4.6 AIRSPACE

Section 4.6 describes the impacts that could potentially occur to the existing airspace environment from the proposed action. Potential impacts would stem from the establishment of new Special Use Airspace, including restricted areas, a military operations area, and a warning area. Establishment of these requires rulemaking (restricted areas) and non-rulemaking (military operations and warning areas) actions by the Federal Aviation Administration, per Joint Order 7400.2K. *Procedures for Handling Airspace Matters* (Federal Aviation Administration 2014a). Additional details, including the geographic coordinates, altitudes, and times of use for each proposed area, can be found in Appendix I, *Airspace Technical Memo*.

The analysis of potential impacts to airspace addresses: (1) en route operations, (2) access to public airports, (3) air traffic control services, and (4) measures to mitigate or lessen any impacts. Other potential impacts associated with airspace use are covered in Section 4.5, *Noise;* Section 4.9, *Terrestrial Biology*; and Section 4.15, *Socioeconomics and Environmental Justice*. Impacts to air transportation and airports are addressed in Section 4.13, *Transportation*. In accordance with Federal Aviation Administration, Joint Order 7400.2K, Section 6, paragraph 21-6-1, *Aeronautical Study,* an aeronautical study is required for all restricted areas, military operations areas and warning area proposals (Federal Aviation Administration 2014a). For this EIS/OEIS, the Federal Aviation Administration is preparing two separate aeronautical studies, one for Tinian and one for Pagan. Each aeronautical study will identify impacts of the proposed Special Use Airspace on the safe and efficient use of airspace and air traffic control procedures. Phase I of the study will include an in-depth analysis of aircraft operations and existing flight routes based on radar track data and flight plan information recorded by the Performance Data Analysis and Recording System. Other sources deemed necessary to ensure a comprehensive study will also be used. Phase II of the study will be completed by a team that specializes in airspace use, including representatives of the Federal Aviation Administration, U.S. military, and the CNMI. The aircraft operational data gathered during Phase I will be used to design any new approaches required to minimize effects to airport traffic and define the final airspace configurations and the procedures necessary to meet military mission needs while ensuring the safe and efficient use of the airspace by all users.

4.6.1 Approach to Analysis

The methodology for identifying and evaluating impacts to airspace involves defining the existing controlled and uncontrolled airspace used to manage air traffic operations in the CNMI and the amount of air traffic needing access to the airspace. The airspace used to support airport arrivals and departures as well as existing aviation routes used to transit the CNMI set the stage for defining impacts. Available aircraft operations are used as a gauge for competing aviation interests and in identifying airspace requirements specific to the region. Figure 4.6-1 illustrates the region of influence for airspace impacts.

The analysis of potential impacts to airspace considers both direct and indirect impacts. Impacts are based on the existing environment and representative examples of how training missions would use the proposed airspace (see Appendix H, *Noise Study*).

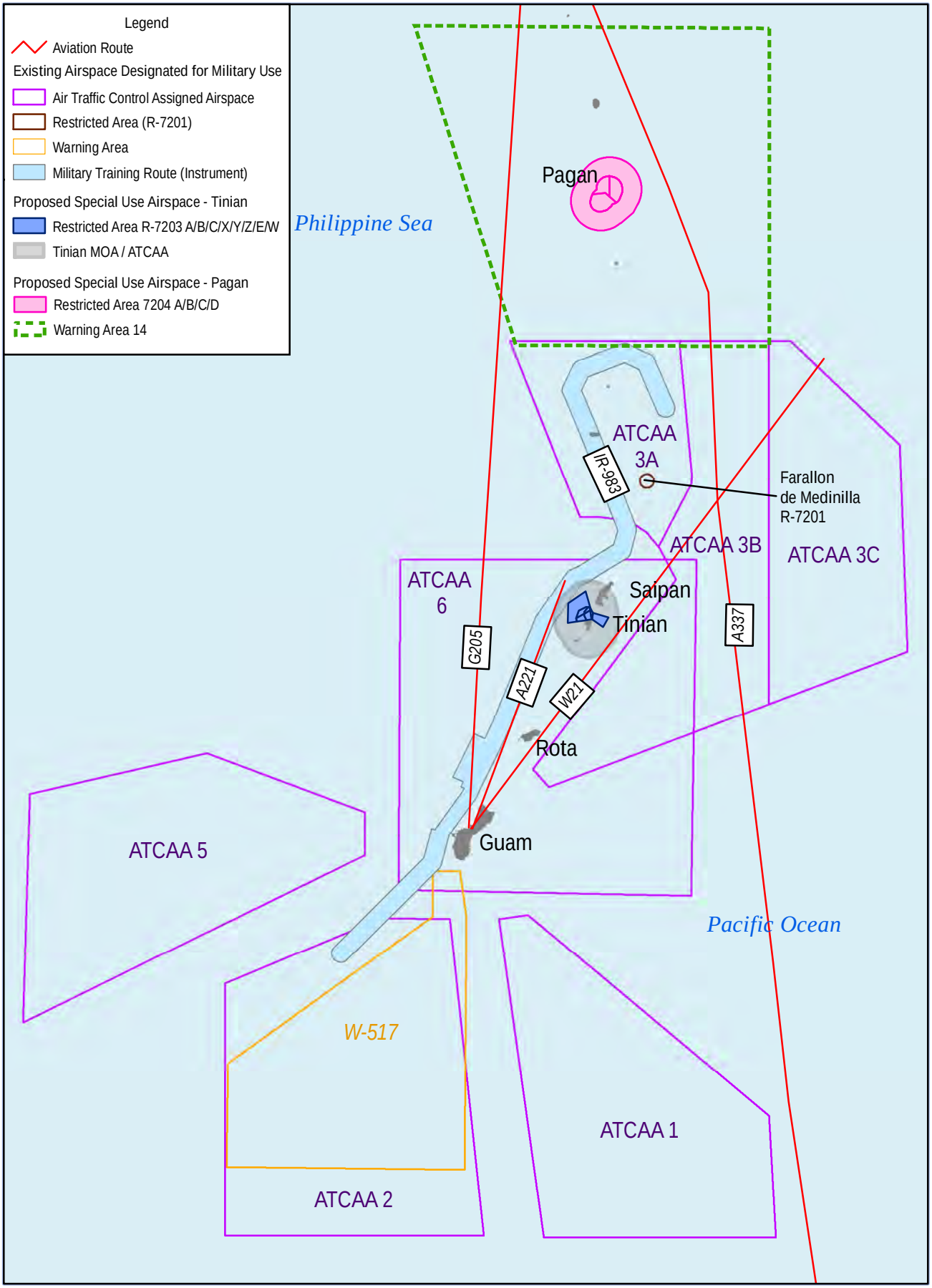


Figure 4.6-1
Airspace Region of Influence

Source: NAVFAC Pacific 2013

For this EIS/OEIS impacts are identified for the local region of influence and based on the best information available. Therefore, significance was determined qualitatively based on the degree of change as well as regulatory standards where applicable. Direct impacts would be expected to result if use of the proposed airspace would interfere with the safe and efficient use of the airspace or interference with the safe, orderly, and expeditious flow of air traffic. Indirect impacts are based on potential economic impacts (i.e., fuel consumption, additional time needed to transit the airspace) that could occur as a result of changes to published aviation routes, instrument approach procedures, standard instrument departure procedures, or a requirement for visual flight rule air traffic to change from a regular flight course or altitude.

The analysis in this EIS/OEIS is based on the following factors.

- Each airspace unit would be activated as needed for live-fire training.
- The proposed Restricted Areas 7203A/B/C would be charted for use daily from 7:00 a.m. to 10:00 p.m. except for periods with Saipan International Airport flight (large passenger jet or jetliner) activity. The airspace would be activated at other times through Notices to Airmen.
- The proposed Restricted Areas 7203X/Y/Z would be charted for use daily from 7:00 a.m. to 10:00 p.m. with activation at other times through a Notice to Airmen.
- The proposed Restricted Areas 7203E/W, and Tinian Military Operations Area would be charted for use and activated as needed through Notices to Airmen. Tinian Air Traffic Control Assigned Airspace would be requested as needed to extend the Tinian Military Operations Area.
- Restricted Area 7204A/B/C/D, and Warning Areas 14 High and 14 Low would be charted for use and activated as needed through Notices to Airmen.
- Each Restricted Area would be activated as needed from the surface to altitudes between 4,000 feet (1,219 meters) and 18,000 feet (5,182 meters) MSL based on the ranges and weapons to be used and the intent to train with participating aircraft (see Appendix I, *Airspace Technical Memo* for additional detail).
- As depicted in Figure 2.4-18, proposed restricted area 7203 has been segmented into eight individual airspace units, Restricted Area 7203A/B/C/X/Y/Z/E and W. Each restricted area's configuration is based on RTA locations and the distance (both vertical and horizontal) needed to ensure safe separation of military activities from non-participating aircraft. The division of Restricted Area 7203 into eight segments would support optimal management of the ranges and airspace and accommodate airport air traffic and smaller inter-island commuter aircraft travelling between Tinian and Saipan. The segmented airspace was specifically designed to provide for airspace activation of those areas and those altitudes necessary to complete training while minimizing any potential effects on air traffic. The segmentation would ensure that provisions can be made for access to Tinian and Saipan International Airports with minimum delay as required by Federal Aviation Administration Joint Order 7400.2K, paragraph 23-1-4.

A Notice to Airmen is a notice or advisory distributed by local aviation authorities. It contains information concerning the establishment, conditions, or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel and systems concerned with flight operations. Joint Region Marianas is responsible for ensuring Notices to Airmen are issued prior to airspace activation. Notices to Airmen are available on the Internet at https://www.notams.jcs.mil.

Additionally, the segmented airspace supports the current requirement for the fleet of single engine airplanes operating between Tinian and Saipan to remain within glide distance to shore.

- The floor of the proposed Tinian Military Operations Areas was raised from 1,500 feet (457 meters) above ground level to 3,000 feet (914 meters) to accommodate air traffic and eliminate penetration of Saipan International Airport's Class D airspace.
- Individual airspace units on Tinian (Restricted Areas 7203A/B/C/X/Y/Z/E/W) and the Tinian Military Operations Area/Air Traffic Control Assigned Airspace (see Chapter 2, *Proposed Action and Alternatives*, Figure 2.4-14a) would be used either individually or in conjunction with each other depending on the training being conducted. Similarly, Pagan (Restricted Areas 7204A/B/C and Warning Areas 14 High and 14 Low) would be used either individually or in conjunction with each other.
- Training periods on Tinian and Pagan could overlap with each other or be independent of each other.
- The operations estimates are based on the optimum number of mission events required by air and ground forces to maintain combat readiness proficiency levels. Due to variations in missions and pilot tactics, the operational information presented in Appendix H, *Noise Study,* to define altitude distributions and times of day are representative examples of how missions would be flown.

In accordance with Federal Aviation Administration Joint Order 7400.2k, paragraph 23-1-4, the restricted area must exclude the airspace 1,500 feet (457 meters) above ground level and below within a 3 nautical mile (5.6 kilometer) radius of airports available for public use. For this EIS/OEIS it is assumed that Change 2 to Federal Aviation Administration Joint Order 7400.2K, publicized and opened for public comment in November 2014, will be approved as requested by the DoN, in part, to support this proposed action. The order states that a reduction to the 3-nautical mile (5.6-kilometer) exclusionary airspace surrounding Tinian International Airport, may be approved by the Federal Aviation Administration on a case-by-case basis after a risk based analysis is accomplished in accordance with the safety risk management process, and development of a risk resolution implementation plan (Federal Aviation Administration 2015).

4.6.2 Resource Management Measures

The Federal Aviation Administration has regulatory authority over the National Airspace System and all airspace is governed by Federal Aviation Administration policies and procedures; therefore, best management practices and standard operating procedures do not apply to airspace. The U.S. military is, however, committed to limiting impacts to other users of the airspace and is working closely with the Federal Aviation Administration with regards to the establishment of this proposed airspace. The potential mitigation measures identified in this section are currently being coordinated with the Federal Aviation Administration and could be modified during the coordination process. A mitigation plan will be prepared in coordination with Federal Aviation Administration as part of the EIS process. The Department of Defense will continue working with the Federal Aviation Administration to minimize potential impacts and define required mitigation measures.

4.6.3 Tinian

The potential impacts analyzed herein are based on establishment and use of the proposed Restricted Areas 7203A/B/C/X/Y/Z/E and W and the Tinian Military Operations Area as they relate to civilian aircraft operations needing access to the airspace associated with use of the Tinian and Saipan International Airports. Impacts to commercial air traffic on published aviation routes are discussed based on potential interaction with the Tinian Military Operations Area/Air Traffic Control Assigned Airspace. Impacts to navigable airspace as a result of proposed construction projects are addressed as airspace obstructions. Discussion of airspace obstructions includes only the effect of proposed construction projects that would place restrictions on the use of the airspace and that require Federal Aviation Administration review and approval. Details regarding construction and airport improvements are included in Section 4.13, *Transportation*.

The Marine Corps Guam Range Management Division would have the overall responsibility for safety functions during all training events within the RTA on Tinian. These functions would include airspace management, access, aircraft movement, and Special Use Airspace de-confliction surveillance. They are described in detail in Appendix C, *Unconstrained Training Concept for Tinian and Pagan*.

Continued coordination during the Federal Aviation Administration's aeronautical process will include development of the procedures needed to accommodate arrivals, departures and missed approaches to the Saipan and Tinian International Airports. The procedures would set forth appropriate measures to assure the safe passage of all commercial and private aircraft and provide for commercial large passenger jets and jetliners approaching Saipan to be given priority access to the airspace needed to land.

4.6.3.1 Tinian Alternative 1

Tinian Alternative 1 has the potential of impacting the airspace associated with aircraft operations at Tinian and Saipan International Airports, the airspace associated with the transition between Tinian and Saipan, and published commercial routes in the region of influence. The impacts based on the proposed increase in aircraft operations at the Tinian International Airport and establishment of a new military operations area, air traffic control assigned airspace, and restricted area follow.

4.6.3.1.1 Tinian

4.6.3.1.1.1 Increased Operations at Tinian International Airport

The increase in aircraft operations at Tinian International Airport would have direct effects on civilian air traffic. As indicated in Table 4.6-1, there were 48,640 non-military operations at Tinian International Airport in 2013. Approximately 18,656 (i.e., annual average day operations multiplied by 140 days) of the non-military operations could be impacted by the proposed action. These operations would continue to require access to the Tinian International Airport as well as the airspace needed to transit between Tinian and Saipan. This could be expected for some part of each day for up to 20 weeks per year based on the training being conducted.

Table 4.6-1. Change in Tinian International Airport Annual Airport Operations[1,2]

Aircraft Type	*Existing Airport Operations*	*Proposed Airport Operations*	*Change in Airport Operations*
Military	476	9,244	+8,768
GA Single Engine[3]	48,640	48,640	0
Total	**49,116**	**57,884**	**+8,768**

Notes: [1]Operations include departures, arrivals and closed patterns. Closed patterns count as two airport operations, one approach and one departure.
[2]Based on the 2014 to 2040 year-over-year growth rate estimated by the Federal Aviation Administration Terminal Area Forecast (Federal Aviation Administration 2013), air traffic operations for Tinian International Airport would not be expected to change (see also Appendix O, *Transportation Study*).
[3]Air traffic between Saipan International Airport, Tinian International Airport, and Rota International Airport.

As shown in Table 4.6-1, annual operations at Tinian International Airport would be expected to increase by 8,768 operations or an average of approximately 62 operations per day (31 approaches and 31 departures) during some portion of the 20 weeks of training (non-consecutive), although the tempo would fluctuate during the training period. Approximately 45% of the operations (3,898 annual/28 daily) would be related to field carrier landing practice and other practice approaches by fighter aircraft (3,000 annual/21 daily), helicopters (598 annual/4 daily), and MV-22's (300 annual/2 daily). Each airframe would practice multiple approaches during a single flight. The number of approaches is dependent on pilot proficiency requirements. Table 4.5-11, (see Section 4.5, *Noise*), provides detailed information on proposed military operations.

The increase in military air traffic would not restrict access to Tinian International Airport, but civilian flights could experience delays in departures and arrivals during the time when military aircraft are practicing approaches to the runway. Aircraft arrivals and departures would continue to occur on a first come, first serve basis with pilots notifying each other of their intentions via the common traffic advisory frequency or as directed by Air Traffic Control. Pilots flying to and from Saipan would be expected to continue to land and depart using visual flight rules. Guam Combined Center/Radar Approach Control would continue to be responsible for departures and arrivals on published approaches above 3,500 feet (1,067 meters) MSL.

Without mitigation, there is a potential for significant impacts to aircraft needing access to the Tinian International Airport at times when military are practicing field carrier landings. The following potential mitigation measures would minimize direct and indirect impacts to Tinian International Airport arrivals and departures.

Potential mitigation measures include:

- Establish a Letter of Procedure or Joint Use Agreement to accommodate civilian arrivals and departures into the airport.
- Establish communication procedures between Tinian Range Control and Saipan International Airport Air Traffic Control to ensure priority access to Tinian International Airport for life-flight and other emergency-related activities.
- Add positive control measures (e.g., air traffic control tower at Tinian, short-range radar on Tinian or Saipan that would allow air traffic controllers to see aircraft operating below 2,000 feet [609 meters]), and communications capability at Saipan or Tinian to ensure non-participating aircraft are advised of military operations.

Implementation of the above measures and others identified through coordination with the Federal Aviation Administration would reduce impacts to less than significant. The Letter of Procedure and communications procedures would include the procedures necessary to ensure the safe and efficient use of airspace by all users. The addition of a Tactical Air Navigational System and positive control measures would benefit all users of the airspace as air traffic control services would be available to aircraft operating below 2,000 feet (609 meters) MSL.

4.6.3.1.1.2 Tinian Military Operations Area

Activation of the Tinian Military Operations Area independent of the restricted airspace would not be expected to impact commuter flight routes or the departures or approaches to Tinian International Airport.

Tinian Military Operations Area is defined by a 12-nautical mile (22-kilometer) boundary surrounding Tinian with vertical limits from 3,000 feet (914 meters) MSL up to, but not including, 18,000 feet (5,486 meters) MSL with Air Traffic Control Assigned Airspace requested as necessary to support activity at and above 18,000 feet (5,486 meters) MSL.

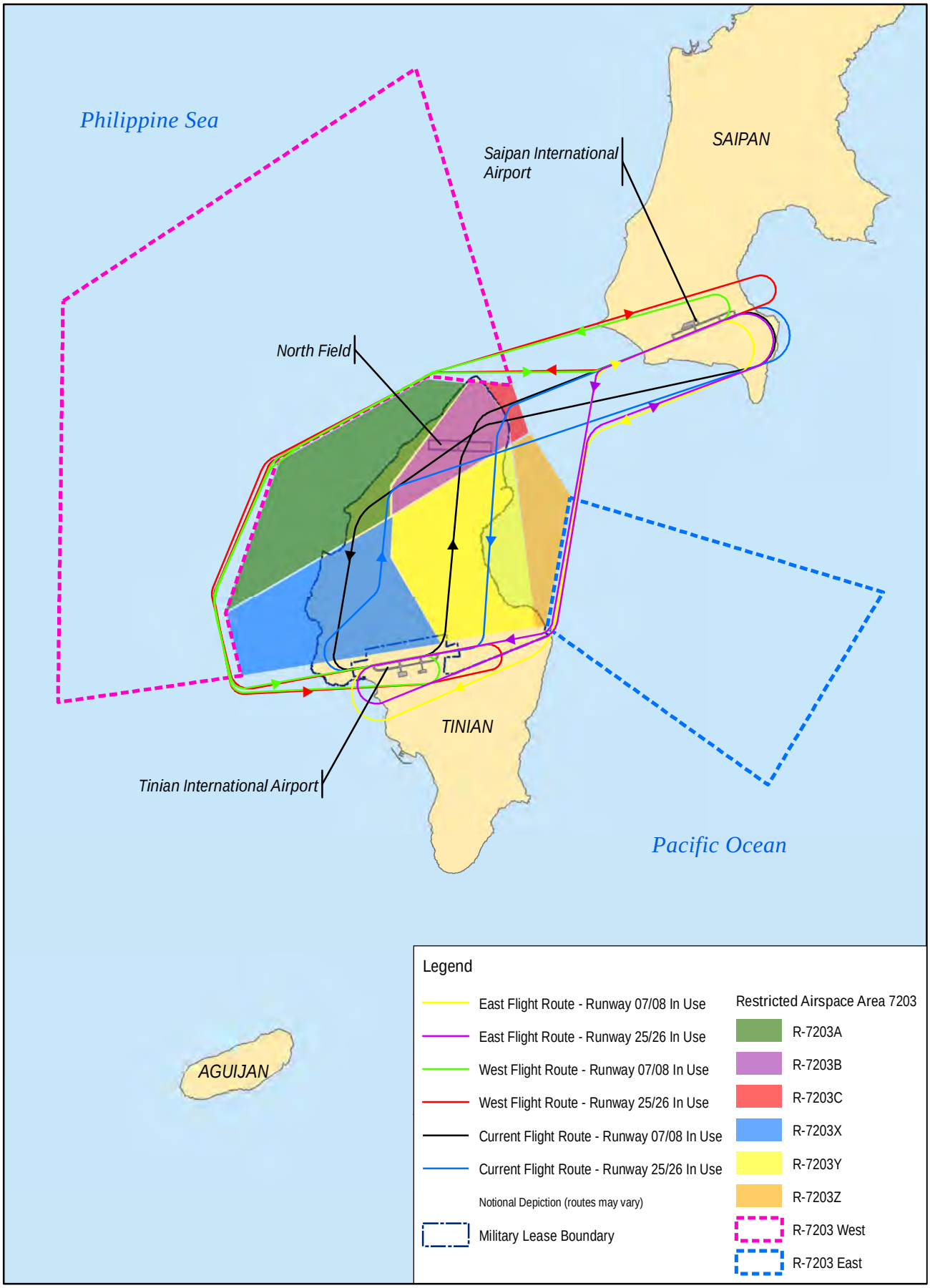
Pilots transiting between Saipan and Tinian would be expected to fly below 3,000 feet (914 meters) MSL, the floor of the Tinian Military Operations Area. Pilots desiring to fly above 3,000 feet (914 meters) MSL (military and non-military) would need to follow see-and-avoid procedures as they do today to ensure safe separation of aircraft. Pilots desiring not to transit through the active military operations area would need to remain below 3,000 feet (914 meters) MSL.

Aircraft arriving on published approaches into Tinian International Airport would be at or above 2,600 feet (792 meters) MSL within 11 nautical miles (20 kilometers) of the runway and would be descending when they reach the Tinian Military Operations Area boundary (Skyvector 2013). Missed approaches to the runway would climb to 2,800 feet (853 meters) and hold or return for another approach. Aircraft departures would need to remain below 3,000 feet (914 meters) until clear of the military operations area. Air traffic would be expected to remain below 3,000 feet (914 meters) MSL.

The proposed Tinian Military Operations Area would have less than significant impacts to aircraft operations needing access to the airspace to transit between Saipan and Tinian.

4.6.3.1.1.3 Restricted Area 7203

As can be seen in Figure 4.6-2, when active, Restricted Area 7203 would directly impact the existing Tinian commuter aircraft flight path. As non-participating aircraft, civilian aircraft would not be permitted to use the existing flight path while the restricted areas are active without permission of the controlling agency. Although chartered and private flights between islands would continue to be flown under visual flight rules using the most direct route possible, they would need to fly outside of the restricted area or obtain permission from the controlling agency to transit the area. The two major airspace units that would have the most impact to this type of transit are Restricted Area 7203W (west of Tinian) and Restricted Area 7203E (east of Tinian). If only one of these is activated together with the airspace units overlying Tinian (Restricted Area 7203A/B/C/X/Y/Z), civilian aircraft can continue flights on the other side of the island. Rerouting around the west end of the island would increase distance and add time to the flights, while rerouting around the east of the island would not (see more detailed discussion below).



0 1 2 4 Nautical Miles

0 1 2 4 Kilometers

Figure 4.6-2
Commuter Flight Routes
All Action Alternatives

NORTH

When all airspace units (i.e., Restricted Areas 7203A/B/C/X/Y/Z/E/W) are activated, civilian aircraft could not transit on either side. However, activation of all airspace units at the same time would typically occur only one or two times per week during the 20 weeks of training, and the duration would be two hours or less. With advance notice and coordination, chartered and private flights would be able to plan for these events. Furthermore, the Department of Defense would coordinate with commercial air taxi and charter services to minimize disruptions to their service to the extent possible.

Based on the notional flight paths presented in Figure 4.6-2, it is possible for civilian aircraft to be routed around the airspace when Restricted Areas 7203E and 7203W are not activated together while staying within the minimum safety glide slope. For example, using a 10:1 glide ratio (i.e., for every 10 feet [3 meters] travelled horizontally, 1 foot [0.3 meter] of altitude is lost), the glide distance of a single engine aircraft such as the Piper Cherokee traveling 3,000 feet (914 meters) above ground level at 100 miles per hour (185 kilometers) would be approximately 5 nautical miles (9 kilometers). Under the proposed configuration, aircraft could fly around the active restricted airspace and remain within 2 nautical miles (3.7 kilometers) of shore except for periods when Restricted Areas 7203E and W are activated together. Traveling around Restricted Areas-7203E or 7203W would require aircraft to be more than 10 nautical miles (18 kilometers) from shore. Based on the above safety glide slope example, when the entire restricted area (i.e., Restricted Areas 7203A/B/C/X/Y/Z/E/W) is activated, single engine aircraft used to transit to and from Saipan and Tinian International Airports would not be able to meet the minimum safety glide slope requirements and flight delays would be expected. This could occur for brief periods during the 1-2 hours per day for up to 135 days per year that Restricted Area 7203E is activated for use.

When Restricted Areas 7203E and 7203W are not in use, civilian aircraft could still transit between Saipan and Tinian even if Restricted Areas 7203A/B/C/X/Y/Z are in use. Aircraft could either fly around the east side or the west side. As can be seen in Table 4.6-2, there would be no change in the distance when aircraft can be routed to the east around the restricted areas. Aircraft would experience the greatest change in distance (10 to 12 nautical miles [18 to 22 kilometers, respectively]) when they need to be routed to the west of the restricted areas. This could be required for some portion of the 1-2 hours per day up to 135 days per year when Restricted Area 7203E is active.

Table 4.6.2 Distances between Saipan and Tinian

Runway in Use	*Distance (Nautical Miles)**				
	Existing Flight Path	*East Around Restricted Area*	*Change*	*West Around Restricted Area*	*Change*
Saipan 25	11	11	0	23	+12
Saipan 07	17	17	0	20	+3
Tinian 26	17	17	0	22	+5
Tinian 08	11	11	0	21	+10

Note: *Distances based on notional flight patterns presented in Figure 4.6-2.

When Restricted Area 7203A/B/C/X/Y/Z and E are activated independently of Restricted Area 7203W and aircraft are routed to the west of the airspace, additional time and fuel would be needed. However, less than significant impacts would be expected as this would only occur up to two hours per day for up to 135 days per year. No impacts would be expected with activation of Restricted Area 7203A/B/C/X/Y/Z/W independent of Restricted Area 7203E as aircraft could fly to the east of Tinian without adding time or distance between locations.

Aircraft needing to be routed to the west around the active airspace would experience indirect effects such as additional travel distances, time en route, and fuel consumption. As mentioned earlier, with advance notice and coordination, chartered and private flights would be able to plan for these events. Furthermore, the Department of Defense would coordinate with commercial air taxi and charter services to minimize to the extent possible disruptions to their service.

Activating all Restricted Area-7203 segments together would rarely occur. However, when it does occur, single engine commuter aircraft would not be able to transit the area as they would not meet the minimum safety glide slope requirements. Without mitigation, commuter aircraft needing access to the airspace during the time (up to two hours per day for up to 135 days per year) would be directly and significantly impacted.

Potential mitigation measures include:

- Establish communication procedures to provide immediate feedback between air traffic controllers and range control to accommodate smaller inter-island commuter aircraft travelling between Saipan and Tinian when needed.
- Add positive control measures (e.g., air traffic control tower at Tinian, short-range radar on Tinian or Saipan that would allow air traffic controllers to see aircraft operating below 2,000 feet [609 meters]), and communications capability at Saipan or Tinian to ensure non-participating aircraft are properly separated from restricted area activities.

Once the U.S. military's coordination with the Federal Aviation Administration is complete, less than significant impacts would be expected. The procedures necessary to ensure the safe and efficient use of airspace by all users would be in place. The addition of positive control measures would benefit all users of the airspace as air traffic control services would be available to aircraft operating below 2,000 feet (609 meters) MSL.

4.6.3.1.1.4 Airspace Obstructions

The proposed construction of a Munitions Storage Area is within 3,600 feet (183 meters) of the approach end of Tinian International Airport's Runway 08. The Munitions Storage Area safety arcs are located to the north of the Runway Protection Zone. Federal Aviation Administration regulations and Unified Facilities Criteria prohibiting flights below 500 feet (152 meters) above ground level over ammunition magazines and staging areas while ammunition is being staged or handled would be in place. When Runway 08 is in use, aircraft arriving on published approaches would be expected to be aligned with the runway and outside of the safety arcs. Commuter aircraft approaching the Tinian International Airport would need to fly around the munitions storage area or be at altitudes greater than 500 feet (152 meters) above ground level and implement a circling approach to land. This would occur up to 20 weeks per year that the area is in use. During the times when the military is not training, live munitions would not be stored in the staging area and no restrictions would be required. Runway 26 departures would experience the same restrictions.

Construction of new towers and use of cranes, etc. during construction of base camp facilities requires notification to the Federal Aviation Administration. The Federal Aviation Administration would complete an obstruction evaluation/airport airspace analysis to determine the marking and lighting requirements

necessary to ensure flight safety in accordance with Federal Aviation Administration's Advisory Circular 70/7460-1K, *Obstruction Marking and Lighting* (see also Section 4.13.2, *Transportation*).

The International Broadcasting Bureau (see Photo 3.6-2) presents an obstruction to aircraft operating at low altitudes (i.e., below 500 feet [152 meters] above ground level) within Restricted Areas 7203X and 7203A. Strobe lighting marks the antenna array to ensure the antennas are visible to aircraft.

Marking and lighting the proposed communication towers in accordance with Federal Aviation Administration requirements, and publishing an avoidance area around the munitions storage area would minimize potential long-term impacts. Therefore, under Tinian Alternative 1, less than significant impacts to airspace and aircraft safety would occur from the additional airspace obstructions.

4.6.3.1.2 Saipan

Tinian Alternative 1 has the potential of impacting the airspace associated with aircraft operations at Saipan International Airport. No additional air traffic is proposed for Saipan International Airport. Impacts could result from an increase in operations at Tinian North Field, and establishment of the proposed Restricted Areas 7203A/B/C/W and the Tinian Military Operations Area. Impacts to commuter flights between Tinian and Saipan are discussed in Section 4.6.3.1.2.3, *Restricted Area 7203.*

4.6.3.1.2.1 Increased Operations at Tinian North Field

Tinian North Field is located under the Saipan International Airport's approach corridor to Runway 07. Under Tinian Alternative 1, there would be an increase of 2,222 annual operations (Table 4.6-3) at North Field for a total of 2,420 operations (an average of 17 per day during the 20 weeks of live-fire training). Approximately 25% (700 annual or five per night during the 140 days of training) of the operations would be expected to occur during the hours of 10:00 p.m. to 7:00 a.m., the primary time when commercial large passenger jet or jetliners are arriving and departing Saipan International Airport. Section 4.5, *Noise,* Table 4.5-11, provides detailed information on proposed military operations and the type of aircraft proposed for use at Tinian North Field.

Table 4.6-3. North Field Annual Operations[1]

Existing Operations	*Proposed Operations*	*Change in Operations*
198	2,420	+2,222

Note: [1]Operations include departures, arrivals and closed patterns. Closed patterns count as two airport operations, one approach and one departure.

As indicated in Section 3.6.4.3, *Saipan International Airport*, there are approximately 175 operations on an average annual day at Saipan International Airport. Nine flights are the result of scheduled daily international arrivals and departures. Major airlines scheduled arrivals typically occur between the hours of 1:00 a.m. and 9:00 a.m. local time with the majority arriving before 5:00 a.m. Departures occur between the hours of 2:00 a.m. and 6:00 p.m. with approximately half occurring before 6:00 a.m. (FlightStats 2014). The remaining operations are the result of air taxi, general aviation and military operations, primarily those transitioning between Saipan and Tinian (discussed above). The 2014 to 2040 year-over-year growth rate estimated by the Federal Aviation Administration's Terminal Area Forecast civilian aircraft indicates operations at Saipan International Airport are projected to increase by approximately 1% each year until 2040 when they project 110,348 annual operations (302 operations per day) for arrivals and departures (Federal Aviation Administration 2014). A 1% increase would not be expected to change the results of this analysis.

Existing procedures used to manage aircraft operations and deconflict military and civilian aircraft would be expected to continue. Arrivals and departures would be within Saipan International Airport's Class E airspace where Saipan Air Traffic Control would be responsible for coordinating the movement of air traffic to ensure that aircraft maintain minimum separation for safety. Aircraft performing local training at North Field would continue to maintain radio contact with Saipan Air Traffic Control to ensure de-confliction with civilian carriers' en route to Saipan International Airport. Unscheduled large commercial jets and jetliners requiring access to Saipan International Airport would have priority over military training. Saipan Air Traffic Control would continue to advise civilian aircraft flying under visual flight rules between islands about activity in the area, and all pilots (military and civilian) would be responsible for following see-and-avoid procedures. The addition of 17 aircraft operations per day at North Field during the 140 days of live-fire training and the need to maintain contact with Saipan Air Traffic Control would result in a minimal increase in the number of aircraft requiring handling by Saipan Air Traffic Controllers. Scheduling of aircraft arrivals and departures to deconflict with Saipan commercial large passenger jets and jetliners would minimize any impacts and result in less than significant impacts to Saipan Air Traffic Control as a result of increased operations at Tinian North Field.

4.6.3.1.2.2 Tinian Military Operations Area

Saipan International Airport is located beneath the Tinian Military Operations Area. Their Class D airspace would not intersect with the proposed Tinian Military Operations Area. Class E airspace extends the Saipan Class D airspace by approximately 8 nautical miles (15 kilometers) to the southwest and approximately 5 nautical miles (9 kilometers) to the northeast as shown in Figure 3.6-5 (Section 3.6, *Airspace*). The Class E extension airspace begins at 700 feet (213 meters) MSL and extends up to 4,500 feet (1,372 meters) MSL. The Class E airspace to the north and southwest intersects with the Tinian Military Operations Area.

Saipan's Class E airspace is used to support published approaches and standard instrument departures for Saipan International Airport by major airlines and large commercial jets. It is not used to support commuter aircraft flying under visual flight rules between Islands. As indicated above, there are nine scheduled daily international arrivals and departures with scheduled arrivals typically occurring between the hours of 1:00 a.m. and 9:00 a.m. local time with the majority arriving before 5:00 a.m. Departures occur between the hours of 2:00 a.m. and 6:00 p.m. with approximately half occurring before 6:00 a.m. The Tinian Military Operations Area would not be activated during periods with Saipan International Airport International flight activity and less than significant impacts would be expected. Impacts to commuter aircraft would be the same as discussed above for Tinian.

4.6.3.1.2.3 Restricted Area 7203

Saipan International Airport and their Class D airspace are located outside of proposed Restricted Area 7203. The Class E airspace that extends the Saipan Class D airspace to the southwest and all published approaches to runway 07 intersect with Restricted Areas 7203A/B/C and W. Restricted Area 7203A/B/C would not be activated during times with scheduled Saipan International Airport commercial large passenger jet and jetliner activity. Restricted Area 7203 W would be activated by Notices to Airmen as needed and would not be activated when it would interfere with scheduled commercial large passenger jet or jetliner activity. Published approaches to Runway 25 would not intersect with Restricted Area 7203. Impacts to commuter aircraft would be the same as discussed above for Tinian.

It is anticipated that proper range scheduling procedures would be in place to ensure no significant disruption of unscheduled commercial large passenger jet and jetliners into and out of Saipan International Airport. However, without mitigation, air and ground activities would have the potential to significantly impact current airspace procedures during the 140 days per year that the Restricted Areas 7203A/B/C and W are scheduled and activated for use.

Potential mitigation measures include:

- Establish a Letter of Procedure between the Federal Aviation Administration and the U.S. military that contains the procedures for access to the airspace and gives priority to large commercial aircraft. The agreement would ensure proper range scheduling procedures are in place to ensure no significant disruption of normal flights into and out of Saipan International Airport.
- Electronically monitor each training event through the use of radar and other surveillance equipment such as an expeditionary control tower (Photo 4.6-1) that would continually monitor the airspace to ensure the safety of the flying public during times when training is occurring.

Photo 4.6-1. Expeditionary Control Tower on Humvee

- Schedule and coordinate training events with Saipan International Airport arrivals and departures as to not conflict.
- Establish procedures and communications that allow for air traffic controllers and range controllers to simultaneously see the airspace and ensure priority is given to any aircraft heading to or from Saipan International Airport. In the event of an unforeseen incursion into an active restricted airspace, the simultaneous ability to monitor activities on the ground and in the air should provide the ability to stop any training in seconds.

Once the U.S. military's coordination with the Federal Aviation Administration is complete, less than significant impacts to airspace management and airport operations at Saipan would be expected. Mitigations developed during the coordination process would include the procedures necessary to ensure safe and timely access to Saipan International Airport.

4.6.3.1.2.4 Tinian Air Traffic Control Assigned Airspace

There are four commercial aviation routes (G205, A337, A221, and W21) that could be impacted by the proposed Tinian Air Traffic Control Assigned Airspace (see Figure 4.6-1). No effects to these routes would be expected when Restricted Area 7203 and/or the Tinian Military Operations Area are activated for use. There would be no effects to aircraft operating on A221 independent of impacts to the arrivals and departures to Saipan International Airport.

Airway W21 lies approximately 10 nautical miles (19 kilometers) to the west of Tinian and within the proposed Tinian Military Operations Area/Air Traffic Control Assigned Airspace. Commercial aircraft en route to and from Guam International Airport on W21 would be expected to be in Class A airspace at altitudes greater than 18,000 feet (5,486 meters) and no impacts to air traffic would be expected from activation of the Tinian Military Operations' Area. Air Traffic Control Assigned Airspace 6 begins at

36,000 feet (10,973 meters) MSL. The proposed Tinian Air Traffic Control Assigned Airspace would have a ceiling of 30,000 feet (9,144 meters) MSL, leaving a 6,000-foot (1,829-meter) gap between the two that would support commercial air traffic.

Air Traffic Control Assigned Airspace 3A, 3B, and 3C are located within 30 nautical miles but do not overlap with the proposed Tinian Air Traffic Control Assigned Airspace.

Aircraft using G205 or A337 that are currently routed to the west or east around Air Traffic Control Assigned Airspace 3A/B/C could continue to be routed around the airspace and would not be affected. The gaps between the existing and proposed airspace designated for military use would provide the airspace necessary to continue to route aircraft around the proposed airspace and no changes to the existing procedures would be expected.

The Guam Combined Center/Radar Approach Control would continue to be responsible for recalling the Air Traffic Control Assigned Airspace as needed to support commercial traffic or for re-routing aircraft around or over the Air Traffic Control Assigned Airspace. Scheduling and use of Air Traffic Control Assigned Airspace would continue to be requested from the Federal Aviation Administration on an as-needed basis. The Federal Aviation Administration would continue to release the airspace for military use only when its use would not interfere with air traffic control operations.

Impacts to civilian aircraft using commercial aviation routes G205, A337, and W21 were analyzed in the *Mariana Islands Range Complex Airspace EA/OEA* (DoN 2013). The EA/OEA found no significant impacts to commercial tracks using any of these routes because of low traffic volumes, rerouting, and/or scheduling of aircraft (DoN 2013; see Table 3.2-1). Less than significant impacts would be expected with implementation of Tinian Alternative 1.

4.6.3.2 Tinian Alternative 2

Impacts to the airspace environment would be similar to those described for Tinian Alternative 1 (Section 4.6.3.1). Impacts to each area are summarized below.

Under Alternative 2, impacts to aircraft requiring use of Tinian International Airport would be the same as Alternative 1 (Section 4.6.3.1). The increase in military air traffic would not restrict access to Tinian International Airport but civilian flights could experience delays in arrivals in departures. Aircraft transiting between Saipan and Tinian could be routed around the active airspace and add up to 12 nautical miles (22 kilometers) to their trip each way when needed unless all restricted airspace is activated at the same time. When all restricted areas are activated at the same time, single engine aircraft would not meet the minimum safety glide slope requirements and flight delays would be encountered. Indirect effects including increased fuel consumption and travel time could occur.

Existing procedures used by Saipan Air Traffic Control to manage the airspace and deconflict military aircraft using Tinian North Field and civilian aircraft would continue. Indirect effects to Saipan Air Traffic Control would occur as the increase in operations at Tinian North field would result in a minor increase in the number of aircraft requiring handling by Saipan Air Traffic Controllers.

Impacts of commercial aviation routes would be the same as Tinian Alternative 1. Release of the Air Traffic Control Assigned Airspace for military use only when it would not interfere with commercial operations would ensure no significant impacts to published commercial aviation routes.

Under Alternative 2, impacts to airspace obstructions would be similar to Tinian Alternative 1 (Section 4.6.3.1) with the following exception: the International Broadcasting Bureau would be relocated, eliminating one of the airspace obstructions and resulting in a beneficial impact to airspace obstructions. The required marking and lighting on the proposed communication tower and a published avoidance area around the munitions storage area would minimize the potential for an aircraft mishap. Beneficial impacts to aircraft safety would be expected under Tinian Alternative 2.

With implementation of one or more of the potential mitigation measures described in Section 4.6.3.1, *Tinian Alternative 1*, and continuing coordination with the Federal Aviation Administration to mitigate potential impacts to airport air traffic that would ensure safe and timely access to the airport, less than significant impacts to airspace management or aircraft operations would be expected under Tinian Alternative 2.

4.6.3.3 Tinian Alternative 3

Impacts to the airspace environment would be the same as described for Tinian Alternative 1 (Section 4.6.3.1).

With implementation of one or more of the potential mitigation measures described in Section 4.6.3.1, *Tinian Alternative 1*, and continuing coordination with the Federal Aviation Administration to mitigate potential impacts to airport air traffic that would ensure safe and timely access to the airport, less than significant impacts to airspace management or aircraft operations would be expected under Tinian Alternative 3.

4.6.3.4 Tinian No-Action Alternative

Use of airspace around Tinian during the periodic times when non-live-fire military training occurs on the Military Lease Area of Tinian would include infrequent fixed-wing and helicopter use for training and transport. These activities would be coordinated with local and regional authorities. The duration and frequency of these activities, given recent experience, would be short term. Therefore, impacts to airspace would be less than significant. As documented in the Guam and CNMI Military Relocation EIS (DoN 2010a), there would be no changes in existing airspace configurations in order to accommodate the potential future operations in the planned four live-fire training ranges (see Table 7.2-4; DoN 2010a). Airspace operations within the Mariana Islands Range Complex, would remain similar to current conditions around Tinian (DoN 2010b) airspace configurations would not be altered under the no-action alternative, and when considered collectively, there would be less than significant impacts to airspace under the no-action alternative.

4.6.3.5 Summary of Impacts for Tinian Alternatives

Table 4.6-4 provides a comparison of the potential impacts to airspace resources for the three Tinian alternatives and the no-action alternative.

Table 4.6-4. Summary of Impacts for Tinian Alternatives

Resource Area	*Tinian (Alternative 1)*		*Tinian (Alternative 2)*		*Tinian (Alternative 3)*		*No-Action Alternative*	
Airspace	**Construction**	**Operation**	**Construction**	**Operation**	**Construction**	**Operation**	**Construction**	**Operation**
Tinian	*Not applicable*	*SI mitigated to LSI*	*Not applicable*	*SI mitigated to LSI*	*Not applicable*	*SI mitigated to LSI*	*Not applicable*	*NI*
Saipan	*Not applicable*	*SI mitigated to LSI*	*Not applicable*	*SI mitigated to LSI*	*Not applicable*	*SI mitigated to LSI*	*Not applicable*	*NI*

Legend: *LSI* = less than significant impact; *NI* = no impact; *SI* = significant impact. Shading is used to highlight the significant impacts.

4.6.3.6 Summary of Potential Mitigation Measures for Tinian Alternatives

Table 4.6-5 provides a comparison of the potential mitigation measures to airspace resources for the three Tinian alternatives and the no-action alternative.

Table 4.6-5. Summary of Potential Mitigation Measures for Tinian Alternatives

Impacts	*Category*	*Potential Mitigation Measures*	*Tinian Phase*	
			Construction	*Operation*
AIRSPACE				
Tinian The increase in military air traffic would not restrict access to Tinian International Airport. Private flights could experience minimal delays in departures and arrivals during the time when military aircraft are practicing approaches to the Tinian International Airport runway. Restricted Area 7203 was segmented to minimize impacts to commuter flight traffic between Tinian and Saipan. Civilian aircraft can be routed around the restricted airspace while staying within the minimum safety glide slope except for periods when Restricted Area 7203A/B/C/X/Y/Z/E/W are activated together. Indirect effects such as increased fuel consumption and time en route could be experienced. No impacts would be expected with activation of the Tinian Military Operations Area.	*SI mitigated to LSI*	• Establish a Letter of Procedure or Joint Use Agreement to accommodate civilian arrivals and departures into the airport. • Establish communication procedures between Tinian Range Control and Saipan International Airport Air Traffic Control to ensure priority access to Tinian International Airport for life-flight and other emergency-related activities. • Add positive control measures (e.g., air traffic control tower at Tinian, short-range radar on Tinian or Saipan that would allow air traffic controllers to see aircraft operating below 2,000 feet [609 meters]), and communications capability at Saipan or Tinian to ensure non-participating aircraft are advised of military operations. • Establish communication procedures to provide immediate feedback between air traffic controllers and range control to accommodate smaller inter-island commuter aircraft traveling between Saipan and Tinian.		X

Table 4.6-5. Summary of Potential Mitigation Measures for Tinian Alternatives

Impacts	*Category*	*Potential Mitigation Measures*	*Tinian Phase*	
			Construction	*Operation*
Saipan Air and ground activities would have the potential to significantly impact current airspace procedures during the 140 days per year that the Restricted Areas 7203A/B/C and W are scheduled and activated for use. Restricted areas would not be activated during times with scheduled Saipan International Airport commercial large passenger jet and jetliner activity. Existing procedures used to manage aircraft operations at Tinian North Field and deconflict military and civilian aircraft would be expected to continue.	*SI mitigated to LSI*	• Establish a Letter of Procedure between the Federal Aviation Administration and the U.S. military that contains the procedures for access to the airspace and gives priority to large commercial aircraft. The agreement would ensure proper range scheduling procedures are in place to ensure no significant disruption of normal flights into and out of Saipan International Airport. • Electronically monitor each training event through the use of radar and other surveillance equipment such as an expeditionary control tower that would continually monitor the airspace to ensure the safety of the flying public during times when training is occurring. • Schedule and coordinate training events with Saipan International Airport arrivals and departures as to not conflict. Establish procedures and communications that allow for air traffic controllers and range controllers to simultaneously see the airspace and ensure priority is given to any aircraft heading to or from Saipan International Airport. In the event of an unforeseen incursion into an active restricted airspace, the simultaneous ability to monitor activities on the ground and in the air should provide the ability to stop any training in seconds.		X

Legend: *LSI* = less than significant impact; *SI* = significant impact. Shading is used to highlight the significant impacts.

4.6.4 Pagan

There would be no differences in proposed airspace configurations and designations between the two action alternatives so the discussion below applies to both Pagan Alternatives 1 and 2. In addition to the proposed airspace, use of chaff and flares are proposed for use in offshore areas of Warning Area 14 and Restricted Areas 7204A/B/C under both alternatives.

For each Pagan Alternative, effects are discussed in the areas of airspace management (i.e., how the airspace would be managed to support all users) and the number of aircraft needing access to the airspace (operations). For the airspace designated for military use, effects are discussed based on the connection to other airspace and the ability for the Federal Aviation Administration to manage the airspace in a manner that supports all users of the airspace, additionally use of chaff and flares are discussed as it relates to flight safety. Airspace obstructions are included to cover construction of the proposed communications tower that would require Federal Aviation Administration review to ensure marking in support of airspace safety.

As shown in Chapter 2, *Proposed Action and Alternatives*, Figure 2.5-5, there are two types of Special Use Airspace proposed for Pagan: Warning Areas 14 Low and 14 High, and four Restricted Areas (R-7204A, R-7204B, R-7204C and R-7204D). Each individual proposed airspace segment would be activated as needed based on the training being accomplished. Joint Region Marianas, would be responsible for scheduling the airspace and ensuring Notices to Airmen are issued prior to activation.

The warning areas would be activated when needed for ship-to-shore, air-to-ground, and supersonic aircraft operations. The restricted areas would be activated either independently or together as needed when training with live munitions during ground based training, air-to-ground training, and ship-to-shore training. Maximum altitude for the restricted areas would vary from 4,000 feet (1,219 meters) above ground level to 30,000 feet (9,144 meters) MSL depending upon which systems/activities have been scheduled. Communications equipment would be in place supporting real-time communications between onsite range users, onsite range safety personnel, the Marine Corps Range Control Facility, and air traffic control facilities.

4.6.4.1 Pagan Alternative 1

4.6.4.1.1 Restricted Area

Pagan Airfield lies within Restricted Area 7204B and aircraft not participating in military activities would be prohibited from accessing the airfield when activated for military use. In 2007 there were only 10 aircraft operations recorded for Airfield (detailed information is presented in Table 3.2-1 of Appendix O, *Transportation Study*). Pagan Airfield is located in uncontrolled (Class G) airspace and there are no published approaches or air traffic control services for use of the airspace surrounding the airfield. Pilots of the rare civilian aircraft that might require use airfield are required to use see-and-avoid visual flight rules. Active management of the airspace by the U.S. military during times when training is occurring would minimize any potential impacts to aircraft needing access to the Pagan Airfield. Less than significant impacts would be expected for civilian aircraft desiring to use Pagan Airfield based on the low number of operations.

4.6.4.1.2 Warning Area

As shown in Figure 4.6-1, two existing commercial aviation routes cross within the proposed Warning Area 14, A337, and G205. Aviation route A337 is within 23 nautical miles (43 kilometers) of Pagan and G205 lies within 40 nautical miles (74 kilometers). Neither airway would be impacted if Restricted Area 7204 were activated independently of the warning area. When proposed Warning Area 14 High and Low are activated together, aircraft using these routes could be re-routed around the warning area or Warning Area 14 High could be recalled by air traffic control to allow aircraft to fly over the active airspace.

Air Traffic Control Assigned Airspace 3A lies approximately 60 nautical miles (111 kilometers) south of Pagan and its northern border forms the southern border of proposed Warning Area 14. Air Traffic Control Assigned Airspace 3A is scheduled for use by Joint Region Marianas and controlled by the Federal Aviation Administration Guam Combined Center/Radar Approach Control. Air Traffic Control Assigned Airspace 3 is scheduled for use approximately 160 days per year (see Table 3.6-1). If Warning Area 14 were activated at the same time as Air Traffic Control Assigned Airspace 3, aircraft flying on A337 that have been re-routed to the east around Air Traffic Control Assigned Airspace 3 could experience additional re-routing. Air Traffic Control Assigned Airspace 3 and Warning Area 14 could be scheduled for use during the same time frame or independent of each other. The ongoing coordination with the Federal Aviation Administration would be used to ensure the safe and efficient use of airspace needed to route commercial aircraft outside of the warning area in a manner that would minimize both direct and indirect impacts to commercial aircraft and aviation routes to being less than significant.

Under the proposed action, maximum use of Warning Area 14 would be up to 112 days per year and for as long as 22 hours per day (see Tables 2.5-1 and 2.5-2 for additional details on proposed aircraft operations and munitions use). As described in 3.6.4.4, *Airspace Designated for Military Use*, use of Air Traffic Control Assigned Airspace 3 requires at least one aircraft to continuously monitor the appropriate Guam Combined Center/Radar Approach Control frequency for immediate recall of the altitude/airspace as needed to support commercial air traffic.

Airspace management and commercial operations could be impacted as a result of multiple flight information regions (Guam Combined Center/Radar Approach to the south and Seattle Air Route Traffic Control Center around Pagan and to the north). To minimize impacts from Pagan Alternative 1, coordination with the Federal Aviation Administration is in progress to establish procedures for use, including the possibility of installing long-range radar that could be used to modify flight information region boundaries. Therefore, less than significant impacts to airspace are expected under Pagan Alternative 1.

4.6.4.1.3 Airspace Obstructions

The proposed construction of a field ammunition staging area would result in a restriction to flights arriving and departing the Pagan Airfield. Flight restrictions prohibit flights below 500 feet (152 meters) above ground level over ammunition magazines. Aircraft would need to be routed around the field ammunition staging area or be at altitudes greater than 500 feet (152 meters) above ground level. During times when the military is not training, live munitions would not be stored in the staging area and no restrictions would be required. Because live munitions would not be stored when the RTA is inactive, no impacts would be expected to the few civilian aircraft that use the Pagan airfield.

4.6.4.1.4 Use of Chaff and Flares

Under this alternative, aircraft using Warning Area 14 and Restricted Area 7204 A/B/C would train using electromagnetic countermeasures such as RR-188 Chaff and MJU-10 Flares. It is estimated that approximately 2,400 self-protection chaff and 2,400 flares would be deployed on an annual basis. Flare use would be limited to areas over water and above 500 feet (152 meters) MSL.

Modern chaff (known as "angel hair" chaff) is thinner than a fine human hair and normally ranges in length from 0.3 to 1.0 inch (7.6 to 25.4 millimeters). Chaff is made as small and light as possible so that it would disperse quickly and remain in the air long enough to confuse enemy radar. The chaff proposed for use contains fibers configured to reduce interference with radars operated by the Federal Aviation Administration throughout the National Airspace System. New Federal Aviation Administration radars are sensitive enough to detect chaff so communication of when and where aircraft are training with chaff permits the Federal Aviation Administration to identify and differentiate chaff from natural weather events (such as thunderstorms) (Air Force 2011). Chaff used for training does not interfere with radio communications.

Defensive flares are not explosive; they are magnesium pellets that, when deployed, burn for a short period (approximately 5 seconds) at approximately 1,202 degrees Fahrenheit (650 degrees Celsius). The burn temperature is hotter than the exhaust of an aircraft engine and, therefore, attracts and decoys heat-seeking weapons and sensors targeted on the aircraft. Flares would be ejected downward from altitudes greater than 500 feet (152 meters) and drop behind the aircraft. They burn out after falling approximately 500 feet (152 meters).

Use of chaff and flares would not interfere with the management of the airspace, and no cases of an aircraft being struck by a residual piece of a defensive countermeasure have ever been recorded (Air Force 2011).

No impacts to other users of the airspace would be expected from the use of chaff and flares associated with Pagan Alternative 1.

4.6.4.2 Pagan Alternative 2

Impacts to the airspace environment would be the same as described for Pagan Alternative 1 (Section 4.6.4.1). Less than significant impacts would be expected for civilian aircraft desiring to use Pagan Airfield based on the low number of operations. No impacts to other users of the airspace would be expected from the use of chaff and flares. Based on the availability of airspace in the region and the ability for Air Traffic Control to recall airspace as needed for commercial operations, less than significant impacts to commercial aviation routes would be expected with implementation of Pagan Alternative 2.

4.6.4.3 Pagan No-Action Alternative

Under the no-action alternative, no changes in existing airspace would occur. Airspace around Pagan would remain as Class G airspace. Special Use Airspace would not be needed to accommodate operations on Pagan. Commercial air traffic would not be required to deviate from published commercial aviation routes. Airspace operations within the Mariana Islands Range Complex would remain similar to current conditions. Airspace configurations would not be altered under the no-action

alternative, and when considered collectively, there would be less than significant impacts to airspace under the no-action alternative.

4.6.4.4 Summary of Impacts for Pagan Alternatives

Table 4.6-6 provides a comparison of the potential impacts to airspace resources for the two Pagan alternatives and the no-action alternative.

Table 4.6-6. Summary of Impacts for Pagan Alternatives

Resource Area	***Pagan (Alternative 1)***		***Pagan (Alternative 2)***		***No-Action Alternative***	
Airspace	**Construction**	**Operation**	**Construction**	**Operation**	**Construction**	**Operation**
Pagan	*Not applicable*	*LSI*	*Not applicable*	*LSI*	*Not applicable*	*NI*

Legend: *LSI* = less than significant impact; *NI* = no impact.