Draft

Environmental Impact Statement / Overseas Environmental Impact Statement

GUAM AND CNMI MILITARY RELOCATION

Relocating Marines from Okinawa, Visiting Aircraft Carrier Berthing, and Army Air and Missile Defense Task Force

Volume 9: Appendices

November 2009

Comments may be submitted to:

Joint Guam Program Office
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Guam and CNMI Military Relocation EIS/OEIS

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CHAPTER 1. RECREATIONAL RESOURCES

1.1 INTRODUCTION

1.2 NORTH

1.2.1 Andersen AFB

1.2.1.1 Trails

Tarague Embayment Interpretive Trail

This 1.5-mile (2.4-kilometer [km]) trail traverses along Tarague Beach.

Anao Trail

This 1.4-mile (2.3-km) hike commences from a limestone forest plateau to the edge of the Anao cliff line.

1.2.1.2 Historic and Cultural Attractions

Arc Light Memorial

This site is dedicated to the 75 airmen who lost their lives flying B-52 missions over North Vietnam from 1965 to 1973.

F-4 Memorial

This site memorializes Andersen Air Force Base (AFB) support to U.S. Forces in Southeast Asia during the Vietnam Conflict.

1.2.1.3 Scenic Points

Tarague Embayment Overlook

This overlook contains a view of Ritidian Point with Tarague Beach in the distance.

Ritidian Point Scenic Vista

Th0s vista near Achae Point on the northwest corner of Guam provides a view of Ritidian Point and Ritidian Beach. The Island of Rota can be seen on a clear day.

1.2.1.4 Beaches and Parks

Tarague Beach

This beach is the only area on Andersen AFB where swimming is allowed.

Pati Point Preserve and Pati Point Marine Preserve

The Pati Point Preserve was established in 1973 by the Air Force to protect the beach strand and limestone forest, natural habitat for deer, monitor lizards, Marianas fruit bats, and birds. In 1993, the Pati Point Marine Preserve was established as a sanctuary for tropical marine life. The Marine Preserve extends from Tarague Beach east to Anao Point and seaward to the 600 feet (ft) (183 meters [m]) depth. Composed of reef flats and offshore waters, the Marine Preserve is a spawning area for marine life.

Sirena Beach

Sirena Beach is a private beach located approximately a mile north of Tarague Beach at Andersen AFB. Sirena Beach includes restrooms with showers, a screened pavilion with patio, barbecue grill, electricity, water, a volleyball net, and a large play area. No swimming is permitted at Sirena Beach unless a 36th Force Support Squadron employed lifeguard is present.

Scout Beach

Scout Beach is located on the northern coast of Guam inside of Anderson Air Force Base, so access is available only to the military or by special permission.Pati Point Beach

Pati Point Beach is located on the northern coast of Guam inside of Anderson Air Force Base, so access is available only to the military or by special permission.

1.2.1.5 Others

Palm Tree Golf Course

This 18-hole golf course is located on the east side of the base.

Coco Palm Resort

Coco Palm Resort, also known as Cocol Palm Beach Garden, is a privately owned resort located in a secluded area in Urunao. The area around the facilities is beautifully landscaped with tropical flowers and plants and because it is located along the beach, it gives guests a front-row seat of Guam's northwestern coastline.

1.2.2 Finegayan

1.2.2.1 Trails

Haputo Trail

This 0.6-mile (1-km) trail leads to the Haputo Beach. Noted activities at the terminus of the trail are swimming, snorkeling, and SCUBA diving. Haputo Beach is situated in the Haputo ERA and fishing is prohibited.

Double Reef Beach

The 2.4-mile (3.9-km) hike leads to a remote beach where visitors can enjoy snorkeling and swimming.

1.2.2.2 Dive Spots

Shark's Hole

Located off Hilaan Beach, the dive site reaches a depth of 30 ft (9 m).

Double Reef

This beginner dive spot ranges in depths from 15 to 70 ft (5 to 21 m) with colorful corals filled with small invertebrates and reef fish.

1.2.2.3 Beaches and Parks

Guam National Wildlife Refuge

Located at the northernmost tip of Guam, the refuge preserves pristine sand beaches, limestone forests, coral reefs, ancient pictographic caves, and habitat for endangered birds and fruit bats at Ritidian Point. Picnicking and fishing are allowed at the refuge. Waters are normally dangerous due to strong waves and currents, and there are no lifeguards on duty (Lotz 2001).

1.2.3 Non-DoD Land

1.2.3.1 Trails

Ritidian to Falcona Trail

This 6-mile (10-km) trail begins at the Ritidian Point in the Guam National Wildlife Refuge and traverses the Uruno and Falcona Beaches.

Ague Cove

The 0.4-mile (0.6-m) trail begins from the former Oceanview Housing Area. Visitors can enjoy snorkeling and swimming at the Ague Cove, where the trail ends.

Hilaan

A 2.6-mile (4.2-km) hike starts from the Tanguisson Power Plant at the Guma Fahou beach to Danu Charu Point. At the trail terminus, visitors can enjoy snorkeling, SCUBA diving, swimming, fishing, picnicking, and camping. A trail in the middle of the Hilaan trail leads to Lost Pond, a natural freshwater pool. Hilaan hike is considered Guam's best hike (Lotz 2001).

1.2.3.2 Scenic Points

Uruno Scenic Vista

This scenic vista provides a view of northern Guam cliffs to Hilaan Beach to Orote Point. The vista is on a private property and access may be restricted.

1.2.3.3 Dive Spots

Dolphin Point

Located off Ague Point, this site is noted for numerous corals and fish in clear water ranging in depth from 25 to 75 ft (8 to 23 m).

Northern Cave

This cave diving spot for advanced divers leads to an inland passage and a clear fresh water spring. The water depth ranges from 20 to 60 ft (6 to 18 m).

1.2.3.4 Beaches and Parks

Tanguisson Beach

Adjacent to Hilaan, an ancient Chamorro settlement, the surrounding area of the beach has been relatively undisturbed. The beach is noted for its snorkeling.

Guma Fahou

Situated north of Tanguisson Beach, this site is used for picnics, fishing, snorkeling, and hiking north to Hilaan.

South Pacific Memorial Park

This park was established to memorialize the half million Japanese and American soldiers and local people who died during World War II.

Y-Piga Conservation Reserve

This interior limestone forest is situated in Yigo Village.

1.2.3.5 Others

Jinapsan Beach Resort

This private beach resort offers water activities.

Guam International Country Club

This 18-hole golf course is in Dededo.

Alte Guam Golf Resort

This 18-hole golf course is recognized by the United States Golf Association and features a driving range.

1.3 CENTRAL

1.3.1 Non-DoD Land

1.3.1.1 Trails

Fadian Cove Trail

This 1-mile (1.6-km) trail from Route 16 and Ignacio Way leads to a scenic vista containing a view of the coastline and cliffs, to Huchunao, the Hawaiian Rock Quarry, Mangilao Golf Course, and Taguan. Visitors can enjoy snorkeling and picnicking at Fadian Cove.

Taguan

This 1.2-mile (1.9-km) trail has been provided by the Mangilao Golf Course as public shoreline access. The trail encounters rugged limestone terraces towards the coastline before the shoreline is reached.

Gun Beach to Tanguisson

This 1.8-mile (2.9-km)coastal trail begins from the east end of the Tumon Bay to the Tanguisson Beach.

Dos Amantes Biking and Hiking Trail

This 5.5-mile (8.9-km) trail serves as a hike and bike trail. The parking lot at Puntan Dos Amantes serves as the starting point.

1.3.1.2 Historic and Cultural Attractions

Fo Guang Shang Guam Temple

This Buddhist temple is operated by the Guam Buddhist Society.

Father Duenas Memorial School and Statue

Guam's only all-boy preparatory high school has a statue of Father Jesus Duenas who became a martyr during World War II.

War in the Pacific National Historic Museum

This museum provides displays and memorabilia from World War II. The museum was established by the U.S. Congress on August 18, 1978 and is managed by the National Park Service.

White Lady Bridge

This bridge is located in a secluded valley surrounded by bamboo groves. It is alleged that a sighting of the "White Lady" at the bridge signals a dangerous storm approaching the island.

Korean Air Lines Crash Memorial

This site of the KAL Flight 801 crash on August 6, 1997 can be viewed across the valley of the Fonte River on the far slope. Access on the pipeline access road is closed except for the annual remembrance ceremony of the disaster.

Agana Naval Cemetery

This pre-World War II Naval Cemetery was used primarily for U.S. military and dependents. The graves of German sailors killed in the scuttling of the SMS Cormoran in 1917 are also contained there.

Chief Quipuha Park

Located on the Paseo de Susana peninsula stands the statue of Chief Quipuha (Imahen Madalahi as Kepuha), the highest ranking chief in the Hagåtña area at the time the first Spanish settlers came to Guam. The park was dedicated in 1977 to recognize Chief Quipuha, who welcomed the first Jesuit missionaries to introduce Christianity in the Mariana Islands. He donated the land where the present Dulce Nombre de Maria Basilica stands.

Chamorro Village (I Sengsong Chamorro Village)

This shopping village is situated adjacent to Paseo Susana; the market is a popular lunch spot for local residents and visitors. On the main mall, local artisans demonstrate and teach their crafts. Cultural demonstrations by local entertainers are provided weekly.

San Antonio Bridge (To'lai Acho)

Built in 1800 by Spanish Governor Manuel Muro, this bridge connects the San Ignacio and Bilibic districts across Agana River. The river was filled in during the post-war rehabilitation of Agana in 1945.

Sirena Statue

Guam's legendary mermaid statue of Sirena who was cursed by her mother and turned into a fish for neglecting her chores to go swimming. Sirena's godmother overheard this curse and asked that the gods spare the part of Sirena that belonged to her. Sirena was turned into a mermaid and can only be caught with a net of human hair.

Plaza de Espana

Situated in the middle of Hagatna's business district, this plaza hosts social and civic functions, including the inauguration of the Governor of Guam.

Pope John Paul II Statue

This statue marks the site where Pope John Paul II celebrated Mass on February 23, 1981. He was the first pontiff to visit the island. The bronze statue rotates at a rate of one full revolution every 12 hours.

Skinner Plaza

Within this Plaza is a marker to Governor Skinner, Guam's first civilian governor, and a replica of a memorial to the Chamorro people who died at Wake Island while serving the U.S. during World War II. The Plaza also has a Korean War Memorial.

Hagåtña Historic District

This area contains several pre-war Chamorro homes, notable among which are the Rosario House, Martinez-Notley House, Leon Guerrero House, Lujan House, L.D. Flores House (Kamalen Karidat), Shimizu House, and Ungacta House.

Padre Palomo Grave

This site pays tribute to the first ordained Chamorro priest, Padre Jose Torres Palomo, who aided Lieutenant Governor Wiliam E. Safford in appeasing the Chamorro people with the new government.

Adelup Point

The Governor's Office and other government agencies are located at Adelup Point. A cluster of pavilions is available below the Adelup Complex for use by the public. This site is also used for outdoor Government of Guam ceremonies.

Government House

Combining Spanish and Chamorro architecture, the Government House is the symbolic home of the people of Guam and the official residence of the Governor of Guam.

Japanese Fortifications

Numerous fortifications were constructed to defend Guam against an American invasion during World War II. Fortifications like these are dispersed along Tumon Bay.

Padre San Vitores Shrine

This shrine marks the spot where the leader of Spain's first Jesuit mission, Padre Diego Luis de San Vitores, was martyred on April 2, 1672 by Chamorro Chief Matapang, who opposed the unapproved baptism of his daughter.

1.3.1.3 Scenic Points

Bayview Baptist Church Scenic Vista

This scenic vista provides an expansive view from Paseo Stadium in Hagatna to Tamuning.

Top O' the Mar

The scenic vista from the Navy Club provides a view of Guam's western coastline.

Asan Bay Overlook

This scenic overlook provides a view of Asan Beach to Orote Peninsula. The overlook contains the Memorial Wall with the names of those who died fighting to liberate Guam during World War II.

Two Lovers Point (Puntan dos Amantes)

This popular cliff lookout marks the spot where two legendary lovers, whose parents opposed their marriage, jumped to their deaths after tying their hair together. The lookout provides a view of the white sand beaches and lush hillsides along the Philippine Sea and Central Guam.

Old Guam Memorial Hospital Scenic Vista

This scenic vista at the west end of Pale San Vitores Road provides a view overlooking Tumon Bay.

Palace Hotel Scenic Vista

This scenic vista that provides a view of East Hagatna Bay can be reached by way of the public access adjacent to the Palace Hotel. The access also leads to the Palace Wall and Rick's Reef, where users can enjoy snorkeling, SCUBA diving, and surfing sites.

1.3.1.4 Dive Spots

Asan Cut

This dive spot features a coral reef wall and an American amphibious landing vehicle tracked sunk in the invasion of Guam on July 21, 1944.

Camel Rock

This dive boat site features corals, fish, and small anemones with depths from 40 to 130 ft (12 to 40 m). The bottom is littered with dumped unexploded ordnance from World War II.

1.3.1.5 Beaches and Parks

Francisco F. Perez Beach

This is a 2-acre (0.8-hectare [ha]) site with a pavilion, picnic tables, benches, and restrooms located just north of the mouth of the Pago River. The site is the only public vehicle access to the shores of Pago Bay Perez Beach is used for picnics, snorkeling, and fishing.

Asan Beach Unit

This site contains gun encasements, caves, and pill boxes, over an area of 445 acre (180 ha). There are a number of World War II memorials, relics, and informational signs scattered around the park. The beach area is lined with coconut trees to provide shade. Additionally, the site hosts a park used by the public for active outdoor activities Asan Beach Unit is part of the War in the Pacific National Historic Park.

East Hagatna Beach

This beach is one of two sites in Agana Bay where regulated jet skiing is allowed. Previously, East Hagatna Beach was used by net fishermen, who still have priority use of the site during the runs of manahak (juvenile rabbitfish) which occur three times a year—April-May, June, and October.

West Hagatna Beach

This 8-acre (3-ha) beach provides swimming, snorkeling, and fishing uses.

Agana Central Park

This 45-acre (18-ha) public recreational complex has a swimming pool, four tennis courts, and two handball courts.

Padre Palomo Park

This beach park offers shelters for picnicking.

Paseo de Susana Park

This site is on a man-made peninsula constructed with bulldozed debris of war-time Hagåtña after the liberation of Guam in 1944. The annual Liberation Day festivities and parade are held during the month of July.

Japanese Caves Park

This park features several interconnected caves that were dug by Chamorro people under forced labor by the Japanese during World War II. These sites served as air raid shelters and defensive strong points.

Senator Angel Leon Guerrero Santos Latte Stone Park

This park contains eight latte stones, transferred from the remote Me'pu village, an ancient Chamorro settlement in the southern interior valley of Guam.

Gun Beach

This secluded beach is named for an anti-aircraft military gun found next to the cliff wall.

Matabang Beach

Located along Tumon Bay, this beach contains shelters and restrooms.

Governor Joseph Flores Park (Ypao Beach Park)

Used widely to host concerts and other events, this is one of the most popular recreational areas on Guam (Guam Visitors Bureau). Ypao Beach has pavilions, restrooms, and shower amenities. The beach is also noted for its snorkeling.

Tumon Bay Marine Preserve

This preserve was established in 1997 to protect the coral reef and aquatic creatures contained within the preserve area.

Apotguan Park

Located on Agana Bay, this beach park has picnic facilities and restrooms. A notable feature is the 1993 statue of the Chamorro Women of Guam located in the vicinity of the old Carolinian settlement.

Archbishop Felixberto C. Flores Par

This park is noted for the statue of the first Chamorro Archbishop of the Catholic Church holding images of Pale San Vitores with Santa Maria Kamalen in his hands.

Chinese Park

This park was developed in 1978 by the Chinese Community of Guam. Notable features include a statue of Confucius and several pagodas. The park features a panoramic view of Tumon Bay and has restrooms on-site.

Cushing Zoo

This zoo features sharks, monkeys, turtles, tropical fish, lizards, tortoise, and a crocodile.

Fafai Beach

Situated nearby Tumon Bay, Fafai Beach is a prehistoric coastal site as evidenced by the remains of six to eight latte structures. These sets, and the deep midden deposits, are remnants of a prehistoric village of the Chamorro people.

1.3.1.6 Spelunking

Marbo Cave

This limestone cave is filled with freshwater, with a depth up to 30 ft (9 m), from the underground lens. Smaller caves are connected to the main cave.

1.3.1.7 Others

Guam International Raceway

The Guam International Raceway, Guam's only automobile raceway, is on a 250-acre (101-ha) parcel of land leased from the Chamorro Land Trust and operated under a 21-year commercial license administered by the Guam Economic Development Authority (also see Sections 2.8, Land and Submerged Land Use and 2.16, Socioeconomics and General Services).

In February 1998, Bill No. 435 was passed by the Guam Legislature and signed by Governor Carl Gutierrez, providing credits against Guam's Gross Receipts Tax for contractors, designers, and material suppliers who work on the Guam International Raceway in addition to exceptions from real estate taxes on the race facility's property. Raceway construction began in 2001 and continued through March of 2007. To date, the Government of Guam has spent approximately $7.3 million and volunteers have donated many hours developing the Raceway's facilities.

The Raceway began holding events in 2002 and has since operated continuously. The Raceway offers a variety of race venues on asphalt and dirt tracks capable of accommodating a range of ages and skill levels, including a 14-mile (22-km) dirt track; a 0.5-mile (0.8-km) asphalt NASCAR type track; a 1-mile (2-km) long off-road course; and a paved 2.2-mile (3.6-km) Formula Three track.

These race venues provide a variety of activities for various user groups, including participation in soap box derbies and mini bike races for children; quarter mile drag racing, drifting, obstacle course maneuvering, four wheeling rock crawl and mud events, stock car racing, and off-road racing for adults and young adults; and construction vehicle events for spectators of all ages. Motocross and drag races are the most frequently held events. International motorcycle and off-road races promote tourism and draw professional competitors from both the U.S. and Asia.

Future plans for the Raceway include continuing the development of the 0.5-mile (0.8-km) NASCAR style track and a 2.2-mile (3.6-km) Formula Three track. The future NASCAR and Formula Three tracks are planned to provide additional international venues to increase sport tourism travel and spending on the island. Cost estimates to complete Raceway development range from $6 to 9 million.

In addition to races, the Raceway hosts a number of special events every year, including music concerts, car shows, and driving schools. Some special events are combined with races and draw crowds of over 5,000 people. The Raceway is a popular recreational venue for tourists and Guam's local civilian and military population, and has over 100 races and events scheduled for 2009.

Mangilao Golf Course

This coastal 18-hole golf course is located on the coastline of Mangilao. The golf course has a restaurant in the clubhouse. A portion of the golf course protects the Chamorro archaeological site at Mochom along the bay.

Leo Palace Resort

This resort includes a 27-hole golf course, restaurant, tennis courts, and swimming pools.

Alupang Beach Club

This club offers a wide variety of activities, including dolphin watching, trolling, and parasailing.

Hagatna Springs and Hagatna Swamp

Water flowing from limestone forms the Hagatna Springs and flows through the Hagatna Swamp into the Hagatna River that flows into the Hagatna Bay. The springs were first used in 1914 by the Navy to overcome dry season water shortages and continued to be used until deactivation in 1957. In 1970, the springs were restored by the Guam Science Teachers Association.

Hagatna Pool

This 45-acre (18-ha) public recreational area has a large swimming pool and several tennis courts.

Target Golf

This site features a lighted par-3 golf course for night play.

Hotel Nikko Water Park

This water park at Hotel Nikko offers multiple pools and waterslides.

Hyatt Regency Water Park

Located at the Hyatt Regency, this water park features three free-form pools with water slides and a river pool.

Tarza Water Park

This water park has a variety of water slides.

Under Water World

Located at Pleasure Island, this water park has an aquarium with an underwater tunnel containing an abundance of small and large sea life.

Pacific Islands Club

This club features day use for windsurfing, kayaking, snorkeling, in-line skating, a swim-through aquarium, a water park with water games and water slides, tennis, squash, and racquet ball.

Onward Beach Resort

This resort offers different kinds of water activities and water slides. At low tide, visitors may walk across to the uninhabited Alupat Island.

Hagåtña Marina

Hagåtña Marina is a public boating facility with docks, launching ramps, and a fueling facility. The Marina is also a kayaking starting point west of the Seamen's Service, east of Tumon's Beaches, and a long paddle from Merizo Pier.

1.3.2 Piti/Nimitz Hill

1.3.2.1 Trails

Piti Guns

This trail is very short at 0.1 mile (0.2 km). The trail leads to one of the only two places on Guam where Japanese guns are found in their original fortification.

Asan Falls

This 0.9-mile (1.4-km) trail begins at Nimitz Hill. The trail is hidden in a secluded river valley above the Asan village. The trail leads through a series of waterfalls.

San Carlos Fall

This trail is 3.2-mile (5.1-km) long and begins at Nimitz Hill. At the trail terminus is a swimming hole and waterfall.

Lonfit Valley

This 2.4-mile (3.9-km) trail leads through dense grass and towards red slopes to the river valley and then to a steep descent into a tributary of the Lonfit River.

1.3.2.2 Scenic Points

Mount Chachao Scenic Vista

This scenic vista provides a view of Piti and Apra Harbor. The site serves as a trailhead to several hikes leading to a mountain and waterfalls.

Cabras Island Scenic Vista

This scenic vista at the northern edge of Cabras Island has a view of the Two Lovers Point to Ritidian Point.

1.3.2.3 Dive Spots

Glass Breakwater

This spot attracts divers and surfers, but access to the site can be difficult due to its location on Navy property. To the north of the breakwater is Luminao Reef, a barrier reef with a diversity of corals conducive to both snorkeling and SCUBA diving. To the west of Luminao Reef is a dive site called Blue and White, named for its deep blue water and white sand. Divers can explore the plateaus, slopes, and native marine life.

Nichiyu Maru

This site hosts a 6,871-ton (6,233-metric ton) Japanese freighter torpedoed by the U.S. submarine Permit on May 5, 1943. The freighter currently lies below the Shell fuel pier in 100 ft (30 m) of water. Divers are required to obtain permission from Shell to dive the ship.

Tokai Maru

This site hosts a 8,359-ton (7,583-metric ton) Japanese passenger-cargo ship torpedoed by the U.S. submarine *Flying Fish* on January 25, 1943. Divers can tie up to one of several mooring buoys south of the seaplane ramp.

S.M.S. Cormoran

This site hosts a German ship that lies besides the *Tokai Maru*. A buoy chain leads to the ship with the buoy anchor lying between the *Tokai Maru* and the *S.M.S. Cormoran*.

Japanese Tugboat

This site hosts a sunken tug that lies near *Tokai Maru*.

Kitsugawa Maru

This site hosts a 1,915-ton (1,737-metric ton) Japanese freighter sunk by the dive bombers from the U.S. aircraft carrier *Enterprise*. The freighter lies in 140 ft (43 m) of water.

The Val

This site hosts a Japanese Navy D3A2 dive bomber shot down on June 19, 1944 and currently lies near the Glass Breakwater in 80 ft (24 m) of water.

American Tanker

This site hosts an American Tanker along with sunken barges in 40 to 120 ft (12 to 37 m) near the south end of the breakwater.

The Scotia

This site hosts a sunken cable ship sent to Guam to fix a sinking buoy near the entrance of the Apra Harbor. It sank while attempting to enter the harbor in 1904.

Western Shoals

This site is located in the middle of the harbor. The reef has several large crevices with sponges, reef fish, invertebrates, and stag horn corals that can be explored by either SCUBA diving or snorkeling. The depths of the shoals can range from 5 to 75 ft (23 m).

Hourglass Reef

This site is located to the west of Western Shoals across a narrow and deep channel. The reef, shaped like an hourglass, reaches depths up to 100 ft (30 m). There are many anemones, barrel sponges, corals, and fish.

1.3.2.4 Beaches and Parks

Dog Leg Pier

This site features octopi, eels, parrotfish, clownfish, anemones, and other marine life in the coral reef. The pier is used by KC Water Sports, Charles Marine Sports Club, Paradise Aqua, and Dive City Academy exclusively.

Family Beach

This beach is used by Guam Dolphins Marine for water recreational activities. The site is noted for snorkeling, SCUBA diving, and wind surfing.

Tepungan Beach

This public beach has picnic shelters and a restroom. The park is frequently used by visitors after diving and snorkeling at the *Piti Bomb Holes*.

Port Authority Beach

Although this beach is a public facility, a reservation is required. The beach is situated adjacent to the Navy's Delta and Echo Fuel Piers.

Fish Eye Marine Park

This site features an underwater observatory where visitors can view tropical fish and corals beneath the surface of the water.

1.3.2.5 Fishing

Piti Bomb Holes Preserve

The Piti Bomb Holes are natural reef formations that received their name because they appear to have been created by bombs. Fishing is restricted to protect the coral reef and fish that inhabit the area.

Masso Reservoir

Masso Reservoir is a 28-acre (11-ha) site with a 2.5-acre (1-ha) man-made reservoir in Piti. The site offers camping, picnicking, hiking, and fishing opportunities. The site is the only publicly accessible freshwater lake on Guam. Although no longer used, the reservoir was constructed in the 1950s to supply water to the village of Piti.

Sasa Bay Preserve

Fishing in this Preserve is restricted to protect the coral reef and fish along with an estuary of mangrove swamp.

1.3.2.6 Others

Marianas Yacht Club

Located in Apra Harbor, this club sponsors races and regattas, as well as facility uses, such as mooring, tender parking, and mail holding.

Devil's Punchbowl

This site features a vast natural limestone sinkhole.

Seaplane Ramp

This ramp is used to launch boats into Apra Harbor.

1.3.3 Apra Harbor

1.3.3.1 Trails

Orote Point

The 1-mile (2-km) hike begins at the end of Orote Peninsula. The trail leads through a forested area and through cave bases and terminates at a coral pebble beach. Hikers may swim and snorkel at the beach.

1.3.3.2 Historic and Cultural Sites

Pan Am Clipper Landing Site

This is the old Pan Am Clipper Landing Site, which was used from 1935 to 1941 by Pan American Airways for transporting passengers to and from Manila and Hawaii, and beyond. The service ended due to the Japanese bombing of Pan Am's headquarters in December 1941.

Orote Airfield

Orote Airfield was constructed during World War II by the Japanese with forced Korean and Chamorro labor. The airfield was operational during the war and, after the U.S. liberation of Guam, it was used by Marine Corps Air Group 21 to service Navy and Marine aircraft. Today, much of the field is used as training grounds. This site is closed when the adjoining Orote Peninsula is being used to offload ammunition from ships for safety reasons.

Sumay Village

The site of Sumay Village has several historic features. Sumay Village was a Chamorro settlement since prehistoric times (Lotz 2001). During Spanish colonial times, the village was a port of call for Spanish galleons. During World War II, the village hosted two Japanese engineer construction battalions. Currently, the former village site occupies a portion of the Navy Main Cantonment.

War Dog Cemetery

The Cemetery memorializes 25 Marine Corps dogs killed in action on Guam. The dogs were used to find Japanese hiding in caves and in defensive positions, as scouts, sentries, messengers, and for locating mines and booby traps.

1.3.3.3 Scenic Points

Orote Point Scenic Vista

This scenic vista is located at the end of Orote Point Road and contains a scenic vista of Orote Point, the Apra Harbor entrance, the Glass Breakwater, and Orote Island.

1.3.3.4 Dive Spots

Old Fuel Piers

North of the Old Fuel Piers are the remains of two Japanese seaplanes. Visitors may SCUBA dive or snorkel.

Shark Pit

This dive spot marks the site where, after World War II, AMTRACS, mess hall trays, old china, food, and garbage were dumped and ultimately attracted sharks. Sharks are no longer present, but tuna, jacks, butterfly fish, and parrotfish are abundant. Water depths range from 1 to over 130 ft (40 m).

Blue Hole and Crevice

This crevice is a deep canyon with a large boulder at the mouth off Orote Peninsula. There are sea fans, whips, fish, moray eels, shells, and corals in 60 to over 130 ft (18 to 40 m) of water.

Sponge Reef

This 300-ft (91-m) reef is relatively flat where numerous corals, anemones, and fish are present at depths ranging from 40 to a 100 ft (12 to 30 m).

Finger Reef

The water depth at this reef runs to 100 ft (30 m) at this site.

1.3.3.5 Beaches and Parks

San Luis Beach and Fort San Luis

This beach offers picnic facilities and a swimming area.

Gab Gab Beach

This beach is noted for snorkeling and plenty of fish in waters reaching 100 ft (30 m) in depth. There are picnic tables and shelters on-site.

Dadi Beach

Dadi Beach is a kayak starting point to Turtle Rock, North Tipalao Cave, and Agat Marina.

1.3.3.6 Others

Sumay Cove Marina

Sumay Cove is the Marina which offers sailboats for rent for recreational use to military personnel and their dependents.

1.4 SOUTH

1.4.1 Naval Munitions Site (NMS)

1.4.1.1 Historic and Cultural Attractions

Fena Massacre Site

Several Chamorro men were massacred by Japanese soldiers in a cave nearby Harmon during the American bombardment of Guam.

1.4.1.2 Scenic Points

Japanese Lookout

Contrary to the belief that the lookout constructed on top of Mt. Alifan was use by the Japanese soldiers, the lookout was actually an American military communications installation built after the U.S. liberation of Guam. From the lookout is a scenic vista of Orote Peninsula, Santa Rita, and Agat.

1.4.1.3 Fishing

Fena Reservoir

Constructed in 1951, this reservoir provides a dependable water supply for the Navy on Guam. Between 1956 and 1968, several species of fish, including tilapia, peacock bass, small and large mouth bass, and channel catfish, were introduced to the reservoir. Fresh water fishing is popular at the Fena Reservoir.

1.4.1.4 Others

Almagosa and Dobo Springs

These two springs lie deep within the Fena Valley. In 1931, pipes were installed to connect the springs to the Maanot Water Reservoir to supply water to Apra Harbor. Nearby are the Dobo latte site and Almagosa Waterfall, which are points of interest.

1.4.2 Non-DoD Land

1.4.2.1 Trails

Sella Bay Trailhead

The terminus of the 1.5-mile (2.4-km) trail within the Guam Seashore Park at Sella Bay is noted for swimming, snorkeling, and SCUBA diving with ledges, tubes, and underwater caves to explore. The river contains tilapia and freshwater shrimp and attracts fishing activities. Sella Bay is also remembered as a site of a leper colony during the time of Spanish rule.

Tarzan Valley Bike Trail

The trail starts near the former Smoking Wheels track and ends at Route 17.

Atilling Acho

The 2.2-mile (3.5-km) trail begins from the Cetti Bay Overlook to the Cetti Bay, where hikers can snorkel.

Cetti Fall

Located within the Guam Seashore Park, a series of seven falls make up the Cetti Falls. The trail begins at the Cetti Bay Overlook.

Umatac to Toguan Bay

The 1.2-mile (1.9-km) coastal trail begins at either Umatac Village or Toguan Bay. Hikers are advised to stay along the beach as most of the inland area is under private ownership. Depending on where the hike begins, visitors may rest and snorkel near the Toguan Bay or Umatac trail ends.

Faha and Tinta

The 0.8-mile (1.3-km) trail leads to massacre sites of the Chamorro people by the Japanese soldiers during World War II.

Priest's Pools

The 0.6-mile (1-km) trail from Pigua to a series of eight pools located in a pillow basalt cave. The top pool, with clear and cool water, is the largest and is ideal for swimming.

Mt. Lamlam

The 2.2-mile (3.5-km) trail leads to Mt. Lamlam, Guam's highest point at 1,334 ft (407 m) above sea level. The summit offers a panoramic view of Guam's hilly interior toward the north and a panoramic view of the southern coastline. Although a portion of the trail is located on a Navy property, there is no access restriction

Southern Mountains

The series of hikes along the southern mountains of Guam begins at the Cetti Bay Overlook trailhead. The total length of the trail is 23.8 miles (38.3 km).

Mt. Schroeder

The 1-mile trail to Mt. Schroeder begins at the end of Cruz Avenue in Merizo. A scenic point on Mt. Schroeder provides a view of the southern mountains and Cocos Lagoon.

Mt. Sasalaguan

The 4.2-mile (6.8-km) trail begins at Ija and ends at Mt. Sasalaguan within the Guam Seashore Park.

Ricky's Beach and Ylig Bay

The 2.2-mile (3.5-km) trail commences from Tagachang Beach on the eastern shoreline of Yona. Ricky's Beach is at the base of the cliff tucked between the ocean and the shore. Ylig Bay can be reached by retracing steps to Tagachang Beach and heading south along the coastline.

Paicpouc Cove and Matala Beach

The 2-mile (3-km) trail commences at Talofofo Bay. Along the trail near Paicouc Cove are the remains of the *Aratama Maru*, a Japanese ammunition ship that was torpedoed by a Navy submarine.

Inarajan Falls

The 5-mile (8-km) trail begins at the Inarajan Middle School. *Inarajan Falls* can be seen along the trail. A short distance from the falls is the longest series of latte stones, consisting of the 14 pieces found on Guam. Hikers can enjoy shallow pools and the river at the trail terminus.

Asiga

The 1.5-mile (2.4-km) trail begins at the Malojloj Coral Pit trailhead. The trail leads to cliff faces, which hikers can climb to reach a series of several caves.

Waterfall Valley

Five waterfalls can be seen during the 0.8-mile (1.3-km) trail along the green gorge of the Aslinget River just north of Inarajan Village.

Fintasa and Laolao Falls

These waterfalls are located in the rolling hills west of Inarajan Village. Hikers have an unobstructed view of the Inarajan Village and the Fintasa Falls valley, and a small island where the Laolao Falls are located.

Sigua Valley Bike Trail

This trail begins at Mt. Chachao Scenic Vista and terminates at Mt. Tenjo. There are also a series of bike trails in the easterly direction from the trail end.

Upper Sigua and Alutom Falls

This 2.5-mile (4-km) trail commences at Mt. Chachao and follows along a series of falls at Upper Sigua Falls and Alutum Falls.

Sigua River

This 5-mile (8-km) trail begins at Mt. Chachao.

Upper and Lower Sigua Falls

This trail along the central grasslands and jungle leads to the waterfalls at the junction of the Upper Sigua River and the Lower Sigua River.

Lower Sigua Falls, Sinisa Falls, and Tank Farm

This 6.2-mile (10-km) trail leads to Lower Sigua Falls, Sinisa Falls, and Tank Farm, which consists of American military vehicles used for target practice after Guam's liberation. Visitors can swim and picnic at the trail terminus.

Maguagua Falls

The 2.5-mile (4-km) trail that begins west of Mt. Chachao and ends at Maguagua Falls.

Mt. Chacho and Mt. Tenjo

Hikers may encounter one of several relics from World War II during the hike on this three mile remote and hilly trail, including an American gun encasement. The hike traverses the War in the Pacific National Historical Park.

Guatali Falls

The 3.2-mile (5.1-km) trail commences at the War in the Pacific National Historical Park. Notable features along the hike are Malaa Falls, Upper Guatali Falls, and Lower Guatali Falls.

Tarzan Falls

The 1.4-mile (2.3-km) trail is a boonie trail. The trail begins at the Cross Island Road and runs through a series of waterfalls along Tarzan River within the Government of Guam Coastal Conservation Reserve.

Tarzan Swim Hole

The 2-mile (3.2- km) trail begins at the Cross Island Road.

1.4.2.2 Historic and Cultural Attractions

Gaan Point

The flags of the U.S., Japan, and Guam fly in memory of those killed during the U.S. liberation of Guam. There are remnants of an extensive fortified knoll, a Japanese naval coastal defense gun, and a Japanese dual mount anti-aircraft cannon. The park also features picnic facilities and a restroom.

Inarajan Village

This site is considered to be the primary example of a Spanish-influenced village on Guam. The *Inarajan Village* offers historical insight on the architectural design and development of structures built during the late Spanish and early American periods The site was placed in the National Register of Historic Places in 1977 as a Historic District.

Malesso Kombento

Built in 1856 shortly after the smallpox epidemic that killed two-thirds of the population, *Malesso* (Merizo) *Kombento* provided housing for Catholic missionaries and village priests in Guam.

Merizo Bell Tower (Kanapanayan Malesso)

The site was built around 1910 under the direction of Father Cristobal de Canals; restored in 1981; and is included on the National Register of Historic Places.

1.4.2.3 Scenic Points

Cetti Bay Overlook

This scenic point provides a spanning view of Cetti Bay, from Cocos Island to the Merizo barrier reef in the distance.

Fouha Bay Scenic Vista

This scenic point contains a view of the Fouha Bay.

Talofofo Bay Scenic Vista

This scenic vista features Talofofo Bay and the southern mountains to the west.

Mt. Alifan Unit

The scenic vista on the top of the hill provides a view to the north of Orote Point, Facpi Point to the south, Agat, and Mt. Alifan to the east. The Marines landed along the coast to liberate Guam on July 21, 1944.

Inarajan Scenic Vista

This scenic point provides a view of Inarajan village.

Pago Bay Overlook

This scenic overlook from the largest bay on the central windward side of the island provides a view of Pago Bay. In the distance is Mangilao, the University of Guam, and Iates Point.

Ylig Bay Scenic Vista

This scenic vista provides a view of Ylig Bay.

Ija Scenic Vista

This scenic vista provides a view of the coastline of Inarajan and of the southern mountains.

1.4.2.4 Dive Spots

The AMTRAC

This dive site hosts snorkeling and SCUBA diving. An AMTRAC sunk by a Japanese shell rests on the ocean floor at a depth of 50 ft (15 m).

Hap's Reef

This bread loaf-shaped reef is located offshore of Tongcha Beach and north of Gaan Point. Divers may enjoy swimming alongside tropical fish in depths between 25 and 60 ft (8 to 18 m).

Pete's Reef

This reef features a mixture of coral heads, sandy patches, and marine life including an occasional eel and dolphin in the depths ranging from 20 to 80 ft (6 to 24 m).

Japanese Zero

This is an offshore dive site from San Jose in 50 ft (15 m) of water The site is home to a Mitsubishi A6M5, a Japanese Navy fighter from World War II.

Fouha Bay

This dive spot contains corals, ledges, and caverns in the depth to 40 ft (12 m).

Nathan's Dent

This site is situated south of Facpi Point, and contains corals, caves, and sea life up to 80 ft (24 m) in depth.

Mana Bay Cut

This site offers free diving off the shore of Ipan Beach Resort with water depth of 80 ft (24 m). Mana Bay Cut is noted for soft corals, schools of angel fish, clownfish, stone fish, and an occasional octopus.

Aratama Maru

This site contains a 6,783-ton (6,153-metric ton) Japanese ammunition ship that was damaged and abandoned after an attack by a U.S. submarine on April 8, 1944. The ship lies broken up in 50 ft (15 m) of water.

Cocos Lagoon

Cocos Lagoon was created by the offshore barrier reef. The site is noted for its broad expanse of extensive corals, sand flats, and sea grass beds. Two channels cut through the barrier reef. Cocos Lagoon attracts snorkeling, SCUBA diving, surfing, and windsurfing uses.

1.4.2.5 Beaches and Parks

Nimitz Beach Park

This park offers a view of the small islands located in Agat Bay and the Orote Peninsula. The 10-acre (4-ha) beach park is noted for its monkey pod and coconut trees, a pavilion, shelters, and restrooms.

Asquiroga Cove (Devil's Cove or First Beach)

Situated towards the south end of the Asanite Bay, this cove features an area to swim and snorkel.

Talofofo Beach Park

The Talofofo River, Guam's longest and widest, empties into the bay, considered to be one of Guam's most picturesque body of water. The beach is a popular surfing beach.

Talofofo Falls Park

Visitors to the park picnic and swim at the waterfall, cascading from the Ugum River. Other features include the Guam Historical Museum, Yokoi's Cave, Observation Tower, and Ghost House.

Aflleje Park at Rizal Beach

This site features the Friendship Pavilion, restrooms, and the Aflleje Beach Memorial Park Peace Memorial. Rizal Beach is noted for its snorkeling and SCUBA diving. Offshore, the Rizal reef has a depth of about 40 ft (12 m) and a sandy bottom containing clams, shrimp, eagle rays, sting rays, manta rays, fish, and finger corals.

Namo Falls Botanic Park

This park is privately owned and a user fee is required. Namo Falls Botanic Park provides a walk through a botanic garden featuring tropical flowers and two waterfalls, Guello and Guella Falls.

Togcha Beach

Formerly known as the Agat Family Beach, Tongcha Beach offers shelters and a restroom.

Salinas Beach

Visitors to this small and secluded beach may enjoy swimming and snorkeling.

Ipan Beach

Situated near Asquiroga Cove, Ipan Beach is a long, strand beach. The beach features a World War II rest camp for Navy submariners, Camp Dealy, as well as a Japanese fortification near Tongcha Bay. Along the beach are swimming holes and old drums.

Umatac Bay Park

Every year, Umatac Bay Park hosts the Magellan Monument commemorating the explorer's landing in 1521. The Park also contains the Mayor's office, picnic facilities, restrooms, and a boat ramp. The park is the starting point for kayak trips to Sella and Cetti Bays.

I Memorias Para I Lalahita

Dedicated in 1971, this park memorializes those men from Guam who died during the Vietnam War.

Agfayan Bay and Bear Rock

Agfayan Bay is noted for fishing, swimming, surfing, and snorkeling.

Saluglula (Inarajan) Pool

This natural marine waterhole is noted for picnic and swimming sites. The public park also hosts a pavilion, restrooms, shelters, and barbecue pits.

Pauliluc Bay

This bay is placid; visitors can swim and fish.

Toguan Bay

The bridge over the Toguan River marks the boundary between Umatac and Merizo. Toguan Bay is where the Toguan River enters the ocean. Toguan Bay, along with Bile Bay to the south, is normally protected water for snorkeling and SCUBA diving.

Tagachan Beach

The park has a pavilion, restrooms, picnic shelters, and a location for swimming, snorkeling, and scuba diving when the waters are calm. The coastline at Tagachan is ideal for beachcombing.

Merizo Pier Park

Located in Guam's barrier reef, this park is the gateway to Cocos Island. The park is a protected recreational area for various water sports. Each year, the park hosts the Malesso Fiestan Tasi (Merizo Water Festival). The park is noted for the large monkey pod trees and the historic Merlyn G. Cook Schoolhouse along with a children's playground, boat ramp, pier, restroom, and picnic facilities. The park also serves as the starting point for kayak trips to explore Cocos Lagoon and Cocos Island.

Ylig Bay

Visitors can fish, swim, and surf at the bay. There is a boat ramp on the south side of the Ylig River Bridge. The dirt road north of the bridge and the paved road south of the bridge lead to undeveloped beaches. The Ylig River is also a kayaking route.

Achang Reef Flat Preserve

The Preserve spans from Achang Bay to Ajayan Channel and inland from the 33-ft (10-m) line, or the nearest public right-of-way (ROW), seaward to the 600 ft (183 m) depth. The Achang Reef Flat is noted for its extensive sea grass beds especially between Agrigan Island and Guam. These sea grasses are protected as they function as nurseries for replenishing fish stock (Lotz 2001). The Preserve was established in 1997 to protect the coral reef and aquatic creatures contained within the area.

1.4.2.6 Spelunking

Gadao's Cave

This cave is one of the more famous caves on Guam because of ancient Chamorro petroglyphs on the cave walls. The petroglyphs depict the legendary tale of Chief Gadao of Inarajan and Chief Malaguana of Tumon. A massive statue of Chief Gadao paddling his half of the canoe is situated in the Inarajan Village.

Talofofo Caves

This series of six caves is located north of the Route 4 and 4A intersection in Talofofo. The caves are accessed through private properties and Government of Guam (GovGuam) lands that represent important archaeological and pictographic resources. There are no access restrictions within the trail. There are numerous sinkholes, caves, and stalactites in the Mariana Reef limestone formation.

1.4.2.7 Others

Talofofo Golf Resort

This resort features an 18-hole golf course with a pro shop.

Country Club of the Pacific

This 18-hole golf course with a pro shop is noted for the spacious and soaring roof design of the club house.

Windward Hills Country Club

This 18-hole golf course also has a pro shop.

Ipan Beach Resort

This resort occupies Jones Beach and offers day uses including tennis courts, a swimming pool overlooking the beach, volleyball court, and picnic facilities. Rustic huts for overnight stays are also offered.

Cocos Island

This 100-acre (40-ha) island resort is surrounded by a clear, turquoise lagoon off of Merizo. Available activities include jet skiing, windsurfing, and snorkeling.

Bangi Island

Bangi Island is closest to the Guam shore. There is a Japanese fortification from World War II that was taken by the 4th Marines on July 21, 1944. Although the islands are within the authorized boundaries of the War in the Pacific National Historical Park, Bangi Island is private property so access may be restricted. Kayaking is also popular around the island.

Anae Island

This island is extremely rugged, eroded limestone, covered with a variety of plants. Near the center of the island is a cave that descends to salt water. The cave contains unique orange stalactites. A stalactite is a deposit of calcium carbonate (as calcite) resembling an icicle hanging from the roof or sides of a cave. The entire island's edge is an overhanging limestone cliff about 12 ft (4 m) above the water, with interesting caves along the its edge. The offshore patch reef is not connected with the fringe reef around Guam. The reef offers a diversity of coral species located in numerous underwater ridges. Depths range from 15 to 55 ft (5 to 17 m), and is the water is ideal for SCUBA diving and snorkeling. Visitors can also find windsurfing and kayak outfitters on the island.

Agat Small Boat Harbor

Built in 1990, this harbor lies adjacent to Nimitz Beach and provides docking facilities for boaters. Docks, boat ramps, and a fueling facility are present for public use. Agat Small Boat Harbor is a starting point to kayak to Bile Bay and further south to the Pier in Merizo.

Gef Pa'go

Located on the Inarajan Bay, *Gef Pa'go* is a "living museum" that consists of eight thatched huts. Each hut demonstrates ancient Chamorro crafts and practices.

CHAPTER 2.
TERRESTRIAL BIOLOGICAL RESOURCES

2.1 INTRODUCTION

2.2 SPECIES LISTS

English/Chamorro Name	*Scientific Name*
PLANTS	
- /Mapunyao	*Aglaia mariannensis*
- /Puteng	*Barringtonia asiatica*
- /Gaosali	*Bikkia tetrandra*
- /Ilang ilang	*Cananga odorata*
- /Chuti	*Cerbera dilatata*
- /Katot	*Claoxylon marianum*
- /Federiko	*Cycas circinalis (= micronesica)*
- /Gulos	*Cynometra ramiflora*
- /Yoga	*Elaeocarpus joga*
- /Chosga	*Glochidion marianum*
- /pai pai	*Guamia mariannae*
- /Ufa halomtano	*Heritiera longipetiolata*
- /Ifil, ifet	*Intsia bijunga*
- /Fago	*Neisosperma oppositifolia*
- /Langiti	*Ochrosia mariannesis*
- /Nigas	*Pemphis acidula*
- /Umumu	*Pisonia grandis*
- /Langsat	*Pisonia umbellifera*
- /Ahgao	*Premna obtusifolia*
- /Aplokating palaon	*Psychotria hombroniana*
- /Faia	*Tristiropsis acutangula*
African tulip tree/ -	*Spathodea campanulata*
Alexandrian laurel/Daog	*Calophyllum inophyllum*
Banyan/Nunu	*Ficus* spp.
Beach heliotrope/Hunig, hunik	*Tournefortia argentea*
Beach naupaka/Nanaso	*Scaevola taccada*
Breadfruit/Lemmai	*Artocarpus altilis*
Coconut/Niyog	*Cocos nucifera*
Coral tree or tiger's claw/Gabgab	*Erythrina variegata* var. *orientalis*
Fig/Nunu	*Ficus prolixa*
Fire tree/Hayun lagu	*Serianthes nelsonii*
Flametree/Arbol de fuego	*Delonix regia*
Formosa acacia/ -	*Acacia confusa*
Fountaingrass/ -	*Pennisetum* spp.
Golden leatherfern/ -	*Acrostichum aureum*
Hibiscus, sea/Pago	*Hibiscus tiliaceus*
Indian mulberry/Lada	*Morinda citrifolia*
Ironwood or Australian pine/Gago	*Casuarina equisetifolia*
Limeberry/Lemon china	*Triphasia trifolia*
Marianas breadfruit/dugdug	*Artocarpus mariannensis*
Madras thorn/Kamachile	*Pithecellobium dulce*
Pandanus/Kafu	*Pandanus* spp.
Papaya/ -	*Carica papaya*
Para grass/ -	*Brachiaria mutica*
Portia tree/ kilulok	*Thespesia populnea*
Puff or yellow tough sponge	*Neofibularia hartmani*
Reed/ -	*Phragmites karka*
Siam weed	*Chromolaena odorata*
Siris tree Tronkon mames	*Albizia lebbeck*
Sword grass/ -	*Miscanthus floridulus*

English/Chamorro Name	*Scientific Name*
Tangantangan/Tangantangan	*Leucaena leucocephala*
Tree fern/Chacha	*Cyathea lunulata*
Tropical almond/Talisai	*Terminalia catappa*
Vitex/ -	*Vitex parviflora*
INVERTEBRATES	
Asian cycad scale	*Aulacaspis yasumatsui*
Blue-banded king crow butterfly/Ababang	*Euploea eunice*
Branched sandpaper coral/ -	*Psammocora contigua*
Broadhand coral hermit/ -	*Pylopaguropsis kiejii*
Caribbean barnacle/ -	*Chthamalus proteus*
Cauliflower coral/ -	*Pocillopora*
Chinese slipper lobster/ -	*Panulirus guttattus*
Coconut crab/Ayuyu	*Birgus latro*
Common emigrant butterfly/ Ababang	*Catopsilia pomona*
Common mormon butterfly/ Ababang	*Papilio polytes*
Crow eggfly butterfly/Ababang	*Hyplolimnas anomala*
Crown-of-thorns starfish	*Acanthaster planci*
Double-spined rock lobster/ Mahongang	*Panulirus penicillatus*
Formosa staghorn coral/ -	*Acropora formosa*
Fragile tree snail/Akaleha'	*Samoana fragilis*
Galaxy coral/ -	*Galaxea fascicularis*
Giant African snail/Akaleha'	*Achatina fulica*
Great eggfly butterfly/Ababang	*Hyplolimnas bolina*
Guam tree snail/Akaleha'	*Partula radiolata*
Hump coral	*Porites cylindrica*
Humped tree snail/Akaleha'	*Partula gibba*
Knob coral/ -	*Porites convexa*
Kona crab/ -	*Ranina ranina*
Lace coral/ -	*Pocillopora damicornis*
Land hermit crab/Umang	*Coenobita brevimanus*
Lesser grass blue butterfly/ Ababang	*Zizina otis*
Mangrove crab/ -	*Scylla serrata*
Mantis shrimp/ -	*Squilla empusa*
Mariana eight-spot butterfly/ Ababang	*Hypolimnas octicula*
Mariana wandering butterfly/ Ababang	*Vagrans egistina*
Monarch butterfly/Ababang	*Danaus plexippus*
Pineapple coral, Artichoke coral, Starry cup coral, Favia	*Acanthastrea echinata*
Reticulate moray eel	*Muraena retifera*
Rosy wolf snail/ -	*Euglandina rosea*
Scalloped spiny lobster/ -	*Panulirus homarus*
Spider conch	*Lambis* sp.
Spiny lobster/Mahongang	*Panulirus marginatus*
Three-spot grass yellow butterfly/Ababang	*Eurema blanda*
Tiny grass blue butterfly/Ababang	*Zizula hylax*
Top shell	*Trochus niloticus*

English/Chamorro Name	*Scientific Name*
Turban shell	*Turbo torquata*
FISH	
Albacore tuna/ -	*Thunnus alalunga*
Bigeye scad/ -	*Selar crumenophthalmus*
Bigeye tuna/ -	*Thunnus obesus*
Broadbill swordfish/ -	*Xiphias gladius*
Humphead parrotfish/Atuhong	*Bolbometopon muricatum*
Indo-Pacific blue marlin/ -	*Makaira mazara*
Napolean wrasse/Tanguisson	*Cheilinus undulatus*
Northern bluefin tuna/ -	*Thunnus thynnus*
Scalloped hammerhead/ -	*Sphyrna lewini*
Skipjack tuna/ -	*Katsuwonus pelamis*
Snake mackerel	*Gempylus serpens*
Striped marlin/ -	*Tetrapturus audax*
Yellowfin tuna/ -	*Thunnus albacares*
REPTILES AND AMPHIBIANS	
Azure-tailed skink/ Guali'ek halom tano'	*Emoia cyanura*
Blind snake/Ulo' attelong	*Ramphotyphlops braminus*
Brown tree snake/Kolepbla	*Boiga irregularis*
Cane or marine toad/Kairo	*Chaunus (Bufo) marinus*
Crab-eating frog/ -	*Fejervarya cancrivora*
Curious skink/ Guali'ek halom tano'	*Carlia fusca*
Eastern dwarf tree frog/ -	*Litoria fallax*
Greenhouse frog/ -	*Eleutherodactylus planirostris*
Green sea turtle/Haggan betde	*Chelonia mydas*
Gunther's Amoy frog	*Sylvirana guentheri*
Hawksbill sea turtle/Hagan karai	*Eretmochelys imbricata*
House gecko/Guali'ek	*Hemidactylus frenatus*
Leatherback sea turtle	*Eretmochelys imbricata*
Littoral or tidepool skink/ Guali'ek kantun tasi	*Emoia atrocostata*
Loggerhead sea turtle	*Dermochelys coriacea*
Micronesian gecko/Guali'ek	*Perochirus ateles*
Monitor lizard/Hilatai	*Varanus indicus*
Moth skink/Guali'ek halom tano'	*Lipinia noctua*
Mourning gecko/Guali'ek	*Lepidodactylus lugubrus*
Mutilating gecko/Guali'ek	*Gehyra mutilata*
Oceanic gecko/Achiak	*Gehyra oceanic*
Oceanic snake-eyed skink/ Guali'ek halom tano'	*Cryptoblepharus poecilopleurus*
Pacific blue-tailed skink/ Guali'ek halom tano'	*Emoia caeruleocauda*
Pacific slender-toed gecko/Guali'ek	*Nactus pelagicus*
Slevin's skink/Guali'ek halom tano'	*Emoia slevini*
BIRDS	
American golden plover/Dulili	*Pluvialis dominica*
Barn swallow/ -	*Hirundo rustica*
Black drongo/Salin Taiwan	*Dicrurus macrocercus*
Black francolin/ -	*Francolinus francolinus*
Black noddy/Fahang dikike'	*Anous minutus*
Brown booby/Lu'ao	*Sula leucogaster*
Brown noddy/Fahang dankolo	*Anous stolidus*
Collared kingfisher/ -	*Todiramphus chloris*
Eurasian tree-sparrow/ Ga'ga' pale'	*Passer montanus*
Fish crow	*Corvus ossifragus*
Fork-tailed swift/ -	*Apus pacificus*

English/Chamorro Name	*Scientific Name*
Great egret/ -	*Ardea modesta*
Great frigatebird/Ga'ga'manglo'	*Fregata minor*
Greenshank/ -	*Tringa nebularia*
Grey-tailed tattler/Dulili	*Heteroscelus brevipes*
Guam bridled white-eye/Nossa	*Zosterops conspicillatus conspicillatus*
Guam Micronesian kingfisher/Sihek	*Halcyon cinnamomina cinnamomina*
Guam rail/Ko'ko	*Rallus owstoni*
Intermediate or yellow-billed egret/ -	*Egretta intermedia*
Island-collared dove/Paluman senesa	*Streptopelia bitorquata*
Lesser sand plover/ -	*Charadrius mongolus*
Little egret/ -	*Egretta garzetta*
Mariana common moorhen/Palattat	*Gallinula chloropus guami*
Mariana crow/Aga	*Corvus kubaryi*
Mariana fruit-dove/Totot	*Ptilinopus roseicapilla*
Mariana swiftlet/Yayaguak	*Aerodramus bartschi*
Masked booby/ -	*Sula dactylatra*
Micronesian honeyeater/Egigi	*Myzomela rubratra*
Micronesian megapode/Sasangat	*Megapodius laperouse*
Micronesian starling/Sali	*Aplonis opaca guami*
Osprey/ -	*Pandion haliaetus*
Pacific reef-heron/ Chuchuko atilong	*Egretta sacra*
Red-footed booby/Lu'ao talisai	*Sula sula*
Red-tailed tropicbird/ -	*Phaethon rubricauda*
Ruddy turnstone/Dulili	*Arenaria interpres*
Rufous fantail/Chichirika	*Rhipidura rufifrons uraniae*
Tinian monarch/Chuchurikan	*Monarcha takatsukasae*
White-tailed tropicbird/ Fakpe or Utag	*Phaethon lepturus*
White tern/Chunge'	*Gygis alba*
White-throated grounddove	*Gallicolumba xanthonura*
Yellow bittern/Kakkak	*Ixobrychus sinensis*
Wandering tattler/Dulili	*Tringa incana*
Whimbrel/Kalalang	*Numenius phaeopus*
MAMMALS	
Bottlenose dolphin/Toninos	*Tursiops truncatus*
Feral cat/ -	*Felis catus*
Feral dog/ -	*Canis familiaris*
Feral goat/ -	*Capra hircus*
Little Mariana fruit bat/Fanihi	*Pteropus tokudae*
Mariana fruit bat/Fanihi	*Pteropus mariannus mariannus*
Musk shrew/Cha'ka akaleha'	*Suncus murinus*
Pacific sheath-tailed bat/Payesyes	*Emballonura semicaudata rotensis*
Philippine deer/Binadu	*Rusa marianna*
Spinner dolphin/Toninos	*Stenella longirostris*
Water buffalo/Karabao	*Bubalus bubalis*
Wild pig/Babuen halumtano	*Sus scrofa*

Falanruw et al. 1990 (primary source for plant names using Stone [1970] corrected names and Fosberg [1946]); Raulerson and Rinehart 1991; Vogt and Williams 1990; Lutz and Musick 1997; Rice 1998; Nelson et al. 2004; FishBase 2006; Peterson 2006; Gill et al. 2009.

2.3 SPECIES PROFILES

Common Name: Coconut crab

Chamorro Name: Ayuyu

Scientific Name: *Birgus latro*

Species Description

The largest terrestrial crab, and the most terrestrial of the decapod crustaceans due to well-developed thoracic lungs. Considered a hermit crab, but only use the shell of other mollusks during very early life stages. Body color varies between shades of light violet to deep purple to brown. Body length can be up to 16 in (400 mm) and weight on the order of 8.8 lbs (4 kg). Males and females are difficult to distinguish from one another, but males are generally larger.(1)

Threats

Threats include overharvesting and modification of habitat. Highly prized as a food item, as large body size provides substantial amounts of flesh. Commercial interest has led to declining numbers.(1)

Ecology

Found on land after the juvenile phase. Older juveniles begin the move from water, and adults only visit the ocean to hatch eggs and drink seawater as needed. Forage for fruits, nuts, and seeds, and occasionally eat dead animals.(2) Individuals hide and rest during the day and emerge at night to feed. Eggs are hatched in the ocean where the larvae are planktonic. Lifespan is thought to be around 30-40 years.(1)

Historical and Current Distribution

Found on oceanic islets and atolls and along the coasts of islands in the tropical Indo-Pacific area.(1) This species occurs regularly on Guam and CNMI.(3)

References

1. Schiller, C. 1992. Assessment of the status of the coconut crab *Birgus latro* on Niue Island with recommendations regarding an appropriate resource management strategy. South Pacific Aquaculture Development Project. Suva, Fiji. http://www.fao.org/docrep/field/003/AC281E/AC281E00.HTM.

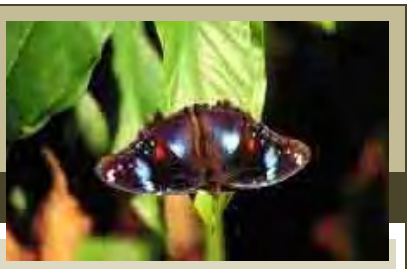
2. Wilde, J.E., S.M. Linton, and P.G. Greenaway. 2004. Dietary assimilation and digestive strategy of the omnivorous anomuran land crab *Birgus latro* (Coenobitidae). Journal of Comparative Physiology and Biology 174:299-308.

3. CNMI DFW. 2009. Game Species Profiles: Coconut Crab. ftp://ftp-fc.sc.egov.usda.gov/GU/features/land_animals/CNMI/Coconut_Crab.PDF.
Photo:http://media-2.web.britannica.com/eb-media/58/125658-004-25041ADE.jpg.
Map: http://www.fao.org/docrep/field/003/AC281E/AC281E06.jpg.

Common Name: Mariana eight spot butterfly, Forest flicker

Chamorro Name: Ababbang

Scientific Name: *Hypolimnas octucula mariannensis*



SPECIES DESCRIPTION

A very rare butterfly, endemic to the islands of Guam and Saipan. Body color is primarily orange and black, with differences exhibited by males and females. Males are black with an orange stripe on each wing, and small black dots accompanying the stripe on the hindwings. Females are more orange overall, and display black bands scattered with white dots across the top of both pairs of wings. Males are smaller than females by at least a third in body size.[(1)]

LISTING STATUS

A federal candidate for Endangered Species Act listing.[(2)] In Guam, considered a Species of Greatest Conservation Need.[(3)]

THREATS

Threats include habitat degradation and removal, competition from introduced butterfly species, disease, predation by ants, and parasitism by wasps.[(1)]

ECOLOGY

Larvae feed on two native forest herbs that grow only on karst limestone.[(1)]

HISTORICAL AND CURRENT DISTRIBUTION

Historically, found on Guam and CNMI but now occurs with any certainty only on Guam.[(1)]

REFERENCES

1. USFWS. 2008. Species Assessment and Listing Priority Assignment Form: Mariana Eight Spot Butterfly (*Hypolimnas octucula mariannensis*). Portland, OR.
2. USFWS. 2008. Endangered and threatened wildlife and plants; review of native species that are candidates for listing as endangered and threatened; annual notice of findings on resubmitted petitions; annual description of progress on listing actions. Federal Register 73:75175-75244.
3. GDAWR. 2006. Guam Comprehensive Wildlife Conservation Strategy (GCWCS). Department of Agriculture, Guam. 7 November.

Photo: http://www.botany.hawaii.edu/basch/uhnpscesu/htms/parkrota/butterfly.htm#top.

Common Name: Mariana wandering butterfly, Marianas rusty

Chamorro Name: Ababbang

Scientific Name: *Vagrans egestina*

SPECIES DESCRIPTION

A very rare butterfly, endemic to the islands of Guam and Rota. Body color is primarily orange and black, with black bordering the wings. A large orange irregular shape extends from the forewings to the hindwings. Females and males are similar in body color and size.[1]

LISTING STATUS

A federal candidate for Endangered Species Act listing.[2] In Guam, considered a Species of Greatest Conservation Need.[3]

THREATS

Threats include habitat degradation and removal, competition from introduced butterfly species, disease, predation by ants, and parasitism by wasps.[1]

ECOLOGY

Larvae feed on a plant species (*Maytenus thompsonii*) that is endemic to the Mariana Islands. Adults are good fliers and can move considerable distances.[1]

HISTORICAL AND CURRENT DISTRIBUTION

Historically, found on Guam and CNMI (Rota), but now occurs with any certainty only on Rota.[1]

REFERENCES

1. USFWS. 2008. Species Assessment and Listing Priority Assignment Form: Mariana Wandering Butterfly (*Vagrans egistina*). Portland, OR.
2. USFWS. 2008. Endangered and threatened wildlife and plants; review of native species that are candidates for listing as endangered and threatened; annual notice of findings on resubmitted petitions; annual description of progress on listing actions. Federal Register 73:75175-75244.
3. GDAWR. 2006. Guam Comprehensive Wildlife Conservation Strategy (GCWCS). Department of Agriculture, Guam. 7 November.

Photo: Schreiner, I.H. and D.M. Nafus. 1997. Butterflies of Micronesia. Agricultural Experiment Station, College of Agriculture and Life Sciences, University of Guam.

Common Name: Guam tree snail, Pacific tree snail

Chamorro Name: Akaleha'

Scientific Name: *Partula radiolata*

SPECIES DESCRIPTION

Endemic to Guam, this species is a small snail. The shell is slightly oblong with a conical shape, and has five whorls that are slightly convex. Shell color is pale yellow with dark axial rays and brown lines. Body size is approximately 0.8 in (19 mm) in length, with a shell diameter of 0.4 in (10 mm).[1]

LISTING STATUS

A federal candidate for Endangered Species Act listing.[2] Listed as critically endangered globally by the IUCN.[3] In Guam, considered a Species of Greatest Conservation Need.[4]

THREATS

Threats include habitat degradation and removal, predation by native and introduced flatworms and other snails, and typhoons negatively impacting the forest.[1]

ECOLOGY

Preferred habitat is cool, shaded forest with high humidity. These snails also prefer subcanopy vegetation. Diet consists of decaying material, and foraging occurs primarily at night. Life history includes hermaphroditism, with reproduction occurring within the first year of life. Lifespan is thought to be up to five years. This species gives birth to live young.[1]

HISTORICAL AND CURRENT DISTRIBUTION

Found historically and currently on Guam.[1]

REFERENCES

1. USFWS. 2008. Species Assessment and Listing Priority Assignment Form: Guam Tree Snail (*Partula radiolata*). Portland, OR.
2. USFWS. 2008. Endangered and threatened wildlife and plants; review of native species that are candidates for listing as endangered and threatened; annual notice of findings on resubmitted petitions; annual description of progress on listing actions. Federal Register 73:75175-75244.
3. Mollusc Specialist Group. 1996. *Partula radiolata*. *In* IUCN Red List of Threatened Species. Version 2009.1. www.iucnredlist.org.
4. GDAWR. 2006. Guam Comprehensive Wildlife Conservation Strategy (GCWCS). Department of Agriculture, Guam. 7 November.

Photo: http://www2.hawaii.edu/~capers/PacEco/wesa/pacSnails.html.

Common Name: Humped tree snail, Mariana Islands tree snail

Chamorro Name: Akaleha'

Scientific Name: *Partula gibba*

SPECIES DESCRIPTION

Named for the enlarged last whorl of its shell forming a "hump". The shell is a conical shape, and has four to four and a half whorls. Primary shell color is chestnut brown to whitish yellow, and occasionally purple. All forms are accented by white or brown lines along the suture between shell whorls.[(1)]

LISTING STATUS

A federal candidate for Endangered Species Act listing.[(2)] Listed as critically endangered globally by the IUCN.[(3)] In Guam, considered a Species of Greatest Conservation Need.[(4)]

THREATS

Threats include habitat degradation and removal, predation by native and introduced flatworms and other snails, and typhoons negatively impacting the forest.[(1)]

ECOLOGY

Preferred habitat is cool, shaded forest with high humidity. These snails also prefer subcanopy vegetation. Diet consists of decaying material, and foraging occurs primarily at night. Life history includes hermaphroditism, with reproduction occurring within the first year of life. Lifespan is thought to be up to five years. This species gives birth to live young. [(1)]

HISTORICAL AND CURRENT DISTRIBUTION

Found historically on Guam and numerous islands within the CNMI including Rota, Aguiguan, Tinian, Saipan, Anatahan, Sarigan, Alamagan, and Pagan. At present, found in the areas listed above, with the exception of Tinian and Anatahan, where the species is thought to be extirpated.[(1)]

REFERENCES

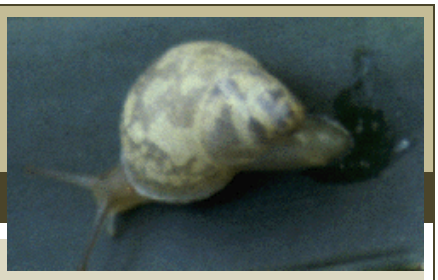
1. USFWS. 2008. Species Assessment and Listing Priority Assignment Form: Humped Tree Snail (*Partula gibba*). Portland, OR.
2. USFWS. 2008. Endangered and threatened wildlife and plants; review of native species that are candidates for listing as endangered and threatened; annual notice of findings on resubmitted petitions; annual description of progress on listing actions. Federal Register 73:75175-75244.
3. Mollusc Specialist Group. 1996. *Partula gibba*. *In* IUCN Red List of Threatened Species. Version 2009.1. www.iucnredlist.org.
4. GDAWR. 2006. Guam Comprehensive Wildlife Conservation Strategy (GCWCS). Department of Agriculture, Guam. 7 November.

Photo: http://www2.hawaii.edu/~capers/PacEco/wesa/pacSnails.html.

Common Name: Mariana Islands fragile tree snail

Chamorro Name: Akaleha'

Scientific Name: *Samoana fragilis*



SPECIES DESCRIPTION

Named for its thin, semi-transparent shell making the animal appear "fragile". The shell is a conical shape, and has four whorls that spiral to the right. Primary shell color is buff, and other markings are created by internal organs visible through the shell. Shell size is 0.5-0.6 in (12-16 mm) long and 0.4-0.5 in (10-12 mm) wide.[1]

LISTING STATUS

A federal candidate for Endangered Species Act listing.[2] Listed as critically endangered globally by the IUCN.[3] In Guam, considered a Species of Greatest Conservation Need.[4]

THREATS

Threats include habitat degradation and removal, predation by native and introduced flatworms and other snails, and typhoons negatively impacting the forest.[1]

ECOLOGY

Preferred habitat is cool, shaded forest with high humidity. These snails also prefer subcanopy vegetation. Diet consists of decaying material, and foraging occurs primarily at night. Adults are sexually mature before reaching maximum shell size. Eggs are large and tough, and are reabsorbed before the snail gives birth to live young. Lifespan is thought to be up to five years.[1]

HISTORICAL AND CURRENT DISTRIBUTION

Found historically and currently on Guam and the CNMI (Rota).[1]

REFERENCES

1. USFWS. 2008. Species Assessment and Listing Priority Assignment Form: Fragile Tree Snail (*Samoana fragilis*). Portland, OR.
2. USFWS. 2007. Endangered and threatened wildlife and plants; review of native species that are candidates for listing as endangered and threatened; annual notice of findings on resubmitted petitions; annual description of progress on listing actions. Federal Register 72:69033-69106.
3. Mollusc Specialist Group. 2000. *Samoana fragilis*. *In* IUCN Red List of Threatened Species. Version 2009.1. www.iucnredlist.org.
4. GDAWR. 2006. Guam Comprehensive Wildlife Conservation Strategy (GCWCS). Department of Agriculture, Guam. 7 November.

Photo: http://www2.hawaii.edu/~capers/PacEco/wesa/pacSnails.html.

Common Name: Tree fern, Tsatsa

Chamorro Name: Chacha

Scientific Name: *Cyathea lunulata*

SPECIES DESCRIPTION

An extremely rare organism, this tree fern is fairly large with a physical appearance typical of tree ferns. This species has a tall trunk (on average 26.2-32.8 ft [8-10 m]) and giant leaves.[(1)]

LISTING STATUS

Cyathea linulata was considered for listing, but determined to have an "undefined status".[(2)]

THREATS

Threats include typhoons and wildland fires which reduce available habitat.

ECOLOGY

Preferred habitat is on hills, wet ravines and muddy drainage slopes.[(1)]

HISTORICAL AND CURRENT DISTRIBUTION

Found historically in American Samoa, Fiji, Guam, Federated States of Micronesia, New Caledonia, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga and Vanuatu.[(3)] In Guam, it is found in the southern hills.[(1)]

REFERENCES

1. Stone, B.C. 1970. The flora of Guam. Micronesica 6:1-659.
2. USFWS. 1983. Findings on certain petitions and reviews of status for several species. Federal Register 48:6752-6753.
3. UNEP-WCMC. 2009. Species Database. http://sea.unep-wcmc.org/isdb/Taxonomy/index.cfm?displaylanguage=ENG. Accessed July 31.

Photo: http://www.tropicalcentre.com/boomvarens/cyathealunulata/cyathealunulata3.jpg.

Common Name: Cycad

Chamorro Name: Fadang

Scientific Name: *Cycas micronesica*

SPECIES DESCRIPTION

A cycad reaching heights of 26-39 ft (8-12 m). Leaves are deep green, highly glossy, and constructed of tough tissue. Seeds are flattened and long, reaching 2.4 in (60 mm). Pollen cones are orange.[1]

LISTING STATUS

Listed as endangered globally by the IUCN.[2]

THREATS

The most serious threats are introduced pests, including the diapsid scale. This insect voraciously infests and kills the plant. Other threats include the cycad blue butterfly eating the leaves, habitat destruction, direct removal of plants, and reduced numbers of the Marianas fruit bat.[2, 3]

ECOLOGY

Preferred habitat is in closed forest country, coral limestone or coral sand. Use insects to transfer pollen, and in effect make seeds for reproduction.[1, 3]

HISTORICAL AND CURRENT DISTRIBUTION

Found historically in Micronesia, the Mariana Islands group, and the western Caroline Islands. Current population on Guam is thought to be greater than 20,000, and populations on other Mariana Islands are unknown.[1]

REFERENCES

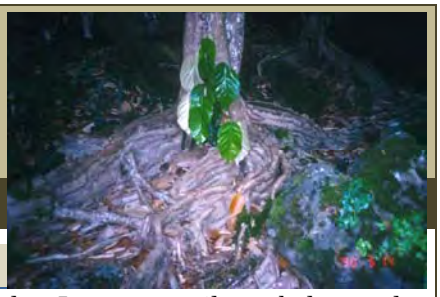
1. Hill, K.D. *Cycas micronesica*. Australian Systematic Botany 7:554-556.
2. Marler, T., J. Haynes, and A. Lindstrom. 2006. *Cycas micronesica*. *In* IUCN Red List of Threatened Species. Version 2009.1. www.iucnredlist.org.
3. WPTRC. 2007. Western Pacific Tropical Research Center News. University of Guam. http://www.wptrc.org/article.asp?artID=35

Photo: T. Marler

Common Name:

Chamorro Name: Ufa-halomtano

Scientific Name: *Heritiera longipetiolata*



SPECIES DESCRIPTION

A tall tree reaching heights of 40 ft (12 m). The bark is mottled brown in color. Leaves are silvery below and dark green above. Roots are massive and grow above-ground. The fruit is approximately 2-3 in (51-76 mm) long and 2 in (51 mm) wide.[(1)]

LISTING STATUS

Listed as vulnerable globally by the IUCN.[(2)]

THREATS

The most serious threats are habitat loss and that pollinator-controls are affected by the non-native brown treesnake.[(1)]

ECOLOGY

Habitat is moist forest on limestone cliffs and coastal sites with windy conditions.[(2)] Very little is known about the ecology of this species.[(1)]

HISTORICAL AND CURRENT DISTRIBUTION

Found historically on Guam, Rota, Saipan and Tinian. Currently trees have been confirmed on Guam, Tinian and Saipan, but not on Rota.[(2)]

REFERENCES

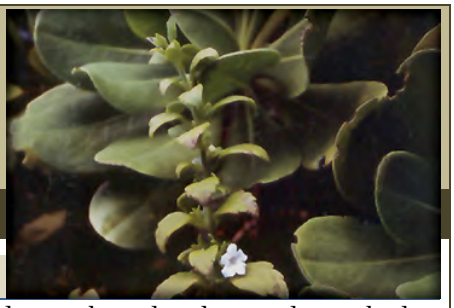
1. CPC. 2009. Center for Plant Conservation National Collection Plant Profile: *Heritera longipetiolata*. http://www.centerforplantconservation.org/asp/CPC_ViewProfile.asp?CPCNum=2219.
2. Wiles, G.1998. *Heritera longipetiolata*. *In* IUCN Red List of Threatened Species. Version 2009.1. www.iucnredlist.org.

Photo: Waimea.

Common Name: None

Chamorro Name:

Scientific Name: *Nesogenes rotensis*



SPECIES DESCRIPTION

A low-growing herbaceous plant in the verbena family. Leaves are small, lance-shaped and coarsely toothed. Flowers are white and tubular, and plants branch near the base. Plants measure up to 3 ft (1 m) in diameter.[(1)]

LISTING STATUS

Listed as endangered by the Endangered Species Act.[(1)]

THREATS

The most serious threats are habitat destruction or alteration, often caused by agriculture or non-native plant introductions.[(1)]

ECOLOGY

Habitat is exposed, raised limestone flats in non-forested coastal strand habitat. Grows in association with several other species. Known to flower in March, April, May and November. Fruiting has been observed in January, March and November. Above-ground parts are thought to die back annually. Little is known about the life history or ecology.[(1)]

HISTORICAL AND CURRENT DISTRIBUTION

Found historically and currently on Rota. Only two known populations of 15-20 plants are thought to exist currently.[(1)]

REFERENCES

1. USFWS. 2007. Recovery Plan for Two Plants from Rota (*Nesogenes rotensis* and *Osmoxylon mariannense*). Portland, OR.

Photo: http://www.parasiticplants.siu.edu/Scrophulariaceae/Hemipar.html.

Common Name:

Chamorro Name:

Scientific Name: *Osmoxylon mariannense*

SPECIES DESCRIPTION

A spindly, soft-wooded tree in the ginseng family. Height is up to 33 ft (10 m). Leaves vary in size, but mature leaves are approximately 1 ft (300 mm) long. Leaves are alternate or whorled. Flowers are yellow and fruits are round and maroon in color.[1]

LISTING STATUS

Listed as endangered by the Endangered Species Act.[1] Listed as critically endangered globally by the IUCN.[2]

THREATS

The most serious threats are habitat destruction or alteration, often caused by agriculture or non-native plant introductions. A particular threat is the construction of roads through suitable habitat.[1]

ECOLOGY

Habitat is limestone forests on the Sabana (cloudswept plateau located on the western half of Rota). Grows as understory in forests. Known to flower in February, March, and October. Fruiting has been observed November-March. Seeds are thought to be difficult to germinate. Little is known about the life history or ecology.[1]

HISTORICAL AND CURRENT DISTRIBUTION

Found historically and currently on Rota. Only 10 individual plants are known to exist currently.[1]

REFERENCES

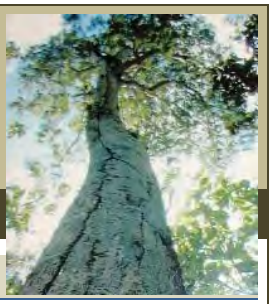
1. USFWS. 2007. Recovery Plan for Two Plants from Rota (*Nesogenes rotensis* and *Osmoxylon mariannense*). Portland, OR.
2. Wiles, G.1998. *Osmoxylon mariannense*. *In* IUCN Red List of Threatened Species. Version 2009.1. www.iucnredlist.org.

Picture: G. Koob.

Common Name: Fire tree

Chamorro Name: Hayun lagu (Guam), Tronkon guafi (Rota)

Scientific Name: *Serianthes nelsonii*



SPECIES DESCRIPTION

One of the largest native trees in the Marianas, with reported heights of 118 ft (36 m) and trunk diameters of 6.6 ft (2 m). One or more large roots are exposed above ground, and roots possess nitrogen-fixing nodules. Bark is smooth and light brown in color. Rust-colored "hairs" cover the flowers, seed pods, and newer vegetative growth. Flowers are brush-like and pinkish in color.[1]

LISTING STATUS

Listed as endangered by the Endangered Species Act.[1] Listed as critically endangered globally by the IUCN.[2]

THREATS

The most serious threats are insect predation on seeds, seedling mortality caused by introduced mealybugs, and overgrazing by introduced ungulates (e.g. Philippine deer).[1, 2]

ECOLOGY

Habitat is primarily mature limestone forests near steep hillsides or cliffs. New leaves are produced year-round, but production is lower during the dry season. Flowers and flower buds may be present during all months. Epiphytic ferns and other plants are known to grow in the crowns. Little is known about the life history or ecology.[1]

HISTORICAL AND CURRENT DISTRIBUTION

Found historically and currently on Rota and Guam. Only one tree exists on Guam and over 100 on Rota.[1, 2]

REFERENCES

1. USFWS. 1994. Recovery Plan for *Serianthes nelsonii*. Portland, OR.
2. Wiles, G.1998. *Serianthes nelsonii*. *In* IUCN Red List of Threatened Species. Version 2009.1. www.iucnredlist.org.

Photo: http://www.uog.edu/herbarium/dynamicdata/Online%20exhibit.asp.

Common Name:

Chamorro Name:

Scientific Name: *Tabernaemontana rotensis*

SPECIES DESCRIPTION

A medium sized tree growing up to 30 ft (9 m) tall. Flowers are white and mature fruits are bright orange-red colored.[1, 2]

THREATS

The most serious threats are habitat destruction or alteration.[1]

ECOLOGY

Habitat is primarily raised limestone terraces. Little is known about the life history or ecology.[1]

HISTORICAL AND CURRENT DISTRIBUTION

Found historically and currently on Rota and Guam.[1, 2]

REFERENCES

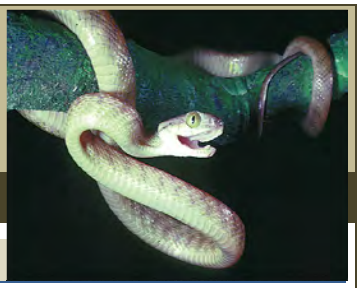
1. Union of Concerned Scientists. 2009. Scientific Integrity. http://www.ucsusa.org/scientific_integrity/abuses_of_science/political-interference-in.html.
2. Tuquero, J. 2005. Forestry Native Plants of Guam Series: *Tabernaemontana rotensis*. http://www.guamforestry.org/docs/publications/tabernae_FINAL.pdf.

Photo: http://www.guamforestry.org/docs/publications/tabernae_FINAL.pdf.

Common Name: Brown tree snake

Chamorro Name: Culepla

Scientific Name: *Boiga irregularis*



SPECIES DESCRIPTION

A seemingly harmless snake typically ranging in length from 3-6 ft (0.9-1.8 m). On Guam, such an abundance of prey items are available that individuals are known to grow to lengths of 10 ft (3.0 m). Body type is long and slender, and body color ranges from patterned brown to yellow-green to beige with red markings. On Guam, the coloration is typically brown/olive green with markings. This species does have relatively weak venom, but only the last two teeth are used to inject it, making it rather difficult to use. The venom poses a risk for small children.[(1)]

ECOLOGY

Preferred habitat is cool, shaded areas during the day for resting. Most feeding and other activities take place at night. Diet includes a large variety of prey organisms, such as small mammals, birds, bird eggs, and other reptiles. On Guam, these snakes are voracious eaters and have been discovered rummaging through garbage. They have also created a major threat to the existence of many native species on Guam, limiting the number of small mammals and the Mariana fruit bat and the extirpation of numerous native birds,. Reproduction is not well documented, but females are thought to produce two clutches of eggs each year.[(2)]

HISTORICAL AND CURRENT DISTRIBUTION

Found historically in the South Pacific, including coastal Australia, Papua New Guinea, and numerous islands in northwestern Melanesia. This species was unintentionally introduced to Guam in the 1950s.[(1)]

REFERENCES

1. Fritts, T.H. and D. Leasman-Tanner. 2001. The Brown Treesnake on Guam: How the arrival of one invasive species damaged the ecology, commerce, electrical systems, and human health on Guam: A comprehensive information source. http://www.fort.usgs.gov/resources/education/bts/bts_home.asp.
2. USGS. 2009. Biology of brown treesnake. http://www.fort.usgs.gov/resources/education/bts/bioeco/btsnake.asp.

Map: http://www.fort.usgs.gov/resources/education/bts/bioeco/btsnake.asp#.

Common Name: Micronesian gecko

Chamorro Name: Guali'ek

Scientific Name: *Perochirus ateles*

SPECIES DESCRIPTION

A relatively large gecko with mottled brown body color. Length is typically 3.5 in (90 mm), and total body length up to 7.5 in (190 mm).[1] The tail is flattened with enlarged scales on its ventral surface. Toes are webbed, and it has clearly reduced toes and fingers. Males can be distinguished by possessing two to five enlarged pores in front of their vent.[2]

LISTING STATUS

In Guam, considered a Species of Greatest Conservation Need.[3]

THREATS

Threats include predation by the brown treesnake, oceanic gecko, and feral cats.

ECOLOGY

Preferred habitat is thought to be limestone forests and beach strands, and there is a possible association with large trees.[2] Other habitat associations include palm leaf axils, shrubs and bushes, and under loose bark. This species is found in association with other geckos, and therefore does not appear to compete with conspecifics.[4]

HISTORICAL AND CURRENT DISTRIBUTION

Found historically on the Marianas Islands, including Guam, Rota, Tinian, and Saipan, and Micronesia. Current distributional information is lacking, but this species is thought to be rare throughout its present distribution. This species has not been collected or sighted on Guam in recent years.[2]

REFERENCES

1. Goris, R.C. and N. Maeda. 2004. Guide to the Amphibians and Reptiles of Japan. Krieger Publishing Company. Malabar, Florida. 285 p.
2. USGS. 2009. Extinctions and loss of species from Guam. http://www.fort.usgs.gov/resources/education/bts/impacts/herps.asp.
3. GDAWR. 2006. Guam Comprehensive Wildlife Conservation Strategy (GCWCS). Department of Agriculture, Guam. 7 November.
4. Buden, D. 1998. The reptiles of Kapingamarangi Atoll, Micronesia. Atoll Research Bulletin 453:1-8.

Photo: http://www.fort.usgs.gov/resources/education/bts/impacts/herps.asp.

Common Name: Oceanic gecko, Island gecko

Chamorro Name: Achiak

Scientific Name: *Gehyra oceanic*

SPECIES DESCRIPTION

One of the largest geckos with a fairly distinct appearance with a rounded tail. Coloration ranges from grey to tan to dark brown, and the dorsal surface is spotted white. Body lengths reach nearly 4 in (100 mm).[(1)] This species has elongated scales behind the tip of the chin. Toes are webbed, and it has clearly reduced toes and fingers. Males can be distinguished by possessing 26-42 enlarged pores in front of their vent.[(3)]

THREATS

The major threat is predation by the brown treesnake.

ECOLOGY

Preferred habitat is thought to be along limestone cliffs and in dense clusters of screw pine (*Pandanus*). This species is found in association with other geckos, and therefore does not appear to compete with conspecifics, but is known to prey on other gecko species.[(3)]

HISTORICAL AND CURRENT DISTRIBUTION

Found historically on Cocos, Guam, Rota, Tinian, Saipan, Guguan, Alamagan, and Asuncion. This species has not been collected or sighted on Guam in recent years, but was last collected in 1989. It is thought to be common where it does occur.[(3)]

REFERENCES

1. Vogt, S.R. and L.L. Williams. 2004. Common flora and fauna of the Mariana Islands. Published by Laura L. Williams and Scott R. Vogt. Saipan, CNMI.
2. Reptilesdownunder.com. 2009. Oceanic gecko (*Gehyra oceanic*). http://www.reptilesdownunder.com/arod/reptilia/Squamata/Gekkonidae/Gehyra/oceanica.
3. USGS. 2009. Extinctions and loss of species from Guam. http://www.fort.usgs.gov/resources/education/bts/impacts/herps.asp.

Photo: http://www.fort.usgs.gov/resources/education/bts/impacts/herps.asp

Common Name: Pacific slender-toed gecko, Rock gecko

Chamorro Name: Guali'ek

Scientific Name: *Nactus pelagicus*

SPECIES DESCRIPTION

One of the most distinctly colored geckos in the region, with alternating dark and light markings. The tail is narrow and rounded with small bumps along the surface. Length averages 2.2 in (57 mm).[(1)] This species lacks widened digital pads on the hands and feet, unlike other geckos in the region. No males have been identified.[(2)]

THREATS

The major threat is predation by the brown treesnake and the musk shrew (*Suncus murinus*).[(2)]

ECOLOGY

Preferred habitat is thought to be rough rock substrates for foraging, and areas with crevices and hiding places during the day for a resting period. Cryptic coloration allows for blending into the environment. This species is particularly prone to hiding or running from man or other animals it sees as a threat. This is an all-female species.[(2)]

HISTORICAL AND CURRENT DISTRIBUTION

Found historically on Guam, Rota, and Tinian. This species is rare on Guam in recent years, but was common prior to 1945. Thought to possibly occur on other islands, but to go undetected due to its tendency to hide during the day.[(2)]

REFERENCES

1. Reptilesdownunder.com. 2009. Pelagic gecko (*Gehyra oceanic*). http://www.reptilesdownunder.com/arod/reptilia/Squamata/Gekkonidae/Nactus/pelagicus.
2. USGS. 2009. Extinctions and loss of species from Guam. http://www.fort.usgs.gov/resources/education/bts/impacts/herps.asp.

Photo: http://www.fort.usgs.gov/resources/education/bts/impacts/herps.asp.

Common Name: Azure-tailed skink

Chamorro Name: Guali'ek halom tano'

Scientific Name: *Emoia cyanura*

SPECIES DESCRIPTION

Easily confused with the blue-tailed skink, this species is small with a wide, light colored stripe down the length of its body. The main coloration is dark grey or brown.[1]

LISTING STATUS

In Guam, considered a Species of Greatest Conservation Need.[2]

THREATS

The major threats are habitat loss, competition with non-native skinks, and predation by non-native species such as the musk shrew.[3]

ECOLOGY

Preferred habitats appear to be the forest edge rather than interior, and hot and dry open areas near the coast.[1, 4]

HISTORICAL AND CURRENT DISTRIBUTION

Endemic to Guam, this species has only been documented from Cocos Island, although its absence from the main island of Guam is difficult to explain. This species is currently only found on Cocos Island off the southern tip of Guam.[1]

REFERENCES

1. USGS. 2009. Extinctions and loss of species from Guam. http://www.fort.usgs.gov/resources/education/bts/impacts/herps.asp
2. GDAWR. 2006. Guam Comprehensive Wildlife Conservation Strategy (GCWCS). Department of Agriculture, Guam. 7 November.
3. Fritts, T.H. and G.H. Rodda. 1998. The role of introduced species in the degradation of island ecosystems: a case history of Guam. Annual Review of Ecological Systems 29:113-140.
4. McCoy, M. 1980. Reptiles of the Solomon Islands. Wau Ecology Institute Handbook No. 7. Wau, Papua New Guinea.
5. Rodda, G.H, T.H. Fritts, and J.D. Reichel. 1991. The distributional patterns of reptiles and amphibians in the Marianas Islands. Micronesica 24:195-210.

Photo: http://www.fort.usgs.gov/resources/education/bts/impacts/herps.asp.

Common Name: Moth skink

Chamorro Name: Guali'ek halom tano'

Scientific Name: *Lipinia noctua*

SPECIES DESCRIPTION

A small skink with a yellow dot on the top of the head which extends down the length of the body as a stripe. Body length is typically 2.2 in (55 mm)[1]. The main coloration may be brown or tan with flecks of other colors. The belly color ranges from yellow to orange under the body and legs, and a pale blue-green under the tail and head. This species will break off its toes and/or tail when threatened by a predator.[2]

LISTING STATUS

In Guam, considered a Species of Greatest Conservation Need.[3]

THREATS

The major threats are habitat loss, competition with non-native skinks, and predation by non-native species.[4]

ECOLOGY

Preferred habitats appear to be on the ground or in low trees, using tree trunks for shelter. Like many skink species, they are known to hide from predators and become active at night. This species gives birth to live young.[2]

HISTORICAL AND CURRENT DISTRIBUTION

Known to occur in most of the western Pacific, but in the Marianas is only found on Guam. Only several specimens have been sighted on Guam.[5]

REFERENCES

1. Vogt, S.R. and L.L. Williams. 2004. Common flora and fauna of the Mariana Islands. Published by Laura L. Williams and Scott R. Vogt. Saipan, CNMI.
2. USGS. 2009. Extinctions and loss of species from Guam. http://www.fort.usgs.gov/resources/education/bts/impacts/herps.asp
3. GDAWR. 2006. Guam Comprehensive Wildlife Conservation Strategy (GCWCS). Department of Agriculture, Guam. 7 November.
4. Fritts, T.H. and G.H. Rodda. 1998. The role of introduced species in the degradation of island ecosystems: a case history of Guam. Annual Review of Ecological Systems 29:113-140.
5. Vogt, S.R. and L.L. Williams. 2004. Common Flora and Fauna of the Mariana Islands. Self Published.

Photo: http://www.fort.usgs.gov/resources/education/bts/impacts/herps.asp.

Common Name: Slevin's and Mariana skink

Chamorro Name: Guali'ek halom tano'

Scientific Name: *Emoia slevini*

SPECIES DESCRIPTION

Large body size with brown or tan body coloration covered with white square blotches. Body length can be up to 2.95 in (75 mm)[1]. The sides of the body are often black. Some individuals exhibit bright orange coloration along the rear part of the belly. The smallest and largest individuals resemble other skink species.[2]

LISTING STATUS

In Guam, considered a Species of Greatest Conservation Need.[3]

THREATS

The major threats are competition with non-native skinks and predation by non-native species such as the musk shrew or brown treesnake. [4]

ECOLOGY

Preferred habitats appear to be low on tree trunks, old fields or on the forest floor. Like many skink species, they are known to hide from predators and become active at night. Other ecological information for this species is lacking.[2]

HISTORICAL AND CURRENT DISTRIBUTION

Known to occur historically on Cocos Island, Guam, Rota, Tinian, Guguan, Alamagan, Asuncion, and Maug. Although known to occur at one time on the island of Guam, was never very common and was not sighted in recent surveys.[2]

REFERENCES

1. Vogt, S.R. and L.L. Williams. 2004. Common flora and fauna of the Mariana Islands. Published by Laura L. Williams and Scott R. Vogt. Saipan, CNMI.
2. USGS. 2009. Extinctions and loss of species from Guam. http://www.fort.usgs.gov/resources/education/bts/impacts/herps.asp.
3. GDAWR. 2006. Guam Comprehensive Wildlife Conservation Strategy (GCWCS). Department of Agriculture, Guam. 7 November.
4. Fritts, T.H. and G.H. Rodda. 1998. The role of introduced species in the degradation of island ecosystems: a case history of Guam. Annual Review of Ecological Systems 29:113-140.

Photo: http://www.fort.usgs.gov/resources/education/bts/impacts/herps.asp.

Common Name: Snake-eyed skink

Chamorro Name: Guali'ek halom tano'

Scientific Name: *Cryptoblepharus poecilopleurus*

SPECIES DESCRIPTION

Very slender-bodied with small limbs. Body length is up to approximately 1.8 in (45 mm)[1], and shape is slightly flattened dorso-ventrally. Body color is dark brownish-black with three gold colored stripes that run down the body and merge into two down the tail. The stripes are rough along the bottom edges and clearly defined along the top. The name is derived from eyes that appear to be open at all times due to the eyelids being fused over the eyes.[2]

LISTING STATUS

In Guam, considered a Species of Greatest Conservation Need.[3]

THREATS

The major threats are competition with non-native skinks and intense predation by the brown treesnake.[4]

ECOLOGY

Preferred habitats appear to be located in loose, sandy soil near coastal strands. This species is highly mobile and known to climb over matter such as rocks or tree trunks. Like many skink species, they are known to hide from predators and become active at night. One known hiding place is under the bark of Australian pine trees.[2]

HISTORICAL AND CURRENT DISTRIBUTION

Known to occur in Cocos Island, Guam, Rota, Aguijan, Tinian, Saipan, Anatahan, Sarigan, Guguan, Alamagan, Agrihan, Asuncion, and Maug. Although known to occur at one time on the island of Guam, it was never very common and has not been sighted since the late 1960s.[1, 2]

REFERENCES

1. Vogt, S.R. and L.L. Williams. 2004. Common flora and fauna of the Mariana Islands. Published by Laura L. Williams and Scott R. Vogt. Saipan, CNMI.
2. USGS. 2009. Extinctions and loss of species from Guam. http://www.fort.usgs.gov/resources/education/bts/impacts/herps.asp.
3. GDAWR. 2006. Guam Comprehensive Wildlife Conservation Strategy (GCWCS). Department of Agriculture, Guam. 7 November.
4. Fritts, T.H. and G.H. Rodda. 1998. The role of introduced species in the degradation of island ecosystems: a case history of Guam. Annual Review of Ecological Systems 29:113-140.

Photo: http://www.fort.usgs.gov/resources/education/bts/impacts/herps.asp.

Common Names: Littoral skink

Chamorro Name: Guali'ek kantun tasi

Scientific Name: *Emoia atrocostata*

SPECIES DESCRIPTION

Relatively slender shape and small in size, with a typical body length of 3.3 in (85 mm)[1]. Bodies appear to be "shiny", as bronze is the main body color. Scales are large, limbs are long, and eyelids are clear and movable.[2]

THREATS

The major threats are competition with non-native skinks and predation by non-native species such as the musk shrew.[3, 4]

ECOLOGY

Preferred habitats are near the coast in mangroves or other vegetation and on mudflats during low tide. Capable of swimming, but prefers to stay above water most of the time. Uses the ocean to move around and escape predators. Unlike many skink species, tidepool skinks are known to be active during the day, and have been sighted sunning themselves. Diet consists of insects and small crabs captured during low tide.[2]

HISTORICAL AND CURRENT DISTRIBUTION

Known to occur historically from Japan and Taiwan, down the Malayan peninsula to Australia and the Pacific Islands. Endemic to the Marianas, but is not presently common on Guam.[3]

REFERENCES

1. Vogt, S.R. and L.L. Williams. 2004. Common flora and fauna of the Mariana Islands. Published by Laura L. Williams and Scott R. Vogt. Saipan, CNMI.
2. Sungei Buloh Nature Park. 2001. Species fact sheet. http://www.naturia.per.sg/buloh/verts/mangrove_skink.htm.
3. Martin, G. 2006. Saving Saipan's White-eye. Endangered Species Bulletin 31(3):8-11.
4. Fritts, T.H. and G.H. Rodda. 1998. The role of introduced species in the degradation of island ecosystems: a case history of Guam. Annual Review of Ecological Systems 29:113-140.

Photo: http://www.naturia.per.sg/buloh/verts/mangrove_skink.htm.

Common Name: Green sea turtle

Chamorro Name: Haggan betde

Scientific Name: *Chelonia mydas*

SPECIES DESCRIPTION

The largest of all the hard-shelled sea turtles at over 3 ft (0.9 m) in length and 300 lbs (136 kg). Their name stems from green-colored fat, which reportedly occurs from their primarily herbivorous diet. The carapace ranges from shades of black, grey, green, brown and yellow, while their ventral surface (plastron) is yellowish-white.(1)

LISTING STATUS

Protected under the Endangered Species Act, with breeding populations in Florida and the Pacific coast of Mexico listed as endangered, and all others listed as threatened.(2) Listed as endangered globally by the IUCN.(3) In Guam, considered a Species of Greatest Conservation Need.(4)

THREATS

The major threats are alteration or loss of nesting habitat, decreased quality of sensitive marine habitats such as seagrass, vessel strikes, hunting for commercial or subsistence use, take of eggs, incidental take in fisheries, and diseases such as fibropapillomatosis, which results in internal and/or external tumors.(2)

ECOLOGY

Preferred habitat varies by life stage, and highly mobile. All young are born on the beach, and females return to land to nest. Adults primarily occur in coastal waters, but do make long migrations over deep waters to transit to and from foraging, nesting and mating areas. Limited nesting activity has been confirmed on the beaches of Guam and Tinian from January-March. Adults feed primarily on seagrass and a variety of algae, although some have been documented eating invertebrates. Juveniles are thought to remain in convergence zones for many years, feeding on pelagic prey items such as floating mats of algae (e.g. *Sargassum*) or ctenophores.(2)

HISTORICAL AND CURRENT DISTRIBUTION

Occurs in most oceans, including the western, central and eastern Atlantic, Mediterranean Sea, western, northern and eastern Indian, southeast Asia, and the western, central and eastern Pacific. In the Pacific, occurs around most of the islands, including the Hawaiian Island chain, American Samoa, Guam, and CNMI. The most abundant sea turtle species on Guam.(2)

REFERENCES

1. NMFS. 2009. Office of Protected Resources. Species profile. http://www.nmfs.noaa.gov/pr/species/turtles/green.htm
2. NMFS and USFWS. 2007. Green sea turtle (*Chelonia mydas*), 5-year review: summary and evaluation. August.
3. Seminoff, J.A. 2004. *Chelonia mydas*. *In* IUCN Red List of Threatened Species. Version 2009.1. www.iucnredlist.org.
4. GDAWR. 2006. Guam Comprehensive Wildlife Conservation Strategy (GCWCS). Department of Agriculture, Guam. 7 November.

Photo: http://www.nmfs.noaa.gov/pr/species/turtles/green_photos.htm.

Common Name: Hawksbill sea turtle

Chamorro Name: Haggan karai

Scientific Name: *Eretomochelys imbricata*

SPECIES DESCRIPTION

A smaller sea turtle, measuring less than 3 ft (0.9 m) in length and 150 lbs (68 kg). Their name stems from the shape of the head, which is elongated and narrows to a point. Carapace has tortoiseshell coloring, ranging from dark to gold-brown with streaks of colors including orange, red and black, while their ventral surface (plastron) is a clear yellow color.[(1)]

LISTING STATUS

Protected under the Endangered Species Act, with all populations listed as endangered.[(2)] In Guam, considered a Species of Greatest Conservation Need.[(3)]

THREATS

The major threats are alteration or loss of nesting habitat, decreased quality of sensitive marine habitats such as seagrass, vessel strikes, hunting for commercial or subsistence use, take of eggs, incidental take in fisheries, and diseases such as fibropapillomatosis, which results in internal and/or external tumors.[(2)]

ECOLOGY

Preferred habitat is varies by life stage, and this species is highly mobile. All young are born on the beach, and only females return to land to nest. Adults are found in coastal and offshore waters, and are known to make long migrations over deep waters to transit to and from foraging, nesting and mating areas. Limited nesting activity has been confirmed on the beaches of Guam from January-March. Adults forage on the seafloor on corals and other invertebrates. Adults are known to frequent ledges and caves of coral reefs, and to return to the same areas nightly to rest. Juveniles are thought to feed on the surface, but in the Pacific little is known about the juvenile phase.[(1)]

HISTORICAL AND CURRENT DISTRIBUTION

Occur circumtropically, from 30°N to 30°S in the Atlantic, Pacific, and Indian Oceans and associated water bodies, including the Caribbean Sea and Gulf of Mexico. In the Pacific, occurs around most of the islands, including the Hawaiian Islands, American Samoa, Guam, and CNMI. Although rarely sighted, individuals have been documented nesting on Guam.[(1)]

REFERENCES

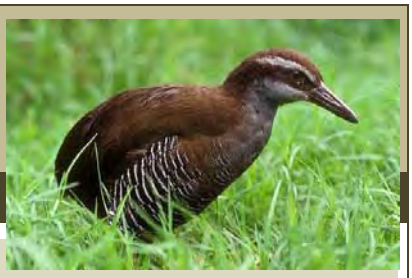
1. NMFS. 2009. Office of Protected Resources. Species profile. http://www.nmfs.noaa.gov/pr/species/turtles/hawksbill.htm.
2. NMFS and USFWS. 2007. Hawksbill sea turtle (*Eretmochelys imbricata*), 5-year review: summary and evaluation. August.
3. GDAWR. 2006. Guam Comprehensive Wildlife Conservation Strategy (GCWCS). Department of Agriculture, Guam. 7 November.

Photo: http://www.nmfs.noaa.gov/pr/species/turtles/hawksbill_photos.htm.

Common Name: Guam rail

Chamorro Name: Ko'ko'

Scientific Name: *Rallus owstonii*



SPECIES DESCRIPTION

A flightless bird with no external sexual dimorphism. Coloration is grey on the upper breast, lower neck and eyebrow, and brown on the head, neck, eye stripe, iris, legs and feet. The stomach is distinctly white-striped. Although outward appearance is indistinguishable between sexes, males weigh on average more than females (8.5 vs 7.5 oz [241 vs. 213 g]).[(1)]

LISTING STATUS

Listed as endangered under the Endangered Species Act, and an experimental population in Rota lised as "Experimental Population, Non-essential" .[(2)] Currently the species is only found in captive breeding facilities in zoos on the U.S. Mainland and at GDAWR on Guam. In Guam, considered a Species of Greatest Conservation Need.[(3)]

THREATS

The major threats are predation by non-native species such as dogs, cats, rats, a monitor lizard, and the brown treesnake, past hunting efforts, and impacts of typhoons to populations with such low numbers.[(2)]

ECOLOGY

Preferred habitats are numerous, and include all habitats located on Guam except for wetlands. Diet is omnivorous, consisting of snails, skinks, geckos, insects, seeds, and palm leaves. Nesting occurs year-round, with males and females sharing in the nesting duties. Young leave the nest to learn to forage within 24 hours of hatching.[(2)]

HISTORICAL AND CURRENT DISTRIBUTION

Endemic to Guam, and was once found throughout the island. Currently the species is extirpated from Guam and captive breeding programs were created to prevent extinction of this species.[(1)]

REFERENCES

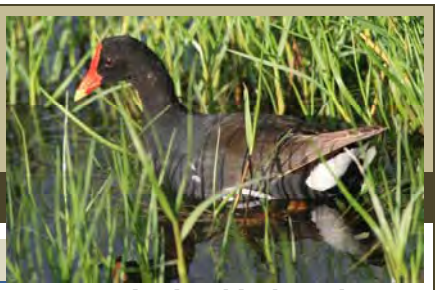
1. GDAWR. 2009. Species fact sheet- Guam rail. http://www.guamdawr.org/learningcenter/factsheets/birds/rail_html
2. USFWS. 2009. Species profile- Guam rail. http://ecos.fws.gov/docs/life_histories/B063.html
3. GDAWR. 2006. Guam Comprehensive Wildlife Conservation Strategy (GCWCS). Department of Agriculture, Guam. 7 November.

Photo: Smithsonian National Zoo.

Common Name: Mariana common moorhen

Chamorro Name: Pulattat

Scientific Name: *Gallinula chloropus guami*



SPECIES DESCRIPTION

A member of the rail family, although slightly resembles a duck. Coloration is primarily slate black, with white undertail coverts and a white line along the flank. Legs are long and olive green or yellow colored. The most distinguishing feature is a red frontal "shield" on the bill. Toes are lobed, making it possible for walking across plants that are floating on top of the water. Females closely resemble males, but have a smaller frontal shield. Overall body length is typically 14 in (350 mm).[1, 2]

LISTING STATUS

Listed as endangered under the Endangered Species Act.[3] In Guam, considered a Species of Greatest Conservation Need.[4]

THREATS

The most serious threat is habitat loss, particularly loss of wetlands. Other threats include encroachment of non-native vegetation and human disturbance.[1,2]

ECOLOGY

Preferred habitats include natural and manmade wetlands, including freshwater lakes, marshes and swamps, and some brackish areas such as tidal channels or mangrove wetlands. Diet is omnivorous, consisting of such items as grass, insects, and insect larvae. Nesting occurs year-round, and nests are created on or near standing water. Young leave the nest to learn to forage soon after hatching.[1]

HISTORICAL AND CURRENT DISTRIBUTION

Historic distribution was Guam, Saipan, Tinian and Pagan. Populations on Guam were once large and occurred in many wetland locations on the island. Current distribution includes Guam and the northern Mariana Islands, but numbers are much fewer than in the past.[1]

REFERENCES

1. USFWS. 1992. Recovery plan- Mariana Common Moorhen (*Gallinula chloropus guami*). September.
2. GDAWR. 2009. Species fact sheet- Guam rail. http://www.guamdawr.org/learningcenter/factsheets/birds/moorhen_html.
3. USFWS. 2009. Species profile- Mariana common moorhen. http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B062.
4. GDAWR. 2006. Guam Comprehensive Wildlife Conservation Strategy (GCWCS). Department of Agriculture, Guam. 7 November.

Photo: S. Vogt.

Common Name: Mariana crow

Chamorro Name: Aga

Scientific Name: *Corvus kubaryi*

SPECIES DESCRIPTION

Known as a small crow. Coloration is various shades of black, from greenish black on the head to bluish black on the wings and tail. The bases of the feathers are light grey to white, which can give a "ragged" appearance. Females and males are difficult to distinguish, but females are smaller.[(1)]

LISTING STATUS

Listed as endangered under the Endangered Species Act. Critical habitat was designated on Guam and Rota.[(1)] Listed as critically endangered globally by the IUCN.[(2)] In Guam, considered a Species of Greatest Conservation Need.[(3)]

THREATS

The most serious threats include predation by non-native organisms such as the brown treesnake, cats, rats and a monitor lizard. Preventative efforts have included "snake-proofing" trees where nests are located. Other threats include habitat destruction and human disturbances.[(4, 5)]

ECOLOGY

Preferred habitats include forested areas such as limestone, strand, ravine, and secondary forests, although limestone forests seem to be the most preferred habitat type. Diet is omnivorous, consisting of a large variety of plants and animals such as grasshoppers, skinks, and a variety of foliage and fruits. Foraging occurs primarily in native trees. Nesting is thought to occur year-round, and nests are created over a week-long period in native trees.[(1, 5)]

HISTORICAL AND CURRENT DISTRIBUTION

Historic distribution was on Guam and Rota. where populations were once large. Current population on Guam limited to only several individuals that originated from a translocation program from Rota.[(5)]

REFERENCES

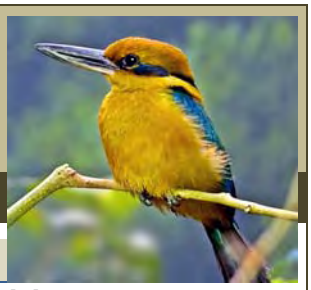
1. USFWS. 2009. Species Profile- Mariana Crow. http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B05X.
2. Birdlife International. 2008. *Corvus kubaryi*. *In* IUCN Red List of Threatened Species. Version 2009.1. www.iucnredlist.org.
3. GDAWR. 2006. Guam Comprehensive Wildlife Conservation Strategy (GCWCS). Department of Agriculture, Guam. 7 November.
4. GDAWR. 2009. Species fact sheet- Guam rail. http://www.guamdawr.org/learningcenter/factsheets/birds/crow_html.
5. USFWS. 2005. Draft revised recovery plan for the Mariana crow (*Corvus kubaryi*). May.

Photo: C. Kessler.

Common Name: Guam Micronesian kingfisher

Chamorro Name: Sihek

Scientific Name: *Halcyon cinnamomina cinnamomina*



SPECIES DESCRIPTION

Known as a small to medium-sized kingfisher. Coloration varies by sex, with males exhibiting a cinnamon-brown head, neck and upper parts, a black line that extends around the nape, a greenish-blue lower back, shoulder, and underwings, and a blue tail. Females are very similar to males, with the major differences being a paler upper chest, chin and throat, and underparts and underwing linings white instead of cinnamon-brown. Body length is approximately 8 in (200 mm) and weight is on the order of 1.8-2.7 oz (50-76 g).[(1)]

LISTING STATUS

Listed as endangered under the Endangered Species Act. Critical habitat was designated on Guam.[(1)] In Guam, considered a Species of Greatest Conservation Need.[(2)]

THREATS

Primary threats are habitat destruction and modification, predation by non-native species such as cats, rats a monitor lizard and brown tree snakes, and limited population growth in the captive-bred population.[(1)]

ECOLOGY

Preferred habitats include a wide variety of forested areas such as limestone, strand, ravine, agricultural and secondary forests, edge habitats, and forest openings. Diet is carnivorous, consisting of a large variety of animals such as skinks, insects, and hermit crabs. Foraging occurs primarily in native trees. Nesting takes place in cavities created in standing dead trees.[(1, 3)]

HISTORICAL AND CURRENT DISTRIBUTION

Historic distribution was on Guam only. Populations were once large, but have been extirpated from the wild. Captive individuals number just over 100.[(1)]

REFERENCES

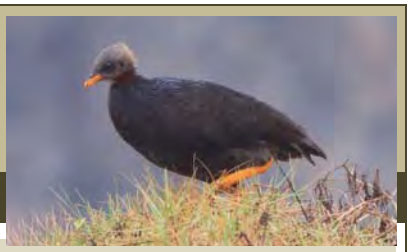
1. USFWS. 2008. Revised Recovery Plan for the Sihek or Guam Micronesian kingfisher (*Halcyon cinnamonina cinnamonina*). October.
2. GDAWR. 2006. Guam Comprehensive Wildlife Conservation Strategy (GCWCS). Department of Agriculture, Guam. 7 November.
3. GDAWR. 2009. Species fact sheet- Guam rail. http://www.guamdawr.org/learningcenter/factsheets/birds/crow_html.

Photo: K. Ilio.

Common Name: Micronesian megapode

Chamorro Name: Sasangat

Scientific Name: *Megapodius laperous*



SPECIES DESCRIPTION

A medium-sized megapode measuring approximately 1.2 ft (38 cm) in body length, with an average body weight of 0.8 lbs (350 g). The primary colors of plumage are dark grey-brown to black, with an ash grey head. The crest is dark grey, wings are short and rounded, and the bill, legs and feet are yellow. Feathers on the head are patchy or absent, which reveals red skin.(1)

LISTING STATUS

Listed as endangered under the Endangered Species Act.(1)

THREATS

Most serious threats include modification or destruction of habitat, past hunting practices, predation by native and non-native species including to a greater extent the brown treesnake, and competition with non-native birds.(1)

ECOLOGY

Preferred habitat is limestone forest, although they are known to use native or non-native secondary forest adjacent to limestone forest. Have been described as “birds of the forest floor”. Known to “burrow nest” in areas warmed by the sun or to place nests among rotting roots of trees or logs, and in patches of rotting sword grass. External heat is thought to be necessary for egg incubation. Male-female pairs are monogamous for a prolonged period, and both sexes are territorial. Feeding habits are omnivorous, and food items include seeds, ants and other insects, and various plant matter.(1)

HISTORICAL AND CURRENT DISTRIBUTION

Historically found on all of the Mariana Islands, this species was extirpated from all of the large islands, and presently occurs only on small uninhabited islands in the Northern Mariana Island chain. Was thought to have been extirpated on Guam prior to the introduction of the brown treesnake.(1)

REFERENCES

1. USFWS. 1998. Recovery plan for the Micronesian megapode (*Megapodius laperouse laperouse*). Portland, OR.

Photo: S. Vogt.

Common Name: Mariana swiftlet

Chamorro Name: Yayaguak

Scientific Name: *Aerodramus vanikorensis bartschi*

SPECIES DESCRIPTION

A small bird with primarily dark grey-brown body color. Plumage is paler on the ventral surface. A dark line crosses through the eye, and the tail is squared off. Males and females are similar in external appearance. 1.2 ft (38 cm) in body length, with an average body weight of 0.8 lbs (350 g).[(1)]

LISTING STATUS

Listed as endangered under the Endangered Species Act.[(2)] In Guam, considered a Species of Greatest Conservation Need.[(2)]

THREATS

Most serious threats include modification or destruction of habitat and disturbance of caves from guano mining or other human interference. Predation by non-native species may have also played a role in this species' decline.[(1)]

ECOLOGY

Preferred habitat is in limestone caves with entrances measuring approximately 6.6 ft (2 m) high. Known to nest and roost inside these caves, and to leave the caves to eat and drink. Foraging occurs over many habitat types, although preferred foraging habitat appears to be ridge crests and open grassy areas. Diet includes various insects. This species uses echolocation for navigation, further enabling successful living inside caves.[(1)]

HISTORICAL AND CURRENT DISTRIBUTION

Historically found on the Mariana Islands of Guam, Rota, Aguijan, Tinian, and Saipan. Individuals from Guam were transplanted to Hawaii in the 1960s. This species presently occurs on Guam and the Saipan, but is considered extirpated from Tinian and Rota.[(1, 3)]

REFERENCES

1. USFWS. 1992. Recovery plan for the Mariana Islands population of Vanikoro swiftlet (*Aerodramus vanikorensis bartschi*). USFWS. Portland, OR. September.
2. GDAWR. 2006. Guam Comprehensive Wildlife Conservation Strategy (GCWCS). Department of Agriculture, Guam. 7 November.
3. Cruz, J.B., S.R. Kremer, G. Martin, L.L. Williams, and V.A. Camacho. 2008. Relative abundance and distribution of Mariana swiftlets (Aves: Apodidae) in the Northern Mariana Islands. Pacific Science 62:233-246.

Photo: http://www.mesc.usgs.gov/resources/education/bts/impacts/birds.asp

Common Name: Micronesian starling

Chamorro Name: Sali

Scientific Name: *Aplonis opaca guami*

SPECIES DESCRIPTION

A small bird with primarily glossy black body color in adults. Tail is short and they eye is distinctly yellow. Body length is approximately 9 in (230 mm).[1]

LISTING STATUS

Federal status is undefined.[2] In Guam, considered a Species of Greatest Conservation Need.[3]

THREATS

Most serious threats include modification or destruction of habitat and predation by the brown treesnake and other non-native species.[1]

ECOLOGY

Known to use all habitat types, although most common in forested areas. Foraging occurs over many habitat types, but preferred foraging habitat appears to be ridge crests and open grassy areas. Diet is omnivorous and includes various insects, seeds and fruits. Known as a cavity nester, and both parents incubate the eggs. Cavity nesting may be the main reason this species has not been extirpated like other bird species in the region.[1]

HISTORICAL AND CURRENT DISTRIBUTION

Historically found on the Mariana Islands of Guam, Tinian, and Saipan. This species presently occurs on Guam and Cocos Island, and hopes are high for future populations.[1]

REFERENCES

1. Grim, G. 2009. Guam birds: Micronesian starling. ©2008 Guampedia™. http://www.guampedia.com/category/122-guam-s-birds/entry/468-guam-birds-micronesian-starling2.
2. USFWS. 1983. Endangered and threatened wildlife and plants; findings on certain petitions and reviews of status for several species. Federal Register 48:6752-6753.
3. GDAWR. 2006. Guam Comprehensive Wildlife Conservation Strategy (GCWCS). Department of Agriculture, Guam. 7 November.

Photo: http://www.mesc.usgs.gov/resources/education/bts/impacts/birds.asp.

Common Name: Tinian monarch

Chamorro Name: Chichurikan Tinian

Scientific Name: *Monarcha takatsukasae*

SPECIES DESCRIPTION

A small forest songbird with body length of approximately 6 in (150 mm). Coloration includes light underparts, olive-brown upperparts, dark brown wings and tail, and white bars on the wings, and a white rump and undertail coverts.[(1)]

LISTING STATUS

Federal status is "delisted- taxon recovered". Was listed as endangered in 1970, but was later reassessed and deemed recovered in 2004.[(1)] Listed as critically vulnerable globally by the IUCN.[(2)]

THREATS

Most serious threats included modification or disturbance of native forests. The brown treesnake is not known to have invaded Tinian, thus this non-native predator is not currently a threat.[(1)]

ECOLOGY

Known to use many forest habitat types including native limestone, secondary vegetation, a variety of native tree forests, and some non-native tree forests. Foraging and nesting occurs in several habitat types, but preferred habitat appears to be native limestone forest.[(1)] Diet is includes foraging for various insects. Nests are small and cup-shaped, nesting appears to occur year-round, and both parents tend to the nest.[(3)]

HISTORICAL AND CURRENT DISTRIBUTION

Historically found on the Mariana Islands of Tinian, Saipan and possibly Aguiguan. This species presently occurs in relatively large numbers on Tinian.[(1)]

REFERENCES

1. USFWS. 2005. Post de-listing monitoring for the Tinian monarch (*Monarcha takatsukasae*). Endangered Species Division. Pacific Islands Fish and Wildlife Office. Honolulu, HI. May.
2. Birdlife International. 2008. *Monarcha takatsukasae*. *In* IUCN Red List of Threatened Species. Version 2009.1. www.iucnredlist.org.
3. CNMI DFW. 2009. Tinian monarch fact sheet. http://www.dfw.gov.mp/Downloads/Species%20Handouts/TIMO.pdf

Photo: S. Vogt.

Common Name: Mariana fruit bat

Chamorro Name: Fanihi

Scientific Name: *Pteropus mariannus mariannus*

SPECIES DESCRIPTION

A medium sized fruit bat, with body weight in the range of 0.9-1.2 lbs (408-544 g). Body color is black or brown on the ventral surface with some grey hair, and the neck is bright golden brown. The head is brown or dark brown. Appearance has led to a nickname of "flying foxes". Males are slightly larger than females.(1)

LISTING STATUS

Protected under the Endangered Species Act, listed as threatened. Critical habitat is designated in Guam.(2) In Guam, considered a Species of Greatest Conservation Need.(3)

THREATS

Most serious threats include modification or disturbance of habitat, predation by the brown treesnake on juveniles, the use of pesticides and fertilizers, and poaching.(1)

ECOLOGY

Known to use native forest habitat types including native limestone, and also are known to frequent coconut groves. Highly colonial, colonies of several to over 800 individuals exist. The typical social behavior is grouping into harems, with one male grouping with 2-15 females, although some males remain "bachelors".(1) Diet includes foraging for various fruits, flowers and other plant materials. Reproduction appears to occur year-round, and breeding typically occurs after 18 months of age.(2)

HISTORICAL AND CURRENT DISTRIBUTION

Historically and currently found on the CNMI and Guam.(1)

REFERENCES

1. USFWS. 2005. Mariana fruit bat 5-year review. Federal Register 70:1180-1210.
2. USFWS. 2009. Species profile for Mariana fruit bat. http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=A07X.
3. GDAWR. 2006. Guam Comprehensive Wildlife Conservation Strategy (GCWCS). Department of Agriculture, Guam. 7 November.

Photo: USFWS.

CHAPTER 3.
MARINE BIOLOGICAL RESOURCES

3.1 INTRODUCTION

3.2 SPECIES LISTS

Refer to the Species List in Chapter 2, *Terrestrial Biological Resources* for additional information.

3.2.1 Non-Native Species

3.2.1.1 Marine

1. *Aedes albopictus* (insect)

The Asian tiger mosquito is spread via the international tire trade (due to the rainwater retained in the tires when stored outside). In order to control its spread such trading routes must be highlighted for the introduction of sterilisation or quarantine measures. The tiger mosquito is associated with the transmission of many human diseases, including the viruses: Dengue, West Nile and Japanese Encephalitis.

Common Names: Asian tiger mosquito, forest day mosquito, mosquito tigre, moustique tigre, tiger mosquito, tigermücke, zanzare tigre

Synonyms: *Culex albopictus* Skuse, 1895, *Culex albopictus* Skuse,1895

2. *Chthamalus proteus* (crustacean)

Chthamalus proteus is a barnacle native to the Caribbean and western Atlantic. It was introduced to the Pacific in 1970s and first reported in Hawaii in 1995. It is now one of the most abundant organism in the upper intertidal harbors and bays throughout the Hawaiian Islands. C. proteus are likely to be spread by ship hull fouling and larvae by ballast water.

Common Names: Atlantic barnacle, Caribbean barnacle

3. *Oreochromis mossambicus* (fish)

Oreochromis mossambicus (Mozambique tilapia) has spread worldwide through introductions for aquaculture. Established populations of Oreochromis mossambicus in the wild are as a result of intentional release or escapes from fish farms. Oreochromis mossambicus is omnivorous and feeds on almost anything, from algae to insects.

Common Names: blou kurper, common tilapia, fai chau chak ue, Java tilapia, kawasuzume, kurper bream, malea, mojarra, mosambik-maulbrüter, Mozambikskaya tilapiya, Mozambique cichlid, Mozambique mouth-breeder, Mozambique mouthbrooder, Mozambique tilapia, mphende, mujair, nkobue, tilapia, tilapia del Mozambique, tilapia du Mozambique, tilapia mossambica, tilapia mozámbica, trey tilapia khmao, weißkehlbarsch, wu-kuo yu

Synonyms: *Chromis dumerilii* Steindachner, 1864, *Chromis natalensis* Weber, 1897, *Chromis vorax* Pfeffer, 1893, *Sarotherodon mossambicus* (Peters, 1852), *Tilapia arnoldi* Gilchrist & Thompson, 1917, *Tilapia mossambica* (Peters, 1852)

4. *Tilapia zillii* (fish)

In its native, tropical range, Tilapia zillii is important as a food fish as well as for aquaculture. Tilapia zillii provided 70% of Egypt's fish production, however outside its native range, this freshwater fish has the ability to establish itself even in highly salinated waters, only being held back by a low tolerance to cold water. Often introduced for use in aquatic weed control, Tilapia zilli can alter native benthic communities through the elimination of macrophytes and exhibits aggressive behaviour towards other fish species.

Common Names: akpadi sila, akpasila, amnun matzui, a-sannoh, bere, biare, biering, bugu, bulti, cichlid, didee, disiwulen, Engege, Epia, Erihere, falga, garagaza, gargaza, gba gba ferah, gbatchekede, guring, ifunu, isiswe, karfasa, karwa, ka-yainkain, kido, kokine, kpro ibre, kuda, loroto, mango fish, mojarra,

mojarrita, mpupa, ngege, ngipie, ngorkei, njabb, obrouyou, pastenague boulee, perege, punavatsatilapia, redbelly tilapia, sato, sili, silla, sohn, striped tilapia, tegr-pere, tha thompo, tihil, tilapia, tome, tsokungi, ukuobu, waas, waas gnoul, wesafun, Zilles Buntbarsch, zilli's cichlid, zill's tilapia

Synonyms: *Acerina zilli* (Gervais, 1848), *Chromis andreae* (Gunther, 1864), *Chromis coeruleomaculatus* (Rochebrune, 1880), *Chromis faidherbii* (Rochebrune, 1880), *Chromis melanopleura* (Dumeril, 1861), *Chromis menzalensis* (Mitchell, 1895), *Chromis tristrami* (Gunther, 1860), *Chromis zillii* (Gervais, 1848), *Coptodon zillii* (Gervais, 1848), *Coptodus zillii* (Gervais, 1848), *Glyphisidon zillii* (Gervais, 1848), *Haligenes tristrami* (Gunther, 1860), *Sarotherodon zillei* (Gervais, 1848), *Sarotherodon zillii* (Gervais, 1848), *Tilapia faidherbi* (Rochebrune, 1880), *Tilapia melanopleura* (Dumeril, 1861), *Tilapia menzalensis* (Mitchell, 1895), *Tilapia multiradiata* (Holly, 1928), *Tilapia shariensis* (Fowler, 1949), *Tilapia sparrmani multiradiata* (Holly, 1928), *Tilapia tristrami* (Gunther, 1860)

5. *Varanus indicus* (reptile)

Varanus indicus (mangrove monitor) is a terrestrial-arboreal monitor lizard that has been introduced to several locations for its meat, skin or as a biological control agent. It has created a nuisance on many islands preying on domesticated chickens and scavenging the eggs of endangered sea turtles. Bufo marinus (cane toad) was introduced to control mangrove monitor populations in several locations, but this has led to devastating consequences. In many places both of these species are now serious pests, with little potential for successful control.

Common Names: ambon lizard, erebachi, flower lizard, George's island monitor, Indian monitor, Indian monitor lizard, kalabeck monitor, mangrove monitor, Pacific monitor, Pazifikwaran, regu, sosi, stillahavsvaran, varan des indes, varan des mangroves, varano de manglar

Synonyms: *Monitor chlorostigma, Monitor doreanus, Monitor douarrha, Monitor indicus, Monitor kalabeck, Tupinambis indicus, Varanus chlorostigma, Varanus guttatus, Varanus indicus indicus, Varanus indicus kalabecki, Varanus indicus spinulosis, Varanus leucostigma, Varanus tsukamotoi*

3.2.1.2 Estuarine

1. *Aedes albopictus* (insect)

The Asian tiger mosquito is spread via the international tire trade (due to the rainwater retained in the tires when stored outside). In order to control its spread such trading routes must be highlighted for the introduction of sterilisation or quarantine measures. The tiger mosquito is associated with the transmission of many human diseases, including the viruses: Dengue, West Nile and Japanese Encephalitis.

Common Names: Asian tiger mosquito, forest day mosquito, mosquito tigre, moustique tigre, tiger mosquito, tigermücke, zanzare tigre

Synonyms: *Culex albopictus* Skuse, 1895, *Culex albopictus* Skuse,1895

2. *Bubulcus ibis* (bird)

Bubulcus ibis are small stocky herons that associate with grazing species of mammals both domestic and wild. They have strong migratory instincts and disperse thousands of miles in the direction of their choosing. They are, for the most part, self-introduced. They have been observed 'feeding on' native species of birds. They are known to host ticks that could introduce and spread certain tick-borne diseases.

Common Names: Afrikaanse koereiger, buff-backed heron, cattle egret , depulgabuey, elephant bird, garcilla bueyera, garcilla garrapatera, garcita de ganado, garrapatera, garrapatosa, garza de ganado, garza de vaquèra, garza ganadera , héron garde-boeufs , hippopotomus egret, Indian cattle egret, rhinoceros egret

Synonyms: *Ardea ibis, Ardeola ibis, Bulbucus ibis*

3. *Chthamalus proteus* (crustacean)

Chthamalus proteus is a barnacle native to the Caribbean and western Atlantic. It was introduced to the Pacific in 1970s and first reported in Hawaii in 1995. It is now one of the most abundant organism in the upper intertidal harbors and bays throughout the Hawaiian Islands. C. proteus are likely to be spread by ship hull fouling and larvae by ballast water.

Common Names: Atlantic barnacle, Caribbean barnacle

4. *Clarias batrachus* (fish)

Clarias batrachus a voracious predator native to southeastern Asia has been introduced into many places for fish farming. Walking catfish, as it is commonly known (named for their ability to move over land), is an opportunistic feeder and can go for months without food. During a drought large numbers of walking catfish may congregate in isolated pools and consume other species. They are known to have invaded aquaculture farms, entering ponds where they prey on fish stocks. C. batrachus has been described as a benthic, nocturnal, tactile omnivore that consumes detritus and opportunistically forages on large aquatic insects, tadpoles, and fish.

Common Names: alimudan, cá trê tráng, cá trèn trang, clarias catfish, climbing perch, freshwater catfish, Froschwels, hito, htong batukan, ikan keling, ikan lele, Ito, kawatsi, keli, klarievyi som, koi, konnamonni, kug-ga, leleh, magur, mah-gur, mangri, marpoo, masarai, mungri, nga-khoo, pa douk, paltat, pantat, pla duk, pla duk dam, pla duk dan, pla duk nam jued, pla duk nam juend, Thai hito, Thailand catfish, trey andaing roueng, trey andeng, walking catfish, wanderwels, Yerivahlay

Synonyms: *Clarias assamensis* Day, 1877, *Clarias jagur* (Hamilton, 1822), *Clarias magur* (Hamilton, 1822), *Clarias punctatus* Valenciennes, 1840, *Macropteronotus jagur* Hamilton, 1822, *Macropteronotus magur* Hamilton, 1822, *Silurus batrachus* Linnaeus, 1758

5. *Cyprinus carpio* (fish)

The common carp (Cyprinus carpio) has been introduced as a food and ornamental fish into temperate freshwaters throughout the world. It is considered a pest because of its abundance and its tendency to reduce water clarity and destroy and uproot the aquatic vegetation used as habitat by a variety of species.

Common Names: carp, carpa, carpat, carpe, carpe, carpe commune, carpeau, carpo, cerpyn, ciortan, ciortanica, ciortocrap, ciuciulean, common carp, crap, crapcean, cyprinos, escarpo, Europäischer Karpfen, European carp, German carp, grass carp, grivadi, ikan mas, kapoor-e-maamoli, kapor, kapr obecný, karp, karp, karp, karp, karp, karp dziki a. sazan, karpa, karpar, karpe, Karpe, karpen, karper, karpfen, karpion, karppi, kerpaille, koi, koi carp, korop, krap, krapi, kyprinos, læderkarpe, lauk mas, leather carp, leekoh, lei ue, mas massan, mirror carp, olocari, pa nai, pba ni, pla nai, ponty, punjabe gad, rata pethiya, saran, Saran, sarmão, sazan, sazan baligi, scale carp, sharan, skælkarpe, soneri masha, spejlkarpe, sulari, suloi, tikure, trey carp samahn, trey kap, ulucari, weißfische, wild carp, wildkarpfen

Synonyms: *Carpio carpio gibbosus* (Kessler, 1856), *Carpio flavipinna* Valenciennes, 1842, *Carpio vulgaris* Rapp, 1854, *Cyprinus acuminatus* Heckel & Kner, 1858, *Cyprinus acuminatus* Richardson, 1846, *Cyprinus angulatus* Heckel, 1843, *Cyprinus atrovirens* Richardson, 1846, *Cyprinus bithynicus* Richardson, 1857, *Cyprinus carpio anatolicus* Hanko, 1924, *Cyprinus carpio aralensis* Spiczakow, 1935, *Cyprinus carpio brevicirri* Misik, 1958, *Cyprinus carpio elongatus* Walecki, 1863, *Cyprinus carpio fluviatilis* Pravdin, 1945, *Cyprinus carpio longicirri* Misik, 1958, *Cyprinus carpio monstrosus* Walecki, 1863, *Cyprinus carpio oblongus* Antipa, 1909, *Cyprinus chinensis* Basilewsky, 1855, *Cyprinus conirostris* Temminck & Schlegel, 1846, *Cyprinus festetitsii* Bonaparte, 1845, *Cyprinus flamm* Richardson, 1846, *Cyprinus fossicola* Richardson, 1846, *Cyprinus haematopterus* Temminck & Schlegel, 1846, *Cyprinus melanotus* Temminck & Schlegel, 1846, *Cyprinus nordmannii* Valenciennes, 1842, *Cyprinus sculponeatus* Richardson, 1846, *Cyprinus thermalis* Heckel, 1843, *Cyprinus tossicole* Elera, 1895, *Cyprinus vittatus* Valenciennes, 1842

6. *Eichhornia crassipes* (aquatic plant)

Originally from South America, Eichhornia crassipes is one of the worst aquatic weeds in the world. Its beautiful, large purple and violet flowers make it a popular ornamental plant for ponds. It is now found in more than 50 countries on five continents. Water hyacinth is a very fast growing plant, with populations known to double in as little as 12 days. Infestations of this weed block waterways, limiting boat traffic, swimming and fishing. Water hyacinth also prevents sunlight and oxygen from reaching the water column and submerged plants. Its shading and crowding of native aquatic plants dramatically reduces biological diversity in aquatic ecosystems.

Common Names: aguapé, bekabe kairanga, bung el ralm, bung el ralm, floating water hyacinth, jacinthe d'eau, jacinto de agua, jacinto-aquatico, jal khumbe, jal kumbhi, lechuguilla, lila de agua, lirio acuatico, mbekambekairanga, riri vai, wasserhyazinthe, water hyacinth, water orchid, wota haisin
Synonyms: *Eichhornia speciosa* Kunth, *Heteranthera formosa*, *Piaropus crassipes* (Mart.) Raf., *Piaropus mesomelas*, *Pontederia crassipes* Mart. (basionym)

7. *Gambusia affinis* (fish)

Gambusia affinis is a small fish native to the fresh waters of the eastern and southern United States. It has become a pest in many waterways around the world following initial introductions early last century as a biological control of mosquito. In general, it is considered to be no more effective than native predators of mosquitoes. The highly predatory mosquito fish eats the eggs of economically desirable fish and preys on and endangers rare indigenous fish and invertebrate species. Mosquito fish are difficult to eliminate once established, so the best way to reduce their effects is to control their further spread. One of the main avenues of spread is continued, intentional release by mosquito-control agencies. G. affinis is closely related to he eastern mosquitofish (*G. holbrooki*), which was formerly classed as a sub-species. Their appearance, behaviour and impacts are almost identical, and they can therefore be treated the same when it comes to management techniques. Records of G. affinis in Australia actually refer to G. holbrooki.
Common Names: Barkaleci, Dai to ue, Gambusia, Gambusie, Gambusino, Gambuzia, Gambuzia pospolita, Gambuzija, guayacon mosquito, Isdang canal, Kadayashi, Koboldkärpfling, Kounoupopsaro, Live-bearing tooth-carp, Mosquito fish, Obyknovennaya gambuziya, pez mosquito, San hang ue, Silberkärpfling, tes, Texaskärpfling, Topminnow, western mosquitofish, Western mosquitofish
Synonyms: *Fundulus inurus* (Jordan & Gilbert, 1882), *Gambusia affinis affinis* (Baird & Girard, 1853), *Gambusia affinis* (Baird & Girard, 1853), *Gambusia gracilis* Girard, 1859, *Gambusia humilis* Günther, 1866, *Gambusia patruelis* (Baird & Girard, 1853), *Haplochilus melanops* Cope, 1870, *Heterandria affinis* Baird & Girard, 1853, *Heterandria patruelis* Baird & Girard, 1853, *Zygonectes brachypterus* Cope, 1880, *Zygonectes gracilis* (Girard, 1859), *Zygonectes inurus* Jordan & Gilbert, 1882, *Zygonectes patruelis* (Baird & Girard, 1853)

8. *Hydrilla verticillata* (aquatic plant)

Hydrilla verticillata is a submerged freshwater aquatic weed that can tolerate salinity up to 7%. It crowds out native plants by shading them and out-competing them for nutrients. The dense masses it forms interfere with recreational activities such as boating, fishing and swimming. Hydrilla verticillata can be dispersed by river flow, waterfowl and recreational activities and is sold as an aquarium plant.
Common Names: Florida elodea, hydrilla, oxygen weed, water thyme, water weed

9. *Oreochromis mossambicus* (fish)

Oreochromis mossambicus (Mozambique tilapia) has spread worldwide through introductions for aquaculture. Established populations of Oreochromis mossambicus in the wild are as a result of intentional release or escapes from fish farms. Oreochromis mossambicus is omnivorous and feeds on almost anything, from algae to insects.
Common Names: blou kurper, common tilapia, fai chau chak ue, Java tilapia, kawasuzume, kurper bream, malea, mojarra, mosambik-maulbrüter, Mozambikskaya tilapiya, Mozambique cichlid, Mozambique mouth-breeder, Mozambique mouthbrooder, Mozambique tilapia, mphende, mujair, nkobue, tilapia, tilapia del Mozambique, tilapia du Mozambique, tilapia mossambica, tilapia mozámbica, trey tilapia khmao, weißkehlbarsch, wu-kuo yu
Synonyms: *Chromis dumerilii* Steindachner, 1864, *Chromis natalensis* Weber, 1897, *Chromis vorax* Pfeffer, 1893, *Sarotherodon mossambicus* (Peters, 1852), *Tilapia arnoldi* Gilchrist & Thompson, 1917, *Tilapia mossambica* (Peters, 1852)

10. *Paspalum vaginatum* (grass)

Paspalum vaginatum (seashore paspalum) is a North American grass which now has a pantropical distribution. It has been widely used for landscaping and revegetation and is a common turf grass on golf

courses. Paspalum vaginatum has naturalised in coastal salt marshes where it changes the composition of vegetation and in some cases dominates, impacting on fauna communities and estuarine hydrology.

Common Names: biscuit grass, capim-paturá, grama de costa, grama de mar, grama-rasteira, gramilla, gramilla blanca, gramón, herbe rampante, jointgrass, kambutu, knot grass, knottweed, matie, mauku ta'atai, mauku vairakau, mosie kalalahi, mutia, mutie, salt grass, saltwater couch, saltwater paspalum, seashore crowngrass, seashore grass, seashore paspalum, silt grass, swamp couch, water couch, wujoojkatejukjuk

Synonyms: *Digitaria foliosa* Lag. , *Digitaria tristachya* (Leconte) Schult., *Digitaria vaginata* (Sw.) Magnier, *Panicum littorale* (R.Br.) Kuntze, *Panicum vaginatum* (Sw.) Gren. & Godr., *Paspalum gayanum* E. Desv., *Paspalum boryanum* C. Presl, *Paspalum distichum* L. subsp. *vaginatum* (Sw.) Maire, *Paspalum distichum* L. var. *littorale* (R.Br.) F.M.Bailey, *Paspalum distichum* L. var. *nanum* (Döll) Stapf, *Paspalum distichum* L. var. *tristachyum* (Leconte) A.W.Wood, *Paspalum distichum* L. var. *vaginatum* (Sw.) Griseb., *Paspalum foliosum* (Lag.) Kunth, *Paspalum gayanum* E.Desv., *Paspalum inflatum* A. Rich., *Paspalum jaguaense* León, *Paspalum kleineanum* J.Presl, *Paspalum littorale* R. Br., *Paspalum reimarioides* Chapm., *Paspalum squamatum* Steud., *Paspalum tristachyum* Leconte, *Paspalum vaginatum* Sw. subsp. *nanum* (Döll) Loxton, *Paspalum vaginatum* Sw. var. *littorale* (R.Br.) Trin. ex Büse, *Paspalum vaginatum* Sw. var. *nanum* Döll, *Paspalum vaginatum* Sw. var. *reimarioides* Chapm., *Rottboellia uniflora* A. Cunn., *Sanguinaria vaginata* (Sw.) Bubani

11. *Poecilia reticulata* (fish)

Poecilia reticulata is a small benthopelagic fish native to Brazil, Guyana, Venezuela and the Caribbean Islands. It is a popular aquarium species and is also commonly used in genetics research. In the past Poecilia reticulata was widely introduced for mosquito control but there have been rare to non-existing measurable effects on mosquito populations. It can occupy a wide range of aquatic habitats and is a threat to native cyprinids and killifishes. It is a carrier of exotic parasites and is believed to play a role in the decline of several threatened and endangered species.

Common Names: guppie , guppii , guppy, hung dzoek ue, ikan seribu, lareza tripikaloshe, lebistes, lepistes, Mexicano, miljoenvis, miljoonakala, million fish, millionenfisch, millions, poisson million, queue de voile, rainbow fish, sarapintado, Sardinita, Wilder Riesenguppy, zivorodka duhová

Synonyms: *Acanthophacelus guppii* (Günther, 1866), *Acanthophacelus reticulatus* (Peters, 1859), *Girardinus guppii* Günther, 1866, *Girardinus reticulatus* (Peters, 1859), *Haridichthys reticulatus* (Peters, 1859), *Heterandria guppyi* (Günther, 1866), *Lebistes poecilioides* De Filippi, 1861, *Lebistes poeciloides* De Filippi, 1861, *Lebistes reticulatus* (Peters, 1859), *Poecilia reticulatus* Peters, 1859, *Poecilioides reticulatus* (Peters, 1859)

12. *Tilapia zillii* (fish)

In its native, tropical range, Tilapia zillii is important as a food fish as well as for aquaculture. Tilapia zillii provided 70% of Egypt's fish production, however outside its native range, this freshwater fish has the ability to establish itself even in highly salinated waters, only being held back by a low tolerance to cold water. Often introduced for use in aquatic weed control, Tilapia zilli can alter native benthic communities through the elimination of macrophytes and exhibits aggressive behaviour towards other fish species.

Common Names: akpadi sila, akpasila, amnun matzui, a-sannoh, bere, biare, biering, bugu, bulti, cichlid, didee, disiwulen, Engege, Epia, Erihere, falga, garagaza, gargaza, gba gba ferah, gbatchekede, guring, ifunu, isiswe, karfasa, karwa, ka-yainkain, kido, kokine, kpro ibre, kuda, loroto, mango fish, mojarra, mojarrita, mpupa, ngege, ngipie, ngorkei, njabb, obrouyou, pastenague boulee, perege, punavatsatilapia, redbelly tilapia, sato, sili, silla, sohn, striped tilapia, tegr-pere, tha thompo, tihil, tilapia, tome, tsokungi, ukuobu, waas, waas gnoul, wesafun, Zilles Buntbarsch, zilli's cichlid, zill's tilapia

Synonyms: *Acerina zilli* (Gervais, 1848), *Chromis andreae* (Gunther, 1864), *Chromis coeruleomaculatus* (Rochebrune, 1880), *Chromis faidherbii* (Rochebrune, 1880), *Chromis melanopleura* (Dumeril, 1861), *Chromis menzalensis* (Mitchell, 1895), *Chromis tristrami* (Gunther, 1860), *Chromis zillii* (Gervais, 1848), *Coptodon zillii* (Gervais, 1848), *Coptodus zillii* (Gervais, 1848), *Glyphisidon zillii* (Gervais, 1848), *Haligenes tristrami* (Gunther, 1860), *Sarotherodon zillei* (Gervais, 1848), *Sarotherodon zillii* (Gervais,

1848), *Tilapia faidherbi* (Rochebrune, 1880), *Tilapia melanopleura* (Dumeril, 1861), *Tilapia menzalensis* (Mitchell, 1895), *Tilapia multiradiata* (Holly, 1928), *Tilapia shariensis* (Fowler, 1949), *Tilapia sparrmani multiradiata* (Holly, 1928), *Tilapia tristrami* (Gunther, 1860)

3.3 BIOSTATUS NOT SPECIFIED

1. *Acanthaster planci* (sea star)

Coral gardens from Micronesia and Polynesia provide valuable marine resources for local communities and environments for native marine species such as marine fish. In coral ecosystems already affected by coral bleaching, excess tourism and natural events such as storms and El Nino, the effects of the invasive coral-feeding starfish (Acanthaster planci) on native coral communities contributes to an already dire state of affairs. Acanthaster planci significantly threatens the viability of these fragile coral ecosystems, and damage to coral gardens by the starfish has been quite extensive in some reef systems.

Common Names: coral-eating starfish, coral-feeding starfish, crown of thorns starfish, crown-of-thorns starfish, giant thorny starfish, rrusech

2. *Acanthophora spicifera* (algae)

Acanthophora spicifera is a red algae which is found in most tropical or subtropical seas of the world. Its plastic morphology allows it to adapt to a variety of environmental conditions, and hence it can invade a diverse range of habitats. It is an alien invasive species in Hawaii. It is amongst the most successful alien algal species in this region, where it may modify native communities and compete with native algae.

Common Names: bulung tombong bideng, culot, red alga, spiny alga, spiny seaweed

Synonyms: *Acanthophora antillarum* Montagne ex Kützing 1865, *Acanthophora intermedia* Crouan, *Acanthophora orientalis* J. Agardh 1863, *Acanthophora orientalis* var. *wightii* (J. Agardh) Sonder 1879, *Acanthophora spicifera* f. *orientalis* (J.Agardh) Weber-van Bosse 1923, *Acanthophora spicifera* f. *wightii* (J. Agardh) Weber-van Bosse 1923, *Acanthophora spicifera* var. *orientalis* (J. Agardh) Zaneveld 1956, *Acanthophora thierryi* f. *gracilis* P.L. Crouan & H.M. Crouan 1878, *Acanthophora thierryi* J.V. Lamouroux 1813, *Acanthophora wightii* J. Agardh 1863, *Chondria acanthophorara* C. Agardh 1822, *Fucus acanthophorus* J.V. Lamouroux 1805, *Fucus spicifer* M. Vahl 1802

3. *Gracilaria salicornia* (algae)

The introduction of alien algae in the marine environment is a potential threat to the health and stability of near-shore ecosystems. Gracilaria salicornia threatens coral reefs and native benthic communities in Hawaii and elsewhere. It may reduce marine species diversity and alter marine community structure.

Common Names: canot-canot , red algae

Synonyms: *Corallopsis cacalia* Agardh, *Corallopsis concrescens* Reinbold, *Corallopsis dichotoma* Ruprecht, *Corallopsis opuntia* Agardh, *Corallopsis salicornia* Greville, *Corallopsis salicornia* var. *minor* Sonder, *Gracilaria cacalia* Dawson, *Sphaerococcus salicornia* Agardh

3.4 APRA HARBOR HABITAT SUMMARY

3.4.1 GLASS BREAKWATER

The reefs on the northwestern tip of the Glass Breakwater as well as the tip of Orote Peninsula and the northwestern sides of Orote Island are greatly influenced by the open ocean. Many species such as the sponge *Xestospongia exigua* were found only in this part of Apra Harbor yet are common outside the harbor. The Glass Breakwater is a steep, man-made shore composed of limestone boulders down to a depth of 16 to 22 feet (ft) (5-7 meters [m]). These boulders generally sit on solid reef pavement and extend outwards forming a shelf for approximately 320 to 640 ft (100-200 m). Once this shelf reaches a depth of around 32 to 48 ft (10-15 m), it slopes downwards to below 96 ft (30 m). Although the shelf and slope areas contain a diverse coral community typical of Outer Apra Harbor, the limestone boulders,

which comprise the breakwater contain few corals with only Porites rus being common (Paulay et al. 1997).

The Glass Breakwater currently supports coral reef and colonized hardbottom along its inner edge at 10 to 50% live coverage, with an isolated area of high live coral coverage (50 to 100%). There is a coral area of special significance approximately 1,110 ft (338 m) to the east of this high coral coverage area (NOAA 2005).

3.4.2 Orote Point to the Entrance of Inner Apra Harbor

Paulay et al. (1997) surveyed biodiversity in the harbor and divided the southern portion of Apra Harbor into two zones: (1) Orote Point to San Luis Point and (2) San Luis Point to the entrance of Inner Apra Harbor. The area between Orote Point and San Luis Point contains a diverse assemblage of corals, sponges, soft corals, others invertebrates, and nearshore growth macroalgae. The area contains mostly fringing reefs and fringing reef slopes, which become more oceanic in character moving westward from San Luis Point towards Orote Point. *Porites rus* is the dominant hard coral on the slopes of the fringing reef. Although diverse, all species encountered in the survey are found on other reefs of Guam.

Other studies have also shown coral high cover in this area. Several studies looked at the area between Orote Point and Gab Gab Beach including east and west of Kilo Wharf (Navy 1999, Smith 2004, NOAA 2005). The areas surrounding Kilo Wharf contain nearly 100% live coral cover consisting mainly of *Porites rus* (>90% of the live cover) with other hard corals including *Porites lichen, Porites lobata, Platygyra pini, Leptoseris* spp., *Lobophyllia corymbosa,* and *Acanthastrea echinata* (Smith 2004).

Corals also occur on reefs off the tip of the Orote Peninsula along with turf algae. Paulay et al. (2000) described two macrohabitats in this area, the Orote Point reef slope and the Orote Point fringing reef. The Orote Point reef slope is found at the tip of the peninsula and extends from Spanish Steps to the western end of Orote Island. This area supports higher coral and fish diversity and higher fish biomass compared to other locations of Guam. The submerged terrace slopes gently down to a water depth of 39 to 49 ft (12 to 15 m) followed by a steep forereef slope that plunges down to 50+ ft (30+ m). The area of reef that is contiguous with Apra Harbor is populated by the biota commonly found in the harbor (e.g., *Porites rus* and sponges). The *Porites rus* dominated reef is limited to an area immediately adjacent to the harbor. Along the northern end of the Orote Peninsula west from the harbor, the coral community is more diverse. Paulay et al. (2001) observed 19 species of corals in this area and noted that this was the most diverse coral area of the coastline from Spanish Steps to Agat Bay. The diversity of fishes was also greatest in this area with 53 species observed. In addition, found in this diverse area was a possible new *Acropora* species record for Guam. The coral species appeared to be similar to *Acropora nasuta* (Paulay et al. 2000).

The Orote Point fringing reef is located between the tip of the Orote Peninsula and Orote Island. It has a reef front facing the southern coast of the Orote Peninsula and another facing the southwestern end of Apra Harbor intrinsically providing a connection between the north and south sides of the peninsula. Karstic shores flank the other two sides of the reef with a "strong gradient in species composition" on this reef. The middle and northern parts of the reef supported coral species that are typical of Apra Harbor (including *Porites rus*, *Porites cylindrica*, *Pavona venosa*, *Pavona divaricata*, *Psammocora contigua*, and *Porites damicornis*). Corals found on the southern end of the reef were characteristic of an oceanic, reef front community with corals including *A. digitifera*, *Galaxea fascicularis*, and an *Acropora* species similar to *Acropora valida* (Paulay et al. 2000).

The area between San Luis Point and Inner Apra Harbor is quite different. Much of this area has been altered or created by landfill during original construction of the inner harbor. The shallow areas contain a narrow shelf down to approximately 6 to 10 ft (2 to 3 m) in depth followed by a steeper slope characterized primarily by *Halimeda* (a slow growing calcareous macroalgae) attached to the sandy substrate. Some coral patches appear below 32 or 64 ft (10 or 20 m), again dominated by *Porites rus*, a coral common throughout the harbor (Paulay et al. 1997).

3.4.3 Entrance Channel

The Inner Apra Harbor entrance channel is between Polaris Point and the former SRF and allows entrance by vessels with a maximum draft of 31 ft (10 m). The eastern side of the entrance channel extends for approximately 1,760 ft (550 m) while the western side extends approximately 1,280 ft (400 m). The width of the entrance channel is 960 ft (300 m). Corals are also found on sheet piles in the entrance channel of the Inner Apra Harbor and the outer reaches of the Inner Apra Harbor (Navy 2005). The entrance channel contains patches of coral cover estimated at over 60%; however these sites generally are very limited in size, at less than 1,024 square feet [sf] (100 square meters [m^2]). The coral community in the entrance channel, although present, is much less diverse, less complex, supports smaller individual coral colonies and has a much lower rugosity (creases, wrinkles and ridges) factor than coral communities in Outer Apra Harbor. *Porites rus* and *Porites cylindrica* are the most common and abundant corals in both the inner and outer harbor, however at least 10 additional coral families are present in the outer harbor (COMNAV Marianas 2006c) (see Volume 4, Figure 11.1-10).

The coral community in the entrance channel is routinely subjected to the types of stresses typical to a harbor entrance: abrasion from ships' hulls, breakage from towing cables, severe propeller wash from tug boats and large vessels, etc. Relative to Outer Apra Harbor, the Inner Apra Harbor benthic community is highly disturbed and degraded. Furthermore, the coral community within the entrance channel is not biologically significant, based upon the size of the individual coral colonies, the growth forms of the colonies, or the species present. Other benthic invertebrates are well represented in Outer Apra Harbor and very poorly represented within the Inner Apra Harbor or the entrance channel (Smith 2007).

The coral community in the entrance channel was found to be composed of four major species. The most abundant species was *Porites rus.* This coral species is ubiquitous throughout Apra Harbor, and occurs in a variety of growth forms, particularly overlapping plates and columnular spires. *Porites rus* occurred in the regions of sparse coral as isolated colonies. The abundance of *Porites rus* in the entrance channel indicates that this species is particularly well adapted to thrive in areas of low light and continuous suspended sediment deposition. Many of the colonies observed in the entrance channel had layers of silt deposited on their upper surfaces. Another dominant coral in the entrance channel was the branching species *Porites cylindrica.* This species occurs as mats of interconnected branches that extend uninterrupted for several square meters in some areas of the entrance channel floor. Third in abundance is the finely branched coral *Pocillopora damicornis,* which forms low, flat plates near the sediment surface. The relevance of these observations is that the coral species assemblages found in the entrance channel are similar to those documented in the CVN dredge area (Smith 2007).

3.4.4 Shoals and Mounds

West of Sasa Bay in the center of the Outer Harbor is the most notable reef ecosystem in the harbor, including Western Shoals, Jade Shoals and Middle Shoals (see Volume 4, Figure 11.1-10). These shoals are patch reefs that rise from the harbor floor to approximately 32 ft (10 m) from the water surface, potions of which are exposed during extreme low tides (COMNAV Marianas 2007b). These shoals have coral reefs and colonized hardbottom with 50 to 100% live coral coverage and are identified as coral areas

of special significance (NOAA 2005) (Figure 11.1-10). Each is dominated by the coral species *P. rus* and contain several other coral species including *Porites lobata*, *Porites annae*, *Porites cylindrica*, *Millepora dichotoma*, *Acropora formosa*, and *Pocillopora damicornis* (Paulay et al. 1997). These shoal areas do not contain an abundance of algal species (Navy 2009a).

There are also several mounds located in deeper parts of the lagoon, including Sponge Mound, which comes to within 64 ft (20 m) of the surface. Paulay et al. (1997) surveyed Sponge Mound (located west-southwest of Western Shoals) and found that the top of the mound supported the highest diversity of sponges in all of Guam with several sponge species known only from this site (COMNAV Marianas 2007b) (see Volume 4, Figure 11.1-10).

The most pristine coral reef ecosystem in Apra Harbor is located along the southern shoreline of the harbor and includes Gab Gab reef (COMNAVAR 2007b). These reefs are popular sites for fishing, snorkeling, and scuba diving. These fringing reef ecosystems have 50 to 100% live coral coverage and extend from San Luis Point west to Orote Point and have two areas identified as coral areas of special significance (NOAA 2005). Deeper coral reef ecosystems are present in Apra Harbor's deeper waters (greater than 40 ft [12 m]) (Paulay et al. 1997).

3.5 SPECIES PROFILES

Common Name: Common bottlenose dolphin

Chamorro Name: Toninos

Scientific Name: *Tursiops truncatus*

Species Description

One of the most widely known marine mammals in the world. Body type is strong and robust, with a head that ends in a "beak" which is short and thick compared to other dolphins. Body is counter-shaded, with light grey on the bottom and variations ranging from dark grey to black along the back. Body size ranges from 6-12 ft (1.8-3.6 m) in length and 300-1,400 lbs (136-636 kg) in weight. Males and females are difficult to distinguish from one another, but males are generally larger.(1)

Listing Status

Protected under the Marine Mammal Protection Act (MMPA).(1) In Guam, considered a Species of Greatest Conservation Need.(2)

Threats

Most serious threat is incidental catch from fishing gear which use nets or long lines with large hooks pose a threat to dolphins. Although outlawed in most of the world, legal harvest still takes place in Japan and Taiwan, and illegal harvest occurs in other locations. General ocean water quality issues such as pollution also pose a risk for the health and safety of bottlenose dolphins. (1)

Ecology

Found offshore over deep waters and nearshore in coastal environments such as estuarine, bay, or river mouth. Uses echolocation to locate and capture prey, and prey items vary based on habitat but are generally various fish species. Typically found in small groups, but can form large groups with 100s of individuals, and are often associated with other marine mammal species (e.g., pilot whales). Calves are born after a 1-year gestation period, and sexual maturity is reached between 9-14 years for males and 5-13 years for females. Lifespan is thought to be around 50 years.(1)

Historical and Current Distribution

Found worldwide, generally ranging from latitudes 45°N to 45°S. This species occurs regularly in Guam and surrounding areas.

References

1. NMFS. 2009. Bottlenose Dolphin (*Tursiops truncatus*). http://www.nmfs.noaa.gov/pr/species/mammals/cetaceans/bottlenosedolphin.htm.

2. GDAWR. 2006. Guam Comprehensive Wildlife Conservation Strategy (GCWCS). Department of Agriculture, Guam. 7 November.

Photo: http://www.nmfs.noaa.gov/pr/images/cetaceans/bottlenose_calf_swfsc.jpg.

Map: http://www.iucnredlist.org/details/22563/0/rangemap.

Common Name: Spinner dolphin

Chamorro Name: Toninos

Scientific Name: *Stenella longirostris*

SPECIES DESCRIPTION

Well known and named for their impressive capability to leap out of the water and spin through the air. Body is small, with a head that ends in a "beak" which is long and narrow compared to other dolphins. Body is counter-shaded, with light grey on the bottom and variegated medium grey to dark grey along the back. Colors vary based on geographic location, with a "white belly" form inhabiting the Pacific Islands. Body size ranges from 4-7 ft (1.2-2.1 m) in length and 100-165 lbs (45-75 kg) in weight.(1)

LISTING STATUS

Protected under the Marine Mammal Protection Act (MMPA). The Eastern stock in the Eastern Tropical Pacific Ocean is MMPA depleted.(1) In Guam, considered a Species of Greatest Conservation Need.(2)

THREATS

Most serious threat is incidental entanglement in fishing gear; an unexplained association between large yellowfin tuna and spinner dolphins exists. Interactions with tourists disturb this species, as ideally they should be resting during the day to prepare for night time hunting.(3) General ocean water quality issues such as pollution also pose a risk for the health and safety of spinner dolphins.(1)

ECOLOGY

Generally found offshore over deep waters, but some populations are coastal, spending time in small groups resting in bays and other protected areas. At night, large groups feed on prey items such as fish and squid found in deep waters. Often associated with other marine mammal species such as spotted dolphins and humpback whales.(3) Calves are born after a 10.5-month gestation period. Lifespan is thought to be around 20 years.(1)

HISTORICAL AND CURRENT DISTRIBUTION

Found in all tropical and subtropical oceans. In Guam and surrounding areas, the "white belly" form is found along the coastline during the day and in deeper waters at night.(1)

REFERENCES

1. NMFS. 2009. Spinner Dolphin. http://www.fpir.noaa.gov/PRD/prd_spinner.html.
2. GDAWR. 2006. Guam Comprehensive Wildlife Conservation Strategy (GCWCS). Department of Agriculture, Guam. 7 November.
3. NMFS. 2009. Spinner Dolphin (*Stenella longirostris longirostris*). http://www.nmfs.noaa.gov/pr/species/mammals/cetaceans/spinnerdolphin.htm.

Photo: http://www.fpir.noaa.gov/PRD/prd_spinner.html.

Map: http://www.iucnredlist.org/details/20733/0/rangemap.

Common Names: Humphead and Napoleon wrasse, Napoleonfish

Chamorro Name: Tanguisson

Scientific Name: *Cheilinus undulatus*

SPECIES DESCRIPTION

The largest living wrasse, with male body length reaching over 6 ft (1.8 m) and weight over 420 lbs (190 kg); females are smaller, with a maximum length of 3 ft (0.9 m). Body coloration varies greatly by life stage. Small juveniles are black and white; larger juveniles are a pale green with black spots running vertically on each scale; adults vary between shades of olive green and blue-green with a very distinct bar running vertically on each scale.(1)

LISTING STATUS

NOAA/NMFS Species of Concern and listed as Endangered by the International Union for Conservation of Nature (IUCN).(1) In Guam, considered a Species of Greatest Conservation Need.(2)

THREATS

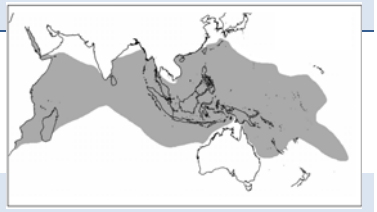
Most serious threats are from commercial and subsistence fishing, including directed live capture for food, spearfishing with scuba gear, and fishing techniques that employ destructive methods such as the use of dynamite or cyanide. This species is particularly vulnerable to overfishing due to slow growth, long lifespan, late age of sexual maturity, and a preference for immature fish by consumers. General habitat loss and degradation are also major threats to this species.(1)

ECOLOGY

Generally found nearshore over reef and channel slopes and lagoon reefs, in depths ranging from 3-330 ft (1-100 m). Adults are found in open areas around reefs, while juveniles seek refuge from predators within dense coral or seagrass growth. Seasonal Spawning takes place in aggregations and is dependent on the tidal cycle. Adults are found in male-female pairs or in small groups of less than seven individuals. This species is a protogynous hermaphrodite, with select females changing to males. Sexual maturity occurs between 5 and 7 years of age, and lifespan is at least 30 years.(1)

HISTORICAL AND CURRENT DISTRIBUTION

Found throughout most of the tropical Pacific in low densities. In Guam and surrounding areas, this species was once very common and economically important, but today is rarely sighted.(1)



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1. NOAA. 2007. Species of Concern, Humphead wrasse, *Cheilinus undulatus*. http://www.fpir.noaa.gov/Library/PRD/SOC/Revised%20fact%20sheets_2007/humpheadwrasse_detailed.pdf. November.
2. GDAWR. 2006. Guam Comprehensive Wildlife Conservation Strategy (GCWCS). Department of Agriculture, Guam. 7 November.

Photo: Randall, J.E. 1990. Reef and Shore Fishes of the Hawaiian Islands. Seagrant College Program, University of Hawaii.

Map: http://www.iucnredlist.org/details/4592/0.

Common Name: Bumphead parrotfish
Chamorro Name: Atuhong
Scientific Name: *Bolbometopon muricatum*

SPECIES DESCRIPTION

The largest living parrotfish, with body length reaching 4 ft (1.2 m) and weight 100 lbs (45 kg). Body coloration varies greatly by life stage, but not by sex. Juveniles are greenish to brown with 5 rows of white spots running vertically; adults are dull green with a pale yellow to pink head. The adult form has a large bulbous forehead with "buck" teeth.

LISTING STATUS

NOAA/NMFS Species of Concern.(1) In Guam, considered a Species of Greatest Conservation Need.(2)

THREATS

Most serious threats are from commercial and subsistence fishing, including spearfishing or netting at night when fish are sleeping, the use of "bangsticks", and fishing techniques that employ destructive methods such as the use of dynamite or cyanide. This species is particularly vulnerable to overfishing because of slow growth, long lifespan, and late age of sexual maturity. General habitat loss and degradation are also major threats to this species.(1)

ECOLOGY

Generally found nearshore over barrier and fringing coral reefs, in depths ranging from 3-100 ft (1-100 m). Adults are found in outer lagoons and seaward reefs, while juveniles seek refuge from predators within dense seagrass growth inside lagoons. Spawning takes place in aggregations and is dependent on the lunar cycle. Adults are typically found in small groups, but are also known to form large groups of over 75 individuals. Adults sleep in groups in caves or sandy lagoon flats. Lifespan is up to 40 years.(1)

HISTORICAL AND CURRENT DISTRIBUTION

Found in the Indo-Pacific from the Red Sea and East Africa to Samoa and the Line Islands, north to the Yaeyama and Wake islands, and south to the Great Barrier Reef and New Caldonia. In Guam, this species has been described as "virtually extinct".(3)

REFERENCES

1. NOAA. 2007. Species of Concern, Bumphead parrotfish, *Bolbometopon muricatum*. http://www.fpir.noaa.gov/Library/PRD/SOC/Revised%20fact%20sheets_2007/bumpheadparrotfish_detailed.pdf. November.
2. GDAWR. 2006. Guam Comprehensive Wildlife Conservation Strategy (GCWCS). Department of Agriculture, Guam. 7 November.
3. Chan, T., Y. Sadovy, and T.J. Donaldson. 2007. *Bolbometopon muricatum*. *In* IUCN Red List of Threatened Species. Version 2009.1. www.iucnredlist.org.

Photo: Randall, J.E. 1990. Reef and Shore Fishes of the Hawaiian Islands. Seagrant College Program, University of Hawaii.

Map: http://www.fishbase.org/Summary/SpeciesSummary.php?id=5537.

CHAPTER 4. CULTURAL RESOURCES

4.1 INTRODUCTION

4.2 ELIGIBLE CULTURAL RESOURCES IN TINIAN MLA (TUGGLE 2008)

Table 4.2-1. Eligible Cultural Resources in Tinian MLA (Tuggle 2008)

Site Complex Designation	*Site Description*	*TN-site Number (if applicable)*
1-A	Japanese defenses, area of coral depressions, also used as US dumps	
1-B	Japanese fields and structures (plus isolated gun positions)	1150, 1159, 1162, 1164, 1172, 1176
1-C	Japanese Gurguan Point Airfield; US, West Field Runway No. 4	589
1-D	Japanese fields and structures (plus isolated gun positions)	
1-E	Japanese fields and structures	1183, 1184, 1185
1-G	Japanese fields and structures	611
1-H	Gun emplacement	
1-K	Military facility	
1-L	Japanese railroad platform	1163
1-M	Railroad berm	1182
1-N	Railroad berm	1182
1-O	486 Bomber Group	604
2I-A	Quarry and WWII dump	
2I-B	Japanese fields and structures	500, 501, 570, 572, 576, 579
2I-C	US 504 Bomb Group Camp	52
2I-D	Japanese fields and structures	
3aI-A	US Military Complex	14, 598
3aI-B	Japanese fields and structures	515, 516, 519
3aI-C	Japanese defensive caves	527
3aI-F	Japanese fields and structures	517, 518, 520, 582
3aI-G	Japanese Railroad terminus complex	587, 669
3aI-K	Japanese defensive cave complex	
3aI-L	Japanese fields and structures	
3aI-M	Said to be sugarcane factory, but uncertain	631
3aI-N	Butchering Facility – US?	
3aI-O	Japanese fields, but clay soils possible ceramic source, also area of dirt bike trails from 1980s	
3aI-P	Mount Laso Shrine	4
3aI-Q	Japanese defensive caves	15
3aII-A	Earth terraces and other modifications, Japanese; function uncertain, agricultural, military	
3aII-B	Japanese field and structures	
3aII-D	Cemetery for Camp Churo (Japanese/Okinawan civilians	
3aII-F	Japanese, Churo Village (with NKK buildings) US, Camp Churo (or Chulu) internment, Chamorro resettlement	2, 564, 608, 932, 933, 935, 935
3aII-G	US, Camp Churo cemetery (for internment or resettlement?)	34

Site Complex Designation	*Site Description*	*TN-site Number (if applicable)*
3aII-H	Japanese railroad berm	1182, 939, 940
3aII-I	Japanese fields and structures	565, 939, 977
3aIII-A	Japanese fields and structures	568, 569, 1147, 1149
3aIII-B	US Anti-aircraft position	1148
3aIII-C	Portion of 107th NCB camp	12
3aIII-D	Japanese fields and structures	
3aIII-E	Military facility associated with West Field	979
3aIII-G	Bulldozing and military facility	
3aIII-H	Japanese, part of a village	984
3aIII-I	Quarry and dump	
3aIII-J	Well	
3aIV-A	Japanese field and structures	
3aIV-B	446 Bomber Group	601
3aIV-C	Quarry	
3aIV-D	462 Bomber Group	49
3aIV-E	Possibly part of Army Garrison Forces (site 0050)	50
3aIV-F	Remnant fields, structures	
3aIV-G	486 Bomber Group	604
3aIV-H	Remnant of Kahit Village	1160
3aIV-I	Army Garrison Forces	50
3aIV-J	Part of Army Garrison Forces? Largely undeveloped	50
3aIV-K	Japanese structures and fields	1146
3aIV-L	Quarry and dump	567
3aIV-M	58th Wing Headquarters	31
3aIV-N	107 CB Camp	32
3aIV-O	Unidentified military activities	
3aIV-1182	Section of Japanese railroad berm	1182
3aV-B	Japanese fields, re-farmed during US period	
3aV-C	Remnant of Shinminato Village	
3aV-D	Japanese fields/structures, modern farming mixed	661, 662, 663, 1141, 1142, 1143, 1143, 1144
3aV-F	Unidentified US facility	
3aV-G	9th Bomb Group	603
3aV-H	6th Bomb Group	602
3aV-1182	Section of Japanese railroad berm	1182
3aVI-B	313 Bomb Wing Headquarters	36, 581
3aVI-C	Japanese fields farmed during war	
3b-A	Pre-contact latte sets, Puntan Tahgong, and extensive sherd scatter	76
3b-C	Defensive complex	
3b-D	Japanese agricultural complex	383, 385, 386, 508
3b-E	US, reuse of gun position, Japanese gun position, fuel drum, enclosure, slabs, (Ushi Point complex 1)	378
3b-F	Japanese, gun positions; fuel drum enclosures	391
3b-G	US, 313 Wing Base Service Command service group shop area (359, 358, 77 and 72 Service Groups) and adjacent facilities	387, 401, 560, 617
3b-I	US, "A" Battery; 17 AAA; foundation piers, concrete pads	382
3b-J	US, A-bomb assembly structures, earthen enclosures, platforms	41

Site Complex Designation	*Site Description*	*TN-site Number (if applicable)*
3cI	Push piles, recent bulldozing, North Field runways and hardstands	364
3cII	Push piles, concrete, pipes in area of runways, hardstand, recent bulldozing, North Field runways and hardstands	364, 415
3cIII	Push piles, recent bulldozing	364
3dn-A	Japanese defensive complex	20, 397
3dn-C	Japanese military feature, Tahgong revetments, munitions storage	394
3ds-B	Pre-contact latte sets Unai Chiget	77
3ds-C	Japanese defensive caves with pre-contact deposits	432
3ds-E	Pre-contact latte sets and stratified deposits, features	433
3ds-F	Lusong in rockshelter	552
3e-A	Japanese fields and structures	473, 486
3e-B	US, 67 NCB second camp, later occupied by 1322 Engineering Regiment	471
3e-C	US "C" Battery 17 AAA; and possibly 16 AAA	489
3e-D	Japanese railroad berm	1182
3e-E	Japanese railroad bern	1182
3e-F	Japanese railroad berm	1182, 436, 437, 438
3e-G	Japanese military area, defenses, dump	487, 488
3e-H	US (?) defensive complex	468
3e-I	Japanese fields and structures	
3e-J	Japanese cliff line defensive complex	439, 469
3e-K	RR grade on slope and disturbance	
3f-A	US, West Field. Remnant features in small area of larger site	30
3f-B	US, West Field. Remnant features in small area of larger site	30
3f-C	US, West Field. Remnant features in small area of larger site	30
3f-D	Portions of US fuel farm; "Storage Farm AVGAS", "East-H-14-A"	968
3fE-B	Portions of US fuel farm; "Storage Farm AVGAS", "East-H-14-A"	619
3fF-A	Camp of the US 9th NCB	0480a
3fG-A	121st NCB Camp	480
3fH	NKK shrine	8
3fH-I	Japanese fields and structures	462, 950, 957, 958
3fH-II	Japanese fields and structures	
3f-HIII	Japanese fields and structures	
3fH-V	Defensive features	
3fH-VI	Japanese fields, US livestock reserve	
3fH-VII	Cave complex	15
3fH-VIII	Service Corps 87, 25	606
3fH-IX	Japanese fields and structures	461, 619
3fH-X	Fuel farm	
3f-TN-0015	Cave complex	
3f-TN-0461	Japanese fields and structures	
3g-B	Railroad berm/alignment	1182
3g-F	Portions of US fuel farm; "Storage Farm AVGAS", "East-H-14-A"	619
3g-G	US 87 and 25 Service Corps	606

Site Complex Designation	*Site Description*	*TN-site Number (if applicable)*
3g-H	US, West Field. Remnant features, small portion of larger site	30
3g-I	Service corps 87, 25	606
3g-J	US, West Field	30
3h-A	Japanese agricultural facility, US overbuilt for 696 Signal AW Co	599, 1076
3h-C	Japanese agricultural complex, fields and structures	511, 1070, 1072, 1074, 1084, 1088, 1092, 1094, 1095
3h-D	Japanese fields and structures, modified	1061, 1067
3h-E	Japanese caves, defenses	1089, 1090
3h-F	Japanese fields and structures, modified	
TN-0481	NCB, 18; temp 509th	
TN-496 (expanded)	Japanese fields and structures	
BTA-A	Cultural Deposit	
BTA-B	Japanese defenses	22, 1033, 1034
BTA-C	Ceramics	
BTA-D	Japanese defensive	
BTA-E	Caves and ceramics	
BTA-F	Japanese defenses	
BTA-G	Latte complex	78
BTA-H	Japanese field and structures	1035, 1036
BTA-I	Isolated prehistoric ceramics	
BTA-J	Petroglyphs in beach rock	907
BTA-K	Cave with petroglyphs	563
BTA-L	Japanese fields and structures	482, 1006, 1007, 1014, 1016
BTB-A	Latte complex and associated deposits	73
BTB-B1	Pillbox	16
BTB-B2	Pillbox	16
BTB-C	Japanese fields heavily impacted by US	
BTB-D	Cemetery – US Marines	398
BTB-E	Japanese fields heavily impacted by US	
BTB-F	Railroad berm	1182
BTB-G	US defensive complex	406
BTB-I	Japanese defensive complex	539
BTB-J	Fields, little impact from US	
8th	8th Ave (Japanese “National Road”)	
42nd	42nd Street	
72nd	72nd Street	
86th	86th Street	
96th	96th Street	
110th	110th Street	
Boston	Boston Post Road	
B’way	Broadway (Japanese “National Road”)	
R’side	Riverside	
S’Mill	Saw Mill River Road	
West E	West End Avenue (Now called 9th)	

4.3 ELIGIBLE CULTURAL RESOURCES IN TINIAN MLA LOCATED BEFORE 2008 SURVEY

Table L-2 Eligible Cultural Resources in Tinian MLA Located before 2008 Survey

Site Complex Designation	*Site Description*	*TN-site Number (if applicable)*
	US, feature associated with 6 Bomb Group (Site 602)	3
	US, asphalt plant, wall foundation	5
	Japanese, Asahi (sunrise) shrine/ US, reconstruction	7
	Japanese, inter-island radio complex and holding area for Japanese POWs/ US, brig01	9
	Japanese, 86th St. Shinto shrine, part of Kahi Village	11
	Japanese, fortified beach at Unai Chulu; pillboxes (held 20 mm cannons); JM 3rd Co 1st Battalion, 50th Infantry	16
	Japanese, drainage ditch (Ushi Field Complex)	18
	Japanese, cave with naval artillery gun (16 cm; called the Peipeinigul Gun), only gun known to still be in position, probably used against the *Colorado* and *Norman Scott*	24
	Japanese, antenna tower supports; location used as bivouac for 112 NCB?	25
	West Field	30
	US, 509 Composite Group encampment (previously 13 NCB)	39
	US, 17 AAA structure remnants; recreation? HQ?	42
	US, Masalok storage ARMCO structures; munitions storage Quonset huts	43
	US, Masalok storage revetments [combines TN-33 and TN-45]	45
	Prehistoric, *latte* sets, Sabanetan Famalaoan	72
	Prehistoric, ceramic deposit, *latte*, Unai Lamlam	75
	Japanese, cistern	353
	Japanese, defense (earthen enclosure)	354
	Japanese, defensive complex: Unai Babui fuel drum gun enclosures; JM 3rd Co, 1st Battalion, 50th Infantry Division/ US, assault White Beach 1	355
	Japanese, gun position (fuel drum revetment)	356
	US, gun position (fuel drum revetments)	357
	US, gun position (fuel drum revetment)	358
	US, landing craft, and craft fragments	359
	Prehistoric, ceramic scatter	360
	Japanese, trash scatter	361
	US, 509 Composite Group service area	362
	Japanese, gun position	363
	US, atomic bomb loading pits	365
	Japanese, Air Administration staff building; Naval 1st Air Fleet HQ and radio center (Ushi Field Complex)/ US, re-use of building	366

Site Complex Designation	*Site Description*	*TN-site Number (if applicable)*
	Japanese, Air Operations building (Ushi Field Complex)/ US, re-use of building	367
	Japanese, power plant (Ushi Field Complex)	368
	Japanese, air raid shelters (Ushi Field Complex)	369
	Japanese, aircraft parking area (Ushi Field Complex)	370
	Japanese, air raid shelters, housing remains, cisterns, etc. (Ushi Field Complex, west side)	371
	Japanese, air raid shelters, housing remains, cisterns, etc. (Ushi Field Complex, east side)	372
	Japanese, fuel drum storage bunker (Ushi Field Complex)	373
	Japanese, ammunition/bomb storage bunker, demolished (Ushi Field Complex)	374
	Japanese, gun positions; fuel drum enclosures; concrete storage bunker (Ushi Field Complex)	375
	US, debris, equipment	380
	Prehistoric, ceramic scatter	381
	US, dump	390
	Prehistoric, ceramic scatter	392
	US, aircraft debris, rubbish	403
	Prehistoric, ceramic scatter	404
	Japanese, gun position; fuel drum revetment	405
	Japanese, Unai Babui defensive complex; fuel drum revetments; earthen mounds; JM 3rd Co. 1st Battalion, 50th Infantry Division	407
	Japanese, water collection culverts for purification plant; structures; also see TN-0018	409
	Japanese, boundary marker, dump	410
	US, airplane wreck	411
	US, tower base, fuel drums, and culverts, with inscriptions by 110 NSB; inscriptions by 13 NCB	412
	US, tower base, fuel drums, and culverts, with inscriptions by 110 NSB; inscriptions by 13 NCB	412
	Japanese, gun position fuel drum enclosures; tower bases/ US, re-use?	413
	Japanese, farmsteads, with railroad bed	414
	Prehistoric, *latte* pillars	417
	Prehistoric, ceramic scatter	418
	Prehistoric, *latte* stones (possible)	419
	Japanese, village remnant? / US, building foundations	420
	Prehistoric, ceramics	421
	Bulldozed debris	422
	US, enclosure, earthen, pit; storage	423
	US, dump	424
	US, dump	425
	US, service area (first CBs on island)	426
	US, defensive enclosure of metal boxes	427
	US, enclosures; earthen; storage	428

Site Complex Designation	*Site Description*	*TN-site Number (if applicable)*
	US, encampment, original 67 NCB (moved to Site 68), and probably including remains of 121 NCB camp	429
	Japanese defensive complex; with gun positions; fuel drum/ US, re-use of defensive complex	430
	Japanese, farmstead	440
	Prehistoric, ceramic scatter	441
	Prehistoric, rockshelters, with deposits/ Japanese, defensive complex in rockshelters	451
	Japanese, farmstead	452
	Prehistoric, deposit/ US, temporary encampment	453
	Prehistoric, ceramic scatter	454
	Japanese, defensive complex, Laderan Lasu	458
	Japanese, farmstead	459
	Road	460
	Japanese, defensive position	463
	US, military camp	465
	Prehistoric, ceramic scatter	467
	Japanese, dump/ US, dump	472
	Japanese, farmstead	473
	Japanese, gun position, fuel drum enclosures	493
	US, debris in cave	494
	Japanese, farmstead	497
	Japanese, farmsteads	502
	Japanese, defensive complex, San Hilo	503
	Japanese, farmstead	504
	Japanese, farmsteads	505
	Japanese, defensive position	506
	Japanese, railroad bed	507
	Japanese, defensive position	509
	Japanese, farmstead	510
	Japanese, farmstead	511
	Japanese, farmstead	512
	US, munitions storage? large earthen enclosures	513
	Japanese, farmsteads	514
	Prehistoric, sinkhole with ceramics	521
	Prehistoric, rockshelter with ceramics	522
	Japanese, farmsteads	523
	Japanese, defensive complex, Famalaoan	524
	US, defensive position, earthen platform	525
	US, defensive position, earthen platform	525
	Japanese, gun position; fuel drum enclosure	526
	Japanese, observation post; survey marker; platform	528
	US, bulldozed debris	529
	Road on Maga	530
	US, West H-14-C North Field fuel tank farm	531
	Japanese, gun position	532
	Japanese, cisterns	533
	Prehistoric, ceramic scatter	534

Site Complex Designation	*Site Description*	*TN-site Number (if applicable)*
	Japanese, farmstead	535
	Japanese, farmstead	537
	Japanese, farmstead	538
	Japanese, RDF tower bases and calibration building	543
	US, "B" Battery, 17 AAA; and ABCD Annex (?); fuel drum enclosures	544
	US, ARMCO building	545
	? Airplane wreck	546
	US, landing craft, invasion remnants	547
	US, "D" Battery, 17 AAA; earthen enclosure; fuel drum enclosures; metal posts	549
	Japanese, farmstead, re-used for defensive position	550
	Japanese, gun enclosure, fuel drum	551
	Japanese, rockshelter with trash	553
	US, landing craft fragments	554
	US, water pumping station; slab with 12 CB inscription	555
	US, cistern	556
	Japanese, gun positions; fuel drum enclosures	558
	Prehistoric, ceramic scatter	559
	Japanese, land boundary marker	561
	Japanese, gun emplacement; for 76.22 dual purpose gun?	562
	Prehistoric, petroglyph cave	563
	Prehistoric, *latte* set	588
	Prehistoric, *latte* set; plus Spanish period ceramics?	590
	Prehistoric, *latte* set; quarry	591
	Prehistoric, Masalok *latte* complex	592
	Prehistoric, rock shelter with ceramics, mortar	593
	Prehistoric, artifact scatter, possible displaced *latte*	594
	Prehistoric, artifact scatter	595
	Prehistoric, artifact scatter	596
	US, hospital	600
	US, 240 Ordnance Ammo Company; 813, 827, 891 Chemical Company	607
	US, "C" Battery, 18 AAA	609
	US, "A" Battery, 180 SCA*	610
	Japanese, torii (temple entrance gate) (?) remains	614
	Japanese, farmstead	648
	Japanese, rockshelter, defenses	649
	Prehistoric, latte set; bulldozed	650
	Prehistoric, latte set; bulldozed	651
	Prehistoric, latte set; disturbed	652
	Prehistoric, latte set; disturbed; associated rockshelters	653
	Prehistoric, latte set, mortar	654
	Prehistoric, rockshelters/ Japanese, refuge	655
	Prehistoric, latte set	656

Site Complex Designation	*Site Description*	*TN-site Number (if applicable)*
	Japanese, cave, defense/refuge	657
	Prehistoric, rockshelter and two latte sets	658
	Prehistoric, rockshelters/ Japanese, defense/refuge	659
	Prehistoric, latte set/ Japanese, rockshelter, defense/refuge	660
	US, machinery	664
	Japanese, caves, field hospital (?)	666
	US, bottle dump	667
	Japanese, caves, defense	679
	Prehistoric, petroglyphs on a limestone shelf, Unai Dangkulo	907
	Prehistoric, artifact scatter	937
	Japanese, agricultural feature	938
	Japanese, farmstead	940
	Japanese, farm feature?	941
	Japanese, farmstead; plus prehistoric ceramics	942
	Prehistoric, artifact scatter	943
	Japanese, farmstead	944
	Prehistoric, caves with ceramics/ Japanese, defensive use	945
	Japanese, defensive position	946
	Japanese, agricultural structure and WWII dump	947
	Japanese, agricultural feature	948
	Japanese, farmstead	949
	Japanese, artifact scatter	956
	Japanese, farmstead	969
	Japanese, farmstead	970
	Japanese, caves, defense	975
	Japanese, refuse pit	980
	Japanese, agricultural field boundary	981
	Japanese, farmstead	985
	Japanese, farmstead	989
	Japanese, farmstead	990
	US, dump	991
	Japanese, refuse dump	992
	Japanese, defensive position, caves and rockshelters	993
	US, dump	994
	Japanese, agricultural field marker	995
	Japanese, agricultural field structure	996
	Japanese, agricultural field structures	998
	US, 240 Ordnance Company or one of the chemical companies (827, 913, or 991)	999
	Japanese, defensive pit for mortar or machine-gun	1000
	Japanese, agricultural feature	1002
	Japanese, cisterns	1003
	Japanese, agricultural field structures	1004
	Japanese, cisterns	1005
	Japanese, agricultural field structures	1008
	Japanese, agricultural field structures	1011

Site Complex Designation	*Site Description*	*TN-site Number (if applicable)*
	Japanese, defensive position, gun emplacement	1013
	Japanese, defensive position, gun emplacement	1015
	Japanese, animal enclosures	1017
	Japanese, cisterns	1019
	Prehistoric, ceramic scatter/Japanese, agricultural features	1020
	Japanese, agricultural irrigation ditch	1021
	Japanese, agricultural irrigation ditch	1022
	Japanese, agricultural field structure	1023
	Japanese, refuse dump	1024
	Japanese, foxhole complex	1025
	Japanese, agricultural field mounds	1027
	Japanese, agricultural field mounds	1028
	Japanese, military cable and rockshelter complex	1029
	Japanese, military storage; associated with 1029?	1030
	Japanese, agricultural mounds	1031
	Prehistoric, cave with ceramics/ Japanese, straggler use of cave	1032
	Japanese, cistern	1040
	Japanese, cisterns	1042
	Prehistoric, artifact scatter	1043
	Japanese boundary wall	1044
	Japanese, defensive complex, bunkers	1045
	Prehistoric, rockshelters in sinkholes, prehistoric ceramics/ Japanese, military use of sinkholes	1046
	Japanese, defensive position, enclosure	1047
	Japanese, defensive position, in ravine	1048
	Prehistoric, complex in ravine/ Japanese, farming use (extensive complex)	1049
	Japanese, rockshelter	1050
	Japanese, agricultural feature	1051
	Japanese, cistern	1052
	Japanese, agricultural feature (rock wall)	1053
	Japanese, farmstead	1054
	Japanese, farmstead	1055
	Japanese, road	1056
	Japanese, agricultural feature (stone enclosure)	1057
	Japanese, rockshelter, defense	1058
	Japanese, agricultural feature (rock enclosure)	1059
	Prehistoric, caves/ Japanese, defense	1060
	Prehistoric, latte and mortar	1062
	Prehistoric, latte and mortar	1062
	Japanese, rockshelter, defense	1063
	Japanese, rockshelter, defense	1064
	Japanese, rockshelter, defense	1065
	Japanese, farmstead	1066
	Japanese, refuse dump	1067
	Japanese, rockshelter, defense	1068
	Japanese, railroad complex	1069
	Japanese, farmstead	1071

Site Complex Designation	*Site Description*	*TN-site Number (if applicable)*
	Japanese, road and associated features	1077
	Japanese, defensive complex: pits and walls; location of 4 140mm coastal defense guns?	1078
	Japanese, boundary markers	1079
	Japanese, gun position (excavated enclosure)	1080
	Japanese, gun position (trench in bedrock)	1081
	Japanese, field structures	1082
	Japanese, farmstead	1083
	Japanese, farm cistern and feature	1086
	Japanese, farmstead	1087
	Japanese, road	1091
	Japanese, farmstead/hamlet; later military defensive position	1096
	Japanese, agricultural features (cobble mounds)	1097
	Japanese, agricultural features (cobble mounds)	1098
	Japanese, railroad berm	1099
	Prehistoric, latte set, mortar	1100
	Japanese, defensive features	1101
	Japanese, farmstead	1102
	Japanese, farmstead	1103
	Japanese, farmstead (mortar also in area)	1104
	Japanese, rockshelters, defense	1105
	Japanese, farmstead	1106
	Japanese, farmstead	1107
	Japanese, agricultural feature (rock enclosure)	1108
	Prehistoric, rockshelter with pottery, mortar	1109
	Prehistoric, latte set and tool manufacturing	1110
	Japanese, farmstead, plus mortar	1111
	Prehistoric, latte set	1112
	Japanese, rockshelter (farm shelter)	1113
	Japanese, agricultural feature (rock wall)	1114
	Japanese, road	1115
	Japanese, farmstead	1116
	Prehistoric, rockshelters with ceramics/ Japanese, defensive use, probably 75 mm gun position	1117
	Japanese, farmstead	1118
	Japanese, farmstead	1119
	Prehistoric, cave with artifacts	1120
	Prehistoric, cave with artifacts/ Japanese, defensive use (HQ?) and straggler shelter	1121
	Japanese, farmstead	1122
	Prehistoric, cave with pictographs/ Japanese, military shelter ?	1123
	Japanese, farmstead	1124
	Prehistoric, cave with ceramics/Japanese, defensive position ?	1125
	Japanese, defensive position, rock structures	1126
	Japanese, cave, defense	1127
	Japanese, gun position, rock features, pits	1128
	Japanese, rockshelter, defense	1130
	Japanese, cave, defense	1131

Site Complex Designation	*Site Description*	*TN-site Number (if applicable)*
	US, communication tower foundations, West Field	1135
	Japanese, processing facility, possibly for tofu	1136
	Japanese, agricultural use, excavated area	1137
	Japanese, quarried area, associated with Kahi Airfield	1151
	Japanese, quarried area, associated with Kahi Airfield	1152
	Japanese, farmstead	1153
	Japanese, farmstead	1154
	Japanese, anti-aircraft gun position, soil and rock enclosure	1155
	Japanese, agricultural feature, concrete, date indicates built in 1938	1156
	Japanese, agricultural processing facility	1157
	Japanese, gun position	1165
	Japanese, farmstead	1166
	Japanese, railroad station	1167
	Japanese, cisterns for agriculture or railroad	1168
	Japanese, farmstead	1169
	Japanese, cistern	1170
	Japanese, cistern	1171
	Japanese, farmstead	1177
	Japanese, farmstead	1178
	Japanese, farmstead, possible kiln	1179
	Japanese, wall	1186
	Japanese, stone platforms, associated with Kahi Airfield	1188
	Prehistoric, rockshelters with deposits	1189

4.4 ELIGIBLE CULTURAL RESOURCES IN THE VOA PARCEL

Site No.	*Site Description*	*NR Status**
35	U.S. Military Period; stone headwalls, street intersection	Eligible
36	U.S. Military Period; Remains of 313th Bomb Wing HQ	Eligible
51	U.S. Military Period; U.S. guard rail	Eligible
52	U.S. Military Period; Remains of 504th Bomb Group camp	Eligible
71	Latte Period; San Hilo Pictographs	Eligible
501	Battle of Tinian Period; Japanese defensive complex, San Hilo	Eligible
502	Japanese Colonial Period; Japanese farmsteads	Eligible
570	U.S. Military Period; refuse dump and crash site	Eligible
571	U.S. Military Period; U.S. camp	Eligible
573	Battle of Tinian Period; Japanese gun position, fuel drum enclosure	Eligible
574	Japanese Colonial Period; Japanese concrete structure	Eligible
575	Japanese Colonial Period; Japanese concrete stairway, shrine or residence	Eligible
576	Japanese Colonial Period; Japanese cistern	Eligible
577	Latte Period; ceramic scatter	Eligible
578	Japanese Colonial Period; Japanese farmstead	Eligible
580	Japanese Colonial Period; Japanese cistern	Eligible
581	Latte Period; ceramic scatter	Eligible
597	U.S. Military Period; Remains of 505th Bomb Group	Eligible
1182	Japanese Colonial Period; Japanese railroad berm	Eligible

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CHAPTER 5.
HAZARDOUS MATERIALS AND WASTE RESOURCES

5.1 INTRODUCTION

5.2 PARSONS TRANSPORTATION GROUP/PARSONS BRINCKERHOFF TEAM

A total of 123 potentially contaminated sites were identified in the four geographic regions of the Guam study area as having a potential for contamination. The presence of contamination could have an effect on the proposed roadway, bridge, and intersection improvements. Information on each of these sites is described herein. The site descriptions herein are based on interpretations from best available information.

5.2.1 North

The 13 sites described below were identified in the North Region.

Site No. 1 – Utility Building

Site No. 1 is a utility building owned by the Guam Power Authority (GPA). It is located in the northeast quadrant of Route 3 and Route 28. This facility was included in the Environmental Data Resources (EDR) report prepared for this project. This facility was included in the Comprehensive Environmental Response, Compensation, and Liability Act Information Systems (CERCLIS) list. It is not on the National Priorities List (NPL); Site Reassessment Start Needed. A Site Assessment was completed in September 1991; the priority level was deferred to the Resource Conservation and Recovery Act (RCRA) (Subtitle C). During a site visit in March 2009, the property was fenced and locked, restricting access. Project team members viewed the property from the roadway. One 1,020-gallon aboveground storage tank (AST) containing diesel fuel was observed onsite. The AST, located approximately 135 feet (ft) (41 meters [m]) east of the Route 3 edge of pavement, was in an approximately 2.0-ft (0.6-m) high concrete secondary containment. A danger sign posted nearby read, "CHLORINE GAS."

The extent of potential contamination is unknown; however, there was no visual evidence of remediation on-site.

Site No. 2 – Jet Fuel Transmission Line

A jet fuel transmission line is located from the Route 3/28 intersection, leading to Andersen Air Force Base (AFB). A review of aerial photography shows the jet fuel transmission line crossing Route 3 south of the Route 3/3A intersection where the transmission line enters Andersen AFB. It is unknown if there are incidents of contamination associated with this jet fuel line; however, there was no visual evidence of soil or groundwater assessment or remediation at the area where the transmission line crosses under Route 3, and no groundwater monitoring wells were found on- or off-site.

Site No. 3 – Shell Gasoline Station

This facility is a retail gasoline station. It is located on the east side of Route 3. This site was not identified in the EDR reports, and it does not have a record of documented contamination. It is unknown if there are incidents of contamination associated with this site; however, during a site visit in March 2009, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 4 – Tires Shop

This facility is a small tire shop. It is located on the east side of Route 3, north of Site No. 82 – Shell Gasoline Station. During a site visit in March 2009, many abandoned vehicles and miscellaneous car parts were found on-site. The small service area is covered by a tin roof. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 5 – Utility Building

This utility building with a generator and petroleum fuel AST owned and operated by GPA, is located on the east side of Route 3 (north of Site No. 83). A 1,020-gallon AST containing diesel fuel is located on-site; the facility is secured with a chain-link fence. The utility building is adjacent to the underground jet fuel transmission line (Site No. 81) approximately 100 ft (30 m) to the east of Route 3. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 6 – Utility Building

This facility is a utility building owned and operated by GPA. This utility building is located on the east side of Route 3, adjacent to the north of Ritidian Mart. During a site visit in March 2009, a portable generator can be seen through windows and is located inside the building. Underground storage tanks (USTs) or ASTs containing fuel for the generator were not found. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 7 – Power Substation

This facility is a power substation owned and operated by GPA. It is located at the northwest quadrant of the Route 3/3A intersection. It is unknown if there are incidents of contamination associated with this site; however, during a site visit in March 2009, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 8 – Potts Junction Tank Farm

This site is located within the military installation adjacent to the south side of Route 9, just north of Chalan Kareta and south of the Route 9/3 intersection. This site is included in the Installation Restoration Program (IRP) Sites – Andersen AFB Main Base plans provided by the Department of Defense (DoD); however, the associated information regarding this site is not included in the reports reviewed for this project. According to the DoD IRP Sites – Andersen AFB Main Base plans, this site is included in the IRP. A review of aerial photography shows heavy vegetation cover and possible remnants of concrete pads. During a site visit in March 2009, this site was inaccessible and could not be seen from the roadway. It is unknown if there are incidents of contamination associated with this site; however, no groundwater monitoring wells were found on- or off-site.

Site No. 9 – Site 7/Landfill 9

This site is a landfill located in the North Field of Andersen AFB, adjacent to the north of Route 9. According to the DoD IRP Sites – Andersen AFB Main Base plans, this site is included in the IRP. This site encompasses approximately 8 acres (ac) (3 hectares [ha]). This landfill operated from 1949 to 1955. Contaminants of concern include sanitary trash, construction debris, and concrete. A Record of Decision

(ROD) was issued in 2007. During a site visit in March 2009, this property was inaccessible from the roadway. The site is covered with sparse vegetation. A review of aerial photography shows minor earthwork and construction activities. The current environmental disposition of the site is unknown.

Site No. 10 – Site 6/Landfill 8

This site is a landfill. It is located between the North and Northwest Fields of Andersen AFB, north of Route 9. According to the DoD IRP Sites – Andersen AFB Main Base plans, this 14-ac (6-ha) site is included in the IRP. This site operated from 1946 to 1949. Contaminants of concern include asphalt and asphaltic wastes. A ROD was issued in 2007, and some remedial action is planned for fiscal year 2010. During a site visit in March 2009, this property was inaccessible or visible from the roadway. The current environmental disposition of the site is unknown.

Site No. 11 – Site 35/Waste Pile 1

This waste pile is located in the North Field of Andersen AFB, north of Route 9. According to the DoD IRP Sites – Andersen AFB Main Base plans, this site is included in the IRP. This site encompasses approximately 3 ac (1-ha). Contaminants of concern include asphalt tar. A ROD was issued, and some cleanup is scheduled for 2009. During a site visit in March 2009, this property was inaccessible or visible from the roadway. The current environmental disposition of the site is unknown.

Site No. 12 – Site 2/Landfill 2

This site is a landfill located in the North Field at Andersen AFB, on the north side of Route 9. According to the DoD IRP Sites – Andersen AFB Main Base plans, this site is included in the IRP. This site is part of Landfills 2, 4, and 5; it encompasses approximately 40 ac (16 ha). Landfill operations were from 1947 to 1975, with a small portion of the landfill being used up through 1982. Contaminants of concern include waste chemicals; pesticides; petroleum, oil, and lubricants (POL); solvents; ferrous metal; sanitary trash; construction debris; and unexploded ordnance (UXO). A remedial investigation/feasibility study is ongoing for Landfill 2. During a site visit in March 2009, this property was inaccessible or visible from the roadway. The current environmental disposition of the site is unknown.

Site No. 13 – Site 4/Landfill 6

This site is a landfill. It is located in the North Field of Andersen AFB, adjacent to the north side of Route 9. According to the DoD IRP Sites – Andersen AFB Main Base plans, this site is included in the IRP. This site encompasses approximately 2 ac (1 ha) and operated from 1953 to 1954. Contaminants of concern include sanitary trash. A ROD was issued in 2007. During a site visit in March 2009, this property was inaccessible from the roadway. The site was covered with sparse vegetation. There was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site. The current environmental disposition of the site is unknown.

5.2.2 Central

The 93 sites described below were identified in the Central Region.

Site No. 14 – Former Mobil Gasoline Station

This facility was formerly a retail gasoline station. It is located in the northwest quadrant of the Route 1/11 intersection. This site was not identified in the EDR report prepared for this project, and it does not have a record of documented contamination. During a site visit in March 2009, a former tank pad was found approximately 60 ft (18 m) south of the Route 1 edge of pavement. This area was overgrown with grass. The closest fuel dispenser is located approximately 45 ft (14 m) south of the Route 1 edge of

pavement. Five groundwater monitoring wells were found on-site. The closest monitoring well is located approximately 25 ft (8 m) south of the Route 1 edge of pavement. It could not be determined if the groundwater monitoring wells were active. The extent of potential contamination on-site is unknown; however, there was no visual evidence of remediation.

Site No. 15 – Asan Pump Station, Building 590

This facility is a pump station and a storage yard. It is located on the south side of Route 1, across from Asan National Park. The pump station is owned by the U.S. Navy. During a site visit in March 2009, the property was fenced and locked, restricting access. Project team members viewed the property from the roadway. The storage yard appeared to be privately owned; however, this could not be confirmed. Two tanker trailers and one large AST (contents and size unknown) were located in the storage yard. The condition of the AST could not be determined. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 16 – Automobile Repair Shop

This facility is an automobile repair shop. It is located on the south side of Route 1, east of the Ason River. During a site visit in March 2009, containers that likely hold oil were observed inside the repair shop. Several cars were observed in various stages of repair in the storage yard. An exhaust pipe was also observed, indicating that painting may be conducted on-site. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 17 – Automobile Repair Shop/Former Gasoline Station

This facility is an automobile repair shop; it was formerly a retail gasoline station. It is located in the northeast quadrant of the Route 1/Ninio Perdido Road intersection. This site was not identified in the EDR report prepared for this project, and it does not have a record of documented contamination. During a site visit in March 2009, a site representative was not available. A former tank pad location could not be determined. The former fuel dispenser is located approximately 50 ft (15 m) south of the Route 1 edge of pavement. Several old cars were stored on-site. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 18 – 3-D Automobile Repair Shop

This facility is an automobile repair shop. It is located at the Route 1/Ninio Perdido Road intersection. During a site visit in March 2009, a site representative was not available. Moderate staining was observed on the shop floor. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 19 – Wastewater Facility (GWA CD4)

This facility is a Guam Waterworks Authority (GWA) wastewater facility pump station. It is located on the north side of Route 1, west of the Route 1/Senator Juan Tim Toves Drive intersection. During a site visit in March 2009, no treatment ponds or lagoons were observed. One approximately 1,000-gallon AST containing diesel fuel is located approximately 20 ft (6 m) forth of the Route 1 edge of pavement. The AST was in an approximately 1.0-ft (0.8-m) high concrete-enclosed secondary containment. It is unknown if there are incidents of contamination associated with this site; however, there was no visual

evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 20 – Metal Scrap Yard

This facility is a metal scrap yard. It is located on the north side of Route 1, west of the Route 1/6 intersection. During a site visit in March 2009, the property was fenced and locked, restricting access. Project team members viewed the property from the roadway. No hazardous waste containers or drums, ASTs, or USTs were observed on-site. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 21 – Tires Direct

This facility is a tire repair shop. It is located in the southwest quadrant of the Route 1/6 intersection. During a site visit in March 2009, this facility appeared to be a former retail gasoline station. What appeared to be a former tank pad was located approximately 10 ft (3 m) from the Route 1 edge of pavement. No hazardous waste containers or drums, ASTs, or USTs were observed on-site. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 22 – Mobil Gasoline Station

This facility is a retail gasoline station. It is located in the southeast quadrant of the Route 1/6 intersection. This site was not identified in the EDR report prepared for this project, and it does not have a record of documented contamination. During a site visit in March 2009, reworked pavement was found around the USTs. The USTs and fuel islands are located approximately 30 ft (9 m) east of the Route 6 edge of pavement and 55 ft (17 m) south of the Route 1 edge of pavement. It is unknown if there are incidents of contamination associated with this site; however, during a site visit in March 2009, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 23 – Jackson's Car Wash

This facility is a car wash located on the south side of Route 1 east of the Route 1/6 intersection. During a site visit in March 2009, the facility appeared to be abandoned. The site appears to be a former gasoline station, based on the existing building and former fuel island and canopy. Areas of the pavement appeared to be reworked, and three possible groundwater monitoring wells were found on-site, adjacent to the Route 1 edge of pavement. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of remediation.

Site No. 24 – King's Auto Parts, Pat's Tinting, and Six Seven One Mufflers and Auto Services

This property includes an automobile repair shop, a tinting shop, and a muffler service shop. It is located on the north side of Route 1, east of the Route 1/6 intersection. It is unknown if there are incidents of contamination associated with this site; however, during a site visit in March 2009, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 25 – Mobil Gasoline Station

This facility is a retail gasoline station with an automatic car wash. It is located on the south side of Route 1, west of the Route 1/4 intersection. This site was not identified in the EDR report prepared for this project, and it does not have a record of documented contamination. During a site visit in March 2009, reworked pavement was found around the USTs. The USTs are located approximately 100 ft (30 m) south of the Route 1 edge of pavement. Used oil was contained in 55-gallon steel drums. Disposal practices, however, are unknown. Groundwater monitoring wells were found on-site; the closest well is located approximately 50 ft (15 m) south of the Route 1 edge of pavement. The extent of potential contamination on-site is unknown; however, there was no visual evidence of remediation.

Site No. 26 – Circle K/76 Gasoline Station

This facility is a retail gasoline station with a convenience store and a car wash. It is on the north side of Route 1, west of the Route 1/4 intersection. This site was not identified in the EDR report prepared for this project, and it does not have a record of documented contamination. During a site visit in March 2009, reworked pavement was found around the USTs. The USTs are located approximately 35 ft (11 m) north of the Route 1 edge of pavement. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 27 – Napa Auto Parts

This facility is a tire shop. It is located on the south side of Route 1, west of the Route 1/4 intersection. During a site visit in March 2009, a dumped storage tank was found behind the building. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 28 – Six Seven One Motorsports/Scoot da Vill

This facility is one building with two businesses: a motorsports store specializing in lift kids, bumpers, wells, and accessories; and a retail scooter store. It is located in the southwest quadrant of the Route 8/1 intersection. During a site visit in March 2009, small oil containers and what appeared to be a tool washing station were found in the motorsports shop. The pavement in the shop had minor staining. No other drums, ASTs, or USTs were observed on-site. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 29 – Shell Gasoline Station

This facility is a retail gasoline station with a convenience store and a hand car wash. This site is located on the south side of Route 1, approximately 2,000 ft (610 m) east of the Route 1/8 intersection. This site was not identified in the EDR report prepared for this project, and it does not have a record of documented contamination. An approximately 25-ft (8-m) by 40-ft (12-m) tank pad is located approximately 135 ft (41 m) south of the Route 1 edge of pavement. The closest fuel dispenser is approximately 40 ft (12 m) south of the Route 1 edge of pavement. Water from the hand car wash appeared to drain into a storm drain system. It is unknown if there are incidents of contamination associated with this site; however, during a site visit in March 2009, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 30 – East Agara Mobil Gasoline Station, Building #620

This facility is a retail gasoline station, an automatic car wash, and a two-story office building. It is located south of Route 1, approximately 0.5-mile (0.8-km) west of the Route 1/30 intersection. This site was not identified in the EDR report prepared for this project, and it does not have a record of documented contamination. During a site visit in March 2009, water from the automatic car wash appeared to drain into a storm drain system. The tank pad is located approximately 65 ft (20 m) south of the Route 1 edge of pavement. The closest fuel dispenser is approximately 40 ft (12 m) south of the Route 1 edge of pavement. One 240-gallon AST (contents unknown) is located approximately 135 ft (41 m) south of the Route 1 edge of pavement. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 31 – Mobil Gasoline Station, Building #706

This facility is a retail gasoline station. It is located in the southwest quadrant of the Route 1/ Sport O Dome Drive intersection. This site was not identified in the EDR report prepared for this project, and it does not have a record of documented contamination. A tank pad is located approximately 25 ft (8 m) south of the Route 1 edge of pavement. The closest fuel dispenser is approximately 15 ft (5 m) south of the Route 1 edge of pavement. The area around the fuel dispensers had minor pavement staining. It is unknown if there are incidents of contamination associated with this site; however, during a site visit in March 2009, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site. After a review of best available information, this site received a risk rating of low.

Site No. 32 – Circle K/76 Gasoline Station

This facility is a retail gasoline station with an automobile repair shop. It is located in the northwest quadrant of the Route 1/Route 14B intersection. This site was not identified in the EDR report prepared for this project, and it does not have a record of documented contamination. A tank pad is located approximately 50 ft (15 m) from the Route 1 edge of pavement. The closest fuel dispenser is approximately 20 ft (6 m) from the Route 1 edge of pavement. An automobile shop with two maintenance bays and specializing in tire repairs, tune-ups, constant-velocity (CV) boots, brakes, radiator repairs, transmissions, oil changes, suspension, and minor repairs is also on-site. Access to the repair shop was restricted. One 55-gallon drum and a tool washing station were observed. Minor pavement staining was observed on the shop floor. It is unknown if there are incidents of contamination associated with this site; however, during a site visit in March 2009, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 33 – Mobil Gasoline Station, Building #101

This facility is a retail gasoline station and a convenience store. This site is located north of the Route 1/10A intersection. Mobil Quick Lube, EZ Tire and Lube, and National Car Rental are also located on this property. Both lube centers conduct oil changes and tire repair services. This site was not identified in the EDR report prepared for this project, and it does not have a record of documented contamination. During a site visit in March 2009, the maintenance bays to the lube centers appeared clean. The used oil is kept in sealed containers; however, disposal practices are unknown. The tank pad is located approximately 35 ft (11 m) from the Route 1 edge of pavement. The closest fuel dispenser is located approximately 60 ft (18 m) from the Route 1 edge of pavement; another diesel fuel dispenser is located approximately 120 ft (16 m) from the Route 1 edge of pavement. Three groundwater monitoring wells

were found on-site west of the convenience store. The closest monitoring well is approximately 110 ft (34 m) from the Route 1 edge of pavement. The extent of potential contamination on-site is unknown; however, there was no visual evidence of remediation.

Site No. 34 – Circle K/76 Gasoline Station

This facility is a retail gasoline station and a convenience store. It is located in the southeast quadrant of the Route 1/10A intersection. This site was not identified in the EDR report prepared for this project, and it does not have a record of documented contamination. During a site visit in March 2009, two former maintenance bays were closed. The tank pad was located approximately 75 ft (23 m) south of the Route 1 edge of pavement. The closest fuel dispenser is located approximately 35 ft (11 m)south of the Route 1 edge of pavement; another diesel fuel dispenser is located approximately 55 ft (17 m) south of the Route 1 edge of pavement. A large generator was found near the southeast area of the property; however, there did not appear to be an AST associated with the generator. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 35 – Wastewater Facility (GWA CD 25)

This facility is a wastewater pump/transfer station owned by GWA. It is located on the northeast side of Route 1 and east of Simon Sanchez Road. During a site visit in March 2009, the property was fenced and locked, restricting access. A site representative was not available. Project team members viewed the property from the roadway. One approximately 300- to 500-gallon AST containing diesel fuel was located east of the Route 1 edge of pavement. There did not appear to be staining around the AST. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 36 – Shell Gasoline Station

This facility is a retail gasoline station with a convenience store. This site is located on the northeast side of Route 1, west of the Route 1/14A intersection. This site was not identified in the EDR report prepared for this project, and it does not have a record of documented contamination. During a site visit in March 2009, four observation wells were found within the tank pad. The tank pad is located approximately 45 ft (14 m) from the Route 1 edge of pavement. The closest fuel dispenser is located approximately 44 ft (13 m) from the Route 1 edge of pavement; one diesel fuel dispenser is located approximately 90 ft (28 m) from the Route 1 edge of pavement. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of other soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 37 – Mobil Gasoline Station

This facility is a retail gasoline station, a convenience store, and an automatic car wash. This site is located on the northeast side of the Route 1/14A intersection. This site was not identified in the EDR report prepared for this project, and it does not have a record of documented contamination. During a site visit in March 2009, two observation wells were found within the tank pad. The tank pad is located approximately 185 ft (56 m) south of the Route 1 edge of pavement. The closest fuel dispenser is located approximately 30 ft (9 m) south of the Route 1 edge of pavement. The wash water from an on-site automatic car wash appeared to drain to a storm drain system. It is unknown if there are incidents of contamination associated with the USTs; however, there was no visual evidence of other soil or

groundwater assessment or remediation on-site, and no groundwater monitoring wells for found on- or off-site.

Site No. 38 – Harman Substation

This facility is an electrical substation owned by GPA. It is located on the north side of Route 1, diagonal from the Guam Micronesia Mall. During a site visit in March 2009, the property was fenced and locked, restricting access. Project team members viewed the property from the roadway. Numerous transformers were observed; however, no polychlorinated biphenyls (PCBs) were found. No hazardous waste containers or drums, ASTs, or USTs were observed on-site. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 39 – Circle K/76 Gasoline Station

This facility is a retail gasoline station with a convenience store. It is located in the southeast quadrant of the Route 1/26 intersection. This site was not identified in the EDR report prepared for this project, and it does not have a record of documented contamination. During a site visit in March 2009, four double-sided fuel islands, 12 fuel pumps, and two diesel pumps were observed on-site. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 40 – 1688 Laundry

This facility is a laundromat located in the southeast quadrant of the Route 1/26 intersection. During a site visit in March 2009, one AST containing flammable gas was found in the rear of the property. The AST was enclosed by a chain-link fence. A water storage/softener tank was also found behind the building. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 41 – Shell Gasoline Station/Napa Auto Parts

This facility is a retail gasoline station with a car wash. It is on the northeast quadrant of the Route 1/26 intersection. This site was not identified in the EDR report prepared for this project, and it does not have a record of documented contamination. During a site visit in March 2009, diesel fuel warnings were posted on the Napa building. A hazardous waste container (used oil), five fuel islands, nine fuel pumps, and two diesel pumps were observed on-site. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 42 – Mobil Gasoline Station

This facility is a retail gasoline station. It is on the northeast quadrant of the Route 1/26 intersection (adjacent to the east of Site No. 45 – Shell Gasoline Station/Napa Auto Parts). This site was not identified in the EDR report prepared for this project, and it does not have a record of documented contamination. During a site visit in March 2009, a hazardous waste container (used oil), six fuel islands, 12 fuel pumps, and two diesel pumps were observed on-site. The USTs are approximately 30 ft (9 m) from the Route 1 edge of pavement. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 43 – Pacific Tyre LTD

This facility is a tire service center on the northeast quadrant of the Route 1/26 intersection (adjacent to the east of Site No. 46 – Mobil Gasoline Station). During a site visit in March 2009, oil drums were observed on-site. The facility has two maintenance bays and a third bay that provides vehicle safety inspections. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 44 – Communication Transfer Station

This site contains multiple utility facilities located across from the Puag Kaish Reservoir, approximately 150 ft (45 m) from the Route 1 edge of pavement. During a site visit in March 2009, an AST containing diesel was observed on-site. The AST was on an approximately 4-inch (in) (10-centimeter [cm]) concrete pad. The vegetation in the area of the AST did not appear to be distressed. Five groundwater monitoring wells were found on-site. The extent of potential contamination on-site is unknown; however, there was no visual evidence of remediation.

Site No. 45 – Power Substation

This facility is a large power substation owned and operated by GPA. It is located adjacent to the Prestige BMW dealership. During a site visit in March 2009, access to the property was restricted. Project team members viewed the property from the roadway. Fuel cans and other miscellaneous liquids were being stored near a shed on-site. It is unknown if there are incidents of contamination associated with this site; however, there was no evidence of on-site soil or groundwater assessment or remediation that was visible from the roadway, and no groundwater monitoring wells were found on- or off-site.

Site No. 46 – Utility Building

This facility is a utility building owned by GPA. It is located north of the Route 1/26 intersection near Skate Park. During a site visit in March 2009, one 1,000-gallon AST containing diesel fuel was found on-site. It is located approximately 100 ft (30 m) from the Route 1 edge of pavement. The AST is in an approximately 2.0-ft (0.6-m) high concrete secondary containment; the entire facility is secured by a chain-link fence and is inaccessible. It is unknown if there are incidents of contamination associated with this site; however, there was no evidence of on-site soil or groundwater assessment or remediation that was visible from the roadway, and no groundwater monitoring wells were found on- or off-site.

Site No. 47 – Mobil Gasoline Station

This facility is a retail gasoline station. It is located in the northeast quadrant of the Route 1/27A intersection. This site was not identified in the EDR report prepared for this project, and it does not have a record of documented contamination. During a site visit in March 2009, three groundwater monitoring wells and two test wells were found on-site. The fuel island is located approximately 30 ft (9 m) east of the Route 1 edge of pavement. The USTs are located approximately 20 ft (6 m) east of the Route 1 edge of pavement. Drums labeled "Hazardous Waste" were found behind the building. The extent of potential contamination on-site is unknown; however, there was no visual evidence of remediation.

Site No. 48 – Site 37/War Dog Burrow Pit

This site is the War Dog Burrow Pit located in Andersen AFB South on the north side of Route 1, approximately 0.5-mile (0.8-km) east of the Route 1/15 intersection. This site was identified in the IRP Sites – Andersen South maps as part of the DoD IRP. This site is comprised of approximately 55 ac (22

ha). A ROD was issued in 2008. During a site visit in March 2009, this site was inaccessible from the roadway. The site was observed to be sparsely covered with vegetation and grass. There were no indications of the burrow pit. The current environmental disposition of the site is unknown.

Site No. 49 – Site 58/Waste Pile 10, Northwest Field, DPO69

This site is an inactive waste disposal site in Andersen AFB (Andersen South) on the south side of Route 1, approximately 0.5-mile (0.8-km) east of the Route 1/28 intersection. The waste disposal site is approximately 600 ft (180 m) northeast of the Southwest Cross-Over at the South Runway. This site was identified as an area of concern, according to the DoD IRP Sites – Andersen South plans. Contaminants of concern include partially buried drums under crushed coral and soil. A remedial investigation/feasibility study (RI/FS) is in process. During a site visit in March 2009, this site was inaccessible and could not be seen from the roadway. The current environmental disposition of the site is unknown.

Site No. 50 – Site 55/Area Outside of Landfill 14, LF066

This site is a landfill in Andersen AFB (Andersen South) on the south side of Route 1, approximately 1.5 miles (2.4 km) east of the Route 1/28 intersection. This site was identified in the IRP Sites – Andersen South plans as part of the DoD IRP. This site is located just outside of Landfill 14, approximately 1,500 ft (450 m) south of Route 1. A ROD was issued in 2008. During a site visit in March 2009, this site was inaccessible and could not be seen from the roadway. A review of aerial photography shows a dirt road leading to the site and several buildings. The current environmental disposition of the site is unknown.

Site No. 51 – Site 57/Waste Pile 9, Northwest Field, DP068

This site is in Andersen AFB (Andersen South) on the south side of Route 1, approximately 2 miles (3.2 km) east of the Route 1/28 intersection. This site was identified in the IRP Sites – Andersen South plans as part of the DoD IRP. This area is identified as an inactive waste disposal site in a former borrow pit located south of the North runway in the Northwest Field. The types of contamination found were 55-gallon drums and other items of unknown content. The RI/FS is in process. During a site visit in March 2009, this site was inaccessible and could not be seen from the roadway. The current environmental disposition of the site is unknown.

Site No. 52 – Kilroy's Alternator and Starter Repair Shop

This facility is a tire shop. It is located in the southwest corner of the Route 1/Chalan Lujuna intersection. It is unknown if there are incidents of contamination associated with this site; however, during a site visit in March 2009, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 53 – New Lujan Tire Shop

This facility is a tire shop. It is located in the southwest corner of the Route 1/Chalan Lujuna intersection. The fuel island is located approximately 60 ft (18 m) south of the Chalan Lujuna edge of pavement. It is unknown if there are incidents of contamination associated with this site; however, during a site visit in March 2009, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 54 – Pacific Laundry – Maite Plant

This site is a dry-cleaning facility; dry cleaning is conducted on-site. It is located at the Route 8/ Biang Street intersection. The building is located approximately 25 ft (8 m) from the Route 8 edge of pavement.

The Maite Plant houses the main dry-cleaning facility and serves as a drop-off location for customers from south and central Guam. It is equipped with a state-of-the art dry-cleaning machine and several conventional washers, dryers, and steamed flat ironers (Pacific Laundry 2009). During a site visit in March 2009, no hazardous waste containers or drums, ASTs, or USTs were observed on-site. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 55 – Smile Market/Guam Church of Resurrection

This facility is a convenience store and a church. It is located south of Pacific Laundry/Dry Cleaners (Site No. 54) at the Route 8/Biang Street intersection. A painted sign on the back portion of the building said "A.T.C. Rims Ent. Inc." During a site visit in March 2009, no hazardous waste containers or drums, ASTs, or USTs were observed. The building appeared to have been a former manufacturing facility. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 56 – A1 Maite Laundry

This site is a wash, iron, and steam laundry facility. No dry cleaning is conducted on-site. It is located approximately 0.3–mile (0.5-km) east of the Route 8/Biang Street intersection. The building is located adjacent to the Route 8 edge of pavement. During a site visit in March 2009, no hazardous waste containers or drums, ASTs, or USTs were observed. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 57 – Mobil Mart

This facility is a retail gasoline station/McDonalds Restaurant and a car wash. It is located in the southeast quadrant of the Route 8/Sgt. Roy T. Damian Jr. Road intersection. This site was not identified in the EDR report prepared for this project, and it does not have a record of documented contamination. During a site visit in March 2009, the car wash, located approximately 28 ft (9 m) south of the Route 8 edge of pavement, did not appear to be in use. Six fuel islands and a tank farm are located approximately 40 ft (12 m) south of the Route 8 edge of pavement. A remediation shed was found on-site adjacent to Sgt. Roy T. Damian Jr. Road. Eight groundwater monitoring wells were found on-site. The closed monitoring well is located approximately 22 ft (7 m) south of the Route 8 edge of pavement. The extent of potential contamination on-site is unknown; however, there was no visual evidence of remediation.

Site No. 58 – Shell Gasoline Station

This facility is a retail gasoline station with a convenience store. It is located on the south side of Route 8, approximately 0.2-mile (0.3-km) east of the Route 8/Sgt. Roy T. Damian Jr. Road intersection. This site was not identified in the EDR report prepared for this project, and it does not have a record of documented contamination. During a site visit in March 2009, one AST and generator were found behind the building. The AST was not in secondary containment. The fuel island and tank pad are located approximately 28 ft (9 m) south of the Route 8 edge of pavement. Four fill ports are located approximately 75 ft (24 m) south of the Route 8 edge of pavement. The facility appeared to have active remediation equipment in use; however, no groundwater monitoring wells were found on- or on- or off-site.

Site No. 59 – Abandoned Gasoline Station

This facility is a former gasoline station and automobile repair shop. It is located in the southeast quadrant of the Route 8/Canada Toto intersection. This site was not identified in the EDR report prepared for this project, and it does not have a record of documented contamination. During a site visit in March 2009, a site representative stated that this site was formerly a gasoline station. It was unknown how long ago the gasoline station closed or if the USTs had been removed. The current use appeared to be a maintenance shop used only by the owner/occupant. The three doors to the maintenance bays were closed at the time of the site visit. The former fuel island and tank pad are located approximately 25 ft (8 m) south of the Route 8 edge of pavement. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 60 – Abandoned Automobile Repair Shop/Possible Gasoline Station

This facility is a former automobile repair shop/possible gasoline station. It is located on the south side of Route 8, approximately 0.2-mile (0.3-km) west of the Route 8/ADM Sherman Road intersection. During a site visit in March 2009, this facility was abandoned. Four maintenance bays and a store area were locked. The canopy suggests that this site may have previously been a gasoline station; however, there was no evidence of a former fuel island or tank farm. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 61 – Island Lube Express

This facility is an automobile repair shop and oil change center. It is located south of Route 8 and west of ADM Sherman Road. During a site visit in March 2009, a site representative stated that this site was formerly a gasoline station. It was unknown how long ago the gasoline station closed, or if the USTs had been removed. This site was not identified in the EDR report prepared for this project, and it does not have a record of documented contamination. The former fuel island and tank pad are located approximately 20 ft (6 m) south of the Route 8 edge of pavement. One AST (appeared to contain petroleum), approximately six 55-gallon drums (labeled oil), old cars in various stages of repair, and a pile of rubber tires were found behind the building. The AST was not in secondary containment. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 62 – Shell Gasoline Station

This facility is a retail gasoline station with a convenience store. It is located in the southwest quadrant of the Route 8/10 intersection. This site was not identified in the EDR report prepared for this project, and it does not have a record of documented contamination. During a site visit in March 2009, one AST and generator were found behind the building. The fuel island is located approximately 25 ft (8 m) west of the Route 10 edge of pavement and approximately 70 ft (22 m) south of the Route 8 edge of pavement. The tank farm is located approximately 22 ft (7 m) south of the Route 8 edge of pavement. Remediation equipment appeared to be located behind the building; however, no groundwater monitoring wells were found on- or on- or off-site. The extent of potential contamination on-site is unknown; however, there was no visual evidence of remediation.

Site No. 63 – Circle K/76 Gasoline Station

This facility is a retail gasoline station with an automobile repair shop. It is located in the southeast quadrant of the Route 8/10 intersection. This site was not identified in the EDR report prepared for this project, and it does not have a record of documented contamination. The fuel island is located approximately 20 ft (6 m) east of the Route 10 edge of pavement, and the tank pad is located approximately 25 ft (8 m) east of the Route 10 edge of pavement. Four 55-gallon drums (labeled oil) and approximately 100 used tires were found adjacent to the repair shop. Three of the drums were sealed, and one drum appeared to contain water. It is unknown if there are incidents of contamination associated with this site; however, during a site visit in March 2009, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 64 – Scrapyard/Junkyard/Automobile Repair Shop

This facility is located in the southeast quadrant of the Route 8/Jolene Leon Guerrero Road intersection. During a site visit in March 2009, the property was fenced and locked, restricting access. Project team members viewed the property from the roadway. The site appeared to be a scrapyard/junkyard/automobile repair shop. Scrap metal, new and used drums containing oil, old construction trucks, used tires, and many other unidentifiable containers and drums were observed on-site. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 65 – Military Electrical Substation

This facility is a military electrical substation. It is located on the north side of Route 8 at the entrance to the military facility. During a site visit in March 2009, the property was fenced and locked, restricting access. Project team members viewed the property from the roadway. An electrical transformer and other unidentifiable transformers were observed on-site. No PCBs, hazardous waste containers or drums, ASTs, or USTs were observed on-site. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 66 – Commercial Tire Depot

This facility is a tire repair/replacement shop. It is located in the southeast quadrant of the Route 16/South Sabana Barrigada Drive intersection. During a site visit in March 2009, access to the property was limited. Piles of used tires were found throughout the property. No hazardous waste containers or drums, ASTs, or USTs were observed on-site. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 67 – Mobil Gasoline Station

This facility is a three-story retail gasoline station (top two stories are used as offices) with a convenience store. It is located on the east side of Route 16 north of Sabana Barrigada Drive. This site was not identified in the EDR report prepared for this project, and it does not have a record of documented contamination. The fuel island and tank pad are located approximately 45 ft (14 m) east of the Route 16 edge of pavement. The pavement around the fuel island/tank farm had minimal pavement staining. It is unknown if there are incidents of contamination associated with this site; however, during a site visit in

March 2009, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 68 – Asia Motors

This facility is an automobile repair center specializing in brakes, oil changes, and tire alignments. It is located on the east side of Route 16 north of Perez Coral Road. During a site visit in March 2009, the property was fenced and locked, restricting access. Project team members viewed the property from the roadway. Several 55-gallon drums containing oil and transmission fluid were observed inside of the maintenance bays. The shop floor appeared to have moderate pavement staining. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 69 – Gaja and Sons Automobile Shop

This facility is an automobile repair center. It is located on the east side of Route 16 north of Bello Road. During a site visit in March 2009, the property was fenced and locked, restricting access. Project team members viewed the property from the roadway. Cars in various stages of repair were observed on-site. Scrap metal and drums (contents unknown) of various sizes were also stored on-site. No hazardous waste containers or drums, ASTs, or USTs were observed on-site. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 70 – Circle K/76 Gasoline Station

This facility is a retail gasoline station with a convenience store and a car wash. It is located in the southwest quadrant of the Route 16/10A intersection. This site was not identified in the EDR report prepared for this project, and it does not have a record of documented contamination. The fuel island is located approximately 45 ft (14 m) south of the Route 10A edge of pavement and approximately 120 ft (36 m) west of the Route 16 edge of pavement. The tank pad is located approximately 90 ft (27 m) south of the Route 10A edge of pavement. A diesel fuel island is located approximately 80 ft (24 m) west of the Route 16 on-ramp. During a site visit in March 2009, the wash water from an on-site automatic car wash appeared to drain to a public sanitary or storm drain system; however, this could not be verified. A large generator and one approximately 100-gallon AST containing fuel oil was found near the rear of the property. The generator and AST were fenced and sat on an approximately 6-in (15-cm) high concrete pad. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 71 – Shell Gasoline Station/One-Stop Auto Care and Tire Outlet

This facility is a retail gasoline station with a convenience store and an automobile repair center. This site is located at 1776 Route 16 (on the west side of Route 16 south of the Route 16/27 intersection). This site was not identified in the EDR report prepared for this project, and it does not have a record of documented contamination. An automobile care and tire outlet is adjacent to the Shell automobile repair center. An approximately 30-ft (9-m) by 50-ft (16 m) tank pad is located approximately 45 ft (14 m) from the Route 16 edge of pavement. The fuel island is located approximately 40 ft (12 m) from the Route 16 edge of pavement. Several 55-gallon drums appeared to be used as a washing station. The automobile care and tire outlet had two maintenance bays; the shop floors appeared to have minimal pavement staining. This facility was included in the EDR report prepared for this project. The facility was entered

into the UST Expedited Settlement Program (date not listed). During a site visit in March 2009, there was no visual evidence of remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 72 – Pacific Laundry – Harmon Plant

This site is a dry cleaning facility. It is located in the southwest quadrant of the Route 27/16 intersection. The Harmon Plant is equipped with two tunnel washers, a 10/batch and an 8/batch, five flatwork ironers, two flatwork folders, six steam dryers, and several conventional washers and dryers. It also houses a "clean room" facility dedicated exclusively for Guam Memorial Hospital's laundry requirements (Pacific Laundry 2009). During a site visit in March 2009, the building was not accessible. One 60,000-gallon AST containing diesel fuel is located approximately 30 ft (9 m) south of Route 27. The AST is in secondary containment; no pavement staining was found near the AST. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 73 – School Bus Storage Area

This site is a school bus storage yard owned by the Guam Public School System. It is located in the southeast quadrant of the Route 27/Metgut Road Intersection. During a site visit in March 2009, the property was fenced and locked, restricting access. Project team members viewed the property from the roadway. There appeared to be three fuel-dispensing stations near the rear of the asphalt lot; however, this could not be verified. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 74 – Macheche Substation

This facility is an electrical substation operated by GPA. It is located in the southeast quadrant of the Route 27/Metgut Road Intersection, west of Site No. 77 – School Bus Storage Area. According to the U.S. Environmental Protection Agency (USEPA) Enforcement and Compliance History Online (ECHO) database, a Clean Air Act (CAA) inspection was conducted in February 2007. No formal enforcement actions have been taken against the facility within the last 5 years. The Three-Year Air Compliance Status by Quarter (April/June 2006 through January/March 2009) indicates that this facility does not have any compliance violations. As of March 2009, the facility was not considered to be in high-priority violation (HPV). During a site visit in March 2009, the property was fenced and locked, restricting access. Project team members viewed the property from the roadway. Five ASTs (contents and sizes unknown) were observed on-site. Three of the five ASTs appeared to be in secondary containment. Transformers were found in the front area of the property, adjacent to Route 27; however, no PCBs were observed. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 75 – Electrical Substation

This facility is an electrical substation operated by GPA. It is located on the north side of Route 27, east of Kayou Tun Francisco Drive. During a site visit in March 2009, the property was fenced and locked, restricting access. Project team members viewed the property from the roadway. One 1,000-gallon AST containing diesel fuel was observed on-site. The AST appeared to be in secondary containment. Transformers and PCBs were not observed on the property. It is unknown if there are incidents of

contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 76 – Mobil Gasoline Station

This facility is a retail gasoline station. It is located in the southwest corner of the Route 1/Chalan Lujuna intersection. This site was not identified in the EDR reports, and it does not have a record of documented contamination. The fuel island is located approximately 40 ft (12 m) south of the Chalan Lujuna edge of pavement. The USTs are located approximately 40 ft (12 m) south of the Chalan Lujuna edge of pavement. It is unknown if there are incidents of contamination associated with this site; however, during a site visit in March 2009, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 77 – Wash's and Dry's Laundromat

This facility is a laundromat. It is located on the west side of Route 1, north of Chalan Lujuna. During a site visit in March 2009, one AST containing flammable gas was found in the rear of the property, approximately 30 ft (9 m) from the building. It is unknown if there are incidents of contamination associated with this site; however, during a site visit in March 2009, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 78 – Shell Gasoline Station

This facility is a retail gasoline station with a car wash. It is located on the west side of Route 1, approximately 800 ft (240 m) north of the Route 1/Chalan Lujuna intersection. This site was not identified in the EDR report prepared for this project, and it does not have a record of documented contamination. During a site visit in March 2009, five double-sided fuel islands were observed on-site. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 79 – Yigo Motors Auto Service

This facility is an automobile repair shop. It is located north of the Route 1/Chalan Lujuna intersection, on the east side of Route 1. During a site visit in March 2009, cars in various stages of repair were on-site. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 80 – Quarry

This facility is a quarry owned and operated by Smithbridge Guam, Inc. It is located on the east side of Route 15. NIPPO Construction is located adjacent to the quarry. During a site visit in March 2009, multiple large ASTs (possible containing water) were observed on-site. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 81 – Yigo Speedway

This facility is a race-car speedway. It is located on the east side of Route 15. During a site visit in March 2009, the property was fenced and locked, restricting access. Project team members viewed the property

from the roadway. An area of excavation and a large pile of used tires were observed on-site. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 82 – Storage/Private Solid Waste

This facility is dump/storage area. It is located on the west side of Route 15, north of Fadian Point. During a site visit in March 2009, the property was fenced and locked, restricting access. Project team members viewed the property from the roadway. Abandoned gasoline tanks, empty diesel tanks, tractors, and old trucks were observed on-site. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 83 – Hawaiian Rock Products

This facility is a large construction company with an aggregate/concrete/asphalt plant. It is located on the east side of Route 15. This facility was included in the EDR report prepared for this project. According to the Material Licensing Tracking System, the license number for this site is 56-23278-01. The license use was not reported and expired in June 2003. According to the USEPA ECHO database, a CAA inspection was conducted in March 2007. No formal enforcement actions have been taken against the facility within the last 5 years. The Three-Year Compliance Status by Quarter (April/June 2006 through January/March 2009) indicates that this facility does not have any compliance violations. As of March 2009, the facility was not considered to be an HPV.

During a site visit in March 2009, the property was fenced and locked, restricting access. Project team members viewed the property from the roadway. It is anticipated that a diesel tank is used on-site to fuel the fleet vehicles. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 84 – Amelco, Inc.

This site is a bus and tractor maintenance facility. It is located across from Site No. 83 – Hawaiian Rock Products and adjacent to JM Sand Blasting off of Route 15. During a site visit in March 2009, diesel, oil, propane, and gasoline usages were observed on-site. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 85 – Black Construction

This facility is a construction company. It is located off Route 15. This facility is registered as a conditionally exempt small generator of hazardous wastes. According to the USEPA ECHO database, an RCRA inspection has never been conducted. No formal enforcement actions have been taken against the facility within the last five years. The Three-Year Compliance Status by Quarter (April/June 2006 through January/March 2009) indicates that this facility does not have any compliance violations. As of March 2009, the facility was not considered to be in significant non-compliance (SNC). During a site visit in March 2009, access was limited. Cranes, backhoes, and power poles were observed on-site. It is anticipated that a diesel tank is used on-site to fuel the vehicles. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 86 – Abandoned Tank

This abandoned AST was found on the west side of Route 15, just north of Site No. 83 – Hawaiian Rock Products during a site visit in March 2009. The AST contains liquid oxygen and is owned by the U.S. Air Force. It is unknown if there are incidents of contamination associated with this AST; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 87 – Utility Building

This facility is a utility building owned by GPA. It is located on the east side of Route 15, south of Maibo Cave. During a site visit in March 2009, one 1,020-gallon AST containing diesel was found on-site. Chlorine gas warnings were also posted. It is unknown if there are incidents of contamination associated with this AST; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 88 – Site 60/Cliff-Line Dump Site, LF071 or former AOC 102

This site is located on Andersen AFB (Andersen South) on the north side of Route 15, south of the Route 15/Chalan Lujuna intersection. According to the DoD IRP Sites – Andersen South plans, this site is an area of concern. This site was used to dump a variety of wastes. It is located along the adjacent cliff. No further response action is planned according to the DoD. During a site visit in March 2009, this property was inaccessible or visible from the roadway.

Site No. 89 – Site 46/Storm Water Retention Pond, Tumon Tank Farm, SDO57 or former AOC 69

This site is located on Andersen AFB (Andersen South) adjacent to the south side of Route 15, north of the Route 15/26 intersection. According to the DoD IRP Sites – Andersen South plans, this site is an area of concern. This site consists of a retention pond. No further response action is planned. A review of aerial photography shows earthwork and construction activities possibly associated with construction of the retention pond; however, during a site visit in March 2009, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 90 – Site 47/Cleaning West of Housing at Northwest Field, DPO58 or former AOC 80

This site is located on Andersen AFB (Andersen South) on the south side of Route 15, north of the Route 15/26 intersection (south of Site No. 106). According to the DoD IRP Sites – Andersen South plans, this site is an area of concern. This site was the subject of concern due to the presence of surface waste debris, but that matter has been settled. Contaminants of concern include heavy metals, grease cans, metal debris, and glass bottles. A ROD was issued in 2008. During a site visit in March 2009, this property was inaccessible or visible from the roadway. The current environmental disposition of the site is unknown.

Site No. 91 – Site 56/Waste Pile 8, Northwest Field; DP067

This area is an inactive waste disposal site located on Andersen AFB (Andersen South), on the north side of Route 15, in a quarried area between the North Runway and North Taxiway at Northwest Field. The IRP Sites – Andersen South plans indicate that this site is under the DoD IRP. Contaminants of concern include drums, tires, canisters, and asphalt. An RI/FS is in process. During a site visit in March 2009, this property was inaccessible or visible from the roadway. The current environmental disposition of the site is unknown.

Site No. 92 – Site 59/MSA Magazine 7 Trench, LF070

This magazine trench is located on Andersen AFB (Andersen South) on the north side of Route 15, west of Wilson House. This site was identified as an area of concern in the IRP Sites – Andersen South plans. No further response action is planned according to the DoD. During a site visit in March 2009, this property was inaccessible or visible from the roadway.

Site No. 93 – Utility Building

This facility is a utility building owned by GPA. It is located on the west side of Route 10, south of the Route 10/15 intersection. During a site visit in March 2009, one 1,020-gallon AST containing diesel was found on-site. Chlorine gas warnings were also posted. It is unknown if there are incidents of contamination associated with this AST; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 94 – Wastewater Facility

This site is a wastewater facility. It is located on the west side of Route 10, south of the Route 10/15 intersection (adjacent to the south of Site No. 110 – Utility Building). It is unknown if there are incidents of contamination associated with this site; however, during a site visit in March 2009, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 95 – Utility Building

This facility is a utility building owned by GPA. It is located on the west side of Route 10, south of the Route 10/15 intersection (south of Site No. 111 – Wastewater Facility). During a site visit in March 2009, one 1,020-gallon AST containing diesel was found on-site. Chlorine gas warnings were also posted. It is unknown if there are incidents of contamination associated with this AST; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 96 – Napa Auto Parts/Bridge Stone/Pacific Tyre/Firestone/Shell Helix Motor Oils

This facility provides brake services, wheel alignments, and safety inspections. It is located on the east side of Route 10, north of the Route 10/Couten Towes intersection. During a site visit in March 2009, moderate pavement staining with oil was observed. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 97 – Shell Gasoline Station

This facility is a retail gasoline station. This site is located on the east side of Route 10, north of the Route 10/32 intersection. This site was not identified in the EDR report prepared for this project, and it does not have a record of documented contamination. During a site visit in March 2009, three double-sided fuel islands and six pumps were observed on-site. It is unknown if there are incidents of contamination associated with this site; however, during a site visit in March 2009, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 98 – Mobil Gasoline Station

This facility is a retail gasoline station. It is located at the southwest quadrant of the Route 10/32 intersection. This site was not identified in the EDR report prepared for this project, and it does not have a

record of documented contamination. During a site visit in March 2009, four double-sided fuel islands, eight gasoline pumps, two diesel fuel pumps, and a trash compactor were observed on-site. A drum labeled "Hazardous Materials" was found near the fuel island. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 99 – Utility Building

This facility is a utility building owned by GPA. It is located on the west side of Route 10, south of the Route 10/32 intersection. During a site visit in March 2009, one 1,020-gallon AST containing diesel fuel was observed on-site. The AST was in an approximately 2.0-ft (0.6-m) high concrete secondary containment. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 100 – Friendly Laundromat

This facility is a laundromat. It is located on the west side of Route 10, south of the Route 10/32 intersection (south of Site No. 99 – Utility Building). During a site visit in March 2009, one AST (contents unknown) and a propane tank were found on-site behind the building. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 101 – Wastewater Treatment Facility

This site is a wastewater treatment facility owned by GWA. It is located on the east side of Route 10, north of the Route 10/4 intersection. During a site visit in March 2009, one 3,250-gallon AST containing diesel fuel was found on-site. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 102 – Utility Building

This facility is a utility building. It is located adjacent to the north of Untalan Middle School on the east side of Route 10. During a site visit in March 2009, one AST containing diesel fuel and one AST containing chlorine gasoline were observed on-site. GPA owns the diesel fuel tank. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 103 – Laundry World

This site is a laundromat located south of the Route 10/15 intersection. During a site visit in March 2009, one 1,020-gallon AST containing diesel was found on-site. Two 55-gallon steel drums containing oil were found behind the building. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 104 – Rainbow Laundry & Mart

This site is a laundromat located north of Route 15, south of Wendy's Restaurant. During a site visit in March 2009, one portable generator was found adjacent to the building. It is unknown if there are

incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 105 – Utility Building

This facility is a utility building owned by GPA located in the northwest quadrant of Route 10 and Route 15. During a site visit in March 2009, one 1,020-gallon AST containing diesel fuel was observed on-site. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 106 – Utility Building

This facility is a utility building owned by GPA. It is located in the southeast quadrant of Route 10 and Route 15. During a site visit in March 2009, one 1,020-gallon AST containing diesel fuel was observed on-site. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

5.2.3 Apra Harbor

The 12 sites described below were identified in the Apra Harbor Region.

Site No. 107 – Mobil Gasoline Station

This facility is a retail gasoline station with a convenience store. It is located at the northeast quadrant of the Route 2A/5 intersection. This site was not identified in the EDR report prepared for this project, and it does not have a record of documented contamination. During a site visit in March 2009, one AST (contents and size unknown) and ventilation pipes were found behind the convenience store building. The AST sat on the ground and was not within secondary containment. The area around the AST was overgrown with vegetation; however, the vegetation did not appear to be distressed. The exterior of the tank appeared to be in good condition and did not have an odor. Two fuel islands are located approximately 25 ft (8 m) east of the Route 2A edge of pavement. The area surrounding the fuel islands had light pavement staining, but it did not appear to have reworked pavement. Two USTs (contents and sizes unknown) are located approximately 65 ft (20 m) north of the Route 2A edge of pavement. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 108 – Island Equipment Company

This site is a commercial facility. It is located on the north side of Route 2A, approximately 0.2-mile (0.3-km) east of the Route 2A/1 intersection. According to the facility's Web site, Island Equipment Company serves customers in energy, healthcare, commercial, and industrial markets; products and services include industrial and medical gases, safety equipment, fire extinguisher services, and welding supplies (Island Equipment Company 2009). The two main bulk products that are produced and liquefied in the on-site air separation plant are oxygen and nitrogen. The company also has liquid argon; carbon dioxide refrigerated liquid is also produced for retail. Island Equipment Company is the only facility authorized by the U.S. Department of Transportation (DOT) for hydrostatic testing in the region. This facility was included in the EDR report prepared for this project. This facility is currently registered as a small quantity generator (SQG) of hazardous wastes. The facility registered as a conditionally exempt SQG in 2002. The reported

waste types are ignitable hazardous wastes, corrosive hazardous wastes, lead, and benzene. According to the USEPA ECHO database, an RCRA inspection has never been conducted. No formal enforcement actions have been taken against the facility within the last 5 years. The Three-Year Compliance Status by Quarter (April/June 2006 through January/March 2009) indicates that this facility does not have any compliance violations. As of March 2009, the facility was not considered to be in SNC. During a site visit in March 2009, the property was fenced and locked, restricting access. Project team members viewed the property from the roadway. A sign posted outside of the property indicated that this site is a gas manufacturing plant. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 109 – AIC International

This site is a commercial facility. It is located on the north side of Route 2A, approximately 0.06-mile (0.09-km) east of the Route 1/2A intersection. During a site visit in March 2009, one approximately 1,000-gallon AST and one approximately 500-gallon AST containing diesel fuel were found on-site approximately 1.0-mile (1.6-km) east of the Route 2A edge of pavement. The ASTs were in concrete secondary containment, and no staining was observed. The exterior of the tanks appeared to be in good condition and did not have an odor. The vegetation in the area of the ASTs did not appear to be distressed. It is unknown if there are incidents of contamination associated with the ASTs; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 110 – Taco Bell

This site is a fast-food restaurant. It is located in the northeast quadrant of the Route 1/2A intersection. During a site visit in March 2009, two approximately 1,000-gallon ASTs containing diesel fuel and propane were found on-site behind the building. Both ASTs were enclosed by an approximate 5.0-ft (1.5-m) concrete wall that was locked and gated. The ASTs are located approximately 100 ft (30 m) east of the Route 1 edge of pavement. The AST containing diesel fuel was in concrete secondary containment, and no staining was observed. The exterior of both ASTs appeared to be in good shape and did not have odors. It is unknown if there are incidents of contamination associated with the ASTs; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 111 – Stell Newman Master Center/Navy Housing – Navy Federal Credit Union

This site is a visitor center; it is the entrance point to the Navy base, Navy housing, and the Federal Credit Union. It is located at the west side of the Route 1/2A intersection. According to the IRP Sites – Apra-Harbor Naval Complex plans, a potential contamination site, referred to as "Abandoned UST at X-ray Wharf," is located within this property. The IRP Sites – Apra Harbor Naval Complex plans indicate that this site is under the DoD IRP. Contaminants of concern include petroleum compounds and lead. The soil contains contaminants from the former UST. This site was transferred from the Navy's UST program. During a site visit in March 2009, no hazardous waste containers or drums, ASTs, or USTs were observed on-site. The extent of potential contamination on-site is unknown; however, there was no visual evidence of remediation. The current environmental disposition of this site is unknown.

Site No. 112 – Valve Pits at Tenjo Vista

This site is located within the military installation on the east side of Route 1. This site is included in the IRP Sites – Apra Harbor Naval Complex plans provided by the DoD; however, the associated information

regarding this site is not included in the reports reviewed for this project. According to the DoD IRP Sites – Apra Harbor Naval Complex plans, this site is included in the IRP. During a site visit in March 2009, this site was inaccessible and could not be seen from the roadway. The current environmental disposition of this site is unknown.

Site No. 113 – Old NSD Drum Storage Lot

This site is located within the military installation adjacent to the west side of Route 1. This site is included in the IRP Sites – Apra Harbor Naval Complex plans provided by the DoD; however, the associated information regarding this site is not included in the reports reviewed for this project. An open and cleared area is located just north of the Atantano River. According to the DoD IRP Sites – Apra Harbor Naval Complex plans, this site is a designated Solid Waste Management Unit. During a site visit in March 2009, a possible disposal site was found several hundred feet west of Route 1. The current environmental disposition of this site is unknown.

Site No. 114 – Lower Sasa Fuel Burning Pond

The former Lower Sasa Fuel Burning Pond at the former Fleet Industrial Supply Center (FISC) is located in the southwestern portion of Guam. The site is located in a military installation adjacent to the east side of Route 1, approximately 0.7-mile (1.1 km) south of the Route 1/11 (Cabras Highway) intersection and is comprised of approximately 20 ac (8 ha). This site is included in the IRP Sites – Apra Harbor Naval Complex plans provided by the DoD, and it is identified as part of the IRP. The facility managed oily wastewater from ships and the FISC Fuel Department. Waste was collected in the pond and drained through a channel to adjacent wetlands. Contaminants of concern include waste oil.

A Decision Document has been issued and will serve as the final remedy for the site. Land use controls (LUCs) are to be used as the final remedy for the site. The LUCs specify that all future property owners are responsible for implementing, maintaining, reporting, and enforcing the LUCs until such time that they are terminated. The LUCs specify that there will be no unauthorized site access. In addition, the LUCs prevent the use of the site for schools, day care, or recreational facilities. In addition, five-year site reviews will be conducted per CERCLA requirements. No highly toxic or highly mobile source material was identified at the site, so from a risk assessment perspective, LUCs were viewed to be an acceptable final remedy. The Decision Document includes use of signs to restrict access to the area, installing a locked chain across the access road, periodic maintenance of the chain and signs, and monitoring conditions within the adjacent wetlands to ensure that the LUCs remain effective. During a site visit in March 2009, the location could not be verified due to the area being heavily vegetated.

Site No. 115 – Navy Fuel Storage

This facility is a fuel storage yard. It is located on the east side of Route 1, south of the Route 1/6 intersection. This facility was included in the EDR report prepared for this project. It is listed in the Toxic Release Inventory System (TRIS) database, but no other information was provided. During a site visit in March 2009, the property was fenced and locked, restricting access. Project team members viewed the property from the roadway. Five large ASTs (contents and sizes unknown) were observed on-site. The ASTs were in secondary containment. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 116 – South Pacific Petroleum Corporation

This site is a large fuel depot/distribution facility. It is located on the south side of Route 11, approximately 1.65 miles (2.65 km) west of the Route 1/11 intersection. South Pacific Petroleum Corporation purchased the assets of Exxon Guam in December 2000 and operates 10 retail service stations under the licensed name 76 and Circle K (South Pacific Petroleum Corporation 2009). This facility was included in the EDR report prepared for this project. The Registry identification number is 110028165009. This facility is registered as an SQG of hazardous wastes. According to the USEPA ECHO database, an RCRA inspection has never been conducted. No formal enforcement actions have been taken against the facility within the last five years. The Three-Year Compliance Status by Quarter (April/June 2006 through January/March 2009) indicates that this facility does not have any compliance violations. As of March 2009, the facility was not considered to be in SNC. During a site visit in March 2009, the property was fenced and locked, restricting access. Project team members viewed the property from the roadway. Several large ASTs (contents and sizes unknown) and other fuel processing equipment were observed on-site. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 117 – Guam Power Authority (Cabras Power Plant)

This facility is the Cabras Power Plant. It is located at 322 Cabras Highway Route 11, approximately 0.4-mile (0.6-km) west of the Route 1/11 intersection. This facility was included in the EDR report prepared for this project. Violations were reported in May 1992 for PCB disposal; the violations were closed in May 1992. According to the USEPA ECHO database, an RCRA inspection was conducted in June 1992 and a CAA inspection was conducted in February 2007. No formal enforcement actions have been taken against the facility within the last 5 years. The Three-Year Compliance Status by Quarter (April/June 2006 through January/March 2009) indicates that this facility does not have any compliance violations. As of March 2009, the facility was considered to be in SNC. An SNC designation indicates that this site may pose a more severe level of environmental threat. As of March 2009, the facility was not considered to be an HPV.

During a site visit in March 2009, the property was fenced and locked, restricting access. Project team members viewed the property from the roadway. Several ASTs (sizes unknown) that were labeled fuel oil storage, waste oil, and water were observed on-site. The ASTs appeared to be in secondary containment; however, this could not be verified. The extent of potential contamination on-site is unknown; however, there was no visual evidence of remediation.

Site No. 118 – Piti Power Plant

This facility is the Piti Power Plant. It is located in the southwest quadrant of the Route 1/11 intersection. According to the IRP Sites – Apra Harbor Naval Complex Plans, this site is included in the DoD IRP; however, the associated information regarding this site is not included in the reports reviewed for this project. This facility is registered with USEPA's used oil program. According to the USEPA ECHO database, an RCRA inspection was conducted in June 1992. No formal enforcement actions have been taken against the facility within the last 5 years. The Three-Year Compliance Status by Quarter (April/June 2006 through January/March 2009) indicates that this facility does not have any compliance violations. As of March 2009, the facility was not considered to be in SNC.

During a site visit in March 2009, the property was fenced and locked, restricting access. Project team members viewed the property from the roadway. Several ASTs (contents and sizes unknown),

transformers, and ventilation pipes were observed on-site. Several of the ASTs and transformers are located adjacent to the Route 1 and Route 11 edges of pavement. The ASTs appeared to be in secondary containment; however, this could not be verified. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

5.2.4 South

Five sites were identified in the South Region.

Site No. 119 – Apra Height Substation

This facility is an electrical substation operated by GPA. It is located at the southwest quadrant of the Route 5/17 intersection. During a site visit in March 2009, the property was fenced and locked, restricting access. Project team members viewed the property from the roadway. PCBs are widely used for transformers; however, none were observed from the roadway. In addition, no hazardous waste containers or drums, ASTs, or USTs were observed. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 120 – Apra View

This site is Navy housing. It is located in the northeast quadrant of the Route 5/Apra View/ Plumeria intersection. During a site visit in March 2009, access to the property was restricted. Project team members viewed the property from the roadway. No hazardous waste containers or drums, ASTs, or USTs were observed from the roadway. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 121 – Naval Facilities Engineering Command (NAVFAC)

This site is an abandoned three-story apartment building. It is located in the northwest quadrant of the Route 5/Apra View intersection. During a site visit in March 2009, the property was fenced and locked, restricting access. Project team members viewed the property from the roadway. Vacant apartment buildings and a building possibly used as a former school or daycare were observed from the roadway. A posted sign stated that this site is a NAVFAC project undergoing space renovation. No hazardous waste containers or drums, ASTs, or USTs were observed from the roadway. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 122 – Pacific Foundation Company

This site is a commercial/industrial facility. It is located on the north side of Route 5, east of Route 2A. This facility is registered as a conditionally exempt small generator of hazardous wastes. According to the USEPA ECHO database, an RCRA inspection has never been conducted. No formal enforcement actions have been taken against the facility within the last 5 years. The Three-Year Compliance Status by Quarter (April/June 2006 through January/March 2009) indicates that this facility does not have any compliance violations. As of March 2009, the facility was not considered to be in SNC. During a site visit in March 2009, the property was fenced and locked, restricting access. No one was on-site at the time of the site visit, and the property use is unknown. Project team members viewed the property from the roadway. Tractor-trailers and other equipment were in a storage yard adjacent to Route 5. No hazardous waste containers or drums, ASTs, or USTs were observed from the roadway. It is unknown if there are incidents

of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

Site No. 123 – Cell Tower

This facility is a cell tower. It is located north of Route 5 and east of Route 2A (adjacent to a Mobil Gasoline Station). During a site visit in March 2009, the property was fenced and locked, restricting access. Project team members viewed the property from the roadway. A box that appeared to possibly be a transformer was observed on-site; however, its use could not be confirmed. No PCBs, hazardous waste containers or drums, ASTs, or USTs were observed from the roadway. It is unknown if there are incidents of contamination associated with this site; however, there was no visual evidence of soil or groundwater assessment or remediation on-site, and no groundwater monitoring wells were found on- or off-site.

5.3 TEC INC.

Table 5.3-1. Summary of Active Environmental Restoration Sites on Andersen AFB

Site ID / *North Guam*	*Site Description*	*Contaminants*	*Status*
Site 01 (Landfill 1)	This site encompasses approximately 23 acres (ac) in the North Field of Andersen AFB. Landfill operations began in 1945. Some portions of the landfill are still operational. Non-active portions were capped in 2001.	Waste chemicals, pesticides, Petroleum, Oil, Lubricants (POL), solvents, ferrous metal, sanitary trash, and construction debris.	Responsibility was transferred to the RCRA Program in 2007 because the landfill is still active.
Site 02 (Landfills 2,4, & 5)	This site is approximately 69 ac in the North Field of Andersen AFB. Landfill operations were from 1947 to 1974, with a small portion of the landfill being used up through 1982.	Waste chemicals, pesticides, POL, solvents, ferrous metal, sanitary trash, construction debris, and Unexploded Ordnance (UXO).	Landfill 5 was capped under a Removal Action. A Remedial Investigation/Feasibility Study (RI/FS) is ongoing for Landfill 2 while no further response action is required for Landfills 4 and 5.
Site 03 (Waste Pile 3)	This site is about 19 ac and is located in the North Field of Andersen AFB. The site was actively used from 1947 to 1977.	Pesticides, POL, solvents, scrap metal, sanitary trash, construction debris, and industrial waste, pesticides, and construction debris.	RI/FS is ongoing.
Site 04 (Landfill 6)	This site encompasses approximately 10 ac and is located in the North Field of Andersen AFB. The site operated from 1953 to 1954.	Sanitary trash.	Record of Decision (ROD) was completed in 2008.
Site 05 (Landfill 7)	This site is approximately 3 ac and is located in the North Field of Andersen AFB. Years of operation were from 1956 to 1958.	Sanitary trash.	ROD was completed in 2007 that included the requirement for long-term monitoring.
Site 06 (Landfill 8)	Site 06 is about 8 ac and is located between the North and Northwest Fields of Andersen AFB. This site operated from 1946 to 1949.	Asphalt and asphaltic wastes.	ROD was issued in 2007 recommending soil removal that is planned for FY 2010.
Site 07 (Landfill 9)	This site, located in the Northwest Field of Andersen AFB encompasses approximately 8 ac. This landfill operated from 1949 to 1955.	Sanitary trash, construction debris, and concrete.	ROD was issued in 2008 recommending no further action.
Site 08 (Landfills 10, 11, & 12)	This site, located in the North Field of Andersen AFB encompasses approximately 14 ac and operated from the early to late 1950s.	POL, solvents, scrap metals, sanitary trash, construction debris, asphalt wastes, and 55 gallon drums.	In 2007, ROD was issued requiring long-term monitoring for Landfill 10. No further response action is planned for Landfills 11 and 12.

Site ID / *North Guam*	*Site Description*	*Contaminants*	*Status*
Site 09 (Landfill 13)	This site is in Andersen AFB's North Field and is approximately 4.5 ac. The landfill operated from 1951 to 1956.	Waste chemicals, POL, sanitary trash, spent equipment.	In 2007, ROD was issued. Some clean-up activities for the portion of the site below the cliff are planned in 2009.
Site 10 (Landfill 14)	This site is approximately 33 ac located within the North Field of Andersen AFB. This landfill operated in 1976.	Construction debris and concrete.	RI/FS is in process. A ROD recommending no further action is scheduled for 2009.
Site 11 (Landfills 15 & 16)	This site operated from the late 1950s to 1970s is approximately 7 ac and is located in the main base area at Andersen AFB.	Solvents, sanitary trash, construction debris, and drums of lead-based paint.	ROD was issued in 2008. No further response action is planned for Landfill 16.
Site 12 (Landfill 17 and Pau Point Dump)	This approximately 20 ac site operated from 1945 to 1949 and is located on Andersen AFB.	Solvents, sanitary trash, UXO, airplane parts, NiCad batteries, and office waste,	Remedial action is at or near completion.
Site 13 (Landfill 18)	This site located in the North Field of Andersen AFB consists of 4 ac and operated from 1967 to 1968.	Asphalt wastes and waste liquids.	RI/FS report is planned for 2010.
Site 14 (Landfill 19)	This site is located in the North Field of Andersen AFB and is approximately 14 ac. The site operated in 1955.	Asphalt wastes.	RI/FS is planned for 2010.
Site 15 (Landfill 20)	This site located in the North Field of Andersen AFB is approximately 10 ac. The site operated in 1968.	Sanitary trash.	RI/FS is ongoing. A ROD is scheduled for 2009.
Site 16 (Landfill 21)	This site is located in the Northwest Field of Andersen AFB and is approximately 19 ac. The site operated from the mid 1950s to 1963.	Sanitary trash and construction debris. PAHs, lead, and arsenic were detected. Interim soil/debris remedial action was performed.	No further action ROD was issued in 2008.
Site 17 (Landfill 22)	This site is located in the Northwest Field of Andersen AFB and is approximately 3 ac. The site operated in the mid 1950s.	Sanitary trash, UXO, and black powder.	A ROD was issued in 2008 recommended no further action.
Site 18 (Landfill 23)	This site is located in Harmon Annex and is approximately 1 ac. The site operated in the late 1950s.	Sanitary trash.	A ROD was issued in 2008 recommended no further action.

Site ID / *North Guam*	*Site Description*	*Contaminants*	*Status*
Site 19 (Landfill 24)	This site is located in Harmon Annex and consists of 26 ac. The site operated in the 1950s.	Sanitary trash.	A ROD was issued in 2008 recommended no further action.
Site 20 (Waste Pile 7)	This site is located in Andersen South and is approximately 2 ac. The site operated from 1945 to 1962.	POL, solvents, sanitary trash, construction debris, spent equipment, scrap vehicles, dry cleaning fluids.	ROD was issued in 2008. The site is under long-term monitoring through 2028.
Site 21 (Landfill 26)	This site is located in the Northwest Field of Andersen AFB and is approximately 18 ac. The site operated in 1966.	Sanitary trash and construction debris.	Ongoing RI/FS.
Site 22 (Waste Pile 6)	This site is located at Andersen South and consists of 20 ac.	Construction debris.	A ROD was issued in 1998 recommending soil removal. This removal was completed in 2001.
Site 23 (Waste Pile 5)	This site is located at Andersen South and consists of 2 ac.	Construction debris and asphalt.	A ROD was issued in 1998 that recommended no further action.
Site 24 (Landfill 29)	This site is located at Andersen South and is approximately 2 to 3 ac.	Household debris.	A ROD was issued in 1998 recommending soil removal. This removal was completed in 2001.
Site 25 (Firefighter Training Area 1)	This site is located in the North Field and consists of 2 ac. The site operated from 1945 to 1958.	POL and solvents.	A ROD was issued in 2008.
Site 26 (Firefighter Training Area 2)	This site is located in the North Field and consists of 2 ac. The site operated from 1958 to 1988.	POL and solvents.	RI/FS in process. A ROD is scheduled for 2009.
Site 27 (Hazardous Waste Storage Area 1)	This site is located in the North Field and is approximately 1 ac. The site operated in the 1950s and also from the 1970s to 1983.	POL, solvents, and hazardous waste.	RI/FS in process.
Site 28 (Chemical Storage Area 1)	This 4 ac site is located in the North Field. The site operated in the early 1970s.	POL and solvents.	ROD has been issued.
Site 29 (Waste Pile 2)	This site is located in the North Field and consists of approximately 4 ac.	Asphalt and asphalt tar.	Clean up is scheduled for 2010.

Site ID / *North Guam*	*Site Description*	*Contaminants*	*Status*
Site 30 (Waste Pile 4 also known as MMRP site MRA 253)	This 18 ac site is located in the Northwest Field. The site operated from 1950 to 1970.	Waste oils, solvents, and UXO.	No further response action is planned.
Site 31 (Chemical Storage Area 4)	This site consists of about 12 ac and is located in the Northwest Field. The site operated from 1952 to 1956.	Solvents, waste oils, and heavy metals. An interim soil remedial action was performed.	No further action ROD was issued in 2008.
Site 32 (Drum Storage Area 1)	This site consists of approximately 0.5 ac and is located between the North and Northwest Fields.	POL, solvents, asphalt, pesticides, and chemicals	Responsibility transferred to the compliance program. No further response action is planned.
Site 33 (Drum Storage Area 2)	This site consists of approximately 6 ac and is located in the North Field.	Asphalt, waste oils, tar, and paint.	Responsibility transferred to the compliance program.
Site 34 (PCB Storage Area)	The site is approximately 1 ac consists of a concrete pad located in the North Field that is no longer in use.	Transformer oil and transformers.	ROD was issued in 2007.
Site 35 (Waste Pile 1)	This site is located in the North Field and consists of approximately 7 ac.	Asphalt tar.	ROD was issued and some clean up is scheduled for 2009.
Site 36 (Ritidian Point Dump Site)	This 6 ac site is located west of the Northwest Field.	Sanitary trash, UXO, spent metal equipment, 55 gallon drums, batteries, tarpaper, tires, and compressed gas cylinders.	A ROD was issued in 2008 recommending no further action.
Site 37 (War Dog Borrow Pit)	The site is located in Andersen South and is approximately 2 ac.	Various wastes.	A ROD was issued in 1998 recommended no further action.
Site 38 (MARBO Laundry)	This site is located in Andersen South and is approximately 3 ac.	Various wastes.	A ROD was issued in 1998 recommending soil removal which was completed in 1999.
Site 39 (Harmon Substation)	This site is comprised of approximately 9 ac in Harmon Annex area.	Various wastes.	ROD was issued in 2008 recommending no further action.

Site ID / *North Guam*	*Site Description*	*Contaminants*	*Status*
Site 40 (Urbana Dumpsite)	This former dump area of approximately 26 ac known as the Urbana site was used as a disposal site for a number of years and the subject of numerous characterization efforts.	Sanitary trash, construction debris, UXO, airplane parts, vehicle parts, and compressed gas cylinders.	ROD was issued in 2004 recommending soil removal. Cleanup is expected to be completed by 2010.
Site 41 (OPS Support Buildings #1, DAO52)	This site includes support buildings such as food shops, a carpenter store, a generator shop, a heavy vehicle shop, vehicle maintenance shops, and a former laundry facility.	Various unspecified wastes.	RI/FS is in process.
Site 42 (Operational Support Buildings #2)	This 1.5 ac site consists of a former gas station with two aboveground storage tanks (ASTs).	POL.	RI/FS is in process.
Site 43 (Operational Support Buildings #3, DAO54)	This 35 ac site consists of buildings including: a sign paint shop, battery shop, refrigeration shop, plumbing shop, electric shop, carpenter shop, welding shop with a concrete vault, motor pool building garage, grease stand, machine shop, maintenance shops, generator shack, paint shed, steam shop, and warehouses.	Various wastes.	RI/FS is in process.
Site 44 (Septic System Tumon Tank Farm, FL055 or former AOC 65)	This site consists of a septic tank system.	Various wastes.	A ROD issued in 2008 recommended no further response.
Site 45 (Recovery Tank Tumon Tank Farm, TAO56 or former AOC 67)	This site consists of a 23,000 gallon recovery tank.	Various wastes.	A ROD issued in 2008 recommended no further response.
Site 46 (Storm Water Retention Pond, Tumon Tank Farm, SDO57 or former AOC 69)	This site consists of a retention pond (i.e., 10'x10'x5').	Various wastes.	A ROD issued in 2008 recommended no further response.

Site ID / *North Guam*	*Site Description*	*Contaminants*	*Status*
Site 47 (Cleaning West of Housing at Northwest Field, DPO58 or former AOC 80)	This 1.4 ac site was the subject of concern due to the presence of surface waste debris that has subsequently been removed.	Heavy metals, grease cans, metal debris and glass bottles.	A ROD was issued in 2007 recommending soil removal planned for 2010.
Site 48 (Tank Farm, Northwest Field, TAO59 or former AOC 83)	This approximately 14 ac site consists of an area of possible fuel releases associated with an abandoned aviation fuel storage area.	Heavy metals and Polyaromatic Hydrocarbons (PAHs).	A ROD was issued in 2008 recommending no further action.
Site 49 (Native Plantation, Northwest Field, DAO60 or former AOC 84)	This 5.5 ac site is located in the Northwest Field at Andersen AFB.	Heavy metals.	A ROD was issued in 2008 recommending no further action.
Site 50 (Building 8024, Northwest Field, former AOC 85 or SS061)	This site was an area of concern due to the presence of four surface debris mounds.	Heavy metals and construction debris.	A ROD was issued in 2007 recommending soil removal planned for 2010.
Site 51 (South Runway Approach Zone, Northwest Field, LF062 and former AOC 93)	This site is approximately 16 ac and was used as a dump site for a variety of wastes.	Scrap metal, heavy metal, UXO, and glass bottles.	A ROD was issued in 2007 recommending soil removal planned for 2010.
Site 52 (UXO, Northwest Field, LF063)	This site is located in the Northwest Field of Andersen AFB and is portion of a larger 380 ac area.	UXO.	No further response action is planned.
Site 53 (Service Apron "H" and Quonset Huts, former AOC 99)	This 30 ac area was likely used as a hazardous materials dump site. The site is near a group of concrete pads that are the remnants of carpentry, sheet metal, machine, plumbing, and electrical shops.	Heavy metals and PAHs.	A ROD was issued in 2007 recommending soil removal planned for 2010.

Site ID / *North Guam*	*Site Description*	*Contaminants*	*Status*
Site 54 (Building 18006; AOCs 7A, 7B, 7C, & 7D, LF074)	This site includes an aircraft maintenance shop (AOC 7A), an aircraft maintenance and battery shop (AOC 7B), an aircraft maintenance shop and USTs (AOC 7C), and an aircraft maintenance shop and waste products storage area (AOC 7D).	Various wastes.	RI/FS is in process.
Site 55 (Area outside of Landfill 14, LF066)	This 7 ac site is located just outside of Landfill 14.	Various wastes.	A ROD was issued in 2007 recommending soil removal planned for 2010.
Site 56 (Waste Pile 8, Northwest Field; DP067)	This area is an inactive waste disposal site located in a quarried area between the North Runway and North Taxiway at Northwest Field.	Drums, tires, canisters, and asphalt.	No further response action is planned.
Site 57 (Waste Pile 9, Northwest Field, DP068)	This area is identified as an inactive waste disposal site in a former borrow pit located south of the North Runway in the Northwest Field.	55-gallon drums and other items unknown.	RI/FS is in process.
Site 58 (Waste Pile 10, Northwest Field, DPO69)	This site is an inactive waste disposal site located approximately 600 feet (ft) northeast of the Southwest Cross-Over at the South Runway.	Partially buried drums under crushed coral and soil.	A ROD issued in 2008 recommended no further response.
Site 59 (MSA Magazine 7 Trench, LF070)	This magazine trench (i.e., 400'x60'x3') is located at the Northwest Field.	Various wastes.	A ROD issued in 2008 recommended no further response.
Site 60 (Cliff-Line Dump Site, LF071 or former AOC 102)	This 3 ac site located along a cliff-line area at the Northwest Field and was used to dump a variety of wastes.	Various wastes.	Additional site characterization is planned for 2009.
Site 61 (MSA Waste Pile, DPO72)	This 3.5 ac waste pile is located at the Northwest Field.	Various wastes.	A ROD issued in 2008 recommended no further response.

Site ID / *North Guam*	*Site Description*	*Contaminants*	*Status*
Site 62 (MSA UXO Burn/Dump Site)	This 6 ac site was used to deposit and burn UXO.	UXO and munitions constituents.	This site is under consideration for the MMRP.
Site 63 (MSA Coral Dump Site, LF074 or formerly AOC 105)	This site is approximately 8 ac.	Scrap metal, corrugated sheet metal, UXO, auto parts, aircraft engine parts, drums, and ordnance and explosive waste.	RI/FS is in process.
Site 64 (Asphalt Drum Area, DAO75)	This 3.5 ac drum disposal area is on Andersen AFB.	Asphalt waste.	RI/FS is in process.
Site 65 (Asphalt Drum Area and OEW Area with Oil/Water Separator)	This 50 ac drum disposal area and oil/water separator is located within the confines of Andersen AFB.	POL and asphalt.	RI/FS is in process. Part of this site will be transferred to the MMRP.
Site 66 (Abandoned Sewage Disposal)	This former sewage disposal area is approximately 10 ac and is located within the confines of Andersen AFB.	55-gallon drum remnants, construction debris, and unspecified waste.	RI/FS is in process.
Site 67 (Quarry Cliff-line Dump, LF078)	This 4 ac dump site is located within the confines of Andersen AFB.	Scrap metal, tools, asphalt, and various other wastes.	A ROD issued in 2008 recommended no further response.
Site 68 (Beach Road Waste Pile, DPO79)	This 10 ac waste pile is within the Andersen AFB boundary line.	Scrap metal, tools, asphalt, and various other wastes.	A ROD issued in 2008 recommended no further response.
Site 69 (Fuel Storage Tanks and Associated Piping Tumon Tank)	This site consists of 7 fuel storage tanks and associated piping located at Andersen AFB. The total capacity was approximately 2.1 million gallons.	POL.	A ROD issued in 2008 recommended no further response.
Site 70 (Waste Pile 11, Northwest Field, DP081)	This site is an inactive waste disposal area located in the Northwest Field at Andersen AFB.	Sanitary trash, scrap metal, canisters, and buckets.	A ROD issued in 2008 recommended no further response..

Site ID / *North Guam*	*Site Description*	*Contaminants*	*Status*
Site 71 (Waste Pile 12, Northwest Field, DP082)	This site consists of a former waste pit that contains a variety of waste materials.	Scrap metal, construction debris, 55-gallon drums, telephone poles, and electrical components.	RI/FS is in process.
Site 72 (Waste Pile 13, Northwest Field, DP083)	This waste pile is located in the Northwest Field at Andersen AFB.	Various wastes.	RI/FS is in process.
Site 73 (Waste Pile 14, Northwest Field, DPO84)	This site is a former quarry area located approximately 150 ft from the intersection of 6th and A streets, in the dependent housing area of Andersen AFB.	Drum pile of approximately 20 rusty, but still intact drums – Various wastes.	A ROD issued in 2008 recommended no further response.
Site 74 (UST, Northwest Field, TT085 or former AOC 13)	This site contained one UST in the vicinity of the former flight line facilities. The UST appeared to be inactive; however the UST did contain some unknown fluid inside.	Unknown wastes.	RI/FS is in process.
Site 75 (AST, Northwest Field, TAO86 or former AOC 15, 16, & 20)	This site contained four above ground storage tanks. The drums contained petroleum waste materials.	Petroleum wastes and other contaminants.	RI/FS is in process.
Site 76 (Mixed Waste Area, Northwest Field, WM087 or former AOCs 23, 24, 25, 26, & 27)	This site contains two waste piles, an asphalt pile, abandoned drums, and a trench used for household waste disposal.	Metal and concrete debris, asphalt waste, drums, wood, and telephone poles.	RI/FS is in process.
Site 77 (Operational Support Buildings #4, DAO88)	This 37 ac site consists of a series of operational support buildings located at Andersen AFB.	Scrap metal, aircraft and automobile parts, and UXO.	RI/FS is in process.
Site 78 (Firefighter Training Area 3 or former AOC 8)	This 10 ac site as a former firefighter Training Area.	Aircraft parts, POL, and dioxins.	RI/FS is in process.

***** These sites are associated with Andersen AFB. This list does not include the Andersen AFB stormwater drain system (Zones 1, 2, or 3), drain fields, Solid Waste Management Units (SWMUs), Areas of Concern (AOCs), or the Barrigada Communication Facility.

(Andersen AFB 1993, Air Force 2009 a and b; Air Force 2008a; NAVFAC Pacific 2008d, NAVFAC 2009)

Table 5.3-2. Summary of Applicable SWMUs and Areas of Concern (AOC) Sites on Andersen AFB

Site Number or Location	*Site Identification*	*Name/Description*	*Program or Site Status*
1	AOC 1	Hazardous Waste Storage Facility	RCRA
2	AOC 2	Hazardous Waste Accumulation/Storage Area	FFA
4	AOC 4	Asbestos Disposal Trench	FFA
5	AOC 5	Trench of EIS Site 4	FFA
6	AOC 7A	Aircraft Maintenance Shop – Battery Shops	RCRA
7	AOC 7B	Aircraft Maintenance Shop – USTs	FFA
8	AOC 7C	Aircraft Maintenance Shop – Waste Products Storage Area	FFA
9	AOC 7D	Aircraft Maintenance Shop – Degreasing Unit	FFA
10	AOC 8	Former Firefighter Training Area 3	FFA
11	AOC 9	Oil Blending Facility	FFA
12	AOC 29	Hazardous Waste Storage Area	RCRA
Northwest Field, Andersen AFB	AOC 79 Abandon AVGAS Pipeline	Identified as an AOC due to the potential release of fuel-related constituents from an abandoned aviation gas pipeline. No contaminants of concern were detected above PRGs.	No Further Action Recommended
Northwest Field, Andersen AFB	AOC-80 Clearing West of Housing	Identified as an AOC due to the presence of surface waste debris such as grease cans, metal debris, and glass bottles near a cleared area. Heavy metals found above preliminary remediation goals (PRGs), thus soil remedial or removal action is required.	Soil Remedial or Removal Action is recommended
Northwest Field, Andersen AFB	AOC-81 Air-to-Ground Gunnery Range	Identified as an AOC due to the presence of surface waste debris such as metal debris and glass bottles at the former air-to-ground gunnery range with trenches, mounds, and depressions. Heavy metals found above preliminary remediation goals (PRGs) thus soil remedial or removal action is required.	Soil Remedial or Removal Action is recommended
Northwest Field, Andersen AFB	AOC-82 Sanitary and Burnable Dump	Identified as an AOC due to the presence of surface waste debris such as metal debris and cylinders at a former dump site with glass and metal debris. DDT, copper, and lead above residential PRGs were detected.	No Further Action is recommended based upon health risk assessment
Northwest Field, Andersen AFB	AOC-83 Tank Farm	Identified as an AOC due to the potential release of fuel-related constituents to soils from the abandoned aviation fuel storage area. Benzo(a)pyrene, Benzo(b)fluoranthene, Lead above residential PRGs has been detected.	Soil Remedial or Removal Action is recommended for lead impacted area

Site Number or Location	*Site Identification*	*Name/Description*	*Program or Site Status*
Northwest Field, Andersen AFB	AOC-84 Native Plantation	Identified as an AOC due to the unknown nature of the site's operation. Manganese was detected above residential PRGs.	Soil Remedial or Removal Action is recommended for manganese impacted area
Northwest Field, Andersen AFB	AOC-85 Building 8024	Identified as an AOC due to the presence of surface waste debris such as metal and construction debris near an area with four debris mounds. Antimony, Beryllium, and Manganese were detected above residential PRGs.	Soil Remedial or Removal Action is recommended
Northwest Field, Andersen AFB	AOC-86 Achae Point Quarry	Identified as an AOC due to the potential disposal of hazardous materials including pesticides, PCBs, and/or petroleum related products at an abandoned dump site with glass bottles, scrap metal, vehicle parts, and used oil filters.	No Further Action is recommended based on health risk evaluation
Northwest Field, Andersen AFB	AOC-87 Radar Bomb Scoring Site Cleared Area	Identified as an AOC due to the presence of surface waste debris such as metal debris and an empty 55-gallon drum near a shallow depression area. No contaminants of concern were detected above PRGs.	No Further Action is recommended based on health risk evaluation
Northwest Field, Andersen AFB	AOC-88 Radar Bomb Scoring ite	Identified as an AOC due to the potential disposal of hazardous materials near a group of concrete pads containing remnants of a generator building, former automobile maintenance shop, two small tanks, a flammable storage area, and a septic tank.	No Further Action is recommended based on health risk evaluation
Northwest Field, Andersen AFB	AOC-89 Lighthouse Road Quarry	Identified as an AOC due to the presence of surface waste debris such as soda bottles, a diesel engine block, tires, air brake cylinders, vehicle parts, and scrap metal near quarry. Antimony, Lead, Manganese, and Arsenic were detected at the site.	No Further Action is recommended based on health risk evaluation
Northwest Field, Andersen AFB	AOC-90 Mt. Machanao Area	Identified as an AOC due to the presence of surface waste debris such as a utility pole, insulators, scrap metal, and wires near a mound. Manganese was detected at the site.	No Further Action is recommended based on health risk evaluation

Site Number or Location	*Site Identification*	*Name/Description*	*Program or Site Status*
Northwest Field, Andersen AFB	AOC-91 EOD Rifle Range	Identified as an AOC due to the potential presence of spent ordnance at two mounds suspected of a backdrop for the firing range. Beryllium and Manganese were detected above residential PRGs.	Soil Remedial or Removal Action is recommended
Northwest Field, Andersen AFB	AOC-92 Abandoned AVGAS Tanks	Identified as an AOC due to the potential release of fuel-related constituents and surface waste debris such as bottles, cans, scrap metal, and metal pieces at a former aviation fuel tank farm.	No Further Action is recommended based on health risk evaluation
Northwest Field, Andersen AFB	AOC-93 South Runway Approach Zone	Identified as an AOC due to the presence of surface waste debris such as glass bottles and scrap metal near a group of trenches and mounds. Aluminum, Beryllium, Total Chromium, and Manganese were detected above residential PRGs.	Soil Remedial or Removal Action is recommended
Northwest Field, Andersen AFB	AOC-94 UXO	Identified as an AOC due to the suspected disposal of ordnance at the 380-ac area.	Needs further investigation to characterize the existence of UXO contamination or its potential for a release to the environment.
Northwest Field, Andersen AFB	AOC-95 North Buildings	Identified as an AOC due to unknown nature of the site operation near a group of concrete pads. No contaminants of concern were detected above PRGs.	No Further Action is recommended
Northwest Field, Andersen AFB	AOC-96 Earthen Mounds	Identified as an AOC due to unknown nature of the site operation near an area consisting of two linear mounds. Manganese detected slightly above the residential PRG.	No Further Action is recommended based on health risk evaluation
Northwest Field, Andersen AFB	AOC-97 Waste Pile	Identified as an AOC due to the presence of surface waste debris such as concrete, rusty metal, and broken ceramic dishware near a waste disposal site. No contaminants of concern were detected above PRGs.	No Further Action is recommended
Northwest Field, Andersen AFB	AOC-98 2X Tank Farm	Identified as an AOC due to the potential release of fuel-related constituents to soils at the former location of above ground storage tanks. Benzo(a)pyrene was detected slightly above the residential PRG.	No Further Action is recommended

Site Number or Location	*Site Identification*	*Name/Description*	*Program or Site Status*
			based on health risk evaluation
Northwest Field, Andersen AFB	AOC-99 Service Apron "H" and Quonset Huts	Identified as an AOC due to the suspected disposal of hazardous materials near a group of concrete pads identified as remnants of carpentry, sheet metal, machine, plumbing, and electrical shops. Benzo(a)pyrene, Benzo(a)anthracene, Benzo(b)fluoranthene, Indeno(1,2,3-c,d)pyrene, Copper, and Manganese were detected above the residential PRGs.	Soil Remedial or Removal Action is recommended
Northwest Field, Andersen AFB	AOC-100 East Barracks	Identified as an AOC inadvertently. AOC-100 was a former residential area.	No Further Action is Recommended
Northwest Field, Andersen AFB	AOC-101 Dispensary	Identified as an AOC due to the suspected disposal of hazardous materials at the buildings near the three pits found at the site. No contaminants of concern were detected above PRGs.	No Further Action is Recommended
Northwest Field, Andersen AFB	AOC-102 West Barracks	Identified as an AOC due to presence of surface waste debris such as metal debris and deteriorated drums at the trench. No contaminants of concern were detected above PRGs.	No Further Action is Recommended
Northwest Field, Andersen AFB	AOC-103 Apron 2051	Identified as an AOC due to the potential release of fuel-related constituents to soils near an unpaved aircraft service area. No contaminants of concern were detected above PRGs.	No Further Action is Recommended
Northwest Field, Andersen AFB	AOC-104 Quarry	Identified as an AOC due to the presence of surface waste debris such as empty 55-gallon drums, grease tubes, scrap metal, vehicle parts, and bottles near a quarry. No contaminants of concern were detected above PRGs.	No Further Action is Recommended
14	SWMU 4	Outside Aircraft Washrack Oil/Water Separator	FFA
15	SWMU 6	Outside Drum Storage Area	FFA
16	SWMU 7	Inside Washrack Oil/Water Separator	RCRA
17	SWMU 8A	Outside Drum Storage Area	FFA
18	SWMU 8B	East Oil/Water Separator	FFA
19	SWMU 8C	West Oil/Water Separator	FFA
20	SWMU 9	Outside Drum Storage Area	FFA
21	SWMU 10	Outside Drum Storage Area	FFA
22	SWMU 11	Outside Drum Storage Area	FFA
23	SWMU 12	Outside Drum Storage Area	FFA
24	SWMU 13A	Outside Drum Storage Area	FFA
25	SWMU 13B	Oil/Water Separator	RCRA
26	SWMU 15	Buildings 2550 and 2552 Oil/Water Separator	FFA
27	SWMU 16A	Oil/Water Separator	RCRA
28	SWMU 16C	Waste Oil Storage Tanks	FFA

Site Number or Location	*Site Identification*	*Name/Description*	*Program or Site Status*
29	SWMU 17	Oil/Water Separator	FFA
30	SWMU 18	Outside Drum Storage Area	FFA
31	SWMU 20D	Service Station: Outside Drum Storage Area	FFA
32	SWMU 20E	Service Station: In-ground Sumps and Trenches	FFA
33	SWMU 21C	USAF Clinic, Photo Lab: Incinerator	RCRA
34	SWMU 22A	Aircraft Corrosion Control: Inside Drum Storage Area	FFA
35	SWMU 22B	Aircraft Corrosion Control: Inside Storage Room	FFA
36	SWMU 22C	Aircraft Corrosion Control: Outside Drum Storage Area	FFA
37	SWMU 23A	Hazardous Waste Satellite Accumulation Point	RCRA
38	SWMU 23B	Used Petroleum Products Area	FFA
39	SWMU 25	Defensive Fire Control: Drum Storage Area	RCRA
40	SWMU 27	Corrosion Control (Hazardous Waste Accumulation Area, Flammable Storage Room)	RCRA
41	SWMU 29A	Industrial Corrosion Control – Drum Storage Area	FFA
42	SWMU 29B	Industrial Corrosion Control – Hazardous Materials Storage Areas and Associated Spill Areas	FFA
43	SWMU 29B	Industrial Corrosion Control – Hazardous Materials Storage Areas and Associated Spill Areas	FFA
44	SWMU 29C	Industrial Corrosion Control: Septic System	FFA
45	SWMU 30C	Aerospace Ground Equipment: Oil/Water Separator: Includes Settling Tank	FFA
46	SWMU 30D	Aerospace Ground Equipment: Drum Storage Areas	FFA
47	SWMU 31A	Refueling Maintenance: Drum Storage Area	RCRA
48	SWMU 31B	Refueling Maintenance: Spill Site	FFA
49	SWMU 32A	Auto Hobby Shop: Inside Drum Storage Area	RCRA
50	SWMU 32D	Auto Hobby Shop: Used Petroleum Products Storage Area	RCRA
51	SWMU 32E	Auto Hobby Shop: Abandoned Car Storage Area	FFA
52	SWMU 32G/F	Auto Hobby Shop: Used Battery Storage Area	FFA
53	SWMU 33	Fuels Laboratory	FFA
54	SWMU 34A	Liquid Oxygen (LOX) Facility: Oil/Water Separators	FFA
55	SWMU 34B	Liquid Oxygen (LOX) Facility: Septic Tank and Leach Field	RCRA
56	SWMU 35A & B	Bomb Renovation, Paint, and Refrigeration: Inside Storage Area	FFA
57	SWMU 35C	Bomb Renovation, Paint, and Refrigeration: Outside Storage and Staging Area	FFA
58	SWMU 37A	Line Delivery and Handling: Vehicle Maintenance Pit	FFA
60	SWMU 40B	Roads and Grounds (and heavy equipment shops): Flammable Materials Storage Room	RCRA
61	SWMU 40C	Roads and Grounds (and heavy equipment shops): Equipment Washing Area – Washrack	FFA
62	SWMU 41	Fire Protection Branch	FFA
63	SWMU 42B	Oil/Water Separator	FFA

Site Number or Location	*Site Identification*	*Name/Description*	*Program or Site Status*
64	SWMU 42C	Battery Shop	RCRA
65	SWMU 42D	Hazardous Waste Satellite Accumulation Point	FFA
66	SWMU 42E	Drum Storage Area	FFA
67	SWMU 42F	Vehicle Salvage Area	FFA
68	SWMU 43	Dumpster Washrack	FFA
69	SWMU 44	Hanger Oil/Water Separator	FFA
70	SWMU 46A	POL Washrack Oil/Water Storage Area	FFA
71	SWMU 46B	Outside Drum Storage Area	FFA
72	SWMU 47C	Northwest Field – Power Plant: Waste Oil Storage	FFA
73	SWMU 53B	Andersen 1 Tank Farm: Drum Storage Area	FFA
74	SWMU 53C	Andersen 1 Tank Farm: Land Disposal Area	FFA
75	SWMU 53D	Andersen 1 Tank Farm: Routine Spill Site	FFA
76	SWMU 53F	Andersen 2 Tank Farm: Collection Pit	FFA
77	SWMU 56	Landfill Complex – Landfill 01	RCRA
78	SWMU 57	Drum Storage Area No. 2	FFA
79	DSA – 1	Drum Storage Area No. 1	FFA

(Andersen AFB 1993, Air Force 2009 a and b; Air Force 2008a; NAVFAC Pacific 2008d)

Table 5.3-3. Summary of Active Navy Environmental Restoration Sites in Central Guam

Site ID *Central Guam*	*Site Description*	*Contaminants*	*Status*
BRAC NAS Agana Site 30-37: Agana Power Plant (APP)	The Navy is the lead cleanup agency under BRAC for the APP. APP covers about 3 acres and is located in the village of Mongmong in central Guam. APP was built in 1949 to provide electricity to former Naval Air Station (NAS) Agana (now the Antonio B. Won Pat International Airport). NAS Agana was closed in 1995 eliminating the need for APP.	VOCs, SVOCs, PCBs, dioxins, and TPHs.	Investigations and cleanup activities at the site are complete. Cleanup initiatives completed included the removal and disposal off island of PCB contaminated soils. Land use controls (LUCs) serve as the final remedy for this site. The LUCs involve zoning restrictions, permit requirements, and deed restrictions. In addition statutory five-year reviews of the site are mandated.
IR PWC Site 2810: Construction Battalion (CB) Landfill	The former CB Landfill is located at the Naval Computer and Telecommunications Area Master Station (NCTAMS), Finegayan, Guam. It encompasses 2.6 ac and is located in the southwestern portion of the facility. The former CB Landfill was used primarily for disposal of wastes from a CB maintenance shop. The site was investigated from 1982 through 1995. A removal action was conducted at the site in 1998 and included a low permeability containment system consisting of a soil and synthetic cover system over buried landfill wastes. Based on results of post-removal action monitoring, the site no longer requires groundwater and gas monitoring.	POL	The final remedy for this site is the implementation of LUCs. The site is currently maintained semiannually and five-year reviews are implemented to ensure that the site is not used.
BRAC NAS Agana Site 28: POI-26 Lead-Based Paint Residue in the Enlisted Family Housing Area	This site is one of 11 LUC sites that are part of Operable Unit 2 and IRP Site 2 that are located at the former NAS Agana. Constructed in the 1950s and 1960s and used for housing until the base closed in April 1995. The units are now occupied by GovGuam and are used as offices. Some units have been demolished and the remaining units are scheduled to be demolished.	Lead	Investigations and cleanup activities at the site are complete. The final remedy for this site is the implementation of LUCs. Five-year reviews are implemented to ensure that the site use is restricted.
BRAC NAS Agana Site 7: POI-05 Former Auto Hobby Shop	This site is one of 11 LUC sites that are part of Operable Unit 2 and IRP Site 2 that are located at the former NAS Agana in central Guam. A 1959 Master Shore Station Development Plan shows five structures in the location of the Former Auto Hobby Shop. According to historical maps and aerial photographs, the Auto Hobby Shop was used from at least the early 1970s until 1977. It is not known whether these structures were associated with	Waste oil	The final remedy for this site is the implementation of LUCs. Five-year reviews are implemented to ensure that the site use is restricted.

Site ID *Central Guam*	*Site Description*	*Contaminants*	*Status*
	the Auto Hobby Shop. Although vehicle fluids were supposed to have been containerized in drums, cars were reportedly parked above the two trenches and their vehicle fluids were drained directly into them. These trenches terminate at a ravine, which in turn, drain into the adjacent wetland. The amount of waste oil disposed of into the trenches has not been determined. The trenches were cleaned in 1988 and filled with rocks to prevent further use. No evidence of any oil migrating from the trenches was noted at that time.		
BRAC NAS Agana Site 8: POI-06 GSE Maintenance Facility	This site is one of 11 LUC sites that are part of Operable Unit 2 and IRP Site 2 that are located at the former NAS Agana in central Guam. The facility provided maintenance functions for all ground support equipment from 1965 to 1994. Prior to 1962, waste dry-cleaning solvents were discharged to the ground surface around the facility, and waste oil was reportedly used for weed control in the area before 1963. A hazardous-materials storage locker that stored chemical conversion coatings was located on site. The concrete apron between the two buildings slopes down toward the center where it discharges to two unlined culverts at the fence line. From approximately 1978 to 1991, a sandblast booth was operated on site to strip equipment of enamel paint. No records exist that document the removal and/or disposal of the sandblast grit mounds at the facility.	Waste oil and solvents	Investigations and cleanup activities at the site are complete. The final remedy for this site is the implementation of LUCs. Five-year reviews are implemented to ensure that the site use is restricted.
BRAC NAS Agana Site 12: POI-10 Former Fire Fighting Training Pits	This site is one of 11 LUC sites that are part of Operable Unit 2 and IRP Site 2 that are located at the former NAS Agana in central Guam. From 1955 to base closure, the NAS Agana crash crew regularly conducted fire fighting training activities in four burn pits.	Waste oils, Freon, hydraulic fluids, aviation fuels (JP-4 and JP-5)	Investigations and cleanup activities at the site are complete. The final remedy for this site is the implementation of LUCs. Five-year reviews are implemented to ensure that the site use is restricted.

Site ID *Central Guam*	*Site Description*	*Contaminants*	*Status*
	Activities included burning 500–1,000 gallons of aviation fuel at a time mixed with approximately ten percent waste oils, Freon, and hydraulic fluids.		
BRAC NAS Agana Site 13: POI-11 Former Coral Pit/Dump	This site is one of 11 LUC sites that are part of Operable Unit 2 and IRP Site 2 that are located at the former NAS Agana in central Guam. The Coral Pit/Dump site was created following cessation of fire fighting training in Burn Pit No. 1 in the 1950s. The burn pit was excavated for coral and eventually served as a disposal site for vegetative slash. A 1957 drawing shows this dump in association with an abandoned coral pit. Several 1950s-era aerial photos show standing liquid in the coral pit/dump and four upright, aligned cylindrical objects immediately to the south; in 1959 photos, the cylindrical objects were no longer present. Both the 1956 and the 1959 aerial photos depict an AST to the south and another coral pit to the east.	Asbestos containing material (ACM), Total Petroleum Hydrocarbons (TPHs)	Investigations and cleanup activities at the site were completed in 2001with the removal of debris, asbestos containing material, and TPH impacted soil for disposal at NAS Agana Landfill. The final remedy for this site is the implementation of LUCs. Five-year reviews are implemented to ensure that the site use is restricted.
BRAC NAS Agana Site 20: POI-18 VQ-5 Interceptor Drainage	This site is one of 11 LUC sites that are part of Operable Unit 2 and IRP Site 2 that are located at the former NAS Agana in central Guam. The oil/water separator (OWS) operated for 20–30 years. The adjacent OWS was constructed in approximately 1980, and was used to separate oil and water in the aircraft wash rack effluent or storm water runoff that entered the wash rack.	Waste oils	Investigations and cleanup activities at the site are complete. The final remedy for this site is the implementation of LUCs. Five-year reviews are implemented to ensure that the site use is restricted.
BRAC NAS Agana Site 21: POI-19 PWC Maintenance Facility	This site is one of 11 LUC sites that are part of Operable Unit 2 and IRP Site 2 that are located at the former NAS Agana in central Guam. The hazardous waste storage area was used from the early 1960s until 1995 to store wastes generated at the repair shop prior to offsite disposal. The two USTs adjacent to Bldg. 16-6103 were investigated by the Navy's UST program, and are not addressed here.	Waste oils, solvents	Investigations and cleanup activities at the site are complete. The final remedy for this site is the implementation of LUCs. Five-year reviews are implemented to ensure that the site use is restricted.
BRAC NAS Agana Site 22:	This site is one of 11 LUC sites that are part of Operable Unit 2 and IRP Site 2 that are located at the former NAS Agana in	Fuels, gasoline	Investigations and cleanup activities at the site are complete. The remediation effort completed in 1997

Site ID *Central Guam*	*Site Description*	*Contaminants*	*Status*
POI-20 PWC Guam Gas Station	central Guam. Bldg. 16-94 was used as a fuel-dispensing station from the 1960s through 1993. A leak in the piping beneath the former pump islands was discovered in 1993; an estimated 2,500 gallons of unleaded gasoline was released.		removed TPH containing soil and the above ground storage tank system. The final remedy for this site is the implementation of LUCs. Five-year reviews are implemented to ensure that the site use is restricted.
BRAC NAS Agana Site 23: POI-21 Former Operations Area North of Runway	This site is one of 11 LUC sites that are part of Operable Unit 2 and IRP Site 2 that are located at the former NAS Agana in central Guam. The Navy conducted the majority of aircraft operations and maintenance activities at POI-21 until a 1962 typhoon destroyed most of the structures. Onsite maintenance of planes was also reportedly performed along the flight line. Seven areas (A–G) were identified for investigation based on the hazardous substances reportedly used, stored, generated, and potentially released or disposed of at these locations. These areas include ASTs, OWSs, drainage areas, and the runway zone.	Waste oils, hydraulic fluids, and fuels	Investigations and cleanup activities at the site are complete. The final remedy for this site is the implementation of LUCs. Five-year reviews are implemented to ensure that the site use is restricted.
BRAC NAS Agana Site 5: POI-03 Former Aircraft Graveyard	This site is one of 11 LUC sites that are part of Operable Unit 2 and IRP Site 2 that are located at the former Naval Air Station (NAS) Agana in central Guam. In an aerial photograph from the 1950s, approximately 20 abandoned airplanes in various stages of disrepair are visible on site. In a subsequent photograph taken in 1959, the aircraft are no longer visible. Historic maps indicated no other use of the parcel than that of an aircraft graveyard. It is unknown if aircraft were removed or buried at the site.	Waste oils, hydraulic fluids	Investigations and cleanup activities at the site are complete. The final remedy for this site is the implementation of LUCs. Five-year reviews are implemented to ensure that the site use is restricted.
BRAC NAS Agana Site 2: IRP-02 Drainage Basin Holding Pond	This site is one of 11 LUC sites that are part of Operable Unit 2 and IRP Site 2 that are located at the former NAS Agana in central Guam. As early as 1944, the ponds collected storm water and other wash-down runoff water from runways, access roads, and station facilities, which drain to the interior of NAS Agana. Twenty-eight pre-1950 dry injection wells are installed in each pond to facilitate infiltration into the underlying fractured limestone aquifer. The ponds receive runoff from	PAHs, VOCs, semi volatile organic compounds (SVOCs), pesticides, and metals	The Navy conducted a site investigation during 1986–1989 at IRP-02 as part of the Navy IRP. Investigations and cleanup activities at the site are complete. The final remedy for this site is the implementation of LUCs. Five-year reviews are implemented to ensure that the site use is restricted.

Site ID *Central Guam*	*Site Description*	*Contaminants*	*Status*
	approximately 85 acres of taxiways.		
BRAC NAS Agana Site 1: Former NAS Agana Landfill Site located at the former NAS Agana, Guam	The former NAS Agana Landfill located at the former NAS in the area referred by locals as Tiyan. Tiyan is approximately 40 acres located approximately 4,000 ft west-northwest of the intersection of Routes 8 and 10. The site includes two formerly used refuse disposal areas referred to as the upper and lower landfills.	VOCs, semi volatile organic compounds (SVOCs), pesticides, and metals	LUCs serve as the final remedy for the site. These LUCs prohibit the development and use of the property for residential housing, schools, child care facilities, & playgrounds. Five-year site reviews will be conducted per CERCLA requirements.
IR NCTAMS WESTPAC Site 14: RTF Barrigada Golf Course	The site is a landfill that was utilized from 1950 to 1954. The site is a depression located approx. 400 ft to the southeast of the 3rd hole and approx. 300 ft directly north of the 5th hole of the Nimitz Golf Course. It was reported that municipal "refuse" and possibly waste oil from motor pool activities were indicated that debris generated during construction of the golf course (e.g. trees, shrubs, dirt and rocks) were disposed of at the site.	Total petroleum hydrocarbons (TPH), total fuel hydrocarbons (TFH), and SVOCs.	A Site Inspection (SI) was conducted in September 1991. The SI recommended that further work be conducted to assess the nature and extent of the identified hydrocarbons. A remedial investigation (RI) is programmed to start in FY 12. Potential media: soil and groundwater.
BRAC NAS Agana Site 38: Tamuning Telephone Exchange (TTE), Tamuning, Guam	TTE is a 2-ac land parcel that fronts Marine Corps Drive (Route 1). Hagatna, the capital of Guam is located about 2 miles to the west of TTE and the former NAS Agana is about 700 ft to the southeast of the site. The site is vacant and has a 7-ft high chain link fence surrounding the property to deter unauthorized access. The facility was constructed in 1949 to provide telephone and fire alarm services to NAS Agana until it was closed in 1995. Two USTs were installed at TTE to provide diesel fuel for the emergency generator. The site contains lead/acid batteries and spent solvents.	Sulfuric acid, solvents (carbon tetrachloride)	SI and cleanup are complete. LUCs serve as the final remedy for the site. Five-year site reviews will be conducted per CERCLA requirements.

Site ID *Central Guam*	*Site Description*	*Contaminants*	*Status*
IR PWC Site 36-40: Various Electrical Utilities	The Various Electrical Utilities include Piti Power Plant, Piti Substation, Marbo Power Plant, Harmon Substation, Barrigada Substation, and 13 transmission line sites. These sites are located throughout northern and central Guam. These sites were previously identified to have known or suspected soil contamination in an Environmental Baseline Survey (EBS) in 1996. A Removal Site Evaluation was performed in 2008 and PCBs and metals in soil were detected at concentrations higher than the action levels.	PCBs and metals	The sites are currently undergoing a removal action. Based on the results of the removal action, the sites may require implementation of LUCs as the final remedy. The LUCs may include restrictions on future land use and development and require CERCLA site reviews every five years.
MRP NCTAMS WESTPAC UXO 1: NCTAMS Trap and Skeet Range	The range is located in the area east of Haputo Point. The range was used for recreational shooting in the 1960s and 1970s. It has not been used since the 1980s.	Metals, PAHs	SI field work complete. Preliminary results indicate that elevated concentrations of lead and PAHs are present at this site and further study will be required.
MRP NCTAMS WESTPAC UXO 2: NCTAMS Small Arms Range	The range purportedly exists south of the trap and skeet range. No information is available.	Metals	SI field work complete. Preliminary results indicate that no risk to human health or ecological receptors is present and no further action will be required..

Source: NAVFAC Pacific 2009

Table 5.3-4. Summary of Active Navy Hazardous Waste Sites in Apra Harbor

Site ID *Apra Harbor*	*Site Description*	*Contaminants*	*Status*
IR FISC SWMU #12 DRMO Salvage and Scrap Yard	The site was a DRMO salvage and scrap yard where hazardous materials and waste were stored and handled. Final RFI report recommended cleanup of surface soil and sediment because of SVOCs, PCBs, and lead contamination. In July 1999, about 50 cubic yards of contaminated soil at various locations within the DRMO compound and adjacent drainage swales were removed. Subsequent verification sampling determined that all contamination was removed except PCB hotspots located in adjacent drainage swales. Average concentration of 84 mg/kg in subsurface soils was not deemed hazardous to human or ecological receptors because of the existing vegetation cover	Waste oils, solvents, PCBs, metals, TPHs	. A removal action is ongoing for the removal of PCBs in surface and subsurface soil within the drainage swale.
IR NAVACTS Site 4: NEX Garage, Waste Battery Storage Area & Oil/Water Separator	Site was a former garage, waste battery storage area that also contained an oil/water separator. Final RFI report recommended removal of lead from surface soil, catch basin sediment, and drainage ditch sediment. No other contaminants were detected at hazardous concentrations. Cleanup of lead contaminated areas below site cleanup levels for continued restricted use have been completed. Site is considered response complete, no further action necessary.	Solvents, metals, PCBs, and TPHs	The final remedy for this site is the implementation of LUCs. Five-year reviews are implemented to ensure that the site use is restricted.
IR NAVACTS SWMU #26: Spanish Steps Disposal Area	This site was a former disposal area of a variety of hazardous wastes and substances.	Solvents, PAHs, PCBs, waste paints, TPHs, metals	Final RFI report recommended source removal action in tidal pond. Limited sediment removal and ecological risk assessment have been performed. Draft Baseline Ecological Risk Assessment identified potential risk from PCBs to ecological receptors in tidal pond water and sediments. Additional studies are planned for this site.
IR PWC Site #16: PWC Transformer Filter Area, Building 3009	Building 3009 was used as an electrical transformer maintenance and repair shop from 1950 to 1977. Electrical transformers were overhauled there, which involved the cleaning and repairing of parts and the recycling of transformer oils. Four storage tanks were located beside the building with two filtering systems; one for mineral oil and the other for PCB oil. In 1977, the PCB filter system and piping were removed due to leakage from the PCB storage tank.	PCBs	The site is currently undergoing a removal action to address PCB soil contamination using a thermal treatment system and is anticipated to be completed in 2009. LUCs will be implemented for portions of the site as the final remedy. The LUCs will include restrictions on future land use and development and require CERCLA site reviews every five years.

Site ID *Apra Harbor*	*Site Description*	*Contaminants*	*Status*
IR NAVACTS Site #31: Dry Cleaning Shop (DCS) Site Apra Harbor	The DCS Site was in operation from 1952 to 1975 and processed the laundry and dry cleaning for all Naval facilities. Eight USTs were located onsite which contained Stoddard solvents (dry cleaning solvents), fuel oils (for use in the cleaner boilers), and brine storage (possibly for water softening treatment). An investigation was initiated because solvents were believed to have leaked from USTs or dumped on the ground as sludge and could potential have impacted to the groundwater. The result of the baseline human health risk assessment and preliminary ecological risk assessment showed that current contaminant levels at the site do not pose a significant risk to humans or the environment. Concurrence of the final remedy of no further action at the site under an industrial land use scenario was documented in the decision document signed by the Navy and Guam EPA.	Fuel, TPHs, PAHs, solvent-related , and metals	The final remedy for this site is the implementation of LUCs. Five-year reviews are implemented to ensure that the site use is restricted.
IR NAVACTS Site #1: Orote Landfill Waste Burning & Disposal Area	The Orote Landfill occupies approximately 7 ac of land. It was used for the disposal of residential, industrial, and construction wastes from approximately 1944 to 1969. Construction of a seawall and landfill cap was completed in 2001.	PCBs, pesticides, dioxins, PAHs, VOCs, and metals.	Long-term monitoring and maintenance of the landfill cap and seawall, long-term groundwater monitoring and LUCs are proposed as the final remedy. Long-term monitoring and maintenance of the landfill cap and seawall at this site is ongoing. The LUCs will restrictions on future land use and development and require CERCLA site reviews every five years.
IR NSRF Site #24: Area Behind NAVSHIPREP FAC Fenceline	Site was a former hazardous waste disposal area. A Removal Action was completed in 2007. Decision Document was signed in October 2007 and a Land Use Control Work Plan was finalized in March 2008. 12-month wetland restoration monitoring was completed in September 2008.	TPH, solvents, pesticides, PCBs, and metals	Long-term monitoring (annual monitoring) is in-progress. The final remedy for this site is the implementation of LUCs. The site is currently maintained semiannually and five-year reviews are implemented to ensure that the site is not used.
IR NSRF Site #26: Building 27 Boiler Facility & Demineralization	Site includes a former boiler facility and demineralization unit.	Petroleum contaminants	A RI is scheduled for 2010. The Final Current Conditions Report recommended no further action for the Demineralization Units.

Site ID / *Apra Harbor*	*Site Description*	*Contaminants*	*Status*
Units			
IR FISC Site #35: UST at X-ray Wharf	Former UST and X-ray wharf area.	Petroleum compounds and lead	Site transferred from UST program. Soil contains contaminants from former UST. Site schedule is: -Fieldwork (Fall 2009) -Draft SI Report (Winter 2009) -Final SI Report (Spring 2010)
IR FISC Site 19: Former Lower Sasa Fuel Burning Pond Piti, Guam	The former Lower Sasa Fuel Burning Pond at the former Fleet Industrial Supply Center (FISC), Piti, Guam is located in the southwestern portion of Guam. The site is comprised of approximately 20 ac and is about 0.7 mile south of the intersection of Route 1 and Cabras Highway. The facility managed oily wastewater from ships and the FISC Fuel Department. Waste was collected in the pond and drained through a channel to adjacent wetlands. A Removal Action was completed in 2007. Decision Document was signed in October 2007 and a Land Use Control Work Plan was finalized in March 2008. 12-month wetland restoration monitoring was completed in September 2008.	Waste oil	Long-term monitoring (annual monitoring) is in-progress. The final remedy for this site is the implementation of LUCs. The site is currently maintained semiannually and five-year reviews are implemented to ensure that the site is not used.
MRP NAVACTS UXO 4: Orote Point Rifle and Pistol Range	The range is located on the southern portion of Orote Peninsula outside the restricted access area related to Kilo Wharf. The range was last used by Marine units in the 1980s.	Metals	SI field work complete. Preliminary results indicate that elevated concentrations of lead. Further study is required.
MRP NAVACTS Site 2: Spanish Steps Trap and Skeet Range	The range is located along the northern cliff line of the Orote Peninsula. Primarily used for recreational shooting during the 1960s and 1970s, the range was closed and deactivated in the late 1980s. The area is infrequently used as an informal overflow parking lot for the Spanish Steps, Spanish Well, and Orote Archaeology Sites (three historic sites located in this area)	Metals, PAHs	SI field work complete. Preliminary results indicate that elevated concentrations of lead and PAHs are present at this site and further study is required.

Source: NAVFAC Pacific 2009

Table 5.3-5. Summary of Active Navy Hazardous Waste Sites in South Guam

Site ID *South Guam*	*Site Description*	*Contaminants*	*Status*
IR NAVACTS Site 35: Tear Gas Burial Site	This site is located in the northwest corner of the Naval magazine in southern Guam. Approximately 350 pounds of tear gas were buried in the 1960s in one gallon metal canisters about 8 ft deep.	Chloroacetophenone (CN) or mace and chlorobenzylidene malononitrile (CS) and other debris and burn area-related chemicals	Planned activities include a RI to evaluate the extent of the site. If necessary, based on the results of the RI, an evaluation of cleanup alternatives will be conducted.
BRAC NAVACTS Site 28: Route 2A, formerly known as the Old WESTPAC site	The former NAVACTS is located in the New Apra Habor Complex in West-central Guam. Route 2A is located within the southernmost portion of the former NAVACTS, northeast of Agat Bay. Route 2A is a former vehicle and heavy equipment maintenance and automotive repair unit operational from 1947 to 1967 and sporadically up until 1979. Activities included steam cleaning and sand blasting. A diesel and gasoline fueling station was part of the site as well as two electrical transformers. Contaminants were dumped directly on the ground or washed down the storm drain system which discharges into wetlands immediately south of the site. Removal actions at five areas within the Route 2a site have reduced risks to ecological receptors. There are still two areas where PCB levels exceed criteria for unrestricted land usage. Approximately 1,400 cubic yards of contaminated soil were removed and disposed of off-island at an approved waste facility.	Waste oils, solvents, paints, battery acid, brake and transmission fluids, hydraulic fluids, chlordane, Dichloro-Diphenyl-Trichloroethane (DDT), lead, copper, and PCBs	Investigations and cleanup activities at the site are complete. The final remedy for this site is the implementation of LUCs. Five-year reviews are implemented to ensure that the site use is restricted.
MRP NAVACTS UXO 3: Naval Magazine Small Arms Range	The range is located close to Bona Spring in the northern portion of former Naval Magzine. The range was last used by Marines units in the 1980s.	Metals	SI field work complete. Preliminary results indicate that elevated concentrations of lead may present a risk. Further is study is required.

Source: NAVFAC Pacific 2009

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