4.4 AIR QUALITY

Section 4.4 addresses the potential impacts to air quality as a result of the proposed action. Air quality can be affected by air pollutants produced by mobile sources, such as vehicular traffic, aircraft, or non-road equipment used for construction activities, and by fixed or immobile facilities, referred to as "stationary sources." Stationary sources can include combustion and industrial stacks and exhaust vents. The impact analysis includes an incremental emissions analysis of criteria air pollutants associated with the following construction and operation activities:

- Construction equipment and vehicle emissions during RTA and supporting facilities construction
- Land training, inclusive of associated weapon firing and vehicle usage
- Amphibious training
- Air support and training
- Operations for transporting military training personnel
- Supporting equipment emissions within the base camp and training ranges
- Barge and equipment operations for solid waste transfer

Greenhouse gas emissions associated with the above activities occur locally; however, their impacts are both global in scale and cumulative over time. Therefore, greenhouse gas emissions have been calculated and are presented in this section, but their impacts are assessed in Chapter 5, *Cumulative Impacts*.

4.4.1 Approach to Analysis

The air quality impact analysis estimates emissions that would occur from proposed construction and operational activities. These emissions are compared against the thresholds established in the Clean Air Act's Prevention of Significant Deterioration program, to evaluate the extent of potential air quality impacts.

Air quality impacts associated with the proposed construction activities result from both construction equipment and vehicle exhaust, as well as from fugitive dust generated by earth moving activities. Emission sources associated with operational activities include: aircraft during landing, take-off, and cruising below 3,000 feet (914 meters) above ground level; marine vessels; vehicles; support equipment; use of ordnance; and mobile sources associated with interim solid waste transfer operations. The proposed training facilities would also generate fugitive dust emissions if training operations occur within areas of exposed soil.

Both Tinian and Pagan are considered unclassified and in attainment for all criteria pollutants. Because no regulatory de minimis emission thresholds have been established for an attainment area and the proposed alternatives would occur in areas that are considered to be in attainment, the "major stationary source" definition (250 tons [227 metric tons] per year or more of air pollutants that are subject to regulations under the Clean Air Act) from the Prevention of Significant Deterioration program applicable in an attainment area was selected as a comparable significant impact threshold for this EIS/OEIS. This threshold only applies to criteria pollutants and is not applicable to greenhouse gas emissions in terms of carbon dioxide. There is no specific impact threshold for carbon dioxide. The

potential impacts of greenhouse gas emissions, including carbon dioxide, are discussed in Chapter 5, *Cumulative Impacts*.

More detailed information on methodology for determining air quality impacts related to the proposed action, including annual emission calculations, is presented in Appendix G, *Air Quality Technical Memo*.

4.4.1.1 Construction

Air quality impacts were evaluated based on the construction and ground disturbance activities described in Chapter 2, *Proposed Action and Alternatives*. Criteria pollutants and carbon dioxide emissions were calculated based on the equipment type, the duration of equipment use, and anticipated manpower, detailed in Appendix G, *Air Quality Technical Memo*.

Construction equipment and manpower requirements were based on the data contained in 2003 *RSMeans Facilities Construction Cost Data* (RSMeans 2002) and 2011 *RSMeans Facilities Construction Cost Data* (RSMeans 2010). It was assumed for emission estimating purposes that construction activities would start in 2017 and continue through 2027.

Construction equipment emissions were calculated based on estimated hours of equipment use and the emission factor assigned to the equipment, as provided by the U.S. Environmental Protection Agency in the NONROAD emission factor model (U.S. Environmental Protection Agency 2008). National default model inputs for off-road construction equipment and vehicles, average equipment horsepower values, and equipment power load factors were also obtained from the U.S. Environmental Protection Agency model (U.S. Environmental Protection Agency 2008).

Because the operational activity data presented in RSMeans' cost data books are generated based on the overall length of time equipment is onsite, an equipment actual running time factor (i.e., actual usage factor) was employed to estimate equipment emissions. The usage factor for each equipment type was obtained from Federal Highway Administration's *Roadway Construction Noise Model User's Guide* (Federal Highway Administration 2006). Emission factors related to construction delivery trucks were estimated using the latest version of the Motor Vehicle Emission Simulator, MOVES2010b (U.S. Environmental Protection Agency 2012). The MOVES2010b emission factor model provides a specific emission factor database for truck and commuter vehicle classifications. Because the MOVES2010b model does not contain data for the CNMI, the database for the U.S. Virgin Islands was used, based on a recommendation from the U.S. Environmental Protection Agency (Dave Brzezinski, U.S. Environmental Protection Agency, personal communication, May 30, 2013). To estimate air emissions generated during construction of the proposed Tinian and Pagan RTAs, the following prototypical elements were used to extrapolate emissions for the overall construction effort:

- General range clearing and grading
- Range automation installation
- Range equipment shed
- Base camp
- Airfield improvements
- Roadway construction
- Port improvements

4.4.1.2 Operation

Proposed operational training activities with the potential to impact air quality include:

- Aircraft flight operations during take-off and landing, cruising training, and transporting troops, weapons, and other training equipment
- Marine vessel operations
- Ground vehicle operations at ranges
- Support equipment operations
- Munitions operations
- Interim solid waste transfer/process operations

4.4.1.2.1 Aircraft Emissions

The number of annual training flight missions and flight hours within 3,000 feet (914 meters) above ground level defined for each alternative were based on information described in Chapter 2, *Proposed Action and Alternatives*. This altitude is defined by the U.S. Environmental Protection Agency to account for aircraft emissions within a mixing zone (see Appendix G, *Air Quality Technical Memo* for more details). The training data includes the number of landings and take-offs at Tinian International Airport and at various designated landing practice zones, and overall in-flight hours operating below 3,000 feet (914 meters) above ground level within Tinian and Pagan airspace. The emissions from aircraft flight operations were estimated using the methods and emission factors obtained from the following references:

- *Procedures for Emission Inventory Preparation, Volume IV: Mobile Sources* (U.S. Environmental Protection Agency 1992).
- DoN aircraft engine emission factors developed by the DoN's Aircraft Environmental Support Office (Aircraft Environmental Support Office 2000-2013).
- *Air Emissions Guide for Air Force Mobile Sources* (Air Force Civil Engineer Center 2013) and U.S. Federal Aviation Administration Emissions and Dispersion Modeling System (Version 5.01) for non-DoN aircraft emissions factors (Federal Aviation Administration 2014).

4.4.1.2.2 Marine Vessel Emissions

The training vessel operational data such as the engine power level for each vessel type, the operational hours per vessel per event, and the number of events per year were predicted based on the training tempo described in Chapter 2, *Proposed Action and Alternatives*. Vessel emissions were calculated using the methodologies, emission factors, and load factors related to diesel marine vessels obtained from *Current Methodologies in Preparing Mobile Source Port-related Emission Inventories* (U.S. Environmental Protection Agency 2009). Emission factors were multiplied by predicted annual running hours for each identified vessel to determine overall estimated emissions on an annual basis.

4.4.1.2.3 Ground Vehicles Emissions

Ground training vehicle exhaust emissions from trucks, high mobility multi-purpose wheeled vehicles, and buses used during training exercises were estimated with the same method used to predict construction vehicle emissions. The U.S. Environmental Protection Agency MOVES2010b emission factor model was used to predict emissions factors associated with each type of training vehicle (U.S. Environmental Protection Agency 2012). The model-established emission factors are based on the average weight and fuel type of each type of training vehicle. The emission factors were then multiplied by the annual vehicle running hours to determine overall emissions on an annual basis. In addition, because most of these training vehicles would maneuver on unpaved roads with the potential to generate fugitive dust, the U.S. Environmental Protection Agency's AP-42, *Compilation of Air Pollution Emission Factors*, was also used to predict particulate matter components in fugitive dust emissions from training vehicles (U.S. Environmental Protection Agency 1995).

4.4.1.2.4 Supporting Equipment and Generator Emissions

It is anticipated that during the training exercises, mobile and portable equipment; such as water and fuel trucks; forklift; and mobile and stationary diesel generators would also be required. The supporting equipment emission factors are based on both the U.S. Environmental Protection Agency's AP-42 (U.S. Environmental Protection Agency 1995) and the NONROAD model database (U.S. Environmental Protection Agency 2008). Relevant emission factors were multiplied by the annual equipment running hours to determine overall emissions on an annual basis.

4.4.1.2.5 Weapon Firing Emissions

Air emissions potentially occur during each weapon firing. Emission releases may occur during the launching of a projectile, from the propellant charge at firing position, and from the detonation explosion of the projectile in the target vicinity. The U.S. Environmental Protection Agency has published emission factors mostly in draft forms for various munitions in the AP-42 guidance. These emission factors for weapons firing and explosive detonation were used to predict overall munitions emissions.

4.4.1.2.6 Solid Waste Transfer Equipment Emissions

It is anticipated that solid waste generated as part of training exercises would be processed and transferred from Tinian to a regulatory compliant facility off-island. Mobile equipment (e.g., barges, loaders) would therefore be required to process and transport the waste between islands. The equipment emission factors are based on the same references described previously for barge emissions and non-road equipment.

4.4.2 Resource Management Measures

Resource management measures that are applicable to air quality include the following best management practices and standard operating procedures:

- Maintenance and operation of construction equipment in compliance with the Environmental Protection Agency's Tier 2 engine emission standards
- Minimization of land disturbance during construction and operational periods

- Stabilization of construction site entrances
- Covering trucks when hauling soil, stone, and debris
- Utilization of water trucks to minimize dust during construction activities
- Minimization of truck idling time
- Utilization of construction equipment with emission control devices (e.g., diesel particulate filters)

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

4.4.3 Tinian

4.4.3.1 Tinian Alternative 1

4.4.3.1.1 Construction Impacts

Operation of construction equipment and associated vehicles may result in short-term impacts to air quality. The total construction-related air emissions were averaged evenly over a potential 9-year build period on Tinian to obtain an annual emission average (Table 4.4-1). The average annual emissions are well below the 250 tons (227 metric tons) per year threshold. Therefore, Tinian Alternative 1 construction activities would result in less than significant direct or indirect impacts to air quality.

Table 4.4-1. Annual Average Construction Emissions – Tinian Alternative 1

Construction Year	*Pollutant (tons per year)*						
	SO_2	*CO*	*PM_{10}*	*$PM_{2.5}$*	*NO_x*	*VOC*	*CO_2*
1 – 9	0.19	9.25	0.69	0.65	8.09	1.71	1,207.57

Legend: CO = carbon monoxide; CO_2 = carbon dioxide; NO_x = nitrogen oxides; PM_{10} = particulate matter with a particle diameter of less than or equal to 10 microns; $PM_{2.5}$ = particulate matter with a particle diameter of less than or equal to 2.5 microns; SO_2 = sulfur dioxide; VOC = volatile organic compound.

Note: 250 ton per year threshold does not apply to CO_2.

4.4.3.1.2 Operation Impacts

Tinian Alternative 1 would not affect the permitted operational capacity of existing utility systems as discussed in Section 4.14, *Utilities*. Therefore, no adverse air quality impacts from stationary sources (i.e., new or modified fixed or immobile facilities) would occur. Annual military training activities in Tinian would increase under Tinian Alternative 1. Therefore, annual emissions for criteria pollutants would increase relative to the existing conditions. Calculated emissions are summarized in Table 4.4-2.

Table 4.4-2. Operational Training Annual Emissions – Tinian Alternatives 1, 2, and 3

Pollutant (tons per year)						
SO_2	*CO*	*PM_{10}*	*$PM_{2.5}$*	*NO_x*	*VOC*	*CO_2*
Aircraft Sorties around Tinian International Airport						
8.12	256.27	42.69	42.69	89.02	75.18	25,048.85
Aircraft Training Exercises						
2.74	3.25	11.29	11.29	28.70	0.37	3,740.83
Marine Vessels						
31.61	8.85	3.75	3.43	106.28	4.02	5,144.48
Ground Vehicles						
13.38	42.31	109.13	19.38	141.71	9.11	1,192.42
Support Equipment						
0.17	3.43	16.48	2.12	7.50	0.64	794.05
Generators						
0.35	4.71	0.34	0.29	20.57	0.60	994.00
Solid Waste Transfer						
0.10	0.31	0.06	0.06	0.95	0.07	84.56
Munitions						
0.03	56.01	38.68	13.80	1.72	0.01	82.21
Total						
56.45	375.14	222.42	93.06	396.45	90.00	37,081.40

Legend: CO = carbon monoxide; CO_2 = carbon dioxide; NO_x = nitrogen oxides; PM_{10} = particulate matter with a particle diameter of less than or equal to 10 microns; $PM_{2.5}$ = particulate matter with a particle diameter of less than or equal to 2.5 microns; SO_2 = sulfur dioxide; VOC = volatile organic compound.

Note: 250 ton per year threshold does not apply to CO_2.

The operational training-related emissions for Tinian Alternative 1 (Table 4.4-2) are below the comparative impact threshold of 250 tons (227 metric tons) per year for all criteria pollutants, except carbon monoxide and nitrogen oxide. The training-related carbon monoxide and nitrogen oxide emissions would occur across a large geographic area that consists of both the airspace around the airport and training facilities where aircraft would operate, the proposed RTA where training vehicles and aircraft would operate, and coastal areas where aircraft and vessels would operate.

Approximately 71% of total carbon monoxide and 56% of nitrogen oxide emissions would be generated by aircraft and seafaring vessels and would not result in impacts to air quality at ground level on land where human exposure would occur. Consequently, the total ground level carbon monoxide and nitrogen oxide emissions would be well below the 250 tons (227 metric tons) per year comparative impact threshold. Furthermore, the dominant trade winds in the region blowing from the east and northeast would quickly disperse emissions towards the ocean. Therefore, Tinian Alternative 1 operations would result in less than significant direct or indirect impacts to air quality.

4.4.3.2 Tinian Alternative 2

4.4.3.2.1 Construction Impacts

Tinian Alternative 2 would result in slightly higher construction impacts to air quality than estimated from Tinian Alternative 1. The predicted average annual construction emissions under Tinian Alternative 2 as shown in Table 4.4-3 are well below the significance threshold of 250 tons (227 metric tons) per year for criteria pollutants. Therefore, Tinian Alternative 2 construction activities would result in less than significant direct or indirect impacts to air quality.

Table 4.4-3. Annual Average Construction Emissions – Tinian Alternative 2

Construction Year	Pollutant (tons per year)						
	SO_2	CO	PM_{10}	$PM_{2.5}$	NO_x	VOC	CO_2
1 – 9	0.19	9.49	0.70	0.66	8.20	1.75	1,223.55

Legend: CO = carbon monoxide; CO_2 = carbon dioxide; NO_x = nitrogen oxides; PM_{10} = particulate matter with a particle diameter of less than or equal to 10 microns; $PM_{2.5}$ = particulate matter with a particle diameter of less than or equal to 2.5 microns; SO_2 = sulfur dioxide; VOC = volatile organic compound.
Note: 250 ton per year threshold does not apply to CO_2.

4.4.3.2.2 Operation Impacts

Operational training impacts to air quality resulting from Tinian Alternative 2 would be the same as those from Tinian Alternative 1 (see Table 4.4-2) because operations would be the same under both alternatives in terms of activities although the location of some of the activities would differ. See Section 4.4.3.1, *Tinian Alternative* 1, for a discussion of impacts. Therefore, Tinian Alternative 2 operations would result in less than significant direct or indirect impacts to air quality.

4.4.3.3 Tinian Alternative 3

4.4.3.3.1 Construction Impacts

Annual construction emissions resulting from Tinian Alternative 3 would be similar to, but slightly higher than, emissions resulting from Tinian Alternative 1 construction activities. The average annual construction emissions from Tinian Alternative 3, as shown in Table 4.4-4, are below the significance threshold of 250 tons (227 metric tons) per year for criteria pollutants. Therefore, construction activities associated with Tinian Alternative 3 would result in less than significant impacts to air quality.

Table 4.4-4. Annual Average Construction Emissions – Tinian Alternative 3

Construction Year	Pollutant (tons per year)						
	SO_2	CO	PM_{10}	$PM_{2.5}$	NO_x	VOC	CO_2
1 – 9	0.19	9.30	0.69	0.65	8.12	1.72	1,210.85

Legend: CO = carbon monoxide; CO_2 = carbon dioxide; NO_x = nitrogen oxides; PM_{10} = particulate matter with a particle diameter of less than or equal to 10 microns; $PM_{2.5}$ = particulate matter with a particle diameter of less than or equal to 2.5 microns; SO_2 = sulfur dioxide; VOC = volatile organic compound.
Note: 250 ton per year threshold does not apply to CO_2.

4.4.3.3.2 Operation Impacts

Tinian Alternative 3 would result in the same impacts to air quality as those resulting from Tinian Alternative 1 operations (see Table 4.4-2) because operations would be the same under both alternatives in terms of activities although the location of some of the activities would differ. See Section 4.4.3.1, *Tinian Alternative 1*, for a discussion of impacts. Therefore, Tinian Alternative 3 operations would also result in less than significant direct or indirect impacts to air quality.

4.4.3.4 Tinian No-Action Alternative

Under the no-action alternative for Tinian, periodic non-live-fire military training exercises would continue. Air emissions would include minor and short-term amounts of criteria pollutants related to fossil fuel combustion exhausts from ground vehicle and aircraft operations. Particulate matter in the form of dust would be emitted as vehicles and troops used unpaved road and staging areas. There would also be annual air emissions associated with the construction and subsequent operations of the four live-fire training ranges envisioned in the Guam and CNMI Military Relocation EIS (DoN 2010a). These emissions from the four ranges would be less than significant (see Table 5.2-2; DoN 2010a). Emissions under Mariana Islands Range Complex training would produce minor localized emissions and would not affect current attainment status of all criteria pollutants (see Table 3.4-8; DoN 2010b). When the combined emissions from the no-action alternative activities are considered, they would be well below the significance threshold of 250 tons (227 metric tons) per year; therefore, the no-action alternative would result in less than significant impacts to air quality on Tinian.

4.4.3.5 Summary of Impacts for Tinian Alternatives

Table 4.4-5 provides a comparison of the potential impacts to air quality resources for the three Tinian alternatives and the no-action alternative.

Table 4.4-5. Summary of Impacts for Tinian Alternatives

Resource Area	*Tinian (Alternative 1)*		*Tinian (Alternative 2)*		*Tinian (Alternative 3)*		*No-Action Alternative*	
Air Quality	**Construction**	**Operation**	**Construction**	**Operation**	**Construction**	**Operation**	**Construction**	**Operation**
Air Quality	*LSI*	*LSI*	*LSI*	*LSI*	*LSI*	*LSI*	*LSI*	*LSI*

Legend: *LSI* = less than significant impact.

4.4.4 Pagan

4.4.4.1 Pagan Alternative 1

4.4.4.1.1 Construction Impacts

The annual emissions were conservatively estimated based on a 4-year construction period and are summarized in Table 4.4-6. As discussed in Chapter 2, *Proposed Action and Alternatives,* construction would occur over an 8 to 10 year period. The type and intensity of construction activities would vary across the 8 to 10 year construction period. Averaging emissions across a 4-year construction period provides a conservative estimate of annual emissions. Total emissions are below the 250 tons (227 metric tons) per year threshold. Therefore, Pagan Alternative 1 construction activities would result in less than significant direct or indirect impacts to air quality.

Table 4.4-6. Annual Construction Emissions – Pagan Alternative 1

Construction Year	*Pollutant (tons per year)*						
	SO_2	*CO*	*PM_{10}*	*$PM_{2.5}$*	*NO_x*	*VOC*	*CO_2*
1 – 4	0.07	5.76	0.33	0.31	3.00	1.14	369.53

Legend: CO = carbon monoxide; CO2 = carbon dioxide; NOx = nitrogen oxides; PM_{10} = particulate matter with a particle diameter of less than or equal to 10 microns; $PM_{2.5}$ = particulate matter with a particle diameter of less than or equal to 2.5 microns; SO2 = sulfur dioxide; VOC = volatile organic compound.

Note: 250 ton per year threshold does not apply to CO_2.

4.4.4.1.2 Operation Impacts

The annual emissions for the operational elements and training exercises are summarized in Table 4.4-7 and are well below the comparative impact threshold of 250 tons (227 metric tons) per year for all criteria pollutants, except for nitrogen oxide. Approximately 75% of nitrogen oxide emissions would be generated by ground training vehicles. The training would also involve explosions detonated on lava rocks that likely contain hazardous fibrous materials and would release particulates in the air. However given the lack of studies of the impact from rock detonations, the particulate emissions generated cannot be feasibly quantified. However, because no sensitive land uses are located close to the proposed RTA and the dominant trade winds in the region would quickly disperse all emissions (including nitrogen oxide or particulates from rock detonations) towards the ocean, Pagan Alternative 1 operations would result in less than significant direct or indirect impacts to air quality.

Table 4.4-7. Operational Training Activity Annual Emissions – Pagan Alternative 1

Pollutant (tons per year)						
SO_2	***CO***	***PM_{10}***	***$PM_{2.5}$***	***NO_x***	***VOC***	***CO_2***
Aircraft Sorties around Tinian International Airport						
2.98	74.22	17.16	17.16	42.66	29.71	7,607.25
Aircraft Training Exercises						
2.29	2.31	8.00	8.00	42.64	0.28	4,810.82
Marine Vessels						
2.18	0.84	0.27	0.25	10.22	0.36	353.86
Ground Vehicles						
32.80	94.12	155.51	35.46	335.45	20.41	1,421.42
Support Equipment						
0.02	0.49	1.24	0.20	0.92	0.09	102.75
Generators						
0.30	4.04	0.29	0.25	17.61	0.52	851.20
Munitions						
0.04	6.63	24.92	23.05	0.19	0.06	315.34
Total						
40.61	182.65	207.39	84.37	449.69	51.43	15,462.64

Legend: CO = carbon monoxide; CO_2 = carbon dioxide; NO_x = nitrogen oxides; PM_{10} = particulate matter with a particle diameter of less than or equal to 10 microns; $PM_{2.5}$ = particulate matter with a particle diameter of less than or equal to 2.5 microns; SO_2 = sulfur dioxide; VOC = volatile organic compound.

Note: 250 ton per year threshold does not apply to CO_2.

4.4.4.1.2.1 Volcanic Impacts to Operation

Existing volcanic gases would continue to be released from volcanic eruptions as part of natural geological processes. Sulfur dioxide, a criteria pollutant, is one of the most common gases released in volcanic eruptions and is hazardous to humans. Periodic sulfur dioxide releases due to volcanic eruptions could potentially have an adverse impact to air quality. However, volcanic eruptions are natural geological processes, and the proposed action would not have an impact on the frequency of such eruptions. Therefore, Pagan Alternative 1 operations would have no impacts to air quality in regard to volcanic eruptions.

4.4.4.2 Pagan Alternative 2

4.4.4.2.1 Construction Impacts

Pagan Alternative 2 construction emissions would be similar but slightly less than emissions predicted to result from Pagan Alternative 1. The modeled annual construction emissions summarized in Table 4.4-8 are below the significance threshold of 250 tons (227 metric tons) per year for criteria pollutants. Therefore, Pagan Alternative 2 construction activities would result in less than significant impacts to air quality.

Table 4.4-8. Annual Construction Emissions – Pagan Alternative 2

Construction Year	Pollutant (tons per year)						
	SO_2	CO	PM_{10}	$PM_{2.5}$	NO_x	VOC	CO_2
1 – 4	0.05	4.21	0.24	0.23	2.22	0.84	273.91

Legend: CO = carbon monoxide; CO_2 = carbon dioxide; NO_x = nitrogen oxides; PM_{10} = particulate matter with a particle diameter of less than or equal to 10 microns; $PM_{2.5}$ = particulate matter with a particle diameter of less than or equal to 2.5 microns; SO_2 = sulfur dioxide; VOC = volatile organic compound.
Note: 250 ton per year threshold does not apply to CO_2.

4.4.4.2.2 Operation Impacts

Operation impacts to air quality resulting from Pagan Alternative 2 would be nearly the same as those predicted to result from Pagan Alternative 1, as the same operational activities would take place under both alternatives. See Section 4.4.4.1, *Pagan Alternative 1*, for a discussion of impacts. Therefore, Pagan Alternative 2 operations would also result in less than significant impacts to air quality.

4.4.4.2.2.1 Volcanic Impacts to Operation

Impacts to Pagan Alternative 2 operations resulting from volcanic activity would be the same as Alternative 1. See Section 4.4.4.1, *Pagan Alternative 1*, for a discussion of impacts. Therefore, Pagan Alternative 2 operations would have no impacts to air quality in regard to volcanic eruptions.

4.4.4.3 Pagan No-Action Alternative

Under the no-action alternative, air emissions associated with the proposed operations would not occur and air quality conditions would remain the same as existing conditions described in Chapter 3, *Affected Environment*. The continuation of a minor amount of visits to Pagan would not result in any impacts to air quality under the no-action alternative.

4.4.4.4 Summary of Impacts for Pagan Alternatives

Table 4.4-9 provides a comparison of the potential impacts to air quality resources for the two Pagan alternatives and the no-action alternative.

Table 4.4-9. Summary of Impacts for Pagan Alternatives

Resource Area	Pagan (Alternative 1)		Pagan (Alternative 2)		No-Action Alternative	
Air Quality	**Construction**	**Operation**	**Construction**	**Operation**	**Construction**	**Operation**
Air Quality	*LSI*	*LSI; NI (regarding volcanic activity)*	*LSI*	*LSI; NI (regarding volcanic activity)*	*NI*	*NI*

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