

3.10.7 Protection of Children

Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks (April 21, 1997), requires federal agencies to identify and assess environmental risks and safety risks that may disproportionately affect children. On Tinian, most families with children reside south of the Military Lease Area in the villages of San Jose and Marpo Heights. The island’s schools, parks, and playgrounds are located within San Jose. No children reside, attend school, or otherwise congregate for long periods in the Military Lease Area.

3.11 Utilities

Utilities on Tinian include water supply (potable water, non-potable water, and groundwater), wastewater treatment, management of solid and hazardous waste, green waste, stormwater, electrical power systems, and communications systems.

3.11.1 Potable, Non-Potable, and Groundwater Water Supply

3.11.1.1 Commonwealth Utilities Corporation

The Commonwealth Utilities Corporation owns, operates, and maintains the public water system on Tinian, including sources, treatment, storage, testing, and distribution of potable water to approximately 800 metered connections outside the Military Lease Area (Commonwealth Utilities Corporation 2015). The distribution system does not extend into the Military Lease Area.

A single groundwater well, Maui Well Number 2, is the sole source of potable water for the island. Maui Well Number 2 has a total operational pumping capacity of approximately 1.5 million gallons per day (Commonwealth Utilities Corporation 2015; DON 2019). Maui Well Number 2 meets U.S. EPA Primary and Secondary Drinking Water Standards including for per- and poly-fluoroalkyl substances (Commonwealth Utilities Corporation 2024a). Figure 3.11-1 provides an overview of the Commonwealth Utilities Corporation public water system and its components. The system disinfects water using chlorine and no other water treatment is necessary.

Table 3.11-1 summarizes water production (i.e., extraction) quantities from Maui Well Number 2 as recorded by the Commonwealth Utilities Corporation at the well site for the last five years. Production includes water delivered into the distribution system, which is inclusive of water billed to customers, unmetered uses, leaks, losses, and overflows.

**Table 3.11-1 Commonwealth Utilities Corporation
Water Production from Maui Well Number 2**

<i>Year</i>	<i>Total Annual (MG)</i>	<i>Average Daily (MGD)</i>
2019	313	0.86
2020	312	0.85
2021	307	0.84
2022	321	0.88
2023	306	0.84
Average		0.85

Legend: MG = million gallons; MGD = million gallons per day.

Source: Commonwealth Utilities Corporation 2024b.



Figure 3.11-1 Public Water System

Table 3.11-2 summarizes billing records for all the Commonwealth Utilities Corporation customers based on meter readings. All registered connections served by the Commonwealth Utilities Corporation are metered and read monthly.

Table 3.11-2 Commonwealth Utilities Corporation Billed Water Demand

<i>Year</i>	<i>Total Annual (MG)</i>	<i>Average Daily (MGD)</i>
2019	88	0.24
2020	77	0.21
2021	81	0.22
2022	84	0.23
2023	87	0.24
Average		0.23

Legend: MG = million gallons; MGD = million gallons per day.

Source: Commonwealth Utilities Corporation 2024c.

The average daily production from Maui Well Number 2 between 2019 and 2023 was 0.85 million gallons per day and the average billed water demand was 0.23 million gallons per day.

The Commonwealth Utilities Corporation water system includes a total of 1.25 million gallons of storage between three existing aboveground welded steel reservoirs.

- Marpo Tank has a capacity of 0.25 million gallons and is currently out of service.
- Carolinas Tank 1 has a capacity of 0.50 million gallons.
- Carolinas Tank 2 has a capacity of 0.50 million gallons and is in operation.

3.11.1.2 Francisco Manglona Borja / Tinian International Airport

TNI is owned and operated by the Commonwealth Ports Authority. As a customer of the Commonwealth Utilities Corporation, it receives all potable water from Maui Well Number 2. Downstream of the Commonwealth Utilities Corporation water meter, the Commonwealth Ports Authority operates its own water system within the airport property.

3.11.1.3 United States Agency for Global Media

The USAGM, formerly the International Broadcasting Bureau, operated a radio transmitting facility on Tinian. This facility is not connected to the Commonwealth Utilities Corporation system. Rainwater is captured from a portion of the roof and stored in two aboveground tanks with a total capacity of 8,500 gallons. All water used at the facility is non-potable, except for a point-of-use-reverse osmosis system which treats water for potable use in the kitchen. Most water comes from harvesting rainwater, except in dry months. Approximately 5,000 gallons per year are purchased from Commonwealth Utilities Corporation and trucked in bulk.

3.11.1.4 Tinian Mayor’s Office

Groundwater is owned by the Tinian Mayor’s Office and a fee is charged for the quantity of water extracted. The Tinian Mayor’s Office owns and operates two non-potable water wells: M-21 and M-26. Neither well is connected to a pipeline network.

- Well M-21 is primarily used by the contractor for the U.S. Air Force’s Tinian Divert Infrastructure Improvements project at TNI. It has a water meter and a 40,000-gallon tank.

In 2024, it was permitted to extract up to 1.8 million gallons per month (J. Aldieri, NAVFAC Marianas, Personal Communication, September 10, 2024).

- Well M-26 is primarily used by cattle ranchers and is not metered.

3.11.2 Wastewater Treatment

Tinian has no centralized municipal wastewater collection and treatment system. Public and private buildings rely on individual septic tanks and leach fields, or seepage pits for wastewater treatment and disposal. The Bureau of Environmental and Coastal Quality Wastewater, Earthmoving, and Erosion Control Program oversees residential septic systems design and permitting. It also conducts village-by-village household surveys to identify septic systems that require upgrades or need a pump-out to properly collect and treat wastewater (CNMI Bureau of Environmental and Coastal Quality 2020). The Commonwealth Utilities Corporation has initiated a feasibility study for a new wastewater treatment system with collection mains for Tinian (CNMI Bureau of Environmental and Coastal Quality, Personal Communication, September 12, 2024). Until such a system is funded and constructed, residents and visitors will continue to rely on private septic systems.

The USAGM operated an Individual Wastewater Disposal System, constructed in 1997, consisting of a packaged wastewater treatment system for aerobic digestion. Treated wastewater is disposed of in a leach field without a septic tank.

The DoD owns and operates an existing septic tank and leach field near Camp Tinian, which is located inside the Military Lease Area. The septic tank measures 25 by 20 by 5 feet and the leach field is 75 by 40 feet. The system is permitted for an average daily sewage flow of 6,640 gallons per day (Department of Environmental Quality 1999). This septic tank and leach field is not anticipated to be used for the Proposed Action.

3.11.3 Solid Waste and Hazardous Waste

The CNMI Department of Public Works operates an unlined, open dump for municipal solid waste at Tinian Puntan Diablo disposal facility located adjacent to 8th Avenue near San Jose and the southwest coast. In 2010, the Bureau of Environmental and Coastal Quality issued an administrative order to the CNMI Department of Public Works documenting violations of the CNMI Solid Waste Management Regulations and imposing operational requirements. In response to the administrative order, the CNMI Department of Public Works planned to close the dump by February 2017 but has not done so, leaving the open dump as the only solid waste disposal option on Tinian (USMC Utilities Working Group Meeting April 2023). Because the existing Puntan Diablo disposal facility has limited remaining capacity, the CNMI is initiating permitting efforts for a new landfill at Atgidon site, located north of 86th Street and between Riverside Drive and 10th Avenue. The CNMI anticipates permitting of this new landfill would take 5 years to complete.

In 2020, the CNMI Department of Public Works completed construction of the Tinian Transfer Station and Recycling Center, and operations began in 2022 (CNMI Department of Public Works 2020, 2022). The facility currently collects source-separated recyclable materials such as cardboard/paper, plastic bottles, and aluminum cans. Recyclable materials are shipped off the island for processing and sale, and the costs of handling and transportation exceed the revenue generated by the sale of the recyclables.

Tinian has no public facilities for hazardous waste transport, storage, or disposal. Commercial hazardous waste generators use contractors to dispose of hazardous waste off the island (CNMI Office of the Governor 2023). Household hazardous waste in the municipal solid waste stream includes used batteries, electronics, appliances, cleaning agents, fertilizers, and pesticides. These items are currently disposed of in the same landfill as all other solid waste on Tinian.

Due to the lack of a permitted and compliant landfill or hazardous waste disposal facility on Tinian, the military currently removes all solid and hazardous waste generated during training exercises for off-island disposal in accordance with applicable laws and regulations. This includes expended brass deposited during training events (DON 2023).

The USAGM facility contains two 30,000-gallon diesel fuel storage tanks (International Broadcasting Bureau 2009). The facility generates universal wastes, such as fluorescent light bulbs and batteries, which are temporarily stored in the facility's hazardous waste storage area before transporting them off-island for proper disposal/recycling (DON 2013). Solid waste from the facility is managed within the local solid waste infrastructure. Residual waste, after recycling, is disposed of at the Puntan Diablo facility.

3.11.4 Green Waste

Green waste generated by residents on Tinian is managed at the Tinian Organics Processing Site operated by the Department of Public Works. It was permitted in June 2022 for green waste disaster debris and does not accept green waste from commercial generators. The site is equipped with a wheel loader and a chipper for processing and storing green waste. It receives approximately 660 cubic yards per year (CNMI Office of the Governor 2023).

3.11.5 Stormwater Management

Stormwater is managed within the public road infrastructure, at TNI, and the Port of Tinian. The CNMI Department of Public Works maintains the roadway stormwater infrastructure, primarily consisting of concrete gutters, curbs, and vegetated swales. The Commonwealth Ports Authority maintains the airport and port stormwater infrastructure. At the Port of Tinian, inlets and pipes direct runoff from paved areas into shallow retention basins. At TNI, paved surface areas are graded to direct runoff into large, shallow retention basins. Stormwater captured in swales, retention basins, and depressions infiltrates rapidly due to the high soil porosity throughout the island. During heavy rainfall, excess stormwater flows into the ocean.

The CNMI Division of Environmental Quality, Bureau of Environmental and Coastal Quality, and the U.S. EPA regulate stormwater under the National Pollutant Discharge Elimination System. The program regulates three pollutant sources: municipal separate storm sewer systems, construction activities, and industrial activities. Tinian is not regulated as a municipal separate storm sewer system because no municipal stormwater outfalls exist on Tinian. Construction and industrial activities must implement best management practices to minimize stormwater runoff from transporting pollutants to surface waters, nearshore waters, and groundwater.

In the Military Lease Area, stormwater flows mainly over unmaintained swales and shallow depressions constructed during World War II. Tinian's highly porous soils and karst geology enable rapid stormwater infiltration.

3.11.6 Electrical Power System

The Commonwealth Utilities Corporation operates a diesel-fueled power plant on Tinian consisting of six engines totaling 20 megawatts of rated capacity. There are 18.5 megawatts of this capacity held for reserves to support the island wide distribution covered in this study (Commonwealth Utilities Corporation 2021). The operating capacity of the power plant is currently 18.2 megawatts. In 2021, the Commonwealth Utilities Corporation reported an average peak load of 1.9 megawatts per day, lower than the pre-2019 average of 2.5 megawatts per day (Commonwealth Utilities Corporation 2021). Four feeder circuits consisting of overhead electrical lines convey power from the plant to the customers. Feeders 1, 2, and 3 supply power outside the Military Lease Area. Feeder 4 supplies power within the Military Lease Area to the former USAGM facility. Feeder 4 has a 5-megawatt capacity with the USAGM using 1.4 megawatts, leaving 3.6 megawatts available in the Military Lease Area. See Appendix M, Electrical System Analysis for detailed information on the existing electrical power system.

The Commonwealth Utilities Corporation also has several small solar photovoltaic projects installed at public facilities and schools and is planning a 3-megawatt solar photovoltaic plant (Energy Information Administration 2020). To meet the Comprehensive Sustainable Development Plan's clean affordable energy goal of meeting 20 percent of the peak electricity demand on each of the inhabited CNMI islands, the Commonwealth Utilities Corporation is developing a Comprehensive Energy Plan and planning installation of an integrated utility-scale photovoltaic system (CNMI Office of Planning and Development 2021). The corporation is collaborating with the U.S. Department of the Interior, Office of Insular Affairs and the U.S. Department of Energy to update a new Energy Master Plan (Commonwealth Utilities Corporation 2021).

In 2020, the Commonwealth Utilities Corporation received a \$36 million CNMI federal grant to repair and reinforce infrastructure damaged by recent typhoons. The funds will support powerplant upgrades, concrete power pole installation, and undergrounding of transmission lines to protect them from future storm damage (Energy Information Administration 2020). As of October 2021, CNMI had installed approximately 1,000 new concrete power poles on Tinian (Commonwealth Utilities Corporation 2021). Figure 3.11-2 provides an overview of power distribution on Tinian.



Figure 3.11-2 Tinian Power Distribution

3.11.7 Communications

Tinian's information technology and communications infrastructure includes telephone, internet, cable television, and satellite service. IT&E and Docomo Pacific provide commercial information technology and communications services. Both companies provide phone, internet, and cellular phone service through overhead distribution lines and towers in the southern part of Tinian. Marianas Cable Vision Broadband and Docomo Pacific provide cable television service through overhead distribution lines in the southern part of Tinian. The Military Lease Area has no commercial or military information technology and communications infrastructure.

Two undersea fiber optic cable links, one owned by IT&E and one owned by Docomo Pacific, connect Tinian and Saipan to the Trans-Pacific Cable hub on Guam, enabling phone, internet, cellular phone, and high-definition television services. A microwave system provides alternative connectivity if the cables fail. The USAGM Tinian site has thirteen towers, and the USAGM site on Saipan has four.

3.12 Topography, Geology, and Soils

Topography, geology, and soils describe surface and subsurface features of land. Topography is typically described with respect to the elevation, slope, and surface features found within a given area. Geology is characterized by the physical features of the earth and includes rock type, geologic structure (e.g., faults, folds, and tilting of rocks) and mineral deposits. Soil is the unconsolidated mineral or organic material on the top layer of the earth that serves as a natural medium for the growth of plants.

The USAGM Saipan site is not discussed further under the existing environment section for topography, geology, and soils. USMC would repurpose existing communication towers at the USAGM Saipan site, and no clearing or new construction would be required.

3.12.1 Topography

Tinian is approximately 12 miles long and 6 miles wide. The island is composed of a series of limestone plateaus separated by steep slopes and cliffs (U.S. Department of Agriculture 1989). The northern portion of the Military Lease Area is generally level with elevations that range between 30 and 100 feet above mean sea level, except for Lake Hagoi, where the elevation is approximately at sea level. The southern portion of the Military Lease Area and TNI is a broad and gently sloping plateau. Within the northern part of this plateau is a highland with a maximum elevation of 545 feet above mean sea level at Mount Lasso. From Unai Dankulo and Unai Masalok in the southeastern portion of the Military Lease Area, a low, broad depression extends southward past Marpo Marsh and includes San Jose Village and the area around the Port of Tinian. This area has a maximum elevation of 150 feet above mean sea level. To the east of this broad depression are the Pina Plateau and Carolinas ridges that extend to the southern tip of Tinian and includes Kastiyu, the highest part of the island at 614 feet above mean sea level. It has steep slopes and cliffs as high as 500 feet above mean sea level. Wetland topographic features including Lake Hagoi and Marpo Marsh are discussed in Section 3.14.1 (Surface Water). Topographic contours are shown in Figure 3.12-1.