

## **CHAPTER 16.**

# **SOCIOECONOMICS AND GENERAL SERVICES**

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Because of the relatively small size of the island of Guam, most of the anticipated socioeconomic impacts of the proposed action are expected to affect the island as a whole. Therefore, many of the sections in this chapter are not divided by geographical area, as on other chapters of this Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS). Instead, this chapter begins with an Affected Environment section that provides a current and historical perspective on the socioeconomic status of the island of Guam, including Population Characteristics, Economic Characteristics, Public Services, and Sociocultural Issues. This affected environment section provides the baseline context for the analysis of the relocation of Marines to Guam and other proposed and connected actions, including off base roadways. A socioeconomic impact analysis is then provided with respect to four major components of Environmental Consequences: Population Impacts, Economic Impacts, Public Services, and Sociocultural Impacts. This chapter then concludes with a Summary of Impacts and a Summary of Potential Mitigation Measures.

As part of the analysis, this chapter summarizes a detailed socioeconomic analysis performed in 2008-2009 and documented in a Socioeconomic Impact Analysis Study (SIAS) that is provided in its entirety in Appendix F. This impact analysis was prepared with the best currently available information on relevant topics such as construction conditions, military personnel numbers, and relocation schedules. However, ongoing federal legislative, planning, and scheduling decisions could result in changes to various input assumptions and thus also to the projected impacts.

### **16.1 AFFECTED ENVIRONMENT**

#### **16.1.1 Definition of Resource**

Socioeconomics is defined as the basic attributes and resources associated with the human environment. Socioeconomic “resources” include population size and demographics; employment and income; economic activity (including interaction of economic sectors with the military); government-funded health and human services; and social cohesion (including, but not limited to, Chamorro issues and military-civilian relations).

Because of the diversity of these topics, other resource chapters in Volume 2 of this EIS/OEIS discuss related concerns for the proposed relocation of Marines to Guam. When appropriate, the reader will be referred to such chapters for further information and discussion.

#### **16.1.2 Historical and Economic Overview**

The discussion in this section is limited to the time period following World War Two (WWII). However, it should be noted that Guam’s socioeconomic history was heavily influenced by 400 years of Spanish rule, historic American occupation, the battles of WWII, and the Japanese occupation. Since WWII, Guam’s economic history has been volatile, led by changes in population and global events in the military, social, and natural spheres. This section chronologically presents the most important changes.

Post-war reconstruction and the formation of new United States (U.S.) military bases were the basis for Guam’s first major economic expansion and the initial placement of contemporary infrastructure. During this period of reconstruction, Guam’s population experienced substantial increase – from a pre-war 1940

level of 22,900 (with a military and dependent population of 1,427) to 59,498 (with a military and dependent population of 26,617) in 1950 (U.S. Census Bureau 2008a).

The 1950s brought with it a shift in military governance, presence, and focus on Guam. Two important events took place in 1950: Congress enacted the Organic Act of 1950 and the major hostilities of the Korean War began. The Organic Act re-designated the island of Guam as an unincorporated territory of the U.S., passing its control from the U.S. Navy to the Department of the Interior (DoI) and granting a greater measure of self-governance to the people of Guam. The destruction caused by Typhoon Alice in 1954 required that the U.S. military shift its focus on Guam from base construction to the island's public works. Although the ongoing Korean War and the Cold War with the Soviet Union required a continued military presence on Guam, the island's military population experienced an overall decline of 15% between 1950 and 1960 (Table 16.1-1).

**Table 16.1-1. Combined Military and their Dependents Population on Guam, Selected Years**

1950	1960	1970	1980	1987	1990
26,617	23,300	19,777	20,000	23,790	19,610
1993	1994	1997	2000	2003	2007
22,077	15,865	13,002	11,624	11,832	14,110

Source: U.S. Census Bureau 2008a

In the 1960s, Super Typhoon Karen brought considerable damage to Guam, destroying temporary and permanent structures, and leaving many residents homeless in its wake. The lifting of visitor security clearance requirements, combined with the initiation of Pan American Airway services from Japan to Guam in 1967, sparked opportunities for direct growth of Guam's tourist industry. This growth also led to indirect growth in related industries such as construction, recreational fishing and diving, commercial fishing and retail trade.

Guam's economy stagnated in the 1970s and early 1980s, partially in response to the 1973 Organization of the Petroleum Exporting Countries (OPEC) oil embargo. Construction activity and visitor arrivals declined over the decade. Poor economic conditions continued into the 1980s. However, the economic trend stabilized from 1982 to 1984 and improved between 1985 and the end of the decade. In the latter part of the 1980s, Cold War military spending and the closing of U.S. bases in the Philippines increased Guam's military population (including dependents) to a level not seen since the 1960s (23,800 in 1987), thereby adding to its economic base.

The late 1980s brought fluctuation and an eventual decrease to military population levels on Guam that lasted through the 1990s. Troops temporarily transplanted from closed Philippine bases were relocated at the end of the 1980s resulting in a new post-war military population low of 19,600 in 1990. The Base Realignment and Closure (BRAC) process led to the closure of Naval Air Station Hagatna (also referred to as Naval Air Station Agana) causing the military population on Guam to fall from 22,077 in 1993 to 15,865 in 1994. By 2000 Guam's military and dependent population was 11,624.

Guam's Asia-oriented visitor base expanded and peaked between 1995 and 1997, generating substantial increases in the construction of hotels and condominiums. However, the 1997 collapse of Asian financial markets, compounded by the crash of a Korean Air Lines plane full of visitors, led to a 12.4% decline on Guam's primary Japanese market and an 83% decline in its secondary Korean market from 1997 to 1998 (Guam Bureau of Statistics and Plans 2006). While visitor numbers have increased since that low mark, the peak levels experienced in the mid-1990s have yet to be recaptured.

From 2000 through 2008, Guam's economy has continued to mirror its volatile recent past. In 2000, the visitor industry appeared poised to regain health. This was stymied however by the attacks of September 11 in 2001, the costly Super Typhoon Pongsona in 2002, and the pandemic of severe acute respiratory syndrome in 2003. From 2001 to 2003, Guam's economy contracted: unadjusted for inflation, total payroll declined by 2%, employment declined by 4%, and individual salaries increased by only 1%. From 2004 to 2006, partially in response to the announcement of the proposed action, Guam's economy has once again showed signs of expansion. Using 2005 data, a study for the Guam Visitors Bureau (GVB) (GVB 2007) found that tourism was the island's second largest private industry (following Finance, Insurance, and Real Estate) and both the primary Japanese and second Korean market were growing at that time.

As of the end of 2008, Guam's real estate market has shown signs of slowing. Commercial real estate on Guam has declined in value due to worldwide issues of tight credit and declines in consumer discretionary spending. Reports show that Guam real estate sales and construction activity have dropped from 2007 levels due to the global economic decline coupled with a moratorium on development in the Tumon Bay area, that at the time of writing continues to be under debate (Captain 2008b). By the end of 2008, international economic conditions plus other market and demographic factors produced declining year-over-year trends for a variety of key tourism indicators, including total arrivals, hotel occupancy rates and taxes, and hotel room-nights sold (GVB 2008, Guam Hotel and Restaurant Association 2008).

### 16.1.3 Population Characteristics

#### 16.1.3.1 Overall Trends

As of the most recent full U.S. Census of 2000, Guam's population was 154,805. In 2008, the U.S. Census Bureau provided a more recent estimate of Guam's population of 175,877 (U.S. Census Bureau 2008a). The island's population has grown substantially since becoming a U.S. Territory. From 1950 to 2000 Guam's population grew at an average rate of 21% per decade (about 2.1% annually). However, as is shown in Table 16.1-2, the Census Bureau projects (without the proposed action) that this growth will taper off, possibly due to out-migration rates observed around 2002, when the estimates in this table were made.

**Table 16.1-2. Annual Rate of Increase on Guam's Population**

	1950- 1960	1960- 1970	1970- 1980	1980- 1990	1990- 2000	2000- 2008	2010- 2020*	2020-2030*
Annual Population Increase	1.2%	2.4%	2.2%	2.3%	1.5%	1.6%	1.2%	0.9%

\* Estimated.

Source: U.S. Census Bureau 2008a

#### 16.1.3.2 Demographics

Table 16.1-3 shows Guam's population growth and changing ethnic mix from 1920 to 2000. Between 1990 and 2000, the percentage representation of Chamorro and Caucasian ethnicities on Guam's population declined, while Filipino and "Other" ethnicities (most often composed of other Asian or Pacific Islander ethnicities) increased. Some changes in ethnic percentages reflect differences in Census definitions over time. However, the dramatic changes in the Chamorro and Caucasian percentages from 1940 to 1950 are a product of WWII, when the U.S. military buildup resulted in population increases of other ethnicities on Guam.

**Table 16.1-3. Guam-Wide Total Population and Ethnicity, 1920-2000**

	1920	1930	1940	1950	1960	1970	1980	1990	2000
Total Population	13,275	18,509	22,290	59,498	67,044	84,996	105,979	133,152	154,805
<b>Ethnicity</b>									
Chamorro/Part-Chamorro	92%	89%	91%	46%	52%	N/A	45%	43%	42%
Caucasian	2%	7%	4%	39%	31%	N/A	8%	14%	7%
Filipino	3%	2%	3%	12%	13%	N/A	21%	23%	26%
Other	3%	3%	3%	4%	4%	N/A	26%	20%	25%

Source: U.S. Census Bureau 2000a

Table 16.1-4 provides demographic information for Guam and the island's individual villages for the year 2000. The three largest village populations are in the northern villages of Dededo and Yigo and the centrally-located village of Tamuning.

**Table 16.1-4. Demographic Characteristics 2000, Guam Total and Individual Villages**

	Population/Gender			Ethnicity						Median Age	Place of Birth				Education (25 yr. and over pop)	
	Total	Male	Female	Chamorro/Pt Chamorro	Filipino	Caucasian	Other Pacific Islander	Other	Guam		Other U.S.	Philippines	Other Pacific Islands	High School	College Degree	
Guam Totals	154,805	79,181	75,624	42%	26%	7%	8%	17%	27.1	52%	12%	21%	7%	52%	25%	
North	Dededo	42,980	21,645	21,335	30%	45%	3%	8%	13%	27	46%	7%	35%	7%	50%	23%
	Yigo	19,474	9,999	9,475	27%	31%	15%	8%	19%	25	40%	23%	25%	7%	53%	26%
	Tamuning	18,012	9,420	8,592	18%	26%	8%	10%	37%	32	31%	11%	22%	9%	49%	31%
Central	Barrigada	8,652	4,320	4,332	56%	19%	5%	7%	13%	28.3	62%	9%	15%	7%	53%	25%
	Mangilao	13,313	6,958	6,355	47%	22%	4%	11%	16%	27.4	55%	8%	18%	10%	50%	23%
	Mongmong-Toto-Maite	5,845	2,895	2,950	53%	16%	4%	13%	15%	27.1	60%	8%	13%	11%	54%	22%
	Hagåtña	1,100	672	428	49%	16%	4%	17%	14%	31.8	52%	8%	14%	15%	51%	21%
	Sinajana	2,853	1,433	1,420	73%	7%	4%	6%	9%	28.7	73%	10%	6%	6%	55%	23%
	Agana Heights	3,940	1,946	1,994	68%	10%	6%	7%	8%	28.1	68%	13%	9%	6%	53%	28%
	Chalan Pago-Ordot	5,923	3,011	2,912	53%	11%	5%	6%	26%	27.3	66%	10%	11%	7%	55%	22%
	Asan	2,090	1,078	1,012	71%	8%	8%	5%	8%	28.9	70%	15%	6%	5%	56%	24%
	Piti	1,666	882	784	60%	7%	16%	3%	14%	30.3	60%	22%	7%	4%	50%	31%
	South	Yona	6,484	3,242	3,242	70%	5%	6%	4%	15%	24.3	76%	12%	4%	4%	53%
Agat		5,656	2,910	2,746	67%	23%	3%	3%	4%	25.3	70%	7%	18%	3%	52%	19%
Santa Rita		7,500	4,028	3,472	31%	20%	24%	1%	24%	26.3	38%	38%	17%	1%	58%	30%
Talofofo		3,215	1,641	1,574	79%	3%	7%	5%	6%	24.8	78%	12%	2%	5%	55%	22%
Umatac		887	465	422	95%	1%	1%	1%	2%	21.9	91%	6%	1%	1%	66%	6%
Inarajan		3,052	1,546	1,506	86%	2%	2%	2%	8%	23.5	86%	7%	2%	3%	57%	11%
Merizo	2,163	1,090	1,073	89%	1%	3%	2%	5%	23.3	86%	9%	2%	2%	62%	11%	

Source: U.S. Census Bureau 2000a

### North

As of 2000, 40% of Guam's population resided in the Northern region. That percentage has likely increased since that time as Dededo and Yigo have been growing quickly over the past 10 years.

The region was 50.06% male, 49.94% female compared to the overall Guam population (51.15% male, 48.84% female). Ethnically, the Northern region was less Chamorro than the rest of Guam; Dededo was far more Filipino than the rest of Guam (45% vs. 26%) and Yigo was more heavily populated with Caucasians than the Guam average (15% vs. 7%).

The median age of the population in the Northern region was similar to that of Guam's overall population; Dededo's median age was 27 years old and Yigo's was 25 years old compared to Guam's overall median age of 27.1 years old.

A lower percentage of people in the Northern region was born on Guam compared to the rest of the Island; similar to the ethnicity of the areas, a proportionally large percentage of Dededo's population was born in the Philippines (35%) and a proportionally large percentage of Yigo's population was born in other areas of the United States.

In terms of education level, the 2000 Northern region was very similar to the rest of Guam. Dededo has slightly lower percentages of people who have completed high school or college while Yigo had slightly higher percentages than Guam overall.

### Central

As of 2000, 41% of Guam's population resided in the Central region. The most populous villages in the region were Tamuning (18,012) and Mangilao (13,313). Piti and Hagatna were the least populous (1,666 and 1,100, respectively). The Central region was 51.44% male, 48.56% female compared to Guam's overall population (51.15% male, 48.84% female).

Ethnically, the Central region was slightly more Chamorro than the rest of Guam (45% vs. 42%) with the largest Chamorro populations residing in Mangilao and Barrigada. On a percentage basis, Sinajana and Asan were the most heavily Chamorro. Tamuning had the largest Filipino population in 2000; however, the central region is less Filipino than Guam overall (19% vs. 26%).

The Central region tended to be older than Guam overall; the median age in the region was 29.4 years old compared to the overall median age of 27.1 years old. Tamuning had the oldest population on Guam with a median age of 32 years old.

A total of 57% of Central region residents were born on Guam, which is greater than Guam's overall rate of 52%. Mangilao had the highest number of residents who were born on Guam.

In terms of education, the Central region was similar to the rest of Guam. For residents over the age of 25, both had rates of 52% who had completed high school and 25% who had completed college.

### South

As of 2000, about 19% of Guam's population resided in the Southern region. The most populous villages in the region were Santa Rita (7,500) and Yona (6,484). Umatac was the least populous (887).

The Southern region was 51.53% male, 48.46% female compared to Guam's overall population (51.15% male, 48.84% female). The Southern region was 64% Chamorro in 2000, by far the most heavily Chamorro of the three regions. Umatac, Merizo and Inarajan were each over 85% Chamorro. Agat and Santa Rita were each over 20% Filipino and Santa Rita had the highest percentage of Caucasians in all of Guam.

The Southern region tended to be younger than Guam overall; the median age in the region was 25.3 years old compared to the Guam overall median age of 27.1 years old. Umatac had the youngest population on Guam with a median age of only 21.9 years old.

A total of 76% of Southern region residents were born on Guam that was greater than Guam overall (52%). In Umatac, Merizo, and Inarajan, over 85% of residents were born on Guam.

In terms of education, the Southern region had a higher percentage of high school graduates when compared to the rest of Guam (57% vs. 52%), but a lower percentage of college graduates (22.8% vs. 25%).

## 16.1.3.3 Household Characteristics

Table 16.1-5 provides demographic information for Guam and the island's individual villages for the year 2000.

**Table 16.1-5. Household Characteristics 2000, Guam Total and Individual Villages**

	Population in HHs	Number of HHs	Avg HH Size	% of HHs that are Family HHs	% of HHs that are Married	% of HHs that are Families	Median HH Income	Income per HH member	% HHs below poverty line
Guam Totals	150,928	38,769	3.89	83%	59%	36%	\$39,317	\$10,107	22%
North	Dededo	42,635	10,016	4.26	89%	63%	\$37,654	\$8,839	23%
	Yigo	18,947	4,634	4.09	91%	70%	\$37,415	\$9,148	19%
Central	Tamuning	17,619	5,953	2.96	68%	48%	\$35,347	\$11,942	24%
	Barrigada	8,481	2,097	4.04	87%	61%	\$49,974	\$12,370	16%
	Mangilao	12,474	3,190	3.91	83%	55%	\$39,754	\$10,167	26%
	Mongmong-Toto-Maite	5,833	1,633	3.57	76%	47%	\$31,134	\$8,721	31%
	Hagåtña	822	268	3.07	69%	43%	\$31,136	\$10,142	27%
	Sinajana	2,850	742	3.84	82%	50%	\$48,750	\$12,695	20%
	Agana	3,862	1,058	3.65	81%	51%	\$47,396	\$12,985	14%
	Chalan Pago-Ordot	5,846	1,573	3.72	79%	50%	\$36,506	\$9,813	30%
	Asan	2,089	552	3.78	84%	52%	\$48,611	\$12,860	19%
	Piti	1,613	474	3.4	77%	53%	\$54,167	\$15,931	13%
South	Yona	6,434	1,486	4.33	89%	61%	\$52,955	\$12,230	20%
	Agat	5,633	1,298	4.34	86%	54%	\$37,398	\$8,617	24%
	Santa Rita	6,512	1,780	3.66	87%	73%	\$41,928	\$11,456	9%
	Talofofo	3,192	738	4.33	88%	59%	\$47,885	\$11,059	22%
	Umatac	887	162	5.48	93%	54%	\$34,286	\$6,257	33%
	Inarajan	3,036	644	4.71	91%	60%	\$42,361	\$8,994	24%
	Merizo	2,163	471	4.59	89%	57%	\$39,940	\$8,702	23%

Source: U.S. Census Bureau 2000a; HH refers to Households.

**North**

As of 2000, almost 41% of Guam's population living in households resided in the Northern region; Dededo was the single largest village on Guam in terms of population in households and number of households.

Both villages in the Northern region had larger average household sizes (Dededo, 4.26 people and Yigo, 4.09 people) than Guam's overall household counts (3.89 people).

Compared to Guam overall, Dededo and Yigo had a higher percentage of family households, married family households, and family households with children.

Household incomes in Dededo (\$37,654) and Yigo (\$37,415) were lower than Guam overall (\$39,317); also, each had lower incomes per household member. Dededo had a higher percentage of households below the poverty line than Guam overall but Yigo had a far lower percentage; the region, on average, had a similar percentage of households below the poverty line (21.5% vs. 22%).

### Central

The Central region, similar to the Northern region, was occupied by about 41% of Guam's population living in households. Tamuning and Mangilao were the largest villages in the region in terms of population living in households and number of households.

The Central region had a much lower number of persons per household than Guam overall (3.51 vs. 3.89). The low number for the region was greatly influenced by Tamuning that had only 2.96 persons per household – the lowest number on Guam.

The Central region had lower percentages of households that were family households, married family households, and family households with children than did Guam overall.

Households in the Central region had higher incomes than Guam overall (\$39,764 vs. \$39,317); the region also had a higher income per household member (\$11,383 vs. \$10,107). The village of Piti had the highest household income and income per household member on Guam. While the Central region had higher incomes in general, the region had a higher percentage of households below the poverty line; two of the region's villages, Mongmong-Toto-Maite and Chalan Pago-Ordot, had 30% or more households below the poverty line.

### South

As of 2000, the Southern region was occupied by about 18% of Guam's population living in households. Santa Rita and Yona were the largest villages in the region in terms of population living in households and number of households.

The Southern region had more persons per household than Guam overall (4.23 vs. 3.89). Umatac had the most persons per household on Guam (5.48).

Compared to Guam overall, the Southern region had higher percentages of households that were family households, married family households, and family households with children.

Households in the Southern region had higher incomes than Guam overall (\$43,905 vs. \$39,317); the region also had slightly higher income per household member (\$10,460 vs. \$10,107). While incomes, on average, in the Southern region were higher than Guam overall, some of Guam's poorest villages were located there; Agat, Inarajan, Merizo and Umatac each had incomes that were well below the Guam overall average. Umatac had a higher percentage of households below the poverty line than any other village on Guam.

#### 16.1.3.4 Military Demographics

Military populations can affect the composition and growth of villages on Guam (Table 16.1-6). Dededo and Yigo cover military-owned land and have high proportions of military residents relative to other villages. Between 1990 and 2000, these two villages experienced rapid population growth: Yigo's by 37% and Dededo's by 35%. The more service- and tourism-based village, Tamuning, experienced population growth of 8% during the same period. Guam's active duty military population has remained constant at about 6,200 over the past ten years, with a slight dip from 2000 through 2003.

**Table 16.1-6. Active Duty Military Population on Guam, 1998-2007**

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Total Active Duty	6,379	6,155	5,806	5,974	5,820	5,944	6,220	6,514	6,253	6,286
Navy	3,946	3,902	3,741	3,626	3,810	3,760	3,922	4,085	3,867	3,879
Air Force	2,119	1,964	1,752	1,981	1,670	1,828	1,950	1,844	1,596	1,596
Army	178	158	172	183	200	217	211	422	606	632
Coast Guard	134	130	136	180	136	136	134	160	180	175
Marine Corps	2	1	5	4	4	3	3	3	4	4

Sources: Guam Bureau of Statistics and Plans 2006, COMNAV Marianas 2008

The demographic characteristics of military personnel and their dependents living on Guam in 2000 are shown in Table 16.1-7. Military and military dependents on Guam were younger than Guam overall. Additionally, there were more Caucasians and fewer Pacific Islanders among the group. Military households had a lower median income than Guam overall. However, military households also had fewer persons per household to the extent that income per household member was greater than Guam overall (\$10,963 vs. \$10,107). It should also be noted that Military households also receive a basic allowance for housing which provides them with more disposable income. Military and military dependents had slightly higher educational attainment; 58% completed high school and an additional 36.6% obtained a college degree.

**Table 16.1-7. Active Duty Military and Military Dependent Demographic Characteristics, 2000**

Median Age	Gender		Ethnicity					Median Household (HH) Income	Median HH Size	Income Per HH Member	Education (25 yr. and over pop)	
	Male	Female	White	Asian	Native Hawaiian/ Other Pacific Islander	Black or African American	Other				High School	College Degree
23	52.2%	47.8%	44.6%	16.0%	11.8%	8.2%	19.4%	\$33,000	3.01	\$10,963	58%	36.6%

Source: U.S. Census Bureau 2000c

## 16.1.4 Economic Characteristics

### 16.1.4.1 Employment and Income

#### Employment by Industry

As of 2000, Guam's industrial employment composition was quite different than that of the U.S. as a whole. Guam's economy was more government- and service-oriented and less production-oriented.

Table 16.1-8 shows that GovGuam is the major employer on Guam. Furthermore, it shows that the percentage of Guam's payroll employment in the Government sector is high compared to the U.S. overall.

**Table 16.1-8. Government's Share of Employment (June 2009)**

Country/Territory	Payroll Employment	Government Workers	Government Workers (% of Labor Force)
U.S.	132,609,000	22,511,000	17%
Guam	59,340	14,430	24.3%

Sources: U.S. Bureau of Labor Statistics 2009, Guam Department of Labor 2009b

Table 16.1-9 shows the industrial employment composition of Guam's economy. Between 2000 and 2009 the number of construction jobs has increased. Over the same period, the number of jobs in the retail trade industry declined, possibly due to lower spending by Guam residents coping with decreasing price-adjusted incomes (see subsequent discussion).



**Table 16.1-9. Guam Civilian Employment by Industry, 2000 and 2009**

<i>Industry</i>	<i>2000 Number</i>	<i>% of 2000 Total</i>	<i>2009 Number</i>	<i>% of 2009 Total</i>	<i>Change 2000- 2009 Number</i>	<i>% Change 2000- 2009</i>
Agriculture	288	0%	410	1%	122	42%
Construction	4,430	7%	6,790	11%	2360	53%
Manufacturing	1,619	3%	1,690	3%	71	4%
Transportation & Public Utilities	4,981	8%	4,690	8%	-291	-6%
Wholesale Trade	1,942	3%	2,050	3%	108	6%
Retail Trade	12,324	20%	11,190	19%	-1134	-9%
Finance, Insurance & Real Estate	2,657	4%	2,580	4%	-77	-3%
Services	15,129	25%	15,510	26%	381	3%
Federal Government (excl. active-duty military)	4,436	7%	3,790	6%	-646	-15%
GovGuam	12,741	21%	10,640	18%	-2101	-16%
<b>Totals</b>	<b>60,547</b>	<b>100%</b>	<b>59,340</b>	<b>100%</b>	<b>-1207</b>	<b>-2%</b>

Source: Guam Department of Labor 2008a

### Occupational Profile

Whereas Table 16.1-9 showed employment on Guam by industry classifications 2000 and 2009, in contrast Table 16.1-10 shows Guam employment by occupational classifications in 2000 and 2008. Industry and occupational employment are different classifications of employment. For instance, construction industry employment includes all employees working for firms in the construction industry (including sales, office support etc.) while construction occupational employment includes only employment related to actual construction work.

As shown in Table 16.1-10 from 2000 to 2008, as measured by the U.S. Bureau of Labor Statistics, Guam added 1,800 jobs (from 57,000 to 58,810) an increase of 3.2%.

More jobs were held in Office and Administrative Support occupations than any other occupation; common jobs under this category include Executive Secretaries and Administrative Support, Customer Service Representatives, and various clerking positions. Jobs in Community and Social Services, Computer and Mathematical, and Legal occupations increased at high rates while jobs in Transportation and Materials Moving, Production, and Healthcare Support each declined by over 10%.

**Table 16.1-10. Guam Employment by Occupation, 2000 and 2008**

<i>Occupation</i>	<i>Employment</i>		
	<i>2000</i>	<i>2008</i>	<i>% Change</i>
Office and administrative support	10,090	10,660	6%
Food preparation and serving related	6,360	5,790	-9%
Sales and related	5,530	5,500	-1%
Management analysts	4,960	4,590	-8%
Construction and extraction	3,380	4,510	33%
Education, training, and library	3,600	4,170	16%
Transportation and material moving	4,120	3,420	-17%
Building and grounds cleaning and maintenance	3,660	3,360	-8%
Installation, maintenance, and repair	3,000	3,140	5%
Personal care and service	1,720	2,430	41%
Protective service	2,370	2,420	2%
Business and financial operations	2,090	2,060	-1%
Production	1,810	1,510	-17%

Occupation	Employment		
	2000	2008	% Change
Healthcare practitioners and technical	1,230	1,500	22%
Architecture and engineering	750	810	8%
Community and social services	360	710	97%
Healthcare support	690	620	-10%
Arts, design, entertainment, sports, and media	590	540	-9%
Computer and mathematical	260	460	77%
Life, physical, and social science	290	370	28%
Legal	140	240	71%
<b>Total</b>	<b>57,000</b>	<b>58,810</b>	<b>3%</b>

Source: U.S. Bureau of Labor Statistics 2009.

### Income Profile

Table 16.1-11 shows median annual salary by occupation for Guam during 2000 and 2008, and includes the percentage change in salary in each occupation over that period. From 2000 to 2008, as measured by the U.S. Bureau of Labor Statistics, median salary for Guam jobs increased by \$3,041 per year (from \$22,890 to \$25,931) an increase of 13%.

The highest salaries were found in Legal, Management Analyst, and Architecture and Engineering occupations. Salaries in Education, Training and Library, and Arts, Design, Entertainment, Sports and Media occupations increased at high rates while salaries in Legal, Community and Social Services, and Life, Physical, and Social Science occupations declined.

**Table 16.1-11. Guam Median Annual Salary by Occupation, 2000 and 2008**

Occupation	Median Annual Salary		
	2000	2008	% Change
Legal	\$61,460	\$55,850	-9%
Management analysts	\$43,320	\$47,270	9%
Architecture and engineering	\$37,700	\$43,000	14%
Computer and mathematical	\$37,770	\$40,860	8%
Healthcare practitioners and technical	\$34,870	\$39,940	15%
Business and financial operations	\$36,660	\$39,540	8%
Life, physical, and social science	\$38,870	\$38,000	-2%
Education, training, and library	\$27,960	\$37,740	35%
Community and social services	\$30,320	\$29,810	-2%
Installation, maintenance, and repair	\$24,420	\$25,860	6%
Construction and extraction	\$24,710	\$25,750	4%
Arts, design, entertainment, sports, and media	\$19,920	\$24,560	23%
Protective service	\$23,820	\$24,510	3%
Office and administrative support	\$20,320	\$23,480	16%
Healthcare support	\$20,180	\$21,380	6%
Production	\$19,350	\$21,030	9%
Personal care and service	\$18,100	\$20,150	11%
Transportation and material moving	\$16,900	\$19,390	15%
Sales and related	\$15,330	\$15,830	3%
Building and grounds cleaning and maintenance	\$13,490	\$15,350	14%
Food preparation and serving related	\$13,670	\$15,180	11%
<b>Employment Weighted Average</b>	<b>\$22,890</b>	<b>\$25,931</b>	<b>13%</b>

Source: U.S. Bureau of Labor Statistics 2009

### Price Adjusted Income

Changes in salary, over-time, should be understood in terms of purchasing power. Purchasing power is how much people can buy with their income. How much an individual can buy with their income depends on the prices of the goods and services they purchase. Purchasing power will increase if salaries increase faster than prices but purchasing power will decrease if prices increase faster than salaries.

As shown in the table above, salaries on Guam increased by an average of 13% from 2000 to 2008. However, during that same period consumer prices on Guam increased by 47.3%, as shown in Table 16.1-12. This means purchasing power on Guam decreased substantially.

**Table 16.1-12. Guam and U.S. Consumer Price Index (CPI) Comparison,  
(All Items, Index, Year 2000 = 100)**

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Guam CPI	100	98.6	99.3	102.0	108.2	116.5	129.9	138.7	147.3
U.S. CPI	100	102.8	104.5	106.9	109.7	113.4	117.1	120.4	125

Sources: Guam Bureau of Statistics and Plans 2009, U.S. Bureau of Labor Statistics, Division of Consumer Prices 2008.

To illustrate the impacts that price changes have on income, Table 16.1-13 uses information from the previous two tables. Salaries in Table 16.1-11 are divided by the Guam price index in Table 16.1-12. Since the price index begins in 2000 and the value is set at 100, year 2000 salaries are divided by 1 and are thus unchanged. The price index in 2008 reaches a value of 147.3 so 2008 salaries are divided by 1.473 and are thus reduced by 47.3%.

When adjusted for price change, the median salary on Guam decreased by 30% from 2000 to 2008, though it shows a 13% increase in the table above. A 30% decline in price adjusted income means that the same person working the same job could purchase 30% fewer goods and services in 2008 than they could have in 2000.

**Table 16.1-13. Guam, Price Adjusted Median Annual Salary by Occupation, 2000 and 2008**

Occupation	Median Annual Salary (Adjusted for Prices)		
	2000	2008	% Change
Legal	\$61,460	\$37,912	-62%
Management analysts	\$43,320	\$32,087	-35%
Architecture and engineering	\$37,700	\$29,189	-29%
Computer and mathematical	\$37,770	\$27,736	-36%
Healthcare practitioners and technical	\$34,870	\$27,112	-29%
Business and financial operations	\$36,660	\$26,840	-37%
Life, physical, and social science	\$38,870	\$25,795	-51%
Education, training, and library	\$27,960	\$25,618	-9%
Community and social services	\$30,320	\$20,235	-50%
Installation, maintenance, and repair	\$24,420	\$17,554	-39%
Construction and extraction	\$24,710	\$17,479	-41%
Arts, design, entertainment, sports, and media	\$19,920	\$16,672	-19%
Protective service	\$23,820	\$16,638	-43%
Office and administrative support	\$20,320	\$15,938	-27%
Healthcare support	\$20,180	\$14,513	-39%
Production	\$19,350	\$14,275	-36%
Personal care and service	\$18,100	\$13,678	-32%
Transportation and material moving	\$16,900	\$13,162	-28%
Sales and related	\$15,330	\$10,746	-43%
Building and grounds cleaning and maintenance	\$13,490	\$10,420	-29%

Occupation	Median Annual Salary (Adjusted for Prices)		
	2000	2008	% Change
Food preparation and serving related	\$13,670	\$10,304	-33%
<b>Employment Weighted Average</b>	<b>\$22,890</b>	<b>\$17,602</b>	<b>-30%</b>

Source: U.S. Bureau of Labor Statistics 2009.

### Unemployment

Table 16.1-14 summarizes Guam's civilian labor force between 2000 and 2007, the last year that data are available.

Between 2000 and 2004, Guam's civilian labor force experienced drastic decline. It began expanding again following 2004, possibly due to news announcements of the proposed action and/or to increases in the number of H-2B workers (see below).

As of 2007, the expansion on Guam's labor force still had not brought the island back to its 2000 level. This is an indicator that Guam's recent economy remains unsettled, despite decreases in unemployment and small increases in total employed persons that have been tracked over the same period. A reduced labor force reflects probable out-migration of Guam's skilled workers and/or is an indicator that "discouraged workers" are dropping out of Guam's economy. Furthermore, Guam's unemployment rate of 8.3% in September 2007 was higher than the national figure (4.4%) at that time (though the U.S. rate has since increased, to 9.5% as of September 2009). Guam has no unemployment insurance program.

As of July 2008 there were 1,619 H-2B workers on Guam (Guam Department of Labor 2008b). The H-2B temporary worker program is for "temporary service or labor if unemployed persons capable of performing such service or work cannot be found in this country." (8 U.S. Code (USC) 1101(a) (15) (H))

**Table 16.1-14. Guam Employment Trends 2000-2007**

Year	Civilian Labor Force	Labor Force Participation Rate <sup>1</sup>	Employed	Unemployment Rate
2000	70,800	67.8%	59,950	15.3%
2001	64,800	64.5%	56,040	13.5%
2002	62,050	62.4%	54,980	11.4%
2004	61,520	61.7%	56,810	7.7%
2005	64,130	61.1%	59,630	7.0%
2006	65,940	62.9%	61,390	6.9%
2007	63,600	57.8%	58,290	8.3%

<sup>1</sup>The labor force participation rate is the percentage of the adult population 16+ either employed or unemployed but actively seeking employment.

Source: Guam Department of Labor 2007b

#### 16.1.4.2 Housing Supply and Characteristics

As of the 2000 Census there were approximately 48,000 housing units on Guam. Overall, Guam at that time had a very high vacancy rate (19%) as compared to the U.S. nationwide figure for 2000 (9%).

During the early 2000s, while Guam's economy was in recession, both real estate prices and the construction of new housing units fell. Decreased new home construction led to historically low values of new residential building permits from 2000-2002. Housing price declines continued into 2003, when home prices bottomed at a median price of around \$110,000 for a single-family home (First Hawaiian Bank 2007).

In 2004, real estate prices began to rise again, in response to improving worldwide economic conditions and initial discussions of the proposed action. This in turn spurred new construction. From the time the market bottomed in 2003 through 2006, home prices rose 41% and condo prices rose 74% (First Hawaiian Bank 2007). Data showed prices increasing through 2007 (Captain 2008a), and anecdotal evidence suggested that this trend was expected to continue through 2008 (First Hawaiian Bank 2008). However, while home prices have continued to increase, the rate of price increase has begun to decline in the currently slowing economy (Captain 2008b).

Table 16.1-15 illustrates declining home prices during the early part of the 2000s and rising home prices more recently. The home purchase component of Guam's Consumer Price Index (CPI) increased 98% from 2003 to 2006 while median salaries increased only 2.7% during the same period (U.S. Bureau of Labor Statistics Division of Occupational Employment Statistics 2008).

**Table 16.1-15. Home Purchase Component of Guam CPI, 2000-2006**

	2000	2001	2002	2003	2004	2005	2006
Home Purchase	100.0	98.6	86.5	94.5	124.7	155.9	187.3

Notes: The Guam CPI shows prices bottoming in 2nd quarter 2002 while some market research shows prices continuing to fall into 2003; the true bottom to housing prices probably falls somewhere in between.

Source: Guam Department of Labor 2006

Table 16.1-16 provides year 2000 housing characteristics information for Guam and each of Guam's villages.

**Table 16.1-16. Housing Characteristics for Guam, 2000**

	Total Housing Units	Vacant Units		Occupied Units		Median Rooms	Avg. Bedrooms	Median Value (Owner-Occupied)	Median Rent		Median Year Structure Built	
		Total	For Rent	Total	Renter Occupied				Gross	Contract		
Guam Totals	47,677	19%	10%	38,769	52%	4.1	2.5	\$171,900	\$775	\$645	1983	
North	Dededo	12,119	17%	7%	10,016	45%	4.1	2.6	\$163,100	\$695	\$590	1985
	Yigo	5,489	16%	5%	4,634	57%	4.4	2.5	\$161,800	\$719	\$609	1985
	Tamuning	8,108	27%	21%	5,953	75%	3.4	2.2	\$273,600	\$855	\$720	1983
Central	Barrigada	2,307	9%	5%	2,097	38%	4.2	2.6	\$190,900	\$837	\$705	1983
	Mangilao	3,926	19%	14%	3,190	50%	3.9	2.4	\$182,700	\$741	\$626	1988
	Mongmong-Toto-Maite	2,102	22%	15%	1,633	62%	4	2.3	\$179,900	\$732	\$620	1981
	Hagåtña	395	32%	27%	268	69%	3.5	2	\$266,100	\$665	\$544	1976
	Sinajana	857	13%	10%	742	45%	4.5	2.7	\$189,800	\$852	\$675	1976
	Agana Heights	1,193	11%	8%	1,058	50%	4.4	2.5	\$194,200	\$718	\$623	1976
	Chalan Pago-Ordot	1,920	18%	6%	1,573	44%	4.1	2.5	\$175,900	\$884	\$755	1990
	Asan	660	16%	3%	552	39%	4.7	2.6	\$209,800	\$814	\$661	1979
	Piti	576	18%	15%	474	43%	4.8	2.9	\$271,400	\$1,025	\$911	1977
	Yona	1,745	15%	10%	1,486	32%	4.6	2.7	\$173,100	\$724	\$547	1981
South	Agat	1,499	13%	8%	1,298	51%	3.8	2.4	\$162,700	\$585	\$458	1982
	Santa Rita	2,517	29%	2%	1,780	63%	5	2.8	\$174,000	\$1,006	\$835	1976
	Talofofa	849	13%	3%	738	34%	4.3	2.5	\$170,400	\$797	\$663	1987
	Umatac	179	9%	3%	162	35%	4.7	2.6	\$152,100	\$413	\$213	1984
	Inarajan	701	8%	2%	644	28%	4.2	2.5	\$172,700	\$768	\$613	1986
Merizo	535	12%	8%	471	41%	4.2	2.4	\$171,800	\$679	\$525	1984	

Notes: "Median Rent" is the value where half the rents are higher and half lower. "Contract rent" is the monthly rent regardless of any costs for furnishings, utilities, fees, meals, etc. "Gross rent" includes those additional things.

Source: U.S. Census Bureau 2000a

### North

As of 2000, the Northern region had a total of 17,608 housing units (12,119 in Dededo and 5,489 in Yigo); this comprised 37% of the total number of housing units on Guam.

Overall, Guam had a very high vacancy rate (19% compared to the U.S. Nationwide figure of 9%); the Northern region had a lower vacancy rate than Guam overall, but with a 17% rate in Dededo and a 16% rate in Yigo, the region still had a high vacancy rate.

About 7% of total units in Dededo and 5% in Yigo were available to be rented compared to the Guam overall rate of 10%.

The Northern region, on average, had fewer renter occupied units as a percentage than Guam overall; the relatively low rate in Dededo (45%) more than offset the relatively high rate in Yigo (57%).

Housing units were slightly larger in the Northern region compared to Guam overall; Yigo had more rooms per unit and Dededo had more bedrooms per unit than the Guam overall average.

Despite the slightly larger and newer (median year built in 1985 vs. 1983) housing units in the Northern region, prices were lower than Guam overall both in terms of median value and rents.

### Central

As of 2000, the Central region had a total of 22,044 housing units; this comprised 46% of the total number of housing units on Guam.

Overall, Guam had a very high vacancy rate (19% compared to the U.S. Nationwide figure of 9%); the Central region had an even higher vacancy rate than Guam overall. Tamuning had a high percentage of units that were vacant (27%), most of that were available for rent (21%). In general, the Central region had a higher rate of renter occupied units than Guam overall.

Housing units were smaller in the Central region compared to Guam overall; Tamuning had the smallest sized units on Guam.

Despite the smaller units in the Central region, prices were higher than Guam overall both in terms of median value and rents.

Housing units in the Central region were about the same age as Guam overall, the median year units were built was 1983.

### South

As of 2000, the Southern region had a total of 8,025 housing units; this comprised 17% of the total number of housing units on Guam.

Overall, Guam had a very high vacancy rate (19% compared to the U.S. Nationwide figure of 9%); the Southern region had a slightly lower vacancy rate than Guam overall and only a small percentage of these (5%) were available to be rented. On average, the Southern region had a lower rate of renter occupied units than Guam overall.

Housing units were larger in the Southern region compared to Guam overall; Santa Rita had the largest units on Guam in terms of number of rooms.

Despite the larger units in the Southern region, prices were generally lower than Guam overall.

Housing units in the Southern region were older than Guam overall, the median year units were built was 1981.

#### Temporary Workforce Housing

Based on information from Guam construction contractors and the Guam Department of Land Management (GDLM) there is presently capacity to house 3,700 temporary workers. Over half of this capacity (1,900) is owned and operated by one contractor at a single location in Harmon Industrial Park. The remainder of the capacity (1,800) is spread among 17 different locations, mostly in the north and central regions (JGPO & NAVFAC Pacific 2009).

#### 16.1.4.3 Revenue Sources for the Government of Guam

Table 16.1-17 explains the tax rates, sources, and budgetary destinations for the major internal revenue sources (plus Compact Impact funding – reimbursements to the local government agencies of Guam, CNMI and Hawaii [HI] for costs incurred due to the in-migration of Micronesians, as per Section 104(e) of the Compact of Free Association). The subsequent Table 16.1-18 provides a more comprehensive breakdown of all projected revenues by source for Fiscal Year (FY) 2009.

**Table 16.1-17. Revenue Sources for the GovGuam**

<i>Tax</i>	<i>Tax Rate</i>	<i>Taxed Item</i>	<i>Budgetary</i>
Gross Receipts Tax	4%	Gross income	General Fund
Hotel Occupancy Tax	11%	Daily room rate	Tourist Attractions Fund
Personal Income Tax	10% - 35%	Income	General Fund
Corporate Income Tax (Guam Based)	15% - 35%	Net income	General Fund
Corporate Income Tax (Other Business on Guam)	15% - 35%	Guam source income	General Fund
Real Property Sales Tax	35% of the full cash value	Sale of land or buildings	Territorial Education Facility Fund
Annual Real Property Tax	0.005% for land	Assessed value	Territorial Education Facility Fund
Annual Real Property Tax	.01% for buildings	Assessed value	Territorial Education Facility Fund
Liquid Fuel Tax	\$0.10 per gallon	Diesel	Highway Fund
Liquid Fuel Tax	\$0.04 per gallon	Aviation fuel	Highway Fund
Liquid Fuel Tax	\$0.11 per gallon	All other fuel	Highway Fund
Federal Grant	Total Federal Grant	Grant Base	Budgetary
Compact Impact Payment	\$30,000,000	% of Insular FAS Population	Discretionary (Governor)
GG.501	Interior Department - Payments to the Territories	Various formulae for broad category of grants and programs <sup>1</sup>	Multiple

Legend: FAS= Freely Associated States of Micronesia.

<sup>1</sup>For FY 2008, GovGuam received \$299 million.

Sources: Guam Department of Revenue and Taxation 2008, USDOJ 2009.

**Table 16.1-18. Projected FY 2009 Breakdown of GovGuam Projected Revenues**

<i>FY 2009 Revenue Source</i>	<i>Amount</i>
Income tax	(see "Federal Sources" below)
Corporate	\$104,039,979
Individual	\$77,505,105
Withholding taxes, interest and penalties	\$174,329,231
Provision for tax refund	\$(88,600,000)
<b>Total Income Taxes ( listed above)</b>	<b>\$267,274,315</b>
Business privilege tax	\$196,131,262
Other taxes	\$1,468,543
<b>Total Taxes</b>	<b>\$464,874,120</b>
Federal Sources	\$48,351,222
Use of Money and Property	\$3,293,486
Licenses, Fees, and Permits	\$3,248,507
Department Charges	\$954,462
<b>Total General Fund Revenue</b>	<b>\$520,721,797</b>
<b>Total Special Fund Revenue</b>	<b>\$108,007,741</b>
Administration	\$928,738
Agriculture	\$455,600
Attorney General	\$3,254,724
Guam Council on the Arts and Humanities	\$240,500
Guam Police	\$740,911
Integrated Services for Individuals with Disabilities	\$2,052,208
Judiciary of Guam	\$545,825
Labor	\$35,000
Military Affairs	\$1,055,955
Public Health and Social Services	\$23,298,212
UoG	\$1,508,000
<b>Total Federal Grant Revenue (listed above)</b>	<b>\$34,115,673</b>
<b>Total Other Sources of Funding</b>	<b>\$406,941</b>
<b>Grand Total</b>	<b>\$663,252,152</b>

Source: Guam Bureau of Budget and Management Research 2008.

GovGuam bases most of its Gross Receipts and Income taxes on the Internal Revenue Service code. Guam residents do not pay federal income taxes. Instead, GovGuam taxes resident income at the federal rates and passes the money to the federal government. The federal government then passes the same amount back. While real property taxes on Guam are relatively low, taxes on real estate transactions are 35%. The largest sources of tax revenue go to the Guam General Fund. Smaller tax revenues go into a variety of Special Funds for specific projects.

In FY 2008, GovGuam received \$5.5 million in funding for health, education, social and public safety services, and for infrastructure related to services affected by qualified non-immigrants. It also received \$6.1 million in Compact Impact funds for the Guam Schools Leaseback project (USDOJ 2009).

By far the largest portion of federal grants-in-aid to GovGuam is for public health and social services. However, there are sizeable grants for the attorney general's office, people with disabilities, the University of Guam (UoG), and military affairs. Total federal grant revenue (\$299 million) is about 5% of projected grand total revenues for FY 2009.

#### Federal Expenditures in the Economy

While federal expenditures represent an important element for the Guam economy, the per-capita level of total federal expenditures as of FY 2007 was barely above the national average (Table 16.1-19). As of



that FY, 21 states and the District of Columbia had higher per capita total federal expenditures than did Guam.

**Table 16.1-19. Per Capita Federal Expenditures, Guam Versus U.S., FY 2007**

	<i>Total</i>	<i>Retirement and Disability</i>	<i>Other Direct Payments</i>	<i>Grants</i>	<i>Procurement</i>	<i>Salaries and Wages</i>
Guam	\$8,647.44	\$1,464.16	\$525.50	\$1,745.75	\$2,965.36	\$1,946.67
U.S. Total	\$8,339.18	\$2,571.22	\$1,926.36	\$1,624.13	\$1,392.57	\$824.91

Source: U.S. Census Bureau 2008b.

It should also be noted that Guam's per capita federal total of \$8,647 was the highest of all American "outlying areas," followed by the Virgin Islands (\$5,976), Puerto Rico (\$4,261), and American Samoa (\$3,691). Amounts for the CNMI and other Micronesian areas were all below \$2,000 as of fiscal 2007.

The same Census report cited above showed that total federal expenditures on Guam peaked in FY 2003 and fell back slightly thereafter. From 1998 to 2007, the national figure increased 72%, compared to just 48% for Guam.

#### Overview of Current GovGuam Capacity Issues

Because of its geographic and historical circumstances GovGuam faces two broad types of capacity challenges both of which will affect its ability to cope with the impacts of the proposed action: (1) human resources, and (2) financial resources.

##### *Human Resources*

Guam is geographically remote from any major population center and its population base is small. Guam's population is much smaller than any U.S. state and would rank only 126 among U.S. mainland cities (U.S. Census Bureau 2007). This small and remote population is a limiting factor to having a pool of available skilled, technical and managerial workers.

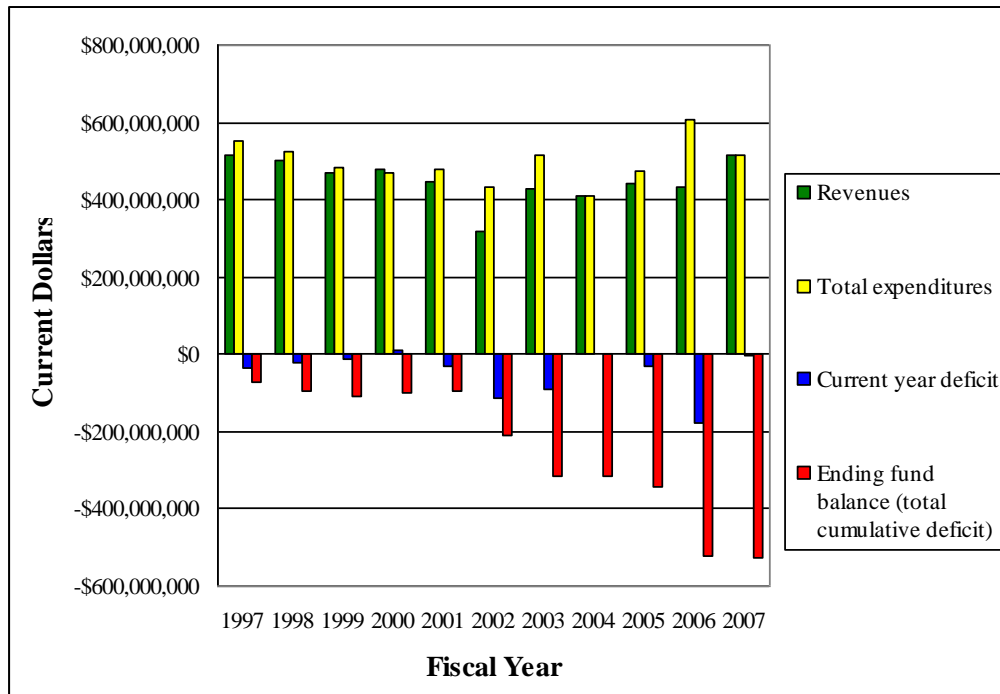
Additionally, Guam's history as a remote colony of Spain for 400 years, its 20<sup>th</sup>-century occupation by Japan, and being governed by U.S. Naval Officers until the passage of the Organic Act in 1950 has temporally limited Guam's experience at self governance as compared to most U.S. mainland local and state governments. This lack of governance experience has affected GovGuam's performance, especially in regard to handling of federal funds. Several GovGuam agencies have been put into federal receivership because of delinquent services or been cited for high-level administrative fraud.

##### *Financial Resources*

Guam's financial challenges involve both revenues for its normal operations and also ability to borrow money to provide infrastructure for either existing or potential population growth from the proposed action. Therefore, some detail is provided below to explain the status of Guam's government finances. Additional detail is provided in the Appendix F SIAS.

The General Fund is the primary operating fund of most American government units. It is used to account for all assets and liabilities of a government except those particularly assigned for other purposes in another more specialized fund. An example of a specialized fund is the capital projects fund that accounts for financial resources used for acquisition, construction, or operation of major capital facilities. Guam has had a persistent problem with deficits in its General Fund receipts and expenditures over the past 10 years. Figure 16.1-1 shows annual General Fund revenues, expenditures, and deficits from FY 1997 to FY 2007. General Fund Expenditures grew by an annual average of about 1.8% over FY 1996 to FY 2006,

primarily due to a jump in FY2006. However, revenues fell substantially over that period, resulting in a total cumulative deficit of \$528 million by the end of FY 2007.



Sources: Banc of America LLC 2007, Guam Office of the Public Auditor 2008

**Figure 16.1-1. Historical Guam General Fund Revenues, Expenditures, and Deficits**

In part because deficits were affecting the ability to sell bonds for existing costs and new infrastructure, the government started a deficit reduction plan in FY 2007. This plan included tighter spending controls, more diligent revenue collection, more careful accounting systems, and more timely audits. Upon completion of audits, the FY 2008 balance is expected to show a small surplus (Banc of America LLC 2007). The current (2009) cumulative Guam General Fund deficit is also somewhat improved, at approximately \$510 million (Standard & Poor’s 2008). To achieve balanced budgets Guam has cut staffing and services.

Guam’s efforts to reduce its outstanding \$510 million debt are complicated by even larger “unfunded obligations,” that are not included in its official cumulative debt estimates. Unfunded obligations refer to future commitments that were not backed up by reliable provisions to pay for those commitments. These unfunded obligations, in sum, are much higher than the official Guam total deficit. This means that Guam’s capacity to borrow in order to correct its problems is very limited, creating extreme difficulty in maintaining current levels of service. In addition, both expansion of services and also building new infrastructure (such as could be necessary to accommodate the proposed action) may be difficult in the absence of adequate amounts and sources of borrowing. See the Appendix F SIAS for additional information.

The proposed action would generate more demands on Guam for roads, ports, sewer, water, power, and other necessary infrastructure. Part of these needs can be paid for by setting up private sector responsibilities for their provision, and/or user fees. However, in sum, these demands would increase the pressure for substantial borrowing.

#### 16.1.4.4 Gross Island Product

Gross Island Product (GIP) measures the total value of all final goods and services produced in a particular island economy; it is the most commonly used benchmark to gauge the overall size of an island economy. The most recent measure of GIP on Guam was completed in 2002. It was estimated that Guam's GIP was about \$3.4 billion. Table 16.1-20 details Guam's GIP from 1991 to 2002.

**Table 16.1-20. Guam GIP 1991-2002 (Millions of Current \$)**

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
GIP	\$2,667	\$2,902	\$2,917	\$3,014	\$2,999	\$2,993	\$3,109	\$3,551	\$3,025	\$3,420	NA	\$3,428

Notes: "Current dollars" reflect the dollar value for the years data were recorded; for example, in the table above, 1991 GIP is in 1991 dollars, 1992 GIP is in 1992 dollars and et cetera.

Source: Guam Bureau of Statistics and Plans 2006.

### 16.1.5 Public Services

#### 16.1.5.1 Education Services

Primary, secondary, and high-school education for the civilian residents of Guam is provided through the GPSS, and various private schools. Although there are currently no charter schools on Guam, the recently enacted (January 30, 2009) Guam Public Law 29-140 authorized the establishment of such schools. School-age children of active duty military and other federally-related populations on Guam are served by schools in the DoD Dependent Schools Pacific/DDESS Guam system.

Higher education services on Guam are provided by the UoG, Guam Community College (GCC), and the Pacific Islands University. UoG and GCC also provide vocational training and business development programs.

#### Primary, Secondary and High School Education

##### *Public Schools (GPSS)*

GPSS is one unified school district, supporting 40 schools (26 elementary, eight middle, five high and one alternative). GPSS plans to open three new schools. A large number of GPSS schools are located within Guam's central region, followed by the northern area, with the smallest number of schools in the south and Apra Harbor region. As of July 2008, GPSS employed about 4,000 employees and serviced approximately 31,000 students (Kelman 2008).

The student population of GPSS is very diverse. In school year 2007/2008, the largest student ethnic groups were Chamorro (46%), Pacific Islander (30%) and Filipino (21%). A total of 11,739 (37.79%) students were listed as Languages Other Than English students (Guam Department of Education 2008). There are also an estimated 100 military dependents that are part of the total GPSS student population (Appendix F SIAS - GPSS Interview).

##### *Private Schools*

Guam has approximately 27 private schools. Of these schools, 15 are Catholic; 11 are Christian; and one is non-denominational. Civilian and military families wishing for their dependents to receive a faith-based education often choose private schools. The Catholic Church opened a new high school in November 2008; is studying the possibility of building another in northern Guam whether or not the proposed action occurs; and could build more private schools if the buildup does occur (Kelman 2008). Overall, private schools on Guam have an enrollment of approximately 6,500 (Guam Civilian Military Task Force Education Sub-Committee 2009).

### *Military Schools (DDESS)*

All information for this section was obtained from a 2009 interview with DDESS staff (Appendix F SIAS – DDESS Interview).

Education for military dependents in the U.S. is supplied by the umbrella organization, the DoD Educational Activity. Prior to 1997, military dependents on Guam enrolled in the GPSS. Guam's military school system was established during school year 1997/1998, citing that GPSS was unable to meet accountability expectations in school improvement. Currently, Guam's military schools are part of the DDESS system that manages military education in territories of the U.S. Although Guam is technically part of DDESS and the school system will be referred to as DDESS in this EIS/OEIS, the operational control of Guam's military school district was passed in school year 2004/2005 to DoD Dependent Schools-Pacific, headquartered in Okinawa, Japan.

DDESS runs two elementary schools, two middle schools and one high school on Guam. Andersen Elementary and Middle School are located in the north. McCool Elementary and Middle School is located near Apra Harbor. Most recently built (September 2007), Guam High School, is also located in central Guam, as is the District Superintendent's office. As of 2009, DDESS employed approximately 267 employees and had a student population of 2,672. Refer to Appendix F SIAS for details on DDESS enrollment by parental employer type.

### Higher Education

GCC, UoG, and Pacific Islands University are located in Mangilao, in the central region of Guam. GCC and UoG are both fully accredited by the Western Association of Schools and Colleges. Pacific Islands University is accredited by the Transnational Association of Christian Colleges and Schools. See the Appendix F SIAS for additional information on these institutions.

### Educational Attainment

Overall, data from the 2000 Census show a fairly high level of educational attainment on Guam although this attainment is slightly lower than the national average, as shown in Table 16.1-21.

**Table 16.1-21. Guam Educational Attainment as of 2000**

	<i>Guam</i>	<i>%</i>	<i>U.S.</i>	<i>%</i>
<b>Total Population 25 Years &amp; Over</b>	<b>83,281</b>	<b>100%</b>	<b>182,211,639</b>	<b>100%</b>
Less than 9 <sup>th</sup> grade	7,843	9%	13,755,477	8%
9 <sup>th</sup> grade to 12 <sup>th</sup> grade, no diploma	11,862	14%	21,960,148	12%
High school graduate (includes equivalency)	26,544	32%	52,168,981	29%
Some college or associate degree	20,398	24%	49,864,428	27%
Bachelor's degree	12,774	15%	28,317,792	16%
Graduate or professional degree	3,860	5%	16,144,813	9%
<b>% High School Graduate or Higher</b>	<b>76%</b>		<b>81%</b>	
<b>% Bachelor Degree or Higher</b>	<b>20%</b>		<b>25%</b>	

Source: U.S. Census Bureau 2000a.

#### 16.1.5.2 Health and Human Services

Health services involve the preservation of health and prevention, treatment and management of illness through the professions of medicine, dentistry, nursing, and allied health. Human Services can incorporate a range of agencies and services including support of low-income, specially identified, or at-risk populations.

This section first gives brief detail of the overarching factors that affect health and human services on Guam. It then outlines the key public, nonprofit, private and military agencies that provide primary health and human services to Guam's population.

Guam's population currently experiences a variety of health concerns. Guam's Office of Vital Statistics lists heart disease, cancer, and cerebrovascular disease as the leading causes of death on Guam (Guam Memorial Hospital Authority 2008).

Challenges to the island also include fertility rates, communicable and infectious diseases, and obesity. Diabetes is a huge risk factor in the population, and the rate of dialysis has increased by 540% in the last 10 years, reaching five times the rate of the mainland U.S. (USDHHS 2008). In 2007, Guam recorded the highest number of reported influenza/flu symptoms since 1996. Furthermore, in 2007 Guam reported the most new cases of tuberculosis (TB) since 1997. Guam's TB infection rate is 53 new cases per 100,000 population, or 12 times the 2007 U.S. rate of 4.4 (GDPHSS Office of Epidemiology and Research 2007).

Guam's place as a hub in the Asia Pacific region is an additional factor affecting its overall health status. The island can be susceptible to health concerns that are emergent in neighboring areas, whose populations often have high health needs and often do not have immunization or health records. For example, populations in both Chuuk and the Philippines have experienced high levels of TB, with Chuuk recently experiencing incidents of drug-resistant versions of TB (U.S. Public Health Service Interview – Appendix F SIAS). Because individuals from these locations often come from disadvantaged socioeconomic conditions and backgrounds, upon immigrating to Guam they become eligible for federal public assistance. After arrival on Guam, these populations sometimes live in isolated, overcrowded and substandard conditions that include inadequate infrastructure for living (such as water and power supply) and poor quality public services (such as waste collection, fire and police protection). This leads to high rates of hepatitis B, TB, cholera, and Hansen's disease, among other public health concerns.

Since 1988, Guam has been considered a Medically Underserved Area (GDPHSS Maternal and Child Health Services 2007) that demonstrates the island's difficulty in meeting the above health care needs. The island is currently experiencing shortages of health care providers and lacks specific health care specialists. It is often difficult to recruit specialists from the U.S. mainland because of its remote location and a typically lower pay scale. In 2005, Guam had a total of 244 physicians serving its population, including physicians at the Guam Memorial Hospital and licensed military physicians working on a part-time basis (Western Pacific Region Health Databank 2007). Other statistics show a count of 14.1 active physicians per 10,000 residents, compared to the national average of 25.9 in 2005 (USDHHS 2006). Guam's dentist to population ratio (including private practice dentists) is 1:2,500 (GDPHSS Maternal and Child Health Services 2007). This indicates significantly lower coverage than the national average dentist to population ratio, where in 2000 it was 1:1,691 (American Dental Survey Center 2002).

Guam's distance also means that referral for specialized services in the U.S. require patients to take a seven-hour trip by commercial plane to HI. Flight times from Guam to various countries for treatment are as follows:

- Manila, Philippines – 3.3 hours
- Tokyo, Japan – 3.4 hours
- Hong Kong, China – 4.4 hours
- Cairns, Australia – 4.9 hours

Also affecting Guam's ability to meet the health care needs of its population is that a large percentage of the island's population does not have adequate health insurance to cover medical costs. Often, immigrants

arriving on Guam through the Compact of Free Association agreement are without insurance. The Guam Department Public Health and Social Services (GDPHSS) has estimated that 60,000 individuals on Guam are uninsured or underinsured, out of a total population of approximately 160,000 (Guam Memorial Hospital Authority 2008). An individual may be considered underinsured if they possess private health insurance but that insurance does not adequately cover necessary treatments. Furthermore, many individuals that have health insurance are unable to afford the co-pays for treatments or medications and will turn to government health agencies for free services. The agencies' mandates are to serve all those that come in through the door. Although they do have processes to verify whether an individual is insured or not, private insurance companies are unwilling to release the names of their clients due to confidentiality issues. Often if an individual states he or she does not have health insurance, agency staff must take their word for it.

Finally, the funding of Medicaid and Medicare programs also provide unique challenges to the Guam healthcare system. For example, by statute Guam's Medicaid funding is capped and annual increases are based on the CPI. Federal matching funds for Medicaid (the Federal Medical Assistance Percentage) is set for 50%, the minimum rate. Once Guam has exhausted this capped Medicaid funding, all Medicaid costs must be assumed by GovGuam. Medicare funding on Guam is still paid under the system of the Tax Equity and Fiscal Responsibility Act of 1982 that limits Guam Memorial Hospital's reimbursement to \$6,000 per discharge. This is a lower rate than allowed to most other U.S. states and territories (USDHHS 2008).

#### Guam Memorial Hospital Authority

Unless otherwise noted, all information for this section was obtained from a 2008 survey and 2009 interview with Guam Memorial Hospital Authority (GMHA) staff (Appendix F SIAS - GMHA Interview).

GMHA is Guam's only civilian general hospital, servicing the entire population's primary health care needs. In 1964, a public law was passed for GovGuam to administer and operate GMHA. In 1978, the hospital moved to its current location in Tamuning, a building originally built for the Catholic Diocese to serve as a private acute care facility. In 1996, GMHA opened a Skilled Nursing Unit (SNU) facility in Barrigada Heights. GMHA employs 105 medical staff. Approximately 77% of GMHA staff is board certified.

Currently, the 22,000-square-foot GMHA provides a total of 250 beds including 158 acute care beds. The SNU has 40 beds. GMHA is often at capacity.

GMHA is funded primarily through patient payment. Patients are mostly civilian, although military dependents do at times access GMHA services, after that the hospital can bill TRICARE (military health plan provider).

#### Guam Department of Public Health and Social Services

The GDPHSS provides various health services to the public including primary and acute health care.

##### *Bureau of Primary Care Services*

The GDPHSS Bureau of Primary Care Services (BPC) was established in 1998 to administer two Community Health Clinics (CHCs): the Northern Region Community Health Center (NRCHC) and the Southern Region Community Health Center (SRCHC). These centers are Federally Qualified Health Centers that provide primary, acute and preventative care on an outpatient basis only. Prior to 1998, primary care services from GDPHSS did not exist, and services were limited to preventive services under

the Maternal Child Health Program of the GDPHSS Bureau of Family Health and Nursing Services (BFHNS).

Anyone is able to use the services of the CHCs regardless of income, family size, or ability to pay, however, the Clinics focus on low income, uninsured and medically underserved populations. Their Sliding Fee Program is based on the federal income poverty guidelines that take into account income and family size. Through this program, patients receive discounts of 100%, 75%, 50% or 25%. Furthermore, GMHA will refer patients who have no primary care provider and/or health care to CHCs after they are discharged from the GMHA Emergency Room or after hospitalization (Appendix F SIAS - GDPHSS BPC Interview).

#### *Bureau of Family Health and Nursing Services*

The GDPHSS BFHNS provides health and social services, mostly to individuals with no insurance, except in the case of TB or sexually transmitted diseases (STDs). It is located at the central GDPHSS location, has one room at the NRCHC, and its staff makes visits to the SRCHC. The BFHNS provides: women's health services, family planning services, child health services, services for children with special health needs, home care services, communicable disease services (e.g. immunization, TB clearance, health certificate, and skin tests), chronic screenings in the community, and information to the public through information booths. BFHNS has experienced a dramatic increase in access of communicable disease services between 2007 and 2008. Decreases in various other services accessed do not necessarily indicate a decreasing need for these services, but rather the inability for BFHNS to meet these needs. Because of staffing and supply shortfalls, the BFHNS currently prioritizes its work in the following order: infectious diseases, child health, prenatal care, women, chronic needs, and family planning. Integral to the work of the BFHNS is its staff of nursing personnel. Community Health Nurses at the BFHNS travel to different villages on Guam, making visits in order of priority (Appendix F SIAS - BFHNS Interview).

#### *Bureau of Communicable Disease Control*

All information for this section was obtained from a 2009 interview with Bureau of Communicable Disease Control (BCDC) staff (Appendix F SIAS – CDC Interview). The Center for Disease Control (CDC) provides STD, human immune-deficiency virus (HIV), and tuberculosis (TB) related services, children and adult immunizations, and laboratory services. These services are provided at the central GDPHSS location, as well as at the NRCHC and SRCHC through Memoranda of Understanding agreements. Services at the main location are completely free of charge while the Community Health Clinics charge a fee for service. The Community Health Clinics see approximately 22,000 clients a year, with higher morbidity rates in the northern areas of Guam.

#### *Division of Public Welfare*

All information for this section was obtained from a 2009 interview with Division of Public Welfare staff (Appendix F SIAS – DPW Interview). The Division of Public Welfare is responsible for a wide array of social services, administered through a number of different Bureaus. The Division's administrative headquarters are located in the main building, while eligibility sites for each of the social services it administers are scattered throughout the island. Bureaus and sections encompassed by the Division of Public Welfare are the Bureau of Social Services Administration, Bureau of Health Care Financing Administration, Bureau of Economic Security, and the Work Programs Section.

### *Division of Environmental Health*

The DEH provides regulatory services including the generation of sanitary permits and health certificates, and the issuance of health citations. The DEH will perform pre-operation inspections of new permanent or temporary facilities, issue permits for their operation, and continue to perform periodic inspections of these facilities during operations. DEH also generates health permits for employees requiring such a permit (such as those working with food, at massage parlors, or cosmetologists), making sure that the employees have completed their TB skin test and any food safety workshops (offered at GCC) that are required.

In 2008, DEH generated 2,841 sanitary permits for permanent establishments, conducted 1,112 facility inspections, and generated 22,573 health certificates (Appendix F SIAS – DEH Interview).

### Guam Department of Mental Health and Substance Abuse

Guam's behavioral health service providers are made up of the GDMHSA, the single state agency offering comprehensive behavioral health services to adults and children on Guam, as well as private and non-profit providers. The Guam Department of Mental Health and Substance Abuse (GDMHSA) is located next to the Guam Memorial Hospital.

All individuals are eligible for services at GDMHSA, although the agency prioritizes the most indigent clients. Prioritization of GDMHSA's work is as follows: emergency services, inpatient acute care, medication dispensation, residential treatment services, outpatient services and prevention and outreach activities. Those with insurance will typically be seen in a private practice environment. However, insured individuals wishing to access free medication will sometimes go through GDMHSA's diagnosis system (Appendix F SIAS - GDMHSA Interview).

### Guam Department of Integrated Services for Individuals with Disabilities

All information for this section was obtained from a 2009 interview with GDISID staff (Appendix F SIAS – GDISID Interview).

GDISID was created to be a single point of entry to services for Guam's disabled population. It is made up of three departments: the Division of Vocational Rehabilitation, the Division of Support Services, and the Division of Evaluation Enforcement and Compliance. GDISID manages the Guam Get Care System, a web-based comprehensive directory of services, funded by a grant from the Aging and Disability Resource Center through the year 2010. Divisions encompassed by GDISID include the Division of Vocational Rehabilitation, Division of Support Services, and Division of Evaluation Enforcement and Compliance.

### Naval Hospital Guam

The Naval Hospital Guam in Agana Heights offers medical care to military personnel, military dependents, veterans, and in case of emergency, civilians. The military also runs small outpatient clinics at Andersen Air Force Base (AFB) and on the Naval Base, as well as a dental clinic. The current Naval Hospital Guam facility was opened in 1954, is 306,000 square feet, and houses 38 active beds including six intensive care unit beds, plus an additional 64 contingency beds (Naval Hospital Guam 2008).

Collaboration between the military and public health systems includes limited consultation and treatment services by specialized military medical officers, assistance when GMHA or the GDPHSS encounter supply or pharmaceutical shortages, as well as a source of back up during times of human or natural disaster.



The military sector provides mental health services to active duty members and their dependents, while the Veterans Affairs (VA) Administration services the mental health needs of veterans and their families.

#### Guam VA Office

All information for this section was obtained from a 2009 interview with the Guam VA that advocates for veterans and active-duty personnel on Guam for access to veterans' benefits (Appendix F SIAS – VA Interview).

The U.S. Department of VA is responsible for the provision of benefits for qualified veterans. The Guam VA office, currently run by a staff of two individuals, assists veterans with information and applications for their benefits and claims. Guam also provides veterans with free driver's licenses and veterans license plates that can be processed on Guam. However, most of the forms and claims filed by Guam veterans are sent to the U.S. Department of Veterans Affairs in Honolulu, where they are reviewed and processed.

#### Private Providers

There has been a recent increase in private mental health providers on Guam. Private providers are mostly psychiatrists, clinical psychologists, and individual, marriage, and family therapists. Private clinics also provide mental health services. Only a limited number of private providers and pharmacies accept government insurance such as the MIP and Medicaid due to factors such as slow reimbursement.

#### Non-Profit or Academic Centers/Providers

Currently there are no non-profit groups on Guam providing health care and no academic medical centers. Various non-profit providers on Guam serve both adults and youth, and provide ancillary and support services, as well as emergency, homeless, and youth shelter. Some examples of these include: the Guam Salvation Army, Sanctuary, Inc., and Catholic Social Services. These organizations are important elements in supporting the health and human service system on Guam. Often, local and federal government agencies contract with these organizations for services.

#### 16.1.5.3 Public Safety

Public Safety includes the protection from and prevention of events endangering the general public's safety, including crime and disasters, both natural and man-made. Government agencies on Guam involved in law and traffic enforcement, fire suppression, emergency medical response, safety inspections, civil and criminal litigation, justice, and corrections are all considered public safety agencies.

While overall crimes as processed by the Guam Police Department (GPD) increased by about 9% between 2002 and 2006, the territory had significantly lower reported rates of both violent and property crimes per 100,000 residents when compared to U.S. averages. Table 16.1-22 compares recent crime rates for Guam and the U.S. (using Part I or "serious" crime as defined by the Federal Bureau of Investigation). The violent crime rate on Guam has recently been trending down while the property crime rate has been trending up. In 2006, larceny-theft (2,639 cases) was the most common offense known to GPD. Vandalism (1,500 cases), burglary (1,292 cases) and disorderly conduct (1,156 cases) were other common offenses. Other than disorderly conduct, each of the crimes mentioned had increased from 2002 levels.

Guam is a high-risk public safety area during times of natural and man-made disasters. The remaining information in this section is from the Guam Emergency Response Plan (Guam Homeland Security Office of Civil Defense 2009), unless otherwise noted.

**Table 16.1-22. Comparison of Violent and Property Crime Rates, Guam Versus U.S., 2002-2006**

Year	Violent crime rate per 100,000 residents		Property crime rate per 100,000 residents	
	Guam	U.S.	Guam	U.S.
2002	292.4	494.4	2,188.7	3,630.6
2003	302.0	475.8	2,332.6	3,591.2
2004	277.8	463.2	2,189.2	3,514.1
2005	230.2	469.0	2,749.1	3,431.5
2006	239.7	473.5	2,423.1	3,334.5

Sources: Guam Police Department 2007, U.S. Department of Justice, Federal Bureau of Investigation 2006

The territory's location makes it vulnerable on a number of levels. Guam is located in an area of high risk for natural disasters including typhoons, tropical storms, and tsunamis. Its remoteness means that it cannot depend on aid from contiguous regions in the event of disaster (Suburban Emergency Management Project 2007). Guam's geographic location is also one that places it in close proximity to areas such as North Korea and China, and the proposed action itself is meant to utilize this strategic positioning to "...fulfill U.S. government national security and alliance requirements in the Western Pacific Region" (Suburban Emergency Management Project 2007).

The Emergency Operations Center at the Office of Civil Defense (whose administrator is designated by the Governor of Guam) is the primary agency responsible for coordinating Guam's response to all emergencies and disasters through the National Incident Management System. The primary federal agency that works with the territory of Guam in times of emergency is the Federal Emergency Management Agency (FEMA), and more specifically, the FEMA Region IX Pacific Area and Regional offices.

The next section gives brief overviews of the key GovGuam agencies responsible for public safety on Guam and concludes with a description of some of the local and military collaborations. More information on Guam's public safety agencies is provided in the Appendix F SIAS.

#### Guam Police Department

GPD is the law enforcement agency for the entire territory, outside of federal property. GPD's four precincts include: Hagatna, Dededo, Agat, and Tumon/Tamuning. Police stations are located in, respectively, Hagatna, Dededo, Agat, and the Tumon Bay resort area. A new Yigo precinct is also planned for the near future. The 2006 precinct population was as follows:

- Dededo 68,996
- Hagatna 53,148
- Agat 28,976
- Tamuning 19,899

In 2007, GPD employed 309 sworn personnel and 66 civilian employees. The total number of arrests in 2007 were 3,315 (Guam Police Department 2007).

#### Guam Fire Department

GFD is the primary agency responsible for fire suppression, search and rescue, and emergency medical response for the territory of Guam. GFD operates 12 fire stations (5 in the northern district and 7 in the southern district), two rescue bases, and the E911 Integrated Emergency Communications Center. Guam experiences weather conditions that make it vulnerable to wildland/urban interface brush fires. GFD is

usually the first responder in such incidents. GFD currently employs approximately 200 full time sworn personnel, including emergency medical technicians. Approximately 32 of these personnel are equipped to perform open water rescues.

GFD cooperates with military fire response agencies through the National Incident Management System. For land-based search and rescue incidents that occur on federal or military property, military responders take the lead on emergency coordination, supported by GovGuam agencies. For sea-based incidents beyond the GFD's capacity, the USCG takes operational lead (Guam Homeland Security Office of Civil Defense 2009).

GFD also employs two inspectors that work in cooperation with the Guam Department of Public Works (GDPW) to ensure that any construction plans are reviewed for compliance with fire codes prior to being approved. The GFD's Code Enforcement Section performs inspections of facilities for code compliance (Appendix F SIAS - GFD Interview).

#### Guam Department of Corrections

The Guam Department of Corrections (GDoC) is responsible for the handling of persons after their conviction of a criminal offense. The Department is organized into four divisions: Administration, Prison Security, Diagnostic Treatment Services, and Parole Services.

Space constraints currently exist for GDoC facilities. Overcrowding at the Hagatna Detention Facility necessitates that the Adult Correctional Facility be used to house some pre-trial individuals. GDoC has considered building a new facility to meet housing needs, but there have been no firm plans to do so (GDoC 2008).

#### Guam Department of Youth Affairs

The Guam Department of Youth Affairs (GDYA) runs a variety of programs geared toward youth development, rehabilitation, and involvement with the community. Its youth programs and facilities include Youth Correctional Facility and Cottage Homes, Counseling/Case Management, and Community Social Development Resource Centers and Prevention.

#### Military Security

While Navy and Air Force security personnel work independently, they share facilities and training. In addition, if military personnel are given base suspension or debarment on one military property, they lose privileges on all military bases. Currently the Air Force and Navy are adapting to new Joint Region Marianas requirements, whereby the Navy will take the lead for the joint region. In the 1980s, a military corrections facility existed on the Naval Base, but that facility has since been closed due to underuse. Andersen AFB maintains a small correctional facility of four cells (Appendix F SIAS - Naval Security Interview).

In addition to on-base patrol, military security plays a role outside the fence. There is a close working relationship between GPD and military security. GPD headquarters are located in old Navy facilities that GPD provides safety briefings for the military and have recently begun working together to patrol the Tamuning/Tumon area. Furthermore, when large ships come in to port, shore patrol is a requirement (Appendix F SIAS - GPD Interview).

#### 16.1.5.4 Agencies Affected by Population Growth

The agencies discussed in this section were selected because they will likely be impacted by increases in service population or an increase in H-2B construction workers.

### Guam Department of Parks and Recreation

The Guam Department of Parks and Recreation (GDPR) administers approximately 70 public parks and recreational facilities, including beach parks, community parks, skate parks, historic parks, baseball fields, a baseball stadium, a sports complex, tennis courts and a public pool. All other community centers and parks fall under the 19 village mayors, who work closely with GDPR. GDPR also runs sports leagues and provides swimming and tennis lessons among others. A sports complex is in the process of being built in Dededo, and it will include baseball fields and a swimming pool (Appendix F SIAS – GDPR Interview).

GDPR current staffing runs less than 80 employees. Staffing for park rangers, teaching positions, and park maintenance is primarily outsourced. GDPR's Historic Preservation Office (HPO) conducts cultural resource review under federal law and engages a comprehensive historic preservation program on Guam. It also conducts permit reviews. This office has a staff of approximately 13 people (Appendix F SIAS – GDPR Survey).

Further discussion on Guam recreational assets and facilities may be found in Chapter 9, Recreation, of this volume.

### Guam Public Library System

The Guam Public Library System (GPLS) provides one main library in Hagatna, five branch libraries in the villages of Agat, Barrigada, Dededo, Merizo, and Yona, and a bookmobile. Currently, GPLS employs a staff of 28. GPLS supports the needs of the public, as well as schools and government agencies, providing library services, programs for school children and families, and reference and internet searching. All residents on Guam are eligible for a library card.

Library resources are also available at all public and some private schools on Guam, institutions of higher education, and other institutions such as the Territorial Law Library (Appendix F SIAS – GPLS Survey).

### Judiciary of Guam

The Judiciary of Guam is comprised of the Courts and Ministerial Division, Probation Services Division, Marshal's Services Division, Client Services and Family Counseling Division, and Procurement and Facilities Management Division.

Until recently, the Judiciary was housed on one site in Hagatna. As of August 2009, it opened up a Northern Court Satellite in the Dededo Mall, where there is room for one court room that will process small claims and traffic violations, among others (Appendix F SIAS – Guam Judiciary Interview).

### Guam Department of Labor

The Guam Department of Labor (GDoL) consists of numerous divisions, bureaus, and programs related to employment. The agency's organizational chart presents three main clusters: (1) "Statistics," including the Bureau of Labor Statistics and its Economic Research Center; (2) "Employment and Training," including various employment assistance and job training programs; and (3) "Regulatory and Compliance," including divisions for occupational safety and health, fair employment, etc. The Workforce Investment Board is also attached to the Director's Office.

While all parts of GDoL would be affected by the proposed action, the Agency for Human Resources Development and the Alien Labor Processing and Certification Division (ALPCD) are among those particularly likely to be affected, and in fact are already heavily involved. The Agency for Human Resources Development works to increase the pool of labor on Guam by identifying actual or potential discouraged workers – including those deficient in basic skills – and improving their skills through means

ranging from classroom training to on-the-job training with private-sector partners. The ALPCD is responsible for processing applications to bring foreign (“alien”) workers into Guam and assuring compliance with federal Department of Homeland Security requirements (Guam Department of Labor 2009a).

ALPCD is the primary Guam entity reviewing and issuing permits under the H-2B work visa program of the U.S. Citizenship and Immigration Service (USCIS), and would be the primary unit of GovGuam affected by the proposed project’s use of H-2B workers (indirect effects arising from housing these workers on GDPW and possibly GDLM would occur).

ALPCD manages the H-2B program’s Guam components (with oversight by the Governor and in cooperation with the U.S. State Department), and is involved in the H-2B process in six ways:

1. Prospective employers file applications for Temporary Labor Certification with ALPCD
2. ALPCD adjudicates these applications, recommending approval or denial to the Governor of Guam (the Governor’s recommendation, further interviewing, and visa issuance are handled by the U.S. State Department)
3. If ultimately approved by the USCIS, once the worker arrives on Guam, he/she must report to the ALPCD to file an Application for Registration and get a worker identification card issued by ALPCD
4. ALPCD conducts labor law enforcement, compliance monitoring, job site and temporary worker housing inspections
5. ALPCD processes Exit Clearance forms two weeks before the worker is ready to depart the U.S.
6. Statistics, data gathering, and recordkeeping on ALPCD programs

H-2B workers are issued one-year permits, renewable up to three years. For the proposed action, it is likely that most workers hired before 2015 would stay for more than one year, meaning extensions would have to be granted by ALPCD.

For the most recently completed FY2007 and FY2008, staffing of the ALPCD totaled 5 full-time equivalents (FTEs).

#### 16.1.5.5 Agencies Affected by Development on Guam

The agencies discussed in this section were selected because they will likely be impacted by increases in development and construction on Guam as a result of the proposed action. They are GovGuam agencies responsible for issuing, monitoring, and enforcing development permits on Guam.

Because actions taken on federal land do not require local development permits, most of the impact on GovGuam development permitting functions would come from off-base growth generated by the proposed action (i.e., purchases from construction or operations and from indirect growth). In a few cases – such as the Guam Environmental Protection Agency (GEPA) – federal agencies have delegated responsibility for oversight of direct project activities to local agencies, and so the direct project impacts also affect local permitting, monitoring, and enforcement to some extent.

For private-sector development permits, two primary agencies are involved: GDLM for rezoning proposals and GDPW for building permits. If rezoning (including conditional use permits) is required, developers apply with GDLM (that acts as technical arm for the Guam Land Use Commission [GLUC] and also makes referrals to other agencies for rezone reviews). If the rezoning action is allowed, developers then go to the “one-stop permitting” center with GDPW (GDPW in turn, typically refers part

of the building permit review to GDLM). If no rezoning is needed, the GDPW one-stop permitting center is the primary point of contact for applicants. GDPW typically refers building permit applications for review by any or all of the agencies addressed in this section (listed above).

#### Guam Environmental Protection Agency

GEPA was initially established in 1973 as prescribed in Guam Public Law 11-191, signed into law on December 7, 1972. The Agency has six divisions: Administrative Services, Water Programs, Environmental Monitoring and Analytical Services, Air and Land Programs, Environmental Planning and Review, and Energy, Sustainable Development, and Outreach. This last division is new and was approved in GEPA's 2009-2013 work plan. GEPA's jurisdiction includes wastewater; clearing, grading, and excavation; drinking water and water quality certification; groundwater management and water quality monitoring; hazardous waste and clean-up of toxic waste sites air quality; air quality; land use impacts; and water pollution control; clearing, grading, stockpiling and stormwater management (GEPA 2009).

GEPA is delegated authority by USEPA to carry out USEPA mandates on Guam. GEPA has several divisions, including Air and Land, Water, Environmental Planning and Review, and Monitoring.

#### Guam Department of Public Works

GDPW is a multi-purpose agency with responsibility for: highway maintenance, construction, and safety; bus operations; housing management; solid waste management; administration of capital improvement projects; and operation of the "one-stop permitting" center. The focus of this EIS/OEIS is on this agency's permitting operations – namely, building (architectural and structural), electrical, plumbing, flood control, and highway encroachment, as well as management of the one-stop permitting center (Guam Department of Public Works 2009).

GDPW is a "one-stop" permitting center where those needing development permits can get referred to the full range of permits needed for their projects. GDPW not only reviews the permits, but also routes applications to other agencies for their review.

#### Guam Department of Land Management

GDLM has five operating divisions: Land Planning; Land Administration; Land Survey; Land Records, and Geographic Information System (GIS)/Land Information System. The focus of this EIS/OEIS for GDLM is on the Planning Division that has clearance responsibilities relating to building, occupancy, and clearing and grading permits; business, liquor and contractor licenses; temporary worker housing facilities; and childcare facilities. Under the auspices of the Land Use Commission and the Shoreline Protection Commission (as of writing, the latter Commission was to soon be transferred to the Coastal Management Program [CMP]), the Planning Division is responsible for processing zoning changes and variances, subdivision applications, development plans, conditional use and wetland permits, and horizontal property regime requests (Guam Department of Land Management 2009).

Much of GDLM's permitting activity is driven by referrals from GDPW, through GDPW's one-stop permit center. However, other permitting issues arise, especially rezoning proposals previous to issuance of building permits that are heard by the GLUC with staff assistance primarily by GDLM, the GLUC chair.

#### Bureau of Statistics and Plans

The Guam Bureau of Statistics and Plans (GBSP) is responsible for collection and dissemination of economic and business statistics, coordinating information management throughout the government,

producing mapping tools and products that facilitate the use of data by governmental agencies, and the administration of the CMP.

The focus of the analysis for this agency is on CMP administration. The entire island of Guam is designated a Coastal Zone. CMP conducts a number of programs, including public education, permit review, consistency reviews, and policy planning. The agency is responsible for reviewing a wide variety of applications for developments including requests for zone changes; issuing seashore reserve permits; making federal consistency determinations; conducting site inspections; monitoring activities and developing mitigation strategies. When the new Seashore Reserve Plan is adopted, this agency will administer it (Appendix F SIAS – GBSP Interview).

#### Guam Economic Development Authority

The Guam Economic Development Authority (GEDA) (formerly known as the Guam Economic Development and Commerce Authority [GEDCA]), a public corporation, is an autonomous agency of GovGuam. Its mission is to promote a sustainable economy for Guam. It manages three industrial parks as well as several parcels for the Guam Ancestral Land Commission. It provides investor incentives and commercial loans. The Authority generates its own revenues (Guam Economic Development Authority 2009).

#### Guam Department of Agriculture

The Guam Department of Agriculture (GDA) is organized into five divisions: Aquatic & Wildlife Resources, Forestry and Soil Resources, Agricultural Development Services, the Plant Inspection Facility, and Animal Control. It operates five marine reserves and has played an important role in the restoration of coral reefs and fishery resources. The Department must sign off on any construction permits that would impact the environment (Guam Department of Agriculture 2009).

### **16.1.6 Sociocultural Issues**

The announcement of the proposed action necessitated public scoping meetings be conducted (Earth Tech 2007). Several meetings were conducted in 2007. During that time public comments were collected. Of interest in this section are some categories of expressed concerns that relate to the socioeconomic impact of the proposed buildup, above and beyond those discussed above. The section below lists the categories most often mentioned in the public scoping meetings, and provides a summary of historical and current background to these issues. Refer to the Appendix F SIAS for a more detailed discussion.

#### 16.1.6.1 Chamorro Issues and Interests

Chamorros were first conquered by the Spanish soon after contact with Magellan's expedition. Most died of disease within a hundred years after contact. Guam was administered under a U.S. Naval Governor after it was taken from Spain in 1898. The Japanese occupation from 1941 to 1944 was marked by forced labor, cultural assimilation, and violence. The island was a restricted U.S. Navy zone until 1961.

The topics of political minoritization and WWII Reparations discussed below are linked to the military in the minds of many Chamorro and other Guam residents. While they would not technically be "impacted" by the proposed action, the issues are frequently raised in the context of military planning.

To some extent, all these issues have in common a sense of concern over perceived past wrongs that some Guam residents argue should be "made right" by the military and/or the federal government in the course of the planned buildup.

### Cultural Artifacts

The Department of Chamorro Affairs (DCA) is charged with administering and expanding Guam's current relatively small museum for archaeological or other cultural artifacts. An expression of interest has been made that artifacts discovered in archaeological excavations during this EIS/OEIS investigations or subsequent military construction to be stored at this Museum.

### Political Status

Chamorro sovereignty groups feel U.S. military presence works against self-government and strengthens the sense of "colonization" on Guam. As a result of the Spanish-American War, Guam was sold to the U.S. in 1898. During the early period of the U.S. governance of Guam, the island was administered under the authority of the Navy. Naval policies included the intention to assimilate the Chamorro population, and included a banning of the use of Chamorro language in schools (United Nations 1963). Prominent local Chamorro residents drafted a 1902 petition arguing that the non-representative form of government existing at that time went against the ideals of American democracy, and asked for further clarification of Guam's political status.

The Navy's administration of Guam was disrupted during WWII, when in 1941, following the invasion of Pearl Harbor, Japanese military forces bombed Guam. The Japanese took control of the island for two and a half years, where strict social standards were imposed, including restrictions in the use of the Chamorro language as well as English in local education. Guamanians were also used as forced-labor on a variety of Japanese military construction projects. Through alignment with U.S. naval officials and other methods, including prayer and the singing of songs, Chamorro resisted Japanese occupation. Eventual return of the island to the U.S. occurred on July 21, 1944. The end of Japan's occupation was welcomed by local Chamorro. However, renewed U.S. military and political presence on Guam at the end of WWII included policies that put less emphasis on issues such as Chamorro reparations from the Japanese occupancy (see below) or land rights, causing some Chamorro opposition.

The passage of the Organic Act in 1950 provides context for the current political, legal and social relationship of Guam to the U.S. government. Although the Act did not provide full self-determination for Guamanians, it did bring stability as local citizens were given some opportunity to influence the island's governance. The Organic Act extended U.S. citizenship to indigenous and non-indigenous citizens on Guam and contained a bill of rights similar to that found in the amendments to the U.S. Constitution, but not including the provision of a trial by jury. Three branches of government were created, and decision making for the island was given to a local legislature composed of civilians. This ended more than 50 years of Navy administration of Guam. In an island wide 1976 referendum, island residents voted to maintain close ties with the U.S., but to also begin negotiations to improve the Territory's status. A 1979 draft constitution was rejected by a vote of five to one, particularly because of the need for continued discussion on Guam's political status. Seeking to improve its current political status, the Guam Commission on Self-Determination has drafted a proposed Guam Commonwealth Act, which was approved in two 1987 plebiscites. In February 1988, the document was submitted to the Congress for its consideration and was introduced in four consecutive Congresses--the 100th through the 104<sup>th</sup> (USDOI 2009).

Guam is currently an unincorporated Territory administered by the U.S. DOI. As an unincorporated Territory, the island is a possession of the U.S., but not part of the U.S. and not all provisions of the U.S. Constitution apply to the island. While universal suffrage applies to Guamanians 18 years and older, and Guamanians are considered citizens of the U.S.; they are not eligible to vote in U.S. presidential elections;



and Guam's Congressional representative does not have the right to vote on national laws (except in committees).

### Political Minoritization

Related to the issue of political status is a concern about the growing "minoritization" of Chamorro as other ethnic groups – Mainlanders, Filipinos, or non-Chamorro Micronesians – increase as a percentage of the population. Prior to WWII, Chamorros comprised more than 90% of Guam's population. The percentage dropped below 50% by 1980 and was 42% in 2000.

Past labor shortages have resulted in increases in Filipinos and non-Chamorro Micronesians, while the military has been a driver of Caucasian or other Mainlanders coming to Guam. Inter-marriage among ethnic groups on Guam is rare and/or new; the 2000 Census found just 10% of the population identified themselves or household members as being of two or more ethnic groups, and more than 60% of these were children. Most young people are assimilating in the sense that they speak "only English" (65% for those five to 17 in 2000, versus 28% "only English" for those 18 and over). Among the 11% of children who were Chamorro speakers, two-thirds spoke it less frequently than English – while among the 26% of adults who were Chamorro speakers, only one-third spoke it less frequently than English.

### World War II Reparations

Wartime reparations from the Japanese occupation remain a highly contentious issue, particularly because the elderly victims of that period are now reaching the end of their life spans. Guamanians suffered under the Japanese military administration from 1941 to 1944, and some believe that this occupation was the result of U.S. military presence on Guam. Although the U.S. guaranteed Japan immunity from reparations claims through Article 14 of the Treaty of Peace in 1946, Guamanians continue to request that the U.S. federal government pressure Japan to pay war reparations, or that the federal government pay them in Japan's stead. However, neither the U.S. Department of Insular Affairs nor the U.S. State Department has expressed a strong desire to pursue this request and Congress has refused to waive protections in Article 14 (USDOI 2004).

### Military-Civilian Social Issues on Okinawa that Affect Public Perceptions on Guam

Public perception on Guam regarding the proposed action is affected in part by social issues that have emerged on Okinawa. In short, these issues are:

- Use of land
- Economic development
- Environmental damage
- Military-related accidents
- Crime and social order
- Prostitution and crimes against women

Thus, a brief overview of such issues on Okinawa is warranted as background for impact assessment.

Okinawa Prefecture in Japan consists of 49 inhabited and 110 uninhabited islands including the actual island of Okinawa (the largest island in the prefecture).

U.S. military presence on Okinawa began in the closing weeks of WWII with the Battle of Okinawa. Although the U.S. occupation of the main Japanese islands ended in 1952, the U.S. continued administration of the Ryukyu Islands, including Okinawa, until 1972. Over the years, the presence of the

U.S. bases has incurred protests from anti-war organizations, labor and religious groups, women's organizations, and political factions. Some of the major concerns are detailed below.

One stated concern is that while Okinawa comprises a small percentage of Japan's total land area (0.6%), a large amount (approximately 75% of the total land area) of facilities used exclusively by the U.S. Forces in Japan is located in the prefecture. In addition, a majority of U.S. service members in Japan (an estimated 60%) are stationed here, 60% of whom belong to the Marine Corps (Okinawa Prefecture 2009).

Some Okinawa residents perceive military bases as hindering regional economic development. Since 1972, three sets of plans have been set forth to improve the prefecture's infrastructure and incorporated plans for roadways, harbors, airports, and educational facilities. However, the locations and size of U.S. military bases have impeded the planned urban redevelopment. Military bases occupy approximately 10.4% of prefectural land and 18.8% of the main island of Okinawa where most of the population and industries are concentrated (Okinawa Prefecture 2004).

Additional concerns include noise pollution. In "A Report on the Aircraft Noise as a Public Health Problem in Okinawa," studies showed that aircraft noise exposure resulted in a wide range of physical and mental consequences that included sleep disorders, hearing loss, higher rates of low birth weight infants, fatigue, neurosis, and negative effects on children (Asahikawa Medical College 2000).

Environmental damage has also been cited. Reports claim that highly carcinogenic materials (fuels, oils, solvents, and heavy metals) are regularly released (Okinawa Prefecture 2004). Training exercises using live ammunition have caused forest fires, soil erosion, earth tremors, and accidents. Among the results, soil runoff has polluted the coral reef (Okinawa Prefecture 2004).

Military-related accidents and incidents, including helicopter and aircraft crashes, have also been a source of concern. Between Okinawa's reversion and the end of December 2003, 275 U.S. military aircraft-related accidents were recorded (40 of these were aircraft crashes) (Okinawa Prefecture 2004).

Crime and social order issues involving Status of Forces Agreement (SOFA) personnel on Okinawa are also of concern to Guam residents. Available crime counts in Okinawa include active duty military, civilians associated with military, and their dependents. Data from Japan's National Police Agency show that arrests for major crimes have been relatively low from 2003 to 2007, but increased by 11.1% in 2008. Despite this increase, Okinawa police are hesitant to make too much of the numbers, pointing out that the numbers are too small and appear to be more significant than they actually are. Analysts have stated that crimes by Americans are perceived as a major problem largely because of the attention they get in the local and international press and protests by anti-base groups on the island (Allen 2008).

Nevertheless, Americans connected to the military commit far fewer crimes per capita than their Okinawan counterparts. In 2008, SOFA-status people made up 3.28% of the island's population but accounted for 1.62% of all arrests. Previous years' statistics show similar low rates (Allen 2008, 2009; Allen and Sumida 2008; Republic of Korea Drop 2008; Weaver and Kusumoto 2008). During 2008, the Marine Corps made several changes to help prevent misconduct among its service members in Okinawa. Some of the changes included an expansion of uniformed courtesy patrols, a new liberty card policy, checks of outgoing vehicles at Marine Corps installations, and additions to the orientation and education seminar that all newcomers must attend (Allen 2009).

A critical event occurred in September 1995 with the abduction and rape of an Okinawan schoolgirl by three U.S. service members. Widespread public protests led to bilateral negotiations between the U.S. and Japan and led to the establishment of the Special Action Committee on Okinawa.

In looking at the history of U.S. military presence in Okinawa, arguments of justice and jurisdiction surround hundreds of allegations of sexual crimes that have been reported through the years. From 1945 to 1950, 278 rapes by U.S. servicemen were reported and an additional 200 rapes by U.S. military personnel were reported between 1972 and 1997 (Caron 1999). While the military views each crime as an individual incident, local protestors of these sexual crimes see gender-related violence as a structural issue that is perpetuated by legal, political, economic, and social structures (Cachola et al. 2008).

SOFA-related data rely on Okinawa prefecture records that group crime statistics into six major categories:

- Heinous crimes – murder, rape, robbery, arson
- Violent crimes – assaults, blackmail, extortion
- Thefts – burglaries, car thefts, muggings
- Intellectual crimes – fraud, counterfeiting
- Moral offenses – gambling, indecent assault, molestation
- Other, that includes vandalism and trespassing

The only quantitative data available are for “Heinous Arrests.” Information on Moral Offenses is combined with Other Arrests and is therefore not listed in the table below (Table 16.1-23).

**Table 16.1-23. SOFA-Status Total and Heinous Arrests on Okinawa, 2003-2008**

Year	Total Arrests		Heinous Arrests	
	# of Individuals	Cases	# of Individuals	Cases
2003	133	112	12	7
2004	72	59	1	1
2005	65	66	4	2
2006	63	57	5	3
2007	46	63	6	6
2008	63	70	13	7

Source: Allen 2009.

The number of SOFA-status individuals arrested for Heinous Crimes is low, although the specific crime of rape cannot be distinguished from murder, robbery, and arson. Also, low numbers may be attributable to the widely accepted idea that sexual crimes are consistently underreported.

In 1969, at the height of the Vietnam War, the Okinawan police estimated that 7,362 Okinawan women were working in prostitution, though others estimated this number to be 10,000 or more. According to an Okinawan activist group (Okinawa Women Act Against Military Violence 2009), an estimated 7,000 Filipinas today serve as prostitutes – on entertainment visas – for U.S. military personnel in Okinawa, even though prostitution is illegal in Japan.

#### 16.1.6.2 Land Issues

Guam’s land issues have included debate over the large areas of military land on the island restricted from public access and concerns over nonpayment or perceived inadequate payment for land used as military bases during and after WWII. More recently, tighter national security measures following the attacks of September 11, 2001 resulted in the Air Force restricting access to tour groups that had previously accessed to two beaches (Tarague and Jinapsan) on the shores below Andersen AFB. Landowners themselves now must access these properties using all-terrain vehicles along the coastline rather than having direct access through Andersen AFB.

Agencies involved in land issues include the Chamorro Land Trust Commission (CLTC) and the Guam Ancestral Lands Commission.

#### Chamorro Land Trust Commission

The five-member CLTC, assisted by its staff, was set up by Guam Public Law 25-45 to pass title of federal excess lands, once returned to the GovGuam, back to original landowners or their heirs. Guam Public Law 25-178 sets the missions, mandates, powers and jurisdiction of the CLTC in processing claimant applications for Deed of Title.

#### Guam Ancestral Lands Commission

The five-member GALC aided by its staff, controls the Chamorro homelands. It makes these lands available to qualified applicants (native Chamorro or descendants thereof) through residential, agricultural and grazing leases. For purposes of this land trust, a “native Chamorro” is defined as anyone descended from people residing on Guam from the period between 1898 and prior to the 1950 Organic Act (Appendix F SIAS - CLTC Interview).

The GALC also issues commercial licenses to generate the revenue necessary for operating the Program (21 Guam Code Annotated, Chapter 75; Guam Public Law 22-18, and Guam Public Law 23-38 as amended). However, in June 2009 the Legislature passed a bill imposing a moratorium on commercial leases until the CLTC develops regulations and a land use plan designating specific lands available for commercial leases (Hart 2009). This bill was the culmination of a critical report by the Office of the Public Auditor on, and subsequent legislative attention to, a variety of questions about CLTC management and staffing capacity to deliver all its services to native Chamorros. Part of the intent of the bill was to ensure residential leases are prioritized over commercial leases (Gesick 2009).

#### 16.1.6.3 Crime, Vice, and Social Order

Tourism, the military, and periodic construction spikes have all been perceived to create markets for alcohol, illegal drugs, prostitution, and illegal gambling on Guam. Such issues have emerged as significant during public dialogue about the proposed action and its attendant construction phase.

The first U.S. military-civilian conflicts on the island back in 1899 centered on fights due to the sale of liquor to Sailors and Marines, and subsequent “drunkenness” (Rogers 1995). Guamanians also remain particularly concerned about the abuse of local women, due to reports of rapes by military personnel on Okinawa.

Recent figures from 2006 show Part I Offenses account for 26.02 cases per 1,000 residents, while Part II Offenses tally at 42.65 cases per 1,000 residents (Guam Police Department 2007).

As for crimes on-base, Guam has concurrent jurisdiction that allows civilian law enforcement personnel access to the base. For example, U.S. Marshals can go on-base to serve court orders (Guam Judiciary 2008). Depending on the type of case, the military can take jurisdiction. For example, if Child Protective Services is involved, the military and civilian agencies work together, and the information is public. However, if cases are handled by internal base procedures, no public disclosure is necessary (Guam Civilian Military Task Force Committee on Public Safety 2008).

#### 16.1.6.4 Sociocultural Changes

When overseas bases are placed in areas culturally different from the majority of military personnel, there often exists a feeling of disconnect between incoming military personnel’s culture and customs and that of the local population. On Guam, discussions on this often involve the concept of military personnel’s

respect for Guam's people. There is no clear evidence that this feeling is any more or less pronounced on Guam than elsewhere. However, the most common suggestion for the military in conducting the proposed action was better communication (KUAM 2008).

Community surveys capture the diversity of community sentiment toward the proposed action. A March 2007 survey by the Guam Chamber of Commerce found 71% of those polled support an increased military presence (Partido 2007). A subsequent survey conducted by the UoG Public Affairs and Legal Studies Club in 2008 found that 52% of those surveyed think that the proposed action is a good thing for Guam and 88% expect the buildup to bring jobs and other economic benefits to Guam. The Guam Chamber of Commerce then conducted a follow-up survey in early 2009 and again found about a 70% favorable response, with slightly higher support among less affluent households (Tamondong 2009).

#### 16.1.6.5 Quality of Life

The concept "quality of life" overlaps with virtually all topics covered by this EIS/OEIS, and concerns in general the ability of the island to adequately support the proposed action, including how it would affect the island's general tranquility, quality of family and community relations, and standards of living.

The 2007 Guam Chamber of Commerce survey noted above found that 60% of polled Guam residents thought the proposed action would improve quality of life. However, there remain concerns that are heightened by the fact that military facilities are segregated from public facilities, and are ultimately seen as better quality than the latter. For instance, DoD's decision to establish its own school system in the late 1990s was interpreted as a "hostile" action by some elected officials (Underwood 1997), removing funding from a public school system to establish a separate, competing system. This feeling can be extended to health care infrastructure, housing costs and availability, access to recreational facilities, and competitive pricing (on-base versus off-base).

## 16.2 ENVIRONMENTAL CONSEQUENCES

### 16.2.1 Approach to Analysis

This Environmental Consequences section presents impact analysis under the proposed action and the no-action alternative. As the socioeconomic impacts would be islandwide in nature with little difference in effects among the various alternatives, the summary of impacts presented below covers all of the alternatives except the no-action alternative, which is treated separately in Section 16.2.4. For the island of Guam, this analysis addresses potential population impacts, economic impacts, public service impacts, and sociocultural impacts from both construction and operational phases of the proposed action. An analysis of the impacts associated with the off base roadways is discussed in Volume 6 and a summary of impacts from all of the proposed actions is addressed in Volume 7.

Direct, indirect, and combined or "total" impacts of the proposed action are addressed in this section. Direct impacts are impacts that come from *direct expenditures*, or the first round of spending. These include expenditures related to the construction phase first, and then ongoing military expenditures during the operational phase. Indirect impacts are impacts that are stimulated by *indirect expenditures*, or subsequent rounds of spending. These expenditures circulate through the economy, generating "spin-off" sales and businesses. The term "indirect impacts" is used to cover both *indirect effects* and *induced effects*.

The environmental consequences analytical results reported in this chapter are calculated for a maximum potential scenario that assumes there would be no constraints (blockages) to the rapid development of

spin-off private-sector economic activity driven by the military construction and permanent military operational stages.

#### 16.2.1.1 Methodology

Methodology for assessed impacts varied. Following is a brief summary. Refer to the Methodology Chapter (Chapter 2) of the Socioeconomic Impact Assessment Study (SIAS) for details of this methodology (Located in Appendix F).

##### Methods for Population and Economic Sections

Labor force, population, and housing demand estimates all flow from specific economic assumptions about workers per million dollars of expenditures, non-working dependents per worker, and workers per housing unit.

For economic impacts, standardized economic impact models and techniques were used for both construction and operational phases. To calculate the indirect impacts of spending, the 2005 State of HI Input-Output (I-O) model was used to estimate how many jobs and other economic variables are created as initial new spending and later rounds of spending flow through the Guam economy. Since there is no specific updated economic model for Guam, HI models are used to represent Guam's similar island-based economy.

##### Methods for Public Service Sections

Impacts on GovGuam public service agencies were estimated based on information from literature reviews, searches of online and historical data sources, written surveys, key informant interviews, and agency data sources when available.

The basic method of analysis involved first determining the number of key professional staff currently working at each agency and providing the existing population with necessary services. Care was taken to determine an appropriate baseline measure by seeking historical data from the agencies, to reduce the odds that the most recent available figures came from years with unusually high or low standards of service. Then the number of each agency's "service population" (i.e. the people using the services) was determined, and care was taken to determine whether this meant the population in general or just some portion, such as civilians only or children only. Finally, these two numbers were used to develop an agency-specific ratio of key professional staff positions to service population.

Once the above calculations were completed, population increases associated with the proposed action could be applied to the ratios to determine the additional professional staff that would be associated exclusively with the proposed action.

##### Methods for Sociocultural Sections

Sociocultural topics are addressed in a more qualitative fashion. Analysis used available evidence from published sources, interviews, and historical evidence. Some social issues could have many outcomes and are more important to manage than to predict. There are also pre-existing social issues that, due to the nature of the proposed action, may be more often discussed or remembered by residents; issues such as these were acknowledged in the "Affected Environment" sections above.

#### 16.2.1.2 Determination of Significance

It is difficult to assign significance levels to socioeconomic impacts because (1) there is no "national" standard or definition embedded in legislation that defines what constitutes a "significant" socioeconomic impact (i.e., there is no legislation comparable to the Clean Air Act, Clean Water Drinking Act, Historic

Preservation Act, etc.); (2) there are few objective or widely accepted criteria of either the magnitude or valuation, and what might be “beneficial” (or good) to one person could be “mixed” to another and “adverse” (or bad) to yet another; (3) related socioeconomic topics often are like two sides of the same coin, one “beneficial” (such as increased job opportunities) and the other mixed or “adverse” (such as social stress from in-migrant workers attracted by new jobs); (4) some topics have multiple dimensions or sub-topics, and different conclusions may be reached for different aspects; and (5) short-term impacts can differ from long-term ones – especially for the construction period (for instance the construction period would include both a rapid increase in beneficial economic activity and then a decline so sharp that it would meet normal definitions of an economic “recession”).

The U.S. Council on Environmental Quality regulations for implementation of National Environmental Policy Act provides 10 broad guidelines about determining whether the intensity of an impact is “significant.” None are specific to socioeconomic topics but three do refer to the “public” or the “human environment” rather than physical resources or places:

- “The degree to which the proposed action affects public health or safety.” (Code of Federal Regulations [CFR] Title 40 Sec. 1508.27(b)(2))
- “The degree to which the effects on the quality of the human environment are likely to be highly controversial.” (40 CFR 1508.27(b)(4))
- “The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.” (40 CFR 1508.27(b)(5))

While these are insufficient by themselves to generate criteria for significance of socioeconomic impacts, they help in the following formulations.

#### Significance Criteria for Population/Economic Sections

Although there is no national legislation that establishes criteria for defining socioeconomic impacts, there is DoD specific legislation (P.L. 110-17 10 U.S.C. 2391: Military base reuse studies and community planning assistance) and implementing DoD Directives (DoD 3030.01 and 5410.12) that do address the issue of what is a significant impact on communities due to changes in Defense Programs. Collectively these documents establish “thresholds” that allow the DoD’s Office of Economic Adjustment (OEA) to provide communities with technical and financial assistance for organizing and planning for Defense impacts. To qualify for financial assistance, the magnitude of the DoD personnel increases must meet the following statutory thresholds:

- More than 2,000 direct military civilian and contractor DoD personnel (i.e., net additional) or
- More military, civilian and contractor personnel than equal to 10 percent of the number of persons employed in the counties or independent municipalities within 15 miles of the installation, whichever is less, and;
- Federal, state or local community impact planning assistance is not otherwise available.

Additionally, OEA must make a finding that the affected community will experience a “direct and significantly adverse consequence” based on the DoD impacts in light of community-specific needs and resources (Economic Adjustment Technical bulletin 5: Managing Community Growth).

The above thresholds are population/economic and capacity driven and they have been applied by OEA to make financial grants to GovGuam.

The Population/Economic analysis in this document focuses primarily on the impact the proposed action alternatives would have on the economy of Guam and the prosperity of its people.

Given that the OEA threshold criteria have already been met, for purposes of this analysis any population or economic impact was considered “significant” if it would add 2% or more at any point in time to expected population or economic levels without the proposed action. The literature on growth rates that communities can absorb without experiencing serious consequences to their physical and social infrastructure and fiscal health does not provide an absolute threshold. Rather the literature points to the relative abilities of communities to absorb growth based on their existing capacities and contextual settings. The value of 2% was selected for purposes of this study because of the small size and remoteness of Guam’s economy and its relatively limited financial resources. Another value often used for statistical comparisons is 5%, but given Guam’s existing infrastructure capacities and financial capabilities, 5% was deemed too stringent. However, during the construction phase of the proposed action the 5% value is also exceeded.

Quantifiable impacts related to jobs and dollars – the usual measures of prosperity – were considered “beneficial” impacts if they increased the expected level of jobs or dollars by 2% or more. While the potential for economic downturns after the construction boom peak will be noted, they are not considered sufficient to change the overall impact assessment from “beneficial” to “adverse.”

Impacts that are either qualitative (such as effects on tourism) or where precise numbers cannot be predicted (such as cost of living) were given significance ratings on a judgmental basis considering the overall information available from surveys or interviews conducted as part of this study. In some cases the results of these efforts were too mixed in nature to be clearly call an impact as either beneficial or adverse.

Population increases in particular were considered as inherently mixed (both beneficial and adverse), because population growth fuels economic expansion, but sudden growth also strains government services and the social fabric.

#### Significance Criteria for Public Service Sections

The Public Service sections focus primarily on the impact the proposed action alternatives would have on GovGuam public service agencies, especially key professional staff. The proposed action is expected to increase population in the area, resulting in more demands for services. Significance of additional demand was assessed through qualitative and quantitative calculation of whether this increase would necessitate substantial increases in 1) staffing (including consideration of whether staffing needs could easily be met), 2) new or physically altered facilities, and/or 3) equipment/vehicles. In general, however, the 2% criteria was applied, although in relation to the reported actual staffing levels in the “baseline year” (generally 2005) for agencies supplied information. Given the financial challenges facing GovGuam (discussed in Volume 9, Appendix G), demands for additional staffing were considered adverse in nature.

#### Significance Criteria for Sociocultural Sections

Sociocultural impacts are largely qualitative in nature, and the analysis focused less on predicting quantifiable impacts than on identifying potential problems and opportunities. However, sociocultural impacts remain an important element of the proposed action and have attracted much public attention and comment. Many sociocultural impacts tend to be mixed in nature. To the extent their “significance” can be assessed, it was based on the relative magnitude of the proposed action under consideration. They were regarded as “adverse” if they threatened public safety or order, and “beneficial” if they preserved or enhanced the social fabric.



### 16.2.1.3 Issues Identified During Public Scoping Process

The citizens and governments of Guam and CNMI commented on a variety socioeconomic issues during public scoping meetings held on Guam, Saipan, and Tinian on April 17-20, 2007. The importance of these issues was reinforced as additional public comments were received via mail and email. Additionally, these issues have been stressed in studies and publications released by GovGuam and covered in the public media on Guam. This Environmental Consequences section addresses these issues.

Citizens expressed concerns about the following:

- *Social Infrastructure*: e.g., education, healthcare, childcare, and mental health services etc.
- *Community Infrastructure*: e.g., power, water, wastewater, solid waste etc.
- *Labor Impacts*: availability of labor and material for non-defense projects etc.
- *Housing*: e.g., housing supply and demand, affordability, etc.
- *Public Safety*: e.g., police, courts, fire protection, etc.
- *Tourism/recreation*: e.g., effects on tourism and recreational assets and access, etc.
- *Private Property*: concern for use and access to private property, etc.
- *Cultural Impacts*: effects on Chamorro culture of off-island construction workers, etc.

Issues raised during scoping meetings with GovGuam included:

- GovGuam capacity and impacts on agencies
- Federal agencies capacity
- Increasing immigration
- Lack of existing socioeconomic data
- Availability of local trained labor
- Sources of off-island labor
- Housing impacts, especially during the construction stage for off-island workers.

## 16.2.2 Proposed Action

### 16.2.2.1 Population Impacts

Population impacts include analysis of:

- Project Related Population
- Demographic Characteristics
- Household Characteristics

#### Project Related Population

##### *Approach to Analysis*

Project related population impacts predict all new populations on Guam related to the proposed action.

*Direct new populations* include construction workers from off-island and their dependents, active duty military, military dependents, new residents filling on-base civilian jobs and their dependents, and new residents filling jobs created by the first round of spending and their dependents.

*Indirect new populations* include new Guam residents who may move to Guam to fill jobs created by subsequent rounds of spending and their dependents. If there are a large number of “stay-behind” workers (in-migrants that migrate for construction-period jobs and stay on Guam), the decline in population from the beginning of 2014 to the end of 2016 will not be as dramatic as shown in the population impact

calculations below. If the stay-behind worker phenomenon leads to increased in-migration over time, then the population in the years 2017 forward would increase at a faster rate than illustrated. Since it is expected that a large percentage of immigrant workers will originate from the Philippines, population growth related to stay-behind workers would likely, disproportionately, originate from there.

Table 16.2-1 provides assumptions made in conducting analysis for the construction phase, as well as the source of or rationale for those assumptions.

**Table 16.2-1. Construction Component Assumptions for Project Related Population Impacts**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Average number of dependents for in-migrating direct, on-site, construction jobs	0.20 – 0.35	Contractor interviews
Average number of dependents for in-migrating direct from purchases jobs	0.95 - 1.0	U.S Census data on persons per jobs (U.S. Census Bureau 2000d) and GDoL interviews
Average number of dependents for in-migrating indirect/induced jobs	0.95 - 1.0	U.S Census data on persons per jobs (U.S. Census Bureau 2000d) and GDoL interviews

Table 16.2-2 provides assumptions made in conducting analysis for the operations phase, as well as the source of or rationale for those assumptions.

**Table 16.2-2. Operational Component Assumptions for Project Related Population Impacts**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Number of Marines by 2014	8,552	Description of Proposed Action and Alternatives (EIS/OEIS)
Number of Marine dependents by 2014	9,000	same as above
Number of rotational transient Marines by 2014	2,000	same as above
Average number of dependents for in-migrating civilian military personnel	0.95	U.S Census data on persons per jobs (U.S. Census Bureau 2000d)
Average number of dependents for in-migrating direct from purchases jobs	0.95 - 1.0	U.S Census data on persons per jobs (U.S. Census Bureau 2000d) and GDoL interviews
Average number of dependents for in-migrating indirect/induced jobs	0.95 - 1.0	U.S Census data on persons per jobs (U.S. Census Bureau 2000d) and GDoL interviews

### *Impacts*

The projected project related impact on population is shown in Table 16.2-3. As the table indicates, a 2014 peak-year total impact would result in population increase of 65,527, falling to a steady 31,071 as increases in base operational expenditures cease by 2019.

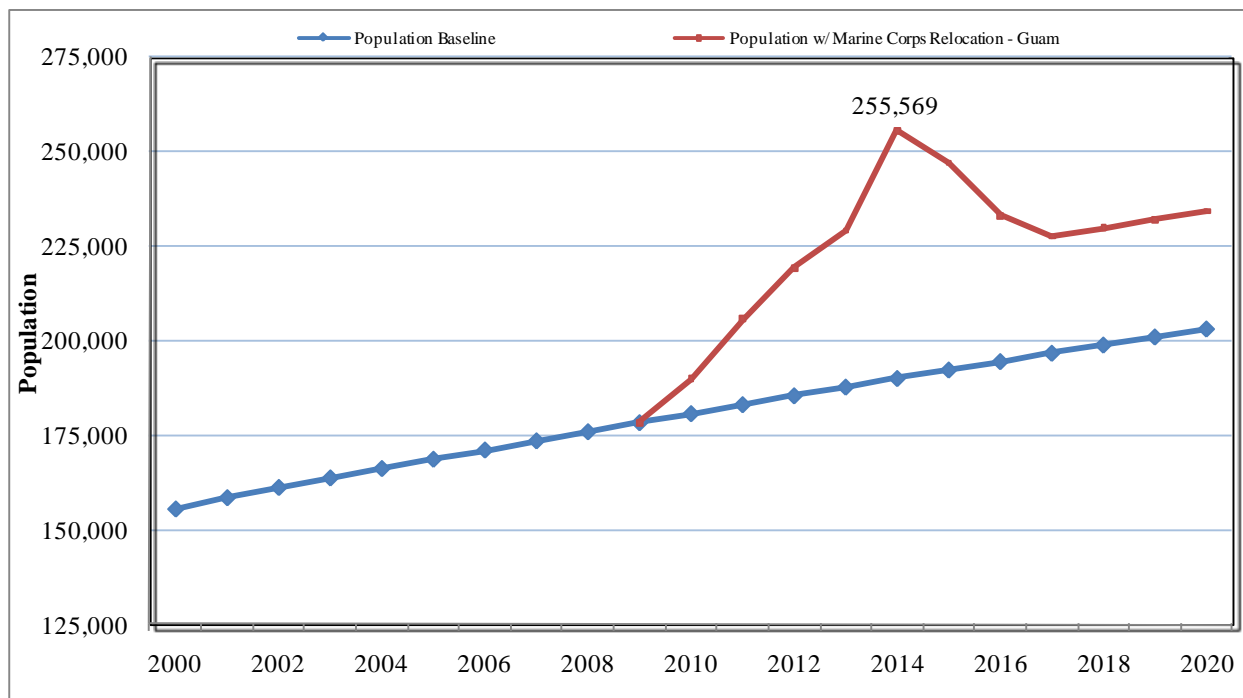
**Table 16.2-3. Estimated Population Increase Associated with Proposed Marine Corps Action**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total Population <sup>1</sup>	9,239	22,667	33,916	41,464	65,527	54,799	38,612	30,894	30,894	31,071	31,071

<sup>1</sup> Marine population numbers include: uniformed Marines, associated civilian workers and their dependents from off-island.

Figure 16.2-1 compares total population on Guam with and without the proposed action. At the 2014 peak, population with the proposed action is 34% higher than it otherwise would have been, without the project. At 2020, the difference declines to 15%.

Figure 16.2-1 indicates significant project related impact. Population increases are considered to be inherently mixed (both beneficial and adverse), because population growth fuels economic expansion but sudden growth also strains government services and the social fabric.



**Figure 16.2-1. Population with and without Proposed Action**

Demographic Characteristics

*Approach to Analysis*

New population on Guam related to the proposed action would have a different demographic composition than what currently exists on Guam, and will thus affect the island’s demographic composition.

Demographic impact data discussed here are broken out into two components. One is for those individuals coming to Guam as part of the proposed action (i.e. marine relocation). The other is for people who are likely to come to Guam seeking employment. The analysis is based on the historic characteristics of in-migrating groups and the military population. Results from this analysis are compared to the demographic characteristics of Guam presented in the Affected Environment Section.

Table 16.2-4 provides assumptions made about the demographic characteristics of population related to the employment component as well as the source of or rationale for those assumptions.

**Table 16.2-4. Employment Component Assumptions for Demographic Characteristic Impacts**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Number of Cases Studied (Not born on Guam, moved to Guam for employment)	1,525	U.S. Census. Guam 10% PUMS data, 2000
Average Year of Entry	1987	U.S. Census. Guam 10% PUMS data, 2000
Median Age when moved to Guam	32	U.S. Census. Guam 10% PUMS data, 2000. Reported median age adjusted for year of entry
<b>Gender</b>		
Male	74.2%	U.S. Census. Guam 10% PUMS data, 2000
Female	25.8%	U.S. Census. Guam 10% PUMS data, 2000
<b>Ethnicity</b>		
Asian Alone	56.1%	U.S. Census. Guam 10% PUMS data, 2000
Native Hawaiian/Other pacific Islander	24.8%	U.S. Census. Guam 10% PUMS data, 2000

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
White Alone	13.1%	U.S. Census. Guam 10% PUMS data, 2000
Other	6.0%	U.S. Census. Guam 10% PUMS data, 2000
<b>Predominant Places of Birth</b>		
Philippines	44.8%	U.S. Census. Guam 10% PUMS data, 2000
U.S.	18.1%	U.S. Census. Guam 10% PUMS data, 2000
Micronesia	13.4%	U.S. Census. Guam 10% PUMS data, 2000
Korea	5.6%	U.S. Census. Guam 10% PUMS data, 2000
China	5.0%	U.S. Census. Guam 10% PUMS data, 2000
Japan	3.9%	U.S. Census. Guam 10% PUMS data, 2000
Palau	2.4%	U.S. Census. Guam 10% PUMS data, 2000
CNMI	1.4%	U.S. Census. Guam 10% PUMS data, 2000
<b>Educational Attainment (25 yrs. and older)</b>		
High School Grad.	42.5%	U.S. Census. Guam 10% PUMS data, 2000
College Degree	33.4%	U.S. Census. Guam 10% PUMS data, 2000

Table 16.2-5 provides assumptions made about the demographic characteristics of population related to the military operational component as well as the source of or rationale for those assumptions.

**Table 16.2-5. Military Component Assumptions for Demographic Characteristic Impacts**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Number of Cases Studied (Military & military dependents)	1,995	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
Median Age	24	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
<b>Gender</b>		
Male	56.7%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
Female	43.3%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
<b>Ethnicity</b>		
White alone	61%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
Asian alone	12%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
Black or African American alone	7%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
Some other race alone	5%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
Two or more major race groups	12%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
<b>Predominant Places of Birth</b>		
U.S.	86.6%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
Philippines	2.5%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
Japan	1.8%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
Germany	1.5%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
Puerto Rico	1.1%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Korea	0.8%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
Guam	0.7%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
<b>Educational Attainment (25 yrs. and older)</b>		
High School Graduate	47.2%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
College Degree	50.7%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates

### *Impacts - Employment Component*

Populations who move to Guam for employment purposes are made up of more males than females. Therefore, the proposed action would increase the percentage male population on Guam.

Populations who move to Guam for work have historically moved at an average age of 32. This is an older population than Guam's current population. Therefore the employment component of the proposed action would increase the average age of the Guam population slightly.

Populations who have moved to Guam for employment purposes in the past have relocated largely from Asian or Other Pacific Island areas, with places of birth located mainly in the Philippines, the U.S., or Micronesia. This component of the proposed action would thus result in the population of Guam being made up of a relatively smaller population of Chamorros and Guam-born individuals, and a relatively higher population of Filipinos, Caucasians from the U.S Mainland, and Micronesians.

The educational attainment levels of people who move to Guam for employment purposes are variable, displaying low levels of high school graduation but high levels of college graduation. This likely represents the historical type of employment available on Guam (typically trades-related or requiring a specialty skill). Overall, the analysis shows that the in-migrant population would have a similar educational attainment as those currently living on Guam (most would have at least a high school diploma).

### *Impacts - Military Component*

The military component incoming population will have a higher ratio of males to females than currently reside on Guam. Therefore, the proposed action would increase the percentage male population on Guam.

The military component incoming population will generally be younger than Guam's population. Therefore this component of the proposed action would decrease the average age of the Guam population slightly.

The military component incoming population will be composed of more Caucasian backgrounds than Guam's current population. This component of the proposed action would thus result in the population of Guam being made up of a relatively smaller population of Chamorros and Guam-born individuals, and a relatively higher population of Caucasians from the U.S Mainland.

There is a higher overall level of educational attainment among the expected military population than is currently present on Guam. Therefore the proposed action would increase the number of people on Guam who possess a college degree.

## Household Characteristics

### Approach to Analysis

If a new population on Guam related to the proposed action had a different household composition than what currently exists on Guam, it would affect the island's household composition.

Impacts are presented in *employment component* and *military operational component* phases. Results from this analysis are compared to the household characteristics of Guam presented in the Affected Environment Section.

Table 16.2-6 provides assumptions made about the household characteristics of population related to the employment component as well as the source of or rationale for those assumptions.

**Table 16.2-6. Employment Component Assumptions for Household Characteristics Impacts**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Number of Cases Studied (Not born on Guam, moved to Guam for employment)	1,525	U.S. Census. Guam 10% PUMS data, 2000
Average Household Size	3.58	U.S. Census. Guam 10% PUMS data, 2000
Median Household Income	\$39,580	U.S. Census. Guam 10% PUMS data, 2000
Income per Household Member	\$11,055	U.S. Census. Guam 10% PUMS data, 2000
Family Households	80%	U.S. Census. Guam 10% PUMS data, 2000
Households with Children	42.4%	U.S. Census. Guam 10% PUMS data, 2000
% of Households Below the Poverty Line Below	23.3%	U.S. Census. Guam 10% PUMS data, 2000

Table 16.2-7 provides assumptions made about the household characteristics of population related to the construction component as well as the source of or rationale for those assumptions.

**Table 16.2-7. Military Component Assumptions for Household Characteristic Impacts**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Number of Cases Studied (Military & military dependents)	1,995	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
Average Household Size	3.4	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
Family Households	87.1%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
Households with Children	31.9%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates
% of Households Below the Poverty Line Below	1.1%	U.S. Census American Community Survey, PUMS 2005-2007 3-yr estimates

### Impacts - Employment Component

The household characteristics of populations who come to Guam for employment purposes are very similar to Guam overall. Households that include persons who moved to Guam for employment purposes have:

- Only a slightly smaller number of people per household
- Slightly more children per household
- The same rate of poverty
- Slightly higher income per household

Impacts to Guam's overall household composition would be fairly negligible.

### *Impacts - Military Component*

The expected military population would have:

- About one-half fewer persons per household
- Fewer children

Military household income in HI was slightly lower than HI households overall. However, this may or may not be the case for the military population on Guam. In 2000, military household income was lower than Guam overall, however, income per household member was higher than Guam overall. The expected impact is that military households would have similar household income but higher income per household member. Only 1.1% of military households lived below the poverty line. Thus, Guam's overall poverty rate will be lowered.

### Summary of Population Impacts

The population impacts analysis indicates direct and indirect significant impacts – of mixed beneficial/adverse nature – due to construction impacts peaking in 2013 at 36,811 additional population (not counting overlap with operations) and final operational impacts of 27,156 military and civilian population.

#### 16.2.2.2 Economic Impacts

Economic impact analysis primarily includes topics for which numerical estimates can be made, including:

- Civilian employment and income
- Housing for civilian population
- Government revenues and sources
- Gross Island Product (GIP)

Some economic topics are less conducive to quantification, but qualitative information about their impacts is presented in the section for:

- Potential effects on standard of living
- Unemployment
- Local business opportunities and constraints
- Effects on tourism

### Employment and Income

Employment and income impacts include the following topics:

- Civilian Labor Force Demand
- Civilian Labor Force Supply
- Civilian Labor Force Income
- Standard of Living
- Unemployment

#### *Civilian Labor Force Demand - Approach to Analysis*

Labor force “demand” refers to the jobs created by the proposed action and the workers needed to fill them. The analysis focused on civilian jobs only, including federal civilian workers and other jobs from spin-off economic growth. Calculations are in terms of full-time equivalents (FTEs). For example, two

half-time jobs would be counted as one FTE. The number of FTE jobs is assumed to be equal to the number of required workers.

Table 16.2-8 provides assumptions made in conducting the civilian labor force demand analysis for the construction phase as well as the source of or rationale for those assumptions.

**Table 16.2-8. Construction Component Assumptions for Civilian Labor Force Demand**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Worker Requirement Factor	75 Workers Per \$10 Mil Project Cost	Guam Contractors Association interviews
Supervisory Worker Requirement Factor	4 Supervisory Workers Per \$100 Mil Project Cost (not additional to other workers)	Guam Contractors Association interviews
Labor Cost as % of Total Project Cost	21%	Calculated as verification of worker requirement factor. Consistent with contractor projections.
Current H-2B Construction Labor on Guam	1,443	GDoL Employers Workplace Monthly Report Summary July, 2008
Guam Construction Workforce	2,531	Average of two estimates. The first estimate is based on GDoL June 2008 Current Employment Report construction industry production workers (with present H-2B construction workers excluded). The second estimate is based on estimates made by contractors during interviews.
Percentage of On-Site Workforce from H-2B	56%-61%	Contractor interviews

Table 16.2-9 provides assumptions made in conducting the civilian labor force demand analysis for the operations phase, as well as the source of or rationale for those assumptions. Table 16.2-10 shows key intermediate calculations feeding into subsequent estimates of the impact on total labor force demand from operations.

**Table 16.2-9. Operational Component Assumptions for Labor Force Demand**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Civilian Military Workers per Active-Duty Marine	0.4	Description of Proposed Action and Alternatives (EIS/OEIS)

**Table 16.2-10. Intermediate Operations-Related Calculations for Civilian Labor Force Demand**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Civilian Military Employees	204	468	468	468	3,421	3,421	3,421	3,421	3,421	3,421	3,421

#### *Civilian Labor Force Demand – Impacts*

Collectively, employment impacts are beneficial (especially during the construction phase). However, total employment after the construction peak will decline substantially but will be above pre-project levels.

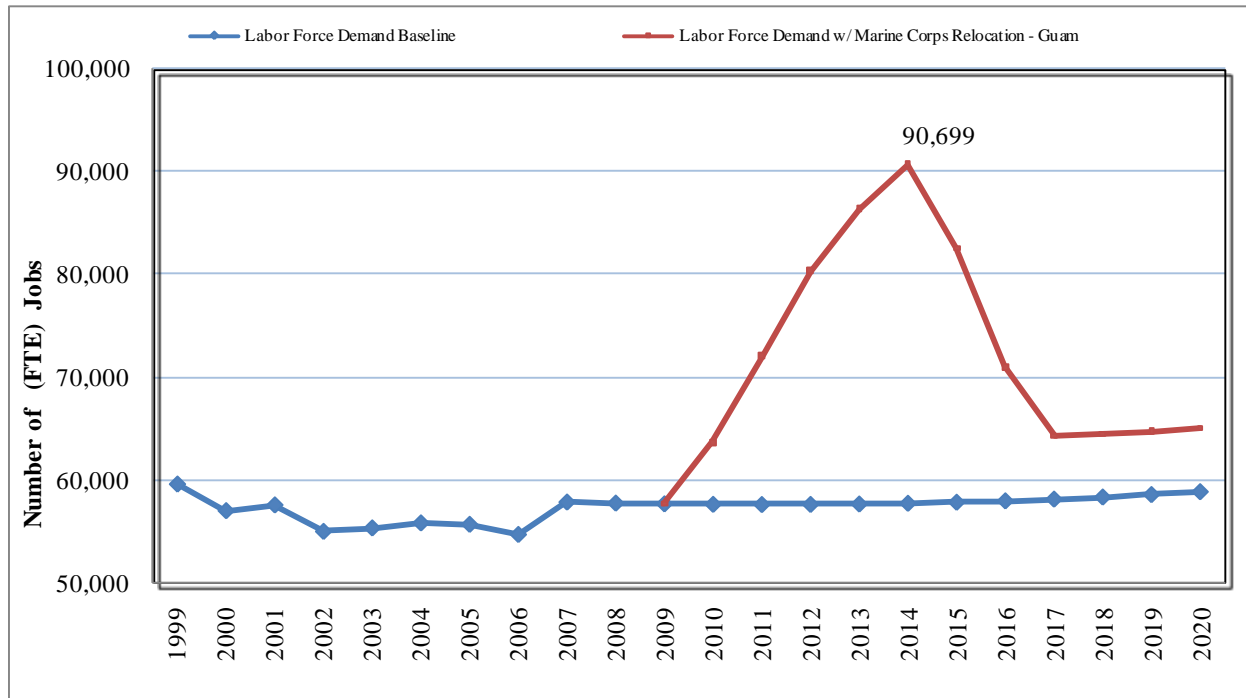
Table 16.2-11 shows the proposed action would support a combined 32,980 workers at the 2014 peak, but only 6,146 after construction abates in 2017.

**Table 16.2-11. Impact on Civilian Labor Force Demand (FTE Jobs)**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Combined Total Employment	6,041	14,440	22,701	28,741	32,980	24,712	13,040	6,146	6,146	6,146	6,146



Figure 16.2-2 compares total labor force demand on Guam with and without the proposed action. At the 2014 peak, civilian labor force demand with the proposed action is 75% higher than it otherwise would have been, without the project. At 2020, the difference declines to 12%.



**Figure 16.2-2. Labor Force Demand with and without Proposed Action**

*Civilian Labor Force Supply - Approach to Analysis*

Evidence for potential labor supply sources is provided for:

- Direct on-site military construction
- Other employment (direct construction jobs from purchases or civilian operational jobs, as well as indirect workers)

Analysis was conducted to address the following two questions:

- How many of the civilian jobs (on a net basis) are likely to accrue to currently unemployed Guam residents?
- From what countries or regions are the rest of the workers likely to in-migrate?

Possible sources for direct on-site military construction workers include:

- Current Guam Residents
- Temporary Foreign Workers
- CNMI and Other U.S. Pacific Islands
- Other Workers from the continental U.S. (CONUS) or Hawaii

Table 16.2-12 presents assumptions about labor sources for direct on-site military construction labor, and the source or rationale for these assumptions. Refer to the Appendix F SIAS for additional descriptions of and historical information regarding each of these sources.

**Table 16.2-12. Assumptions for Origins of Direct On-Site Labor Force Construction Supply**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
<b>Quantitative Assumptions</b>		
Construction employment	75 workers per \$10 million total construction cost	Guam Contractors Association interviews
Guam residents holding construction jobs	Up to 2,670 jobs at peak	GCA and Guam DOL employment by industry data
CONUS/HI/Japan % of workforce	4 supervisory workers from U.S. or Japan per \$10 million project cost.	Guam Contractors Association interviews
Supervisor/Labor split of CONUS/HI/Japan	4% / 96%	Guam Contractors Association interviews
Philippines/Other split of H-2B workforce	85% / 15%	Guam Contractors Association interviews
Other U.S. Pacific Island % of workforce	residuals of work force	Guam Contractors Association interviews
<b>Qualitative Assumptions</b>		
Fees for H-2B workers	They do not become an impediment to recruiting affordable labor	Entire project could founder if the economics are impractical
Competition for CONUS workers from federal stimulus spending	This would alone not be sufficient or widespread enough to deter at least some CONUS workers from Guam	This is a matter of great uncertainty, but there is a strong commitment by government to seek out U.S. workers

*Notes:* No assumption is made about the likely split of “Other Pacific Island” workforce among the CNMI, Federated States of Micronesia, Republic of the Marshall Islands, Palau, and American Samoa. This reflects conflicting evidence in the foregoing table and the general difficulty of predictions for specific small areas.

Possible sources for construction-related jobs other than direct on-site jobs (i.e., direct from purchases and indirect); direct federal civilian jobs associated with the military; and spin-off jobs include:

- Guam Residents
- Temporary Foreign Workers (H-2B visa workers)
- Other U.S. Pacific Island Workers
- Other Workers from CONUS, Hawaii, or Okinawa Transfers

Given the uncertainties involved for various potential off-island labor sources, this analysis is restricted to assumptions and estimates strictly about “on-island” and “off-island” labor force sources (Table 16.2-13). Refer to the Appendix F SIAS for additional descriptions of and historical information regarding these sources.

**Table 16.2-13. Assumptions for Origins (On vs. Off-Island) of Labor Force Supply for Employment Other Than Direct On-Site Construction**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Sources of direct federal civilian employment.	50% Okinawa transfers, 25% military spouses, 25% other off-island.	Planning assumption provided by NAVFAC Pacific
Absorption of Guam’s pool of unemployed workers.	By 2014, Guam’s unemployment rate would decline to 4.0%, then gradually rise somewhat thereafter.	For analysis/modeling purposes, currently unemployed Guam residents were assigned to Indirect employment

#### *Civilian Labor Force Supply - Impacts*

Table 16.2-14 shows the probable origins of the labor force supply for direct onsite military construction jobs.

**Table 16.2-14. Estimated Origin of Workers Constructing Military Facilities**

	2010	2011	2012	2013	2014	2015	2016
<b>TOTAL</b>	<b>3,186</b>	<b>7,672</b>	<b>12,358</b>	<b>15,816</b>	<b>15,257</b>	<b>10,572</b>	<b>3,928</b>
<b>GUAM</b>	<b>562</b>	<b>1,226</b>	<b>1,768</b>	<b>1,999</b>	<b>1,929</b>	<b>1,336</b>	<b>497</b>
<b>OFF-ISLAND</b>	<b>2,622</b>	<b>6,443</b>	<b>10,584</b>	<b>13,810</b>	<b>13,322</b>	<b>9,231</b>	<b>3,430</b>
H-2B Workers	1,775	4,401	7,295	9,600	9,261	6,417	2,384
Philippines	1,508	3,741	6,201	8,160	7,872	5,455	2,027
Other	266	660	1,094	1,440	1,389	963	358
CONUS/HI/Japan	499	1,202	1,936	2,478	2,391	1,656	615
Supervisor (U.S., Japan)	21	50	85	106	100	64	23
Labor	478	1,151	1,854	2,372	2,289	1,586	589
Other U.S. Pacific Islands	349	840	1,353	1,731	1,670	1,157	430

Notes: Numbers may not add exactly due to rounding.

Table 16.2-15 indicates that Guam residents are expected to capture 2,566 jobs at the 2014 construction peak; these jobs include civilian military jobs, direct from purchases jobs and indirect/induced jobs. By 2020, 2,211 jobs related to the proposed action will go to Guam residents. Table 16.2-16 shows that at the 2014 peak, 15,157 jobs would be taken by off-island workers with that number decreasing to 3,935 by 2020.

**Table 16.2-15. Estimated Numbers of On-Island Workers for Various Job Categories Excluding Direct On-Site Construction**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total Jobs, for On-Island Workers (Excluding Direct Military Construction)	479	948	1,334	1,812	2,566	2,466	2,433	2,302	2,302	2,211	2,211

Notes: Demand is in terms of FTE jobs, and assumes one worker per FTE job

**Table 16.2-16. Estimated Numbers of Off-Island Numbers of Workers for Various Job Categories Excluding Direct On-Site Construction**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total Jobs, Excluding Direct Military Construction, for Off-Island Workers	2,376	5,819	9,009	11,112	15,157	11,674	6,678	3,845	3,845	3,935	3,935

Notes: Demand is in terms of FTE jobs, and assumes one worker per FTE job

#### *Civilian Labor Force Income - Approach to Analysis*

Civilian labor force income refers to the cumulative gross wages and salaries (before deductions for taxes) earned by the civilian workers. This information is important for later GovGuam revenue calculations.

Table 16.2-17 provides assumptions made in conducting civilian labor force income analysis for the construction phase, and the source or rationale for these assumptions.

**Table 16.2-17. Construction Component Assumptions for Civilian Labor Force Income**

Assumption	Assumed Value	Source/Rationale
Non-Supervisory Worker Annual Wage	\$27,999	GDoL Current Employment Report June, 2008 - Construction Industry Average Weekly Earnings multiplied by 52.
Supervisory Worker Annual Wage	\$85,830	U.S. Bureau of Labor Statistics Occupational Employment Statistics - Mean annual wage for "Construction Managers."

Table 16.2-18 provides assumptions made in conducting the civilian labor force income analysis for the operations phase, and the source or rationale for these assumptions.

**Table 16.2-18. Operational Component Assumptions for Civilian Labor Force Income**

Assumption	Assumed Value	Source/Rationale
Civilian Military Worker Average Total Income.	\$51,793	Median value of GS Summary Table

Notes: “GS” stands for “General Schedule,” that is a pay scale for federal Employees and is developed by the U.S. Office of Personnel Management (OPM). The OPM produces a table with Grade level on the vertical axis and Time-in-Grade on the horizontal axis. The median value pinpoints the mid-point of the Grade axis and the mid-point of the Time-in-Grade.

*Civilian Labor Force Income - Impacts*

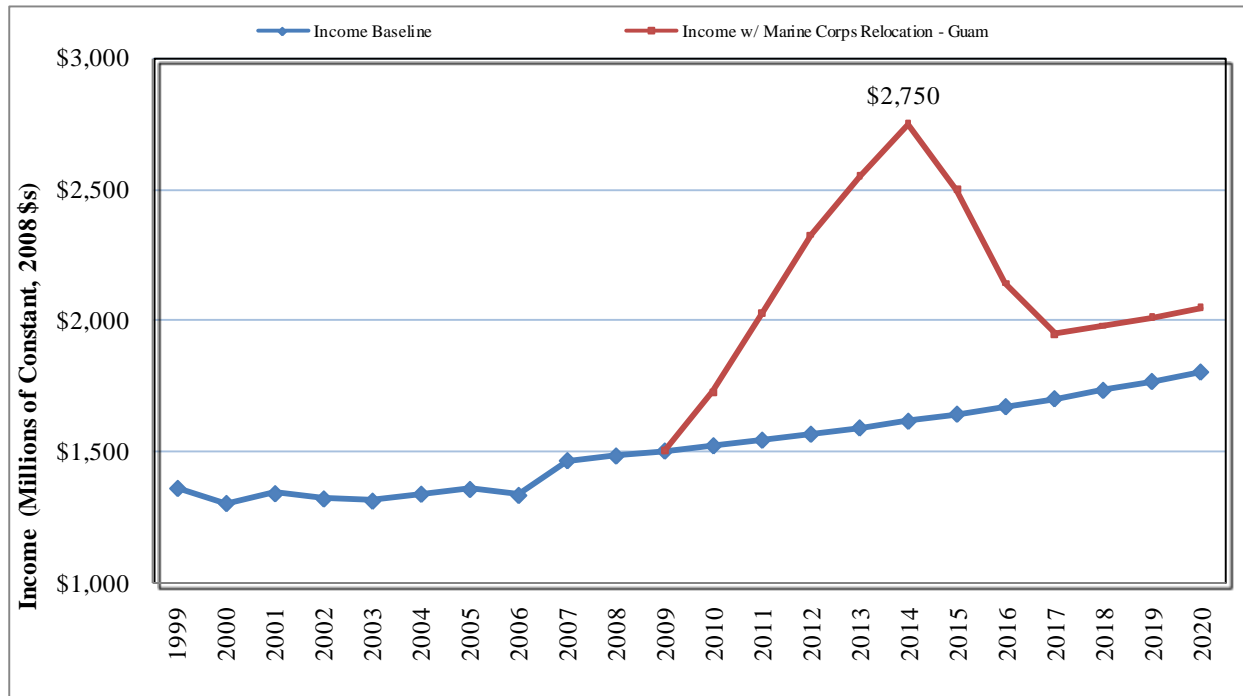
The civilian labor force income amounts presented below apply to the entire labor force rather than to the incomes of individual workers. Collectively, income impacts are beneficial (especially during the construction phase). However total income after the construction peak will decline substantially but will be above pre-project levels.

Table 16.2-19 shows that the peak figure is \$1.1 billion in 2014, falling back to \$246 million as construction ends after 2016.

**Table 16.2-19. Impact on Civilian Labor Force Income (Millions of 2008 \$s)**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total Income	\$203	\$484	\$761	\$959	\$1,134	\$857	\$472	\$246	\$246	\$246	\$246

Figure 16.2-3 compares total income on Guam with and without the proposed action. At the 2014 peak, civilian labor force income with the proposed action is 70% higher than it otherwise would have been, without the project. At 2020, the difference declines to 14%.



**Figure 16.2-3. Labor Force Income with and without Proposed Action**

*Standard of Living - Approach to Analysis*

Standard of living is a measure of purchasing power. If the standard of living increases for a person it means they can purchase more goods and services. If the standard of living declines for that person, he or she can purchase fewer goods and services.

Changes in a person's standard of living are determined by their income and the prices of the goods and services they tend to purchase. A person's standard of living will increase if their income rises faster than the prices of goods and services they tend to purchase. A person's standard of living will decline if the prices of goods and services they purchase rise faster than the person's income.

The average FTE salary for jobs related to the construction phase (including indirect jobs) was derived using current construction worker wages and outputs from the Input-Output Model (I-O). The total income of new jobs (direct and indirect) created was divided by the total number of jobs created.

The average FTE salary for jobs related to the military operational phase (including indirect jobs) was based on estimated civilian military worker current incomes and incomes derived in the modeling process.

*Standard of Living - Impacts*

In both the construction and operational components, the average wage of workers would increase as a function of greater demand for labor. However, the price of goods and services purchased by individuals would rise as well.

Guam incomes are expected to rise; it is estimated that the average FTE salary for jobs related to the construction phase would rise to \$33,500 (compared to 2007 Guam average FTE salary of \$28,150). Construction component salaries are expected to be higher due to the creation of higher-paying jobs in the architecture and engineering, wholesale trade, and health services industries. With a rapid increase in economic activity and a limited pool of on-island labor, there would likely be competition for labor and thus upward pressure on wage rates. The market wage may increase over the estimated \$33,500 due to the fact that the estimation procedure has no basis for estimating the extent of upward pressure on rates.

It is estimated that the average FTE salary for jobs related to the military operational phase would rise to \$40,000 (compare to 2007 Guam average FTE salary of \$28,150). Operational component salaries are expected to be higher, in large part, due to additional higher-paying on-base civilian military jobs. As previously noted, most civilian military jobs would likely go to either spouses of new active duty personnel or to labor brought in from off-island; only about 25% of civilian military jobs are expected to be filled by current Guam residents.

General inflation, arising from the increase in economic activity (and money supply), would likely create an adverse significant impact on household purchasing power. This impact would be more acute during the construction period because of the sudden spike in demand for all types of goods and services. Rates of inflation would likely fall to less than significant levels thereafter. From 2000 to 2008 Guam workers have seen their standard of living decline by 30% and there is no reason to expect the military buildup to reverse that trend – Guam workers will likely continue to see the cost of goods and services rise faster than their incomes. While the proposed action may not represent a reversal of this trend, it will slow the rate of decline in the standard of living that has been prevalent since 2000.

It should be noted that it cannot be definitively predicted whether wages or the price of goods and services would increase at a faster pace. If wages earned by a particular household rise more quickly than the price of goods and services, then the standard of living would increase. If the price of goods and

services rises more quickly than wages, the standard of living would decrease. Thus, households on fixed incomes would experience reduced purchasing power. Those with the ability to quickly renegotiate their wages will have a better chance at maintaining or increasing their standard of living. Overall, the military buildup would likely bring more high skilled, high paying jobs that provide employees more flexibility to have their wages adjusted to meet price increases.

#### *Unemployment - Approach to Analysis*

The proposed action would bring many new jobs to Guam but it would also bring a large new population from off-island. Analysis was done to determine how these two factors would affect the unemployment rate on Guam.

The large influx of new jobs would provide employment opportunities for most that seek them. Therefore, the unemployment rate during the construction component would be lower than current levels and full-employment should be reached or exceeded.

Though not as many new jobs would be available during the operational component as during the construction component there will be many more jobs than at present. Therefore, the impact would result in a generally lower rate of unemployment than there otherwise would have been.

#### *Unemployment - Impacts*

It is projected that the impact of the buildup would be to reduce the rate of unemployment on Guam from the most recently published rate of 8.3% (Guam Department of Labor 2007a). Guam's unemployment rate would ultimately be lowered by the construction and operational phases of the proposed action.

### Housing

Topics in the housing analysis include:

- Civilian Housing Demand
- Housing Supply

The following factors are *not* included in the housing analysis:

- “Stay-Behind” Worker Housing
- Housing for on-base active-duty military and dependents
- Household formation for additional Guam residents
- Temporary Workforce Housing (a description however, is provided below)

Refer to the Appendix F SIAS for more information on these topics. This analysis provides an overview of current plans for temporary workforce housing possibilities, but these plans not included in housing analysis beyond this inclusion.

#### *Temporary Workforce Housing*

Temporary workforce housing is not included in the housing analyses because it is assumed that all H-2B worker housing would be provided by construction contractors and would not generate demand in the private-market. Immigration law requires that employers provide housing for each H-2B worker they bring in. This section reviews current plans for temporary workforce housing.

With 9,600 H-2B workers expected at peak, a large number of new workforce housing units would be required.

There are a number of ways that this demand may be met, including:

- New worker housing.
- Retrofit existing vacant construction workers housing (from past construction booms) or vacant residential apartments.
- Construct new apartment structures.
- Convert large shipping containers into temporary housing units.

DoD would rely on construction contractors, who have significant expertise in the areas of workforce housing and logistics, to support temporary foreign worker housing requirements. While GovGuam and federal agencies would retain their authority to conduct inspections and enforce laws, DoD contract provisions would require quality control, oversight and the hiring of contractors with proven track records. Well thought-out plans related to workforce housing, including quality of life requirements, would be given award preference. Contract provisions would also include requirements to provide workforce medical, dining, transportation and safety/security. There would be health screening of all workers to reduce health risk to the Guam population. Contractors would be required to provide health care either by supplementing local Guam staff and resources or building their own clinic.

Contractors anticipating Navy contract awards would likely proceed with plans on how to provide housing for their temporary workers prior to the Record of Decision.

Table 16.2-20 and Figure 16.2-4 provide further information on existing and planned temporary workforce housing units. The largest planned facility would be located in North Tumon, near Two Lovers Point, and would be built on a currently undeveloped 250 acre (101 hectare) parcel of land; the planned facility has the potential to house up to 18,000 temporary workers.

**Table 16.2-20. Temporary Workforce Housing Locations and Attributes  
(Map Key for Figure 16.2-4)**

<i>Figure 16.2-4 Key</i>	<i>Name/Location</i>	<i>Estimated Worker Capacity</i>	<i>Planned/Existing/Retrofit</i>	<i>Site is Developed/Paved? (Yes/No)</i>
1	North Tumon, (Near Two Lovers Point)	2,000-18,000	Planned (250 Acre Parcel)	No
3	Upper Tumon, (Former Tumon Village, El Dorado Apts.)	3,500-4,000	Retrofit	Yes
4	Harmon Industrial Park	1,900	Existing	Yes
6	Barrigada, Former Naval Air Station Barracks	1,600	Retrofit	Yes
2	Dededo	1,800	Existing	Yes
5	Tamuning		Existing	Yes
7	Yona		Existing	Yes
8	Agat		Existing	Yes

*Notes:* Planned refers to housing being planned by contractors.

*Source:* JGPO and NAVFAC Pacific 2009

#### *Civilian Housing Demand and Supply - Approach to Analysis*

The civilian housing unit demand in this section is an estimate of the number of *required* units (demand) for the in-migrating Guam civilian population. For discussion of the *supply* of housing in response to these requirements, see the following Housing Supply, Deficits and Prices section.

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**Figure 16.2-4**  
**Current and Expected Future Location and Capacity**  
**of Temporary Workforce Housing**



It should be noted that the Guam Housing and Urban Renewal Authority (GHURA) has recently released a detailed housing needs assessment study. The supply estimates presented herein are therefore provisional and may be revised and further informed based on the more detailed housing study by GHURA (GHURA 2009).

The primary focus of this analysis is demand and supply for the private-sector Guam housing market affected by in-migrating civilian populations.

Construction phase impacts on private market housing would arise primarily from the in-migration of:

- non-H-2B workers who are directly employed at the various military construction sites
- non-H-2B workers who take other direct or indirect construction-related jobs.

Table 16.2-21 shows critical assumptions for the construction phase, as well as the source or rationale of those assumptions.

**Table 16.2-21. Construction Component Assumptions for Civilian Housing Demand**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Average Household Population for in-migrants	3.89	U.S. Census Bureau Guam 2000 average
H-2B worker housing	To be provided by employer and would involve predominantly new construction of quarters, with negligible conversion of existing housing stock to H-2B housing. Military contractual requires all construction contractors to provide housing for their H-2B employees	Employers of H-2B workers are allowed to deduct only a limited amount from H-2B workers' paychecks for housing costs (currently, \$320 per month). This very low allowance means almost all H-2B workers would be likely to be housed dormitory-style
New household formation by Guam residents	Negligible effect	Guam residents directly or indirectly employed due to the proposed action would, on average, make somewhat more money than without the project. However, the number of residents previously living with family or friends to save money, who would move to their own housing units due to the increased pay, is likely to be minimal

During the operational phase, all Marines and their dependents would be housed on-base, per specifications of the proposed action. Thus no off-base housing demand would stem directly from that population.

The housing demand during the operations phase is generated by:

- Civilian military workers
- In-migrating direct and indirect workers

Table 16.2-22 provides assumptions made in conducting the housing demand analysis for the operations phase, as well as the source or rationale for those assumptions.

**Table 16.2-22. Operational Component Assumptions for Housing Demand**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Average Household Population for in-migrants	3.89	U.S. Census Bureau Guam 2000 average
Military personnel off-base housing impact	All military personnel would be housed on-base	Master Planning Assumption

Table 16.2-23 provides assumptions made in conducting housing supply analysis for both the construction and military operational phases of the proposed action, and the source or rationale for these assumptions.

**Table 16.2-23. Construction and Operational Assumptions for Civilian Housing Supply**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Number of currently vacant, for-rent housing units	1,915	GBSP (2008)
Current vacant, for sale housing units	467	Multiple Listing Service data provided by Bank of Guam (2009)
Housing units with building permits but that currently have not been completed	500	There are approximately 2,000 such building permits currently, but most are viewed as unlikely to have construction complete at the start of project construction. A factor of 25% was applied
Core total housing vacancy rate	4%	Reflects market delays in matching renters with landlords, and administrative and maintenance factors that would results in some units always being vacant

*Notes:* Of the 467 units vacant for sale, 273 are single-family units (Bank of Guam 2009). Many units currently for sale are “executive units” (priced above \$500,000) that would not be suitable for all but a handful of the expected new population generated by the proposed action.

#### *Civilian Housing Demand and Supply – Impacts*

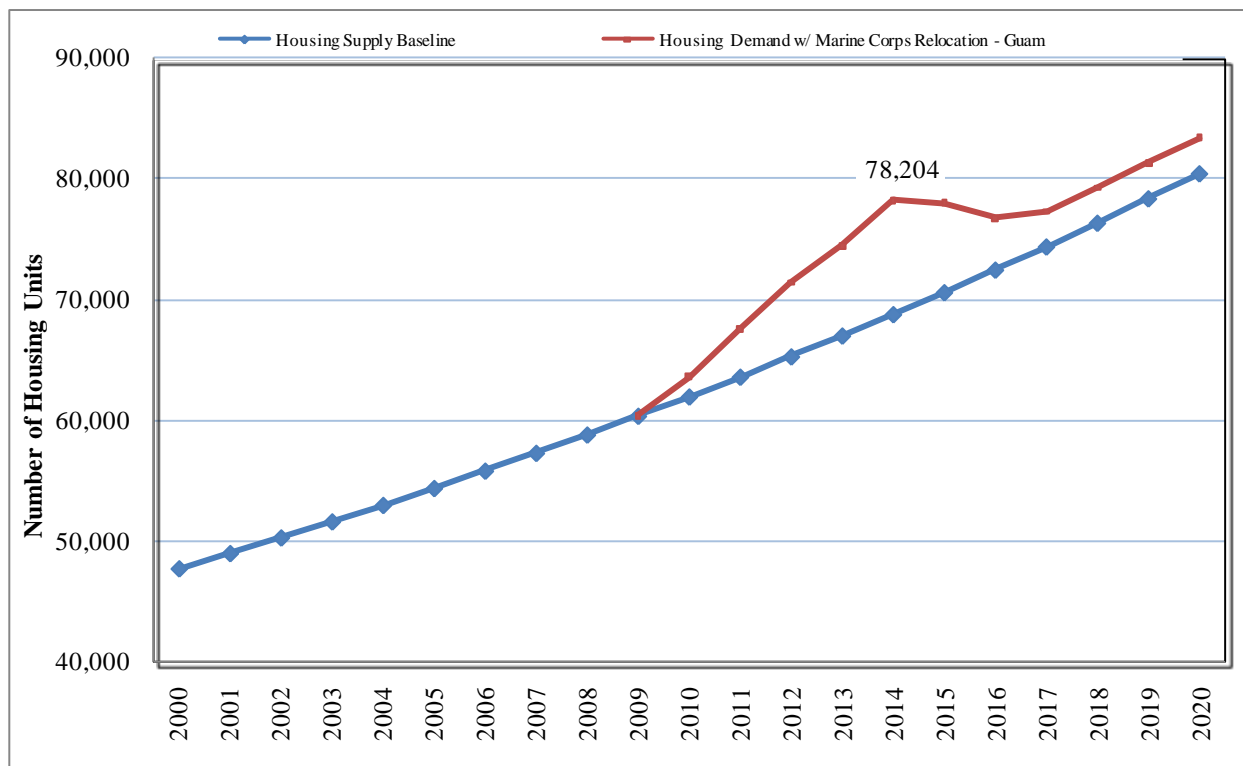
Civilian housing demand and supply impacts were found to be significant.

Table 16.2-24 indicates the combined total impact of the proposed action would be a demand for 9,431 new units in the peak year of 2014, falling to 2,959 by 2020.

**Table 16.2-24. Demand for New Civilian Housing Units**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total Housing Demand	1,648	3,972	6,119	7,465	9,431	7,406	4,283	2,913	2,913	2,959	2,959

Figure 16.2-5 compares total housing demand on Guam with and without the proposed action. At the 2014 peak, housing demand with the proposed action is 14% higher than it otherwise would have been, without the project. At 2020, the difference declines to 4%.



**Figure 16.2-5. Housing Demand with and without Proposed Action**

Based on assumptions, the stock of likely available housing was estimated at 2,787 units at the start of project construction in 2010.

Table 16.2-25 shows an estimated housing surplus in the years subsequent to the construction phase if the market were to provide all the needed housing during the construction-period. The recently released housing needs assessment study by the Guam Housing and Urban Renewal Authority may provide an updated estimate of the available housing and the market’s ability to respond to the additional housing unit demands.

**Table 16.2-25. Demand and Supply for New Civilian Housing Units**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Combined Action Total Impact	1,648	3,972	6,119	7,465	9,431	7,406	4,283	2,913	2,913	2,959	2,959
Annual Change in Demand	1,648	2,324	2,147	1,346	1,966	(2,025)	(3,123)	(1,370)	0	46	0
Available Housing Supply (vacant, likely available)	2,787	1,139	0	0	0	0	0	0	0	0	0
Annual Construction Needed to Eliminate Housing Deficit	0	1,185	2,147	1,346	1,966	0	0	0	0	0	0
<b>Surplus Units if Supply Increases to Eliminate Deficit</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2,025</b>	<b>5,148</b>	<b>6,518</b>	<b>6,518</b>	<b>6,472</b>	<b>6,472</b>

It should be noted that the estimates provided here are theoretical, and meant to be indicative of the amount of housing construction that would be needed to satisfy the increased demand.

In reality it is unlikely that construction of new housing would fully respond to the demand to eliminate a housing deficit. The main challenges to increase housing supply in the face of projected rapid demand increases would occur mostly during the construction phase, and generally fall into three categories:

- Scarcities of labor and materials to build new housing (supply bottlenecks)
- Financial feasibility of constructing housing for short-term demand increases
- Bottlenecks in the Guam housing permitting system to accommodate rapid increases in permit demand

Another factor that should be recognized is the possibility of a typhoon disaster. If a typhoon were to hit Guam, some currently available housing units may be destroyed that would create higher demand for new housing units than shown in tables. Higher demand would stem from a lower number of currently available housing units and a possible spike due to the presence of temporary relief workers.

Housing supply during the post-construction timeframe would be less challenging because local contractors and housing supply materials would have been freed up to meet housing demand more competitively than during the construction period.

Impacts would be adverse if sufficient housing supply cannot be developed and results in crowding, continued price increases, and/or substandard housing development (Refer to the Appendix F SIAS for more detailed discussion).

#### Local Government Revenues

This section provides an estimate of revenues accruing to GovGuam from the primary sources identified in the Affected Environment Section 16.1. The analysis does not specify all governmental costs but does make note of likely differences in timing between costs and revenues.

#### *Approach to Analysis*

Government revenue sources that are analyzed include gross receipts tax, corporate income tax, and personal income tax. These taxes are collected quarterly or annually and there may be a time lag between when government revenues are needed and when they are actually available for use. The analysis assumes GovGuam collects all tax revenues that it would be owed.

Table 16.2-26 provides assumptions made in conducting local government revenue analysis for the construction and operational phases, as well as the source or rationale for these assumptions.

**Table 16.2-26. Assumptions for Local Government Revenue**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
GRT	0.04	GovGuam GRT tax rate
Profit	0.06	Based on market conditions
Corporate income tax rate	0.17	Based on GovGuam Corporate Income tax rate
Personal income tax rate (applies to military as well as to civilians)	0.15	Based on IRS Tax tables

*Notes:* Guam residents do not pay federal income taxes. Instead, GovGuam taxes resident income at the federal rates passes the money to the federal government that then passes the same amount back. Military personnel income taxes are also returned.

#### *Impacts*

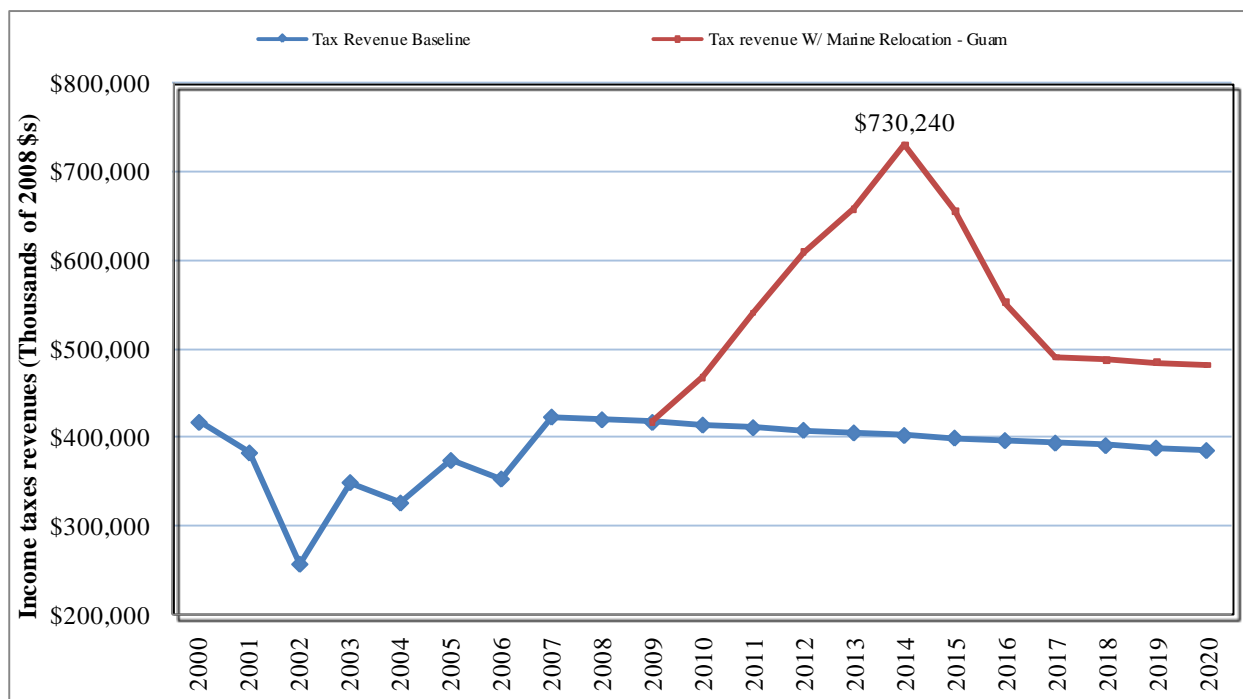
Table 16.2-27 provides GovGuam tax revenue impact summary data. Year-by-year impacts can be found in the Appendix F SIAS.

Revenue impacts are beneficial to GovGuam, subject to the issues of timing and the fluctuation associated with construction ramp-up and decline.

**Table 16.2-27. Impact on GovGuam Tax Revenue Summary (Thousands of 2008 \$s)**

<i>Tax</i>	<i>Peak Impact</i>	<i>Steady Impact</i>
GRT	\$107,638	\$8,433
Corporate Income	\$27,448	\$2,150
Personal Income	\$192,585	\$86,030
<b>Total</b>	<b>\$327,671</b>	<b>\$96,614</b>

Figure 16.2-6 compares total GovGuam tax revenue with and without the proposed action. At the 2014 peak, tax revenues with the proposed action are 81% higher than they otherwise would have been without the project, representing a beneficial increase. At 2020, the difference declines to 25%, a lesser but still beneficial increase.



**Figure 16.2-6. GovGuam Tax Revenues with and without Proposed Action**

Gross Island Product

*Approach to Analysis*

GIP for Guam represents the total market value of all final goods and services produced in a given year. The concept is generally referred to as Gross Domestic Product (GDP) and it the most commonly used benchmark to assess the overall strength of an economy; when the term economic growth is mentioned it usually refers to an increase in Gross Product from one time period to another.

Table 16.2-28 provides assumptions made in conducting the GIP analysis for the construction phase. Table 16.2-29 shows key intermediate calculations feeding into subsequent estimates of the impact on GIP from construction.

**Table 16.2-28. Construction Component Assumptions for GIP**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Gross value of military contracts – 2010	\$425 million	NAVFAC Pacific 2009
Gross value of military contracts – 2011	\$1,023 million	NAVFAC Pacific 2009
Gross value of military contracts – 2012	\$1,648 million	NAVFAC Pacific 2009
Gross value of military contracts – 2013	\$2,109 million	NAVFAC Pacific 2009
Gross value of military contracts – 2014	\$2,034 million	NAVFAC Pacific 2009
Gross value of military contracts – 2015	\$1,410 million	NAVFAC Pacific 2009
Gross value of military contracts – 2016	\$524 million	NAVFAC Pacific 2009
Percent of expenditures made on Guam – Equipment	6%	Interviews with GCA
Percent of expenditures made on Guam – Design	2%	Interviews with GCA
Percent of expenditures made on Guam – Materials	5%	Interviews with GCA
Percent of expenditures made on Guam – Supplies	6%	Interviews with GCA
Construction employment.	75 workers per \$10 million total construction cost	Interviews with GCA
Average construction wages – Supervisory	\$85,830/yr.	U.S. BLS Occupational Employment Statistics
Average construction wages – overall	\$27,999/yr.	GDoL
Percent of gross pay spent on Guam economy – Guam workers	47%	State of HI I-O PCE, adjusted by John M. Knox & Associates
Percent of gross pay spent on Guam economy – High-skilled construction and construction in-migrants from CONUS/FAS/HI	45%	State of HI I-O model PCE, adjusted by John M. Knox & Associates
Percent of gross pay spent on Guam economy – Construction H-2B workers	20%	State of HI I-O model PCE, adjusted by John M. Knox & Associates
Ratio of GIP to Output	0.75	Output is always larger than GIP as GIP represents only final purchases. Output adjusted downward to represent GIP. Based on ratio of total sales from 2002 economic census to Guam GIP from 2002 Bureau of Statistics and Plans

**Table 16.2-29. Intermediate Construction-Related Calculations for GIP**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Direct Non-Labor Construction Spending on Guam Economy	\$74	\$179	\$288	\$369	\$356	\$246	\$92	N/A	N/A	N/A	N/A
Personal Spending of Direct, On-Site, Construction Workers on Guam	\$19	\$46	\$74	\$92	\$88	\$60	\$22	N/A	N/A	N/A	N/A

Notes: All figures are in millions of 2008 dollars.

Table 16.2-30 provides assumptions made in conducting the GIP analysis for the operations phase.

**Table 16.2-30. Operational Component Assumptions for GIP**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Total expenditure, base operations – 2010	\$4.7 million	Estimate based on historical Guam military (USAspending.gov 2008) contracts data scaled over time according to estimated change in on-base population
Total expenditure, base operations – 2011	\$8.7 million	Estimate based on historical Guam military (USAspending.gov 2008) contracts data scaled over time according to estimated change in on-base population
Total expenditure, base operations – 2012	\$9.4 million	Estimate based on historical Guam military (USAspending.gov 2008) contracts data scaled over time according to estimated change in on-base population
Total expenditure, base operations – 2013	\$9.9 million	Estimate based on historical Guam military (USAspending.gov 2008) contracts data scaled over time according to estimated change in on-base population
Total expenditure, base operations – 2014	\$47.8 million	Estimate based on historical Guam military (USAspending.gov 2008) contracts data scaled over time according to estimated change in on-base population
Total expenditure, base operations – 2015-2020	\$52.4 million	Estimate based on historical Guam military (USAspending.gov 2008) contracts data scaled over time according to estimated change in on-base population
Percent of military operations contracts awarded to Guam firms	17%	Historical local contract award expert advice, provided by GCA
Average annual wages of enlisted personnel	\$28,895	Western Pacific Alignment Plan (WAP)
Average annual wages of military support personnel	\$41,435	Estimate based on Government Service (GS) pay scale (Office of Personnel Management 2008)
Percent wages spent on Guam economy, enlisted military	12%	State of HI I-O model, adjusted by John M. Knox & Associates
Percent wages spent on Guam economy, military support	47%	State of HI I-O model, adjusted by John M. Knox & Associates
Federal Military Output Multipliers	1.7	HI 2005 I-O Model
Personal Expenditures Output multiplier	1.89	Based on various multipliers from HI I-O Model weighted by expenditures category
Ratio of Output to GIP	0.75	Output is always larger than GIP as GIP represents only final purchases. Output adjusted downward to represent GIP. Based on ratio of total sales from 2002 economic census to Guam GIP from 2002 Bureau of Statistics and Plans.
Total relocation of all active-duty military personnel to Guam	Complete by 2014	DoD policy – necessary to meet agreement with Government of Japan

The Table 16.2-31 below shows key intermediate calculations feeding into subsequent estimates of the impact on GIP from operations.

**Table 16.2-31. Intermediate Operations-Related Calculations for GIP**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Base Operational Expenditures on Guam	\$5	\$9	\$9	\$10	\$48	\$48	\$48	\$48	\$48	\$48	\$48
On-Base Personnel (includes Active Duty and Civilian Military Employees) Direct Personal Expenditures in Guam economy	\$2	\$4	\$4	\$4	\$28	\$28	\$28	\$28	\$28	\$28	\$28

Notes: All figures are in millions of 2008 dollars.

*Impacts*

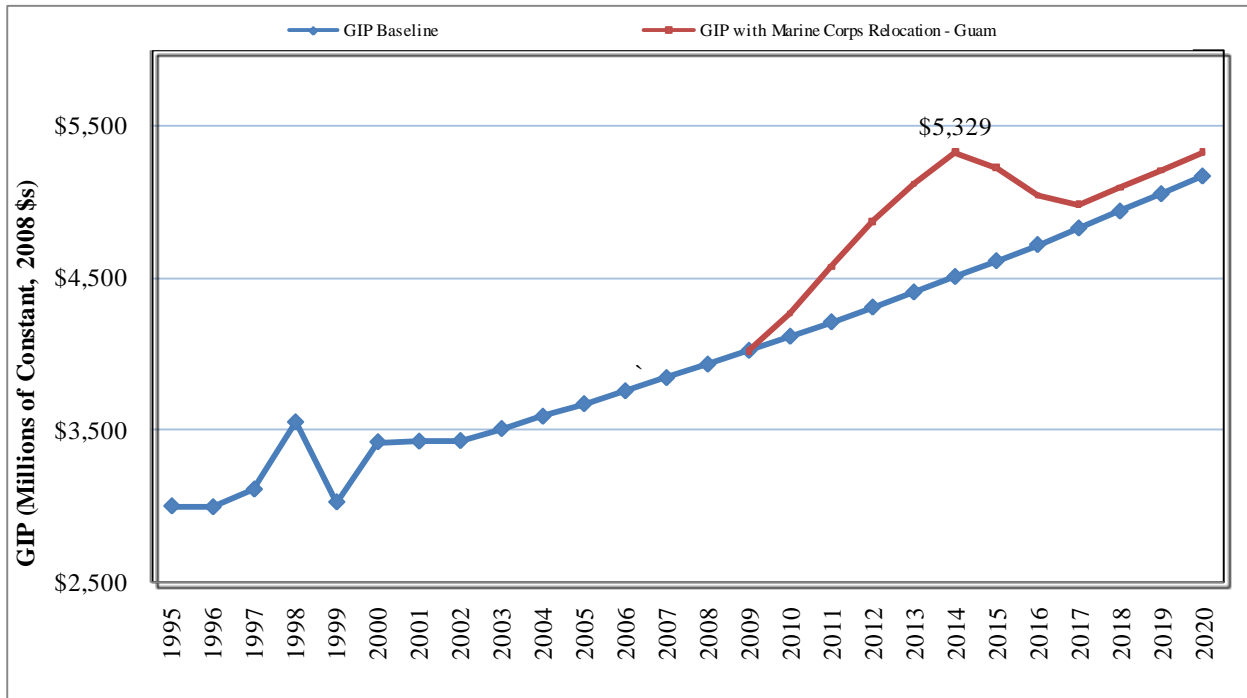
The following impacts are significant. Collectively, GIP impacts are beneficial (especially during the construction phase). However total GIP after the construction peak will decline substantially but will be above pre-project levels.

Table 16.2-32 shows the combined total impact on GIP would be \$822 million in 2014, declining to a stable figure of \$157 million beginning in 2017 during the steady-state operational phase.

**Table 16.2-32. Impact on GIP (Millions of 2008 \$s)**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Total Impact on GIP	\$152	\$361	\$566	\$714	\$822	\$616	\$327	\$157	\$157	\$157	\$157

Figure 16.2-7 compares Guam’s GIP with and without the proposed action. At the 2014 peak, GIP with the proposed action is 18% higher than they otherwise would have been, without the project. At 2020, the difference declines to 3%.



**Figure 16.2-7. Guam Gross Island Product with and without Proposed Action**



### Local Business Contracts

Guam businesses have historically expressed concern about being under-bid by Alaskan contractors using minority-owned small-business status. To address such concerns, this section provides information on relevant legalities, and possible opportunities and constraints.

#### *Approach to Analysis*

Recent legal changes have resulted in a switch from ethnically-based preferences in contracting to geographically-based preferences (Refer to the Appendix F SIAS for more detailed information). With these legal parameters in mind, Naval Facilities Engineering Command Pacific (NAVFAC Pacific) is creating a system of preferences worth \$1 billion for small and local businesses specific to the proposed action (Murphy 2009). The incentives in this system would hold valid for the duration of the action. Also, the Defense Logistics Agency is providing \$386,000 to establish the new Guam Procurement Technical Assistance Center at the UoG School of Business and Public Administration. The Procurement Technical Assistance Center would help small businesses on Guam navigate the DoD's procurement bureaucracy in hopes of increasing the share of contracts awarded (Hodai 2008).

#### *Impacts*

While the topic of local business contract opportunities is important to the Guam business community, exact impacts or results cannot be predicted, other than to say that business opportunities would increase and constitute a beneficial impact.

The main driver of local business impacts during the construction phase would be the specific preferences written by NAVFAC Pacific, especially their application of the Price Evaluation Adjustments on bidding for smaller contracts based on the HUBZones program. These preferences would determine how much of the total construction budget is awarded to Guam companies.

There may also be service contract opportunities (especially food and supplies), for H-2B worker camps during the construction phase. As of March 2009, NAVFAC Pacific was using the legal framework described above to map out set-asides for small businesses on Guam during the construction phase.

The operational phase may bring enhanced business opportunities for Guam companies. Guam businesses tend to compete better for military *service* contracts, as opposed to *construction* contracts (Guam Chamber of Commerce 2008). Although all supplies and products are imported from off-island services, local companies can manage service facilities such as gyms, libraries, and fast food franchises (Appendix F SIAS - Global Facilities Services Interview).

### Tourism

Tourism is Guam's second largest private industry (GVB 2007) and is likely Guam's primary private-sector source of outside dollars injected into the economy.

#### *Approach to Analysis*

Guam's resort hub, Tumon Bay, is located in the central part of Guam and much of the commercial marine tourism activities (e.g., water skiing or scuba diving) also occur in the central area or Apra Harbor. However, both optional tour activities and economic effects of tourism are island wide in nature.

Scoping comments and interviews with industry leaders were used to identify probable tourism impacts of the proposed action. This analysis is qualitative and based largely on interviews with industry leaders in 2008 and early 2009.

Topics identified and addressed include:

- Increased Construction-Related Business Travel
- Infrastructure Improvement
- Loss of Workforce and/or Wage Increases
- Impacts on Ocean-Based Tourism from Environmental Degradation
- Blocked Growth of Chinese and Russian Markets
- Loss of Possible Tourism Attractions from DoD Acquisition of New Land
- Tourism Market Loss Due to Construction Chaos
- Increased Operations-Related Business and Leisure Travel
- Growth in Support Businesses for Ocean-Related Tourism
- Market Loss Due to Conflict Between “Militarization” of Guam and Cultural Tourism
- Impacts on Ocean-Based Tourism from More Population and Competition

### *Impacts*

Overall, tourism impacts would be mixed (both beneficial and adverse). Although numerically more negative than positive consequences were identified, industry leaders stressed they were not opposed to the proposed action because they felt on balance that the positives outweighed the negatives and they felt that they could work with the military to mitigate many of their concerns.

During the construction phase, the following tourism impacts would be possible (more detailed discussion on each of these topics is available in the Appendix F SIAS):

*Increased Construction-Related Business Travel:* Hoteliers and other industry leaders interviewed for this analysis reported an increasing amount of recent new business associated with planning for construction. They anticipate additional business from construction contract managers as military construction begins.

*Infrastructure Improvement:* Infrastructure improvement is an over-arching consideration that would result in positive impacts for all business on Guam.

*Loss of Workforce and/or Wage Increases:* The possibility of wage increases or loss of labor to higher-paying jobs during the construction component is a highly likely outcome, as wages in the construction sector are larger than those in the tourism sector.

*Impacts on Ocean-Based Tourism from Environmental Degradation:* Guam’s warm waters attract tourists to commercial activities such as scuba diving and submarine rides. Potential impacts could occur as a result of dredging and construction activities. Volume 2, Chapter 4 of the EIS/OEIS states that dredging at Apra Harbor will not produce impacts, and Volume 2, Chapter 3 states that Low Impact Development (LID) and applicable laws concerning storm water run-off will mitigate impacts. Therefore, based on these conclusions, there would be no impact on marine-based tourism.

*Loss of Possible Tourism Attractions from DoD Acquisition of Property:* There is some concern that DoD acquisition of land could affect tourism assets. When considering the proposed acquisition sites however, no specific tourism assets have yet been identified in those locations. However, the GVB (Appendix F SIAS – GVB Interview) specified the Guam International Raceway as a prime focus of concern due both to its economic role in attracting racers from Asia and also because of its general social value as a place where military and civilians mingle and a venue for keeping young hot-rodders off the public roads.

*Tourism Market Loss Due to Construction:* Although there was initial concern about this issue, industry leaders interviewed for this analysis now consider it a minimal risk. Historical evidence also shows that

the hotel construction boom during the 1980s and 1990s was centered in the Tumon Bay resort district itself, and the tourism market was able to grow nevertheless. During the operations phase, the following tourism impacts would be possible.

*Increased Operations-Related Business and Leisure Travel:* It is likely that a significant increase in military personnel would generate more visits from friends and family, as well as more business travel. Additionally, off-duty military personnel and their families are likely to patronize retail and restaurants island wide, including the central entertainment district of Tumon Bay.

*Growth in Support Businesses for Ocean-Related Tourism:* Population increases are likely to provide expanded markets for support businesses.

*Market Loss Due to Conflict Between “Militarization” of Guam and Cultural Tourism:* In late January 2009, the GVB launched a rebranding of Guam tourism focused away from the traditional “sun-and-sand” marketing and focused instead on Chamorro cultural and historical assets that are unique to Guam. There is a concern that publicity of the proposed action on Guam and an increase in military activities and imagery on the island would affect visitors’ on-island experiences, supplanting the desired tourism branding with a “military base brand” instead. The supplanting of a cultural tourism branding for one that is more militarized appears to be a strong possibility, as Japan remains the source of 80% of Guam’s visitors, and there has been extensive publicity in Japan about the proposed action. However, a maximum potential adverse outcome is not inevitable. Among the factors that could determine what does actually happen would be:

- Military cooperation in exposing personnel to Chamorro culture and history themselves
- Visible presence of military police in tourist areas frequented by many off-duty Marines, to reassure Japanese visitors with negative perceptions from media accounts
- Overall military-civilian relations and communications efforts that would also affect a sense of partnership with the visitor industry

Impacts on Ocean-Based Tourism from More Population and Competition: Military personnel and their families, as well as additional population from spin-off economic growth, would generate both more business for ocean-based commercial activities and also more participants in non-commercial activities such as boating and diving.

### 16.2.2.3 Public Service Impacts

Public service impact analysis includes:

- Public Education
- Public Health and Human Services
- Public Safety Services
- Other Selected General Services
- Growth Permitting and Regulatory Agencies

#### Public Education

##### *Approach to Analysis*

This section assesses the proposed action’s impact on:

- GPSS – Elementary Schools, Middle Schools and High Schools
- GCC – Post-Secondary School Programs

- UoG – All Programs

In particular, quantitative impact analysis was conducted on:

- Student population numbers
- GPSS teacher and GCC and UoG non-adjunct faculty requirements

The capacity of private or military schooling on Guam was not analyzed, although the presence of such resources was taken into account when analyzing impact on public facilities.

The impacts discussed are independent of any needs that may result from non-project related general population growth.

Table 16.2-33 presents the key construction component assumptions used in analysis of impacts as well as the source or rationale of these assumptions. These include:

- Analysis used the current teacher to student ratios determined through agency surveys.
- The most recent available statistics were used to determine the percentage breakdown of the new *civilian* population that would attend GPSS and private schools at the various levels as well as UoG and GCC.
- Analysis assumed no H-2B population impact on primary, secondary or higher education.

**Table 16.2-33. Construction Component Assumptions for Public Education Agency Impacts**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Elementary Teacher : Student Ratio	1 : 14	GPSS elementary teacher to student ratio (2005-2008). This ratio is supported by the agreement between the Guam Federation of Teachers AFT Local 1581 AFL-CIO and the Guam Education Policy Board (GEPB) contract requirements that mandates specific GPSS teacher to student ratios. (Agreement between the Guam Federation of Teachers AFT Local 1581 AFL-CIO and the Guam Education Policy Board for GPSS Teachers).
Middle School Teacher : Student Ratio	1 : 14	GPSS middle school teacher to student ratio (2005-2008). Remained at 1:14 from 2005 - 2008. This ratio is supported by the GEPB agreement mentioned above.
High School Teacher : Student Ratio	1 : 19	GPSS high school teacher to student ratio (2005 – 2008). Remained at 1:19 from 2005 through 2008. This ratio is supported by the GEPB agreement mentioned above.
GCC Non-adjunct Faculty : Post-Secondary Student Ratio	1 : 18	2007 GCC non-adjunct faculty to post-secondary student ratio (GCC 2007)
UoG Non-adjunct Faculty : Post-Secondary Student Ratio	1 : 18	2000-2007 non-adjunct faculty to student ratios remained relatively steady at 1:18 (University of Guam Survey [Appendix F SIAS]).
% civilian island population composed of primary, middle, and high school age youth	Primary – 14% Middle – 5% High – 6%	Primary school age used: 5-11 years old Middle school age used: 12-14 years old High school age used: 15-18 years old, (U.S. Census Bureau 2000a)
% civilian school-age population attending public and private schools	Public – 86% Private – 14%	1991-2004 Guam public and private school enrollments. (Guam Bureau of Statistics and Plans 2008)

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
% adult (18 years and above) civilian population attending GCC or UoG	GCC – 2% UoG – 3%	2007 GCC and UoG enrollment (GCC and UoG Surveys [Appendix F SIAS]) compared with 2007 adult civilian population estimate.
Number of school-age dependents accompanying H-2B workers	0	Interviews with contractors, GCA, and GDoL (Appendix F SIAS)
Number of H-2B workers attending GCC or UoG	0	Although H-2B workers are able to access some continuing education classes, their numbers are not tracked. To the extent that GCC might accommodate cohorts of H-2B workers in continuing education classes such as ESL, these cohorts would most likely be arranged by sponsoring construction companies and GCC and staffing for the classes taken care of on an as-needed basis. (GCC Interview [Appendix F SIAS]).

Table 16.2-34 presents the key operational component assumptions used in analysis of impacts, as well as the source or rationale of these assumptions. Assumptions include:

- The assumption that increases in DoD school population will be absorbed by existing or new Domestic Dependent Elementary and Secondary Schools (DDESS) schools.
- The most recent available statistics were used to determine the percentage breakdown of the new military population that would take classes at UoG and GCC.

**Table 16.2-34. Operational Component Assumptions for Public Education Agency Impacts**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
All quantitative assumptions for construction component also apply for the operational component, unless negated by the assumptions listed below.		
% of civilian DoD workers whose dependents would be attending DDESS schools.	75%	Assumption is that 50% of civilian DoD workers would be from off-island. Additionally, 25% of civilian DoD workers would be the spouses of active duty military. The dependents of these individuals would be eligible for education through the DDESS system. See above labor section for rationale of DoD worker percentage assumptions.
% students eligible to attend DDESS schools that would go to GPSS schools instead.	0%	Assumption is that – of those dependents of active duty military and DoD civilian workers eligible to attend DDESS schools – none would attend GPSS schools, although some might choose to attend faith-based or other private schools. (Guam DDESS and Guam Public School System Interviews [Appendix F SIAS]).
% of active duty military population enrolled in UoG classes.	0.2%	Number of 2005 UoG active duty military enrollments and total 2005 active duty military population numbers. (UoG Survey [Appendix F SIAS]).
% of military dependent population enrolled in UoG classes.	0.3%	Analysis of 2005 UoG military dependent enrollment statistics and total military dependent population numbers.

### *Impacts*

Table 16.2-35 provides an overview of the proposed action's impacts on GPSS student populations for the action's peak year and steady-state. Table 16.2-36 provides an overview of the proposed action's impacts on GPSS staffing for the action's peak year and steady-state. Year by year breakdowns of impacts are provided in the Appendix F SIAS.

**Table 16.2-35. GPSS Student Population Impacts Summary**

Agency	Baseline Service Population	Peak Year	Peak Year Additional Service Population	Peak Year Percentage Increase	Steady State Additional Service Population (going forward)	Steady Requirements Percentage Increase
GPSS Elementary	14,436	2014	3,173	22%	847	6%
GPSS Middle	6,887	2014	1,331	19%	355	5%
GPSS High	9,661	2014	1,764	18%	471	5%

**Table 16.2-36. Primary and Secondary Education Teacher Requirements Impacts Summary**

Agency	Baseline Teacher Numbers	Peak Year	Peak Year Additional Teacher Requirements	Peak Year Percentage Increase	Steady State Additional Teacher Requirements (going forward)	Steady Requirements Percentage Increase
GPSS Elementary	1,035	2014	229	22%	61	6%
GPSS Middle	504	2014	97	19%	26	5%
GPSS High	514	2014	94	18%	25	5%

Table 16.2-37 and Table 16.2-38 provide overviews of the proposed action's impacts on GCC and UoG student populations and non-adjunct faculty requirements for the action's peak year and steady-state.

**Table 16.2-37. Higher Education Student Population Impacts Summary**

Agency	Baseline Service Population	Peak Year	Peak Year Additional Service Population	Peak Year Percentage Increase	Steady State Additional Service Population (going forward)	Steady Requirements Percentage Increase
GCC	1,806	2014	455	25%	155	9%
UoG	3,282	2014	790	24%	244	7%

**Table 16.2-38. Higher Education Faculty Requirement Impacts Summary**

Agency	Baseline Non-adjunct Faculty Numbers	Peak Year	Peak Year Additional Non-adjunct Faculty Requirements	Peak Year Percentage Increase	Steady State Additional Non-adjunct Faculty Requirements (going forward)	Steady Requirements Percentage Increase
GCC	100	2014	25	25%	9	9%
UoG	185	2014	45	24%	14	8%

Other factors regarding the impact of the proposed action on Guam's public education system include (refer to the Appendix F SIAS for more detailed discussion):

**GPSS Teacher to Student Ratios:** The GPSS ratios do not capture problems with teacher absenteeism. Reports in 2008 indicate the absenteeism of Guam teachers overtook that of students and that on an average school day on Guam 12% of GPSS employees were absent versus less than 7% of GPSS students (Guam Department of Education 2008).

**GPSS Teacher Recruitment:** GPSS's ability to meet the demand for new GPSS teachers depends on Guam's teacher supply. Administrators believe that the expansion of the DDESS system to meet the increasing educational needs of Guam's military population might siphon off GPSS teachers. On the other

hand, the proposed action brings the benefit that some incoming military spouses might be qualified to teach in the public schools.

*GPSS Administrative Staffing:* Other staff positions in GPSS represent an important aspect not included in the analysis above. Examples of these positions include: principals and assistants, administrators, health counselors, cafeteria, custodial/maintenance, and school aides. Survey results indicate that there is an approximate 2:1 ratio between teachers and administrative staff in the GPSS school system. Thus the number of required additional teachers indicated in the tables above could be cut in half to indicate the number of additional GPSS administrative staffing that would be required.

*GPSS Facilities:* GPSS facilities also should be considered in a discussion of the proposed action's impact. There is an existing need for improvement of GPSS classrooms. Three new schools are currently being planned. New schools are most required in the north and central areas, areas of current school overcrowding (for example JFK and George Washington high schools). Schools in the southern region, on the other hand, often have vacant spaces.

*Additional GCC Service Population:* The analysis does not analyze GCC's secondary school age population. This population represents almost 50% of its student body. In 2007, GCC employed 32 faculty and 4 counselors in its secondary school program. It also does not take into account any changes in GCC classes offered that may be determined by the need for additional career and technical education workers and the demand for such classes from buildup-related industries such as construction, or an increase in enrollment that might occur due to the opening of GCC's new allied health building in September of 2009.

*GCC and UoG Adjunct Faculty:* Adjunct faculty are not included in the GCC or UoG calculations, and may be used to meet some of the noted requirements for additional faculty. In 2007, GCC employed 59 adjunct faculty, making up 37% of the GCC faculty population (Guam Community College 2007). Survey results show that in 2007, UoG employed 62 adjunct faculty, making up about 25% of the UoG faculty population (Appendix F SIAS – UoG Survey). GCC and UoG have some flexibility in hiring adjunct faculty to meet specific needs. GCC only hires such faculty if there is a need in upcoming adult education, apprenticeship, or continuing education courses.

*GCC and UoG Administrative Staffing:* Administrative staffing numbers are also not included in the tables above. In 2007, GCC faculty made up 46% of its full-time employee pool. Staff made up another 39% and Administrators the remaining 16% (Guam Community College 2007). In 2008, UoG employed a total of 550 full-time employees. Of these 182 were faculty, 104 performed clerical and secretarial functions, 34 were administrators, and the remaining performed a variety of professional, technical or maintenance jobs.

*GCC and UoG Facilities:* Survey results show that the GCC main campus is currently able to support the number of students being educated there. An increase in study population however would require expansion and renovation of the existing facilities. UoG survey results (Appendix F SIAS) show that of 21 listed University facilities, all except one (the community lecture hall) are currently able to meet the needs of the student population, and a majority would be able to meet the needs of an expanded student population.

## Public Health and Human Services

### *Approach to Analysis*

An analysis was performed of potential impact on the following GovGuam public health and human service agencies that were described in Section 16.1:

- GMHA
- GDPHSS
- GDMHSA
- GDISID

In particular, quantitative analysis was conducted on the proposed action's impact on:

- Service population numbers
- Key public health and human services staffing requirements

The capacity of private or military health care facilities on Guam were not analyzed, although the presence of such resources were taken into account when analyzing impact on public facilities, and are discussed as they pertain to possible overflow into health service demands on public service agencies.

The impacts discussed are independent of any needs that may result from non-project related general population growth.

Table 16.2-39 presents the key construction component assumptions used in analysis of impacts, and the source or rationale for these assumptions. These include:

- Analysis used the current Health Professional to Service Population ratios determined through agency surveys.
- The percentages of *civilian* population are considered part of the service population for the various Health and Human Service agencies of GovGuam.
- The service population of GDPHSS and GDMHSA was defined as 37.5% of Guam's total island population, the percentage of Guam's population that is underinsured (as estimated by GDPHSS), and are thus likely to utilize the services of these two agencies. The term underinsured is used to mean individuals that possess health coverage that does not adequately protect them from high medical expenses.

**Table 16.2-39. Construction Component Assumptions for Public Health Agency Impacts**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
% of Guam's civilian population supported by GMHA services	100%	All incoming population would be part of the service population of GMHA. Although some may choose to access services from private or GDPHSS clinics, they are still considered part of the public and, if in case of medical emergency, would be seen at GMHA. (GMHA Interview [Appendix F SIAS]).
% total island population supported by GDPHSS and GDMHSA Services	37.5%	This is the % total population on Guam that is uninsured or underinsured (GDPHSS estimate). These are the most likely populations to access services from GDPHSS and GDMHSA and the results of this analysis was used as the estimated service population for all impact analyses for GDPHSS and GDMHSA. (GDPHSS and GDMHSA Interviews [Appendix F SIAS])
% of Guam's civilian population supported by GDISID services	100%	All incoming civilian populations would be part of the service population of GDISID, as the agency would provide services to anyone on the island that is or becomes disabled and meets agency criteria. (GDISID Interview



<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
		[Appendix F SIAS]
GMHA Physician : Service Population Ratio	1 : 2,821	2008 GMHA physician to island civilian population ratio - GMHA Survey (Appendix F SIAS)
GMHA Nurse/Allied Health Staff : Service Population Ratio	1 : 453	2008 GMHA nurse and allied health staff to island civilian population ratio - GMHA Survey (Appendix F SIAS).
GDPHSS Bureau of Primary Care Ratio of Providers and Nursing Staff : Service Population Ratio	1 : 1,499	2008 agency bureau provider and nursing staff numbers to service population estimates - GDPHSS Bureau of Primary Care Survey (Appendix F SIAS)
GDPHSS BCDC Ratio of Communicable Disease Prevention Specialists : Service Population Ratio	1 : 1,999	2008 agency specialist numbers to service population estimates - GDPHSS BCDC Survey (Appendix F SIAS)
GDPHSS BFHNS Ratio of Nursing Personnel : Service Population Ratio	1 : 2,915	Midpoint of agency bureau nursing personnel numbers (2005-2008) of staffing data - GDPHSS BFHNS Survey (Appendix F SIAS)
GDMHSA Ratio of Mental Health Professionals : Service Population Ratio	1 : 507	Midpoint of GDMHSA mental health professional numbers (2000-2008) to service population estimate - GDMHSA Survey (Appendix F SIAS)
GDISID Ratio of Social Workers and Counselors : Service Population Ratio	1 : 12,086	2008 agency staffing data to service population ratio - GDISID Survey (Appendix F SIAS).

Table 16.2-40 presents the key operational component assumptions used in the analysis of impacts, and the source or rationale for these assumptions. These include:

- No military or dependents are considered part of the service population of GMHA.

**Table 16.2-40. Operational Component Assumptions for Public Health Agency Impacts**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
All quantitative assumptions for construction component also apply for the operational component, unless negated by the assumptions listed below	See above	See above
% active duty military and military dependent population supported by GMHA	0%	Although there is anecdotal information mentioned in the text below that indicates active duty military and their dependents would sometimes access GMHA services, no quantitative data were available to support this analysis as in general GMHA does not record whether a patient is military or civilian. In certain circumstances, when GMHA does knowingly serve a military individual, they can bill TRICARE for the services.
% of civilian DoD workers supported by GMHA	25%	Assumption is that 50% of civilian DoD workers would be from off-island. Additionally, 25% of civilian DoD workers would be the spouses of active duty military. It is assumed that these populations would be eligible for medical services from the Naval Hospital. The other 25% would be serviced by GMHA. Assumption derived from labor force analysis in above sections.

### Impacts

Table 16.2-41 provides an overview of the proposed action's impacts on GMHA, GDPHSS, GDMHSA and GDISID service populations for the action's peak year and steady-state. Year by year breakdowns of impacts are available in the Appendix F SIAS.

**Table 16.2-41. Impact on Public Health and Human Services, Service Population Summary**

Agency	Baseline Service Population	Peak Year	Peak Year Additional Service Population	Peak Year Percentage Increase	Steady Additional Service Population (going forward)	Steady Requirements Percentage Increase
GMHA	160,797	2014	41,062	26%	5,437	3%
GDPHSS	65,954	2014	23,543	36%	10,183	15%
GDMHSA	65,954	2014	23,543	36%	10,183	15%
GDISID	169,209	2014	54,228	32%	18,604	11%

Table 16.2-42 provides an overview of the proposed action's impacts on various public health and human services agency staffing requirements for the action's peak year and steady-state. Year by year breakdowns of impacts are available in the Appendix F SIAS.

**Table 16.2-42. Public Health and Human Services Impact Summary**

Agency and Staffing Type	Baseline Staffing Numbers	Peak Year	Peak Year Additional Staffing Requirements	Peak Year Percentage Increase	Steady State Additional Staffing Requirements (going forward)	Steady Staffing Requirements Percentage Increase
GMHA Physicians	57	2014	15	26%	2	4%
GMHA Nurses and Allied Health Professionals	355	2014	91	26%	12	3%
GDPHSS - Primary Care Medical Providers and Nursing Staff	44	2014	16	36%	7	16%
GDPHSS – BCDC Communicable Disease Prevention Professionals	33	2014	12	36%	5	15%
GDPHSS - BFHNS Nurses	22	2014	8	36%	4	18%
GDMHSA – Mental Health Professionals	130	2014	46	35%	20	15%
GDISID Social Workers and Counselors	14	2014	4	29%	2	14%

In July of 2008, The U.S. Department of Health and Human Services provided a Guam Issues Inventory response to GovGuam prioritized health and human services issues related to the proposed action (USDHHS 2008). These priorities included acquisition of critical staffing, and capital improvement and funding for infrastructure and services.

Thus, other factors regarding the impact of the proposed action on Guam's public health system include (refer to Appendix F SIAS for more detailed discussion):

*Existing Professional Staffing Deficits:* For many of the GovGuam public health agencies listed above, the existing professional staffing to service population ratios that were used in this analysis are ratios that show existing deficits. Since the above staffing analyses are based upon existing ratios rather than standards, they preserve any professional shortages that currently exist on the Island of Guam.

*Additional Staffing Requirements:* While the analysis above provides an outline of impacts on health professional requirements related to the proposed action, an important caveat to this analysis is that for every one of the public health professional positions required, additional administrative staff are required to support the work of that professional. The GDPHSS Bureau of Primary Care Services (BPC) for example, noted that for each health professional it employs, four additional support staff such as nurse aids and medical records clerks are required. The implications of such a ratio can be far reaching. In the case of the BPC, the project's direct impact peak in 2014 would require the hiring of 48 support staff in addition to the professionals noted in the analysis above. Additional staffing requirements of recent or future public health facility developments (for example, the newly expanded Northern Region Community Health Center [NRCHC] and the soon-to-be expanded Southern Region Community Health Center [SRCHC]) can also affect staffing requirements.

There is also the possibility that the incoming populations associated with the proposed action might require additional staff time and agency resources. For example, GDMHSA staff members have observed that workers from off-island, such as those that would arrive on Guam during the construction phase, often work in stressful and intense situations that increase the prevalence of substance abuse. Similarly, military individuals transferring to a new, remote island location sometimes experience difficulty adapting to a different culture. It has been observed that both these populations would sometimes be inclined to access the confidential and free services of GDMHSA, despite having health insurance, because of the fear that their condition might affect their terms of employment.

*Underinsured Populations:* GDPHSS and GDMHSA target the most indigent populations for health care (see Affected Environment section). Thus the majority of individuals accessing services are uninsured. However, GDPHSS and GDMHSA staff members note that many individuals accessing services do have health insurance, but unaffordable co-payments for services or medications, or missing coverage of specific services and medications makes it necessary that these individuals access the free services of these two agencies. The population growth associated with the proposed action would contribute to these uninsured and underinsured populations, especially in the form of residents entering Guam through the Compact of Free Association agreement that does not require individuals have health coverage before arriving on Guam.

*Military and Civilian Health Care System Overlap:* Note that the GMHA service population analysis is not able to capture some nuances to utilization of GMHA and Navy Hospital Services on Guam:

- In emergency situations, an individual, civilian or military, would be taken to the closest hospital emergency room (GMHA or Naval Hospital) until they are stable enough to be transported to the appropriate facility (Guam Memorial Hospital Interview – Appendix F SIAS).
- Because the Naval Hospital's capacity is low, military dependents do occasionally use GMHA services, that GMHA can bill TRICARE, the military health insurance system (Guam Memorial Hospital Interview [Appendix F SIAS]).
- There are also plans to build a replacement Naval Hospital as well as a separate 6,000 square-foot outpatient clinic for veterans. (The current clinic is located within the current hospital.)

*Facility and Supply Requirements:* Through the process of interviews, qualitative data was collected regarding capital improvement and medical supply needs of various GovGuam public health agencies. GDMHSA reported substandard air quality in the building, fire suppression risks, and mold problems. GDPHSS's TB treatment program was housed in the windowless main public health building. GDPHSS BFHNS indicated a lack of clinical supplies (such as syringes) and antibiotics. GovGuam public health-related capital improvement and feasibility studies are currently being conducted.

*Funding Issues:* The procurement of funding for additional staff, capital improvements, and medical supplies for GovGuam public health agencies is a complex one. In 2008, GovGuam received a total of \$43,283,170 from various federal health and human service funding programs.

In some instances, low staffing numbers or lack of technological capacity inhibits agencies from harnessing the funding that is available. For example, GDMHSA is not able to bill the military TRICARE system for the services they provide, due to technological and staffing capacity issues.

In other instances, lack of funding precludes an agency's ability to operate efficiently and effectively. For example, although the building of a permanent one-stop GDISID facility would eliminate the costly leasing of office space, GDISID lacks the capital to implement the project, even though the agency already has the plan and the land for a facility. As another example, to meet the costs of hiring additional staffing as required by the permanent injunction, GDMHSA must take out loans.

### Public Safety Services

#### *Approach to Analysis*

Analysis was performed on impact on the following GovGuam public safety agencies:

- Guam Police Department (GPD)
- Guam Fire Department (GFD)
- Guam Department of Corrections (GDoC)
- Guam Department of Youth Affairs (GDYA)

In particular, quantitative analysis was conducted on the proposed action's impact on:

- Service population numbers
- Key public safety services staffing requirements

The capacity of military security services were not analyzed, although military security departments are discussed in view of their interaction with government agencies in maintaining public safety on the island.

The impacts discussed are independent of any needs that may result from non-project related general population growth.

Further discussion on public safety implications can be found in Chapter 18 of this Volume, Public Health and Safety.

Table 16.2-43 presents the key construction component assumptions used in analysis of impacts, and the source or rationale for these assumptions. Key assumptions include:

- All incoming population is considered part of the GPD service population. GPD's service population is defined in this analysis as Guam's total population, including active-duty military. This is because even active duty military personnel charged with crimes off-base would go through the GPD and judiciary systems.

- During the construction phase, additional firefighting personnel will be needed due to high hazard conditions on island. This is incorporated into the analysis through the use of an adjusted growth in service population, in order to capture the impact of increased construction and worker housing on the Island of Guam. The National Fire Protection Association (NFPA) Standard #1710, titled the “Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments” (2001 Edition), recommends five to six on-duty personnel per engine company in jurisdictions with tactical hazards, high hazard occupancies, high incident frequencies, geographical restrictions or other pertinent factors as identified by the authorities having jurisdiction. This is compared with the recommendation for four on-duty personnel per engine company in other jurisdictions. Worker housing and working areas fall under such high hazard jurisdictions and would impact GFD staffing requirements more heavily.
- Analysis used the current Safety Professional to Service Population ratios determined through agency surveys.

**Table 16.2-43. Construction Component Assumptions for Public Safety Agency Impacts**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
% island population under the protection of GPD	100%	GPD and Navy Security Interviews (Appendix F SIAS)
% increase over current firefighter to population ratio due to high hazard situations, per year	2010 – 6% 2011 – 11% 2012 – 12% 2013 – 12% 2014 – 10% 2015 – 9% 2016 – 9 %	H-2B housing meets the NFPA definition of high hazard jurisdictions. This would require an additional % increase in required GFD staffing during the construction phase.
% increase in inmates in jail, prison, and federal holds at GDoC per year	2010 – 3% 2011 – 8% 2012 – 13% 2013 – 16% 2014 – 15% 2015 – 10% 2016 – 3%	Percent of adult civilian population increase over baseline as a result of proposed action (construction phase). To produce increase in service population, these percentages were then multiplied by inmate population numbers - GDoC Survey (Appendix F SIAS)
GDYA service population	Ages 10-17	GDYA Interview (Appendix F SIAS)
GPD Sworn Police Officer : Service Population Ratio	1 : 561	2007 GPD staffing numbers to service population ratio - GPD Survey (Appendix F SIAS)
GFD Firefighter : Service Population Ratio	1 : 846	2008 GFD staffing numbers to service population ratio - GFD Survey (Appendix F SIAS)
GDoC Corrections Officer : Inmate Ratio	1 : 6	2008 GDoC staffing to inmate numbers - GDoC Survey (Appendix F SIAS)
GDYA Youth Service Worker : Service Population Ratio	1 : 316	2008 GDYA youth service worker numbers to service population estimates - GDYA Survey (Appendix F SIAS)

Table 16.2-44 presents the key operational component assumptions used in analysis of impacts and the source or rationale for these assumptions. These assumptions are much the same as those used for the construction phase analysis.

**Table 16.2-44. Operational Component Assumptions for Public Safety Agency Impacts**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
All quantitative assumptions for construction component also apply for the operational component, unless negated by the assumptions listed below.		
% increase in inmates in jail, prison or federal holds at GDoC per year.	2010 – 1% 2011 – 1% 2012 – 1% 2013 – 1% 2014 – 4% 2015 – 4% 2016 – 4% 2017 – 4% 2018 – 4% 2019 – 4% 2020 – 4%	Percent of adult population (not including active duty) increase over baseline as a result of proposed action. To produce increase in service population, these percentages were then multiplied by inmate population numbers provided in the GDoC Survey (Appendix F SIAS).

### *Impacts*

Table 16.2-45 provides an overview of the proposed action's impacts on GPD, GFD, GDoC, and GDYA service populations for the action's peak year and steady-state. Year by year breakdowns of impacts are available in the Appendix F SIAS.

**Table 16.2-45. Impact on Public Safety Service Population Summary**

<i>Agency</i>	<i>Baseline Service Population</i>	<i>Peak Year</i>	<i>Peak Year Additional Service Population</i>	<i>Peak Year Percentage Increase</i>	<i>Steady State Additional Service Population (going forward)</i>	<i>Steady Requirements Percentage Increase</i>
GPD	160,797	2014	65,527	41%	31,071	19%
GFD	175,877	2014	49,895	28%	9,604	5%
GDoC	1,035	2014	240	23%	80	8%
GDYA	24,987	2014	9,263	37%	5,731	23%

Table 16.2-46 provides an overview of the proposed action's impacts on various public safety services agency staffing requirements for the action's peak year and steady-state. Year by year breakdowns of impacts are available in the Appendix F SIAS.

**Table 16.2-46. Public Safety Services Staffing Impacts Summary**

<i>Agency and Staffing Type</i>	<i>Current Staffing Numbers</i>	<i>Peak Year</i>	<i>Peak Year Additional Staffing Requirements</i>	<i>Peak Year Percentage Increase</i>	<i>Steady State Additional Staffing Requirements (going forward)</i>	<i>Steady Staffing Requirements Percentage Increase</i>
GPD – Police Officers	309	2014	117	38%	55	17%
GFD - Firefighters	190	2014	59	31%	11	6%
GDoC – Custody and Security Personnel	188	2014	44	23%	15	8%
GDYA – Youth Service Professionals	79	2014	29	37%	18	23%

Other factors regarding the impact of the proposed action on Guam's public safety system include (refer to Appendix F SIAS for more detailed discussion):

*Other Staffing Factors:* Support staff numbers are not included in the analysis above, but are large components of agency staffing. For example, 2006 data show that for every five police officers, approximately one civilian staff member was employed by GPD. Similarly, for every 6 custody and security staff at GDoC, 1 administrative or fiscal employee was employed in the parole division. These staffing ratios would add at the peak impact year of 2014, the requirement of 19 additional civilian staff at GPD and an additional 6 administrative or fiscal employees at GDoC.

*Existing Professional Staffing Deficits:* The GFD analysis is based upon a baseline staffing ratio that does not allow the meeting of certain NFPA fire protection standards on a consistent basis. While GFD is able to meet the response time requirements, the agency is currently unable to meet the recommended staffing ratio per engine company on a consistent basis, due to sick leave, vacations, and deployment of staff through the National Guard. This will be exacerbated due to the proposed action's fire prevention requirements.

*Regional Issues:* Regional aspects of the island affect both GFD and GPD's public safety responsibilities and would affect the number of additional staff that would be required at various locations. High hazard areas GFD must take into consideration include industrial regions where hazardous materials are stored, areas such as the Port Authority, regions with high rise buildings, and the remote and hilly southern regions of the island. Road and traffic congestion as well as lack of water pressure, due to the impacts of construction and a general increase in population would also impact safety and rescue operations. These regions require more staffing than others.

Precinct-specific police officer to population ratios are dependent on demographic traits and characteristics, and would be impacted by incoming population groups. Areas requiring more law enforcement presence include: those with an urban center (businesses), with legal gambling (game rooms), or highly mobile/seasonal populations (Guam Police Department 2007). In 2006, the ratio of sworn police officers to 1,000 inhabitants was as follows:

- Tamuning/Tumon Precinct: 2.0
- Agat Precinct: 1.0
- Dededo (including Yigo) Precinct: 0.5
- Hagatna Precinct: 0.5

*Jurisdictional Issues:* Because of the large military presence on the Island of Guam, issues of jurisdiction require close collaboration between local and federal public safety agencies, and such collaboration would require strengthening. In the past and currently, cases involving jurisdictional issues require that federal and local officials talk through the case and decide how the case is best prosecuted. This discussion includes issues such as what is best for all parties, what is best use of taxpayer resources, government assets and the best way to adjudicate and work through issues (Guam-JGPO Public Safety Forum 2008). Overall, collaboration between civilian and military safety agencies has been good, and these positive relationships and formal guidelines would require further development.

*Additional Facilities and Equipment Needs:* Public safety agencies indicate that they deal with current issues of overcrowding and inadequate facilities. Increased staffing population numbers at these agencies would necessarily require upgrades of facilities so that new personnel can work productively. Increased service population numbers would also require additional space.

An increase in agency staff combined with project-related safety incidents would require that GovGuam agencies acquire additional equipment and vehicles. It is difficult to assess the proposed action's impact on type public safety incidents that are likely to occur, and the connected equipment and vehicles that might be required. For instance, while hazardous conditions on road due to construction might cause increased traffic accidents, increased traffic due to a growing population may lead to slower traffic and a lower number of fatalities. It is expected that water emergency incidents such as boating accidents and drowning would increase with population numbers and equipment such as rescue boats and jet skis are used in such incidents.

*Current Facilities and Equipment Deficits:* A number of GFD fire stations were originally built for other purposes and do not house the equipment properly, exposing fire trucks and rescue boats to weather damage. In particular, the fire stations at Sinajana, Agat, and Piti are over capacity, while the stations at Tamuning, Yigo, Astumbo, Inarajan, Umatac, Yona and Talofofu are at maximum capacity.

The GDoC is unable to house all its inmates, overnighters and parolees that are being held on an infraction, and must shift individuals between its Adult Correctional Facility and Hagatna Detention Facility (DoC 2008). GDYA also has crowding issues. While the agency's Dededo facility and one of its Agat facilities would be able to accommodate additional service population, GDYA's remaining four facilities are either at or above capacity currently.

#### Other Selected General Services

##### *Approach to Analysis*

Analysis was performed on the following GovGuam agencies that would be impacted by population growth:

- GDPR
- GPLS
- Guam Judiciary

In particular, quantitative analysis was conducted on the proposed action's impact on:

- Service population numbers
- Key staffing requirements for the three agencies

The impacts discussed are independent of any needs that may result from non-project related general population growth. Also, it should be noted that many parks and community centers on Guam are not under the purview of GDPR, but rather are maintained and managed by the 19 mayors on Guam. Information on these facilities was not available at time of writing.

Table 16.2-47 presents the key construction and operation component assumptions used in analysis of impacts. These include:

- Analysis used the current professional to service population ratios determined through agency surveys.
- This analysis considers the service populations of GDPR, GPLS, and the Guam Judiciary as the entire island population. Each of these agencies service both civilian and military population needs.



**Table 16.2-47. Assumptions for Other Selected Agency Impacts**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
% of island population assumed to be in GDPR service population	100%	The entire island population is allowed access to the parks and recreation areas run by GDPR
% of island population assumed to be in GPLS service population	100%	All island residents and visitors are allowed access to the GPLS libraries, and all individuals with a valid form of identification are allowed to obtain a library card - GPLS Survey (Appendix F SIAS)
% of island population assumed to be on Guam Judiciary's service population	100%	All civil and criminal activity processed and litigated on the Island of Guam would go through the Judiciary system - Guam Judiciary Interview (Appendix F SIAS).
GDPR Staff : Service Population Ratio	1 : 1,954	Midpoint of agency staff (2000-2008) to service population estimates - GDPR Survey (Appendix F SIAS).
GPLS Staff : Service Population Ratio	1 : 6,281	2008 GPLS staff to service population ratio - GDPR Survey (Appendix F SIAS).
Guam Judiciary Judge : Service Pop Ratio	1 : 29,313	2007 Judiciary judges to service population ratio (Guam Judiciary 2008)

*Impacts*

Table 16.2-48 provides an overview of the proposed action's impacts on GDPR, GPLS and Guam Judiciary key staffing requirements for the action's peak year and steady-state. Year by year breakdowns of impacts are available in the Appendix F SIAS.

**Table 16.2-48. Impact on Other Selected General Service Agency Service Population**

	<i>Baseline Service Population Numbers</i>	<i>Peak Year</i>	<i>Peak Year Additional Service Population</i>	<i>Peak Year Percentage Increase</i>	<i>Steady State Additional Service Population Numbers (going forward)</i>	<i>Steady Service Population Percentage Increase</i>
GDPR, GPLS, and Judiciary Service Population	160,797	2014	65,527	41%	31,071	19%

Table 16.2-49 provides an overview of the proposed action's impacts on GDPR, GPLS and Guam Judiciary key staffing requirements for the action's peak year and steady-state. Year by year breakdowns of impacts are available in the Appendix F SIAS.

**Table 16.2-49. Other Selected General Service Agency Impacts Summary**

<i>Agency and Staffing Type</i>	<i>Baseline Key Staffing Numbers</i>	<i>Peak Year</i>	<i>Peak Year Additional Key Staffing Requirements</i>	<i>Peak Year Percentage Increase</i>	<i>Steady State Additional Key Staffing Requirements (going forward)</i>	<i>Steady Requirements Percentage Increase</i>
GDPR – General Staff	90	2014	34	38%	16	18%
GPLS – General Staff	28	2014	10	36%	5	18%
Judiciary - Judges	6	2014	2	33%	1	17%

Other factors regarding the impact of the proposed action on these agencies include (refer to Appendix F SIAS for more detailed discussion):

*Current Agency Capacity Deficits:* The analysis ratios used in the calculations above do not take into account current agency capacity issues. For instance, due to government budget cuts, GDPR has experienced a 50% decrease in staffing in the space of 12 years and despite population increases and staffing numbers have not changed significantly since 2003. According to criteria for determining adequacy of Public Library Services set down by the GPLS Board, the Island of Guam presently lacks at least ten professional librarians. Finally, the Guam Judiciary currently requires three additional judges to manage the workload that is independent of the proposed action (Guam-JGPO Public Safety Forum 2008).

*Additional Support Staff Requirements:* Impacts on support staff (in addition to the “key professional” numbers above) are important aspects of the proposed action’s effects on agency capacity. However, they are much more difficult to quantify because agency support staff numbers were not always available at time of writing or support functions were contracted out.

While staffing numbers in this analysis relate to overall GDPR staffing, the GDPR practices extensive outsourcing of various duties including: maintenance, teacher, lifeguard, and park attendant.

GPLS staffing numbers in this analysis included all staffing. However, it should be noted that because of the lack of professional librarians on Guam, GPLS Library Technicians are often put in charge of library operations.

The Guam Judiciary has engaged the support of the National Center State Courts to develop a comprehensive master plan addressing the entire agency’s staffing needs, including parole, counselors, youth workers and marshals. Although current staffing numbers were not provided, a recent Judiciary needs assessment document indicated the need for nine additional support staff per judge, including chamber clerks, bailiffs, law clerks, and deputy clerks (Guam Judiciary Interview – Appendix F SIAS).

*Facilities and Equipment:* In addition to staffing, the equipment, materials and technology that these agencies currently utilize are often inadequate. The GPLS Five-Year Plan (2008-2012) indicates inadequate library equipment and furniture, and ineffective electronic archiving and catalog systems (GPLS 2007). The Guam Judiciary’s Strategic Plan notes the trends of security technology, use of the Internet, and increased networking of information requiring improved information and telecommunications technology (Guam Judiciary 2006). The GDPR notes that all facilities including beach parks, historical parks and recreational facilities are in poor condition due to budget cuts.

*Budgetary Constraints:* Budgetary constraints are common among these agencies, and affect their ability to meet the requirements of the proposed action’s impact. The Judiciary’s 2009 budget was cut by 10% and the agency has begun to implement a range of cost-cutting measures including a delay in the opening of its satellite center, a hiring freeze, and monitoring and reducing operating expenses. The GDPR has current capacity issues due to government budget cuts – the department has experienced a 50% decrease in staffing in the space of 12 years and despite population increases, staffing has not changed significantly since 2003.

## Growth Permitting and Regulatory Agencies

### *Approach to Analysis*

Analysis was performed on the following GovGuam agencies responsible for issuing, monitoring and enforcing development permits on Guam:

- Guam Department of Public Works (GDPW) Building Permits and Inspection
- Guam Department of Land Management (GDLM)
- Guam Environmental Protection Agency (GEPA)
- Guam Coastal Management Program (CMP), within Guam Bureau of Statistics and Plans (GBSP)
- Guam Power Authority (GPA)
- Guam Water Authority (GWA)
- Guam Fire Department (GFD)
- Historic Preservation Office (HPO), within the GDPR
- Guam Division of Environmental Health (DEH), within the GDPHSS
- Guam Alien Labor Processing & Certification Division (ALPCD) within the GDoL

Unlike the previously described services, the permitting work of these agencies would be driven by increases in permit applications before and during the process of growth on Guam (rather than population increases). Note that impacts to GFD, GDPR and GDPHSS were also addressed in prior impact sections. This section analyzes only the impact on their permitting functions (only a small percentage of their overall functions).

There are no distinctions between construction and operation component assumptions for the agencies analyzed in this section. This is because impacts are driven by the number of development permits estimated to be required, regardless of the project phase. Therefore, the assumptions listed in Table 16.2-50 apply to both components.

**Table 16.2-50. Assumptions for Growth Permitting Agency Impacts**

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
Permits other than building permits	Proportional to population growth	Environmental permits generally grow with population
Monitoring/enforcement	Proportional to population growth except as noted below	Environmental monitoring and enforcement generally grow with population
<b>Department of Land Management Assumptions</b>		
% permits received by GDPW that would be referred to GDLM	100%	Records show that GDLM processed several times the number of permits as did GDPW (Guam Department of Land Management and Guam Bureau of Statistics and Plans Survey Responses)
% FTEs in permitting	33%	2005 base year (GDLM Survey Response 2009)
% FTEs in monitoring/enforcement	11%	2005 base year (GDLM Survey Response 2009)
% FTEs in administrative/support	11%	2005 base year (GDLM Survey Response 2009)
Number permits processed per permitting FTE	1,569	2005 base year (GDLM Survey Response 2009)
Number of rezones	Increase from base year according to population impact with two-year lead time from	Rezoning assumed to be tied to population growth, with two years often needed from submittal to rezone to completion of construction.

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
	population increase	
Enforcement/monitoring	Increase according to permit increase	Enforcement assumed to be tied to population growth.
<b>GEPA Assumptions</b>		
% permits received by GDPW that would be referred to GEPA	74%	2005 base year (GEPA Survey Response 2009)
% FTEs in permitting	65%	2005 base year (GEPA Survey Response 2009)
% FTEs in monitoring/enforcement	15%	2005 base year (GEPA Survey Response 2009)
Number permits processed per permitting FTE.	52.3	2005 base year (GEPA Survey Response 2009)
On-site activities (direct project)	Equivalent of 200 permits on-site in 2010, increasing along with population impacts	Some set-up would be required early in project
Monitoring/enforcement	Proportional to population growth except 200 permit-equivalents needed in 2010	Environmental monitoring and enforcement generally grow with population but typically require effort closer to beginning of projects.
<b>GFD Assumptions</b>		
% permits received by GDPW that would be referred to GFD	% permits received by GDPW that would be referred to GFD	% permits received by GDPW that would be referred to GFD
% FTEs in permitting	% FTEs in permitting.	% FTEs in permitting
% FTEs in monitoring/enforcement	% FTEs in monitoring/enforcement.	% FTEs in monitoring/enforcement
Number permits processed per permitting FTE	Number permits processed per permitting FTE	Number permits processed per permitting FTE
<b>DEH Assumptions</b>		
% permits received by GDPW that would be referred to DEH	% permits received by GDPW that would be referred to DEH	% permits received by GDPW that would be referred to DEH
% FTEs in permitting.	% FTEs in permitting.	% FTEs in permitting
% FTEs in monitoring/enforcement	% FTEs in monitoring/enforcement.	% FTEs in monitoring/enforcement
Number permits processed per permitting FTE	Number permits processed per permitting FTE	Number permits processed per permitting FTE
<b>Department of Parks and Recreation (HPO) Assumptions</b>		
% permits received by GDPW that would be referred to DPR	% permits received by GDPW that would be referred to DPR	% permits received by GDPW that would be referred to DPR
% FTEs in permitting	% FTEs in permitting	% FTEs in permitting
% FTEs in monitoring/enforcement	% FTEs in monitoring/enforcement	% FTEs in monitoring/enforcement
Number permits processed per permitting FTE	Number permits processed per permitting FTE	Number permits processed per permitting FTE
Permits required for direct project activities	Permits required for direct project activities	Permits required for direct project activities
<b>GDoL ALPCD Assumptions</b>		
No H-2B Workers would be associated with operation of the	No H-2B Workers would be associated	No H-2B Workers would be associated with operation of the proposed project. H-2B workers

<i>Assumption</i>	<i>Assumed Value</i>	<i>Source/Rationale</i>
proposed project. H-2B workers would only be employed for direct construction, and not for any indirect or induced activities	with operation of the proposed project. H-2B workers would only be employed for direct construction, and not for any indirect or induced activities	would only be employed for direct construction, and not for any indirect or induced activities
Ratio of H-2B workers to ALPCD staff	Ratio of H-2B workers to ALPCD staff	Ratio of H-2B workers to ALPCD staff

### *Impacts*

Table 16.2-51 shows the estimated number of key growth permitting professional staff required due to the proposed action. The peak requirement in 2014 ranges from about 9% (GPA) up to 103% (Guam DLM) greater than baseline staffing levels, depending on the agency (except for ALPCD that would experience a 200% peak increase in required staffing due to large influx of H-2B workers). After construction ends by the end of 2016, the required staffing levels are 0% (DPR-HPO and ALPCD) to 64% greater (Guam DLM) than reported baseline staffing levels. By the criteria discussed previously, the overall effect would be considered a significant and adverse impact.

**Table 16.2-51. Additional Growth Permitting Staff Required**

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Guam DPW Permitting Staff	8	9	7	6	3	2	2	1	1	1	1
Guam DLM Permitting Staff	8	8	9	9	8	7	7	7	7	7	7
GEPA Permitting Staff	16	19	17	16	12	11	10	3	3	3	3
CMP Permitting Staff	2	2	4	5	5	3	3	2	2	2	2
GPA Permitting Staff	3	4	3	2	2	2	1	1	1	1	1
GWA Permitting Staff	3	4	3	3	2	2	2	1	1	1	1
GFD Permitting Staff	12	14	10	9	5	4	4	2	2	2	2
GDPHSS - DEH Permitting Staff	1	2	2	3	4	3	2	2	2	2	2
Guam DPR - HPO Permitting Staff	2	2	2	2	1	1	1	0	0	0	0
Guam Department of Labor - ALPCD Permitting Staff	6	9	10	8	0	0	0	0	0	0	0

*Notes:* Numbers show combined total impact. See Appendix F SIAS for a breakdown of the above numbers by construction and operations, as well as direct and indirect effects, for each agency.

#### 16.2.2.4 Sociocultural Impacts

Sociocultural Impact analysis includes the following issues:

- Crime and Serious Social Disorder
- Chamorro Issues
- Community Cohesion

#### Crime and Serious Social Disorder

##### *Approach to Analysis*

Scoping comments and interviews were used to identify probable crime and social disorder impacts of the proposed action. Analysis is qualitative and based largely on interviews in 2008 and early 2009.

Topics identified and addressed include:

- Increase in overall crime
- Increase in prostitution
- Increase in drug use/substance abuse
- Increase in sexual assaults
- Increase in crimes against women and children
- Increase in military-civilian fights

#### *Impacts – Construction Phase*

During the construction phase, the following crime and social disorder impacts would be possible (more detailed discussion on each of these topics is available in the Appendix F SIAS):

*Increase in Overall Crime:* It is expected that a spike in the number of offenses and arrests would occur at the onset and for the duration of the construction component, especially considering that the overall social change at this time would be augmented by the relocation of all Marine Corps personnel.

Construction booms in general cause a variety of social disruptions. However, interviews with industry professionals that experienced Guam's hotel construction boom of the late 1980s and early 1990s indicate that Guam did not experience significant increases in crime or social disorder (Guam Contractors Association and Guam Visitors Bureau Interviews – Appendix F SIAS). More recent arrest data on Guam does not indicate an offenders' type of employment, so it is not possible to say whether construction workers in particular are more crime-prone than other types of workers.

The expected construction worker composition may also affect increase in crime, with H-2B workers having historically less of an impact than workers migrating from the Freely Associated States of Micronesia (FAS). Prior experience suggests that H-2B workers would be responsible for little if any increase in crime.

In contrast, in-migration of workers from the FAS (whether for direct construction work or to take new indirect jobs,) has been associated with increased crime. In-migrants from the FAS (including Palau, FSM, and the RMI) are disproportionately represented in arrests for Part I and Part II offenses in the most recent years that data were published. Notably, 2006 statistics show that FAS/FSM arrests were disproportionately high for serious Part I crimes such as Aggravated Assault (44%), Motor Vehicle Theft (43%) and Murder (33%); however, actual numbers of the latter two crimes are low and therefore statistically less reliable (Guam Police Department 2008). For Part II crimes, the FAS/FSM arrests were disproportionately high for offenses such as Other Assaults, Vandalism, Drunkenness, Liquor Laws, Driving Under the Influence, and Disorderly Conduct. Chuukese comprise 80% of indigent defendants currently in the court system. Micronesian gangs are also emerging as a problem, and especially involve Chuukese and Chamorro youth engaging in fights and retaliation actions.

The possibility of ethnic bias in arrest patterns must be acknowledged in reference to the above data.

Cultural differences affect arrest rates as well. Although Guam Police Department data combines FAS and FSM populations, immigrants from the FSM account for the majority of the FAS residents on Guam (U.S. Census Bureau 2009). These immigrants not only come from depressed economies, but also often live by different value systems that may manifest in behavior that is acceptable in their culture but not on Guam. For example, while educational requirements are nominal in FSM, not attending school is defined as truancy on Guam. It should also be emphasized that FAS residents' current apparent propensity for

more crime reflects cultural transition to a more modern society and would not necessarily continue indefinitely.

*Increase in Prostitution:* While the *volume* of prostitution may be assumed to grow consistent with the significant increase in transient population during the construction period, it cannot be conclusively determined whether the *rate* of prostitution would increase.

In general, prostitution prospers in boomtown settings. Thousands of men are added to the local population, and transient workers often have little stake in the community. As a result, drugs, alcohol abuse, and prostitution can become significant problems, and annual arrests can double or triple in a single year (Ortiz et al. 2009).

Inquiries to the Guam Police Department revealed an absence of quantitative data about those who patronize prostitutes. Arrest data refer only to prostitutes, not their clients. Thus, there is no clear evidence whether likely in-migrating groups are any more or less likely to patronize prostitutes. It is therefore not possible to say whether these groups of workers in particular would differ from other construction-related workers in contributing to prostitution.

*Increase in Drug Use/Substance Abuse:* The proposed action would likely increase the number of arrests for drug and alcohol-related offenses simply because of the population growth. Furthermore, rapid social and economic change can significantly impact drug and alcohol abuse.

It is not possible however, to determine whether construction workers in particular would incur more drug and alcohol-related arrests than other types of workers. The Guam Police Department reports on drug abuse arrests by age and types of drugs involved and Driving Under the Influence arrests are reported by outcomes (involving crash, injuries or fatalities) and ethnicity, not by type of employment.

Data is available on FAS/FSM alcohol offenses however, and in 2006 FAS/FSM arrests were disproportionately high for alcohol-related offenses though not for drug violations.

Finally, the flow of goods and legal and illegal immigrants into Guam presents opportunities for drug smuggling. The drug methamphetamine was involved in 54% of the drug arrests in 2006 (Guam Police Department 2008). The 2003 Drug Threat Assessment reported that methamphetamine is the most available, most abused illegal drug on Guam (U.S. Department of Justice 2003). It is readily available on Guam due to a steady supply from the Philippines, Hong Kong, China, Taiwan, and South Korea.

#### *Impacts – Operations Phase*

During the operational phase, the following crime and social disorder impacts would be possible (more detailed discussion on each of these topics is available in the Appendix F SIAS):

*Increase in Overall Crime:* It appears that the military operational component would have little impact on overall crime rates. This is determined with access to limited data, evidence that crime rates for U.S. military in Okinawa are low, and limited statistics on individual branches of the armed forces are available.

Quantitative military data on criminal arrests of Marine Corps personnel or for any branch of the armed services are limited to information on overseas Status of Forces Agreement (SOFA) personnel. The Guam Police Department does not gather specific data on military charged with crimes, and neither the DoD nor Marine Corps websites offer data. Thus the best reliable predictor for an increase in overall crime on Guam once the Marine Corps personnel are relocated is provided by the information on arrests of SOFA personnel while on Okinawa.

Increase in crime by the military dependents on Guam may also be a possible impact. Guam has experienced rising juvenile drug abuse arrests (from seven to 117 between 2002 and 2006) and other assaults from 39 to 160 between 2002 and 2006) (Guam Police Department 2008, Guam Judiciary 2008, Republic of Korea Drop 2008). Dependents of SOFA personnel on Okinawa do contribute to the overall crime statistic. Of the 46 arrests in 2007, 30 were active-duty service members; one was a civilian employee; and 15 were dependents. In 2006, arrests involved 38 service members, three civilians, and 22 dependents arrested. These arrests included 23 minors.

*Increase in Sexual Assaults:* In 2006, Guam Police Department recorded 141 arrests for forcible rape and seven arrests for sex offenses (Guam Police Department 2008). As noted previously, the Guam Police Department does not gather specific data on military charged with crimes.

Thus, quantitative data on sexual assault arrests of Marine Corps personnel or for any branch of the armed services are limited to information on overseas SOFA personnel. This data conveys the impression that the impact of sexual assaults by any branch of the military would not be significant. That conclusion, however, should be viewed with some caution, as detailed information on Marines is lacking.

*Increase in Prostitution:* The overall *volume* of prostitution may be assumed to grow consistent with the significant increase in both military and civilian population stemming from the buildup, but it cannot be conclusively determined whether the *rate* of prostitution would increase.

Historically, prostitution has long been associated with the presence of military bases. Prostitution is frequently cited as a problem around military bases in Korea, the Philippines, and more recently in Bosnia. However, local law enforcement policies are a major factor in determining whether prostitution is, first, considered an important issue, and, second, tolerated or not.

Regardless of the approach or enforcement policies of local authorities, the U.S. military has declared a “zero tolerance” policy regarding prostitution. Realistically, some military personnel, like some civilians, frequent houses of prostitution and engage in other types of commercialized vices. Given that there is already a fairly large military population on Guam, the few 2006 arrests on Guam for prostitution indicate that the problem is not a large one, is not considered so by the police, and/or is not a priority for enforcement by Guam authorities.

Research for this study found that general articles referring to prostitution and the military tend to focus on single events or areas of deployment. No statistical studies were found that give any quantitative data on discrepancies between Marines and other branches of the military in regards to whether one branch is more inclined to utilize the services of a prostitute.

*Increase in Drug Use/Substance Abuse:* “Substance abuse” can include alcohol. The drinking age on the Island of Guam is currently 18. There have been discussions about enforcing an on-base drinking age of 21 (and perhaps off-base as well). However, any off-base limits would be difficult to enforce, and would require the attention of the military.

Information on drug use/substance abuse (including alcohol) in the military is fragmented, but indications are that this may be a growing problem. In 2005, the DoD conducted a survey of 16,037 active-duty military personnel. In the survey, 43% of active-duty military personnel admitted to frequent binge drinking. In addition, 67.1% of binge-drinking episodes were reported by personnel aged 17-25 (representing nearly half of all active-duty military personnel), and a quarter of those episodes were reported by underage personnel (age 17-20) (Central Broadcasting Service News 2009). It should be noted, however, that published results did not compare rates among different military services or with civilians of comparable age and socioeconomic status.



In 2005, 10.5% of enlisted personnel left the military, an increase from 8.7% in 2002. This increase is blamed in part on drug use. The losses include soldiers, Sailors and airmen who are discharged before their term of enlistment is up and have risen among enlisted and officers alike in recent years. Discharges for drug use have risen 40% in the Army since 2002, although discharges for alcohol use declined (Join Together 2006).

Moreover, there is growing concern that military personnel returning from Iraq and Afghanistan are experiencing a range of difficulties, including traumatic brain injury, post traumatic stress disorder, depression, anxiety, and the abuse of tobacco, alcohol and illegal drugs. This has become a major issue to such an extent that a January 2009 conference was convened by the National Institute on Drug Abuse to address substance abuse and co-morbidities among military personnel, veterans, and their families.

No statistical studies were found on any specific branch of the military in regards to drug use and substance abuse. Thus, the conclusion of probable increase in alcohol or other substance abuse issues is based strictly on the addition of significantly more military troops to Guam's population, but not the Marine Corps in particular.

*Increase in Offenses Against Women and Children:* Domestic violence and child abuse were concerns frequently expressed in scoping comments. (Some of these overlap with concerns covered previously).

Despite data limitations, available information suggests the upcoming military re-deployment would cause an increase in offenses against women and children on Guam's military community, certainly in the overall volume and possibly in the rate as well. However, this is a function of increased presence of the military population in general, not the Marines in particular.

Guam data do not provide clear indications of a relationship between current military presence and family violence. In 2006, only 53 arrests for "Offenses Against the Family" were reported (Guam Police Department 2008). There is no indication whether the offenders were civilian or military. For a number of reasons including shame, secrecy, and isolation, both domestic violence and child abuse are typically under-reported (National Committee to Prevent Child Abuse 1996).

Nationally, there have been clearer indications that family violence is a serious military-wide concern, although even these are subject to data limitations.

Following a number of reported high-profile domestic violence cases involving soldiers who killed their spouses, Congress passed the National Defense Authorization Act for FY 2000. The Act required DoD to take several actions to address concerns about domestic violence in the military, including the establishment of a Defense Task Force on Domestic Violence. Over the next three years, the task force issued three reports that collectively contained almost 200 recommendations. The task force reported finding a system where military personnel rarely faced punishment or prosecution for battering their wives and where they often found shelter from civilian orders of protection. The overarching recommendation was for the military to implement a "culture shift" to zero tolerance for domestic violence by holding offenders accountable and by punishing criminal behavior. DoD accepted most of the recommendations and gradually made many changes, ranging from an increase in family counselors to domestic violence training for commanding officers (General Accounting Office 2006, Alvarez and Sontage 2008).

However, specific data on either the Marine Corps or any other branch of the military were not published. In fact, DoD's ability to record domestic violence incidents and disciplinary actions taken by commanders is hampered because the systems used are based on incomplete data (General Accounting Office 2006). DoD's domestic violence database does not capture data from all law enforcement systems. As yet, no

plans have been developed to address the data limitations. Given the incomplete information, DoD cannot know the size and nature of the problems nor have the ability to assess the effectiveness of its actions.

Since the beginning of the current wars in Afghanistan and Iraq, there has been a cluster of family murder-suicides suggesting a possible link between combat tours and domestic violence (Alvarez and Sontage 2008). Again, many questions have been raised about the actual strength of this link, although researchers have established a relationship between combat-induced post-traumatic stress disorder and domestic violence.

*Increase in Military/Civilian Fights:* Fights have occurred between military and civilian populations since the U.S. armed forces first came to Guam. Occasional personal conflicts occur around all military bases throughout the world and regardless of country or nationality. Despite Guam's existing military population, such conflicts are not considered a major issue at present, but interviews with various Guam civic leaders found significant concern based in part on a perception of the Marine's "warrior culture" and in part on widespread memories of violent encounters when there was a larger military presence on Guam during the Vietnam War period (Guam Civilian Military Task Force Committee on the Environment 2008, Guam Civilian Military Task Force Committee on Health and Social Services 2008, Guam Civilian Military Task Force Committee on Public Safety 2008).

Ultimate fighting and mixed martial arts training are currently popular among Guam's young civilian population, and there have been reports that the youth undergoing such training might test themselves against Marines who could react accordingly (Guam Police Department Interview – Appendix F SIAS). If such conflicts occur, they would likely represent a significant transitional "period of adjustment," but the length of this period is not predictable.

### Chamorro Issues

#### *Approach to Analysis*

The biggest impact drivers on Chamorro cultural issues for both the construction and operational phases may be the introduction of military and DoD civilian workers into the population and the feeling of respect by the military for the Chamorro population on Guam. Acquisition or leasing of lands for development would also drive impacts to a lesser extent. In all cases, the more significant impacts on Chamorro issues would be felt during the operations phase as opposed to the construction phase.

Based on scoping input and interviews, Chamorro Issues analysis identifies and addresses the following topics:

- Political minoritization of Chamorros by temporary workers, permanent military population, and in-migration related to the proposed action
- License of public lands from the Chamorro Land Trust Commission
- Unearthing of Chamorro artifacts
- Perceptions of mutual respect from the U.S. military

#### *Impacts – Construction Phase*

During the construction phase, the following issues would be possible (more detailed discussion on each of these topics is available in the Appendix F SIAS):

*Minoritization:* At 42% of the population, Chamorros are already a minority on Guam (although they are still a plurality – i.e., the largest single group). Therefore, the incoming wave of temporary H-2B construction workers and other workers associated with a construction boom could increase Chamorro

feelings of marginalization. However, the portion of these workers from the FAS or on H-2B visas would lack political rights, and most of these workers would leave Guam after 2016. Therefore, the construction component should not have significant ongoing impacts on Chamorro political control.

*Land Acquisition and Leasing:* Under Alternative 1 of the proposed action, the military would acquire new lands for development. Assuming this is done through lease rather than condemnation, for parts of these parcels that are public, the military would require a license from the Chamorro Land Trust (CLT). By its charter, the CLT leases land to Chamorro farmers and business owners, or licenses land to non-Chamorros, using the revenues to promote health and development projects for Chamorros. The military's plans to license public lands from the CLT would determine, in part, the CLT's funds for development projects; and a large increase in development funds for the CLT would have a beneficial impact on the Chamorro population.

*Artifacts:* There is a concern that military development could unearth Chamorro artifacts. Chamorro groups such as the Department of Chamorro Affairs (DCA), the Guam Council on the Arts & Humanities Agency, and the Guam Museum are requesting the military give the anticipated artifacts and provide funding to the Guam Museum. Refer to Volume 2, Chapter 12, Cultural Resources for impact analysis.

#### *Impacts – Operations Phase*

During the operational phase, the following impacts would be possible (more detailed discussion on each of these topics is available in the Appendix F SIAS):

*Minoritization:* Overall, the analysis indicates a sustained increase of approximately 33,500 people on Guam. Most of these people would have political rights as U.S. citizens. Therefore, their sustained presence could affect Chamorro culture in a number of ways, politically and culturally.

Firstly, a reduction in Chamorro voting power would impact certain political issues important to the Chamorro population.

The incoming population would presumably be disinclined to vote for further moves away from the U.S., and this may affect the success or failure of future plebiscites involving Guam's political status. Guam's status and its relationship to the U.S. are largely legal affairs, such as the previous Constitutional Conventions. However, the constitution produced by that 1978 Convention was rejected by the voters the following year (Office of the Governor of Guam 2008). Subsequent attempts to change Guam from an organized but unincorporated territory into a commonwealth have so far collapsed.

A reduction in Chamorro voting power may also be felt on the policy level. For example, it is commonly agreed among Chamorro politicians that public funds should be spent to support funeral and wake activities. However, non-Chamorro elected officials may not appreciate this cultural tradition and support such things (Guam DCA Interview – Appendix F SIAS).

Another goal of Chamorros has been political self determination, and for some Chamorros, total sovereignty. While it is by no means certain that Guam residents would ever vote for full independence even if the military buildup does not take place, the addition of more non-Chamorro voters may make efforts at sovereignty less viable.

On a more purely cultural level, while the loss of the Chamorro language has been occurring for years on Guam, it may be accelerated with the military build-up.

Guam's integration into the larger English-speaking American society has been correlated with a loss of the use of Chamorro language in everyday life. A survey of Chamorro residents (Santos and Salas 2005)

found that 90% said the language was a source of pride, and students are learning to read and write the language with more comprehension than most of their elders. However, younger people are much less able to speak and comprehend the spoken language than their elders. Younger people speak the language primarily just with older relatives, not among their peers.

This loss of language skills is a common occurrence where a more dominant culture influences a minority culture.

*Respect:* Like many small island societies, Chamorros developed an interdependent culture, to achieve consensus whenever possible. Under this sort of consensus-based cultural system, exclusion from decision making may be equated with “disrespect.” This could conflict with the military culture of chain-of-command and their mission of national defense, as opposed to local concerns.

The Chamorro concept of inafa’maolek holds that society is based on good relationships and mutual respect. Inafa’maolek is based on varying familial relationships, and reciprocal obligations between two people in any of these relationships. The relationships tend to be based on age, with the older person owing the younger person responsibility, and the younger owing the older deference. Chamorros expect people to approach their relationships with the wider society conforming to the philosophy of respetu (respect). This philosophy involves respecting the environment and society that the individual lives. Chamorros are held to inafa’maolek and respetu by a strong sense of mamahlao, or shame. A proper Chamorro has a sense of mamahlao in social situations, and does not openly contradict a superior or act outside of social mores (Guam DCA 2003).

Nuanced aspects of the way the military deals with the Chamorro population on Guam would determine the perception of whether they respect the local population and culture. A survey by the Public Affairs and Legal Studies club at the UoG found over 80% of respondents wanted to tell the military that communication would be the surest sign of respect and path to smooth interaction on Guam (KUAM 2008).

### Community Cohesion

#### *Approach to Analysis*

The negative interactions related to incoming new population discussed here do not rise to the level of major issues previously discussed under “Crime and Disorder,” but are more likely to be irritants that may undermine a sense of mutual respect between groups.

Also, the arrival of new populations can bring positive benefits that infuse communities with opportunities for more meaningful interactions.

Topics identified and addressed include:

- Increase in Cultural Conflicts
- Increase in Military Outreach/Community Programs

#### *Impacts – Construction Phase*

During the construction phase, issues of cultural conflict would be possible (more detailed discussion on each of these topics is available in the Appendix F SIAS). The following discussion outlines examples of cultural discontinuities that could emerge during the construction component, producing conflict. Such discontinuity and conflict could reach significant levels as greater numbers of immigrants arrive.

Large-scale in-migration of culturally different populations can easily lead to tension with the host community's longtime residents (United Kingdom Department of Communities and Local Government 2007). The main populations relevant to this proposed action are H-2B construction workers or groups from the Asia Pacific region that may in-migrate for available indirect jobs.

As previously discussed, Guam's temporary foreign workers (H-2Bs) are generally regarded as law-abiding, causing few disruptions to the community. However, there has been some historical experience with foreign construction workers who, due to unfamiliarity with local conditions and prohibition, have disturbed local customs or environments. For example, temporary foreign workers have upset residents by harvesting marine animals normally not consumed on Guam, and by taking shells and corals to the point where reefs have been damaged (Guam Bureau of Statistics and Plans Interview – Appendix F SIAS).

Problems related to immigrants from the FAS who come to Guam for direct construction work or new indirect jobs frequently arise in the areas of public health and education. A 2001 General Accounting Office report on Micronesian migration cited data showing that Compact of Free Association migrants were working low-paying jobs that required few skills, and that most (more than 50%) were living at poverty levels on Guam, HI, and the CNMI in conditions that places a strain on public services.

Conflicts between local and in-migrant customs related to housing and living conditions is also an issue on Guam. For example, up to 15 or 20 individuals from these groups have been reported to reside in a single housing unit, and there are stories of subdivided lots without sewer connections or other infrastructure being sold by unscrupulous developers to Micronesians, who find it natural to live in the "traditional" rural style found on their home islands (Guam Contractors Association 2008, Guam Housing and Renewal Authority 2008). However, it is also argued that these in-migrants accept such crowding and harmful living conditions because of economic reasons, not because it is a cultural norm – i.e., these same in-migrant groups do not live with the same household densities in their home islands (Center for Micronesian Empowerment Interview – Appendix F SIAS).

Cultural conflicts can also be observed in the education sector. Often FAS in-migrants are not highly educated, few have college degrees and just over 50% have graduated from high school (General Accounting Office 2001). However, as mentioned in the Crime and Social Disorder section, the comparatively minimal educational requirements in Micronesia are values that are sometimes brought to Guam by in-migrants, resulting in lax parental enforcement of school attendance, and ultimately resulting in high levels of truancy for Micronesian students.

#### *Impacts – Operations Phase*

During the operations phase, issues of cultural conflict would also be possible (more detailed discussion on each of these topics is available in the Appendix F SIAS).

As noted in the Chamorro Issues section, concerns about increased military-civilian conflict often reflect beliefs that incoming populations would not have sufficient knowledge of and respect for local culture. Also noted previously, the way the military works with the local population and efforts made to understand local issues, would determine whether increased cultural conflicts would occur in the military operational phase. Already in place is a newcomers' orientation program offered by the Navy and the Air Force that informs newly assigned service members and their families about the culture and uniqueness of Guam (Office of the Governor of Guam 2009).

Military outreach and community programs should increase during the operations phase. For decades, a variety of community service programs have encouraged positive interaction and cultural exchange

between the military and civilian populations on Guam. Many of these programs were instituted by the Naval and Air Force commands on the island (Office of the Governor of Guam 2009).

These programs have the potential to bring a beneficial impact to Guam to the point that positive interactions could strengthen military ties to local communities. For example, the larger military contingent would add greater numbers of volunteers to community service programs that would bring together both military and civilian groups working toward shared goals.

Some examples of these programs are:

1. Sister Village Program - Military units are paired with villages to foster mutual sharing and understanding between the people of Guam and the military personnel and their family members stationed on Guam. School partnerships with military units were established in 1987.
2. In 1997, volunteer efforts were formally expanded in five project categories to help strengthen education and the quality of life on Guam through joint military and community effort. Those project categories include:
  - Partnership in Education
  - Guest Teacher Program
  - Health, Safety, and Fitness
  - Environmental Stewardship
  - Campaign Drug
  - Project Good Neighbor (Pacific Daily News 2008)
3. Naval Hospital Guam Community Services
  - Staff contribute thousands of community service hours on projects such as school clean-up, work with Guam Animals in Need and countless other organizations
  - Naval Hospital received top honors in the 2008 Navy Environmental Stewardship Flagship Award for large, shore-based commands
  - Most notable is the nursing mentorship that is provided for seniors of the UoG nursing program (Naval Hospital Guam Interview – Appendix F SIAS)
4. Andersen Air Force Base Programs
  - Big Brother Big Sister
  - Donations to schools through the DoD Computers for Learning Program (Lessard 2008)
  - Air shows open to the community

### 16.2.3 Summary of Impacts

Socioeconomic impacts are anticipated to be largely islandwide in nature with little difference in effects among the various alternatives. The impacts in this chapter are calculated under a scenario that assumes there would be no constraints (blockages) to the rapid development of spin-off private-sector economic activity driven by the military construction and permanent military operational stages. Most impacts are characterized by a burst of activity and impacts in the 2013-2014 timeframe, followed by relatively much lower impacts when construction ends.

#### 16.2.3.1 Population Impacts

Including active-duty Marines, dependents, and rotating transient Marines (about 19,500 people), the proposed action would add about 65,500 residents to Guam's population in 2014 and a subsequent more stable approximate of 31,000 by 2020.

### 16.2.3.2 Economic Impacts

Most long-term economic impacts would be beneficial, though the construction boom would entail substantial growing pains related to rapid population influx and housing shortages. These impacts, combined with others such as increased noise and traffic, would substantially impact quality of life on Guam for several years, until the steady-state military operational phase is in place.

Including all the spin-off activity, the proposed action would provide jobs for about 33,000 civilian workers at the 2014 peak and approximately 6,150 on a more permanent basis. Guam residents are estimated to capture about 2,000 of the direct on-site construction jobs for Marine Corps facilities at the 2013-2014 peak, as well as approximately 2,570 spin-off jobs that year, with a slight decline thereafter.

Although a more detailed fiscal impact assessment will be done by GovGuam using output from this EIS/OEIS, preliminary estimates in this chapter suggest revenues from the three most important tax sources – gross receipts, corporate income, and personal income – would exceed \$325 million in 2014 and stabilize at nearly \$97 million thereafter.

Civilian housing unit demand would peak at about 9,500 units in 2014 – an amount that is unlikely to be entirely met by new construction, resulting in consequences such as crowding, possible illegal units, and further increases in housing costs – falling to about 3,000 for the steady-state phase.

While Guam businesses are expected to benefit from various opportunities, including military set-asides, there could be a variety of impacts on tourism, both positive (e.g., increased hotel occupancies from business travelers and military families) and negative (a military “sense of place” competing with the historic/cultural milieu the GVB hopes to promote).

Guam’s GIP, the total market value of all final goods and services produced in a given year, would increase by \$822 million (2008 dollars) in 2014 and by nearly \$157 million a year from 2017 on.

### 16.2.3.3 Public Service Impacts

Many public services offered by GovGuam would need to increase professional staff to service the new population. Most of these agencies would need to rapidly expand their services and staff during the 2013-2014 peak (raising serious issues of availability of qualified workers), then cut back them back as construction ends.

For public education services, the GPSS, GCC, and UoG together would need to hire a combined 490 teachers/faculty for the year 2014, falling to a combined 135 after construction ends.

For health and human services, this chapter considered impacts on various aspects of the GMHA, the GDPHSS, the GDMHSA, and the GDISID. These agencies would need a combined 192 new key professional workers by 2014, dropping to a combined 52 a few years later.

Public safety agencies – Police, Fire, Corrections, and Youth Affairs – would require a combined 249 key professionals in 2014, falling to a combined 99 a few years later.

Other selected general service agencies – Parks and Recreation, Libraries, and the Judiciary – would require a combined 46 key professionals in 2014, falling to a combined 22 after construction ends.

Agencies that deal with permitting and regulating growth are affected more by the initial requests for permits and then subsequent inspections and monitoring. For the agencies involved in development permitting, impacts on workloads would tend to be slightly earlier than for other agencies, because generally, rezoning and permit applications occur one to two years before construction projects are completed and occupied. The peak year of demand for permitting agency staffing was found to vary by

agency, rather than the 2014 standard. Of the permitting agencies providing information for this EIS/OEIS, the GEPA appeared to require the largest numeric staffing increase, at 19 FTEs in 2011. Other, smaller agencies such as the DLM would experience numerically smaller staff demand increases, but the proportional increases would be similar across permitting agencies.

16.2.3.4 Sociocultural Impacts

Sociocultural impacts by their nature are complex and have no single outcome measure.

Although available evidence does not suggest that Marines would have an impact on Guam’s overall crime rates or assaults on women, there is cause for concern about impacts on crime and social order due to other factors. Construction booms are often accompanied by a sense of loosened norms and social disorder. In-migrants from the FAS – whose numbers may increase in both the construction and operational stages due to more job opportunities – have high crime rates associated with adapting to less traditional social structures. There is a potential for more prostitution, alcohol/substance abuse, and family violence associated with young military populations in general, not Marines in particular. However, the reputation of Marines as fighters could trigger a transitional period of adjustment that local young men test themselves against Marines in fights.

Long term, though, established patterns of military outreach to Guam’s civilian community are likely to minimize the sort of day-to-day irritants that affect the average citizen, including the perceived insufficient respect that underlies one set of Chamorro concerns. Chamorro concerns involves political autonomy are impacted by the potential increase in non-Chamorro populations due to the buildup, increasing the likelihood of more non-Chamorro local political office-holders. More non-Chamorro voters would decrease the possibility of Chamorro political self determination. They would also decrease the possibility of successful plebiscites to achieve greater independence from U.S. control, although at present there is little evidence that a majority would support such moves at any rate.

Table 16.2-52 provides a summary assessment of the potential impacts of the proposed action.

**Table 16.2-52. Summary of Impacts Associated with the Proposed Action**

<i>Proposed Action-All Alternatives</i>	
<b>Construction</b>	
SI	<ul style="list-style-type: none"> <li>• Significant delayed adverse impact to civilian housing demand following construction phase if demand is met at the peak. Subsequent over-supply of housing units would follow the construction period, and result in declining housing values</li> </ul>
SI-M	<ul style="list-style-type: none"> <li>• Significant adverse impacts to population due to strains placed upon government services and the social fabric (See Public Service and Sociocultural impacts below)</li> <li>• Significant adverse impact to civilian housing demand if construction phase housing demand is not met at the peak, resulting in high costs, crowding and/or homelessness</li> <li>• Significant adverse impacts to public service agencies influenced by population increases, due to difficulty in meeting fluctuating staffing requirements during the construction phase with an existing environment of staffing and budget shortfalls and recruitment complications</li> <li>• Significant construction-related adverse impacts to growth permitting and regulatory agencies due to difficulty in meeting fluctuating staffing requirements with an existing environment of staffing and budget shortfalls and recruitment complications</li> <li>• Significant adverse impacts to social fabric resulting in differences in norms and customs between longtime Guam residents and foreign workers or FAS in-migrants arriving on Guam for jobs</li> <li>• Significant adverse impact to crime and social order due to increased overall crime, prostitution, alcohol/substance abuse, domestic offenses, and fights.</li> </ul>



<i>Proposed Action-All Alternatives</i>	
BI	<ul style="list-style-type: none"> <li>• Beneficial impact due to economic expansion fueled by increased population (see Economic impacts below)</li> <li>• Beneficial impacts to civilian labor force demand due to provision of construction-related jobs on Guam</li> <li>• Beneficial impacts to civilian labor force incomes due to infusion of income into the Guam economy</li> <li>• Overall beneficial impacts to the standard of living associated with higher incomes reducing the rate of reductions in standard of living.</li> <li>• Beneficial impacts to local business opportunities due to increased military service contract opportunities for local Guam businesses</li> <li>• Overall, impacts to tourism would be mixed (both beneficial and adverse). On balance the positives outweigh the negatives.</li> <li>• Beneficial impacts due to increase in local government revenue</li> </ul>
<b>Operation</b>	
SI	<ul style="list-style-type: none"> <li>• Significant adverse impact to public service agencies influenced by population increases due to difficulty in recruiting and funding adequate staffing during operational phase</li> </ul>
SI-M	<ul style="list-style-type: none"> <li>• Significant adverse impacts to public service agencies influenced by population increases, due to difficulty in meeting fluctuating staffing requirements following the construction phase with an existing environment of staffing and budget shortfalls and recruitment complications</li> <li>• Significant adverse impacts to indigenous Chamorro efforts to preserve political representation due to lower number of ethnic Chamorro voters, due to increase in non-Chamorro voting population on Guam</li> </ul>
BI	<ul style="list-style-type: none"> <li>• Beneficial impact due to economic expansion fueled by increased population (See Economic impacts below)</li> <li>• Beneficial impacts to civilian labor force due to provision of permanent jobs on Guam</li> <li>• Beneficial impacts to civilian labor force incomes due to permanent infusion of income into the Guam economy</li> <li>• Beneficial impact to public service agencies influenced by population increases, due to provision of additional jobs on Guam, if labor supply and funding is available during operational phase</li> <li>• Overall beneficial impacts to the standard of living associated with higher incomes reducing the rate of reductions in standard of living.</li> <li>• Beneficial impacts to local business opportunities due to increased military service contract opportunities for local Guam businesses</li> <li>• Overall, impacts to tourism would be mixed (both beneficial and adverse). On balance the positives outweigh the negatives.</li> <li>• Beneficial impacts to Gross Island Product due to permanent increased GIP strengthening the Guam economy</li> <li>• Beneficial impacts due to increase in local government revenue</li> <li>• Beneficial operational phase impacts to civilian housing demand due to increase in competitive housing market on Guam</li> <li>• Beneficial impacts to community cohesion resulting from increases in well-established and successful military community outreach programs</li> <li>• Beneficial impacts to Chamorro Issues due to increased funding for development of agricultural, social, and business development programs for Chamorro people (only if military leasing of additional land on Guam through the Chamorro Land Trust occurs)</li> </ul>

Legend: SI = Significant impact, SI-M = Significant impact mitigable to less than significant, LSI = Less than significant impact, NI = No impact.

#### 16.2.4 No-Action Alternative

Under the no-action alternative, Marine Corps units would remain in Japan and would not relocate to Guam. No construction, dredging, training, or operations associated with the military relocation would occur and the Marine Corps would not meet readiness, mission and international treaty obligations. Existing operations on Guam would continue.

Unlike physical resources, socioeconomic systems do not tend to remain completely at “baseline conditions” if a proposed action is not implemented. Economies and population levels change due to other reasons as well. The various foregoing exhibits showing “baseline trends” for economic and demographic variables indicate long-term trends expected to continue without the proposed action, and Volume 7 lists a number of specific socioeconomic changes expected to occur independent of the proposed action. Furthermore, the announcement of the proposed action has already had socioeconomic consequences, such that a 2010 decision not to follow through on the proposed action would have short-term effects associated with a reversal of those existing consequences.

##### 16.2.4.1 Population Impacts

Project related population in-migration would not occur. Nor would associated demographic and household characteristic impacts. Overall Guam population could be expected to increase according to the baseline trend noted above in Figure 16.2-1. The 2010 Census will provide an update on population trends for Guam.

##### 16.2.4.2 Economic Impacts

In the short term, a decision not to implement the proposed action would deflate any current speculative activity attributable the proposed action. Real estate values in particular would likely drop, hurting investors but increasing the affordability of housing. The contrast between the business community’s expectations and a negative Record of Decision would likely produce a period of pessimism about Guam’s economic future, especially if the current national and international economic crisis has not yet abated. These effects, though, would be attributable to an unstable world economic landscape and poor decision making by investors – not to the proposed action.

Long term, the island’s prospects would remain linked to international economic conditions and the health of its tourism industry. Conceivably, a smaller military profile might remove some barriers to growing the potential Chinese tourism market. Growth would resume, though probably with the same volatility experienced in recent decades (see Section 16.1.2).

##### 16.2.4.3 Public Service Impacts

In the case of the no-action alternative, the specific agencies discussed earlier in this chapter would not face the listed pressures to expand professional staffing, and agencies involved in planning and regulating growth would not experience such a sharp increase in workload. Although this was not specifically covered in the foregoing analysis, it may also be noted that agencies that are required to implement major infrastructure developments – such as the ports and highways – would have substantially more time to implement long-term plans rather than having to achieve much of their objectives over the next few years.

##### 16.2.4.4 Sociocultural Impacts

To the extent that Guam experiences job losses crime rates may rise in the short term. The political importance of some Chamorro issues would likely recede as the “militarization” of Guam as perceived by

Chamorro activists would be stabilized at something close to present levels. Military-civilian relations would likely remain at the current generally positive level.

The incentive for increased in-migration from the FAS would decrease, reducing sociocultural issues associated with assimilating that population. However, the current incentives for providing those populations – both on Guam and the Micronesian states themselves – would also be lessened, with detrimental implications for those populations.

### 16.2.5 Summary of Potential Mitigation Measures

A review of the above impacts shows that the proposed action has the potential to have beneficial as well as significant, adverse socioeconomic impacts on Guam. Mitigation measures noted in this section provide avenues to address the major adverse impacts identified in the analysis, as well as the unique position Guam is in, as an isolated island economy.

In particular, while the proposed action has the potential to have substantial beneficial economic impact to the Island of Guam during the operational phase, the large increase and subsequent rapid decrease in construction-related population in tandem with an increase in operational population increase means that the proposed action creates a boom-bust economic cycle on Guam that strains public services during the boom and could result in a recession-like environment following the construction phase.

Secondly, Guam is in a unique position, relying on a small isolated economy that is unable to absorb the large population increase brought about by the proposed action. Typically, local economies are able to absorb and mitigate the impacts to social services that have been discussed above, however, this is not possible in the case of Guam.

Finally, adverse sociocultural impacts are mitigable if the proper preparation in public awareness and cultural education can be implemented.

For this reason mitigations focus on possible approaches to reducing adverse impacts by reducing the impacts of peak population buildup, while also finding ways the DoD can assist the local Government to obtain the necessary capacity and support to meet the requirements of the buildup and reap beneficial impacts. DoD can convene a workgroup to determine possible involvement in assisting to implement the following mitigation measures. Furthermore, in order to assist with GovGuam planning efforts to prepare for the proposed action, the DoD can provide frequent updates to GovGuam on the current planning and construction process.

Table 16.2-53 summarizes potential mitigation measures.

**Table 16.2-53. Summary of Potential Mitigation Measures**

<i>Impact Area</i>	<i>Adverse Impacts</i>	<i>Mitigation Measures</i>
Population	<ul style="list-style-type: none"> <li>Significant adverse impacts due to strains placed upon government services and the social fabric (See Public Service and Sociocultural impacts below)</li> </ul>	<ul style="list-style-type: none"> <li>DoD can relax the construction and operations timeline in order to smooth out the adverse impacts of a large jump in population on Guam – eliminating the boom and bust effect identified in the analysis.</li> <li>DoD can decrease the rapid population increase associated with the operations phase by not allowing dependents to accompany Marines until the construction phase has ended.</li> </ul>

<i>Impact Area</i>	<i>Adverse Impacts</i>	<i>Mitigation Measures</i>
<p>Civilian Housing Demand</p>	<ul style="list-style-type: none"> <li>• Significant adverse impact if construction phase housing demand is not met at the peak, resulting in high costs, crowding and/or homelessness</li> <li>• Significant delayed adverse impact following construction phase if demand is met at the peak. Subsequent over-supply of housing units would follow the construction period, and result in declining housing values</li> </ul>	<ul style="list-style-type: none"> <li>• To reduce impacts on housing availability and expense, DoD can assist GovGuam could in seeking federal funding to expand the stock of low- to moderate-income housing on Guam.</li> </ul>
<p>Public Service and Growth Permitting and Regulatory Agencies</p>	<ul style="list-style-type: none"> <li>• Significant adverse impacts due to difficulty in meeting fluctuating staffing requirements during and following the construction phase with an existing environment of staffing and budget shortfalls and recruitment complications</li> <li>• Significant adverse impact due to difficulty in recruiting and funding adequate staffing during operational phase</li> </ul>	<p>DoD can implement:</p> <ul style="list-style-type: none"> <li>• incentive programs for military spouses and dependents that apply for and are hired into GovGuam public service agency employment.</li> <li>• volunteer programs for military, their spouses and dependents, linking them to long-term GovGuam public service agency volunteer positions.</li> <li>• Collaborative efforts with the federal government and GovGuam to identify and provide grant writing assistance to Guam public service organizations and agencies that have existing AmeriCorps program, or have the potential to host an AmeriCorps program, to facilitate an increase in AmeriCorps service on Guam.</li> </ul> <p>DoD can assist GovGuam in seeking federal funding for:</p> <ul style="list-style-type: none"> <li>• the necessary permanent number professional staff identified, as well as the number of administrative and supporting staff needed for these professions to perform their positions adequately.</li> <li>• an increase in the number of private staffing and service contractors currently working for service agencies, to match staffing requirements.</li> <li>• a one-time hiring bonus of 20% of base pay for all GovGuam agency positions, to increase interest in GovGuam agency employment and compete with wages offered by private offices.</li> </ul> <p>DoD can assist GovGuam with technical assistance, development and implementation of comprehensive data collection systems focused on:</p> <ul style="list-style-type: none"> <li>• public services provided to FAS citizens in order to facilitate GovGuam access of Compact Impact and other related funding.</li> <li>• public services provided to military individuals, in order to facility GovGuam access of TRICARE and other related funding.</li> <li>• patient information, records, and services accessed, in order to facilitate appropriate care administered in a timely manner.</li> </ul> <p>DoD can assist GovGuam in seeking federal funding for technical assistance, development, and implementation of a system of interpreters and translators available for the interpreting and translating needs of GovGuam public service agencies, to facilitate timely and appropriate provision of services for the English as a Second Language service population.</p>

<i>Impact Area</i>	<i>Adverse Impacts</i>	<i>Mitigation Measures</i>
<p>Crime and Social Order</p>	<ul style="list-style-type: none"> <li>• Significant adverse impact due to increased overall crime, prostitution, alcohol/substance abuse, domestic offenses, and fights.</li> </ul>	<ul style="list-style-type: none"> <li>• DoD can collaborate with GovGuam public safety agencies to develop a comprehensive and regular shore patrol system, and maintain a regular visible preventative presence.</li> <li>• DoD can develop community outreach task forces aimed at addressing community crime and social order concerns. These task forces would provide ongoing review, improvement and implementation of military policies related to such offenses or concerns. Members of these task forces would partner with existing civilian groups with similar concerns to share information regarding current policies and programs. The task forces would also implement volunteer programs for military spouses and dependents to link them to long-term volunteer positions at these civilian groups or similar non-profit entities on Guam.</li> <li>• DoD can assist GovGuam in seeking federal funding for collaborative efforts with FSM governments and relevant federal agencies to educate in-migrants on the laws and cultures of the Island of Guam, focused areas where there are known cultural differences.</li> </ul>
<p>Chamorro Issues/Community Cohesion</p>	<ul style="list-style-type: none"> <li>• Significant adverse impacts to indigenous Chamorro efforts to preserve political representation due to lower number of ethnic Chamorro voters, due to increase in non-Chamorro voting population on Guam</li> <li>• Significant adverse impacts to social fabric resulting in differences in norms and customs between longtime Guam residents and foreign workers or FAS in-migrants arriving on Guam for jobs.</li> </ul>	<ul style="list-style-type: none"> <li>• DoD can implement an orientation course on Guam local culture and history, designed in conjunction with the Guam Department of Chamorro Affairs, to be attended by all arriving active-duty DoD personnel and dependents.</li> <li>• DoD can collaborate with GovGuam, the University of Guam, and the Guam Chamber of Commerce to design and implement a scientifically valid semi-annual resident opinion survey, to accurately measure resident concerns and perceptions through the construction period and as needed in the operations phase.</li> <li>• DoD can assist GovGuam in seeking federal funding for technical assistance to identify, translate and produce all necessary GovGuam informational brochures and materials likely to be accessed by in-migrant groups.</li> <li>• To minimize local community perceptions of separation of local resident and military communities, DoD will consider developing a mayoral outreach task force aimed at developing military-civilian relationships. The task force would work with each mayor and their staff to integrate military participation in existing cultural or recreational community events, expand on existing military outreach activities, and develop new civilian-military collaborative projects as determined by the task force and mayors.</li> </ul>

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