The net changes in greenhouse gas emissions from Alternative 2, compared to the No Action Alternative, would increase CO_2e emissions within both the CNMI and the U.S. territories by the percentages shown in Table 4.9-10.

The net changes in greenhouse gas emissions resulting from Alternative 2 were also compared to equivalencies, such as annual household emissions, average emissions from a certain number of vehicles on the road, or the quantity of fuel burned that are summarized in Table 4.9-11. The changes in greenhouse gas emissions from Alternative 2 would only result in a small percentage of total greenhouse gas emissions in the U.S. Therefore, the greenhouse gas emissions from Alternative 2 should have a less than significant impact.

Table 4.9-12 Alternative 2 Greenhouse Gas Annual Emissions (Maximum Construction Year and Training Events Occurring Concurrently)

Location/Source	*Annual Emissions (Metric Tons)*			
	CO_2	***CH_4***	***N_2O***	***CO_2e***
State (0-3 nm offshore) [< 3,000 ft altitude]				
On-road Vehicles	509.674	0.022	0.008	512.743
Off-road Vehicles and Equipment	13,047.661	0.042	0.019	13,054.355
Aircraft	128,374.929	5.390	1.053	128,823.380
Stationary Sources	544.912	0.022	0.004	546.782
Maximum Construction Year	865.570	0.018	0.018	871.386
Total	**143,342.746**	**5.495**	**1.102**	**143,808.646**
Waters of U.S. (3-12 nm offshore) [< 3,000 ft altitude]				
Aircraft	14,919.438	0.623	0.122	14,971.456
Total	**14,919.438**	**0.623**	**0.122**	**14,971.456**
High Seas (>12 nm offshore) [< 3,000 ft altitude]				
Aircraft	8,203.306	0.333	0.067	8,231.524
Total	**8,203.306**	**0.333**	**0.067**	**8,231.524**
> 3,000 ft Altitude				
Aircraft	489,813.914	20.393	4.011	491,519.058
Total	**489,813.914**	**20.393**	**4.011**	**491,519.058**
Combined Alternative 2 + Construction Total	**656,279.403**	**26.844**	**5.303**	**658,530.683**
Increase from No Action Alternative	**61,154.843**	**2.350**	**0.486**	**61,358.307**

Legend: < = less than; > = greater than; CH_4 = methane; CO_2 = carbon dioxide; CO_2e = carbon dioxide equivalent; ft = feet; N_2O = nitrous oxide; nm = nautical miles; U.S. = United States.

4.10 Public Health and Safety

4.10.1 Approach to Analysis

The analysis focuses on the Proposed Action's potential impacts on Tinian to public health and safety from ground training, aviation training and civilian aviation, radio frequency and microwave emissions, natural hazards, construction, and protection of children from environmental health and safety risks. For each of these categories, the subsections below evaluate potential impacts relative to the existing conditions described in Section 3.10, taking into account regulatory standards, established safety protocols, and best management practices as applicable.

The Proposed Action also includes the establishment of a new lease and the reuse of existing facilities, including up to four communication towers at the former USAGM site on Saipan. However, no military training is proposed to occur on Saipan, and public access to the site would remain restricted. Therefore, no impacts to public health and safety are anticipated in association with the Saipan site.

4.10.2 No Action Alternative

Under the No Action Alternative, ground and aviation training events would continue on Tinian with the same or similar types of activities and tempo as described in previous NEPA documents (DON 2010, 2015). The existing environment also includes completed improvements associated with the U.S. Air Force Divert project (U.S. Air Force 2016, 2020). Additionally, projects under the Air Force's Agile Combat Employment program would proceed, including vegetation clearance and restoration of the runway and other engineered surfaces at North Field, which would improve roadways used for public access and benefit public health and safety. Military training within the Military Lease Area would continue under existing standard operating procedures that ensure public safety. Related to wildfires, no new ignition sources would be introduced by military training. Therefore, no changes or impacts to public health and safety would occur under the No Action Alternative.

4.10.3 Alternative 1

4.10.3.1 Ground Training

Under Alternative 1, the tempo of training would increase by approximately 15 percent over the No Action Alternative. As described in Section 3.10, the military employs a proactive and comprehensive program to ensure the safety and health of training personnel and the public who may frequent the Military Lease Area. Range Control would be responsible for ensuring training units follow all federal and local laws and regulations and military guidance, policies, and procedures. Environmental risks associated with live-fire training activities potentially include soil contamination from munitions residues and water contamination from hazardous materials. Lead is also the primary contaminant of concern for the Multi-Purpose Maneuver Range, along with the disposition of small amounts of munitions constituents from ordnance use at both live-fire ranges. Munitions constituents in partially or unexploded ordnance are contained within the munition itself, and thus release of munitions constituents due to corrosion of the casing may take a long time to occur, although salt spray and humidity may accelerate deterioration of the casing. However, lead has low mobility and extremely high soil affinity as the primary condition that would influence the movement or mobility of lead in an environment is the pH of the soil.

The geology of Tinian is predominantly karst, and the soils are derived from limestone bedrock with abundant carbonates and are naturally neutral (pH 6.5–7.0) to alkaline (greater than 7.0). At neutral pH, heavy metals, like lead, become relatively insoluble and the potential for lead to be transported to the groundwater or in surface water runoff would be very low (Weil and Brady 2017) with the soil further acting as a filter for particulate lead (DON 2016).

Therefore, the potential for significant contamination of groundwater is low, and impacts associated with munitions constituents in soil and water would be less than significant with implementation of standard range management practices and monitoring. Range Control would enforce range clearance procedures to ensure hazardous materials are removed and to ensure the long-term safety and sustainability of the live-fire ranges. At the conclusion of training, units are

In addition, Range Control and the training unit would coordinate to identify and address any low-order detonations. This includes post-training inspections to verify that all munitions functioned as intended and that no unexploded or partially detonated ordnance remains. Any suspect items would be reported and handled in accordance with explosive ordnance disposal (EOD) procedures to prevent long-term environmental exposure or migration into soils or groundwater.

The *Operational Range Clearance Program*, MCO 3550.12A, requires live-fire ranges (i.e., the Multi-Purpose Maneuver Range and Explosives Training Range) periodically undergo thorough clearances of any remaining ammunition, dunnage, and other debris resulting from military activities. The appropriate frequency of range clearance activities is determined for each live-fire range based on the recorded data on munitions expenditures along with visual assessments of the range. Further, measures to limit erosion and prevent stormwater from leaving live-fire ranges would be implemented, as described in Appendix D. The specific measures for each live-fire range would be determined during the design of the range to maximize effectiveness. Finally, the USMC would implement a Range Environmental Vulnerability Assessment, which would be conducted one year after the range begins operations and reassessed every five years. Mitigating environmental impacts from active ranges complies with the requirements outlined in DoD Instruction 4715.14, *Operational Range Assessments*.

Operational Range Assessment Program / Range Environmental Vulnerability Assessment Program

DoD Instruction 4715.14, Operational Range Assessments, establishes policies and procedures to ensure the long-term sustainability of operational ranges while being protective of the environment (DoD 2018). In doing so, DoD Instruction 4715.14 provides instruction to aid in the determination of whether a release or substantial threat of a release of munitions constituents from an operational range to an off-range area creates an unacceptable risk to human health or the environment. For this Proposed Action, the "off range" area would be considered as the area outside the range footprint on land (i.e., the boundaries shown for the Multi-Purpose Maneuver Range and Explosives Training Range and their respective surface danger zones). Munitions constituents are any materials originating from unexploded ordnance or other military munitions, including explosive and non-explosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions (10 U.S.C. 2710(e)(4)) (DoD 2018).

Range Environmental Vulnerability Assessment Periodic Reviews are required for each eligible Marine Corps range. New ranges will be assessed as they become operational. After the initial assessment, the USMC would conduct periodic reviews in accordance with the Range Environmental Vulnerability Assessment Periodic Review Guidance Manual every 5 years or sooner, if changes in range use or conditions warrant. Throughout this process, if at any time it is determined a release of munitions constituents has occurred that potentially impacts human health and/or the environment, a notification will be made to the appropriate regulatory agency, as required by DoD Instruction 4715.14.

The primary purpose of a Range Environmental Vulnerability Assessment is determining whether there has been a release or substantial threat of release of munitions constituents from an operational range or range complex to off-range areas that creates an unacceptable risk to human health and the environment.

The Range Environmental Vulnerability Assessment program assesses potential migration of munitions constituents found on USMC ranges, which includes explosives constituents, ammonium and potassium perchlorate, and metals. Among the explosive munitions constituents, the Range Environmental Vulnerability Assessment program focuses on TNT, HMX, RDX, and their respective degradation and breakdown products.

Metals associated with ammunition commonly used at operational ranges include lead, antimony, copper, and zinc. The Range Environmental Vulnerability Assessment program focuses on lead as the munitions constituents indicator. Lead is primarily associated with small arms military munitions and is the most prevalent metal found in soils on operational ranges.

Best management practices to manage munitions constituent migration from operational ranges can include, but are not limited to, operational changes, vegetative solutions, stormwater management, geosynthetic materials, and soil amendments. Operational range clearance and lead recovery are effective best management practices because they reduce the source of munitions constituents from operational ranges.

Transportation

Training under Alternative 1 would result in increased vehicle traffic on paved and unpaved roadways within the Military Lease Area during training events. Increased vehicular traffic on key transportation routes would occur at the beginning and end of training events, when materials and equipment may be transported from TNI or the Port of Tinian on local roadways, primarily 8th Avenue, but Broadway may also be used. Due to the limited traffic volumes on the primary roadways within the Military Lease Area (refer to Section 3.7, Transportation), this increased activity is unlikely to impact public health and safety related to potential collisions, road wear, and reduced visibility due to dust. Although the risks are minimal, they would be further reduced through Range Control's oversight and adherence to speed limits and road safety regulations. When warranted, traffic control measures would be employed, including signage, flaggers, or temporary access control points to ensure the public remains safely separated from military training activities. Range Control and training personnel would monitor military vehicle traffic to ensure compliance with safety guidelines, while coordination with local authorities would help manage traffic flow and minimize disruptions.

Public Access

Range Control would manage access to the areas around live-fire ranges and areas where munitions are temporarily staged to maintain public safety while live-fire training is occurring. The proposed surface danger zones for the Multi-Purpose Maneuver Range and Explosives Training Range are shown in Figure 4.10-1 and the explosive safety quantity distance arcs for the ammunition holding areas are shown on Figure 4.10-2. The temporary staging of ammunition at the holding areas poses risks such as accidental detonation, fire, or unauthorized access, potentially resulting in injuries, property damage, or environmental contamination. To reduce these risks, the training units would ensure that staging areas are secured and monitored to prevent unauthorized access, and handling procedures comply with DoD safety regulations.

Figure 4.10-1 Surface Danger Zones

Figure 4.10-2 Ammunition Holding Area Explosive Safety Quantity-Distance Arcs

Range Control would implement measures to control access within the explosive safety quantity distance while live ammunition is present during training. This may include temporary restrictions along the segment of Boston Post Road that falls within the explosive safety quantity distance arc shown on Figure 4.10-2 during training. However, these restrictions would be temporary and limited to a small portion of this road and the public would be able to access alternate routes within the North Field National Historic Landmark during these time periods while live-ammunition is present.

Surface danger zones are established to protect personnel, equipment, and the public by restricting access to areas where projectiles, fragments, or ricochets from live-fire training may pose a hazard. For the Multi-Purpose Maneuver Range, the surface danger zone extends over land and offshore waters at the northern tip of Tinian (Puntan Taddong, also known as Ushi Point) and would only be activated during live-fire events. The Multi-Purpose Maneuver Range would also be certified for use of Class 3b and Class 4 lasers and firing positions for indirect weapons, such as mortars firing inert ammunition. All firing activities would be conducted in accordance with the established surface danger zones. When surface danger zones are activated, access to the affected area would be temporarily restricted. Range Control would issue advance public notices, including Notices to Mariners, identifying scheduled live-fire training and the specific surface danger zone affected. Real-time updates would also be provided using multiple communication channels to help mariners plan around temporary closures. These access restrictions would occur intermittently and only during scheduled live-fire training, allowing unrestricted access at other times. Nighttime impacts are expected to be minimal due to limited range use and reduced maritime activity. To further ensure boater safety, Range Control would actively monitor the area with surface radar and/or spotters. Efforts would be made to communicate with any vessel approaching an active surface danger zone.

To minimize impacts to boaters by ensuring the smallest area is restricted during each training event, the USMC would establish three separate surface danger zones for the Multi-Purpose Maneuver Range, one for each of the three types of ammunition proposed (Figure 4.10-1). When live-fire training occurs, the surface danger zone would be activated and vessels would be required to reroute around the area for period of time. These restrictions could add approximately 2 to 4 miles to travel distances, depending on which surface danger zone is active. Potential impacts would vary based on factors such as the sea state—the ocean waters off the northeastern coast of Tinian are subject to rough sea states from November through April due to cold temperatures, strong northeast trade winds, and swells (R. Dela Cruz, Jr, Personal Communication, 2025; R Sablan, Personal Communication, 2025). These strong currents, coupled with shallow water hazards, limit access to those areas during this period, resulting in lower levels of fishing and boating activity. Conversely, during the calmer season from May through October—especially from June through September—boaters are more likely to transit these areas, making temporary surface danger zone closures potentially more impactful during those months. However, the limited frequency, duration, and size of closures, and the relatively minor distances vessels would need to travel would result in less than significant impacts to boaters from live-fire training under Alternative 1.

As described in Section 2.1.6.3, the FAA would advise the USMC whether there is a need to establish a controlled firing area airspace designation over either or both proposed ranges. A controlled firing area is uncharted airspace designated by the FAA to contain activities that, if not conducted in a controlled environment, could be hazardous to non-participating aircraft (FAA Joint

Order 7400.2N, Chapter 27, June 17, 2021). The establishment of a controlled firing area would require the USMC to immediately suspend training events when a spotter identifies a non-participating aircraft approaching the area of operations. This is the procedure that the USMC proposes to follow regardless of whether an airspace designation is required by the FAA.

The Explosives Training Range presents additional potential risks for fragmentation hazards and exposure to hazardous materials. To reduce these risks, Range Control would ensure that clear signage marks range boundaries and restricted access, while road guards and barriers would be in place to prevent unauthorized entry during active live-fire training events. Range Control would enforce the surface danger zone and oversee safety protocols, ensuring all explosives are fully consumed upon detonation. Post-training inspections would be conducted to confirm no unexploded ordnance or hazardous materials remain.

4.10.3.2 Aviation Training and Civilian Aviation

The Proposed Action, which includes military aviation operations within the Military Lease Area and surrounding airspace, presents potential risks to public health and safety, particularly in shared airspace used by commercial, private, and military aircraft. Areas of concern include airspace conflicts, overflight of live-fire ranges, interference with Saipan International Airport's Instrument Landing System, and increased military aircraft operations resulting from improvements to North Field and the creation of Landing Zones throughout the Military Lease Area.

One of the primary risks is the overflight of live-fire ranges by commercial and private aircraft. To reduce this risk, Notice to Airmen (NOTAMs) would be issued to inform pilots of range activity. Range flags and red warning lights would be utilized to visually indicate when live-fire training is active. Additionally, radar systems and/or spotters would monitor the airspace for approaching aircraft. If aircraft enter the danger zone, all live-fire activities would be immediately suspended until the aircraft has safely departed the danger zone.

Another concern is interference between live-fire training at the Multi-Purpose Maneuver Range and commercial aircraft using Saipan's Instrument Landing System approach paths. To prevent conflicts, all live-fire training would be suspended whenever aircraft are utilizing the Instrument Landing System at Saipan International Airport. Range Control would coordinate flight scheduling with Saipan International Airport to ensure that military training units are aware of these commercial flight operations. Additionally, radar and/or spotters would continuously monitor the airspace to detect approaching aircraft, allowing for real-time adjustments to training activities to prevent disruptions.

Aviation operations at the Landing Zones and North Field have the potential to cause injury or damage to personal property for non-participating personnel in the vicinity of training activities. To reduce these risks, Range Control would identify activities that present hazards to the public, including takeoffs, landings, specialized insertion techniques such as fast-roping and rappelling, and parachute operations, and implement appropriate control measures to protect public safety. Prior to training exercises, training area closures would be announced to the public, ensuring awareness and preventing unintended entry into designated training areas. Additionally, access restrictions would be enforced through road guards and/or signage, clearly marking restricted areas to enhance public safety and minimize the risk of accidents.

Military aircraft operating in shared airspace with commercial and private aircraft also pose potential risks. To reduce these risks, Range Control would share military flight schedules to

Tinian and Saipan International Airports, ensuring coordination between military and civilian aviation operations. Military aircraft would operate under Visual Flight Rules using "see and avoid" procedures, allowing pilots to maintain visual separation from civilian aircraft and take necessary evasive actions if required.

Adherence to air traffic management protocols and proactive deconfliction measures would ensure that military training can be conducted safely without significant disruption to civilian aviation or public airspace use. With the implementation of airspace coordination, real-time monitoring, and controlled scheduling, the proposed aviation operations would have less than significant effects on public health and safety.

4.10.3.3 Radio Frequency and Microwave Emissions

Under Alternative 1, the USMC would reuse three of the existing communications towers at the Base Camp on Tinian and up to four towers at Saipan during training events. The operation of these communications towers would provide coverage for all training activities within the Military Lease Area. In addition, two surface radar towers on the northern and northwestern coasts of Tinian would be operated to survey the ocean surface. The surface radar towers and communication towers would be secured with fencing and intrusion detection systems to prevent unauthorized access and public exposure to electromagnetic radiation.

During aviation training activities at North Field, a mobile air surveillance radar system known as the Ground/Air Task Oriented Radar (G/ATOR) would be employed to detect virtual threats to the airfield. The system would be set up in the Military Lease Area and could be moved to different locations during an aviation training event. For safety, a minimum of two meters would be maintained between the G/ATOR and military and civilian personnel; 108 meters from the location of an ammunition holding area; and at least 20 meters from the nearest motor vehicle or aviation fueling location.

Coordination with local frequency managers and avoidance of interference with civilian communication and air traffic control systems would further ensure electromagnetic compatibility. With these safeguards and control measures in place, the potential for public exposure or interference with civilian systems would be low and impacts from electromagnetic radiation under Alternative 1 would be less than significant.

4.10.3.4 Natural Hazards

Wildfire

Under Alternative 1, there is a risk that wildfires could occur in association with live-fire range training and aviation operations at Landing Zones. Military training activities, particularly the use of tracers, pyrotechnics, and other heat-producing simulators, would introduce potential ignition sources that could increase wildfire risk, especially within grassland and disturbed grassland plant communities during the dry season. Potential impacts to biological resources are discussed in Section 4.4.3.

Under the Proposed Action, the USMC would implement a comprehensive wildland fire management strategy. A Range Wildland Fire Management Plan (currently being drafted) is being designed to reduce ignition likelihood and limit fire growth through procedural controls, operational restrictions, and site-specific fire prevention measures.

As applicable, the USMC would implement procedures to control wildfire risk. These could include:

- A fire danger rating system linked to daily weather, limiting munitions and training activities by risk level.
- Firebreaks around the Multi-Purpose Maneuver Range, Explosives Training Range, Landing Zones, and key roads.
- Vegetation management and fuel-reduction treatments that limit fire spread near range objectives and critical infrastructure.
- Integration of fire-prevention requirements into range standard operating procedures and mandatory user briefings, ensuring all training personnel understand restrictions, reporting procedures, and ignition-prevention measures.
- Routine maintenance of firebreaks and fuel-management areas to required dry-season standards, reducing fuel continuity and supporting rapid containment.

As described in Section 3.10.6.1, Tinian currently does not have a DoD fire department, and wildfire response is limited to local municipal resources with constrained staffing, limited apparatus, and no specialized wildland firefighting capability. These limitations may increase the potential for small fires within grassland and disturbed grassland communities to grow before suppression resources arrive.

Under Alternative 1, the USMC would implement fire risk management procedures, as described above. These measures would substantially limit ignition probability and provide resources for containment of small fires before they can grow into larger, more damaging events.

Flood Zones

Training events conducted near the shore areas in the Military Lease Area may experience temporary episodic flooding during storms or high tides, but training events would not increase or exacerbate the impact of flooding in near shore areas. The northern border of the proposed North Field Drop Zone, between runway Able and Boston Post Road, is located adjacent to an area designated as a Federal Emergency Management Agency 100-year Flood Zone. Alternative 1 would not increase a flood zone or create additional flood risks.

4.10.3.5 Construction

Construction would periodically limit access to portions of the Military Lease Area to protect the public from construction traffic and activities. These closures would be coordinated with Range Control to ensure the public is notified. In the event of a natural disaster such as a tsunami or typhoon, the response plan would provide information and guidance for maintaining the safety of the construction site and personnel.

Construction best management practices for fire safety, such as fire risk evaluation and fire prevention training, would be implemented to reduce or eliminate the potential for construction-sparked fires. In addition, construction of training infrastructure would not occur in areas designated as Federal Emergency Management Agency flood zones and would not create additional flood areas. Construction would avoid known sinkholes, and fault lines. An engineering evaluation would be conducted before siting structures and construction would comply with

current United Facilities Criteria requirements including seismic standards and for withstanding high winds and rain.

Through the use of best management practices, monitoring, and coordination with Range Control, Alternative 1 would not increase public health and safety risks from construction.

4.10.3.6 Protection of Children

Construction and training events would take place in the Military Lease Area with infrequent transit of personnel and equipment on roads from the Port of Tinian or TNI. Children on Tinian reside in the village of San Jose, south of the Military Lease Area, where there is a concentration of housing, schools, parks, and playgrounds. All training events and construction would take place within the Military Lease Area. The closest training areas of the Base Camp and Landing Zone 1 are approximately 1.5 miles from the closest private property and approximately 3 miles from San Jose. Construction sites in the Military Lease Area would be secured with fencing or other barriers to prevent public access. As discussed above, all training events are managed through Range Control with appropriate notifications to the community. All sources of electromagnetic radiation, including radar and communication systems, would be operated in controlled areas and secured to prevent unauthorized access or incidental exposure, including to children. Given the distances of construction and training events away from populated areas, along with active controls at construction sites and during training events to protect the public, implementation of the Proposed Action would not result in health and safety risks that may disproportionately affect children.

4.10.4 Alternative 2

Under Alternative 2, training would continue and would increase over the No Action Alternative by approximately 5 percent, which is approximately 10 percent less than Alternative 1. All of the same precautions associated with Alternative 1, including that all scheduled training events would be coordinated and communicated through Range Control, would result in a less than significant impact to public health and safety from Alternative 2.

4.11 Utilities

4.11.1 Approach to Analysis

The analysis of potential impacts to utilities focuses on water supply (potable water, non-potable water, and groundwater), wastewater treatment, solid waste, hazardous materials, green waste, stormwater management, electrical power, and communications.

This analysis uses quantitative and qualitative assessments of changes to utilities capacity to determine the potential for training events and construction of the Proposed Action to exceed existing utility capacity or to disrupt existing utilities' services. Factors used to assess the impacts of the Proposed Action on utilities include the following:

- The capacity of existing and planned utilities to accommodate the Proposed Action.
- The extent of utilities disruption, if any, from the Proposed Action.

The analysis is based on training and operational needs, such as fire protection, a vehicle wash facility, and the maximum number of personnel anticipated to be on island at one time: 1,000 training personnel, approximately 30 to 50 operational personnel, and approximately 50 off-island construction workers. Of the 30 to 50 operational personnel, 20 are assumed to be from off-island