

APPENDIX N

CULTURAL RESOURCES TECHNICAL MEMO

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1.0 INTRODUCTION

This technical memo supports Sections 3.11 and 4.11, *Cultural Resources Affected Environment and Environmental Consequences*, respectively of the Commonwealth of the Northern Mariana Islands Joint Military Training (CJMT) Environmental Impact Statement (EIS)/Overseas Environmental Impact Statement (OEIS). [Section 1.0](#), *Introduction*, of this technical memo presents a more detailed discussion of the resource standards and regulations. This is followed by [Section 2.0](#), *Cultural Resources Affected Environment*, where previous cultural resources studies and recorded sites, as well as the history of Tinian and Pagan before World War II are presented. [Section 3.0](#), *Cultural Resources Environmental Consequences*, details the methodology used to evaluate potential impacts, measures taken as part of the proposed action to reduce impacts to cultural resources, identification of impacts specific to the three action alternatives on Tinian and the two on Pagan, and description of the types of sites affected.

1.1 CULTURAL RESOURCES REGULATIONS, STANDARDS, AND GUIDELINES

Statutory and regulatory requirements for cultural resources arise from the National Environmental Policy Act (NEPA), National Historic Preservation Act, and other statutes and executive orders, including the Antiquities Act (1906) and the Sunken Military Craft Act (2004). Additional regulations include Curation of Federally-owned and Administered Archeological Collections (36 Code of Federal Regulations [CFR] § 79), Criteria for Evaluation (36 CFR § 60.4), and Protection of Historic Properties (36 CFR § 800). The Antiquities Act allows the President of the United States (U.S.) to establish national monuments that are then managed by the National Park Service. The Sunken Military Craft Act protects sunken U.S. military vessels and aircraft and the remains of their crews from unauthorized disturbance. Regulation 36 CFR § 60.4 establishes the criteria to evaluate properties for listing in the National Register of Historic Places and 36 CFR § 800 describes the process for the identification and assessment of adverse effects to historic properties (the Section 106 process). Other laws and regulations governing cultural resources include:

- Abandoned Shipwreck Act, 43 U.S. Code § 2101-2106
- Historic Sites Act, 16 U.S. Code § 461-467
- National Historic Landmarks Program (36 CFR 65)
- Curation of Federally-owned and Administered Archeological Collections (36 CFR 79)
- Protection of Historic Properties (36 CFR 800)
- Preservation of American Antiquities (43 CFR 3)
- Executive Order 11593, *Protection and Enhancement of the Cultural Environment*
- Executive Order 13287, *Preserve America*

The process for identifying and evaluating historic properties is established under authority of the National Historic Preservation Act. Section 106 of the Act directs federal agencies to make reasonable and good faith efforts to identify historic properties (36 CFR 800.4(b)(1)). Agencies are to take into account past planning, research, and studies; the magnitude and nature of the undertaking and the

degree of federal involvement; the nature and extent of potential effects on historic properties; and the likely nature and location of historic properties within areas that may be affected. Additionally, the Secretary of the Interior has developed standards (e.g., Historic Preservation Qualification Standards) and guidelines for the identification of historic properties.

A historic property is defined as a district, site, building, structure, or object that meets the specific criteria of the National Register of Historic Places. A property's historic significance is determined by applying certain criteria that evaluate the eligibility of a property to be placed in the National Register of Historic Places. National Register Bulletin 15 (National Park Service 2002) defines these criteria. Properties may be considered eligible for listing in the National Register of Historic Places if they possess integrity of location, design, setting, materials, workmanship, feeling, association, and:

- A. Are associated with events that have made a significant contribution to the broad pattern of history; or
- B. Are associated with the lives of persons significant in the past; or
- C. Embody the distinctive characteristics of a type, period, or method of construction, represent the work of a master, possess high artistic value or represent a significant and distinguishable entity whose components may lack individual distinction; or
- D. Have yielded, or may be likely to yield, information important in prehistory or history (National Park Service 2002).

Properties that meet these criteria are considered "historic properties" and impacts to historic properties are subject to review under Section 106 of the National Historic Preservation Act. The Section 106 process provides interested parties such as local governments, agencies, and the public, an opportunity to provide input and affords the Advisory Council on Historic Preservation an opportunity to comment prior to a federal agency initiating the proposed undertaking. Federal regulation 36 CFR Part 800, Protection of Historic Properties, defines specific procedures for federal agencies to follow in complying with the Section 106 process. An important part is consultation with interested parties regarding potential effects to historic properties that may result from a proposed undertaking. Section 106 consultation for the CJMT proposed action was initiated in April 2013 with the Commonwealth of the Northern Mariana Islands (CNMI) Historic Preservation Officer, and is being conducted in coordination with the NEPA process.

Under NEPA, cultural resources can also include other resources that hold special cultural significance, including cultural practices, cemeteries, memorials, sacred sites, or medicinal plants.

2.0 CULTURAL RESOURCES AFFECTED ENVIRONMENT

Consistent with the standards and guidelines identified above, several methods were used to identify historic properties in the potential impact areas. These included reviewing existing research and literature, evaluating previously recorded sites, and conducting cultural resources studies where needed.

2.1 TINIAN

2.1.1 Historical Overview

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 World War II. Other areas on the island are important because of their historical and traditional use, to the Chamorro as well as to former residents of American, Japanese, and Korean descent.

2.1.1.1 Pre-Contact Period in the Mariana Islands

Early Settlement: Pre-Latte Period

The Pre-Latte Period dates from the time of initial settlement, approximately 3,500 years ago to 1,013 years ago. Moore et al. (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 are limited to several coastal and a few inland sites. 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 (Tomonari-Tuggle et al. 2007). The great quantity of shellfish and reef fish remains found at coastal sites suggests that subsistence practices of early inhabitants relied heavily on nearshore reefs. People used a mixture of hunting, fishing, and collecting activities (Reinman 1977; Kurashina and Clayshulte 1983; 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 have yielded the most substantial body of data for interpreting the Early Unai Phase. The excavations have produced evidence of intensive use, including postholes and hearths, with substantial amounts of habitation debris indicating cooking, food storage, and tool manufacturing. Food remains recovered from the site include marine shells, fish and bird bones, and charred plant material. As is true of most early settlements on the Pacific Islands, birds were an important part of the diet. The Unai Chulu site also produced flaked and ground stone items, and implements and ornaments of bone and shell, including shell fishhooks (Haun et al. 1999).

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 evidenced by occasional postholes, hearths, and midden deposits, primarily in coastal caves and rock shelters. Most sites from the period occur along the coastlines.

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 Tinian, Saipan, Guam, and Rota. The Huyong Phase exhibits a continuation of large flat-bottomed pans, but they decline in frequency as pots with rounded bases become more common.

Latte Period

The Latte Period is distinguished from earlier periods by the presence of stone structures called *latte*. The earliest *latte* structures date to approximately 1,013 years ago and are accompanied by a change in

pottery technology. During this period, populations increased and settlements expanded into areas outside of the coastal environments. Latte Period sites are more abundant than Pre-Latte sites on all of the Mariana Islands.

Latte are typically large limestone pillars, or more infrequently basalt, each topped by a capstone. These pillars were placed in two parallel rows of even numbered uprights forming a single set. Variation in the number and size of *latte* probably reflect differentiation in function, family size, and perhaps the status of the occupants. *Latte* are most commonly found along the shorelines of all the major Mariana Islands and can consist of clusters of up to 18 individual structures forming hamlets or villages (although the Mochong site of Rota has at least 47 documented structures). 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. Other resources exploited included birds, fruit bats, lizards, turtles, and land snails. Human burials are also commonly associated with *latte* sites where individuals were either buried beneath the structure or adjacent to it.

2.1.1.2 Post-Contact Period

European Contact

Western contact in the Mariana Islands is considered to have occurred in 1521, the year that Ferdinand Magellan landed on Guam. At the time of western contact, the Mariana Islands were inhabited by a group of people that came to be known as the Chamorro. *Latte* continued to be built into the Post-Contact period (the period between Magellan's landing on Guam in 1521 and full Spanish colonization). Spanish-introduced materials are found at sites dating to this period and include cattle, pig, sheep, and deer bones; maize (corn) remains; iron; and glass fragments. Breadfruit, yams, and taro were the staple crops during this period as well as bananas, sugarcane, and rice. Marine resources also remained a staple food source.

Colonization Periods

The Mariana Islands were colonized by Spain for over 200 years. Colonization of the Marianas began in 1668 with the arrival of Catholic missionaries. Opposition to the missionaries by the indigenous population soon arose, which led to open revolt against the priests and Spanish troops (Rogers 1995). Sporadic conflicts continued until 1694, when, as a last measure, the Spanish began the forced relocation of all Chamorro to villages on Saipan and Guam. This consolidation program was called the *reducción* by the Spaniards (Rogers 1995), and it took approximately 4 years to complete. Those Chamorro who were initially sent to Saipan were forced to move to Guam in 1698 (Driver 1983; Hezel 1989). In that year, a final Spanish mission to the Northern Mariana Islands removed the last of the Chamorro community from Tinian (Rogers 1995). The northern islands were visited after 1700 by Chamorro fishing and hunting parties, but the Spanish administration restricted Chamorro settlements to Guam, Saipan, and Rota.

During the 1700s, cattle, pigs, and goats introduced by the Spanish, grazed freely on Tinian (Bowers 1950). In 1742, the English vessel *H.M.S. Centurion* dropped anchor off Tinian for almost 2 months, providing several of the early historic accounts of the island. British Commodore George Anson of the *Centurion* observed that the free-roaming livestock was minimally tended and occasionally harvested by Guam residents (Farrell 2011). Sometime between 1815 and 1820, Carolinian refugees began arriving in

the Marianas (Driver and Brunal-Perry 1995). In 1835 the Spanish government transported Chamorro and Carolinian victims of Hansen's disease to the Tinian Leper Colony. The colony supported itself by selling beef and hides to Guam. The colony closed after a small pox epidemic in 1837 (Farrell 2012). It was re-established in 1855, when the administration of Governor Felipe Maria de la Corte allowed Spanish prisoners to establish the village of Sanhalom on Tinian. In 1865, the population of Tinian consisted of about 15 individuals, probably Spanish prisoners, who worked as ranchers and farmers (Farrell 2012). Every 6 months, Carolinians from Saipan would sail to Tinian and transport goods to Guam.

In 1869, Tinian was leased by the Spanish to a rancher named George Johnston, who established a cattle ranch. Johnston brought 230 to 250 Carolinians from Piserasch or Piherarh on the Namunito atoll to work on his ranch (Bowers 1950; Farrell 2012 p. 13). The Johnston ranch did not last long. Johnston was lost at sea and the lease was terminated in 1877. Some of the Tinian Carolinians decided to move to Saipan. By the end of 1886, there were 235 Carolinians and only one Chamorro family (the deputy magistrate on Tinian), all living in a village called San Luis Medina (Olive y Garcia 2006). A severe drought in 1888 caused many of the Carolinians to move to Saipan. A year later, the Governor of the Northern Mariana Islands ordered the remaining Carolinians on Tinian to join the rest on Saipan. The leper colony on Tinian was presumably abandoned when the Carolinians moved to Saipan.

Following the Spanish occupation, the Mariana Islands, with the exception of Guam, were sold to Germany in 1899. The Germans saw the islands as an opportunity to pursue aggressive economic and commercial endeavors they had already begun in the Marshall Islands and subsequently, Palau.

Germany's primary interest was the development of a cash-based agricultural economy based on copra (dried coconut meat used for coconut oil) production. Coconut trees were planted on the island, but in 1905 two typhoons devastated the plantations and the Germans were convinced that their economic gamble had failed (Tomonari-Tuggle et al. 2007). German authority over the islands ended in 1914, when a Japanese naval squadron seized control of Saipan 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 it not be fortified for military use.

Between 1914 and 1922, the Japanese military controlled the Northern Mariana Islands until it was turned over to a Japanese civilian entity called South Seas Bureau in 1922. The South Seas Bureau, or the Nan'yo Kohatsu Kabushiki Kaisha Company, developed large-scale sugarcane production for trade on Saipan. Large tracts of lands were leased by the company and sublet to tenant farmers, most of whom were colonists from Japan and Korea. Plantations were also developed on Tinian, Rota, and Aguijan. The pattern of Japanese occupation was most intensive on Tinian, with sugarcane fields occupying 80% of the island. Tinian was divided into rectangular plots, 14.7 acres (5.9 hectares) in size, each of which were leased by tenant farmers. Their homes, constructed of wood and thatch or sheet metal, were destroyed during World War II, but ruins of cisterns and secondary structures remain to mark the farm sites (Bowers 1950; Dixon et al. 2000).

Japanese war preparation brought further changes to Tinian. Using forced labor composed of the local Japanese population and imported laborers from Korea and Japan, the Japanese constructed two airfields on Tinian (one at Ushi and one at the present airport location), and started a third to the west

at Kahet (Dixon and Welch 2002). Beginning with the attack on Pearl Harbor on December 7, 1941 and the entrance of the U.S. into World War II, the Japanese quickly occupied Guam on December 8, 1941, cementing their hold on the Mariana Islands. During the war, the Japanese took over local schools on Tinian to house the influx of Japanese troops. By 1944, Tinian's civilian population was 17,900 with only 26 of those being Chamorro; most of the population was Japanese (Bowers 1950).

The U.S. began systematic air and naval bombardment of Tinian on June 11, 1944. On July 24, 1944 (Invasion Day), fire concentrated on Tinian Town (currently known as San Jose) as U.S. ships and landing craft feinted offshore in an attempt to fool the Japanese into thinking that the invasion would take place there. Instead, the invasion took place at two lightly defended narrow beaches on the northwest side of the island, designated by the Allies as White One (Unai Babui) and White Two (Unai Chulu). The first wave of the 4th Marine Division landed at 7:40 p.m. and by nightfall, 15,614 troops were ashore. The following day, the 2nd Marine Division landed, and the push inland began to the northeast toward the airstrips, and to the south toward Tinian Town. By July 31, 1944, the 2nd and 4th Marine Divisions had compressed the remaining Japanese forces at the southern end of Tinian, and by the end of the day the last desirable defense locality had been penetrated (Richard 1957). After bitter fighting, throughout the night and the next day, Tinian was declared secured by U.S. Forces at 6:55 p.m. on August 1, 1944, but not without almost complete devastation of Tinian Town and much of the island's rural infrastructure (Dixon and Welch 2002). Japanese soldiers hiding in caves in the southern end of the island staged banzai attacks over the next several days, and some 500 stragglers continued to raid U.S. camps until the end of the war.

Tinian was then transformed into the largest U.S. base in the Pacific (Russell 1995). West Field, the present Tinian International Airport (Dixon et al. 2000; Dixon and Welch 2002) was used by General Curtis LeMay for the high-level bombing of selected Japanese military targets by B-29s, and then for low-level carpet bombing campaigns of other Japanese cities. Pilots used a tall homing tower near Mount Lasso to guide their return to the airfield. At North Field, the former Ushi Field, the SeaBees of the Sixth Naval Construction Brigade constructed 4 additional runways, taxiways, 173 Quonset huts, and 92 steel arch-rib buildings. The airfield also supported two loading pits that were used for the atomic bombs dropped on Hiroshima and Nagasaki, which brought about the end of the war on August 10, 1945.

Following the end of the war, the Japanese civilian population at Camp Churo totaled 10,639 before repatriation in January and February of 1946 (Russell 1998). The few Japanese soldiers who surrendered during the war were also repatriated. The Koreans, Chinese, and Japanese were also returned to their homelands. Following the repatriation of the Japanese and departure of the U.S. military in 1946, the island was largely abandoned except for the U.S. Trust Territory Colony for the Treatment of Hansen's Disease below West Field, which housed individuals with leprosy from all over Micronesia (Farrell 1992 p. 71). This facility was established by the U.S. Navy in 1948, and expanded in 1950 (Farrell 2012). Much of the abandoned military infrastructure and most former sugarcane fields reverted to jungle or fields of dense sword grass.

The village of San Jose (formerly known as Tinian Town during the Japanese Administration) was resettled in 1948 by Chamorro immigrants from Yap Island, who first occupied Camp Chulu (Athens 2009). By 1949, Tinian's population was 354 (Bowers 1950). Families were each given 12, 15, or 17 acres (5, 6, or 7 hectares) of land to homestead by the U.S. government who was administering the island. The

more land a family could cultivate, the more they were given. The land was covered in non-native plant species, such as tangantangan, which had to be cleared for farming. Homesteaders planted fruit trees, raised pigs and cattle, and some tried to farm or ranch near Old Village because it was considered good grazing land. Some farmers continued to use the military land, bulldozing concrete slabs, portions of runways, and other remnant military facilities that were a hindrance to farming. Farmers grew watermelon, tomatoes, tapioca, corn, sweet potatoes, and yams (Fowler et al. 2010). Others found the remaining unexploded ordnance scattered across the landscape a deterrent to farming, and instead collected and sold the abundant scrap metal to several scrap businesses on Guam. Farmers eventually moved south to the Marpo Valley (Fowler et al. 2010).

During the Korean War (1950-1953), the U.S. military again used some of the abandoned facilities on Tinian. North Field supported a base camp for the Navy Patrol Squadron VP-6, as well as a single-target bombing range (Fowler et al. 2010). Since the late 1950s, a minor military presence has continued. In 1975, the leadership of the Mariana Islands (with the exception of Guam) signed the *Covenant to Establish a Commonwealth of the Northern Mariana Islands in Political Union with the United States of America* with concurrence by the Mariana Islands Legislature. This agreement contained a stipulation that the U.S. military maintain a lease for the northern two-thirds of Tinian for training purposes (Farrell 1992 p. 79). In January 1983, the U.S. federal government and the CNMI government finalized a lease agreement for military use of the northern two-thirds of Tinian (i.e., the Military Lease Area). Farming and ranching continued in many areas across the island through the 1980s, but vegetation slowly began to take over the fields as farming became less commonly practiced. Today, tourism and a casino are important economic assets that help to support the population.

The Tinian Landing Beaches, Ushi Field, and North Field were collectively designated as a National Historic Landmark in 1985 (hereinafter referred to as the “North Field National Historic Landmark”). The landmark possesses significance for the invasion of the island by U.S. Marines, considered “the perfect amphibious operation in the Pacific war.” Further significance derives from the fact that North Field, the largest airfield in the Pacific, played a critical role in the Allied victory in the war. The North Field National Historic Landmark encompasses landing beaches White 1 (Unai Babui) and 2 (Unai Chulu), the U.S. Marines’ beachhead, Japanese structures at Ushi Point Field, and North Field. Today, this landmark consists of beaches, runways, remnants of Japanese and American military structures, and the atomic bomb loading pits.

2.1.2 Previous Studies and Recorded Cultural Resources

Our analysis identified 52 cultural resources investigations in the Military Lease Area, immediately north of the Tinian International Airport runways, and the Port of Tinian improvements area. These include archaeological assessments, Phase I surveys, Phase II testing, data recovery excavations, traditional cultural properties studies, and architectural surveys, as well as a cultural landscape study. Testing and/or intensive excavation have been part of nine major studies. Extensive research of U.S., Japan, and Micronesia archives, including references to collections of historical maps and photographs, supplemented the fieldwork. [Table 1](#) summarizes previous cultural resources investigations and locations of previous cultural resources investigations are depicted on [Figure 1](#) (following the table).

**Table 1. Cultural Resource Surveys in the Military Lease Area,
Tinian International Airport, and Port of Tinian**

<i>Authors</i>	<i>Year of Publication</i>	<i>Type of Work</i>	<i>Location</i>	<i>Acres/ Hectares</i>
Marche	(1882) 1982	Excavation	House of Taga/Port of Tinian vicinity	Site specific
Hornbostel	1924-1925	Excavation	House of Taga/Port of Tinian vicinity	Site specific
Hasebe	1928	Excavation	House of Taga/Port of Tinian vicinity	Site specific
Spoehr	1957	Excavation	House of Taga/Port of Tinian vicinity	Site specific
Pellet and Spoehr	1961	Excavation	House of Taga/Port of Tinian vicinity	Site specific
Thomas	1980	Excavation	House of Taga/Port of Tinian vicinity	Site specific
Pangelinan	1982	Survey, site specific	North Field	1,436/581
Denfeld	1983	Survey, site specific	North Field	Site specific
Moore et al.	1986	Survey and testing	All beaches	1,779/720
Donham	1986	Survey	North end of North Field	312/126
Haun	1988	Survey	North end of North Field	80/32
Haun	1989	Site recording	North end of North Field	80/32
Haun and Donham	1989a	Site recording	North end of North Field	80/32
Haun and Donham	1989b	Site recording	North end of North Field	80/32
Haun et al.	1990	Survey	North end of North Field	37/15
Jones	1991	Historic architectural survey	Military Lease Area, Tinian Port	17,798/7,202
Welch and Bodnar	1993	Known site assessments	Military Lease Area	Site specific
Welch	1994	Site specific assessment	Unai Chulu, Unai Dankulo	Site specific
Craib	1995	Survey	Unai Chiget, roadways	528/214
Henry and Haun	1995	Survey and testing	Unai Chulu	25/10
Franklin and Haun	1995a	Survey	Unai Dankulo	200/81
Franklin and Haun	1995b	Data recovery excavations	Road corridor (8 th Avenue)	83/34
Eblé et al.	1997	Survey	International Broadcasting Bureau	Sample of 2,400/971
Putzi et al.	1997	Survey	International Broadcasting Bureau, Area A	192/78
Athens and Ward	1998	Sediment coring	Lake Hagoi	Site specific
Bouthillier	1998	Site recording (Post-Contact Period sites)	Exclusive Military Use Area	Site specific
Craib	1998	Survey and testing	Exclusive Military Use Area	750/304

**Table 1. Cultural Resource Surveys in the Military Lease Area,
Tinian International Airport, and Port of Tinian**

<i>Authors</i>	<i>Year of Publication</i>	<i>Type of Work</i>	<i>Location</i>	<i>Acres/ Hectares</i>
Welch and Tuggle	1998	Site specific assessment	Military Lease Area	Site specific
Moore et al.	1998	Survey and testing	Tinian Power Plant/Port of Tinian vicinity	5/2
Bouthillier	1999	Historic architectural survey	Unai Chiget, Unai Chulu, Unai Babui, Unai Dankulo, Unai Masalok	4,000/1,619
Craib	1999	Survey and testing	Unai Dankulo, Banderon Nunu, portion of Mount Lasso (also area north of House of Taga)	690/279
Haun et al.	1999	Survey, testing; excavation	Unai Chulu	Site specific
Tuggle and Welch	1999	Site protection plan, selected site mapping	Military Lease Area	Site specific
Henry et al.	1999	Survey and testing	Exclusive Military Use Area	4,162/1,684
Dixon et al.	2000	Survey	International Broadcasting Bureau, Areas B and C	1,590/643
Allen et al. Allen and Nees Gosser et al. Allen et al.	2000 2001 2001 2002	Survey; testing, excavation	Military Lease Area	7,710/3,120
Dixon and Welch	2002	Survey	Tinian International Airport	494/200
Denfeld	2002	Military structures survey	Tinian wide	Island-wide
Moore et al.	2001	Survey and testing	International Broadcasting Bureau Area A	150/61
Swift et al.	2002a	Survey and monitoring	San Jose Waterline/Port of Tinian and supply route vicinity	1/.4
Swift et al.	2002b	Survey and monitoring	San Jose Route 202/Port of Tinian and supply route vicinity	63/26
Swift et al.	2005	Survey and monitoring	San Jose Route 205/Port of Tinian and supply route vicinity	84/34
Dixon et al.	2003	Excavation	8 th Avenue realignment/Port of Tinian and supply route vicinity	0.67/.27
Athens	2009	Survey and testing	Military Lease Area	4,597/1,860
Griffin et al.	2010a	Traditional Cultural Properties Study	Military Lease Area	Island-wide
Burns	2010	Underwater survey	Near Unai Chulu and Unai Dankulo	60/24

**Table 1. Cultural Resource Surveys in the Military Lease Area,
Tinian International Airport, and Port of Tinian**

<i>Authors</i>	<i>Year of Publication</i>	<i>Type of Work</i>	<i>Location</i>	<i>Acres/ Hectares</i>
Fowler et al.	2010	Cultural Landscape study	North Field National Historic Landmark	Site specific
Thursby	2010	Architectural survey	Tinian Port	Site specific
Carson	2014	Excavation	House of Taga/Port of Tinian vicinity	Site specific
DoN	2014a	Traditional Cultural Properties Study	Military Lease Area	Island-wide
DoN	2014b	Survey	Tinian Port/roads	79/32
DoN	2015	Survey	Tinian Port/roads	7.8/3.2

Legend: DoN = Department of Navy.

Military Lease Area

Approximately 98% of the Military Lease Area has been surveyed for archaeological resources with only a portion of the property leased by the International Broadcasting Bureau on the western side of the island, yet to be surveyed. Systematic recording of archaeological sites in the Military Lease Area began in the 1980s. Since that time, archaeological surveys of varying intensities have covered the entire Military Lease Area. Athens (2009) surveyed over 15,000 acres (6,070 hectares) by systematic ground surveys with detailed site recording. Several architectural studies have also been conducted, beginning in the 1980s; however, much of the built environment comprises relict World War II structures, which are classified as archaeological resources. There are few intact structures or buildings. Most architectural studies have concentrated on military structures or specific areas, such as the North Field (Denfeld 1983, 2002; Jones 1991; Bouthillier 1999; Fowler et al. 2010). With the exception of the cultural landscape report for the North Field National Historic Landmark, information on other structures within the Military Lease Area is incorporated into archaeological site records and reports.

The previous archaeological, cultural, and historical studies have resulted in the identification of 356 archaeological sites. Of these 356 sites, 2 are listed in the National Register of Historic Places (the North Field National Historic Landmark [including the Tinian Landing Beaches and Ushi Point Field] and the Unai Dankulo petroglyphs), 319 are considered eligible for listing, and 31 are not eligible for the National Register of Historic Places. Recorded sites include Pre-Contact Chamorro, Spanish Administration, pre-World War II Japanese Administration, American and Japanese World War II, and post-World War II American military, as well as various agricultural sites.

Figure

1 Cultural Resource Surveys within the Area of Potential Effects on Tinian

The North Field National Historic Landmark (designated as such in 1985) was a B-29 airbase that now contains several features and structural remains. Some of the features of the National Historic Landmark include four runways; the sites used to assemble and load the two atomic bombs that ended World War II in the Pacific; many former Japanese military structural remnants; coastal gun emplacements; and military unit memorial plaques. As defined by the National Register nomination form (Thompson 1984), the National Historic Landmark boundaries include 26 recorded archaeological sites; however only a few of the features within the National Historic Landmark are considered to be contributing features to the landmark ([Table 2](#)).

Table 2. Contributing Features to the North Field National Historic Landmark

<i>Contributing Feature</i>	<i>Site Number</i>
Landing Beach White 1	TN-1-0074 (landing beach only)
Landing Beach White 2 and Japanese Pillbox	TN-5/6-0016
North Field Runways, Taxiways, Service Aprons	TN-6-0364 and TN-6-0402
Air Operations Building	TN-6-0364
Two Air Raid Shelters	
Japanese Service Apron	
Air Administration Building	

Fowler et al. (2010) prepared a cultural landscape report of the North Field National Historic Landmark and documented facilities and features located both inside and outside the Landmark boundary.

A traditional cultural properties study conducted for this EIS/OEIS in the Military Lease Area identified three traditional Chamorro fishing areas for consideration as traditional cultural properties: Unai Chulu, Unai Dankulo, and Unai Masalok (DoN 2014a). These locations were identified by members of the Chamorro community, who cited them as making a significant contribution to Chamorro culture after the re-settlement of the island by the Chamorro in the 20th century, and the Chamorro community continues to carry out traditional fishing practices in these locations.

Tinian International Airport

All of the area immediately north of the Tinian International Airport runways has been surveyed for archaeological resources. An archaeological survey of the Tinian International Airport was conducted in support of the runway expansion in 1999 (Dixon and Welch 2002). Within the Tinian International Airport area, two archaeological sites have been recorded that are considered eligible for listing in the National Register of Historic Places. These include one farm site from the Japanese Administration and one World War II American military site (West Field) (Dixon and Welch 2002). No architectural studies have been conducted for Tinian International Airport and its facilities because they are modern.

Port of Tinian

Seventeen cultural resources studies have been conducted at the port, along adjacent roads, and in the vicinity. Seven of these studies were excavations at the House of Taga, a historic property located approximately 430 feet (130 meters) from the proposed port improvements. Other studies in the vicinity, but outside of the area of potential effect, include a utilities survey by Swift et al. in 2002 (Swift et al. 2002a).

Ten studies have been conducted within or near the area of potential effects, including locations of the port improvement projects and the munitions supply route and tracked vehicle transit lanes. In 1984, the Harbor Breakwater was briefly described as part of a survey of historical resources conducted by the Department of Navy (DoN) within the Military Lease Area. Due to its diminished integrity, the Harbor Breakwater was not recommended for nomination to the National Register of Historic Places (Jones 1991). In 2008, an architectural survey and archival study for the entire Port of Tinian, which included all structures along the wharf or quay, was conducted (Thursby 2010). Although these structures have deteriorated, the remnant architectural features, such as the breakwater and portions of the quay, are considered to be eligible for listing in the National Register of Historic Places as part of an archaeological site for their association with World War II.

Archaeological surveys of 6th and 8th Avenues were conducted by Franklin and Haun (1995), Henry and Haun (1995), Moore et al. (1986, 1998), Swift et al. (2002b, 2005), and Athens (2009). Additional archaeological surveys were conducted in 2014 and 2015 along portions of training and support facilities that extended from the Port to the Military Lease Area along 6th and 8th Avenues (DoN 2014b, 2015).

Roadways leading from the Port of Tinian to the Military Lease Area would be used for munitions supply routes and tracked vehicle transit lanes. There are 13 sites on these roads. Eight of the sites are eligible for listing in the National Register of Historic Places and five sites are not eligible.

2.2 PAGAN

2.2.1 Historical Overview

The basic chronology on Pagan is similar to the chronology presented for Tinian; however, the specific history of Pagan is not well documented because of its relative isolation from the larger Mariana Islands to the south, where Spanish exploration and settlement was focused (Athens 2011). General background information on the Pre-Contact and Post-Contact history was predominately derived from Athens (2009) and presented in detail in [Section 2.2.2, Previous Studies and Recorded Cultural Resources](#).

The chronology of early settlement on Pagan is currently based upon three radiocarbon-dated contexts from one *latte* site above Regusa Beach (Egami and Saito 1973), and four radiocarbon-dated strata from one shovel test at a *latte* site above Apansanmena Beach (Athens 2009). Taken together, these dates appear to reflect Latte Period occupation of prime coastal settings around Mount Pagan from at least 700 years ago into the early historic period.

Noticeably absent from the archaeological record of Pagan are surface pottery scatters and evidence of Pre-Latte Period settlement. The absence of pottery scatters may be explained by the depth of historic to modern ash or cinder falls and lava covering much of the slopes of Mount Pagan, as well as the high degree of disturbance related to Japanese-era agricultural endeavors on all but the steepest slopes in the north half of the island. The lack of evidence of Pre-Latte Period habitation on Pagan may be attributable to the fact that sea levels were about 6 feet (1.8 meter) higher 1,000 years ago (Dickinson 2000), so that the beach settings so attractive to early settlers were likely too narrow and abrupt to encourage permanent settlement.

Current knowledge of Pre-Contact sites on Pagan implies that much of the terrain with arable soils, of under 15% slope and with access to the coast, was likely used by inhabitants of Latte Period villages (Athens 2009, 2011). They also practiced horticulture or gathering and hunting of native plants and animals in the nearby dense forests. “Traditional horticulture probably was reasonably productive with the major caveat that it would have been subject to potentially severe droughts” (Athens 2011 p. 117). Seventy-six *latte* sites with scattered *lusongs* or occasional boulder grinding stones have been recorded on the slopes of Mount Pagan above prominent beaches such as Regusa, Apansantate, Apansanmena, and Palapala. All of these locations had reliable access to beaches for launching outrigger sailing vessels or fishing canoes. Recent surveys of rugged interior settings (DoN 2014c) and more inaccessible coastal settings (Higelmire and DeFant 2013) suggest some marginal locations with pockets of sheltered resources may also have been used, although most such areas were avoided.

The Spanish explorer Magellan made the first European contact with the Mariana Islands in 1521, and Pagan was claimed by Spain 1565. The indigenous Chamorro continued to inhabit the islands with little external interference well after initial contact with Spain. European trade goods, along with foreign diseases, probably reached most communities in the Marianas, but prior to the late 1600s, there are few documentary sources on the population of the Marianas, and none specific to Pagan.

In 1668, Spanish Jesuit missionaries, who had established a mission on Guam, came to the Northern Mariana Islands. Though the Jesuit priest in charge of the Mariana Islands mission, Father Diego Luis de Sanvitores, renamed each of the Mariana Islands with Spanish names, use of the traditional Chamorro names persisted on the islands with a permanent population (Russell 1998). Pagan was probably populated by the Chamorro at this time, as were the islands of Guam, Rota, Saipan, and Tinian (Athens 2011). Opposition to the missionaries soon arose in the Marianas populace, which led to open revolt against the priests and Spanish troops. Sporadic conflicts continued until 1694, when, as a last measure, the Spanish transported inhabitants of all the islands to either Saipan or Guam. This forced relocation program was called the *reducción* by the Spaniards. Pagan was depopulated in 1697 by the Spanish fleet organized for the forced *reducción* of the Mariana Islands by Governor Madrazo. A significant loss of the island’s population occurred when seven canoes carrying Pagan residents to Saipan were lost in a typhoon (Russell 1998). Those who survived the voyage were initially sent to Saipan and later forced to move to Guam in 1698 (Driver 1983; Hezel 1989).

No documentary sources have been found describing the indigenous population in detail during the Spanish colonial period. Pagan was officially resettled for the first time post-*reducción* in 1865 as 265 Carolinians were brought in from Pulusuk to produce copra for a fledgling agricultural concern named *La Sociedad Agrícola de la Concepción*; the operation was not profitable and ended in 1869 (Spence 1993). In 1887, Antoine-Alfred Marche (1982 p. 20), a French explorer, ethnographer, and scientist observed, “On Pagan, there are only a few Carolinians settled there to harvest coconuts, which trade is carried on by Captain William.”

After Spain’s defeat in the Spanish-American war, Guam became a U.S. territory and Spain sold the Northern Mariana Islands to Germany in 1899. From then on the Northern Mariana Islands remained politically and administratively separate from Guam. The German administration (1899 to 1914) continued its efforts to expand the copra industry, although its success was limited due to damaging typhoons. In 1905, there were an estimated 32,000 coconut palms on Pagan, and by 1912, 951 acres (385 hectares) were dedicated to copra production (Spennemann 1999). The Germans encouraged

cultivation of land and diversification of crops, requiring property owners to farm a quarter-hectare plot at minimum.

Beginning in 1914, the Japanese Navy occupied the German Micronesian Islands. From the Japanese military, the administration of these islands was turned over to a Japanese civilian entity called South Seas Bureau in 1922, which continued the production of copra and intensive agricultural practices of the German administration. Large quantities of sweet potatoes were grown and exported. Due to an increasing need for labor on Pagan, the population in 1923 rose to 137 with 134 “islanders” (Chamorro and Carolinians) and 3 Japanese. The Japanese also built a factory for dried bonito (a Pacific-region fish) near Shomshon Bay and this industry brought Japanese fishermen and their families from Saipan to Pagan.

During the 1930s, major economic activities included coconut tree plantations and a small dried bonito factory along Shomshon Bay. The South Seas Bureau established a branch weather station south of Laguna Lake in November 1936. In December 1938, the Japanese military converted the weather station to a Navy Hydrographic Department Weather Station. With the outbreak of war, the station provided weather forecasts to Japanese military ships and planes. Installation of a government wireless communication system occurred in 1938; a steel tower in Shomshon and a police substation were built as late as 1939; and in April 1940, the first school on Pagan opened near the Pagan Jinja (a Shinto shrine) in Gayapa. By 1940, the “town” had been formed and included a pastry store, tofu store, coffee shop, and a brothel on the inner landside. There was a church and graveyard near the Chamorro village. There was no piped water on the island, but there were water tanks at the weather station, Nan’kō Suisan, and Nan’yō Bōeki. Additionally, each family collected rainwater from their roofs because well water could not be used for drinking.

Construction of an airfield by the Japanese was first initiated in early 1933 to support naval maneuvers scheduled later that year. For military secrecy, it was externally referred to as a “place for drying fishing nets.” A larger-scale construction effort began in September 1938 for use of large ground attack planes. In 1939, after cutting part of a hill for the extended runway, the airfield was constructed, but it was only suitable for smaller aircraft. Also in 1939, a pier for loading and unloading ships was built, as was a barracks near the airfield. By August 1941, a hangar and several water systems, including a concrete water storage tank, pond, water supply pond, a filtration plant, the runway, oil tank, and bomb storage area were completed or under construction.

By 1944, there was only one main road and a number of branch roads established on Pagan. The main road for military use ran south of the airfield below the caldera escarpment, to the west it extended to Shomshon Bay, curved around the west end of the airfield, and then went to the small peninsula, ending at the base of the cliff at Gunkanjima (Puntan Bandera), where it connected to the pier. A branch road also went north from the west end of the airfield to Shomshon town, the steel communication tower, the dried bonito factory, the weather station, and the Chamorro village near Lake Laguna. The National School, civilian residences, and stores were also located along this branch and other side branches.

Although Pagan was under the Japan Fifth Special Base Force in Saipan, there were no defense installations except for the airfield until early 1944. The Japanese Army constructed anti-aircraft gun positions, 70-millimeter battalion guns, anti-tank guns, and mountain guns, as well as expanding the airfield. On June 12, 1944, U.S. air raids began on Pagan and the barracks, a hangar, and runway were

destroyed. Following the surrender of the Japanese, U.S. forces occupied Pagan from 1945 to the early 1950s, with U.S. Marines occupying a camp at the north end of lower Lake Laguna (Corwin et al. 1957).

Since 1951, Pagan has been inhabited sporadically by Chamorro and Carolinians from Saipan and Agrigan. Island residents continued to harvest copra and engaged in a largely subsistence style of living until 1981 (Athens 2009) when they were evacuated after Mount Pagan's eruption. The residents were taken to Saipan, and since then Pagan has not been resettled because of public safety concerns involving a lack of ability to provide adequate emergency services for the island. Unofficially, a few people continue to visit the island.

2.2.2 Previous Studies and Recorded Cultural Resources

Eight cultural resource investigations have been conducted on Pagan. These investigations include a historical overview, site photo documentation, intensive and reconnaissance level surveys, limited excavations, and traditional cultural properties studies (see [Table 3](#)). Extensive research of archives in the U.S., Japan, and Micronesia, including references to collections of historical maps and photographs, supplemented the fieldwork. [Figure 2](#) shows previous cultural resources survey locations on Pagan.

Approximately 60% of the island is covered in lava or has topography with slopes greater than 30%, which are unlikely to contain historic properties. Of the areas with less than 30% slope, approximately 33% of Pagan has been surveyed for archaeological resources. However, many of these areas are in the central portion of the island and are not located near coastlines where most sites tend to be found. Unsurveyed areas with the potential to contain historic properties occur primarily in the southern portion of Pagan. To provide information on unsurveyed areas, archaeological surveys were supplemented by aerial inspections and oral history interviews with former residents, which included additional information on the presence of Pre-Contact villages and other resources of cultural importance in the area (Athens 2009; DoN 2014c).

Table 3. Cultural Resource Surveys on Pagan

<i>Authors</i>	<i>Year of Publication</i>	<i>Type of Work</i>	<i>Location</i>	<i>Acres/Hectares</i>
Egami and Saito	1973	Site recording and excavations	Regusa, Apansantate, Parialu, and Talage (Taragie)	Site specific
Marche	1982	Observation made in 1882 by Marche and translated by Chang	Pagan	Island-wide
Wells	1997	Site photo documentation	Pagan	Island-wide
Athens	2009	Surveys; oral histories, Japanese era history	Pagan	1,853/750
Griffin <i>et al.</i>	2010b	Traditional cultural properties study	Pagan	Island-wide
Higelmire and DeFant	2013	Survey and monitoring	Pagan	69/28
DoN	2014c	Survey	Pagan	Pedestrian: 245/99 Visual: 1,510/611
DoN	2014d	Traditional cultural properties study	Pagan	Island-wide

Figure

2 Cultural Resource Surveys within the Area of Potential Effects on Pagan

The first mention of Pagan archaeology was from French naturalist Antoine-Alfred Marche in 1887 (Marche 1982 p. 21). In the early 1970s, Egami and Saito documented several *latte* at the Regusa, Apansantate, Parialu, and Talage (Taragie) sites (Egami and Saito 1973). This team conducted excavations over a 3-week period in 1972 to 1973 at the Regusa site, located on the southeastern shore of Mount Pagan.

In 1994, and also during the last decade, brief field reconnaissance surveys have been conducted on Pagan by staff members of the CNMI Historic Preservation Office (Athens 2009). The 1994 survey documented a Japanese site and the other surveys have verified previously known *latte* sites and identified one previously unreported *latte* site near the center of the island. Wells (1997) visited and photographed archaeological sites throughout the island from 1977 through 1996 and documented site conditions.

In 2008, an archaeological survey was conducted on Pagan (Athens 2009). The survey included approximately 247 acres (100 hectares) near the airfield and about 1,606 acres (650 hectares) in the central part of the island (see [Figure 2](#)). The survey identified 171 sites.

In 2013, the U.S. Army Engineer Research and Development Center and the U.S. Geological Survey conducted a reconnaissance survey and monitoring of a 17.3-mile (27.8-kilometer) corridor surrounding the northern caldera, along the northern, northeastern, and western sides, and along the island's isthmus (Higelmire and DeFant 2013). All areas coincided with existing roads/trails. The survey identified four new archaeological sites, including three World War II Japanese defensive sites and one Pre-Contact habitation site.

As part of this EIS/OEIS, 245 acres (99 hectares) were intensively surveyed with pedestrian transects and 1,510 acres (611 hectares) were visually inspected from vantage points on the ground or aloft from a helicopter (DoN 2014c). As most of this area contained steep topography and was located away from the coast, few sites were identified and primarily consisted of World War II Japanese defensive sites.

Archaeological surveys at Pagan have identified 181 sites (Athens 2009; Higelmire and DeFant 2013; DoN 2014c). The archaeological sites include 25 Pre-Contact sites, 155 Post-Contact sites, plus 1 site with a single feature that was not determinable. Of the 181 sites, 110 were evaluated and recommended eligible for listing in the National Register of Historic Places and 71 were recommended not eligible.

No Post-Contact sites pre-dating the 20th century were identified. Numerous sites dating to the World War II era or to the pre-World War I Japanese occupation were identified (Athens 2009; Higelmire and DeFant 2013; DoN 2014c). Pre-Contact sites dating to the late Latte Period primarily consist of *latte* structures of coral or basalt and grinding stones or *lusong*. There are also cobble pavements, upright stone alignments, possible medicine grinding stones, a *latte* quarry, and a site with dark organic soil and midden (i.e., food remains), all likely associated with the same general period of traditional Chamorro occupation (Athens 2009). These sites are found in relatively sheltered areas, with a fringing reef and beach access to launch fishing canoes, and leeward of prevailing trade winds during the majority of the year.

In addition to recorded archaeological sites, former Pagan residents identified a number of areas in the southern portion of the island that contained the remains of village sites (Athens 2009).

Archaeological surveys have recorded remnants of a few standing structures, such as cisterns and bunkers (Athens 2009; DoN 2014c). Most of the Post-Contact sites and features pertained to the Japanese military occupation of Pagan both prior to and during World War II. These sites include concrete water cisterns, defensive tunnels, bunkers and lookouts, air raid shelters, building foundations, traditional cooking ovens, the Naval airfield and hangar with a drainage and reservoir system, barracks, airplane wreckage and parts, the remains of a meteorological tower, shoreline piers, possible tank trap berms, and traditional Japanese cemeteries, monuments, and shrines.

A traditional cultural properties study was conducted in 2014 (DoN 2014d) and recommended six potential traditional cultural properties on Pagan—traditional fishing areas at South (Regusa) Beach, Red (Shomshon) Beach, Paliat, and Apansanmena, and traditional healing locations at Pialama and a mortar/medicine stone. Local place names for beaches and lakes are presented in [Table 4](#).

Table 4. Local Place Names

<i>Map Place Name</i>	<i>Local Place Name</i>
Blue Beach	Apan
Gold Beach	Dikiki (or Unai Dikidiki)
Green Beach	Palapala
Lower Lake	Laguna Sanhiyon
North Beach	Tarague/Talagie
Red Beach	Shomshon
South Beach	Regussa/Regusa
South Point	Minami Saki
Upper Lake	Laguna Sanhalom

Resources of cultural importance include a variety of medicinal plants, including *fofgo* (morning glory vine), *gàso'so'* (type of bush), *puntan talisai* (tips of *Terminalia catappa*), *galak* (*Asplenium nidus*, a fern), *niyok* (coconut), *Flores Mayu* (a flower), and *ahgao* (*Premna obtusifolia*, a tree). Gathering locations for these plants are widely dispersed across the island, and occur in upland settings and along clifflines adjacent to the shore. Beaches and near-shore reefs used as traditional fishing areas occur along the coast. There are also named locations for the gathering of resources such as *gaddo'* (wild yam), *gapgap* (arrowroot), *sunì* (taro), *pugua* (betel nut), *dagu* (yams), and *kahet* (oranges). These are dispersed resource patches that tend to cluster along the southwestern and eastern coasts of the island. Shomshon Bay is used for mortuary practice. The gathering of betel nuts as a cultural practice occurs in certain locations along the steep slopes on the isthmus and is associated with marriage rituals.

3.0 CULTURAL RESOURCES ENVIRONMENTAL CONSEQUENCES

Under NEPA, the significance of an impact to a cultural resources is driven by the context and intensity of the effects associated with the action. According to Section 106 of the National Historic Preservation Act, adverse effects to historic properties can be caused by alteration or loss of certain aspects or character-defining features of a historic property that contribute to its significance. Adverse effects may result from direct impacts such as physical destruction or damage to a historic property, as well as indirect impacts such as public access restrictions, or changes in setting through visual or audible intrusions when these characteristics are important to the significance of the resource. Several factors

need to be considered to identify and evaluate potential impacts on historic properties and other resources of cultural importance in each alternative.

In the following discussion, the impact analysis is described by range complex, the Military Lease Area-wide proposals, and the projects associated with the proposed action that are located outside of the Military Lease Area. The discussion includes information on the types of activities proposed for each location, the types of impacts that could occur, and the specific historic properties that would be affected.

Department of Defense actions within this area are currently covered by two Programmatic Agreements—one for military training activities relating to the *Mariana Islands Range Complex EIS/OEIS* (DoN 2010a), and one for the *Guam and CNMI Military Relocation EIS* (DoN 2010b) to establish four ranges on Tinian. If an action alternative is selected, then a new Section 106 of the National Historic Preservation Act programmatic agreement would be signed and implemented to resolve adverse effects to historic properties. The programmatic agreement for this proposed action would reference the *Mariana Islands Range Complex EIS/OEIS* programmatic agreement and supersede the Tinian-specific portions of the *Guam and CNMI Military Relocation EIS* programmatic agreement. If the no-action alternative were selected, then Tinian-specific stipulations in the *Guam and CNMI Military Relocation Programmatic Agreement* (Department of Defense 2011) would be implemented. Section 106 consultation for the current proposed action was initiated on April 20, 2013 and will be completed prior to publication of the Final EIS/OEIS.

3.1 METHODOLOGY

3.1.1 Approach to Analysis

The cultural resources impact analysis addresses potential effects to historic properties (districts, sites, buildings, structures, or objects that are listed in or considered eligible for listing in the National Register of Historic Places). The analysis also considers potential impacts to other kinds of resources that may not be eligible for the National Register of Historic Places, including cultural practices, cemeteries, memorials, sacred sites, or medicinal plants. The Tinian and Pagan Range and Training Areas (RTAs) and their associated support facilities/infrastructure construction footprints (described in Chapter 2, *Proposed Action and Alternatives* in the EIS/OEIS) were examined in relation to locations of historic properties and resources of cultural importance using Geographic Information System to identify potential impacts due to construction and operations. Training area disturbance footprints were also accounted for to ensure that the full range of potential impacts was identified. Under the proposed action, impacts may be either direct or indirect and are distinguished as follows.

Direct impacts occur at the same place and/or time as actions generated by proposed construction (e.g., ground-disturbing activities) and operations (e.g., range use). These impacts may include, but are not limited to, the following:

- Physical destruction, damage, or alteration
- Ground disturbances such as excavating, filling, grubbing (i.e., use of heavy equipment to remove vegetation), and vegetation maintenance (i.e., trimming vegetation, mowing grass, limbing trees)

- Demolition

Direct impacts from construction ground disturbance and operational vegetation clearing were assumed within all areas labeled as facility footprints in Chapter 2, *Proposed Action and Alternatives*, and as “Vegetation Maintenance” in Appendix F, *Geology and Soils Technical Memo* in the EIS/OEIS. Vegetation clearance, including grubbing, would occur in areas such as along roads, Convoy Course engagement areas, Tracked Vehicle Driver’s Course, objective areas, and target areas (e.g., Range Complex A).

Indirect impacts are caused by or result from project- or operation-related activities, occur usually later in time or space, and are reasonably foreseeable. Potential causes of indirect impacts include, but are not limited to, the following:

- Reducing public access to historic properties and resources of cultural importance
- Changes in setting through visual or audible intrusions when these characteristics are important to the significance of the resource
- Potential increase in erosion and ground disturbance related to project-related activities
- Deferred monitoring or stabilization of sites, if needed, while ranges are in operation

The process for identifying and evaluating the significance of the impact is determined by the magnitude and nature of the action; the nature and extent of potential effects on historic properties and resources of cultural importance; and the likely nature and location of historic properties and resources of cultural importance within areas that may be affected. Under the National Historic Preservation Act, adverse effects result from the direct loss of character-defining features and/or aspects of integrity of a historic property. Under NEPA, significant impacts to resources of cultural importance could occur if the characteristics that make the resource important to the culture are altered. If significant impacts were determined, then mitigation may be proposed to minimize or mitigate the adverse effects or impacts.

In Section 4.11, *Cultural Resources*, NEPA terminology, such as significant direct impacts, less than significant impacts, or no impacts were used to describe the effects of the proposed action on historic properties. In this appendix, terminology associated with Section 106 of the National Historic Preservation Act will be used when examining project effects to historic properties. This terminology includes adverse effect, no adverse effect, or no effect. When discussing resources of cultural importance, the NEPA terminology will be used.

3.1.2 Resource Management Measures

Several resource management measures were incorporated during the planning stages of the project and have been incorporated into the proposed action to reduce impacts to historic properties and resources of cultural importance. Resource management measures applicable to cultural resources include the following:

Avoidance and Minimization Measures

- To the degree possible, historic properties and resources of cultural importance were avoided when planning initial construction and operations areas for the proposed action. This included moving target locations, firing positions, engagement zones, and Surface Radar sites, and moving the High Hazard Impact Area boundaries to avoid the North Field National Historic Landmark. The Department of Defense also minimized construction associated with the use of

Amphibious Assault Vehicles to a certain beach, and sited roads and construction laydown areas to avoid impacting historic properties where feasible. Construction was avoided on the historic runways in the North Field National Historic Landmark and use of tracked vehicles was avoided on historic roads associated with the landmark. The Department of Defense will further avoid impacts to historic properties and resources of cultural importance during construction and operations through troop education, marking of sensitive areas, repairing roads, and policing areas at the completion of exercises.

- On Tinian and Pagan, if beach sand is compacted or displaced by landing craft so that the natural appearance of the beach has been altered, the beach topography will be restored within 3 days of the exercise using non-mechanized methods (e.g., rakes or other hand tools).
- Specific measures for avoiding and minimizing impacts to historic properties will be stipulated in a Programmatic Agreement regarding the current undertaking. These measures include implementation of the Secretary of the Interior's Standards for Rehabilitation for all maintenance and repair of runways for the North Field Historic Landmark and the evaluation of archaeological resources found during construction or operations. The Department of Defense would follow standard operating procedures as outlined in the agreement document for inventorying areas or properties that have not been inventoried.

Best Management Practices and Standard Operating Procedures

Best management practices and standard operating procedures that are applicable to cultural resources are listed below and described in Appendix D, *Best Management Practices*.

- Best management practices for erosion control, Spill Prevention, Control and Countermeasures Plans, Facility Response Plans, and Hazardous Materials Management Plans will be implemented to prevent indirect impacts to historic properties during construction and operations from potential contaminants and sediments. A Fire Prevention and Management plan will be implemented to minimize fire risk from training activities that could have an indirect impact to historic properties and resources of cultural importance.
- The Department of Defense would implement a Range Training Area Management Plan that would include stipulations to adhere to protection measures established in cultural resource management plans and implement a monitoring program for minimizing groundwater contamination. Through the Range Environmental Vulnerability Assessment program, the Marine Corps will identify potential release of munitions constituents and develop additional best management practices at the ranges to minimize off-site contamination.

A complete listing of best management practices is provided in Appendix D, *Best Management Practices* of the EIS/OEIS.

3.2 TINIAN

3.2.1 Tinian Alternative 1

3.2.1.1 Construction Impacts

As described in Chapter 2, Section 2.4, *Tinian Alternatives*, Tinian Alternative 1 RTA (Range and Training Areas) development and construction would include construction and improvements for support facilities and infrastructure (e.g., base camp, airport, port, Munitions Storage Area, roadways, utilities) and training facilities (e.g., Range Complexes A, B, C, D, and Military Lease Area-wide training assets). These activities would result in ground disturbance (e.g., vegetation clearing, grubbing, grading, excavation, and filling), and potentially affect historic properties and resources of cultural importance.

In total, 1,902 acres (771 hectares) of ground disturbance would occur under Tinian Alternative 1. Specific vegetation clearance areas within Range Complexes A, B, C, and D; the Landing Zone within Range Complex D; and the Military Lease Area-wide training assets are discussed in Section 4.2, *Geology and Soils*, and Appendix F, *Geology and Soils Technical Memo*, in the EIS/OEIS. [Table 5](#) summarizes the historic properties affected by construction activities associated with Tinian Alternative 1. Specific adverse effects to historic properties and impacts to resources of cultural importance are described in more detail by RTA or construction project.

Table 5. Tinian Alternative 1 Summary of Direct Adverse Effects on Historic Properties from Construction

<i>Complex</i>	<i>Range</i>	<i>Number of Historic Properties</i>
Range Complex A	High Hazard Impact Area	20
Range Complex B	Multi-Purpose Training Range, Combat Pistol Range, Anti-Armor Tracking Range, Battle Site Zero Range	9
Range Complex C	Infantry Platoon Battle Course, Field Fire Range, Multi-Purpose Automated Unknown Distance Range	14
Range Complex D	Northern Battle Area Complex, Urban Assault Course	3
Military Lease Area-wide Training Assets and Support Facilities Outside of the Range Complexes	Convoy Course Engagement Areas	8
	Munitions Storage Area	3
	Roads, Fences, and Utilities, Tracked Vehicle Driver's Course	86
	Base Camp	1
	Tactical Amphibious Training Areas	3
	Landing Zones, Artillery Firing Points, Observation Posts, Surface Radar Sites	19
Outside Military Lease Area	Tinian International Airport	2
	Port of Tinian	0
	Tracked Vehicle Transit Lanes/Supply Route	4
Total		172

Range Complex A: Proposed Range Complex A contains a High Hazard Impact Area. Within the High Hazard Impact Area footprint is a perimeter road, a firebreak/buffer, perimeter road and four ground ranges: (1) a Live Hand Grenade Range; (2) a Grenade Launcher Range; (3) a Light Anti-armor Weapon Range; and (4) a Mortar Range (with 10 firing positions). In addition, within the High Hazard Impact Area are target areas for the ground ranges as well as targets for Indirect Artillery Firing Range (firing positions are distributed within various locations in the Military Lease Area) and two aviation ranges – Offensive Air Support Range and Close Air Support Range.

As described in Chapter 2, Section 2.4, *Tinian Alternatives*, ground disturbance within Range Complex A would occur within the footprint of the ground ranges as well as within the target areas. Construction-related activities, such as clearing, grading, excavation, and soil removal associated with construction of a perimeter road, an access road, and target areas, would directly and adversely affect 20 historic properties (Table 6) including 3 Pre-Contact sites (1 ceramic scatter, 2 cave sites), 7 pre-World War II Japanese Administration sites, 4 World War II-era Japanese defensive sites, and 6 World War II American military sites. Two of these sites include two memorials, the Hinode American Memorial Shrine and the Nan'yo Kohatsu Kaisha (NKK) Shrine. Adverse effects would occur to eight historic properties because of the construction of fences and roads around the perimeter of the High Hazard Impact Area. Since sites in this area tend to be large and dispersed, complete avoidance is not possible. However, in most cases only a portion of the site would be affected by construction activities associated with Alternative 1.

Construction would also directly impact 3 acres (1 hectare) of native limestone forest, which could contain resources of cultural importance, such as medicinal plants. Direct impacts to other cultural resources of cultural importance would include the disturbance of the two memorials described above.

Indirect effects to historic properties and impacts to resources of cultural importance due to visual intrusions, access restrictions during construction, and noise increase during construction would not be adverse as they would be intermittent and temporary. The roundabout, a portion of Broadway Avenue, which is an entrance to the North Field National Historic Landmark and a contributing feature to the cultural landscape, would be closed during construction of Range Complex A target objectives. This closure would be temporary and the effect would not be adverse.

**Table 6. Historic Properties Directly Affected by Range Complex A (Construction)
Under Tinian Alternative 1**

<i>Temporary Number</i>	<i>CNMI Site Number</i>	<i>Site Description</i>	<i>Historic Period (s)</i>	<i>NRHP Eligibility Criteria</i>
NA	TN-1/5-0015	Defensive caves	Pre-Contact, Japanese Administration	A,C,D
NA	TN-1/5-0432	Laderan Chiget Defenses, Rockshelters	Pre-Contact, Japanese Administration	A,C,D
NA	TN-1-0441	Ceramic scatter	Pre-Contact	D
NA	TN-4-0007	Asahi (Sunrise) Shrine, Reconstruction	Japanese Administration, American Administration	A,C,D
NA	TN-4-0008	NKK Shrine	Japanese Administration	A,C,D
NA	TN-5-0439	Laderan Gatot Defensive Caves	Japanese Administration	A,D
NA	TN-5-0468	Laderan Gagot Defenses	Japanese Administration	A,D
NA	TN-5-0488	Gun position, Fuel Drum, Japanese Defenses	Japanese Administration	A,D
NA	TN-6-0442	Central Bomb Dump	American Administration	A

**Table 6. Historic Properties Directly Affected by Range Complex A (Construction)
Under Tinian Alternative 1**

<i>Temporary Number</i>	<i>CNMI Site Number</i>	<i>Site Description</i>	<i>Historic Period (s)</i>	<i>NRHP Eligibility Criteria</i>
NA	TN-6-0471	67 th NCB Camp	American Administration	A,D
NA	TN-6-0478	Fuel Tanks, East H-14-C, North Field	American Administration	A,D
NA	TN-6-0480A	121 st NCB Camp	American Administration	A,D
NA	TN-6-0489	"C" Battery, 17 th AAA	American Administration	A,C,D
NA	TN-6-0491	Mine Depot Number 4	American Administration	D
SC-5031	NA	Fourth Farm District (I)	Japanese Administration	A,D
SC-5056	NA	Fourth Farm District (II)	Japanese Administration	A,D
SC-5059	NA	Defensive Complex	Japanese Administration	A,D
SC-5060	NA	Fourth Farm District (VIII)	Japanese Administration	A,D
SC-5061	NA	Fourth Farm District (X)	Japanese Administration	A,D
SC-5062	NA	Fourth Farm District (XI)	Japanese Administration	A,D

Range Complex B: Range Complex B would include six ground ranges: (1) the Combat Pistol Range; (2) Anti-Armor Tracking Range; (3) Tank/Fighting Vehicle Stationary Target Range; (4) Battle Sight Zero Range; (5) Multi-Purpose Training Range; and (6) the Tank/Fighting Vehicle Multi-Purpose Range Complex. Within Range Complex B, ground disturbance associated with construction would include areas of interior roadways and target firing points and objectives. The total ground disturbance area associated with construction for this range complex would be approximately 47 acres (20 hectares).

Construction-related activities such as vegetation clearing, excavation, and soil removal as well as grubbing associated with vegetation clearance of interior roadways and target firing points would directly and adversely affect 9 historic properties ([Table 7](#)), including 4 pre-World War II Japanese Administration sites, 2 World War II-era Japanese defensive sites, and 3 World War II American military sites. No resources of cultural importance were identified within Range Complex B.

As stated above, indirect effects to historic properties and resources of cultural importance due to visual intrusions, access restrictions during construction, and noise increase during construction would be less than significant as they would be intermittent and temporary. Broadway Avenue, an entrance to the North Field National Historic Landmark and a contributing feature to the cultural landscape, would be closed during construction of Range Complex B target objectives. This closure would be temporary would not be an adverse effect to the Landmark.

**Table 7. Historic Properties Directly Affected by Range Complex B (Construction)
Under Tinian Alternative 1**

<i>Temporary Number</i>	<i>CNMI Site Number</i>	<i>Site Description</i>	<i>Historic Period (s)</i>	<i>NRHP Eligibility Criteria</i>
NA	TN-4-0461	Fourth Farm District (VI)	Japanese Administration	D
NA	TN-5/6-0009	Radio Complex, Holding Area for Japanese POWs	Japanese Administration, American Administration	A,C,D
NA	TN-5-1013	Japanese Defenses	Japanese Administration	A,D
NA	TN-6-0480B	9 th NCB Camp	American Administration	A,D
NA	TN-6-0619	U.S. Fuel Farm, East H-14-A	American Administration	A,D
NA	TN-6-0971	"C" Battery, 17 th Anti-Aircraft Gun Position	American Administration	A,D
SC-5022	NA	Second Farm District (I)	Japanese Administration	A,D
SC-5024	NA	Fourth Farm District (IX)	Japanese Administration	A,D
SC-5031	NA	Fourth Farm District (I)	Japanese Administration	A,D

Range Complex C: Range Complex C includes four ground ranges: (1) the Multi-Purpose Automated Unknown Distance Range; (2) Field Fire Range; (3) Infantry Platoon Battle Course; and (4) Urban Assault Course. Within Range Complex C, interior roadways and target areas would require ground disturbance associated with construction. In addition, approximately 20 temporary one-story roofless structures would be installed as part of the proposed Urban Assault Course. The total ground disturbance area associated with construction for this range complex would be approximately 80 acres (32 hectares).

Construction-related activities such as vegetation clearing, excavation, and soil removal would directly and adversely affect 14 historic properties ([Table 8](#)), including 5 pre-World War II Japanese Administration sites, 2 World War II-era Japanese defensive sites, and 7 World War II American military sites. No impacts would occur to resources of cultural importance at Range Complex C due to construction. As stated above, indirect impacts to historic properties and resources of cultural importance due to visual intrusions, access restrictions during construction, and noise increase during construction would be less than significant as they would be intermittent and temporary.

**Table 8. Historic Properties Directly Affected by Range Complex C (Construction)
Under Tinian Alternative 1**

<i>Temporary Number</i>	<i>CNMI Site Number</i>	<i>Site Description</i>	<i>Historic Period (s)</i>	<i>NRHP Eligibility Criteria</i>
NA	TN-6-0031	58 th Wing Headquarters	American Administration	A,D
NA	TN-6-0032	107 th Naval Construction Brigade	American Administration	A,D
NA	TN-6-0049	462 nd Bomb Group	American Administration	A,D
NA	TN-6-0050	Army Garrison Depot	American Administration	A,D
NA	TN-6-0567	U.S. Quarry, Camp Churo Cesspool, Drainage Ditch	American Administration	D
NA	TN-6-0601	444 th Bomb Group	American Administration	A,D
NA	TN-6-0602	6 th Bomb Group, Church	American Administration	A,D
SC-5007B	NA	Third Farm District (II)	Japanese Administration	A,D
SC-5021	NA	Defenses, Farms	Japanese Administration	A,D

**Table 8. Historic Properties Directly Affected by Range Complex C (Construction)
Under Tinian Alternative 1**

<i>Temporary Number</i>	<i>CNMI Site Number</i>	<i>Site Description</i>	<i>Historic Period (s)</i>	<i>NRHP Eligibility Criteria</i>
SC-5034	NA	Kahi Farm District (I)	Japanese Administration	A,D
SC-5036	NA	Mound of Bulldozed farmhouse Debris	Japanese Administration	D
SC-5038	NA	Latte set and ceramic sherds; U.S. gun position and other	Pre-Contact; American Administration	A,D
SC-5039	NA	Kahi Farm District (II)	Japanese Administration	A,D
SC-5046	NA	Kahi Farm District (IV)	Japanese Administration	A,D

Range Complex D: Range Complex D would include: (1) an aviation Drop Zone; (2) an aviation Landing Zone (i.e., existing cleared runways Able, Baker, Charlie); (3) Unmanned Aircraft Systems Ground Station; and (4) a Forward Arming and Refueling Point. Within Range Complex D, there would be expeditionary runways (North Field runways), pathways, and roadways that would require ground disturbance associated with construction. The total ground disturbance area associated with construction for this range complex would be approximately 475 acres (192 hectares). Historic assets, such as runways and remnant structures would be avoided during construction. However, ground disturbance from grading, vegetation clearing, and soil removal would occur in between these assets along interior roadways and at proposed target areas. These construction-related activities would directly and adversely affect three historic properties ([Table 9](#)), all World War II American military archaeological sites. One of the properties, the North Field runways, is a contributing feature to the North Field National Historic Landmark. The landmark would be directly and adversely affected by ground disturbance associated with the construction of the target areas and a portion of the convoy course. The vegetation clearance at the existing runways, however, is considered to be beneficial as it prevents deterioration of the pavement and restores the area to its historic appearance.

No resources of cultural importance were identified within Range Complex D. As stated above, indirect impacts to historic properties and resources of cultural importance due to visual intrusions, access restrictions during construction, and noise increase during construction would be less than significant as they would be intermittent and temporary.

**Table 9. Historic Properties Directly Affected by Range Complex D (Construction)
Under Tinian Alternative 1**

<i>Temporary Number</i>	<i>CNMI Site Number</i>	<i>Site Description</i>	<i>Historic Period (s)</i>	<i>NRHP Eligibility Criteria</i>
NA	TN-5-0936	Battleline	Japanese Administration	A,C,D
NA	TN-6-0364	North Field Runways and Aprons (NHL)	American Administration	A,B,C,D
NA	TN-6-0426	121 st Construction Battalion Service Area	American Administration	A,B,C,D

Military Lease Area-wide Training Assets and Support Facilities Outside of the Range Complexes:

Military Lease Area-wide training assets for all alternatives consist of: (1) 5 aviation Landing Zones; (2) 8 Observation Posts; (3) 4 tactical amphibious training beaches; (4) 10 Field Artillery Indirect Firing Range firing points; (5) a Convoy Course; (6) a Tracked Vehicle Driver's Course; and (7) 6 Surface Radar sites. Support facilities, including the base camp, Munitions Storage Area, access roads, gates, fences, and utilities (including water, wastewater, electrical, information technology, communications, and solid waste), that are located in the Military Lease Area are also discussed in this section.

Construction-related activities would directly and adversely affect 120 historic properties:

- Eight historic properties would be affected by affected by grading, excavation, and soil removal associated with road construction and grubbing associated with vegetation clearance of the proposed Convoy Course Engagement Areas ([Table 10](#)). These historic properties include 3 pre-World War II Japanese Administration sites, 2 World War II-era Japanese defensive sites, and 3 World War II American military sites (including a contributing feature to the Landmark);
- Three historic properties would be affected by grading, excavation and soil removal within the proposed Munitions Storage Area ([Table 11](#)). These historic properties include three pre-World War II Japanese Administration sites;
- Eighty-six historic properties would be affected by grading, excavation, and soil removal through widening of roads, trenching for utility lines, erection of fences, and improvements for the Tracked Vehicle Driver's Course ([Table 12](#)). These historic properties include 4 Pre-Contact *latte* sites, 5 Pre-Contact ceramic scatters, 2 Pre-Contact cave sites, 29 pre-World War II Japanese Administration sites, 17 World War II-era Japanese defensive sites, and 29 World War II American military sites;
- One historic property, West Field, would be affected by grading, excavation, and soil removal within the proposed base camp ([Table 13](#));
- Three historic properties at the amphibious training areas would be affected by grading, excavation, and soil removal associated with road construction and heavy machinery use during construction activities ([Table 14](#)), including the World War II landing beach at Unai Chulu, a potential traditional cultural property, and a *latte* site; and
- Nineteen historic properties would be affected by grading, excavation, and soil removal associated with clearing and construction at artillery firing points, Surface Radar locations, and Observation Posts, and grubbing and vegetation clearing at the landing zones ([Table 15](#)). These historic properties include 1 Pre-Contact *latte* site, 8 pre-World War II Japanese Administration sites, 4 World War II-era Japanese defensive sites, and 6 World War II American military sites.

**Table 10. Historic Properties Directly Affected by Convoy Course Engagement Areas (Construction)
Under Tinian Alternative 1**

<i>Temporary Number</i>	<i>CNMI Site Number</i>	<i>Site Description</i>	<i>Historic Period (s)</i>	<i>NRHP Eligibility Criteria</i>
NA	TN-5-0589A	JPN Airfield No. 2	Japanese Administration	A,C
NA	TN-5/6-0355	Unai Babui Defenses	Japanese Administration, American Administration	A,C,D
NA	TN-6-0364	North Field Runways and Aprons (NHL)	American Administration	A,B,C,D
NA	TN-5-0526	Defensive platform	Japanese Administration	A,D
NA	TN-6-0567	U.S. Quarry, Camp Churo Cesspool, Drainage Ditch	American Administration	D
NA	TN-6-0612	Extension of West Field Runway No. 4	American Administration	A
SC-5044	NA	Kahi Farm District (III)	Japanese Administration	A,C,D
SC-5049	NA	Shinminato Farm District (II)	Japanese Administration	A,D

**Table 11. Historic Properties Directly Affected by Munitions Storage Area (Construction)
Under Tinian Alternative 1**

<i>Temporary Number</i>	<i>CNMI Site Number</i>	<i>Site Description</i>	<i>Historic Period (s)</i>	<i>NRHP Eligibility Criteria</i>
NA	TN-5-0589A	JPN Airfield No. 2	Japanese Administration	A,C
NA	TN-5/6-0589C	JPN Airfield No. 2; U.S. West Field Runway No. 4	Japanese Administration, American Administration	A
SC-5042	NA	Third Farm District (III)	Japanese Administration	A,D

Table 12. Historic Properties Directly Affected by Roads, Fences, and Utilities, Tracked Vehicle Driver's Course (Construction) Under Tinian Alternative 1

<i>Temporary Number</i>	<i>CNMI Site Number</i>	<i>Site Description</i>	<i>Historic Period (s)</i>	<i>NRHP Eligibility Criteria</i>
NA	TN-1/2/4-0592	Masalok <i>Latte</i> sets	Pre-Contact, Spanish Administration, Japanese Administration	A,D
NA	TN-1/2-0591	<i>Latte</i> sets	Pre-Contact, Spanish Administration	A,D
NA	TN-1/5-0015	Defensive caves	Pre-Contact, Japanese Administration	A,C,D
NA	TN-1/5-0432	Rockshelters, Laderan Chiget Defenses	Pre-Contact, Japanese Administration	A,C,D
NA	TN-1-0073	Unai Chulu <i>Latte</i> Complex	Pre-Contact	A,C,D
NA	TN-1-0074	Unai Babui <i>Latte</i> Set (not landing beach)	Pre-Contact	A,D
NA	TN-1-0404	Ceramic scatter	Pre-Contact	D
NA	TN-1-0431	Ceramic scatter	Pre-Contact	D
NA	TN-1-0594	Artifact scatter	Pre-Contact	D
NA	TN-1-0691	Artifact scatter	Pre-Contact	D
NA	TN-4/6-002	Chulu/Churo Village and Internment Camp	Japanese Administration, American Administration	A,D
	TN-4/6-0599	Agricultural Facility, 696 Signal Aircraft Warning Company	Japanese Administration, American Administration	A,C,D
NA	TN-4-0006	Japanese Village (Hagoi) with Railroad line	Japanese Administration	A,D
	TN-4-0461	Fourth Farm District (VI)	Japanese Administration	D
NA	TN-4-1108	Japanese agricultural feature: rock enclosure	Japanese Administration	D
NA	TN-4-1178	Farmstead	Japanese Administration	A,C,D
NA	TN-4-1182	Japanese railroad	Japanese Administration	A,C,D
NA	TN-5/6-0016	NHL: Unai Chulu Pillboxes, White Beach 2 (Chulu), Bunkers and World War II Assault Beach	Japanese Administration, American Administration	A,B,C,D
NA	TN-5/6-0355	Unai Babui Defenses	Japanese Administration, American Administration	A,C,D
NA	TN-5/6-0589B	JPN Airfield No. 2; U.S. West Field Runway No. 4	Japanese Administration, American Administration	A
NA	TN-5/6-589C	JPN Airfield No. 2; U.S. West Field Runway No. 4	Japanese Administration, American Administration	A
NA	TN-5-0018	Ushi Field Drainage Ditch	Japanese Administration	A,C,D
NA	TN-5-0019	Tahgong Revetment	Japanese Administration	A,C,D
NA	TN-5-0363	Gun emplacement	Japanese Administration	A,C,D
NA	TN-5-0463	Mount Lasso Defenses	Japanese Administration	A,C,D
NA	TN-5-0543	Radio Direction Finding Tower Bases, Radio Station	Japanese Administration	A,C,D

Table 12. Historic Properties Directly Affected by Roads, Fences, and Utilities, Tracked Vehicle Driver's Course (Construction) Under Tinian Alternative 1

<i>Temporary Number</i>	<i>CNMI Site Number</i>	<i>Site Description</i>	<i>Historic Period (s)</i>	<i>NRHP Eligibility Criteria</i>
NA	TN-5-0558	Japanese gun positions, fuel drum enclosures	Japanese Administration	A,D
NA	TN-5-0574	JPN Concrete Terraced Structure (Possible Water Management)	Japanese Administration	D
NA	TN-5-0589A	JPN Airfield No. 2	Japanese Administration	A,C
NA	TN-5-0690	Anti-Aircraft Defenses	Japanese Administration	A,C,D
NA	TN-5-0936	Battleline	Japanese Administration	A,C,D
NA	TN-5-1010	NKK East Building	Japanese Administration	D
NA	TN-5-1013	JPN Defenses (expanded)	Japanese Administration	A,D
NA	TN-5-1025	JPN Defenses, Foxhole Complex	Japanese Administration	A,D
NA	TN-5-1089	JPN Defenses (expanded)	Japanese Administration	A,C,D
NA	TN-5-1140	Japanese defensive position, machine-gun post	Japanese Administration	A,C,D
NA	TN-6-0030	West Field	American Administration	A,D
NA	TN-6-0036	313 th Bomb Wing Headquarters	American Administration	A,D
NA	TN-6-0038	Army Hospital	American Administration	A,C,D
NA	TN-6-0039	509 th Composite Group	American Administration	A,B,C,D
NA	TN-6-0042	17 th Anti-Aircraft Artillery Recreational Structure	American Administration	A,B,C,D
NA	TN-6-0043	Munitions Quonsets, Masalok Bomb Dump	American Administration	A
NA	TN-6-0045	Masalok Revetments	American Administration	A,D
NA	TN-6-0051	Guard Rail	American Administration	D
NA	TN-6-0056	504 th BG Camp	American Administration	A,D
NA	TN-6-0362	509 th Composite Group Service Area	American Administration	A,C,D
	TN-6-0364	NHL: North Field Runways and Aprons	American Administration	A,B,C,D
NA	TN-6-0398	U.S. Marine Corps Former Cemetery	American Administration	A
NA	TN-6-0401	313 th Wing Base Service Command	American Administration	A,D
NA	TN-6-0402	B-29 Service Apron	American Administration	A,B,D
NA	TN-6-0471	67 th Naval Construction Battalion Camp	American Administration	A,D
NA	TN-6-0480A	121 st Naval Construction Battalion Camp	American Administration	A,D
NA	TN-6-0481	18 th Naval Construction Battalion, Temporary 509 th Composite Camp	American Administration	A,B,D
NA	TN-6-0491	Mine Depot Number 4	American Administration	D
NA	TN-6-0531	West H-14C fuel tanks	American Administration	D

Table 12. Historic Properties Directly Affected by Roads, Fences, and Utilities, Tracked Vehicle Driver's Course (Construction) Under Tinian Alternative 1

<i>Temporary Number</i>	<i>CNMI Site Number</i>	<i>Site Description</i>	<i>Historic Period (s)</i>	<i>NRHP Eligibility Criteria</i>
NA	TN-6-0603	9 th Bomb Group	American Administration	A,D
NA	TN-6-0605	40 th Bomb Group	American Administration	A,D
NA	TN-6-0606	87 th and 25 th Service Corps	American Administration	A,D
NA	TN-6-0609	"C" Battery, 18 th Anti-Aircraft Artillery	American Administration	A,D
NA	TN-6-0610	"A" Battery, 18 th AAA	American Administration	A,D
NA	TN-6-0612	Extension of West Field Runway No. 4	American Administration	A
NA	TN-6-0613	"D" Battery, 18 th AAA	American Administration	A,D
NA	TN-6-0619	U.S. Fuel Farm, East H-14-A	American Administration	A,D
SC-5003	NA	Artifacts, East Hagoi Farm District (II)	Pre-Contact, Japanese Administration	A,D
SC-5009B	NA	Chulu Farm District (II)	Japanese Administration	A,C,D
SC-5018	NA	Fourth Farm District (V)	Japanese Administration	A,C,D
SC-5020	NA	Defensive Caves	Japanese Administration	A,D
SC-5027	NA	112 th NCB Camp	American Administration	A,D
SC-5040	NA	Kahi Administrative Center (portion)	Japanese Administration	A,D
SC-5042	NA	Third Farm District (III)	Japanese Administration	A,D
SC-5043	NA	Third Farm District (IV)	Japanese Administration	A,D
SC-5044	NA	Kahi Farm District (III)	Japanese Administration	A,C,D
SC-5048	NA	Shinminato Farm District (I)	Japanese Administration	A,D
SC-5049	NA	Shinminato Farm District (II)	Japanese Administration	A,D
SC-5053	NA	U.S. Quarry	American Administration	D
SC-5054	NA	Shinminato Farm District (III)	Japanese Administration	A,D
SC-5055	NA	Fourth Farm District (IV)	Japanese Administration	A,D
SC-5056	NA	Fourth Farm District (II)	Japanese Administration	A,D
SC-5059	NA	Defensive cave	Japanese Administration	A,D
SC-5060	NA	Fourth Farm District (VII)	Japanese Administration	A,D
SC-5061	NA	Fourth Farm District (X)	Japanese Administration	A,D
SC-5062	NA	Fourth Farm District (XI)	Japanese Administration	A,D
SC-5065	NA	Second Farm District (III)	Japanese Administration	A,D
SC-5066	NA	Second Farm District (IV)	Japanese Administration	A,D
SC-5067	NA	Second Farm District (V)	Japanese Administration	A,D
SC-5068	NA	Second Farm District (VI), Piña section	Japanese Administration	A,D

Table 13. Historic Properties Directly Affected by Base Camp (Construction) Under Tinian Alternative 1

<i>Temporary Number</i>	<i>CNMI Site Number</i>	<i>Site Description</i>	<i>Historic Period (s)</i>	<i>NRHP Eligibility Criteria</i>
NA	TN-6-0030	West Field	American Administration	A,D

Table 14. Historic Properties Directly Affected by Tactical Training Areas (Construction) Under Tinian Alternative 1

<i>Temporary Number</i>	<i>CNMI Site Number</i>	<i>Site Description</i>	<i>Historic Period (s)</i>	<i>NRHP Eligibility Criteria</i>
NA	TN-1-0073	Unai Chulu <i>Latte</i> Set	Pre-Contact	A,D
NA	TN-5/6-0016	Unai Chulu Pillboxes, White Beach 2 (Chulu), Bunkers and World War II Assault Beach (NHL)	Japanese Administration, American Administration	A,C,D
NA	NA	Unai Chulu Beach Traditional Cultural Property	Post World War II	A

Table 15. Historic Properties Directly Affected by Landing Zones, Artillery Firing Points, Observation Posts, and Surface Radar Sites (Construction) Under Tinian Alternative 1

<i>Temporary Number</i>	<i>CNMI Site Number</i>	<i>Site Description</i>	<i>Historic Period (s)</i>	<i>NRHP Eligibility Criteria</i>
NA	TN-1-0074	<i>Latte</i> site (Unai Babui) (not landing beach)	Pre-Contact	A,D
NA	TN-4/6-0599	Agricultural Facility, 696 Signal Aircraft Warning Company	Japanese Administration, American Administration	A,C,D
NA	TN-5-0019	Revetments	Japanese Administration	A,C,D
NA	TN-5-0439	Laderan Gatot Defensive Caves	Japanese Administration	A,D
NA	TN-6-0030	West Field	American Administration	A,D
NA	TN-6-0042	17 th Anti-Aircraft Artillery Recreational Structure	American Administration	A,B,C,D
NA	TN-6-0442	Central Bomb Dump	American Administration	A
NA	TN-6-0491	Mine Depot Number 4	American Administration	D
NA	TN-6-0606	87 th and 25 th Service Corps	American Administration	A,D
SC-5001	NA	17 th AAA Camp (Camp Stinson)	American Administration	D
SC-5009B	NA	Chulu Farm District (II)	Japanese Administration	A,D
SC-5020	NA	Defenses, Farms	Japanese Administration	A,D
SC-5021	NA	Defenses, Farms	Japanese Administration	A,D
SC-5031	NA	Fourth Farm District (I)	Japanese Administration	A,D
SC-5055	NA	Fourth Farm District (IV)	Japanese Administration	A,D
SC-5059	NA	Defensive Cave	Japanese Administration	A,D
SC-5062	NA	Fourth Farm District (XI)	Japanese Administration	A,D
SC-5065	NA	Second Farm District (III)	Japanese Administration	A,D
SC-5067	NA	Second Farm District (V)	Japanese Administration	A,D

Most of the adverse effects associated with these properties occur because of the construction of fences and roads or the grubbing associated with the clearance of landing areas and Observation Posts. As these are large, dispersed sites occurring throughout the Military Lease Area, complete avoidance is not possible. However, in most cases only a portion of the site would be affected by the proposed action. Existing roads surrounding the North Field National Historic Landmark, which are recommended as contributing features to the cultural landscape, would be improved for public access and for use by the Convoy Course and the Tracked Vehicle Driver's Course. Improvement of poorly maintained roads would be a beneficial impact to the landmark; however, grubbing and clearing associated with the construction of the roads would have an adverse effect to other historic properties.

Additionally, an amphibious landing area would be constructed at Unai Chulu. Construction would occur at the access roads leading to the beach and on an area off shore, where a ramp would be erected to assist in AAV training operations. Heavy machinery would be used on the beach and a construction laydown area would be placed behind the beach in an area of low archaeological sensitivity as defined through archaeological testing (Athens 2009). Ground disturbance associated with the use of heavy machinery on the beach and on the existing access roads would have a direct and adverse effect on three historic properties. Unai Chulu, in addition to being a contributing feature of the North Field National Historic Landmark, includes a Pre-Contact *latte* site and is considered a potential traditional cultural property. A permanent change in the setting of the beach would be an adverse effect to the potential traditional cultural property. An additional staging area would be located at North Field on an existing cleared runway, which would not adversely affect the runways or the landmark since it would be temporary and not involve ground disturbance.

An underwater study (Burns 2010) identified a series of magnetic anomalies that potentially represent a submerged cultural resource (e.g., an Amphibious Assault Vehicle, portions of a shipwreck, or historic debris) within the area of proposed dredging around the ramp at Unai Chulu. Marine biological surveys in the area have identified anchors and remnants of World War II-era amphibious assault vehicles. Depending upon the type of submerged cultural resource, it could be managed under the Sunken Military Craft Act, as well as the National Historic Preservation Act.

The purpose of the Sunken Military Craft Act is to protect sunken military vessels and aircraft and the remains of their crews from unauthorized disturbance. This statute confirms that these vessels are sovereign property and provides for archaeological research permits and civil enforcement measures, including substantial penalties, to prevent unauthorized disturbance. Under the Sunken Military Craft Act, a permit is required before any disturbance or investigations can occur to a sunken military craft. Wreck sites that are not entire aircraft or ships, but are parts strewn in a debris field are considered archaeological sites and are managed in accordance with the National Historic Preservation Act. Further investigation would be required to identify the nature of the anomalies. To the degree possible, these anomalies would be avoided during construction. If they cannot be avoided, identification efforts would be conducted to determine whether the anomalies represent a historic property. Therefore, construction of an amphibious landing ramp may impact submerged historic properties.

No resources of cultural importance were identified within the construction areas for these training asset areas. As stated above, indirect impacts to historic properties and resources of cultural importance due to visual intrusions, access restrictions during construction, and noise increase during construction would be less than significant as they would be intermittent and temporary.

Construction of the ramp would likely cause a change in the local fish populations; some populations could decrease, while others may increase (see Chapter 4, *Marine Biology*, Section 4.10.3.1, *Tinian Alternative 1*). As this change would be temporary during the construction process, it would not be an adverse effect to the potential traditional cultural property.

Outside the Military Lease Area: Construction-related activities outside of the Military Lease Area would occur in an area immediately north of the Tinian International Airport runways and at the Port of Tinian, as well as along road modified to accommodate Tracked Vehicle Transit Lanes and a Supply Route. The proposed Port of Tinian improvements consist of the following proposed improvements: (1) a Biosecurity Vehicle Inspection Area; (2) a Biosecurity Cargo Inspection & Holding Area; (3) Biosecurity Facility; (4) a Vehicle Washdown Facility; (5) Notional Stormwater Retention Ponds; (6) a Bulk Fuel Storage Area; (7) improvements to existing boat ramps and (8) a Landscaped Area. All of the area proposed for development at the Port of Tinian and along the Tracked Vehicle Transit Lanes and Supply Route have been surveyed. Construction-related activities such as clearing, excavation, and soil removal as well as grubbing and vegetation clearance of roadways and port and aircraft support structures would directly and adversely affect six historic properties, which include two Pre-Contact sites (ceramic/artifact scatters), three pre-World War II Japanese Administration sites, and one World War II American military site ([Table 16](#) and [Table 17](#)).

**Table 16. Historic Properties Directly Affected by Tinian International Airport (Construction)
Under Tinian Alternative 1**

<i>Temporary Number</i>	<i>CNMI Site Number</i>	<i>Site Description</i>	<i>Historic Period (s)</i>	<i>NRHP Eligibility Criteria</i>
NA	TN-6-0030	West Field	American Administration	A,D
SC-5043	NA	Third Farm District (IV)	Japanese Administration	A,D

Table 17. Historic Properties Directly Affected by Port of Tinian Improvement and Tracked Vehicle Transit Lanes/Supply Route (Construction) Under Tinian Alternative 1

<i>Temporary Number</i>	<i>CNMI Site Number</i>	<i>Site Description</i>	<i>Historic Period (s)</i>	<i>NRHP Eligibility Criteria</i>
NA	TN-1-0691	Artifact scatter	Pre-Contact	D
NA	TN-4-1182	Japanese railroad	Japanese Administration	A,C,D
SC-5043	NA	Third Farm District (IV)	Japanese Administration	A,D
	T-9	Artifact scatter	Pre-Contact, Japanese Administration	D

No resources of cultural importance were identified within the proposed construction areas for these training asset areas. As stated above, indirect effects to historic properties and resources of cultural importance due to visual intrusions, access restrictions during construction, and noise increase during construction would be less than significant as they would be intermittent and temporary.

3.2.1.2 Operation Impacts

Training facility operations and maintenance would occur within the Military Lease Area, immediately north of Tinian International Airport runways, and at the Port of Tinian. Live-fire and aviation training would occur at Range Complex A; vehicle-mounted and dismounted (i.e., by foot) training involving firing at stationary and moving targets by rifles, machine guns and rocket launchers would occur at

Range Complex B; platoon level training involving firing at targets with rifles and inert grenades, rockets, and mortars at Range Complex C; and aviation training and ground training would occur at Range Complex D. The ground training at Range Complex D would involve mostly foot traffic and use of rifles and inert ammunition for grenade launchers, mortars, and rockets.

Other operations within the Military Lease Area would include use of firing points into the High Hazard Impact Area, convoy course engagement areas, landing zones and the Observation Posts and Surface Radar sites, and foot and vehicle traffic on roads and the Tracked Vehicle Driver's Course. In general, the footprint for operations is very similar to construction footprints and most ground disturbance and effects to historic properties and resources of cultural importance would occur during construction of the RTA. Therefore, since disturbance to historic properties has been accounted for in the ranges under construction impacts, impacts to historic properties from training operations at the range complexes B, C, and D will focus on training maneuvers. Training maneuvers concern vehicle and foot traffic within areas; no digging would occur within maneuver areas. However, potential ground disturbance to historic properties in Range Complex A is larger than the footprint for construction and could occur throughout the High Hazard Impact Area.

[Table 18](#) summarizes the historic properties affected by operations for Tinian Alternative 1; impacts associated with construction are summarized in [Table 17](#). In Range Complex A, twelve sites, also affected by construction activities under Tinian Alternative 1, would be significantly impacted by operations ([Table 19](#)).

**Table 18. Tinian Alternative 1 Summary of Direct Adverse Effects on
Historic Properties from Operations**

Complex	Range	Number of Historic Properties
Range Complex A	High Hazard Impact Area	12*
Range Complex B	Multi-Purpose Training Range, Combat Pistol Range, Anti-Armor Tracking Range, Battle Site Zero Range	0
Range Complex C	Infantry Platoon Battle Course, Field Fire Range, Multi-Purpose Automated Unknown Distance Range	0
Range Complex D	Northern Battle Area Complex, Urban Assault Course	0
Military Lease Area-wide Training Assets and Support Facilities Outside of the Range Complexes	Convoy Course Engagement Areas	0
	Munitions Storage Area	0
	Roads, Fences, and Utilities, Tracked Vehicle Driver's Course	0
	Base Camp	0
	Tactical Amphibious Training Areas	3
	Landing Zones, Artillery Firing Points, Observation Posts, Surface Radar Sites	0
Outside Military Lease Area	Tinian International Airport	0
	Port of Tinian	0
	Tracked Vehicle Transit Lanes/Supply Route	0
Total		15

Note: *All of these sites are affected under construction, but are located outside of the area of proposed ground disturbance for construction. Sites solely in the construction area are not included in this total.

**Table 19. Historic Properties Directly Affected by Range Complex A (Operations)
Under Tinian Alternative 1**

<i>Temporary Number</i>	<i>CNMI Site Number</i>	<i>Site Description</i>	<i>Historic Period (s)</i>	<i>NRHP Eligibility Criteria</i>
NA	TN-5-0468	Laderan Gagot Defenses	Japanese Administration	A,D
NA	TN-5-0488	Gun position, Fuel Drum, Japanese Defenses	Japanese Administration	A,D
NA	TN-6-0442	Central Bomb Dump	American Administration	A
NA	TN-6-0471	67th NCB Camp	American Administration	A,D
NA	TN-6-0478	Fuel Tanks, East H-14-C, North Field	American Administration	A,D
NA	TN-6-0489	"C" Battery, 17th AAA	American Administration	A,C,D
NA	TN-6-0491	Mine Depot Number 4	American Administration	D
SC-5031	NA	Fourth Farm District (I)	Japanese Administration	A,D
SC-5056	NA	Fourth Farm District (II)	Japanese Administration	A,D
SC-5060	NA	Fourth Farm District (VIII)	Japanese Administration	A,D
SC-5061	NA	Fourth Farm District (X)	Japanese Administration	A,D
SC-5062	NA	Fourth Farm District (XI)	Japanese Administration	A,D

During training events, foot and vehicle maneuvering would occur within range complexes, Tracked Vehicle Driver's Course, Convoy Course, maneuver areas, and roads. Vehicle traffic would be confined to established roads and trails that are designed to avoid historic properties and, therefore, would not impact historic properties. Use of historic roads associated with the North Field National Historic Landmark by convoys and other vehicles would be in keeping with existing use and would not have an adverse effect on this historic property. Tracked vehicles would use newly constructed gravel roads adjacent to the historic roads to prevent damage. Effects to historic properties from foot traffic would be minimal, as it would occur primarily on roads and designated pathways or sporadically throughout the maneuver areas.

Tactical amphibious training would occur at four beaches—Unai Chulu, Unai Babui, Unai Masalok, and Unai Lam Lam. Training at Unai Chulu would involve Amphibious Assault Vehicles, Landing Craft Air Cushion vessels, inflatable boats, and combat swimmers. Training at Unai Babui and Unai Masalok would involve the use of Landing Craft Air Cushion vessels, combat swimmers, and inflatable boats. Amphibious training at Unai Lam Lam would involve inflatable boats and combat swimmers. No direct adverse effects would occur to historic properties associated with these beaches due to training operations. Training and range management activities associated with Tinian Alternative 1 would directly affect three historic properties ([Table 20](#)), the landing beach at Unai Chulu, which is part of the North Field National Historic Landmark, a potential traditional cultural property, and a *latte* site due to ground disturbance caused by Amphibious Assault Vehicle traffic. As much as possible impacts to the *latte* site would be avoided by using existing and newly constructed roads.

**Table 20. Historic Properties Directly Affected by Tactical Amphibious Training Areas (Operations)
Under Tinian Alternative 1**

<i>Temporary Number</i>	<i>CNMI Site Number</i>	<i>Site Description</i>	<i>Historic Period (s)</i>	<i>NRHP Eligibility Criteria</i>
NA	TN-1-0073	Unai Chulu <i>Latte</i> Complex	Pre-Contact	A,C,D
NA	TN-5/6-0016	NHL: Unai Chulu Pillboxes, White Beach 2 (Chulu), Bunkers and World War II Assault Beach/Traditional Cultural Property	Japanese Administration, American Administration	A,C,D
NA	NA	Unai Chulu Beach Traditional Cultural Property	Post-World War II	A

Within the surface danger zones, which are safety buffers that surround target areas and live-fire maneuver areas and would contain projectiles, fragments, debris and components resulting from the firing of weapons, the potential for direct impacts from strikes from stray rounds is extremely low. The ranges would be designed to contain live-fire inside the boundaries to minimize the potential for rounds landing outside the surface danger zones. Additionally, if a stray round were to escape the ranges, the chance of it hitting a historic property is remote, given the size of the surface danger zones and dispersal of historic properties.

Resources of cultural importance, such as cemeteries, memorials, or potential areas with medicinal plants, would not be directly impacted at these training asset areas by training operations.

In general, public access would be allowed to all locations except for the High Hazard Impact Area, the Munitions Storage Area, the base camp, and the Observation Posts and Surface Radar sites, when training is not occurring. It is envisioned that public access to some or all areas of the RTA, with the exceptions mentioned above, would occur during a couple of daylight hours on a nearly daily basis during the 20 weeks of live-fire training. A range control facility and dedicated range scheduler would be in place to assess public access in real-time and to provide advance notice of public access dates, time frames, and areas. Range control and the scheduler would coordinate public access directly with the Tinian Mayor's Office and other interested parties, such as ranchers and entities within the tourism industry. Access procedures would be implemented to ensure safety and provide guidance and direction. Therefore, intermittent and temporary loss of public access is not considered a significant indirect impact to cultural resources. Historic properties within the High Hazard Impact Area, base camp, Munitions Storage Area, and the Observation Posts and Surface Radar sites would already have been adversely affected by construction activities and loss of access to these areas would be a less than significant impact.

The roundabout, a portion of Broadway Avenue, which is an entrance to the North Field National Historic Landmark and a contributing feature to the cultural landscape, would be closed permanently by the use of the High Hazard Impact Area of Range Complex A. This closure would be permanent and would be an indirect adverse effect to the Landmark.

The permanent presence of Observation Posts and Surface Radar Sites would not be visible to most historic properties. However, towers associated with Surface Radar sites would be constructed at Unai

Babui and near Unai Dankulo. A Surface Radar site would be constructed adjacent and south of Unai Dankulo and would be visible from the beach, which is a potential traditional cultural property. Another Surface Radar site would be constructed within a *latte* site at Unai Babui. The permanent location of these towers would have an indirect adverse effect to these historic properties.

Construction of the ramp would likely cause a change in the local fish populations through a permanent loss in coral reef habitat; some populations could decrease, while others may increase, with a decrease in fishes relying on coral reefs. As this shoreline is part of a potential traditional cultural property associated with fishing, this change would be an indirect adverse effect to the historic property.

3.2.2 Tinian Alternative 2

3.2.2.1 Construction Impacts

As described in Chapter 2, Section 2.4.3, Tinian Alternative 2 construction activities would occur within the Military Lease Area, immediately north of the Tinian International Airport runways, and at the Port of Tinian. Tinian Alternative 2 construction activities would occur within the same areas as Tinian Alternative 1, but would accommodate an additional Battle Area Complex (Range Complex C) and five additional Convoy Course Engagement Areas. This development and construction would result in 2,025 acres (820 hectares) of ground disturbance (e.g., vegetation clearing, grubbing, grading, excavation, and filling), and affect historic properties and resources of cultural importance. [Table 21](#) summarizes the 182 historic properties affected by construction-related activities for Tinian Alternative 2, which is slightly more than the 172 affected under Tinian Alternative 1. Specific adverse effects to historic properties and resources of cultural importance are described in more detail by RTA or construction project below.

**Table 21. Tinian Alternative 2 Summary of Direct Adverse Effects on
Historic Properties from Construction**

<i>Complex</i>	<i>Range</i>	<i>Number of Historic Properties</i>
Range Complex A	High Hazard Impact Area	20
Range Complex B	Multi-Purpose Training Range, Combat Pistol Range, Anti-Armor Tracking Range, Battle Site Zero Range	9
Range Complex C	Southern Battle Area Complex: Infantry Platoon Battle Course, Field Fire Range, Multipurpose Automated Unknown Distance Range, Urban Assault Course	25
Range Complex D	Northern Battle Area Complex, Urban Assault Course	3
Military Lease Area-wide Training Assets and Support Facilities Outside of the Range Complexes	Convoy Course Engagement Areas	7
	Munitions Storage Area	3
	Roads, Fences, and Utilities, Tracked Vehicle Driver's Course	86
	Base Camp	1
	Tactical Amphibious Training Areas	3
Outside Military Lease Area	Landing Zones, Artillery Firing Points, Observation Posts, Surface Radar Sites	19
	Tinian International Airport	2
	Port of Tinian	0
	Tracked Vehicle Transit Lanes/Supply Route	4
Total		182

Range Complex A: Construction-related activities such as grubbing, grading, and soil removal at Range Complex A under Tinian Alternative 2 would be the same as under Tinian Alternative 1 and would directly and adversely affect the same 20 historic properties as described in [Table 6](#) and the same resources of cultural importance (native limestone forest and two memorials) discussed under Tinian Alternative 1. Visual intrusions, access restrictions during construction, and noise increase during construction would not adversely affect historic properties as these effects would be intermittent and temporary. The roundabout, a portion of Broadway Avenue, which is an entrance to the North Field National Historic Landmark and a contributing feature to the cultural landscape, would be closed during construction of Range Complex A target objectives. This closure would be temporary and the impact would not be an adverse effect.

Range Complex B: Construction-related activities at Range Complex B under Tinian Alternative 2 would be the same as under Tinian Alternative 1 and would directly and adversely affect the same 9 historic properties as described in [Table 7](#). No resources of cultural importance were identified within Range Complex B.

Range Complex C: Under Tinian Alternative 2, the proposed Range Complex C consists of: (1) a Multi-Purpose Automated Unknown Distance Range; (2) Infantry Platoon Battle Course Objective Areas; (3) Infantry Platoon Battle Course Lines of Sight; (4) Urban Assault Course South Objective Area; (5) Urban Assault Course South Line of Sight; (6) Infantry Platoon Battle Course Access Roads; (7) southern Battle Area Complex Objective Areas; (8) southern Battle Area Complex Lines of Sight; (9) southern Battle Area Complex Access Roads; (10) southern Battle Area Complex Urban Assault Course Objective Area; and (11) southern Battle Area Complex Urban Assault Course Line of Sight. Within the Infantry Platoon Battle Course there are firing points, lines of sight to the targets (objective areas), and objective areas. Within the Urban Assault Course there are approximately 20 one-story open-roofed structures as well as target objective areas.

Construction-related activities such as vegetation clearing, excavation, and soil removal would directly and adversely affect 25 historic properties ([Table 22](#)), compared to the 14 affected under Tinian Alternative 1. They would include 1 Pre-Contact site, 14 pre-World War II Japanese Administration sites, 1 World War II-era Japanese defensive site, and 9 World War II American military sites. Most of these adverse effects occur because of the construction of roads to the target areas. Since sites in this area tend to be large and dispersed, complete avoidance is not possible. However, in most cases only a portion of the site would be affected by the proposed action. No resources of cultural importance were identified within Range Complex C. Visual intrusions, access restrictions during construction, and noise increase during construction would not have an adverse effect to historic properties as they would be intermittent and temporary.

Range Complex D: Construction-related activities under Tinian Alternative 2 would be the same as under Tinian Alternative 1 and would directly and adversely affect three historic properties, all World War II American military archaeological sites (see [Table 9](#)). One of the properties, the North Field runways and associated areas, is a contributing feature to the North Field National Historic Landmark. Although the runways themselves would be avoided, the surrounding area would be disturbed by construction and vegetation clearing. Therefore, the Landmark would be adversely affected by ground disturbance associated with the construction of the target areas and a portion of the Convoy Course. Vegetation clearance at the existing runways within the proposed Drop Zone, however, is considered to

be beneficial as it prevents deterioration of the pavement and restores the area to its historic appearance.

**Table 22. Historic Properties Directly Affected by Range Complex C (Construction)
Under Tinian Alternative 2**

<i>Temporary Number</i>	<i>CNMI Site Number</i>	<i>Site Description</i>	<i>Historic Period (s)</i>	<i>NRHP Eligibility Criteria</i>
NA	TN-4-0631	Japanese concrete structure	Japanese Administration	A,D
NA	TN-4-1182	Japanese railroad	Japanese Administration	A,C,D
NA	TN-6-0031	58 th Wing Headquarters	American Administration	A,D
NA	TN-6-0032	107 th Naval Construction Brigade	American Administration	A,D
NA	TN-6-0036	313 th Bomb Wing Headquarters	American Administration	A,D
NA	TN-6-0049	462 nd Bomb Group	American Administration	A,D
NA	TN-6-0050	Army Garrison Depot	American Administration	A,D
NA	TN-6-0567	U.S. Quarry, Camp Churo Cesspool, Drainage Ditch	American Administration	D
NA	TN-6-0601	444 th Bomb Group	American Administration	A,D
NA	TN-6-0606	87 th and 25 th Service Corps	American Administration	A,D
SC-5007A	NA	Third Farm District (I)	Japanese Administration	A,D
SC-5007B	NA	Third Farm District (II)	Japanese Administration	A,D
SC-5009A	NA	Chulu Farm District (I)	Japanese Administration	A,D
SC-5009B	NA	Chulu Farm District (II)	Japanese Administration	A,C,D
SC-5010	NA	Churo <i>Latte</i> (Disturbed)	Pre-Contact	D
SC-5011	NA	Earth Terraces	Japanese Administration	A,C,D
SC-5017	NA	Fourth Farm District (III)	Japanese Administration	A,C,D
SC-5018	NA	Fourth Farm District (V)	Japanese Administration	A,C,D
SC-5034	NA	Kahi Farm District (I)	Japanese Administration	A,D
SC-5038	NA	<i>Latte</i> set and ceramic sherds; U.S. gun position and other	Pre-Contact; American Administration	A,D
SC-5046	NA	Kahi Farm District (IV)	Japanese Administration	A,D
SC-5049	NA	Shinminato Farm District (II)	Japanese Administration	A,D
SC-5053	NA	U.S. Quarry	American Administration	D
SC-5054	NA	Shinminato Farm District (III)	Japanese Administration	A,D
SC-5055	NA	Fourth Farm District (IV)	Japanese Administration	A,D

No resources of cultural importance would be directly and adversely impacted at Range Complex D. Visual intrusions, access restrictions during construction, and noise increase during construction would not have an adverse effect to historic properties as they would be intermittent and temporary.

Military Lease Area-Wide Training Assets and Support Facilities Outside of the Range Complexes:

Construction associated with Military Lease Area-wide assets under Tinian Alternative 2 would be similar to Tinian Alternative 1, but would include additional road improvements. It would directly and adversely affect 119 historic properties, one less than under Tinian Alternative 1. Seven sites, one fewer site than under Tinian Alternative 1, would be affected by the Convoy Course Engagement Areas ([Table 23](#)). The historic properties would include 13 Pre-Contact sites (6 *latte* sites, 5 ceramic scatters, and 2 rock overhangs/caves), 43 pre-World War II Japanese Administration sites, 23 World War II-era Japanese

defensive sites, 39 World War II American military sites, and 1 potential traditional cultural property (see Tables 11 through 15). Most of these adverse effects occur because of the construction of roads. Since sites in this area tend to be large and dispersed, complete avoidance is not possible. However, in most cases only a portion of the site would be affected by the proposed action. Existing roads surrounding the North Field National Historic Landmark, which are recommended as contributing features to the cultural landscape, would be improved for public access and for use by the Convoy Course and the Tracked Vehicle Driver's Course. Improvement of poorly maintained roads would be a beneficial impact to the Landmark; however, vegetation clearance adjacent to the roads could have an adverse effect to other historic properties.

**Table 23. Historic Properties Directly Affected by Convoy Course Engagement Areas (Construction)
Under Tinian Alternative 2**

<i>Temporary Number</i>	<i>CNMI Site Number</i>	<i>Site Description</i>	<i>Historic Period (s)</i>	<i>NRHP Eligibility Criteria</i>
NA	TN-5/6-0355	Unai Babui Defenses	Japanese Administration, American Administration	A,C,D
NA	TN-5-0526	Defensive platform	Japanese Administration	A,D
NA	TN-5-0589A	JPN Airfield No. 2	Japanese Administration	A,C
NA	TN-6-0612	Extension of West Field Runway No. 4	American Administration	A
NA	TN-6-0544	"B" Battery, 17th AAA and ABCD Annex	American Administration	A,C,D
SC-5044	NA	Kahi Farm District (III)	Japanese Administration	A,C,D
SC-5055	NA	Fourth Farm District (IV)	Japanese Administration	A,D

Additionally under Tinian Alternative 2, construction activities at the amphibious landing beach at Unai Chulu, would be the same as under Tinian Alternative 1 and would have an adverse effect to the same three historic properties (the landing beach, which is part of the North Field National Historic Landmark and would constitute as adverse effect to the Landmark, a potential traditional cultural property, and a *latte* site). A permanent change in the setting of the beach would be an adverse effect to the potential traditional cultural property. An additional staging area would be located at North Field on an existing cleared runway, which would not affect the runways or the Landmark since it would be temporary and not involve ground disturbance. Construction of an amphibious landing ramp may impact submerged historic properties.

No resources of cultural importance were identified within these training asset areas. As stated above, indirect effects to historic properties and resources of cultural importance due to visual intrusions, access restrictions during construction, and noise increase during construction would be less than significant as they would be intermittent and temporary. Construction of the amphibious landing ramp would likely cause a change in the local fish populations; some populations could decrease, while others may increase (see Section 4.10.3.1, *Marine Biology*). As this change would be temporary during the construction process, the impact would be less than significant.

Outside the Military Lease Area: Construction-related activities outside of the Military Lease Area would occur in an area immediately north of the Tinian Airport runways and at the Port of Tinian, as well as road modifications to accommodate the Tracked Vehicle Transit Lanes and a Supply Route. Adverse effects to historic properties would be the same as under Tinian Alternative 1. Construction-related activities such as clearing, excavation, and soil removal as well as vegetation clearance of roadways and port and aircraft support structures would directly and adversely affect the same six historic properties as described in [Table 16](#) and [Table 17](#).

No resources of cultural importance would be directly and adversely impacted at these training asset areas. Indirect effects to historic properties and resources of cultural importance due to visual intrusions, access restrictions during construction, and noise increase during construction would be less than significant as they would be intermittent and temporary. Construction of the ramp could cause a change in the local fish populations; some populations could decrease, while others may increase (see Chapter 4, *Marine Biology*, Section 4.10.3.1, *Tinian Alternative 1*). As this change would be temporary during the construction process, the impact would be less than significant.

3.2.2.2 Operation Impacts

Operations and maintenance would occur within the Military Lease Area, immediately north of the Tinian International Airport runways, and at the Port of Tinian. In general, the footprint for operations is very similar to construction footprints and most ground disturbance and effects to historic properties and resources of cultural importance would occur during construction of the RTA. Therefore, since disturbance to historic properties has been accounted for in the ranges under construction impacts, impacts to historic properties from training operations at the range complexes B, C, and D will focus on training maneuvers. Training maneuvers concern vehicle and foot traffic within areas; no digging would occur within maneuver areas. However, potential ground disturbance to historic properties in Range Complex A is larger than the footprint for construction and could occur throughout the High Hazard Impact Area.

[Table 24](#) summarizes the historic properties affected by operations for Tinian Alternative 2; impacts associated with construction are summarized in [Table 23](#). In Range Complex A, the same twelve sites as under Tinian Alternative 1, also affected by construction, would be directly and adversely affected by operations (see [Table 19](#)).

**Table 24. Tinian Alternative 2 Summary of Direct Adverse Effects on
Historic Properties from Operations**

<i>Complex</i>	<i>Range</i>	<i>Number of Historic Properties</i>
Range Complex A	High Hazard Impact Area	12*
Range Complex B	Multi-Purpose Training Range, Combat Pistol Range, Anti-Armor Tracking Range, Battle Site Zero Range	0
Range Complex C	Southern Battle Area Complex: Infantry Platoon Battle Course, Field Fire Range, Multipurpose Automated Unknown Distance Range, Urban Assault Course	0
Range Complex D	Northern Battle Area Complex, Urban Assault	0

Table 24. Tinian Alternative 2 Summary of Direct Adverse Effects on Historic Properties from Operations

Complex	Range	Number of Historic Properties
	Course	
Military Lease Area-wide Training Assets and Support Facilities Outside of the Range Complexes	Convoy Course Engagement Areas	0
	Munitions Storage Area	0
	Roads, Fences, and Utilities, Tracked Vehicle Driver's Course	0
	Base Camp	0
	Tactical Amphibious Training Areas	3
	Landing Zones, Artillery Firing Points, Observation Posts, Surface Radar Sites	0
Outside Military Lease Area	Tinian International Airport	0
	Port of Tinian	0
	Tracked Vehicle Transit Lanes/Supply Route	0
Total		15

Note: *All of these sites are also impacted under construction, but are located outside of the area of proposed ground disturbance for construction. Sites solely in the construction area are not included in this total.

Use of historic roads associated with the North Field National Historic Landmark by convoys and other vehicles would be in keeping with existing use and would not adversely affect this historic property. Tracked vehicles would use newly constructed gravel roads adjacent to the historic roads to prevent damage. Effects to historic properties from foot traffic would be minimal, as it would occur primarily on roads and designated pathways or sporadically throughout the maneuver areas.

Training and range management activities associated with Tinian Alternative 2 would have a direct and adverse effect to three historic properties, the landing beach at Unai Chulu, which is part of the North Field National Historic Landmark, a potential traditional cultural property, and a *latte* site due to ground disturbance caused by Amphibious Assault Vehicle traffic (see [Table 20](#)). As much as possible impacts to the *latte* site would be avoided by using existing and newly constructed roads.

Within the surface danger zones, which are safety buffers that surround target areas and live-fire maneuver areas and would contain projectiles, fragments, debris and components resulting from the firing of weapons, the potential for direct impacts from strikes from stray rounds is extremely low. The ranges would be designed to contain live-fire inside the boundaries to minimize the potential for rounds landing outside the surface danger zones. Additionally, if a stray round were to escape the ranges, the chance of it hitting a historic property is remote, given the size of the surface danger zones and dispersal of historic properties.

In general, public access would be allowed to all locations except for the High Hazard Impact Area, the Munitions Storage Area, the base camp, the Observation Posts, and Surface Radar sites, when training is not occurring. It is envisioned that public access to some or all areas of the RTA, with the exceptions mentioned above, would occur during a couple of daylight hours on a nearly daily basis during the 20 weeks of live-fire training. A range control facility and dedicated range scheduler would be in place to assess public access in real-time and to provide advance notice of public access dates, time frames, and areas. Range control and the scheduler would coordinate public access directly with the Tinian Mayor's

Office and other interested parties, such as ranchers and entities within the tourism industry. Access procedures would be implemented to ensure safety and provide guidance and direction. Therefore, intermittent and temporary loss of public access is not considered an adverse effect to historic properties. Historic properties within the High Hazard Impact Area, base camp, Munitions Storage Area, the Observation Posts, and Surface Radar sites would already have been directly and adversely affected by construction activities and loss of access to these areas would not be an adverse effect.

No resources of cultural importance were identified within these training asset areas.

The roundabout, a portion of Broadway Avenue, which is an entrance to the North Field National Historic Landmark and a contributing feature to the cultural landscape, would be closed permanently by the use of the High Hazard Impact Area of Range Complex A. This closure would be an adverse effect to the Landmark.

The permanent presence of Observation Posts and Surface Radar sites would not be visible to most historic properties. However, towers associated with Surface Radar sites would be constructed at Unai Babui and near Unai Dankulo. A Surface Radar site would be constructed adjacent and south of Unai Dankulo and would be visible from the beach, which is a potential traditional cultural property. Another Surface Radar site would be constructed within a *latte* site at Unai Babui. The permanent location of these towers would have an indirect adverse effect to these historic properties.

Construction of the ramp at Unai Chulu would likely cause a change in the local fish populations through a permanent loss in coral reef habitat. Some populations could decrease, while others may increase, especially those associated with coral reefs. As this shoreline is part of a potential traditional cultural property associated with fishing, this change would be an indirect adverse effect to the historic property.

3.2.3 Tinian Alternative 3

3.2.3.1 Construction Impacts

As described in Chapter 2, Section 2.4.4, Tinian Alternative 3 training facility development and construction would result in 2,003 acres (811 hectares) of ground disturbance (e.g., vegetation clearing, grubbing, grading, excavation, and filling), and potentially affect historic properties and resources of cultural importance. Tinian Alternative 3 construction activities would occur within the same areas as Tinian Alternative 1, but would accommodate a southern Battle Area Complex (Range Complex C) and five additional Convoy Course Engagement Areas. Only a Drop Zone would be established in Range Complex D. [Table 25](#) summarizes the 179 historic properties affected by construction-related activities for Tinian Alternative 3; 7 more than found under Tinian Alternative 1. Specific adverse effects to historic properties and resources of cultural importance are described in more detail by RTA or construction project below.

Table 25. Tinian Alternative 3 Summary of Direct Adverse Effects on Historic Properties from Construction

<i>Complex</i>	<i>Range</i>	<i>Number of Historic Properties</i>
Range Complex A	High Hazard Impact Area	20
Range Complex B	Multi-Purpose Training Range, Combat Pistol Range, Anti-Armor Tracking Range, Battle Site Zero Range	9
Range Complex C	Southern Battle Area Complex: Infantry Platoon Battle Course, Field Fire Range, Multipurpose Automated Unknown Distance Range, Urban Assault Course	25
Range Complex D	Drop Zone	0
Military Lease Area-wide Training Assets and Support Facilities Outside of the Range Complexes	Convoy Course Engagement Areas	7
	Munitions Storage Area	3
	Roads, Fences, and Utilities, Tracked Vehicle Driver's Course	86
	Base Camp	1
	Tactical Amphibious Training Areas	3
	Landing Zones, Artillery Firing Points, Observation Posts, Surface Radar Sites	19
Outside Military Lease Area	Tinian International Airport	2
	Port of Tinian	0
	Tracked Vehicle Transit Lanes/Supply Route	4
Total		179

Range Complex A: Construction-related activities at Range Complex A under Tinian Alternative 3 would be the same as under Tinian Alternative 1 and would directly and adversely affect the same 20 historic properties as listed in [Table 6](#) and the same resources of cultural importance (native limestone forest and two memorials) discussed under Tinian Alternative 1. Indirect effects to historic properties and resources of cultural importance due to visual intrusions, access restrictions during construction, and noise increase during construction would be less than significant as they would be intermittent and temporary. The roundabout, a portion of Broadway Avenue, which is an entrance to the North Field National Historic Landmark and a contributing feature to the cultural landscape, would be closed during construction of Range Complex A target objectives. This closure would be temporary and not be an adverse effect to the Landmark.

Range Complex B: Construction-related activities at Range Complex B under Tinian Alternative 3 would be the same as under Tinian Alternative 1 and would directly and adversely affect the same 9 historic properties as described in [Table 7](#). No resources of cultural importance were identified within Range Complex B.

Range Complex C. Construction-related activities under Tinian Alternative 3 would be similar to that under Tinian Alternative 1 except that there would be the construction of a southern Battle Area Complex and associated Urban Assault Course. Construction-related activities such as vegetation clearing, excavation, and soil removal would directly and adversely affect 25 historic properties (see [Table 22](#)) compared to the 14 affected under Tinian Alternative 1. Most of these adverse effects occur

because of the construction of roads to the target areas. Since sites in this area tend to be large and dispersed, complete avoidance is not possible. However, in most cases only a portion of the site would be affected by the proposed action. No resources of cultural importance have been identified in Range Complex C. Indirect effects to historic properties and resources of cultural importance due to visual intrusions, access restrictions during construction, and noise increase during construction would be less than significant as they would be intermittent and temporary.

Range Complex D: Proposed Range Complex D (Alternative 3) consists of: (1) a Drop Zone and (2) an aviation landing zone on North Field. The Landing Zone, an Unmanned Aircraft Systems Ground Station, and a Forward Arming and Refueling Point would be located within the Drop Zone. No construction would be conducted at Range Complex D under Tinian Alternative 3, although vegetation would be cleared around the runways similar to Tinian Alternative 1. This vegetation clearance is considered to be beneficial as it prevents deterioration of the historic runways, which are a contributing feature to the North Field National Historic Landmark and restores the area to its historic appearance.

Military Lease Area-wide Training Assets and Support Facilities Outside of the Range Complexes: Construction associated with Military Lease Area-wide assets under Tinian Alternative 3 would be similar to Tinian Alternative 1, but would include additional road improvements. It would directly and adversely affect 119 historic properties; one less than under Tinian Alternative 1, but the same as under Tinian Alternative 2 (see Tables [11](#) through [15](#), and [Table 23](#)). Most of these adverse effects occur because of the construction of roads. Since sites in this area tend to be large and dispersed, complete avoidance is not possible. However, in most cases only a portion of the site would be affected by the proposed action. Existing roads surrounding the North Field National Historic Landmark, which are recommended as contributing features to the cultural landscape, would be improved for public access and for use by the Convoy Course and the Tracked Vehicle Driver's Course. Improvement of poorly maintained roads would be beneficial to the Landmark; however, vegetation clearance associated with the construction of the roads would have an adverse effect to other historic properties.

Construction activities at the amphibious landing beach at Unai Chulu, would be the same as under Tinian Alternative 1 and would directly and adversely affect the same three historic properties (the landing beach [Unai Chulu], which is part of the North Field National Historic Landmark and would constitute an adverse effect to the landmark, a potential traditional cultural property, and a *latte* site) as described in [Table 14](#). An additional staging area would be located at North Field on an existing cleared runway, which would not affect the runways or the Landmark since it would be temporary and not involve ground disturbance. Construction of an amphibious landing ramp may impact submerged historic properties.

No resources of cultural importance were identified within these training asset areas. As stated above, indirect impacts to historic properties and resources of cultural importance due to visual intrusions, access restrictions during construction, and noise increase during construction would be less than significant as they would be intermittent and temporary. Construction of the ramp would likely cause a change in the local fish populations; some populations could decrease, while others may increase. As this change would be temporary during the construction process, the impact would be less than significant.

Outside the Military Lease Area: Construction-related activities immediately north of the Tinian Airport runways and at the Port of Tinian, as well as road modifications to accommodate the Tracked Vehicle Transit Lanes and a Supply Route would be the same as under Tinian Alternative 1. Construction-related activities such as vegetation clearing, excavation, and soil removal as well as vegetation clearance of roadways and port and aircraft support structures would directly and adversely affect the same six historic properties as described in [Table 16](#) and [Table 17](#).

No resources of cultural importance were identified within these training asset areas. Indirect impacts to historic properties and resources of cultural importance due to visual intrusions, access restrictions during construction, and noise increase during construction would be less than significant as they would be intermittent and temporary.

3.2.3.2 Operation Impacts

Under Tinian Alternative 3, operations and maintenance would occur within the Military Lease Area, immediately north of the Tinian International Airport runways, and at the Port of Tinian. Effects to historic properties and resources of cultural importance would be the same as Tinian Alternative 1. In general, the footprint for operations is very similar to construction footprints and most ground disturbance and impacts to historic properties and resources of cultural importance would occur during construction of the RTA. Therefore, since disturbance to historic properties has been accounted for in the ranges under construction impacts, adverse effects to historic properties from training operations at the range complexes B, C, and D will focus on training maneuvers. Training maneuvers concern vehicle and foot traffic within areas; no digging would occur within maneuver areas. However, potential ground disturbance to historic properties in Range Complex A is larger than the footprint for construction and could occur throughout the High Hazard Impact Area. [Table 26](#) summarizes the historic properties affected by operations for Tinian Alternative 3; adverse effects associated with construction are summarized in [Table 25](#). In Range Complex A, twelve sites, also affected by construction, would be directly and adversely affected by operations (see [Table 19](#)).

Use of historic roads associated with the North Field National Historic Landmark by convoys and other vehicles would be in keeping with existing use and would not adversely affect this historic property. Tracked vehicles would use newly constructed gravel roads adjacent to the historic roads to prevent damage. Effects to historic properties from foot traffic would be minimal, as it would occur primarily on roads and designated pathways or sporadically throughout the maneuver areas.

Table 26. Tinian Alternative 3 Summary of Direct Adverse Effects on Historic Properties from Operations

Complex	Range	Number of Historic Properties
Range Complex A	High Hazard Impact Area	12
Range Complex B	Multi-Purpose Training Range, Combat Pistol Range, Anti-Armor Tracking Range, Battle Site Zero Range	0
Range Complex C	Southern Battle Area Complex: Infantry Platoon Battle Course, Field Fire Range, Multipurpose Automated Unknown Distance Range, Urban Assault Course	0
Range Complex D	Drop Zone	0
Military Lease Area-wide Training Assets and Support Facilities Outside of the Range Complexes	Convoy Course Engagement Areas	0
	Munitions Storage Area	0
	Roads, Fences, and Utilities, Tracked Vehicle Driver's Course	0
	Base Camp	0
	Tactical Amphibious Training Areas	3
	Landing Zones, Artillery Firing Points, Observation Posts, Surface Radar Sites	0
Outside Military Lease Area	Tinian International Airport	0
	Port of Tinian	NA
	Tracked Vehicle Transit Lanes/Supply Route	0
Total		15

Note: *All of these sites are also impacted under construction, but are located outside of the area of proposed ground disturbance for construction. Sites solely in the construction area are not included in this total.

Training and RTA management activities associated with Tinian Alternative 3, however, would directly and adversely affect three historic properties at the landing beach at Unai Chulu (see [Table 20](#))—the same as found under Tinian Alternative 1 (the landing beach at Unai Chulu, which is part of the North Field National Historic Landmark, a potential traditional cultural property, and a *latte* site).

Within the surface danger zones, which are safety buffers that surround target areas and live-fire maneuver areas and would contain projectiles, fragments, debris and components resulting from the firing of weapons, the potential for direct impacts from strikes from stray rounds is extremely low. The ranges would be designed to contain live-fire inside the boundaries to minimize the potential for rounds landing outside the surface danger zones. Additionally, if a stray round were to escape the ranges, the chance of it hitting a historic property is remote, given the size of the surface danger zones and dispersal of historic properties.

In general, public access would be allowed to all locations except for the High Hazard Impact Area, the Munitions Storage Area, the base camp, and the Observation Posts and Surface Radar sites, when training is not occurring. It is envisioned that public access to some or all areas of the RTA, with the exceptions mentioned above, would occur during a couple of daylight hours on a nearly daily basis during the 20 weeks of live-fire training. A range control facility and dedicated range scheduler would be in place to assess public access in real-time and to provide advance notice of public access dates, time

frames, and areas. Range control and the scheduler would coordinate public access directly with the Tinian Mayor's Office and other interested parties, such as ranchers and entities within the tourism industry. Access procedures would be implemented to ensure safety and provide guidance and direction. Therefore, intermittent and temporary loss of public access is not considered an adverse effect to historic properties. Historic properties within the High Hazard Impact Area, base camp, Munitions Storage Area, and the Observation Posts and Surface Radar sites would already have been directly and adversely affected by construction activities and loss of access to these areas would not be an adverse effect.

No resources of cultural importance were identified within these training asset areas.

The roundabout, a portion of Broadway Avenue, which is an entrance to the North Field National Historic Landmark and a contributing feature to the cultural landscape, would be closed permanently by the use of the High Hazard Impact Area of Range Complex A. This closure would be an adverse effect to the Landmark.

The permanent presence of Observation Posts and Surface Radar sites would not be visible to most historic properties. However, towers associated with Surface Radar sites would be constructed at Unai Babui and near Unai Dankulo. A Surface Radar site would be constructed adjacent and south of Unai Dankulo and would be visible from the beach, which is a potential traditional cultural property. Another Surface Radar site would be constructed within a *latte* site at Unai Babui. The permanent location of these towers would have an indirect adverse effect to these historic properties.

Construction of the ramp at Unai Chulu would likely cause a change in the local fish populations through a permanent loss in coral reef habitat. Some populations could decrease, while others may increase, especially those associated with coral reefs. As this shoreline is part of a potential traditional cultural property associated with fishing, this change would be an indirect adverse effect to the property.

3.3 PAGAN

3.3.1 Pagan Alternative 1

3.3.1.1 Construction Impacts

Two High Hazard Impact Areas would be established in the North Range Complex under Pagan Alternative 1. The expeditionary airfield, a temporary munitions storage area, and base camp would be developed just north of the isthmus. This development and construction would result in 764 acres (310 hectares) of ground disturbance (primarily due to vegetation clearance), and potentially affect historic properties and resources of cultural importance. [Table 27](#) summarizes the historic properties affected by construction-related activities for Pagan Alternative 1. Specific adverse effects to historic properties are described in more detail below.

Table 27. Pagan Alternative 1 Summary of Direct Adverse Effects on Historic Properties from Construction

<i>Complex</i>	<i>Range</i>	<i>Number of Historic Properties</i>
North Range Complex	North High Hazard Impact Area	2
	Landing Zones	2
	Field Artillery Direct and Indirect Fire Ranges/Mortar Firing Positions	4
	Amphibious Training Areas	0
	Live-fire Maneuver Area	0
	Isthmus High Hazard Impact Area	2*
	Military Training Trails	7
	Airfield/Base Camp/Bivouac Area/Munitions Storage Area	10
South Range Complex	Non-live-fire Maneuver Area	0
Total		27

Note: *Although this area has not been surveyed, former residents indicate that two potential historic properties are located in the area of potential effects.

North Range Complex: The proposed Pagan North Range Complex for Alternative 1 consists of: (1) a Northern High Hazard Impact Area; (2) 8 Northern High Hazard Impact Target Areas; (3) 11 Landing Zones; (4) 10 Field Artillery Indirect Firing Range firing positions; (5) a Field Artillery Direct Firing Range firing position; (6) 6 firing points associated with the Mortar Range; (7) a Dedicated Live-fire Maneuver Area; (8) a High Hazard Impact Area in the isthmus; (9) 2 southern High Hazard Impact Area Target Areas; and (10) 6 amphibious landing beaches. Support facilities and infrastructure to be constructed include an expeditionary base camp/bivouac area, airfield, expeditionary military training trails, and a temporary Munitions Storage Area.

Construction associated with the High Hazard Impact Area in the north would be minimal; however, 600 acres (243 hectares) would need to be cleared through grubbing for target placement, landing zones, and firing positions. Of this total, about 7 acres (3 hectares) within the northern High Hazard Impact Area is composed of native forest that would be removed (see Section 4.9, *Terrestrial Biology*). A firebreak would be established along the perimeter of the northern High Hazard Impact Area and eight targets put within the impact area. Although most of this area has not been surveyed, in general, the area is covered by lava to depths of over 30 feet (9.1 meters) from recent volcanic eruptions. Historic properties would not be found on the surface in this area. Outside of the lava area, historic properties tend to be found nearer to the coastal areas. Most of the area of potential effects for the firebreak has been surveyed. Construction-related activities associated with the firebreak under Pagan Alternative 1 would directly and adversely affect 2 historic properties ([Table 28](#)), including 1 Pre-Contact artifact scatter and 1 World War II-era Japanese defensive site. Construction would also impact 7 acres (3 hectares) of native forest which could contain resources of cultural importance such as medicinal plants. No other resources of cultural importance, such as cemeteries or memorials would be impacted by construction in this area.

**Table 28. Historic Properties Directly Affected by North High Hazard Impact Area (Construction)
Under Pagan Alternative 1**

<i>Temporary Number</i>	<i>CNMI Site Number</i>	<i>Site Description</i>	<i>Historic Period (s)</i>	<i>NRHP Eligibility Criteria</i>
PA-2	NA	Artifact scatter and Latte Period ceramic scatter	Pre-Contact	D
PA-3	NA	Tunnel complex	Japanese Administration	A,D

Construction associated with the High Hazard Impact Area located on the isthmus would likewise be minimal. A firebreak would be established along the perimeter and vegetation within one target would be cleared during construction. About 7 acres (3 hectares) of this vegetation is composed of native forest that would be removed (see Section 4.9, *Terrestrial Biology*). Because of thick vegetation and steep topography, the isthmus area has not been surveyed for archaeological resources, but it does contain two areas identified by former residents as the location of *Kannathomhum*, a *latte* village located close to the coast, and one unnamed location, which probably contained World War II Japanese military features. Other archaeological sites in the area are unlikely based on the steep topography and lack of accessibility to coastal resources. Construction of a firebreak would not directly and adversely affect these resources, but vegetation clearance associated with a target would directly and adversely affect these resources. Construction would also directly and adversely affect 7 acres (3 hectares) of native forest which could contain resources of cultural importance such as medicinal plants. A resource of cultural importance, a potential area for collecting betel nuts, could be affected by construction.

No construction would occur at the Amphibious landing beaches or within the Live-fire Maneuver Area. Eleven landing zones, 1 Field Artillery Direct Firing Range Position, 10 Field Artillery Indirect Firing Positions (8 co-occur with landing zones), and 6 firing points associated with the Mortar Range would be constructed throughout the northern portion of the island. Most of the landing zones and artillery firing points have either been surveyed or are located on lava. Of the 2 unsurveyed landing zones and the 2 unsurveyed firing points associated with the Mortar Range, 3 are located in steep interior areas surrounding Mount Pagan and one is located in the High Hazard Impact Area on the isthmus in an area surrounded by steep topography. Both of these areas have a low potential for containing historic properties. Construction-related activities associated with the clearing and grubbing of Landing Zones and firing points under Pagan Alternative 1 would directly and adversely affect 6 historic properties ([Table 29](#) and [Table 30](#)), including 1 Pre-Contact *latte* site and 1 pre-World War II Japanese Administration site, and 4 World War II –era Japanese defensive sites.

**Table 29. Historic Properties Directly Affected by Landing Zones (Construction)
Under Pagan Alternative 1**

<i>Temporary Number</i>	<i>CNMI Site Number</i>	<i>Site Description</i>	<i>Historic Period (s)</i>	<i>NRHP Eligibility Criteria</i>
NA	PN-1-0072	<i>Latte</i> complex	Pre-Contact	D
NA	PN-4-0021	Historic settlement area	Japanese Administration	D

**Table 30. Historic Properties Directly Affected by Field Artillery Direct and Indirect Fire Ranges
(Construction) Under Pagan Alternative 1**

<i>Temporary Number</i>	<i>CNMI Site Number</i>	<i>Site Description</i>	<i>Historic Period (s)</i>	<i>NRHP Eligibility Criteria</i>
NA	PN-5-0064	Tunnel complex	Japanese Administration	A,D
NA	PN-5-0066	Tunnel complex	Japanese Administration	A,D
NA	PN-5-0067	Bunker	Japanese Administration	A,D
NA	PN-5-0068	Tunnel	Japanese Administration	A,D

A military training trail network would be constructed around the perimeter of the northern portion of Pagan to provide access to the base camp/bivouac area, Landing Zones, and the northern High Hazard Impact Area. A portion of the access road construction would involve the improvement of existing trails, while new trails would be constructed as well. A total of 37 acres (15) hectares would be cleared and graded in the construction of these trails. Construction-related activities under Pagan Alternative 1 would directly and adversely affect 7 historic properties ([Table 31](#)), including 2 Pre-Contact sites (*latte* sites), 2 pre-World War II Japanese Administration sites, and 3 World War II-era Japanese defensive sites. Given the steep topography, which restricts the locations of trails, it is difficult to avoid known historic properties. Construction would also impact 5 acres (2 hectares) of native forest which could contain resources of cultural importance. No other resources of cultural importance have been identified in this area.

**Table 31. Historic Properties Directly Affected by Access Roads/Trails (Construction)
Under Pagan Alternative 1**

<i>Temporary Number</i>	<i>CNMI Site Number</i>	<i>Site Description</i>	<i>Historic Period (s)</i>	<i>NRHP Eligibility Criteria</i>
NA	PN-1-0086	<i>Latte</i> complex	Pre-Contact	D
NA	PN-1-0092	<i>Latte</i> complex	Pre-Contact	D
NA	PN-4-0021	Historic settlement area	Japanese Administration	D
NA	PN-4-0128	Cisterns, hearth, concrete box	Japanese Administration	D
NA	PN-5-0003	Barracks complex	Japanese Administration	A,D
NA	PN-5-0057	Bunker	Japanese Administration	A,D
NA	PN-5-0133	Bunker and tunnel	Japanese Administration	A,D

The area adjacent to an existing airfield would contain the expeditionary base camp/bivouac area, interior roads, temporary munitions storage, and airfield improvements. A grass airfield would be improved, and a temporary munitions storage area would be constructed. These areas would be cleared of vegetation. Construction-related activities such as grading, vegetation clearing, and soil removal would directly and adversely affect 10 historic properties ([Table 32](#)), including 1 Pre-Contact site (*latte* site or complex), 4 pre-World War II Japanese Administration sites, and 5 World War II-era Japanese defensive sites. No resources of cultural importance would be affected by construction. No resources of cultural importance would be impacted by construction.

**Table 32. Historic Properties Directly Affected by Airfield/Base Camp/Bivouac Area (Construction)
Under Pagan Alternative 1**

<i>Temporary Number</i>	<i>CNMI Site Number</i>	<i>Site Description</i>	<i>Historic Period (s)</i>	<i>NRHP Eligibility Criteria</i>
NA	PN-1-0082	Latte complex	Pre-Contact	D
NA	PN-4-0007	Obelisk	Japanese Administration	A,D
NA	PN-4-0015	Shrine	Japanese Administration	A,D
NA	PN-5-0001	Airfield	Japanese Administration	A,D
NA	PN-5-0009	Bunker	Japanese Administration	A,D
NA	PN-5-0014	Bunker and tunnel complex	Japanese Administration	A,D
NA	PN-5-0017	Pier	Japanese Administration	A,D
NA	PN-5-0070	Tunnel complex	Japanese Administration	A,D
NA	PN-5-0071	Enclosure	Japanese Administration	A,D
PA-1	NA	Concrete foundation with wall and pillar remnants	Japanese Administration	A,D

Although public access would not be allowed in the construction area, the public may be allowed in nearby areas depending upon the type of construction. An increase in noise and changes in visual setting may occur during construction in the vicinity of historic properties, including potential traditional cultural properties, when members of the public are present. This change in noise and visual setting would be intermittent and temporary and would not have an adverse effect to these properties.

South Range Complex: The South Range Complex would be used as a Non-live-fire Maneuver Area. There would be no construction-related ground clearance undertaken; therefore, there would be no direct or indirect adverse effects to historic properties or resources of cultural importance from construction activities associated with the establishment of the South Range Complex.

Although public access would not be allowed to the construction area, the public may be allowed in nearby areas in south Pagan when construction is ongoing. An increase in noise and changes in visual setting may occur during construction in the vicinity of historic properties, including potential traditional cultural properties, when members of the public are present. This change in noise and visual setting would be intermittent and temporary and not result in an adverse effect to historic properties.

3.3.1.2 Operation Impacts

As described in Chapter 2, Section 2.5, *Pagan Alternatives*, under Pagan Alternative 1, operations and maintenance would occur within the North and South Range Complexes. In general, the footprint for operations is very similar to construction footprints and most ground disturbance and impacts to historic properties and resources of cultural importance would occur during construction of the RTA. Therefore, since disturbance to historic properties has been accounted for in most areas under construction impacts, impacts to historic properties from training operations will focus on training maneuvers. Training maneuvers consist of vehicle and foot traffic within maneuver areas; no digging would occur within the maneuver areas. However, potential ground disturbance to historic properties in the High Hazard Impact Areas is larger than the footprint for construction and target placement and could occur throughout either of the High Hazard Impact Areas.

[Table 33](#) summarizes the historic properties affected by operations for Pagan Alternative 1; impacts associated with construction are summarized in [Table 32](#). In the High Hazard Impact Areas, seven historic properties, also affected by construction, would be significantly impacted by operations ([Table 34](#)). Although not all of the northern High Hazard Impact Area has been surveyed; it is primarily covered in lava. Should sites be preserved under the lava, impacts are unlikely since the depth of the ground disturbance associated with munitions would be less than the depth of the lava. Other archaeological sites within the isthmus High Hazard Impact Area are unlikely based on the steep topography and lack of accessibility to coastal resources.

Table 33. Pagan Alternative 1 Summary of Direct Adverse Effects on Historic Properties from Operations

<i>Complex</i>	<i>Range</i>	<i>Number of Historic Properties</i>
North Range Complex	North High Hazard Impact Area	5*
	Landing Zones	0
	Field Artillery Direct and Indirect Fire Ranges/Mortar Firing Positions	0
	Amphibious Training Areas	1
	Live-fire Maneuver Area	46
	Isthmus High Hazard Impact Area	2*
	Military Training Trails	0
	Airfield/Base Camp/Bivouac Area/Munitions Storage Area	0
South Range Complex	Non-five-fire Maneuver Area	NA
Total		54

Notes: *All of these sites are impacted by vegetation clearing in target areas, but are located outside of the area of proposed clearing. Sites solely in the construction/cleared area are not included in this total.

Legend: NA = not applicable.

Table 34. Historic Properties Directly Affected by Live-Fire Maneuver Areas (Operations) Under Pagan Alternative 1

<i>Temporary Number</i>	<i>CNMI Site Number</i>	<i>Site Description</i>	<i>Historic Period (s)</i>	<i>NRHP Eligibility Criteria</i>
PA-2	NA	Artifact scatter and Latte Period ceramic scatter	Pre-Contact	D
PA-3	NA	Tunnel complex	Japanese Administration	A,D
	PN-5-0062	Tunnel	Japanese Administration	A,D
	PN-4-0063	Water valves	Japanese Administration	D
T-PAG-6	NA	Concrete bunker	Japanese Administration	D

Amphibious training, consisting of swimmer and inflatable boat landings, would occur at six beaches—Red, Green, Blue, South, North, and Gold. Amphibious Assault Vehicles and Landing Craft Air Cushion vessels would be used at Red, Green, and Blue beaches. Landing Craft Air Cushion vessels would be used at Red, Green, Blue, and South beaches. Use by swimmers and inflatable boats would have a minimal impact to any historic properties, including traditional cultural properties, and resources of cultural importance. Use of Amphibious Assault Vehicles and Landing Craft Air Cushion vessels could cause

ground disturbance on the beach. Landing Craft Air Cushion vessels would have a significant direct impact to one historic property, a World War II-era Japanese airfield ([Table 35](#)). All beaches have been surveyed and no other resources are recorded within the vicinity of the training areas. The beach areas associated with two potential traditional cultural properties, Red Beach (Shomshon) and South Beach (Regusa), would be disturbed by amphibious landing operations. However, the beach would be restored to its original appearance by contouring and cleaning up expended materials at the end of the exercises (see [Section 3.1.2](#), *Resource Management Measures*). No adverse effects would occur to these potential traditional cultural properties.

**Table 35. Historic Properties Directly Affected by Tactical Amphibious Training Areas (Operations)
Under Pagan Alternative 1**

<i>Temporary Number</i>	<i>CNMI Site Number</i>	<i>Site Description</i>	<i>Historic Period (s)</i>	<i>NRHP Eligibility Criteria</i>
NA	PN-5-0001	Airfield	Japanese Administration	A,D

Training in the northern maneuver areas includes patrolling, establishing defensive positions, and firing live-fire weapons into and/or around the High Hazard Impact Area and integrating supporting arms (including aviation, artillery, and naval gunfire assets). Where possible, mounted wheeled and tracked vehicle maneuvering would be accomplished in the northern maneuver area as well. Vehicles would move along military training trails as well as other terrain that they could safely navigate. Ground disturbance associated with wheeled and tracked vehicles off of roadways and trails would have an adverse effect to 46 historic properties, including 5 Pre-Contact *latte* sites, 1 Pre-Contact midden site, and 40 Japanese Administration sites ([Table 36](#)). Off-road vehicle use would also impact resources of cultural importance such as medicinal plants and plant gathering areas near the shoreline, but would not affect such resources located along cliffclines or on steep slopes. However, training units would be required to identify engagement area locations, direction of attack, targets/threats to be engaged, and types of weapon and ammunition to be used during an engagement. Developed scenarios would be submitted to range control for approval prior to implementation. This process would allow implementation of measures to avoid and protect historic properties and resources of cultural importance.

**Table 36. Historic Properties Directly Affected by Live-Fire Maneuver Areas (Operations)
Under Pagan Alternative 1**

<i>Temporary Number</i>	<i>CNMI Site Number</i>	<i>Site Description</i>	<i>Historic Period (s)</i>	<i>NRHP Eligibility Criteria</i>
PA-4	NA	Stone alignment (possible defensive feature)	Japanese Administration	A,D
NA	PN-1-0072	<i>Latte</i> complex	Pre-Contact	D
NA	PN-1-0082	<i>Latte</i> Complex	Pre-Contact	D
NA	PN-1-0084	<i>Latte</i> Set	Pre-Contact	D
NA	PN-1-0102	Midden	Pre-Contact	D
NA	PN-1-0108	<i>Latte</i>	Pre-Contact	D
NA	PN-1-0110	<i>Latte</i>	Pre-Contact	D
NA	PN-4-0111	Cistern	Japanese Administration	D
NA	PN-5-0004	Military Building	Japanese Administration	A,D

**Table 36. Historic Properties Directly Affected by Live-Fire Maneuver Areas (Operations)
Under Pagan Alternative 1**

<i>Temporary Number</i>	<i>CNMI Site Number</i>	<i>Site Description</i>	<i>Historic Period (s)</i>	<i>NRHP Eligibility Criteria</i>
NA	PN-5-0005	Pillars	Japanese Administration	A,D
NA	PN-5-0022	Bunker	Japanese Administration	A,D
NA	PN-5-0043	Cistern and Bunker	Japanese Administration	A,D
NA	PN-5-0044	Bunker	Japanese Administration	A,D
NA	PN-5-0045	Cistern, Bunker, Concrete Foundation	Japanese Administration	A,D
NA	PN-5-0046	Bunker	Japanese Administration	A,D
NA	PN-5-0048	Tunnel Complex	Japanese Administration	A,D
NA	PN-5-0049	Bunker Complex	Japanese Administration	A,D
NA	PN-5-0050	Bunker	Japanese Administration	A,D
NA	PN-5-0051	Bunker	Japanese Administration	A,D
NA	PN-5-0069	Tunnel Complex	Japanese Administration	A,D
NA	PN-5-0074	Bunker	Japanese Administration	A,D
NA	PN-5-0075	Bunker	Japanese Administration	A,D
NA	PN-5-0076	Tunnel Complex	Japanese Administration	A,D
NA	PN-5-0085	Tunnel and Walls	Japanese Administration	A,D
NA	PN-5-0087	Tunnel Complex	Japanese Administration	A,D
NA	PN-5-0088	Bunker and Tunnel	Japanese Administration	A,D
NA	PN-5-0089	Bunker	Japanese Administration	A,D
NA	PN-5-0090	Bunker	Japanese Administration	A,D
NA	PN-5-0091	Tunnel Complex	Japanese Administration	A,D
NA	PN-5-0093	Tunnel Complex	Japanese Administration	A,D
NA	PN-5-0094	Tunnel Complex	Japanese Administration	A,D
NA	PN-5-0095	Bunker	Japanese Administration	A,D
NA	PN-5-0096	Bunker	Japanese Administration	A,D
NA	PN-5-0097	Bunker	Japanese Administration	A,D
NA	PN-5-0098	Bunker	Japanese Administration	A,D
NA	PN-5-0099	Tunnel	Japanese Administration	A,D
NA	PN-5-0100	Bunker	Japanese Administration	A,D
NA	PN-5-0103	Tunnel Complex	Japanese Administration	A,D
NA	PN-5-0105	Bunker and Tunnel Complex	Japanese Administration	A,D
NA	PN-5-0106	Bunker	Japanese Administration	A,D
NA	PN-5-0107	Bunker	Japanese Administration	A,D
NA	PN-5-0109	Bunker	Japanese Administration	A,D
NA	PN-5-0113	Tunnel Complex and Wall	Japanese Administration	A,D
NA	PN-5-0114	Bunker and Tunnel Complex	Japanese Administration	A,D
NA	PN-5-0142	Tunnel	Japanese Administration	A,D
NA	PN-5-0171	Tunnel Complex	Japanese Administration	A,D

On-foot maneuvers would occur in South Range Complex. Very little of the southern portion of Pagan has been surveyed because of steep topography and access limitations. Information from surveys conducted in the south and interviews with former residents indicates that there are probably at least 8 *latte* villages located primarily along coastal areas. However, effects to historic properties from foot traffic would be minimal, as it would occur primarily on designated pathways or sporadically throughout the maneuver area.

Within the surface danger zones, which are safety buffers that surround target areas and live-fire maneuver areas and would contain projectiles, fragments, debris and components resulting from the firing of weapons, the potential for direct impacts from strikes from stray rounds is extremely low. The ranges would be designed to contain live-fire inside the boundaries to minimize the potential for rounds landing outside the surface danger zones. Additionally, if a stray round were to escape the ranges, the chance of it hitting a historic property is remote, given the size of the surface danger zones and dispersal of historic properties.

In general, public access would be allowed to all locations except for the High Hazard Impact Areas, which would be permanently restricted due to the presence of unexploded ordnance, when training is not occurring. It is envisioned that public access would be allowed at times when such training events are not taking place and may be available during other times depending upon the type of training taking place. This may include public access to areas of southern Pagan while training is occurring elsewhere. Therefore, intermittent and temporary loss of public access is not considered an adverse effect to historic properties. Historic properties within the High Hazard Impact Area would already have been adversely affected by construction activities and loss of access to these areas would not have an adverse effect.

Indirect adverse effects to historic properties and resources of cultural importance due to visual intrusions and noise-level increase from training would be less than significant. An increase in noise and changes in visual setting may occur during operations in the vicinity of historic properties, including potential traditional cultural properties, when members of the public are present. This change in noise and visual setting would be intermittent and temporary and result in a less than significant impact. Indirect impacts to resources of cultural importance such as Laguna Sanhalom due to contamination by munitions in the northern High Hazard Impact Area would be less than significant due to the implementation of best management practices associated with a Range Training Area Management Plan (see [Section 3.1.2, Resource Management Measures](#)).

3.3.2 Pagan Alternative 2

3.3.2.1 Construction Impacts

Under Pagan Alternative 2, only one, smaller northern High Hazard Impact Area would be established in the North Range Complex. This would potentially affect historic properties and resources of cultural importance. Ground disturbance primarily associated with vegetation removal would total 696 acres (283 hectares), or 38 fewer acres (28 hectares) when compared to Pagan Alternative 1. [Table 37](#) summarizes the historic properties affected by construction-related activities for Pagan Alternative 2. Specific adverse effects to historic properties and resources of cultural importance would be the same as found under Pagan Alternative 1, with the exception being that the isthmus High Hazard Impact Area in the south would not be established. A more detailed description of potential impacts follows the table.

Table 37. Pagan Alternative 2 Summary of Direct Adverse Effects on Historic Properties from Construction

Complex	Range	Number of Historic Properties
North Range Complex	Northern High Hazard Impact Area	2
	Landing Zones	2
	Field Artillery Direct and Indirect Fire Ranges/Mortar Firing Positions	4
	Tactical Amphibious Training Areas	0
	Live-fire Maneuver Area	0
	Military Training Trails	7
	Airfield/ Base Camp/Bivouac Area/Munitions Storage Area	10
South Range Complex	Non-live-fire Maneuver Area	NA
Total		25

North Range Complex: Construction associated with the High Hazard Impact Area in the north differs from construction under Pagan Alternative 1 as there would be no High Hazard Impact Area on the isthmus. Although the size of the High Hazard Impact Area would be smaller than the northern High Hazard Impact Area under Pagan Alternative 1, the target clearance would be the same. Although most of this area has not been surveyed, in general, the area is covered by lava to depths of over 30 feet (9.1 meters) from recent volcanic eruptions. Historic properties would not be found on the surface in this area. Outside of the lava area, historic properties tend to be found nearer to the coastal areas. Most of the area of potential effects for the firebreak has been surveyed. Construction-related activities associated with the firebreak under Pagan Alternative 2 would have an adverse effect to the same two historic properties (one Pre-Contact artifact scatter and one World War II-era Japanese defensive site) as under Pagan Alternative 1 (see [Table 28](#)). Construction would also impact 7 acres (3 hectares) of native forest which could contain resources of cultural importance, such as medicinal plants. No other resources of cultural importance, such as cemeteries or memorials, would be directly impacted by construction in this area.

Like under Pagan Alternative 1, no construction would occur at the amphibious training beaches or within the Live-Fire Maneuver Area. Thirteen Landing Zones would be cleared, which is two more than under Pagan Alternative 1 and five firing points would be cleared for the Mortar Range. Most of the landing zones and artillery firing points have either been surveyed or are located on lava. Of the four unsurveyed landing zones and the one unsurveyed firing point associated with the Mortar Range, all are located in steep interior areas surrounding Mount Pagan and have a low potential for containing historic properties. As under Pagan Alternative 1, construction-related activities associated with clearing landing zones and firing points under Pagan Alternative 2 would have an adverse effect to six historic properties (see [Table 29](#) and [Table 30](#)), including one Pre-Contact *latte* site, one pre-World War II Japanese Administration site, and four World War II-era Japanese defensive sites. Adverse effects to historic properties from construction of a military trail network would affect the same seven historic properties as under Pagan Alternative 1 (see [Table 31](#)).

Under Pagan Alternative 2, construction-related impacts associated with the base camp/bivouac area would be the same as found under Pagan Alternative 1 and directly affect the same 10 historic properties as under Pagan Alternative 1 (see [Table 32](#)). Like under Pagan Alternative 1, although public

access would not be allowed in the construction area, the public may be allowed in nearby areas depending upon the type of construction. An increase in noise and changes in visual setting may occur during construction in the vicinity of historic properties, including potential traditional cultural properties, when members of the public are present. This change in noise and visual setting would be intermittent and temporary and would not have an adverse effect.

South Range Complex: Under Pagan Alternative 2, the same Non-live-fire Maneuver Area would be established. There would be no construction-related ground clearance undertaken; therefore, there would be no direct or indirect adverse effects to historic properties or resources of cultural importance from construction. Although public access would not be allowed in the construction area, the public may be allowed in nearby areas in south Pagan when construction is ongoing. An increase in noise and changes in visual setting may occur during construction in the vicinity of historic properties, including potential traditional cultural properties, when members of the public are present. This change in the noise and visual setting would be intermittent and temporary and would not result in adverse effect to historic properties.

3.3.2.2 Operation Impacts

Operations and maintenance would be similar to Pagan Alternative 1. The primary difference would be that there would be only one, smaller High Hazard Impact Area established in the North Range Complex. In addition, 13 landing zones would be maintained and used; two more than under Pagan Alternative 1. As a result of the smaller High Hazard Impact area in the north and elimination of the High Hazard Impact Area in the isthmus, four fewer historic properties would be adversely affected by operations. Adverse effects would result from Pagan Alternative 2 operational activities to 50 historic properties. [Table 38](#) summarizes the historic properties affected by operations for Pagan Alternative 2; impacts associated with construction are summarized in [Table 37](#). In the High Hazard Impact Area, three historic properties, also affected by construction, would be adversely affected by operations ([Table 39](#)). Although not all of the High Hazard Impact Area has been surveyed; it is primarily covered in lava. Should sites be preserved under the lava, impacts are unlikely since the depth of the ground disturbance associated with munitions would be less than the depth of the lava.

Table 38. Pagan Alternative 2 Summary of Direct Adverse Effects on Historic Properties from Operations

<i>Complex</i>	<i>Range</i>	<i>Number of Historic Properties</i>
North Range Complex	Northern High Hazard Impact Area	3*
	Landing Zones	0
	Field Artillery Direct and Indirect Fire Ranges/Mortar Firing Positions	0
	Tactical Amphibious Training Areas	1
	Live-fire Maneuver Area	46
	Military Training Trails	0
	Airfield/ Base Camp/Bivouac Area/Munitions Storage Area	0
South Range Complex	Non-live-fire Maneuver Area	NA
Total		50

Note: *All of these sites are impacted by vegetation clearing in target areas, but are located outside of the area of proposed clearing. Sites solely in the construction/cleared area are not included in this total.

**Table 39. Historic Properties Directly Affected by Live-Fire Maneuver Areas (Operations)
Under Pagan Alternative 2**

<i>Temporary Number</i>	<i>CNMI Site Number</i>	<i>Site Description</i>	<i>Historic Period (s)</i>	<i>NRHP Eligibility Criteria</i>
PA-2	NA	Artifact scatter and Latte Period ceramic scatter	Pre-Contact	D
PA-3	NA	Tunnel complex	Japanese Administration	A,D
	PN-4-0063	Water valves	Japanese Administration	D

As with Pagan Alternative 1, amphibious training, consisting of swimmer and inflatable boat landings, would occur at six beaches—Red, Green, Blue, South, North, and Gold under Pagan Alternative 2. Amphibious Assault Vehicles and Landing Craft Air Cushion vessels would be used at Red, Green, and Blue beaches. Landing Craft Air Cushion vessels would be used at Red, Green, Blue, and South beaches. Use by swimmers and inflatable boats would have a minimal impact to any historic properties, including traditional cultural properties, and resources of cultural importance. Use of Amphibious Assault Vehicles and Landing Craft Air Cushion vessels could cause ground disturbance on the beach. Landing Craft Air Cushion vessels would have a significant direct impact to one historic property, a World War II-era Japanese airfield (see [Table 35](#)). All beaches have been surveyed and no other resources are recorded within the vicinity of the training areas. The beach areas associated with two potential traditional cultural properties, Red Beach (Shomshon) and South Beach (Regusa), would be disturbed by amphibious landing operations. However, the beach would be restored to its original appearance by contouring and cleaning up expended materials at the end of the exercises (see [Section 3.1.2, Resource Management Measures](#)). No adverse effects would occur to these potential traditional cultural properties. The potential for direct impacts to historic properties and resources of cultural importance from stray rounds in surface danger zones is considered to be extremely low.

Training in the northern maneuver area would be the same as under Pagan Alternative 1 and would have an adverse effect to the same 46 historic properties from tracked and wheeled vehicle use (see [Table 36](#)). Foot maneuvers would occur in the South Range Complex, but effects to historic properties would be minimal.

As with Pagan Alternative 1, restrictions in public access to historic properties and resources of cultural importance would not have an adverse effect to these properties since loss of access to all areas except for the High Hazard Impact Area would be intermittent and temporary. Indirect adverse effects to historic properties and resources of cultural importance due to visual intrusions and noise-level increase from training would be less than significant. An increase in noise and changes in visual setting may occur during operations in the vicinity of historic properties, including potential traditional cultural properties, when members of the public are present. This change in noise and visual setting would be intermittent and temporary and result in a less than significant impact. Indirect impacts to resources of cultural importance such as Laguna Sanhalom due to contamination by munitions in the northern High Hazard Impact Area would be less than significant due to the implementation of best management practices associated with a Range Training Area Management Plan (see [Section 3.1.2, Resource Management Measures](#)).

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