR-kit
39 site at the north end of an existing soccer field between Flame Tree and Airport Roads. In both cases the
40 impacted resources are concrete air raid bunkers associated with the Japanese military build-up before
41 World War II and defense during World War II. Six such structures lie in very close proximity to the
42 proposed parking aprons while two lie at one edge of the field that is proposed for the BEAR-kit site.
43 Direct avoidance of these resources is already planned during construction and implementation.
44 However, the structures are susceptible to secondary impacts from vibration-related deterioration due to
45 heavy aircraft traffic at the parking aprons and increased vehicle traffic and personnel presence at the

1 BEAR-kit site. In addition, the latter could face an increased risk of vandalism from military and civilian
2 personnel stationed at the BEAR-kit site during divert activities and training exercises. Further, the
3 district as a whole faces increased fragmentation of its constituent parts from development. This process
4 is already well underway from continued improvements for commercial air travel at GSN. However,
5 impacts on the district's overall cohesiveness from divert-related construction and implementation
6 activities are possible.

7 5.3.8.2 Alternative 2 – TNI

8 Alternative 2 has the potential to contribute to long-term, direct and indirect, adverse, cumulative impacts
9 on historic and archaeological resources. Potential cumulative impacts would involve damage to the four
10 NRHP-listed historic structures in San Jose due to increased heavy vehicle traffic associated with fuel and
11 other supply traffic from the harbor to the airport. This possibility would be evaluated by determining the
12 actual proximity of supply truck routes from Tinian's harbor to TNI and comparing the magnitude of
13 traffic volumes and weights under current conditions and under the conditions to current traffic volumes
14 and weights. If the change is minor, or if the historic structures are sufficient distance from the truck
15 routes to result in no adverse impacts, there would be no cumulative impacts on historic structures in San
16 Jose under Alternative 2. In addition, military use of TNI could have cumulative impacts on the
17 Japanese-era Gurguan Airfield historic site, the U.S. WWII-era West Field site, and the WWII-era
18 U.S. Naval Air Base HQ, the HQ LAA 18th AAA, and the D Battery, 18th AAA site. These sites could
19 face an increased risk of vandalism from military and civilian personnel stationed at the site during divert
20 activities and training exercises. These sites are also susceptible to secondary impacts from
21 vibration-related deterioration due to heavy aircraft traffic at the airport. Finally, cumulative impacts are
22 possible on unrecorded archaeological sites and historic structures in the project area, which has not been
23 completely surveyed for archaeological or architectural resources. This issue will be resolved through
24 archaeological and historic building surveys prior to construction.

25 5.3.9 Recreation

26 5.3.9.1 Alternative 1 – GSN (Preferred Alternative)

27 Short-term, minor, adverse, cumulative impacts and long-term, minor, beneficial cumulative impacts
28 could occur from construction activities. Alternative 1 would generally be consistent with the present and
29 foreseeable use of recreational activities when combined with other projects, such as road resurfacing and
30 hazard elimination, MIRC exercises, or GSN fuel facility expansion as part of the Comprehensive
31 Economic Development Strategic Plan for the CNMI. Short-term, cumulative, minor, adverse, impacts
32 on recreational resources could occur if multiple construction projects associated with road resurfacing,
33 upgrading the lighting system, construction described in Alternative 1, and other construction projects
34 were to occur simultaneously. Travel time to recreational resources could be increased, which could
35 inconvenience tourists. Once completed, an increase in the number of travelers on newly constructed
36 roads could occur; however, access to recreational resources would still be possible and, once completed,
37 proposed roadway improvements could reduce travel times to available recreational resources, resulting
38 in long-term, minor, beneficial cumulative impacts on recreational resources. Alternative 1 would have a
39 negligible contribution to these long-term, beneficial impacts.

40 Long-term, minor to moderate, beneficial and adverse, cumulative impacts would be expected on
41 recreational resources from GSN fuel facility expansion associated with the Comprehensive Economic
42 Development Strategic Plan and Alternative 1. An increased fuel capacity would allow GSN to refuel a
43 larger number of planes, which could increase international air service and tourism. Recreational
44 resources throughout the island would subsequently become more frequently used; therefore, long-term,
45 moderate, beneficial, cumulative impacts would be expected.

1 **5.3.9.2 Alternative 2 – TNI**

2 Short-term, minor, adverse, cumulative impacts could occur if construction associated with roadway
3 improvements, airport and seaport upgrades (as proposed in Alternative 2 and other development
4 projects), and casino development were to occur simultaneously. Travel time to recreational resources
5 could be increased; however, access to recreational activities would not be restricted.

6 As projects are completed (e.g., construction of roadway improvements, fuel upgrades at the airport and
7 seaport, casino development), long-term, moderate, beneficial, cumulative impacts on recreational
8 resources would be expected. Having an increased fuel capacity would reduce travel costs and could
9 increase the use of the airfield. An increase in the use of recreational resources could be expected due to
10 the increase in travelers to the island. Casino resort development would increase the number of tourists
11 and recreational opportunities on Tinian. Lodging on the island would expand and the initial phase of
12 casino development would bring an 18-hole championship golf course to the island.

13 Intermittent, long-term, minor to moderate, adverse, cumulative impacts would be expected on
14 recreational resources from the exercises described in the MIRC EIS, JGPO EIS, and Alternative 2.
15 Restricting access to recreational resources during training activities and the noise associated with those
16 activities could result in a reduction of recreational activities. Training activities would not occur
17 year-round; however, cumulative exercises on Tinian would be more frequent than those on Saipan.

18 Long-term, minor, adverse, cumulative impacts on recreational resources associated with increased noise
19 levels at TNI would be similar to, but less substantial than those described for Alternative 1, due to the
20 lower number of recreational resources near the airport.

21 **5.3.10 Land Use**

22 **5.3.10.1 Alternative 1 – GSN (Preferred Alternative)**

23 No cumulative impacts on land and submerged land use in Saipan would occur. Alternative 1 is
24 consistent with the Saipan Zoning Law of 2008.

25 **5.3.10.2 Alternative 2 – TNI**

26 No cumulative impacts on land and submerged land use in Tinian would occur. Alternative 2 would be
27 consistent with the CNMI DPL land use designations.

28 **5.3.11 Transportation**

29 **5.3.11.1 Alternative 1 – GSN (Preferred Alternative)**

30 Saipan has the largest roadway network in the Mariana Islands. Most roadways operate at an acceptable
31 LOS. The exception is Beach Road north of As Perdido Road, which operates at LOS E or F. Pavement
32 conditions on Saipan tend to be poor as a result of drainage issues and the use of coral and acidic-based
33 pavement materials (CNMI DPW 2009). Short-term, minor to moderate, adverse, cumulative impacts
34 and long-term, minor to moderate, adverse, cumulative impacts would be expected on ground
35 transportation in Saipan.

36 Individually, all ongoing and reasonably foreseeable construction activities on Saipan could have
37 short-term, negligible to minor, adverse impacts on the local transportation network. Impacts on
38 transportation during construction activities include increased traffic congestion from workers commuting

1 to and from the job site, and increased delivery of goods and miscellaneous trips needed to support
2 construction activities. Additionally, road maintenance and construction would be expected to result in
3 lane or road closures, temporarily increasing traffic congestion and delays while active construction is
4 occurring. Projects occurring at the same time and in the same vicinity have the greatest potential for
5 adverse, cumulative impacts on the transportation network. Short-term, minor to moderate, adverse,
6 cumulative impacts on transportation systems could occur.

7 Specific short-term road improvements along the proposed fuel truck route include the following
8 (CNMI DPW 2009):

- 9 • Intersection modifications at Chalan Monsignor Guerrero and Chalan Pale Arnold
- 10 • Intersection modifications at Chalan Monsignor Guerrero and Beach Road
- 11 • Intersection modifications at Chalan Pale Arnold and Navy Hill Road
- 12 • Intersection modifications at Tun Herman Pan and Flame Tree Drive
- 13 • Intersection modifications at Beach Road and Chalan Monsignor Martinez
- 14 • New traffic signal installation at the intersection of Beach Road and Tun Segundo Street
- 15 • Pedestrian crossing relocation on Chalan Pale Arnold near Commonwealth
- 16 • Mid-block or signalized crosswalk additions on Beach Road
- 17 • Speed enforcement on Chalan Monsignor Guerrero and Chalan Pale Arnold
- 18 • Hazard elimination along Route 30 (Chalan Pale Arnold).

19 Specific long-range road improvements along the proposed fuel truck route include the following
20 (CNMI DPW 2009):

- 21 • Construct pedestrian facilities and bike lanes along Chalan Pale Arnold
- 22 • Upgrade drainage along Chalan Monsignor Guerrero near Chalan Tun Herman Pan Road
- 23 • Widen Beach Road from Chalan Monsignor Guerrero to Afetna to install two-way left-turn lane
- 24 • Upgrade and improve Route 35 (Chalan Tun Herman Pan).

25 Other short- and long-term transportation improvements are also planned in the vicinity of the proposed
26 fuel truck route. These road improvement projects would result in long-term, minor to moderate,
27 beneficial impacts on the Saipan transportation network by increasing road safety and capacity. However,
28 no cumulative beneficial impacts would be expected as a result of implementing the Proposed Action
29 under Alternative 1. Ongoing or reasonably foreseeable projects that would be expected to dramatically
30 increase the population have not been identified in this analysis, but the population has increased over the
31 past few decades. It is reasonable to assume that population will continue to increase, independent of
32 implementation of Alternative 1, and any population increase would add to existing road congestion.
33 Planned road improvements would help accommodate some population growth. The long-term, periodic
34 traffic increases associated with Alternative 1 would have a minor, adverse contribution to cumulative
35 impacts on the Saipan transportation network.

36 5.3.11.2 Alternative 2 – TNI

37 All roadways in Tinian operate at LOS A. Pavement conditions tend to be poor as a result of drainage
38 issues and the use of coral and acidic-based pavement materials (CNMI DPW 2009). Short-term, minor
39 to moderate, adverse, cumulative impacts and long-term, minor to moderate, beneficial, cumulative
40 impacts would be expected on ground transportation in Tinian. Long-term, adverse, cumulative impacts
41 would be minor.

1 Individually, all construction activities on Tinian could have short-term, negligible to minor, adverse
2 impacts on the local transportation network. Impacts on transportation during construction-type activities
3 include increased traffic congestion from workers commuting to and from the job site and increased
4 delivery of goods and miscellaneous trips needed to support construction activities. Additionally, road
5 maintenance and construction would be expected to result in lane or road closures, temporarily increasing
6 traffic congestion and delays while active construction is occurring. Projects occurring at the same time
7 and in the same vicinity have the greatest potential for adverse impacts on the transportation network.
8 Short-term, minor to moderate, adverse impacts on transportation systems could occur.

9 Specific short-term road improvements include implementing a directional and guide sign program in San
10 Jose Village, which is in the vicinity of the proposed fuel truck route. Long-term road improvement
11 projects include upgrading and improving Broadway (south of the proposed fuel truck route); upgrading
12 and paving roadways and constructing sidewalks in San Jose Village (near proposed fuel truck route); and
13 upgrading major roadways in Lower Pina, Marpo, and Carolinas (east of fuel truck route) (CNMI DPW
14 2009). These road improvement projects would result in long-term, minor to moderate, beneficial
15 impacts on the Tinian transportation network by increasing road safety and capacity. However, no
16 cumulative beneficial impacts would be expected due to implementing the Proposed Action under
17 Alternative 2. In addition to the implementation phase associated with Alternative 2, several projects are
18 planned on Tinian that could result in increased roadway use, including the casino development and the
19 relocated Marine Corps training and operations. However, since all roadways operate at an acceptable
20 LOS and have substantial excess capacity, it is anticipated that long-term, cumulative impacts from
21 increased traffic would be minor.

22 5.3.12 Hazardous Materials and Wastes

23 5.3.12.1 Alternative 1 – GSN (Preferred Alternative)

24 Short- and long-term, minor, adverse cumulative impacts associated with hazardous materials, hazardous
25 wastes, and petroleum products would be expected from Alternative 1. Implementation of many of the
26 projects identified in **Table 5-1** would require increased quantities of hazardous materials and petroleum
27 products to be delivered, stored, and used on Saipan on a short-term basis during construction and on a
28 long-term basis during facility operations. Increases in hazardous materials, hazardous wastes, and
29 petroleum products when combined with the effects from Alternative 1 would not be significant. No
30 cumulative impacts would result with respect to existing contamination areas, ACMs, LBP, PCB,
31 pesticides, and radon.

32 5.3.12.2 Alternative 2 – TNI

33 Short- and long-term, minor, adverse cumulative impacts associated with hazardous materials, hazardous
34 wastes, and petroleum products would be expected from Alternative 2. Implementation of many of the
35 projects identified in **Table 5-1** would require increased quantities of hazardous materials and petroleum
36 products to be delivered, stored, and used on Tinian on a short-term basis during construction and on a
37 long-term basis during facility operations. A proposed project to construct an airport fuel farm at TNI to
38 accommodate various types of commercial and private aircraft flying direct from Asia would provide TNI
39 with additional jet fuel storage capacity and possibly jet fuel transfer infrastructure beyond that proposed
40 under Alternative 2. Increases in hazardous materials, hazardous wastes, and petroleum products when
41 combined with the effects from or Alternative 2 would not be significant. No cumulative impacts would
42 result with respect to existing contamination areas, ACMs, LBP, PCB, pesticides, and radon.

1 **5.3.13 Infrastructure and Utilities**

2 **5.3.13.1 Alternative 1 – GSN (Preferred Alternative)**

3 Long-term, moderate, adverse and beneficial, cumulative impacts on several infrastructure resources
4 would be expected. Intermittent, short-term, minor, adverse, cumulative impacts might also occur for
5 utility interconnections during construction.

6 Implementation of Alternative 1 would contribute to long-term, moderate, beneficial, cumulative impacts
7 on the infrastructure at the airfield, the communications system at GSN, and the aviation fuel supply
8 system at the seaport and GSN.

9 The electrical system, storm water drainage and conveyances, wastewater system, and water supply
10 system are in poor condition and require upgrades. There are ongoing or reasonably foreseeable projects
11 to address some of these issues. Future projects to improve the electrical system include geothermal,
12 wind, and solar power development. Additionally, P.L. 15-87 promotes the integration of renewable
13 energy sources into the grid distribution system on Saipan (DON 2010a). The water/wastewater system
14 will be undergoing planned upgrades until 2020. The water supply system is also going planned upgrades
15 until 2020 to meet CWA and SDWA requirements. CNMI DEQ's storm water management regulations
16 and BMPs help to control the storm water management issues. It is possible that development projects
17 and increases in population on Saipan would increase the burden on the electrical, storm drainage,
18 wastewater, and water supply systems, resulting in short-term, minor to moderate, adverse, cumulative
19 impacts. However, it is anticipated that ongoing and reasonably foreseeable improvements to these
20 infrastructure systems will help meet current and future demand and also improve utility reliability.
21 Overall, long-term, minor to moderate, beneficial, cumulative impacts are anticipated from
22 improvements.

23 Alternative 1 and other development projects would result in short- and long-term, minor, adverse
24 cumulative impacts on the solid waste system. There would be no anticipated cumulative impacts on the
25 heating and cooling and natural gas systems.

26 **5.3.13.2 Alternative 2 – TNI**

27 Long-term, moderate, adverse and beneficial, cumulative impacts on several infrastructure resources
28 would be expected. Intermittent, short-term, minor, adverse, cumulative impacts might also occur for
29 utility interconnections during construction.

30 Implementation of Alternative 2 and other ongoing and reasonably foreseeable projects would contribute
31 to long-term, moderate, beneficial, cumulative impacts on TNI and seaport, airport communications
32 system, and aviation fuel supply and refueling capability.

33 Tinian's electrical system is in good condition. Implementation of Alternative 2 and other ongoing and
34 reasonably foreseeable projects (e.g., new casinos) would result in short- and long-term, minor, adverse
35 cumulative impacts on the electrical system, particularly if several additional casinos open.

36 The water supply system on Tinian is sufficient; however, approximately 50 percent of the water supply
37 is lost due to leaks in the system. Implementation of Alternative 2 and other ongoing and reasonably
38 foreseeable projects (e.g., new casinos) would result in short- and long-term, minor, adverse cumulative
39 impacts on the water supply system.

1 Storm water management is a major concern on Tinian. Past development activities on the island have
2 resulted in storm water management issues. New development projects (e.g., new casinos) have the
3 potential to result in short- and long-term, minor, adverse cumulative impacts on storm water
4 management. CNMI DEQ's storm water management regulations and BMPs would help to control the
5 storm water management issues.

6 All solid waste on Tinian is shipped off island for disposal. Implementation of Alternative 2 and ongoing
7 and reasonably foreseeable projects would result in short- and long-term, moderate, adverse, cumulative
8 impacts on the solid waste system.

9 Tinian has septic systems throughout the island; therefore, there would be no cumulative impacts on the
10 wastewater system. Additionally, there would be no anticipated cumulative impacts on the heating and
11 cooling and natural gas systems.

12 5.3.14 Socioeconomics and Environmental Justice

13 5.3.14.1 Alternative 1 – GSN (Preferred Alternative)

14 Socioeconomics

15 **Population Characteristics.** Short-term, adverse, cumulative impacts could occur. None of the projects
16 considered in this cumulative analysis would directly result in significant permanent increases to the
17 populations of Saipan, except perhaps casino resort development. Similar to Alternative 1, several
18 development projects would likely result in short-term temporary and long-term periodic population
19 increases in Saipan. The quantity and source of construction workers used for development projects are
20 not known. However, due to the small workforces on Saipan it is likely that foreign workers would make
21 up portions of the workforce on each project. If construction for Alternative 1 overlapped temporally
22 with construction of other development projects, there could be a cumulative impact due to the combined
23 temporary population increases.

24 **Housing.** Short-term, adverse, cumulative impacts could occur. The quantity and source of construction
25 workers for all ongoing and reasonably foreseeable projects are not known. However, it is likely that
26 foreign workers would make up portions of the construction workforce on each project, and these workers
27 would need temporary housing. Saipan has a larger supply of possible housing than Tinian, although
28 there is a limited supply of hotels and other housing units on both islands. If construction of the Proposed
29 Action occurred simultaneous to the construction of other development projects, there would be a
30 cumulative impact on housing due to possible shortages.

31 **Economic Characteristics.** Construction of other projects and the Proposed Action would result in
32 short-term and long-term beneficial cumulative impacts on the economy of Saipan due to increases in
33 employment and spending on goods and services. Indirect beneficial impacts would likely result from
34 secondary increased spending from the increased population (construction workers and long-term
35 personnel), and economic advantages of the increased efficiency and enhancement of infrastructure on
36 Saipan. Therefore, combination of Alternative 1 with other cumulative projects would result in
37 significant short-term and long-term, beneficial, cumulative impacts on the local economy.

38 **Public Services.** Short-term, adverse, cumulative impacts could occur. Most ongoing and reasonably
39 foreseeable projects, including Alternative 1, would have adverse impacts on public services due to the
40 associated short- and long-term population increases. Population increases would increase demand for
41 public services such as medical, law enforcement, and firefighting services. These services, particularly
42 medical care, are currently strained on Saipan, and it is anticipated that the services would not be able to

1 adequately manage additional demand. Cumulative impacts on public services would result from the
2 construction and implementation of Alternative 1 combined with other projects.

3 **Sociocultural Issues.** Negligible to minor, adverse, cumulative impacts could occur. Alternative 1
4 would not have a significant impact on sociocultural issues. Some of the proposed activities would occur
5 on land that could otherwise be used by local residents, and it would contribute to temporary and periodic
6 population increases that could stress the local communities. Other cumulative projects could result in
7 significant impacts on sociocultural issues in Saipan due to large influxes of temporary foreign workers
8 and permanent displacement of local residents from areas. Cumulative impacts on sociocultural issues
9 would occur, but it is not anticipated that these impacts would be significant.

10 Environmental Justice

11 Based on 2000 U.S. Census data, approximately 98 percent or more of the total populations of Saipan and
12 Tinian are considered minority populations, while 28 percent to 50 percent of each island's population is
13 low-income. The specific areas of impact for each cumulative project are not known; however, there is
14 the potential under Alternative 1 for there to be disproportionately high and adverse impacts on minority or
15 low-income populations due to an increase in aircraft noise. Therefore, there is the potential for
16 disproportionately high and adverse cumulative impacts on minority or low-income populations.

17 5.3.14.2 Alternative 2 – TNI

18 Socioeconomics

19 **Population Characteristics.** Short-term, adverse, cumulative impacts could occur. Cumulative impacts
20 under Alternative 2 would be similar to, but greater than, those described for Alternative 1. If several
21 large construction projects overlapped temporally with Alternative 2 on Tinian, there could be a
22 cumulative impact due to the combined temporary population increases.

23 **Housing.** Short-term, adverse, cumulative impacts could occur. Cumulative impacts under Alternative 2
24 would be similar to, but greater than, those described for Alternative 1. There is a smaller supply of
25 possible housing on Tinian than Saipan, and a limited supply of hotels and other housing units on both
26 islands. If several large construction projects overlapped temporally with Alternative 2 on Tinian, there
27 could be adverse cumulative impacts because the existing housing supply is very low and would not be
28 able to support increases needed for large construction projects.

29 **Economic Characteristics.** Short- and long-term beneficial impacts would be expected. Cumulative
30 impacts under Alternative 2 would be similar to, but greater than, those described for Alternative 1.
31 Alternative 2 could also result in adverse impacts on the local economy due to airport disruptions during
32 construction and implementation, and from the 10,000-foot-long Runway Option that would require
33 rerouting of Broadway and possible displacement of local ranchers. Combination of the adverse impacts
34 of the Proposed Action with other cumulative projects would result in cumulative impacts. Cumulative
35 impacts could occur on Tinian where other projects, including the training activities under the Guam and
36 CNMI Military Relocation, would also periodically or permanently displace persons and place restrictions
37 on land use that prevent its beneficial economic use.

38 **Public Services.** Short-term, adverse, cumulative impacts could occur. Cumulative impacts under
39 Alternative 2 would be similar to those described for Alternative 1.

40 **Sociocultural Issues.** Negligible to minor, adverse, cumulative impacts could occur. Cumulative
41 impacts under Alternative 2 would be similar to those described for Alternative 1.

1 **Environmental Justice**

2 Based on 2000 U.S. Census data, approximately 98 percent or more of the total populations of Saipan and
3 Tinian are considered minority populations, while 28 percent to 50 percent of each island’s population is
4 low-income. The specific areas of impact for each cumulative project are not known; however,
5 disproportionately high and adverse impacts on minority and low-income populations are not expected
6 under Alternative 2. Therefore, disproportionately high and adverse cumulative impacts on minority or
7 low-income populations are also not expected.

8 **5.3.15 Human Health and Safety**

9 **5.3.15.1 Alternative 1 – GSN (Preferred Alternative)**

10 Implementation of Alternative 1, when added to other past, current, and future projects, would result in
11 various short-term and long-term cumulative impacts on health and safety. Short-term, minor, adverse,
12 cumulative impacts could occur during construction, when activities necessary to construct the proposed
13 airport and seaport infrastructure would accumulate with impacts from other projects under construction
14 at Saipan at the same time. The short-term cumulative impacts would generally be on contractor health
15 and safety and airfield safety from activities such as those that increase contractor exposure to hazardous
16 work environments and hazardous materials, increase local construction traffic accessing sites, and create
17 temporary airfield obstructions and changes. Adherence to OSHA, USAF AFOSH, and local regulations
18 would minimize the potential for adverse effects on construction workers. Adherence to DOD, USAF,
19 and FAA regulations and policies would reduce the adverse effects on airfield safety. Alternative 1
20 would not result in short-term, cumulative impacts on military health and safety, public health and safety,
21 and explosive safety.

22 Long-term, adverse and beneficial, cumulative impacts on health and safety would be expected from the
23 operational activities associated with Alternative 1. Long-term, negligible, adverse, cumulative impacts
24 on contractor health and safety, public health and safety, and explosive safety could occur. Construction
25 activities within QD safety zones must be coordinated with appropriate airfield or weapons safety
26 personnel to ensure the safety of construction workers. Implementation of many of the projects identified
27 in **Table 5-1** would result in long-term maintenance and repair of infrastructure by contactors and
28 increases in aircraft and vehicle traffic on the island. Long-term, minor, beneficial, cumulative impacts
29 on military health and safety and airfield safety would be expected from improvements at the airfield,
30 including communications enhancements.

31 **5.3.15.2 Alternative 2 – TNI**

32 Short-term, minor, adverse, cumulative impacts from Alternative 2 could occur during construction, when
33 activities necessary to construct the proposed airport and seaport infrastructure would accumulate with
34 impacts from other projects under construction at Tinian at the same time. Similar to Alternative 1, the
35 short-term, cumulative effects from Alternative 2 would generally be on contractor health and safety and
36 airfield safety from activities such as those that increase contractor exposure to hazardous work
37 environments and hazardous materials, increase local construction traffic accessing sites, and create
38 temporary airfield obstructions and changes. Alternative 2 would not result in short-term, cumulative
39 impacts on military health and safety, public health and safety, and explosive safety.

40 Long-term, adverse and beneficial, cumulative impacts on health and safety would be expected from the
41 operational activities associated with Alternative 2. Long-term, negligible, adverse, cumulative effects on
42 contractor health and safety and explosive safety could occur. Construction activities within QD safety
43 zones must be coordinated with appropriate airfield or weapons safety personnel to ensure the safety of

1 construction workers. Implementation of many of the projects identified in **Table 5-1** would result in
2 long-term maintenance and repair of infrastructure by contactors and increases in aircraft and vehicle
3 traffic on the island, particularly from casino resort development. Long-term, minor, beneficial,
4 cumulative impacts on military health and safety would be expected from improvements at the airfield,
5 including communications enhancements. Long-term, minor, adverse, cumulative impacts on public
6 health and safety and airfield safety would primarily be associated with the increased air traffic associated
7 with the casino resort development.

8 **5.4 Unavoidable Adverse Effects**

9 Unavoidable adverse impacts would result from implementation of any of the alternatives. Minor,
10 adverse impacts on soils, storm water management, vegetation, wildlife, air quality, the noise
11 environment, and traffic congestion would be unavoidable during construction activities but not
12 significant.

13 **5.5 Relationship Between Short-Term Uses and Long-Term Productivity**

14 Short-term uses of the biophysical components of the human environment include direct impacts, usually
15 related to construction activities, which occur over a period of less than 5 years. Long-term uses of the
16 human environment include those impacts that occur over a period of more than 5 years, including
17 permanent resource loss.

18 This EIS identifies potential short-term, adverse impacts on the natural environment as a result of
19 construction activities. These adverse impacts include noise emissions, air emissions, soil erosion, storm
20 water runoff into surface water, and increased traffic. The long-term and essentially permanent loss of
21 vegetation and soil to impervious surfaces would have irreversible and irretrievable impacts on natural
22 resources. However, development of either the GSN or TNI would be expected to increase the long-term
23 economic productivity of either Saipan or Tinian while protecting and preserving historical importance of
24 the islands and their cultural resources.

25 **5.6 Irreversible and Irretrievable Commitments of Resources**

26 An irreversible or irretrievable commitment of resources refers to impacts on or losses to resources that
27 cannot be reversed or recovered, even after an activity has ended and facilities have been
28 decommissioned. A commitment of resources is related to use or destruction of nonrenewable resources,
29 and the impacts that loss will have on future generations.

30 Improvement and periodic use of the airport or airports selected would involve the irreversible and
31 irretrievable commitment of materials, energy, terrestrial biota and soil, landfill space, and human
32 resources. The impacts on these resources would be permanent.

33 **Materials.** Material resources irretrievably used for airport improvements would include steel, concrete,
34 and other building materials. Such materials are not in short supply and would not be expected to limit
35 other unrelated construction activities. The irretrievable use of material resources would not be
36 considered significant.

37 **Energy.** Energy resources used for the Proposed Action and airport improvements would be irretrievably
38 lost. These include fossil fuels (e.g., gasoline, diesel, natural gas) and electricity. During construction
39 and utilization of the airport, gasoline and diesel fuel would be used for the operation of construction
40 vehicles, transportation vehicles, and equipment. Overall, consumption of energy resources would not

1 place a significant demand on their availability in the region. Therefore, no significant impacts would be
2 expected.

3 **Terrestrial Biota and Soils.** Airport improvements would result in some irretrievable loss of wildlife
4 habitat and soil resources. This result would be a permanent loss or conversion.

5 **Landfill Space.** The generation of construction debris and subsequent disposal of that debris in a landfill
6 would be an irretrievable, adverse impact. Construction contractors would be expected to recycle, to the
7 greatest extent possible, any debris that is generated. Recycling wastes would reduce irretrievable
8 impacts on landfills. However, any waste that is generated by the Proposed Action that is disposed of in a
9 landfill would be considered an irretrievable loss of that landfill space.

10 **Human Resources.** The use of human resources for construction is considered an irretrievable loss only
11 in that it would preclude such personnel from engaging in other work activities. However, the use of
12 human resources represents employment opportunities and is considered beneficial.

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8. Acronyms and Index

8.1 Acronyms and Abbreviations

$\mu\text{g}/\text{m}^3$	micrograms per cubic meter	BEAR	Basic Expeditionary Airfield Resources
A5U	Strategy, Policy, and Requirements Division	BFOL	Bomber Forward Operating Location
ACHP	Advisory Council on Historic Preservation	BGRT	Business Gross Revenue Tax
ACM	Asbestos-Containing Material	BMP	Best Management Practice
ADT	average daily traffic	C&D	Construction and Development
AFB	Air Force Base	CAA	Clean Air Act
AFH	Air Force Handbook	CEDS	Comprehensive Economic Development Strategic
AFI	Air Force Instruction	CEQ	Council on Environmental Quality
AFMAN	Air Force Manual	CERAP	FAA Center Radar Approach Control
AFOSH	Air Force Occupational and Environmental Safety, Fire Protection, and Health	CFR	Code of Federal Regulations
AFPD	Air Force Policy Directive	CGP	Construction General Permit
AGE	Aerospace Ground Equipment	CHC	Commonwealth Health Center
AGL	Above Ground Level	ChST	Chamorro Standard Time
AIP	Agreed Implementation Plan	cm	centimeters
ALSF	approach lighting system with sequenced flashing	CMC	Commonwealth Code
AMC	Air Mobility Command	CNMI	Commonwealth of the Northern Mariana Islands
AMDTF	U.S. Army Air and Missile Defense Task Force	CO	carbon monoxide
AOR	Area of Responsibility	CO ₂	carbon dioxide
APC	Area of Particular Concern	CPA	Commonwealth Ports Authority
APE	area of potential effect	CRM	Coastal Resources Management
AQCR	air quality control region	CTAF	Common Traffic Advisory Frequency
ARFF	Airport Rescue and Firefighting	CUC	Commonwealth Utilities Corporation
ARTA	Aircraft Rescue Training Area	CWA	Clean Water Act
ARTCC	Air Route Traffic Control Center	CZ	clear zones
AST	Aboveground Storage Tank	CZMA	Coastal Zone Management Act
ATC	Air Traffic Control	DAWR	Division of Aquatic and Wildlife Resources
ATCAA	Air Traffic Control Assigned Airspace	dba	A-weighted decibel
AWI	Air Wing Instruction	DDESB	Department of Defense Explosive Safety Board
BAMS	Broad Area Maritime Surveillance	DEQ	Division of Environmental Quality
BASH	Bird/Wildlife Aircraft Strike Hazard		
bbl(s)	barrel(s)		

DLNR	Department of Lands and Natural Resources	GATR	Guam Aviation Training Relocation
DME	Distance Measuring Equipment	GEPA	Guam Environmental Protection Agency
DNL	Day-Night Average Sound Level	GHG	greenhouse gas
DOD	Department of Defense	gph	gallons per hour
DOI	Department of the Interior	gpm	gallons per minute
DON	Department of the Navy	GRO	Rota International Airport
DOT	Department of Transportation	GSN	Francisco C. Ada Saipan International Airport
DPL	Department of Public Lands	GUM	A.B. Won Pat International Airport
DPS	Department of Public Safety		
DPW	Department of Public Works	GVW	gross vehicle weight
DRMO	Defense Reutilization and Marketing Office	HACCP	Hazard Analysis and Critical Control Points
ECM	Earth-Covered Magazine	HE	Harvest Eagle
ECU	Environmental Control Unit	HF	Harvest Falcon
EIAP	Environmental Impact Analysis Process	HIES	Household, Income, and Expenditures Survey
EIS	Environmental Impact Statement	HIRL	Runway Edge Lights, High Intensity
EISA	Energy Independence and Security Act	HPO	Historic Preservation Office
ELG	Effluent Limitation Guideline	HSV	Hydrant Servicing Vehicle
EMUA	Exclusive Military Use Area	HUD	Department of Housing and Urban Development
EO	Executive Order	IBB	U.S. Government International Broadcasting Bureau
ERS	Economic Restoration Summit		
ESA	Endangered Species Act	IBD	Inhabited Building Distance
ESCP	Erosion-and-sediment-control plan	ICE	Internal Combustion Engines
ETL	Engineering Technical Letter	IFR	Instrument Flight Rules
FAA	Federal Aviation Administration	IICEP	Interagency and Intergovernmental Coordination for Environmental Planning
FAR	Federal Aviation Regulation		
FDM	Farrallon de Medinilla	ILS	Instrument Landing System
FEMA	Federal Emergency Management Agency	INRMP	Integrated Natural Resources Management Plan
FIR	Flight Information Region	IO	Isolated Occurrences
FIRM	Flood Insurance Rate Map	ISR/Strike	Intelligence, Surveillance, Reconnaissance, and Strike
FOD	foreign object debris		
FPPA	Farmland Protection Policy Act	J4	Joint Region Marianas Regional Engineer
FR	Federal Register	JDF	Japanese Defense Force
ft ²	square feet	JGPO	Joint Guam Program Office
ft ³	cubic feet	JLOTS	Joint Logistics Over the Shore
FY	Fiscal Year	JSF	Joint Strike Fighter

JTREG	Joint Region Marianas	MWh	Megawatt Hours
MARIANAS		NAAQS	National Ambient Air Quality Standards
kg	kilogram	NAVAID	Navigational Aid
km	kilometers	NAVAIR	Naval Air Warfare
km ²	square kilometers	NAVFAC	Naval Facilities Engineering Command, Pacific
kV	kilovolt	PAC	
kVA	kilovolt-ampere	NDB	Non-Directional Beacon
kW	kilowatt	NEO	non-combatant evacuation operation
LBA	Leaseback Area	NEPA	National Environmental Policy Act
LBP	Lead-based Paint	NEW	Net Explosive Weight
LFB	low flyby	NHLS	National Historic Landmark System
LFP	low flight pattern	NHPA	National Historic Preservation Act
LOC	Localizer	NKK	Nanyo Kohatsu Kabushiki Kaisha
LOS	level of service	NM	nautical miles
LTO	landing and takeoff	NM ²	square nautical miles
MAJCOM	Major Command	NMFS	National Marine Fisheries Service
MALSR	Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights	NO ₂	nitrogen dioxide
MARFORPAC	Marine Corps Forces Pacific	NOA	Notice of Availability
MBTA	Migratory Bird Treaty Act	NOAA	National Oceanic and Atmospheric Administration
mg/m ³	milligrams per cubic meter	NOI	Notice of Intent
mi ²	square miles	NOTAM	Notice to Airmen
MIMC	Military Integration Management Committee	NPDES	National Pollutant Discharge Elimination System
MIRC	Mariana Island Range Complex	NRCS	Natural Resources Conservation Service
MIRL	Runway Edge Lights, Medium Intensity	NRHP	National Register of Historic Places
MITT	Mariana Islands Training and Testing	NRIS	National Register Information System
MLA	Military Lease Area	NSPS	New Source Performance Standards
mm	millimeters	O ₃	ozone
MMPA	Marine Mammal Protection Act	OEIS	Overseas Environmental Impact Statement
MOA	Memorandum of Agreement	OFZ	Obstacle Free Zone
MOUT	Military Operations in Urban Terrain	OPA	Oil Pollution Act
mph	miles per hour	OSHA	Occupational Safety and Health Administration
MRDC	Marianas Report Development Co.	P.L.	Public Law
MS4	Municipal Separate Storm Sewer System		
MSDS	Material Safety Data Sheet		
MSWF	Marpi Solid Waste Facility		
MW	Megawatts		

PA	Programmatic Agreement	SMS	Safety Management System
PACAF	Pacific Air Forces	SO ₂	sulfur dioxide
PAPI	precision approach path indicator	SPCC	Spill Prevention, Control, and Countermeasures
Pb	lead	SQG	Small Quantity Generator
PCB	polychlorinated biphenyl	SSPP	Strategic Sustainability Performance Plan
pCi/L	picocuries per liter	SUA	Special Use Airspace
PM ₁₀	Particulate Matter 10 microns in diameter	SWPPP	Storm Water Pollution Prevention Plan
PM _{2.5}	Particulate Matter 2.5 microns in diameter	TERPS	Terminal instrument procedures
PMIC	Pacific Marine Industrial Corporation	TGO	touch and go
ppb	parts per billion	TIM	Time-in-mode
PPE	Personal Protection Equipment	TMDL	Total Maximum Daily Load
ppm	parts per million	TNI	Tinian International Airport
PSD	Federal Prevention of Significant Deterioration	TPH	Total Petroleum Hydrocarbon
PTR	Public Traffic Route	tpy	Tons per year
PVASI	Pulsating Visual Approach Slope Indicator	TSA	Transportation Security Administration
QD	Quantity-Distance	TSCA	Toxic Substances Control Act
QDR	Quadrennial Defense Review	U.S.C.	United States Code
RCRA	Resource Conservation and Recovery Act	UFC	Unified Facilities Criteria
REIL	Runway End Identifier Lights	UNICOM	universal communication
ROD	Record of Decision	USACE	U.S. Army Corps of Engineers
ROPU	Reverse Osmosis Purification Unit	USAF	U.S. Air Force
RPZ	Runway Protection Zone	USDA-WS	U.S. Department of Agriculture-Wildlife Services
RSA	Runway Safety Area	USEPA	U.S. Environmental Protection Agency
RT	Revenue Tons	USFJ	United States Forces Japan
SAF/IE	Assistant Secretary of the Air Force for Installations, Environment and Logistics	USFWS	U.S. Fish and Wildlife Service
SARS	severe acute respiratory syndrome	USGS	U.S. Geological Survey
SCC	Source classification codes	USMC	U.S. Marine Corps
SDC	Secondary Distribution Center	yds ³	cubic yards
SDWA	Safe Drinking Water Act	VASI	Visual Approach Slope Indicator
SEL	Sound Exposure Level	VFR	Visual Flight Rules
SHPO	State Historic Preservation Office	WHA	Wildlife Hazard Assessments
SIP	State Implementation Plan	WHMP	Wildlife Hazard Management Plan
		WTO	World Trade Organization

8.2 Index

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