

## CHAPTER 12.

# CULTURAL RESOURCES

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### 12.1 AFFECTED ENVIRONMENT

#### 12.1.1 Definition of Resource

Cultural resources are defined as any district, site, building, structure, or object considered to be important to a culture, subculture, or community for scientific, traditional, religious, or any other reason. Cultural resources include pre-contact (before European contact) and post-contact archaeological resources, architectural resources, and traditional cultural properties. The cultural resources discussed in this chapter only include those that meet the specific criteria of the National Historic Preservation Act (NHPA) and its associated regulations.

Pre-contact and post-contact archaeological resources are area locations (sites) where human activity measurably altered the earth or left deposits of physical remains. Archaeological resources can be identified and evaluated for significance according to each site's cultural importance, integrity, and ability to yield information. Architectural resources are standing buildings, dams, canals, bridges, and other structures of historic or aesthetic significance. Traditional cultural properties are resources associated with cultural practices and beliefs of a living community that are rooted in its history and are important in maintaining the continuing cultural identity of the community. In general, specific locations of archaeological sites are not revealed to the public because of the concern of vandalism. Therefore, figures with specific locations of archaeological sites are not being presented in this chapter. However, figures with commonly known sites are presented in Volume 3, Chapter 9, Recreational Resources.

##### 12.1.1.1 Regulatory Review

Archaeological and architectural resources determined to be significant under cultural resource legislation such as the NHPA and the Archaeological Resources Protections Act are subject to protection or consideration by a federal agency. Significant cultural resources are those that are eligible for or listed on the National Register of Historic Places (NRHP). The criteria for significance are contained in Federal Regulation 36 Code of Federal Regulations (CFR) 60.4 and include association with significant historic events; association with significant people; embodiment of distinctive characteristics; and ability to yield information important in increasing our understanding of the past. The determination of significance is made in consultation with the Historic Preservation Officer (HPO). Section 106 of the NHPA requires federal agencies to consider the effects of their actions on NRHP-eligible or listed cultural properties. The implementing regulations for Section 106 (36 CFR Part 800) specify a consultation process to assist in satisfying this requirement. Procedures are in accordance with the Secretary of the Navy's Instruction 4000.35A, Department of Navy Cultural Resources Program.

National Historic Landmarks (NHL) are cultural resources of national historic importance and are automatically listed on the NRHP. Under the implementing regulations for Section 106 (36 CFR Part 800.10), special consideration to minimize harm to NHL is required and both the Advisory Council for Historic Preservation and the Secretary of the Interior are consulted if any adverse effects are likely to occur to such resources.

Significant post-contact resources usually must be at least 50 years old; however, certain structures at technical or scientific facilities associated with important historic periods may be considered to be eligible for inclusion on the NRHP. Guidelines for determining the significance of traditional cultural properties

are contained in *Bulletin 38: Guidelines for Evaluating and Documenting Traditional Cultural Properties* (National Park Service [NPS] 1998).

Laws related to management and preservation of cultural resources in the Commonwealth of the Northern Mariana Islands (CNMI) include Public Law 3-39, the Commonwealth Historic Preservation Act of 1982 that promoted the preservation of the historic and cultural heritage of the Northern Mariana Islands and prohibited the removal of historic properties and artifacts from the Island; Public Law 3-33 that established a permit and penalty process for the excavation and removal of human remains; and Public Law 10-71 that amended the Commonwealth Historic Preservation Act of 1982 to increase the membership of the Review Board and increase the monetary penalty for violations of the Act. Federal agencies are required to comply with federal laws that supersede local laws; however, such compliance would meet local historic preservation goals.

#### 12.1.1.2 Research Methodology

The region of influence (ROI) for cultural resources includes areas subject to construction, training maneuvers, firing and non-firing ranges, road improvements, and landing zones, among other activities. The ROI for cultural resources is synonymous with the Area of Potential Affect (APE). The methodology for determining the presence of NRHP-eligible or listed cultural resources within the ROI was based on a combination of existing data and special studies. The Navy assessed the adequacy of existing data (Tomonari-Tuggle et al. 2007) and conducted extensive archaeological and architectural surveys in Tinian (Tuggle 2009), Pagan, and Sarigan (Athens 2008). These surveys and studies included:

- Surveying almost 5,000 acres (ac) (2,023 hectares [ha]) on Tinian with subsurface excavations at Unai Chulu and Unai Dangkulo
- Surveying over 5,000 ac (2,023 ha) on Pagan
- Surveying the proposed IBB relocation area on Saipan (20 ac [8 ha])
- Updating all site forms and probability maps
- Conducting oral history studies for World War II (WWII) survivors on Tinian and Pagan
- Conducting interviews for traditional cultural property studies for Tinian and Pagan
- Preparing a Cultural Landscape Report for the NHL North Field on Tinian

Additional information was provided by the Regional Integrated Cultural Resources Management Plan (ICRMP) for Commander of the Navy Region (COMNAV) Marianas Lands (Tomonari-Tuggle et al. 2005), a synthesis of Tinian during both pre-Contact and post Contact periods (Welch and Tuggle 2008), and numerous survey reports.

#### 12.1.1.3 Historical Overview

The Marianas oldest archaeological sites are from the Chamorro period of occupation, prior to western contact in 1521. On Tinian, few archaeological and architectural resources show evidence of the area's status as a colony of Spain and Germany, while numerous structures and relics attest to the island's role in WWII. Other areas on the island are important to people because of their historical and traditional use, both to the Chamorro and to former American, Japanese, Korean, and Okinawan residents. The following discussions involve the type of investigations in each area, the type and number of resources eligible to or listed on the NRHP, and the potential for finding NRHP-eligible or listed cultural resources in the impact areas. Locations of archaeological sites on U.S. title fee land are protected under Archaeological Resource Protection Act to prevent vandalism to sites not known to the general public, therefore, figures with site locations are not included in this section. However, sites commonly known to the public are presented in Volume 3, Chapter 9, Recreational Resources.

### Pre-Contact in the Mariana Archipelago

At the time of western contact, the Mariana Islands were inhabited by a group of people that came to be known to the rest of the world as the Chamorro. Western Contact in this area is considered to be 1521, the year that Ferdinand Magellan and his crew landed on Guam after a 99-day voyage across the Pacific. The inhabitants of all of the Mariana Islands shared similar customs, technology, and artifact styles. They spoke a non-Oceanic Austronesian language with dialect differences between islands (Levesque 1995, as cited in Tomonari-Tuggle et al. 2007).

Chamorro is one of only two non-Oceanic languages within the Austronesian family in remote Oceania (the other is Palauan). Examination of Chamorro syntax, phonology, and lexicon, when compared with other Austronesian languages and discounting post-European contact influences, indicates divergence from a distant Austronesian ancestry prior to the development of more than 450 related Oceanic Austronesian languages in Melanesia, Micronesia, and Polynesia (Carson and Tuggle 2007). Linguistic evidence favors the central or northern Philippines as the most likely origin of populations initially settling the Mariana Islands.

#### *Initial Settlement*

The main Mariana Islands were settled by 1500 Before Christ according to archaeological data. However, some paleo-environmental and archaeological evidence suggests settlement of Saipan by as much as 300 to 900 years earlier. Two early dates of 3,470 and 3,120 years Before Present from the Achugao site come from secure proveniences in two excavation units at the Nansay Resort in the northwest coast of Saipan. These samples are associated with Marianas Red pottery. Similar types of pottery, associated with a charcoal date of 3,210 years Before Present were recovered at Chalan Piao on Saipan's southwest coast.

On Tinian at Unai Chulu, 13 radiocarbon dates come from charcoal samples associated with Marianas Red pottery and incised sherds (Craib 1993, as cited in Tomonari-Tuggle et al. 2007), Jimenez et al. 1996, as cited in Tomonari-Tuggle et al. 2007). Collected from the earliest stratum, they confirm occupation of the area between 3,400 and 2,900 years ago. Sediment coring at Lake Hagoi, located 0.6 mile (mi) (1 kilometer [km]) inland from Unai Chulu, produced evidence clearly supporting the 3,400 year old date for early settlement of Tinian (Athens and Ward 1998). At an interval dated to approximately 3,500 years ago, the sediment core extracted from Lake Hagoi contained traces of charcoal and pollen from *Cocos nucifera*, which is interpreted as the earliest botanical evidence of human colonization.

#### *Early Settlement: Pre-Latte Period*

This period dates from the time of initial settlement to 1000 A.D. Moore (2002) subdivides the Pre-Latte Period into four phases based on pottery styles: Early Unai, Middle Unai, Late Unai, and Huyong. Archaeological sites dating to the Pre-Latte Period is limited to several coastal and few inland sites. Early Mariana Islands sites are usually in coastal calcareous sand deposits and typically contain small numbers of pottery sherds associated with midden remains. The midden remains consist mainly of bivalve shells. Site integrity is frequently badly compromised as a result of both natural shoreline processes reworking of the deposits and later human activities.

Due to poor site integrity, settlement pattern is difficult to ascertain. The basic settlement pattern appears to have been one of small population groups living along the sandy coasts, especially near coastal lagoons with easy access to marine resources (Graves and Moore 1985, in Tomonari-Tuggle et al. 2007). Caves and rock overhangs were used for shelter. Considering the great quantity of shellfish and reef fish remains found in coastal sites, it appears that subsistence practices for this early period focused on ocean resources, with an emphasis on exploitation of the shallow water, fringing reef, and lagoon areas. People

used a mixture of hunting, fishing and collecting activities (Reinman 1977, Kurashina and Clayshulte 1983, Hunter-Anderson 1989, Burtchard 1991, as cited in Tomonari-Tuggle et al. 2007).

Sites from early in this period, also known as the Early Unai Phase, include Unai Chulu on Tinian and the Achuagao and San Roque sites on Saipan. Excavations at the Unai Chulu site on Tinian have yielded the most substantial body of data for interpreting the Early Unai Phase. The excavations have produced evidence of an intensive occupation, including postholes and hearths with substantial amounts of habitation debris indicating cooking, food storage, and tool manufacturing. The food debris includes marine shell, fish bone, bird bone, and charred plant remains. As is true of most early settlements on Pacific Islands, exploitation of birds was particularly important. The site also produced flaked and ground stone items, and implements and ornaments of bone and shell. Fishing gear includes 87 shell fishhook tabs and one fishhook, with nearly 3,000 fish bones providing evidence of the results of the fishing activities (Haun et al. 1999, as cited in Tomonari-Tuggle et al. 2005).

Sites from the next period, the Middle Unai Phase, include Mochong on Rota, Laulau on Saipan, and Taga on Tinian. As in the Early Unai Phase, remains of settlement are mainly evidenced by midden scatters, hearths, and occasional postholes, primarily in coastal caves and rock shelters. The most common Middle Unai sites are subsurface cultural deposits along the coastlines but a few inland sites have also been located.

The Late Unai Phase is characterized by the presence of large thick-walled shallow pan-like ceramic vessels. Late Unai sites occur throughout coastal and inland areas of Guam, Rota, Tinian, and Saipan and include both surface and subsurface scatters of artifacts and midden in diverse settings. The Huyong Phase exhibits a continuation of large flat-bottomed pans but they decline in frequency as pots with rounded bases and slightly incurved rims become more common. Surface and subsurface scatters of pottery and midden have been reported in both coastal and inland settings of Guam, Rota, Tinian, and Saipan.

#### *Latte Period*

The Latte Period is distinguished from earlier periods by the presence of latte stone structures. The earliest latte structures date to 1000 A.D. and are accompanied by a change in pottery technology. During this period populations increased and settlements expanded into areas outside of the optimal coastal environments. Latte Period sites are more abundant than Pre-Latte sites on all of the Mariana Islands.

*Latte* are large upright pillars of limestone or more infrequently basalt each topped by a semi-hemispherical capstone. These pillars were placed in two parallel rows of even numbered uprights forming a single set. *Lattes* served as foundations for house and storage structures of varying size. Variation in the number and size of *latte* probably reflect differentiation in function, family size, and perhaps the status of the occupants. Burials are commonly associated with *latte* sets. Individuals were buried beneath the structure with the area demarcated by the pillars or adjacent to the structure. Residential material is also commonly found in excavation of *latte* sites.

*Latte* sites generally consist of clusters of up to 18 (although the Mochong site of Rota has at least 47 documented structures) individual structures forming hamlets or villages. They are most commonly found along the shorelines of all the major Mariana Islands. Marine resources, such as fish and shellfish provided the primary source of protein during this period. Shell middens contain gastropods or at earlier sites, bivalves. The difference in which type of shell in middens appears to relate to relative changes in sea levels that caused a reduction in mangrove forests that were bivalve habitat. Other resources exploited include bird, fruit bats, lizards, turtles, and land snails.

## Post-Contact Period

### *European Contact*

Latte sets continued to be built into the contact period (the period between Magellan's landing and full Spanish colonization). Spanish-introduced materials are found at sites dating to this period including iron, fragments of glass, bones of cattle, pig, sheep and deer, and remains of maize.

Breadfruit, yams, and taro were the staple crops during this time period. Bananas and sugarcane were also important. Rice was also part of the diet. Fishing, gardening and collecting were all important sources of food.

### *Spanish Period (1668-1899)*

In 1668 Catholic missionary activity was initiated on the northern Marianas. Opposition soon arose to the missionaries, which led to open revolt against the priests and Spanish troops. Sporadic conflicts continued until 1694, when, as a last measure, the inhabitants of all the islands were transported to either Saipan or Guam. Those who were initially moved to Saipan were moved to Guam in 1698. Tinian probably was depopulated by 1700. Only Rota maintained a small resident population throughout the period of *reduccion*.

The original Chamorro population in the Mariana Islands was estimated to be between 40,000 and 73,000. However, after two centuries of Spanish rule, including war, famine, and disease, that number was reduced to 600 in 1825 (Bowers 1950).

Tinian, once depopulated, was never again reoccupied by the Chamorro culture until after WWII. The Spanish used the island as a game preserve and sent regular expeditions there to hunt the feral pigs and cattle that ran wild after removal of the Chamorro population. In 1865, an Irishman leased Tinian and brought in 250 Carolinians from other Pacific Islands to hunt the cattle and pigs, collect trepans, also known as sea cucumbers which were highly prized in China, and raise fruits and vegetables for trade with Guam. The project was abandoned in 1878. This project had so depleted wild livestock on Tinian that hunting was prohibited for seven years. Then a group of 30 Chamorros were settled on the island to hunt the animals and to prepare the meat for shipment. Other Chamorros joined the group and a small village known as Taga developed near the harbor. The population at the end of the Spanish period was 95, of that 59 were Carolinians (Bowers 1950).

### *The Northern Marianas in the 20th Century*

Spain lost all its colonies in the Pacific at the conclusion of the Spanish-American War in 1899. The Mariana Islands, with the exception of Guam, were sold to Germany. The Germans saw the islands as an opportunity to pursue aggressive economic and commercial endeavors they had already begun in the Marshall Islands and later Palau.

Germany's primary interest in the Mariana Islands was the development of a cash based agricultural economy based on copra production. Coconut trees were planted on Saipan as well as the smaller islands. In 1905 two typhoons devastated the young coconut plantations. The Germans were convinced that their economic gamble had failed (Jones and Tomonari-Tuggle 1994, as cited in Tomonari-Tuggle et al. 2007). German authority over the islands was brief, ending in 1914.

A Japanese naval squadron seized control of Saipan in 1914, along with other German possessions in Micronesia. Saipan was placed under military jurisdiction and German nationals were expelled. The

League of Nations awarded Micronesia to Japan in 1921 with the stipulation that they not be fortified for military use.

The Japanese developed large-scale sugarcane production for trade on Saipan in 1922. Large tracts of lands were leased by the company and sublet to tenant farmers, most of whom were colonists from Japan, Okinawa, and Korea. Plantations were also developed on Tinian, Rota, and Aguijan. The pattern of Japanese occupation was best developed on Tinian. The island was divided into rectangular plots, 14.7 ac (6 ha) each that were leased by tenant farmers. The farm homes, constructed of wood and thatch or sheet metal, were destroyed during WWII but the ruins of cement cisterns and barns remain to mark the farm sites (Bowers 1950). Sugar cane fields occupied 68% of the arable land on Saipan, 80% on Tinian, and 33% on Rota. In 1944 the civilian population of Tinian was 17,900 with only 26 of those being Chamorro; most of the population was Japanese, Okinawan, or Korean.

Japanese war preparation brought further changes to Saipan, Tinian, and Rota. On Saipan, the sugar cane fields near Asurito were developed into an airfield, and two other airfields were quickly built at Marpi Point and on the coastal lowland between Chalan Konoa and Garapan. Two airfields were built on Tinian, and a third started. Around these fields, barracks and administrative buildings were built. Natives and imported labor were forced to work on Japanese military construction projects. The influx of Japanese troops brought housing pressures to the Northern Marianas. Native schools were closed and used to house Japanese troops.

WWII battles devastated large areas of Saipan and Tinian. In 1944 air strikes destroyed 150 Japanese planes in the battle for Saipan. From Saipan, United States (U.S.) forces began a bombardment of Tinian that ended with an invasion in July of 1944. Shortly thereafter, the construction of the Tinian airfields for the B-29 and supporting units began, one of the most intensive efforts in WWII. Tinian then served as a crucial locale for the bombing of Japan, culminating with the dropping of the A-bombs from planes based on Tinian that effectively ended the war. Figure 12.1-1 shows the Enola Gay during WWII.



**Figure 12.1-1. The Enola Gay at North Field, Tinian**

*Source: Mathewson 2000 (in Welch and Tuggle 2008).*

After WWII, the U.S. continued administration of the Northern Marianas under a mandate of the United Nations. When the Japanese nationals were removed in January and February of 1946, Tinian, Saipan, and Rota were all occupied by American military personnel. Intensive military construction took place on all three islands.

Several villages have been resettled or established in the Northern Marianas since WWII; one on Tinian, five on Saipan, and one on Rota; two smaller settlements were attempted on Alamagan, and one on Agrihan. San Jose, Tinian, was resettled in 1947 by Chamorro immigrants from Yap Island, who first occupied the former Chulu camp used for Japanese prisoners. Tinian's population in 1949 was only 354, after swelling to almost 150,000 American troops during the war. Songsong, Rota, had a continuous native population for three centuries, but the community was destroyed by WWII. However, native

inhabitants were eager to rebuild on the traditional site after the war and in 1950 it supported a population of about 680. In 1976, the Marianas signed an agreement with the U.S. and became the CNMI.

### 12.1.2 Tinian

Traditional resources such as plant species used by native populations include Ifit trees (*Intsia bijuga*) are used for timber, fuelwood, and craftwood. Dukduk (*Artocarpus mariannensis*) and da'ok (*Calophyllum inophyllum*) are used for canoe building, and their breadfruit are highly prized. Historically introduced chili peppers are also harvested locally, as are native yams.

The Military Lease Area (MLA) on the island of Tinian is divided in two sections, the Exclusive Military Use Area (EMUA) in the north and the Lease Back Area (LBA) in the central part of Tinian. Five limestone terraces that formed on an eroded Eocene volcanic base rise in steps from the coastline to maximum height of 554 feet (ft) (169 meters [m]) above mean sea level. The terraces form level to undulating plains bounded by steep cliffs that occur along fault lines. Sink holes and caves occur in the limestone where it is exposed. Please see Chapter 3 for a discussion on geology and soils.

The key feature is North Field, a large abandoned WWII-era airfield and NHL that is still usable as a contingency landing field. The EMUA has two small sandy beaches: Unai Chulu on the northwest coast and Unai Dankulo, also known as Long Beach, on the east coast.

Tinian's cultural resources include pre-contact Chamorro sites and many WWII-era sites and artifacts associated with the island's development by the Japanese and subsequent U.S. invasion and development. The House of Taga (Figure 12.1-2), with the largest erected *latte* stones in the Marianas, is in a park setting near Tinian Harbor. A large pre-*latte* complex is adjacent to Unai Chulu; other *latte* habitation sites with surface and subsurface deposits are found near Unai Babui, Unai Dankulo, and Tachogna Beach.



**Figure 12.1-2. House of Taga latte set**

Source: Welch and Tuggle 2008.

The following discussions involve the level of archaeological inventories in each area, the type and number of sites and structures eligible for inclusion on the NRHP, and the potential for finding NRHP-eligible or listed cultural resources in the impact areas.

#### 12.1.2.1 North

##### MLA

Forty cultural resources investigations have been conducted on the MLA on Tinian and include overviews and assessments, Phase I surveys, testing, and excavations, and an architectural survey of WWII resources (Welch and Tuggle 2008). The systematic recording of archaeological remains on Tinian is a process that dates to the 1980s. Since that time, archaeological surveys of varying intensities have covered the entire MLA, representing about 62% of the island. Over 16,000 ac (6,475 ha) of the MLA have been surveyed at a high intensity, by systematic ground surveys with detailed site recording. Testing and/or intensive

excavation have been part of six major studies. Extensive research in numerous archives in the U.S., Japan, and Micronesia, including reference to collections of historical maps and photographs, has supplemented the fieldwork. In addition, sites within the proposed locations of the training areas were resurveyed in 2008. Sites were re-recorded and excavations were conducted at Unai Chulu and Unai Dankulo (Tuggle et al. 2008). A summary of previous surveys can be found in Table 12.1-1.

The first surveys on Tinian Island occurred in the mid 1980s by American Resources Group, Ltd. They inventoried several relatively undisturbed parcels including areas landward of Unai Chulu and Babui on the west coast and Unai Dankulo and Masalok on the east coast (Moore et al. 1986). Additional site reviews and field data were collected in a number of historic preservation compliance studies including: Welch (1994), Welch and Tuggle (1998), Tuggle and Welch (1999), and Tuggle and Schilz (1999).

**Table 12.1-1. Previous Surveys on Tinian within the MLA**

<i>Date of Work</i>	<i>Reference</i>	<i>Type of Work</i>	<i>Location</i>
1980-84	Denfeld 1983**	Survey, historic overview	North Field
1982	Pangelinan 1982***	Survey	North Field
1984	Thompson 1984	Survey, NRHP nomination	North Field
1985	Jones 1991**	Historical architecture survey	MLA
1984-5	Moore et al. 1986	High intensity survey, with intensive testing	All beaches
1986	Donham 1986*	Survey, site recording	North end of North Field
1988	Haun 1988	Survey, site recording	North end of North Field
1989	Haun 1989*	Site recording	North end of North Field
1989	Haun and Donham 1989a*	Site recording	North end of North Field
1989	Haun and Donham 1989b*	Site recording	North end of North Field
1990	Haun et al. 1990	Survey, site recording	North end of North Field
1990-1	Dilli and Haun 1991*	Archival compilation	North Field
1992	Craib 1995	Low intensity survey	Unai Chiget, roadways
1994	Welch 1994**	Survey	Unai Chulu, Unai Dankulo
1994	Franklin and Haun 1995a**	Survey	Unai Dankulo
1994	Franklin and Haun 1995b*	Data recovery	Road corridor (8 <sup>th</sup> Ave.)
1994	Craib 1999**	Low intensity survey (sample survey with sketch mapping); limited testing	Unai Dankulo
1994	Bouthillier 1999*	Historic architecture survey	Unai Chiget, Unai, Chulu, Unai, Babui, Unai, Dankulo, Unai, Masalok
1994-5	Haun et al. 1999*	High intensity survey; intensive testing	Unai Chiget, Unai, Chulu, Unai, Babui, Unai, Lamlam
1994	Henry and Haun 1995**	Testing	Unai Chulu
1995	Bouthillier 1998	Recording historic period sites	EMUA
1995	Putzi et al. 1997*	High intensity survey	IBB
1996	Welch and Tuggle 1998	Site specific assessment	Tinian MLA
1994-96	Tuggle and Welch 1999	Site protection plan, selected site mapping	Tinian MLA
1997	Moore et al. 2002*	High intensity survey, limited testing	IBB
1997-98	Tuggle and Schilz 1999	Cultural Resources Management Plan	Tinian MLA
1998-99	Dixon et al. 2000*	Survey	IBB
1999	Dixon and Welch 2002*	High intensity survey	Tinian Int'l Airport
1999-2000	Allen et al. 2000* Allen and Nees 2001**	High intensity survey; testing and/or data recovery	Unai Masalok, Unai, Dankulo



Date of Work	Reference	Type of Work	Location
	Allen et al. 2002**		
1999-2000	Gosser et al. 2001** Gosser et al. 2002	High intensity survey; testing and/or data recovery	LBA
2000	Denfeld 2000*	WWII camps	Tinian MLA
2008	Tuggle 2009	High intensity survey, testing	Tinian MLA
2008	Griffin et al. 2009	Traditional Cultural Properties	Tinian MLA
2009	EDAW and AECOM 2009	Cultural Landscape Report	North Field NHL

Legend: IBB= International Broadcasting Bureau

Notes: \*as cited in Tomonari-Tuggle et al. 2005

\*\*As cited in Tomonari-Tuggle et al. 2007

\*\*\*As cited in Welch and Tuggle 2008

The North Field NHL (Figure 12.1-3) is also located on the northwest portion of Tinian. It was designated as a National Historic Landmark by the NPS in 1987. The area has a B-29 airbase with four runways and includes the sites used to assemble and load the two atomic bombs used to end the war. The two bomb loading pits, many former Japanese military structures, coastal gun emplacements, and unit memorial plaques are some of the features in the Landmark District. The atomic bombs being developed at Los Alamos were too large and did not fit beneath the plane, especially *Fat Boy*, so had to be conventionally loaded into the B-29s. Experiments at Wendover Field, Utah explored different ways of loading the bombs, including tipping the plane on its side. The scientists and military advisors realized that a better method would be to lift the bomb into the bay of the plane, resulting in a pit that was designed and constructed at Wendover during the test program. Two similar pits were later constructed on Tinian. The pits were 10-ft (3-m) wide, 8-ft (5-m) deep and concrete lined with a hydraulic lift installed in the center of the bottom.



Figure 12.1-3. Tinian, North Field 1945

Cultural resources in the LBA were identified in a series of surveys and motivated the Navy to implement various measures, such as a Memorandum of Agreement signed in 1994 prior to a large training exercise. To supplement these agreements, the Navy also developed an interpretive program and trail for north Tinian. The purpose is to inform the public of Tinian's cultural and natural resources and to instill an ethic that emphasizes preservation and protection.

Surveys on Tinian for the Joint Buildup Environmental Impact Statement (EIS) were completed in 2008 (Tuggle 2009). Over 150 archaeological sites were re-recorded during the survey. Excavations were also conducted at Unai Chulu and Unai Dangkulo.

Tuggle (2009) defined a total of 160 NRHP-eligible site complexes in the MLA. Tuggle's site complexes are based largely on historic features rather than prehistoric artifact distributions. Thus, many of the historic site complexes defined below have a prehistoric component. Thirty-nine of Tuggle's (2009) site complexes are Japanese agricultural features (sometimes with associated structures). Forty-six of Tuggle's site complexes are associated with U.S. Military activities, including North Field. Seventeen of the site complexes defined by Tuggle are associated with Japanese military activities (mostly Japanese defensive structures). Thirteen site complexes are associated with a railroad berm. Twelve sites are pre-contact sites; some have *latte* stones. Eleven of the sites are roadways.

Other site types include a quarry/dump, a butchering facility, a sugarcane factory, a shrine, quarries, cemeteries, villages, and a well.

Prior to Tuggle's (2009) survey, a total of 310 NRHP-eligible sites were defined in the MLA. Eighty-four of these sites are Japanese agricultural features (sometimes with associated structures). Fifty-two of these sites are associated with U.S. Military activities. Seventy-one of these sites are associated with Japanese military activities (mostly Japanese defensive structures). Five sites are associated with a railroad berm. Fifty-nine sites are pre-Contact sites; some have *latte* stones. Five of the sites are roadways. Other site types include cisterns, artifact scatters, shrines, dumps, airplane wrecks, land boundary markers, and refuse pits/scatters.

An offshore survey was conducted near Unai Dankulo and Unai Chulu in 2008 (Griffin et al. 2008). No underwater resources were encountered during the survey at Unai Dankulo, but eight anomalies suggestive of cultural resources were encountered near Unai Chulu (Burns 2008). These anomalies are considered significant as Chulu was the primary U.S. invasion beach during WWII.

A traditional cultural property study was conducted on Tinian in 2008. The study identified 13 traditional cultural properties: Puntan Tahgong, Lamlam, Babui, Chulu, Sabanetan Famalaoan, Lasso Shrine, 86<sup>th</sup> Street Shrine, Chiget, Asahi Shrine, NKK Shrine, Dankulo, a petroglyph site, and Masalok.

In 2009, EDAW and AECOM began the documentation and resource assessment of North Field NHL for a Cultural Landscape Report. The purpose of the Cultural Landscape Report was to identify character-defining features of North Field and to provide a treatment plan for management of the cultural landscape. This report would be completed before the Final EIS.

#### *IBB Facility*

The IBB Facility is located on the western coast of Tinian between the EMUA and the LBA. The IBB is a part of the international broadcasting service of the U.S. Information Agency. The IBB provides radio and television broadcasts on news events and entertaining programming on the arts, business, science, government, medicine, and current affairs to a vast audience of citizens of other countries. Construction of the Mariana Relay Station started in 1997. According to a progress report prepared after construction of the complex began, construction of the facilities was scheduled to be completed in 1998 and scheduled broadcasting would begin in 1999.

The IBB Mariana Relay Station consists of an antenna array and operations area (Figure 12.1-4). The antenna array includes eight pairs of high frequency curtain antenna. Each antenna comprises of two vertical steel towers up to 400 ft (122 m) tall. A curtain of horizontal and vertical cables is hung between the towers that are between 150



**Figure 12.1-4. Antenna Array of Mariana Relay Station**

Source: Thursbv 2008.

to 400 ft (46 to 122 m) apart (U.S. Army Corps of Engineers [USACE] 1995). The operations area includes a transmitter and administration building, a maintenance and storage building, a power plant, fuel storage tanks, and a security gatehouse. The buildings are one-story with concrete slab foundations, steel siding, and shallow-pitched roofs. Given its recent age, the IBB Mariana Relay Station on Tinian is not eligible for inclusion in the NRHP (Thursby 2008).

Initial archaeological surveys of three alternative IBB station sites (Areas A, B, and C) in the MLA were conducted in 1995 and consisted of only small surveys within each area (Eblé et al. 1997). The portion of Area A was selected as the location of the relay station and subsequently received more intensive surveying in 1995, followed by additional survey and data recovery activities in 1997 (Moore et al. 2002, as cited in Tomonari-Tuggle et al. 2005) and in 1999 (Dixon et al. 2000, as cited in Tomonari-Tuggle et al. 2005). Approximately 60% of the IBB parcel has been surveyed (Welch and Tuggle 2008).

Nineteen NRHP-eligible archaeological sites have been documented in the IBB site. They include *latte* sites, WWII U.S. military and Japanese fortifications, and Japanese Colonial Period farms.

#### 12.1.2.2 South

The southern portion of Tinian is outside of the MLA and has therefore seen fewer studies. Resources recorded in south Tinian include the House of Taga *latte* site and the Carolinas Rock Shelter.

An architectural survey and archival study was also conducted of Tinian Harbor. Tinian Harbor is more than one-half of a mile long and nearly one-fourth of a mile wide. It consists of a shallow inner basin and a 28 ft (8.5 m) deep outer basin, both were formed between the shore and a breakwater that protects the harbor. The 3,595 ft (1096 m) long cellular, sheet-pile breakwater was built on top of a fringe reef. An unreinforced concrete slab covered the top of the cells that have limestone coral fill. A 1,210 ft (369 m) long single row of sheet piling extends from the northwest end of the cellular breakwater to the shore, enclosing the inner harbor.

After the capture of Tinian from the Japanese in early August 1944, the U.S. forces developed nearly the entire island into a base for the very long range aircraft, the B-29 Superfortress. Tinian; however, lacked a suitable harbor to handle cargo ships for offloading the men, equipment, and materials. Between November 1944 and March 1945, the 50th Naval Construction Battalion (Seabees) and the 301st Battalion built Tinian Harbor with permanent anchorages to accommodate berths for eight cargo ships.

Tinian Harbor is eligible for inclusion on the NRHP (Figure 12.1-5). The harbor is eligible for its vital role in the development of the B-29 air base on Tinian for the atomic bombing mission near the end of WWII, and for embodying the design and construction methods of the Navy Seabees during WWII (Thursby 2008). As a



**Figure 12.1-5. Tinian Harbor, East Quay, Looking Southwest**

whole, the harbor structures retain their integrity, although major portions of several of the individual structures are in poor condition and some material integrity has been degraded.

## 12.2 ENVIRONMENTAL CONSEQUENCES

### 12.2.1 Approach to Analysis

#### 12.2.1.1 Methodology

The methodology for identifying, evaluating, and mitigating impacts to cultural resources has been established through federal laws and regulations including the NHPA and the Archaeological Resource Protection Act.

A significant resource is a cultural resource for or listed on the NRHP. A project affects a significant resource when it alters the resource's characteristics, including relevant features of its environment or use that qualify it as significant according to NRHP criteria. Adverse effects may include the following: physical destruction, damage, or alteration of all or part of the resources; alteration of the character of the surrounding environment that contributes to the resource's qualifications for the NRHP; introduction of visual, audible, or atmospheric elements that are out of character with the resource; neglect of the resource resulting in its deterioration or destruction; and transfer, lease, or sale of the property without adequate and legally enforceable restrictions or conditions to ensure long term preservation of the property's historic significance (36 CFR 800.5(a)(2)).

Analysis of potential impacts to cultural resources considers both direct and indirect impacts. Direct impacts are those that may occur during the construction phase of the project. They may be the result of increased noise or ground disturbing activities involving construction, modification, or the use and maintenance of facilities. Indirect impacts are those that may occur as a result of the completed project such as increased vehicular or pedestrian traffic in the vicinity of the resource that may lead to vandalism or increased erosion. Vandalism is considered to be a significant impact because it damages the integrity of the site, which is the major determinant of NRHP-eligibility. The evidence they left in archaeological sites is finite and cannot renew itself once it has been disturbed. For this reason, federal activities that open areas up to the public or that involve personnel traveling through an area may have an adverse effect if vandalism to NRHP-eligible or listed resources in the vicinity occurs. . If a site is eligible to the NRHP primarily for its setting or location, changes to the visual setting are considered a significant impact. Cumulative impacts, the impact on cultural resources which result from the incremental impact of the action when added to other past, present, and future actions must also be taken into account.

#### 12.2.1.2 Determination of Significance

A historic property is a property that is eligible for or listed on the NRHP. For cultural resources a significant adverse impact is one that disturbs the integrity of a historic property. If a project disturbs the characteristics that make the property eligible for or listed on the NRHP, then it is also considered to be a significant adverse impact.

The ICRMP for Navy property on Tinian has established Standard Operating Procedures for protecting known NRHP-eligible or listed cultural resources; procedures for managing the inadvertent discovery of archaeological resources, inadvertent discovery of human remains, inadvertent disturbance to historic properties; and for distributing permits for archaeological investigations (Tomonari-Tuggle et al. 2005). These protective measures would continue to be implemented under any of the alternatives.

Agreements on limitations in training have also been made as part of the Mariana Islands Training Range Complex (MIRC) EIS/Overseas Environmental Impact Statement (OEIS) Programmatic Agreement (PA) (Navy 2009). The PA (Navy 2009) contains the following provisions.

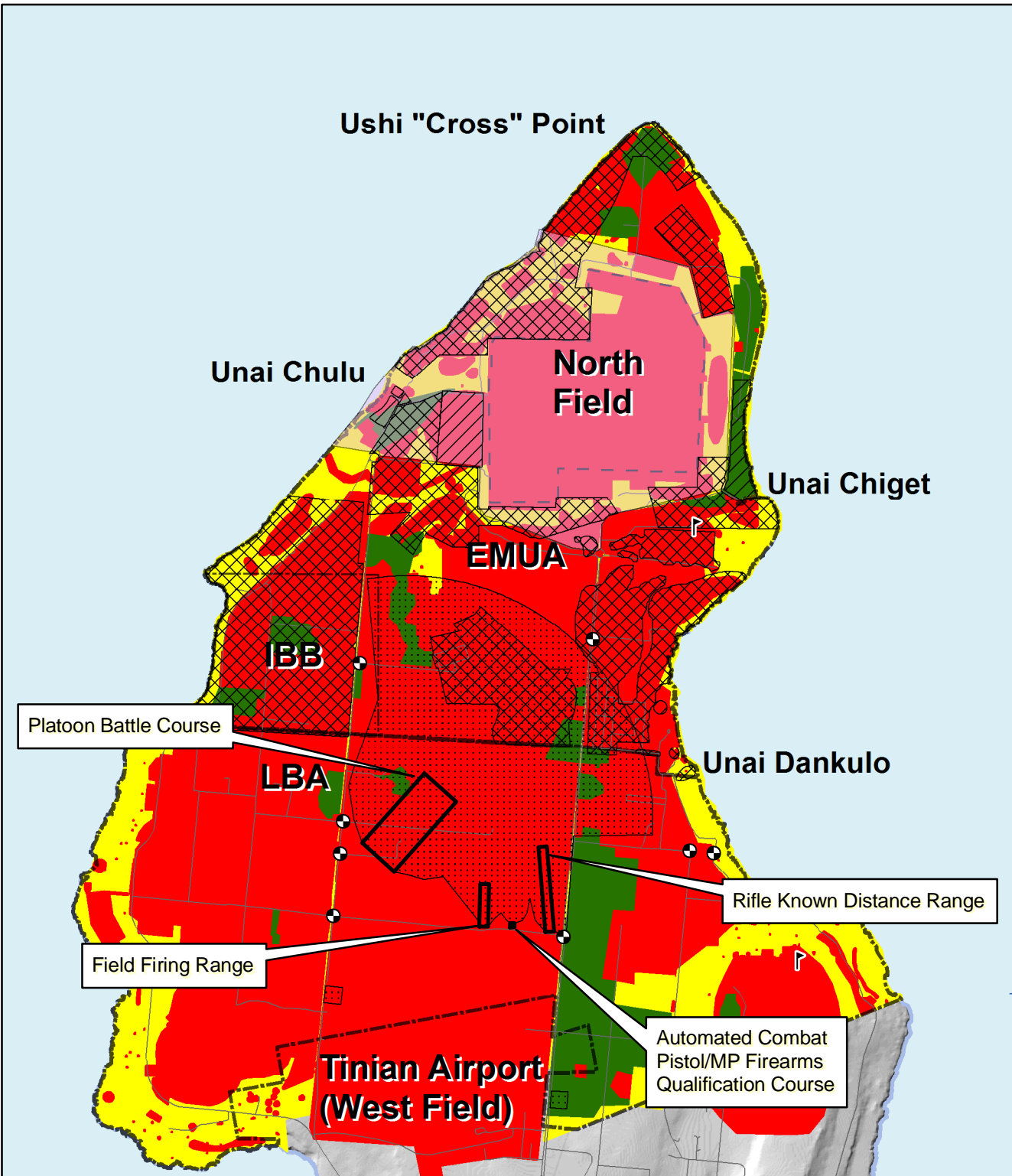
- Establishes the qualifications necessary for professionals performing the work
- Developed training constraints maps that show the locations of off limits or No Training areas and Limited Training areas
  - No Training areas are to be avoided, and no training exercises would occur within these areas
  - Limited Training areas are primarily designated as pedestrian traffic areas with vehicular access limited to designated roadways and/or the use of rubber tired vehicles
- Establishes the procedures for updating and disseminating training constraints maps and identifies quarterly site checks and reporting
- Identifies the procedures for the protection of resources and monitoring of military activities at Unai Chulu, Unai Dankulo, and Unai Masalok
- Identifies the procedures for activities associated with the Tinian (North Field) NHL
  - ongoing survey and evaluation to assess cumulative effects of training to the NHL
  - production of an annual report to the HPO and NPS

Training constraints on Tinian are included on Figure 12.2-1.

As part of the Section 106 consultation process for this EIS/OEIS, a PA for all military training activities, construction, and operations proposed under the proposed action that includes additional mitigation measures and procedures is being prepared. Current signatories to this PA are: the Department of Defense (DoD) (Joint Region Marianas; DoD Representative Guam, the CNMI, Federated States of Micronesia, and Republic of Palau; the Marine Corps; Navy; Army; Air Force), other federal agencies (U.S. Environmental Protection Agency [USEPA], Advisory Council for Historic Preservation, the NPS), and local government agencies (Guam HPO, CNMI HPO). The signed PA would be incorporated into the Final EIS. Stipulations in the PA include the following:

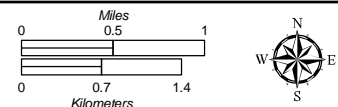
- DoD would ensure that the identification and evaluation of historic properties within the APE for the project is completed prior to the initiation of any part of the project with the potential to impact historic properties.
- For areas or properties that have not been inventoried for historic properties, the DoD would record surface sites and, when possible, areas would also be archaeologically sampled for subsurface sites when easily obtainable (i.e., without having to demolish existing facilities or infrastructure).
- Archaeological probability maps have been generated for all current DoD land on the Island of Tinian. For all other areas and islands impacted by the project, archaeological probability maps would be generated that predict the probability of encountering subsurface cultural resources in three categories (no/low, medium, and high). These maps would be compiled using previous archaeological investigations, historic maps, interviews, and ethnohistoric accounts, and in consultation with the HPOs and the NPS.

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Legend		Archaeological Probability Areas
	National Landmark	High
	Limited Training No Cultural Resource Disturbance	Medium
	No Training Off Limits Area	Low
	Pyrotechnics and Fires Permitted on Pavement	
	Range Control Points	<i>Sources: Tuggle 2009, Welch and Tuggle 2008</i>
	Range Observation Points	
	EMUA/LBA/IBB Boundary	
	Proposed Project Footprint	

**Figure 12.2-1**  
Alternative 1 Proposed Ranges and Archaeological Probability Areas



- **No to Low Probability Areas:** These areas contain no surface sites and include reclaimed fill lands or heavily disturbed areas. No to low probability areas are also areas that have been previously tested and were found not to contain subsurface resources and are areas not likely to contain subsurface materials based on known social practices or history of the area.
- **Medium Probability Areas:** These areas have not been surveyed and may have the potential to contain sites (surface and/or subsurface), or are areas that contain no surface sites but have the potential to encounter subsurface historic resources based on known social practices or history of the area.
- **High Probability Areas:** These areas contain known surface and/or subsurface sites or are areas where old maps, documents, or legends indicate former villages, towns, or other types of activity areas.
- Any properties not evaluated shall be assessed for NRHP eligibility. These historic properties would be incorporated into existing (ICRMPs) as they are revised or updated or if a new ICRMP is developed in consultation with the appropriate HPOs.

Any updates to the existing Geographical Information System cultural resource layers, such as shape files showing the locations of known archaeological sites and historic buildings and structures, would be shared with the appropriate HPO or NPS (if a property is associated with an NHL) in accordance with 36 CFR 800.11(c). The HPOs and the NPS recognize that these layers may contain sensitive information and shall not disseminate or make them available to the public without obtaining permission of the appropriate cultural resource manager whose jurisdiction that historic property is under. Maps of all areas with archaeological potential and sensitivity for the presence of NRHP-eligible or listed architectural and traditional resources would be appended to the PA. No further review under Section 106 is required for areas designated as no to low probability areas except in the case of unexpected discoveries. Mitigation measures for medium and high probability areas would be stipulated as follows:

- For high probability areas, sites would be avoided if possible. If sites are impacted, a mitigation plan would be developed and reviewed by the appropriate HPO and then data recovery excavations would take place.
- Medium probability areas would be subject to monitoring or testing. Prior to any disturbance or excavation, work plans would be developed and reviewed by the appropriate HPO.

In recognition of the significance that many historic properties within the APE of the Joint Guam/CNMI Build Up has to various cultural and historic groups, the DoD would afford access to historic sites to individuals and organizations that attach significance to these historic properties where security requirements are not prohibitive. The PA also provides stipulations for treatment in case of unexpected discoveries, the review process, and report requirements. The Cultural Landscape Report for the North Field NHL (EDAW and AECOM 2009) would contain additional long-term treatment procedures that would accommodate military training, public education and access, and preservation of the NHL.

#### 12.2.1.3 Issues Identified During Public Scoping Process

The following analysis focuses on possible effects to cultural resources-archaeological, architectural, and traditional cultural properties that could be impacted by the proposal. As part of the analysis, concerns related to cultural resources that were mentioned by the public, including regulatory stakeholders, during the public scoping meetings were addressed. A general account of these comments includes the following:

- Access to cultural sites and natural resource collection areas
- Construction impacts to cultural resources, tourism, and use of public roads
- Thorough and adequate data collection
- Public participation in the planning process relating to cultural resources

### 12.2.2 Alternative 1 (Preferred Alternative)

Alternative 1 differs from the Alternatives 2 and 3 by dispersing the four firing ranges in the south-central MLA.

#### 12.2.2.1 Tinian

##### Construction

None of the impact areas are located within areas already designated as no training or light training areas. The Field Firing Range project construction (target area) would take place in an area of high archaeological probability (see Figure 12.2-1). Ground excavation and soil removal have the potential to adversely impact archaeological resources known in the project area, including site 5007 (Japanese fields, U.S. livestock reserves) and would impact a total of 25 ac (10 ha). The Rifle Known Distance (KD) Range project construction would take place in an area of high archaeological probability and would impact a total of 22 ac (9 ha). Ground excavation and soil removal would adversely affect site 5022, TN0030 (U.S. West Field and remnant features in a small portion of the larger site), TN0619 (U.S. Fuel Farm remains), and TN0606 (Service Corps 87, 25).

The Automated Combat Pistol/Multipurpose Firearms Qualification Course project construction would take place in an area of high archaeological probability and would impact 0.6 ac (0.2 ha). Ground excavation and soil removal would impact site TN0606 (Service Corps 87, 25).

The Platoon Battle Course project construction would take place in an area of high, medium, and low archaeological probability and would impact 178 ac (72 ha). Ground excavation and soil removal would impact site TN0002 (U.S. Camp Churo Cemetery), TN0034 (Japanese, Churo Village), 5007B (Japanese fields and structures), 5011 (Japanese railroad berm), 5009 (Japanese fields and structures), and 5012 (Japanese rockshelters).

The bivouac areas would impact site TN0030 (West Field) as Marines would be camping and using these areas for training purposes.

A perimeter road and parking facilities would be constructed near the proposed range footprints. Construction associated with these facilities is likely to adversely impact NRHP-eligible or listed cultural resources.

##### Operation

Operational activities (training and non-training related) associated with the Field Firing Range, the Rifle KD range, the Automated Combat Pistol/Multipurpose Firearms Qualification Course, and the Platoon Battle Course, including bivouac activities, would bring approximately 400 personnel into the area. This increase in personnel in the area could increase site vandalism, although vandalism of sites is an ongoing occurrence in the area even without training personnel present. Disturbance to NRHP-eligible or listed resources indirectly through increasing access to the sites is considered to be an adverse impact.

The Surface Danger Zones (SDZs) overlap light training/No Cultural Resource Disturbance areas. In addition, 55 sites and one traditional cultural property (Lasso Shrine) are located in the SDZs under Alternative 1. The sites include U.S. military sites, prehistoric sites, shrines, Japanese fields and



structures. Direct impacts within the SDZs are unlikely since it is estimated that only 1 in 10,000 rounds would fall outside of the target impact area. This area would not be cleaned up, and impacts due to munitions cleanup activities would not occur.

In addition, some military training exercises would result in temporary, short-term restriction of access in the training area by civilians during activities in which public safety is a consideration. Potentially, denial of access would occur north of the existing Tinian Airport (West Field) and south of the Shinto Shrine American Memorial Circle on Broadway including all lands to the east, and east of 8th Avenue north of the Airport and south of Unai Chulu. This restricted access would include restricting access to certain beaches, and the blowhole which are located within the SDZs, plus *lanchos* used by local farmers. However, access to North Field NHL would still be able to occur during training activities. Training periods would be scheduled in advance with signs posted and published on a regular basis. To facilitate range safety, ground access would be controlled through gates at existing roads. This would safeguard the public by keeping them out of any areas where there are potential dangers while simultaneously maintaining access to areas where training is not being conducted. This would ensure access to the NHL, northern beaches, and the IBB via 8<sup>th</sup> Avenue. Broadway would be closed during training. However, the public can travel up 8<sup>th</sup> Avenue and check in with personnel manning the first access gate. Once cleared by range control, they can proceed up 8<sup>th</sup> Avenue, checking in with each successive guard point until clear of the training area. Therefore, access restrictions associated with Alternative 1 would be less than significant.

#### 12.2.2.2 Summary of Alternative 1 Impacts

Alternative 1 would result in significant direct impacts to 10 NRHP-eligible or listed archaeological sites and indirect impacts to 55 archaeological sites, one NHL, and one traditional cultural property. Table 12.2-1 summarizes Alternative 1 impacts.

**Table 12.2-1. Summary of Alternative 1 Specific Impacts**

<i>Area</i>	<i>Impacts</i>	<i>Project Specific Impacts</i>
Tinian	Construction	Direct and indirect impacts to ten archaeological sites and medium probability areas
	Operation	Indirect impacts to 55 archaeological sites, one NHL, and one traditional cultural property

#### 12.2.2.3 Alternative 1 Potential Mitigation Measures

Alternative 1 would result in significant direct impacts to ten NRHP-eligible or listed archaeological sites and indirect impacts to 55 archaeological sites, one NHL, and one traditional cultural property. However, these impacts are mitigable to less than significant levels through the implementation of the mitigation measures described below.

The range layouts were sited to avoid impacting the majority of historic properties on the island. Another attempt to design around the specific sites would be made as plans progress. Direct impacts to archaeological sites in and around the firing range projects (TN0002, 5007, 5012, 5011, 5009, TN0619, 5022, TN0606, TN0034, TN0030) would be avoided or data recovery would take place. Medium probability areas would be monitored during construction activities. Operational impacts would be mitigated through training of personnel working in the area to avoid impacts to archaeological sites.

Access restriction would be temporary, occurring for approximately 16 weeks per year. In recognition of the significance that many historic properties within the footprint of SDZ has to various cultural and historic groups and tourism, the DoD would generally look favorably on affording access to historic sites

to individuals and organizations that attach significance to these historic properties where security requirements are not prohibitive. However, some access restrictions would be necessary because of public safety. Mitigation to reduce the adverse impact would include public educational materials and displays about the NHL and the history of Tinian.

### **12.2.3 Alternative 2**

Alternative 2 differs from Alternatives 1 and 3 by locating the SDZ for the Automatic Field Firing Range partially over Unai Dankulo and the ocean.

#### **12.2.3.1 Tinian**

##### Construction

The Platoon Battle Course project construction would take place in an area of high and medium archaeological probability (Figure 12.2-2). Ground excavation and soil removal would impact site TN0002 (U.S., Camp Churo cemetery), 5007 (Japanese fields and structures), TN0034 (Japanese, Churo Village), 5009 (Japanese, farmstead), and 5021 (Japanese, farmstead).

The Rifle KD range project construction would take place in an area of high archaeological probability and would impact site 5021 (Japanese fields; U.S. livestock reserve). The Automated Combat Pistol/Multipurpose Firearms Qualification Course project construction would take place in an area of high archaeological probability and would impact site TN0606 (Service Corps 87, 25).

The Field Firing Range project construction would take place in an area medium archaeological probability. The bivouac areas would impact site TN0030 (West Field) as Marines would be camping and using these areas for training purposes.

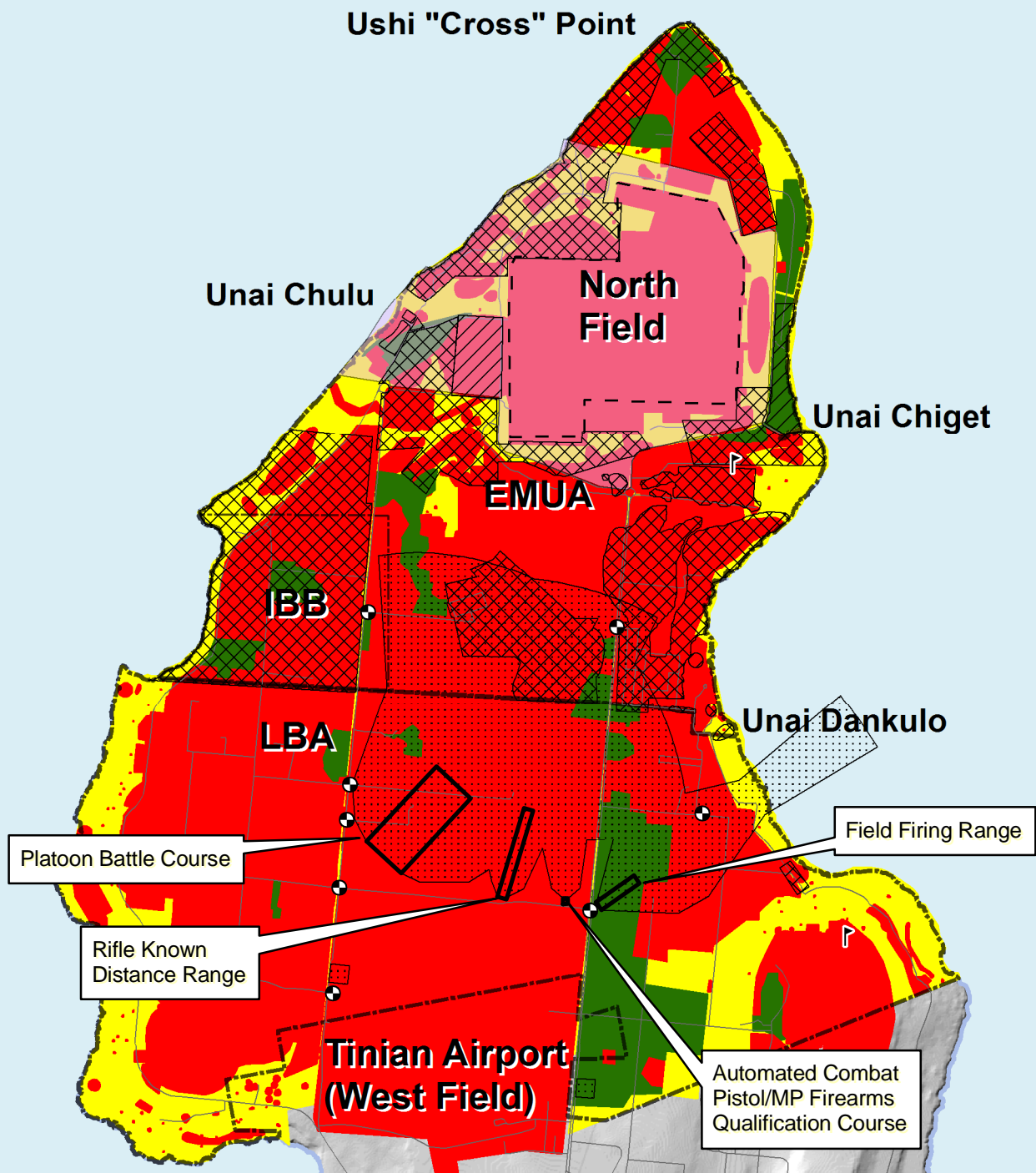
A perimeter road and parking facilities would be constructed near the proposed range footprints. Construction associated with these facilities is likely to adversely impact NRHP-eligible or listed cultural resources.

##### Operation

Operational activities (training and non-training related) associated with the Field Firing Range, the Rifle KD range, the Automated Combat Pistol/Multipurpose Firearms Qualification Course, and the Platoon Battle Course, including bivouac activities, would bring approximately 400 personnel into the area. This increase in personnel in the area could increase site vandalism, although vandalism of sites is an ongoing occurrence in the area even without training personnel present. Disturbance to NRHP-eligible or listed resources indirectly through increasing access to the sites is considered to be a significant adverse effect.

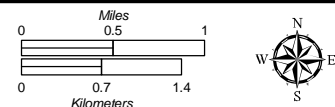
The SDZs overlap light training/No Cultural Resource Disturbance areas. In addition, 52 archaeological sites are located in the SDZs for Alternative 2. These sites include U.S. military sites, prehistoric sites, and Japanese fields and structures. Three traditional cultural properties are located in the SDZ, the Dankulo complex, a petroglyph site, and the Lasso Shrine. Direct impacts within the SDZs are unlikely since it is estimated that only 1 in 10,000 rounds would fall outside of the target impact area. This area would not be cleaned up, and impacts due to munitions cleanup activities would not occur.

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Legend		Archaeological Probability Areas
National Landmark	Range Control Points	High
Limited Training No Cultural Resource Disturbance	Range Observation Points	Medium
No Training Off Limits Area	EMUA/LBA/IBB Boundary	Low
Pyrotechnics and Fires Permitted on Pavement	Proposed Project Footprint	<i>Sources: Tuggle 2009, Welch and Tuggle 2008</i>

**Figure 12.2-2**  
Alternative 2 Proposed Ranges and Archaeological Probability Areas



In addition, some military training exercises would result in temporary, short-term restriction of access in the training area by civilians during activities in which public safety is a consideration. Training periods would be scheduled in advance with signs posted and published on a regular basis. To facilitate range safety, ground access would be controlled through gates at existing roads. This would safeguard the public by keeping them out of any areas where there are potential dangers while simultaneously maintaining access to areas where training is not being conducted. This would ensure access to National Historic Landmark, northern beaches, and the IBB via 8<sup>th</sup> Avenue. Broadway would be closed during training. However, the public can travel up 8<sup>th</sup> Avenue, check in with personnel manning the first access gate. Once cleared by range control, they can proceed up 8<sup>th</sup> Avenue and checking in with each successive guard point until clear of the training area. Therefore access restrictions would be less than significant.

#### 12.2.3.2 Summary of Alternative 2 Impacts

Therefore, Alternative 2 would result in significant direct impacts to seven NRHP-eligible or listed archaeological sites and indirect impacts to 52 archaeological sites, one NHL, and three traditional cultural properties. However, with implementation of the potential mitigation measures listed below, these impacts would be resolved through consultation to less than significant levels. Table 12.2-2 summarizes Alternative 2 impacts.

**Table 12.2-2. Summary of Alternative 2 Specific Impacts**

<i>Area</i>	<i>Impacts</i>	<i>Project Specific Impacts</i>
Tinian	Construction	Direct and indirect impacts to seven archaeological sites and medium probability areas
	Operation	Indirect impacts to 52 archaeological sites, one NHL, and three traditional cultural properties

#### 12.2.3.3 Alternative 2 Potential Mitigation Measures

The range layouts were sited to avoid impacting the majority of the historic properties on the island. Another attempt to design around the specific sites would be made as plans progress. Direct impacts to archaeological sites in and around the firing ranges (TN0002, TN0030, 5007, 5009, 5021, TN0606, TN0034) would be avoided or data recovery would take place in accordance with the PA for this action. A Ground Penetrating Radar study of the former Churo Camp Cemetery would be conducted prior to range construction. Medium probability areas would be monitored during construction activities. Operational impacts would be mitigated through training of personnel working in the area to avoid impacts to archaeological sites.

Access restriction would be temporary, occurring for approximately 16 weeks per year. The PA stipulates the DoD would generally look favorably on affording access to historic sites to individuals and organizations that attach significance to these historic properties where security requirements are not prohibitive. However, some access restrictions would be necessary because of public safety. Mitigation to reduce the adverse impact would include public educational materials and displays about the NHL and the history of Tinian.

### 12.2.4 Alternative 3

Alternative 3 differs from Alternatives 1 and 2 by the location of the Automatic Field Firing Range, the Automated Combat Pistol/Multipurpose Firearms Qualification Course, and the Rifle KD Range to the south.

#### 12.2.4.1 Tinian

##### Construction

The Platoon Battle Course project construction would take place in an area of high and medium archaeological probability and would adversely affect site TN00234 (Japanese Churo Village), TN0002 (U.S., Camp Churo cemetery), 5007 (Japanese fields and structures), 5021 (Japanese farmstead), and 5009 (Japanese farmstead) (Figure 12.2-3). The Rifle KD Range project construction would take place in an area of high archaeological probability and impact site TN0030 (West Field). The Automated Combat Pistol/Multipurpose Firearms Qualification Course project construction would adversely affect site TN0030 (West Field).

The Field Firing Range project construction would take place in an area of high archaeological probability. Ground excavation and soil removal have the potential to adversely affect archaeological resources known in the project area including site TN0030 (West Field). The bivouac areas would impact site TN0030 (West Field) as Marines would be camping and using these areas for training purposes.

A perimeter road and parking facilities would be constructed near the proposed range footprints. Construction associated with these facilities is likely to adversely impact NRHP-eligible or listed cultural resources.

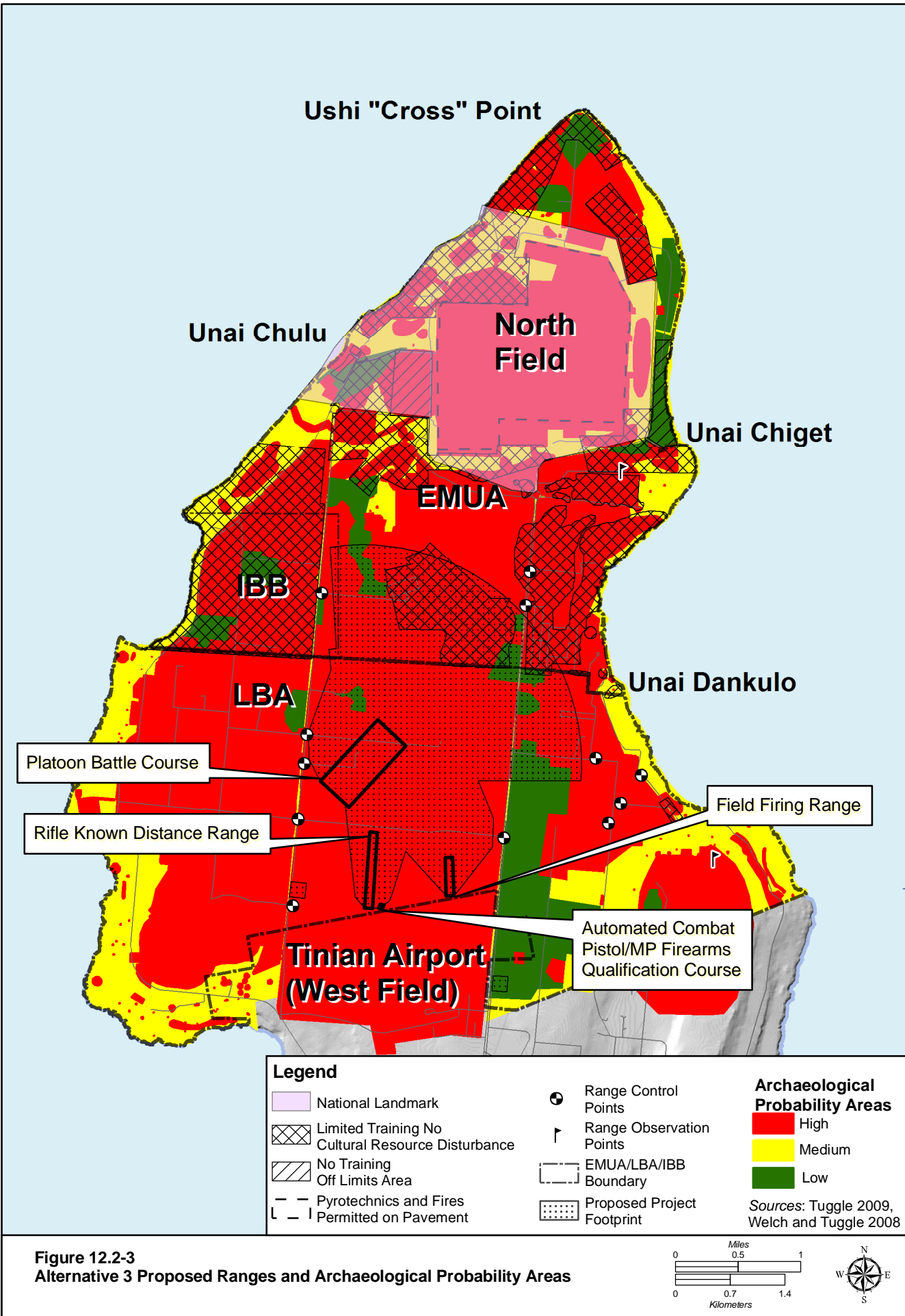
##### Operation

Operational activities (training and non-training related) associated with the Field Firing Range, the Rifle KD range, the Automated Combat Pistol/Multipurpose Firearms Qualification Course, and the Platoon Battle Course, including bivouac activities, would bring approximately 400 personnel into the area. This increase in personnel in the area could increase site vandalism, although vandalism of sites is an ongoing occurrence in the area even without training personnel present. Disturbance to NRHP-eligible or listed resources indirectly through increasing access to the sites is considered to be a significant adverse effect.

The SDZs overlap light training/No Cultural Resource Disturbance areas. In addition, 55 archaeological sites are located in the SDZs for Alternative 3. These sites include U.S. military sites, prehistoric sites, and Japanese fields and structures. Two traditional cultural properties are located in the SDZ, the Lasso Shrine and the 86<sup>th</sup> Street Shrine. Direct impacts within the SDZs are unlikely since it is estimated that only 1 in 10,000 rounds would fall outside of the target impact area. This area would not be cleaned up, and impacts due to munitions cleanup activities would not occur.

In addition, some military training exercises would result in temporary, short-term restriction of access in the training area by civilians during activities in which public safety is a consideration. Training periods would be scheduled in advance with signs posted and published on a regular basis. To facilitate range safety, ground access would be controlled through gates at existing roads. This would safeguard the public by keeping them out of any areas where there are potential dangers while simultaneously maintaining access to areas where training is not being conducted. This would ensure access to NHL, northern beaches, and the IBB via 8th Avenue. Broadway would be closed during training. However, the public can travel up 8th Avenue and check in with personnel manning the first access gate. Once cleared by range control, they can proceed up 8th Avenue, checking in with each

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successive guard point until clear of the training area. Therefore access restrictions would be less than significant.

#### 12.2.4.2 Summary of Alternative 3 Impacts

Alternative 3 would result in significant direct impacts to six NRHP-eligible or listed archaeological sites and indirect impacts to 55 archaeological sites, one NHL, and two traditional cultural properties. However, with implementation of the potential mitigation measures listed below, these impacts would be resolved through consultation to less than significant levels. Table 12.2-3 summarizes Alternative 3 impacts.

**Table 12.2-3. Summary of Alternative 3 Specific Impacts**

<i>Area</i>	<i>Impacts</i>	<i>Project Specific Impacts</i>
Tinian	Construction	Direct and indirect impacts to six archaeological sites and medium probability areas
	Operation	Indirect impacts to 55 archaeological sites, one NHL, and two traditional cultural properties.

#### 12.2.4.3 Alternative 3 Potential Mitigation Measures

The range layouts were sited to avoid impacting the majority of the historic properties on the island. Another attempt to design around the specific sites would be made as plans progress. In accordance with the PA associated with this EIS/OEIS, direct impacts to archaeological sites in and around the firing range projects (TN0002, TN0034, 5007, 5009, 5021, TN0030) would be avoided or data recovery would take place. A Ground Penetrating Radar study of the former Churo Camp Cemetery would be conducted prior to range construction. Medium probability areas would be monitored during construction activities. Operational impacts would be mitigated through training of personnel working in the area to avoid impacts to archaeological sites.

Access restriction would be temporary, occurring for approximately 16 weeks per year. The PA stipulates that the DoD would afford access to historic sites to individuals and organizations that attach significance to these historic properties where security requirements are not prohibitive. However, some access restrictions would be necessary because of public safety. Mitigation to reduce the adverse impact would include public educational materials and displays about the NHL and the history of Tinian.

#### 12.2.5 No-Action Alternative

Under the no-action alternative, no construction or operations associated with the Marine Corps relocation would occur and Marine Corps mission, readiness, national security and international obligations would not be met. Existing operations at the proposed project areas would continue. Therefore, the no-action alternative would not impact NRHP-eligible or listed cultural resources.

#### 12.2.6 Summary of Impacts

Table 12.2-4 summarizes the potential impacts of each action alternative and the no-action alternative. Only NRHP-eligible or listed sites are listed in Table 12.2-4.

**Table 12.2-4. Summary of Impacts**

<i>Alternative 1</i>	<i>Alternative 2</i>	<i>Alternative 3</i>	<i>No-Action Alternative</i>
<b>Archaeological Resources</b>			
SI-M <ul style="list-style-type: none"> <li>Significant adverse direct impacts to 10 NRHP-eligible archaeological resources</li> <li>Indirect impacts to 55 NRHP-eligible archaeological sites in the SDZ and the NHL</li> </ul>	SI-M <ul style="list-style-type: none"> <li>Significant adverse direct impacts to 7 NRHP-eligible archaeological resources</li> <li>Indirect impacts to 52 NRHP-eligible archaeological sites in the SDZ and the NHL</li> </ul>	SI-M <ul style="list-style-type: none"> <li>Significant adverse direct impacts to 6 NRHP-eligible archaeological resources</li> <li>Indirect impacts to 55 NRHP-eligible archaeological sites in the SDZ, and the NHL</li> </ul>	NI <ul style="list-style-type: none"> <li>No impacts to archaeological resources</li> </ul>
<b>Architectural Resources</b>			
NI <ul style="list-style-type: none"> <li>No adverse impacts to NRHP-eligible architectural resources</li> </ul>	NI <ul style="list-style-type: none"> <li>No adverse impacts to NRHP-eligible architectural resources</li> </ul>	NI <ul style="list-style-type: none"> <li>No adverse impacts to NRHP-eligible architectural resources</li> </ul>	NI <ul style="list-style-type: none"> <li>No impacts to NRHP-eligible architectural resources</li> </ul>
<b>Submerged Resources or Objects</b>			
NI <ul style="list-style-type: none"> <li>No adverse impacts to NRHP-eligible submerged resources or objects</li> </ul>	NI <ul style="list-style-type: none"> <li>No adverse impacts to NRHP-eligible submerged resources or objects</li> </ul>	NI <ul style="list-style-type: none"> <li>No adverse impacts to NRHP-eligible submerged resources or objects</li> </ul>	NI <ul style="list-style-type: none"> <li>No impacts to NRHP-eligible submerged resources or objects</li> </ul>
<b>Traditional Cultural Properties</b>			
SI-M <ul style="list-style-type: none"> <li>Indirect impacts to two NRHP-eligible traditional cultural properties</li> </ul>	SI-M <ul style="list-style-type: none"> <li>Indirect impacts to one NRHP-eligible traditional cultural property</li> </ul>	SI-M <ul style="list-style-type: none"> <li>Indirect impacts to two NRHP-eligible traditional cultural properties</li> </ul>	NI <ul style="list-style-type: none"> <li>No impacts to NRHP-eligible traditional cultural properties</li> </ul>

*Legend:* SI-M = Significant impact mitigable to less than significant, NI = No impact.

### 12.2.7 Summary of Potential Mitigation

Mitigation would be conducted in accordance with the PA and include avoidance, survey, monitoring during construction, data recovery, building documentation, public education, and training of Marines to prevent vandalism. Potential mitigation measures are presented in Table 12.2-5.



**Table 12.2-5. Summary of Potential Mitigation Measures**

<i>Alternative 1</i>	<i>Alternative 2</i>	<i>Alternative 3</i>	<i>No-Action Alternative</i>
<b>Archaeological Resources</b>			
<ul style="list-style-type: none"> <li>• Data recovery of sites TN0002, 5007, 5012, 5011, 5009, TN0619, 5022, TN0606, TN0034, TN0030</li> <li>• Monitoring of medium probability areas during construction</li> <li>• Cultural resources education training of Marines to promote protection of sensitive sites</li> </ul>	<ul style="list-style-type: none"> <li>• Data recovery of sites TN0002, TN0034, 5007, 5009, 5021, TN0606, TN0030</li> <li>• Monitoring of medium probability areas during construction</li> <li>• Cultural resources education training of Marines to promote protection of sensitive sites</li> </ul>	<ul style="list-style-type: none"> <li>• Data recovery of sites TN0002, TN0034, 5007, 5009, 5021, TN0030</li> <li>• Monitoring of medium probability areas during construction</li> <li>• Cultural resources education training of Marines to promote protection of sensitive sites</li> </ul>	<ul style="list-style-type: none"> <li>• None</li> </ul>
<b>Architectural Resources</b>			
<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• None</li> </ul>
<b>Submerged Resources and Objects</b>			
<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• None</li> </ul>	<ul style="list-style-type: none"> <li>• None</li> </ul>
<b>Traditional Cultural Properties</b>			
<ul style="list-style-type: none"> <li>• Public educational materials and displays about the NHL and the history of Tinian</li> </ul>	<ul style="list-style-type: none"> <li>• Public educational materials and displays about the NHL and the history of Tinian</li> </ul>	<ul style="list-style-type: none"> <li>• Public educational materials and displays about the NHL and the history of Tinian</li> </ul>	<ul style="list-style-type: none"> <li>• None</li> </ul>

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