5.5 AIR QUALITY

5.5.1 Affected Environment

No air quality monitoring stations are close to the Main Post or SBER. The closest ambient air quality monitoring station is about six miles from SBMR at Pearl City. The Pearl City monitoring station has, in recent years, reported a few instances in which PM_{10} levels exceeded the state 24-hour standard, but not the federal 24-hour standard. These instances of high PM_{10} levels have been attributed to fireworks use during New Year celebrations. The instances of high PM_{10} levels at Pearl City are not representative of conditions at SBMR.

Existing emission sources at SBMR include the following:

- A small quarry with gravel processing equipment;
- Boiler systems in various buildings;
- Generator systems in various buildings for backup power;
- Two incinerators for document destruction;
- Personal and government vehicle traffic;
- Aircraft and helicopter flight operations;
- Warehousing and related equipment operations;
- Equipment maintenance activities;
- Ordnance firing and detonations during training exercises;
- Controlled burning of ranges to restrict vegetative fuel growth; and
- Unplanned wildfires.

The Army operates three automated weather stations at SBMR that are used for monitoring and predicting fire hazard conditions at the SBMR range areas. Weather data from these stations has not been fully summarized. Historical data from WAAF show that average daily minimum temperatures range from 60 degrees F (15 C) in January to 69 degrees F (21 C) in August. Average daily maximum temperatures range from 75 degrees F (24 C) in March to 83 degrees F (28 C) in September. Precipitation averages 37.9 inches (96 cm) per year, with monthly average precipitation ranging from 1.38 inches (4 cm) in July to 5.22 inches (13 cm) in December (WeatherDisc Associates 1990). Wind speeds recorded at SBMR generally are light. Wind speeds at the Main Post generally average between 1 and 7 mph; wind speeds at SBER generally average between 1 and 8 mph. Maximum wind speeds seldom exceed the 15 mph (24 kph) threshold commonly associated with wind erosion processes.

5.5.2 Environmental Consequences

Summary of Impacts

One significant air quality impact has been identified at SBMR under the Proposed Action and the RLA Alternative. Vehicle travel on unpaved roads and in off-road maneuver areas would be a permanent source of increased fugitive dust emissions. Fugitive dust from military vehicle use on unpaved roadways and off-road areas would increase by 780 tons (708 metric tons) per year at SBMR under the Proposed Action and by 826 tons (749 metric tons) per year under the RLA Alternative, based on USEPA 1998 methodologies for estimating PM_{10} generated by vehicles traveling on unpaved roads (USEPA 1998). Dispersion modeling analyses indicate that fugitive dust emissions from vehicle travel on unpaved roads and from vehicle operations in off-road maneuver areas could violate the federal 24-hour PM_{10} standard at off-post locations. The substantial increase in fugitive PM_{10} emissions from military vehicle use at SBMR, the potential for exceeding the federal 24-hour PM_{10} standard and the potential impacts on quality of life to surrounding communities result in a significant air quality impact at SBMR under the Proposed Action. The impact from fugitive dust emissions would be reduced to a less than significant level through mitigation programs that include using washed gravel on military vehicle trails; periodically applying dust control chemicals; monitoring ambient PM_{10} concentrations; and implementation of the DuSMMoP to ensure compliance with federal air quality standards.

Table 5-17
Summary of Air Quality Impacts at SBMR/WAAF

Impact Issues	Proposed Action	Reduced Land Acquisition	No Action
Emissions from construction activities	⊙	⊙	○
Emissions from ordnance use	⊙	⊙	⊙
Engine emissions from military vehicle use	⊙	⊙	⊙
Fugitive dust from military vehicle use	⊘	⊘	⊙
Wind erosion from areas disturbed by military vehicle use	⊙	⊙	⊙
Emissions from increased aircraft operations	⊙	⊙	⊙
Emissions from wildfires	⊙	⊙	⊙
Other emissions from personnel increases	⊙	⊙	⊙

In cases when there would be both beneficial and adverse impacts, both are shown on this table. Mitigation measures would only apply to adverse impacts.

LEGEND:

⊗ = Significant
⊘ = Significant but mitigable to less than significant
⊙ = Less than significant
○ = No impact
+ = Beneficial impact
N/A = Not applicable

Construction activities under either the Proposed Action or the RLA Alternative would result in an increase of nitrogen oxide emissions of 100 tons (91 metric tons) in 2004 and 126 to 149 tons (114 to 135 metric tons) in 2005, the first two years of construction. Nitrogen oxide emissions would be less than 58 tons (53 metric tons) per year for the remainder of the construction period. Nitrogen oxide emissions are of concern primarily as an ozone precursor. These annual emissions of ozone precursors from construction activities associated with the Proposed Action or the RLA Alternative would produce too small a net increase in ozone precursor emissions to have a measurable effect on ozone levels and would not change the attainment status of the area. The higher emissions would also be limited to the first two years of a six-year construction schedule. Consequently, construction-related emissions would have a less than significant air quality impact under the Proposed Action or the RLA Alternative.

Compared to No Action, ordnance use quantities at SBMR would increase by about 25 percent under the Proposed Action and by about 11 percent under the RLA Alternative. Because emission quantities from ordnance use are very small and include only trace quantities of hazardous components they pose very little risk of creating adverse air quality impacts. Consequently no significant air quality impacts would occur. Vehicle use and resulting vehicle engine emissions would increase at SBMR under the Proposed Action or Reduced Land Acquisition because of the addition of Strykers to the tactical and support vehicle inventory. The increase in military vehicle engine emissions would be too small a net increased in ozone precursor emissions to have a measurable effect on ozone levels and would not affect the attainment status of the area

Increased off-road vehicle use under the Proposed Action or RLA could increase the size of areas disturbed by vehicle use, resulting in a minor increase in dust from wind erosion. The low frequency of strong winds and the high frequency of precipitation events would prevent significant air quality impacts from wind erosion. Improvements to WAAF under the Proposed Action or RLA Alternative would better accommodate C-130 aircraft operations. Any increase in C-130 aircraft operations at WAAF would result in a small increase in overall aircraft emissions associated with that facility.

Increased use of tracers and pyrotechnics under the Proposed Action or RLA Alternative would result in a small increase in the potential for wildfires on training range areas, with a resulting increase in emissions from those wildfires. Other emission sources associated with the increase in personnel numbers at SBMR under the Proposed Action or RLA would include personal vehicle use and increased use of existing stationary emission sources such as boilers at some buildings. The net increase in personnel numbers would be about 5.5 percent, resulting in comparable increases in personal vehicle use and fuel use at buildings serving the added personnel and their families.

Table 5-17 summarizes the significance of air quality impacts at SBMR under the Proposed Action, RLA, and No Action. Although fugitive dust from vehicle travel on unpaved areas would be a significant impact in the absence of mitigation, the Army will implement mitigation programs sufficient to avoid violating the federal PM_{10} standard or having substantial adverse health consequences for the public.

Proposed Action

Significant Impacts Mitigable to Less Than Significant

Impact 1: Fugitive dust from military vehicle use. PM_{10} emissions would be approximately 1,640 tons (1,488 metric tons) per year, an increase of almost 780 tons (708 metric tons) per year. Visible dust is a clear indication of airborne PM_{10} concentrations that are typically in the range of several thousand micrograms per cubic meter. It takes only a few hours of such concentrations to produce a 24-hour average that exceeds the state and federal 24-hour average PM_{10} standard of 150 micrograms per cubic meter. PM_{10} represents the size fractions of suspended particulate matter that are likely to penetrate into the lower respiratory tract, creating potential adverse health effects.

Approximately 62 percent of the net increase in fugitive PM_{10} emissions would be associated with vehicle travel on unpaved roads, with the remaining 38 percent representing potential emissions from off-road vehicle maneuver activity, mostly at SBER. The amount of fugitive dust generated by off-road vehicle maneuver activity would depend in part on the extent to which the affected areas can maintain a relatively dense vegetation cover.

Dispersion modeling analyses discussed below indicate that fugitive dust emissions from vehicle travel on unpaved roads and from vehicle operations in off-road maneuver areas could violate the federal 24-hour PM_{10} standard at off-post locations. The substantial increase in fugitive PM_{10} emissions from military vehicle use at SBMR, the potential for exceeding the federal 24-hour PM_{10} standard, and the potential impacts on quality of life in surrounding communities result in a significant air quality impact at SBMR under the Proposed Action. The fugitive dust emissions would be reduced through mitigation programs that include using washed gravel on military vehicle trails; periodically applying dust control chemicals; monitoring ambient PM_{10} concentrations; and/or developing an adaptive management program to manage training area lands and modify training procedures as necessary to ensure compliance with federal air quality standards.

Dispersion modeling analyses have been performed to better evaluate the potential for the federal PM_{10} standard to be violated due to fugitive dust emissions associated with military vehicle use. The modeling analyses used five particle size categories to account for particle settling and deposition. The particle size categories used in the analysis are equivalent to the conventional soil survey categories of clay, very fine silt, fine silt, medium silt, and coarse silt. Meteorological conditions assumed in the modeling analysis included Class D (neutral) and Class E (mild temperature inversion) conditions. Given the minimal diurnal and seasonal variations in air temperature and the predominance of high humidity levels, these atmospheric stability assumptions provide a conservative analysis. Wind speed assumptions used in the modeling analyses were based on site-specific estimates of the wind speed exceeded 75 percent of the time. Emission estimates used in the dispersion modeling assumed a dry surface. Additional details regarding the modeling procedures are presented in Appendix G. The modeling analyses for SBMR included vehicle convoys on Helemanō Trail and company-level vehicle maneuver exercises at SBER.

Vehicle convoys on Helemanō Trail would vary considerably in size, ranging from just a few vehicles to as many as 216 for a major exercise at KTA. The largest convoys probably would not return to SBMR on the same day. Nevertheless, total traffic volumes on the Helemanō Trail might be as high as 300 vehicles per day if large convoys travel to and return from KTA on the same day. If road surfaces are dry and winds are light, even relatively modest numbers of vehicles can create sufficient dust to cause downwind PM_{10} concentrations of more than 150 micrograms per cubic meter. In the absence of any dust control measures, daily traffic volumes of about 100 vehicles per day have the potential for causing PM_{10} problems at locations within 2,000 feet (610 meters) of the roadway. Lower daily traffic volumes could cause PM_{10} problems over shorter distances, and higher daily traffic volumes could cause PM_{10} problems over larger distances.

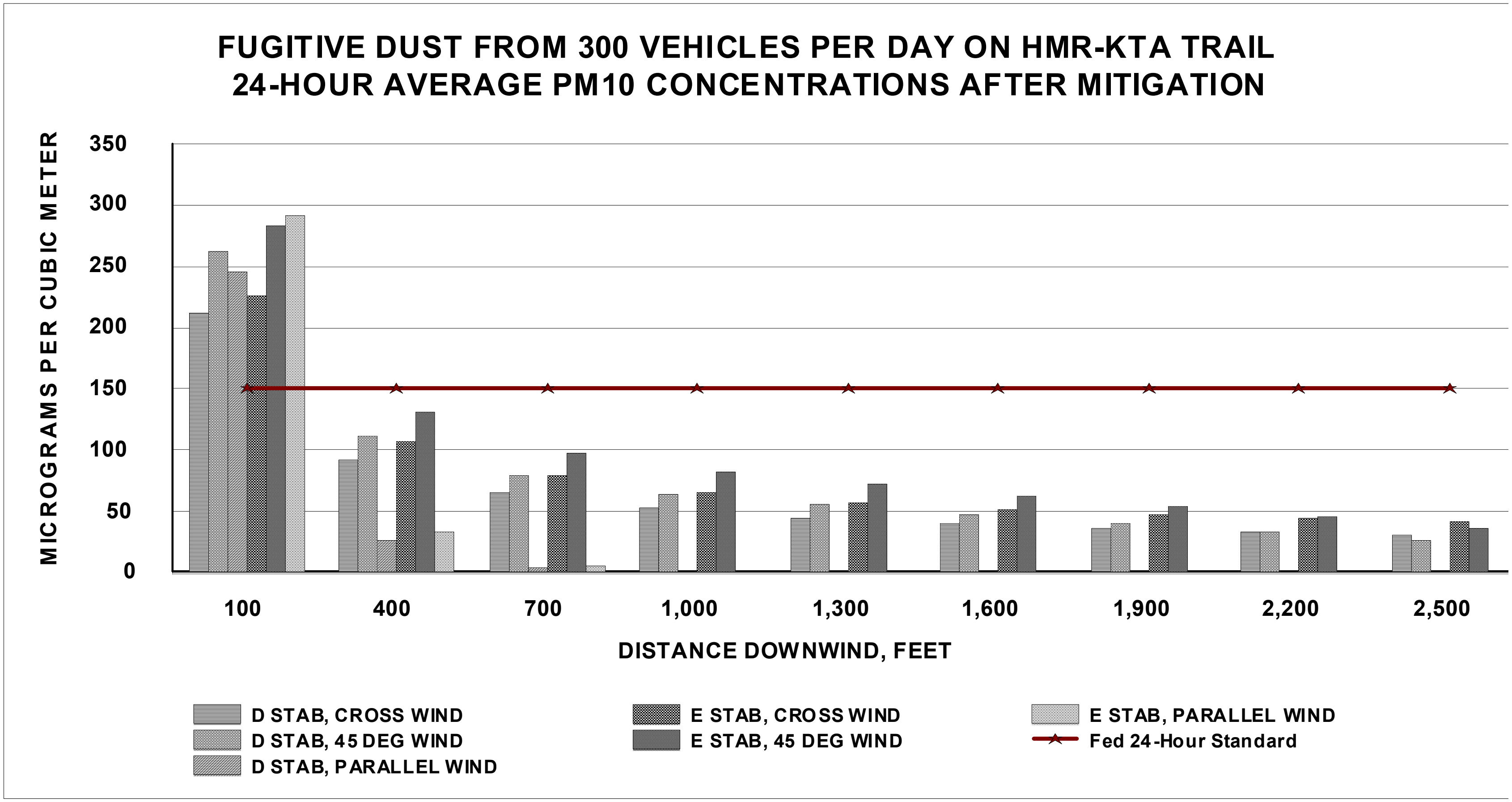
Potential PM_{10} problems from vehicle traffic on Helemanō Trail can be reduced substantially by a combination of feasible mitigation measures, including using washed gravel for surfacing military vehicle trails and/or implementing a dust management program that may include road paving or periodic application of chemical dust suppressants. Alternative dust control compounds include hygroscopic salts (such as calcium chloride or magnesium chloride solutions) and synthetic polymer compounds (such as polyvinyl acetate and vinyl acrylic). If properly applied, dust control measures for unpaved roads would achieve at least 90 percent control of fugitive dust under the weather conditions and roadway use levels prevalent at USARHAW installations.

Expected PM_{10} concentrations downwind of Helemanō Trail on a maximum use day are illustrated in Figure 5-11. The assumed daily traffic volume of 300 vehicles per day would occur infrequently. Most days would have significantly less vehicle traffic and thus would have lower fugitive dust impacts than indicated in Figure 5-11. Because there is no easy way to estimate road surface moisture conditions during dry periods, the modeling analysis effectively assumes a dry surface. In reality, road surface conditions would often have sufficient moisture to substantially reduce fugitive dust emissions.

In addition to Helemanō Trail, there are numerous gravel and dirt roads within the SBMR boundaries. While dirt roads have a higher per-vehicle emission rate than gravel roads, approximately 75 percent of the on-post unpaved roads have a gravel surface. Dirt roads generally carry much smaller traffic volumes than do the gravel roads. Mitigation measures applied to Helemanō Trail generally would be applicable to on-post unpaved roads. Consequently, the fugitive dust modeling for Helemanō Trail is considered representative of conditions for on-post gravel and dirt roads.

Given the anticipated effectiveness of feasible mitigation measures, fugitive dust from vehicle travel on unpaved roads at SBMR is considered a significant but mitigable to less than significant impact.

SBER provides limited areas suitable for off-road vehicle maneuver training. As indicated in Figure 2-3, available maneuver areas occur as multiple noncontiguous parcels. Most vehicle maneuver training at SBER is likely to involve small unit training. As a practical matter,



Note: Chart shows potential PM_{10} concentrations under varied weather conditions: three wind directions relative to the local trail alignment, and two atmospheric stability conditions (neutral D stability and mild inversion E stability).

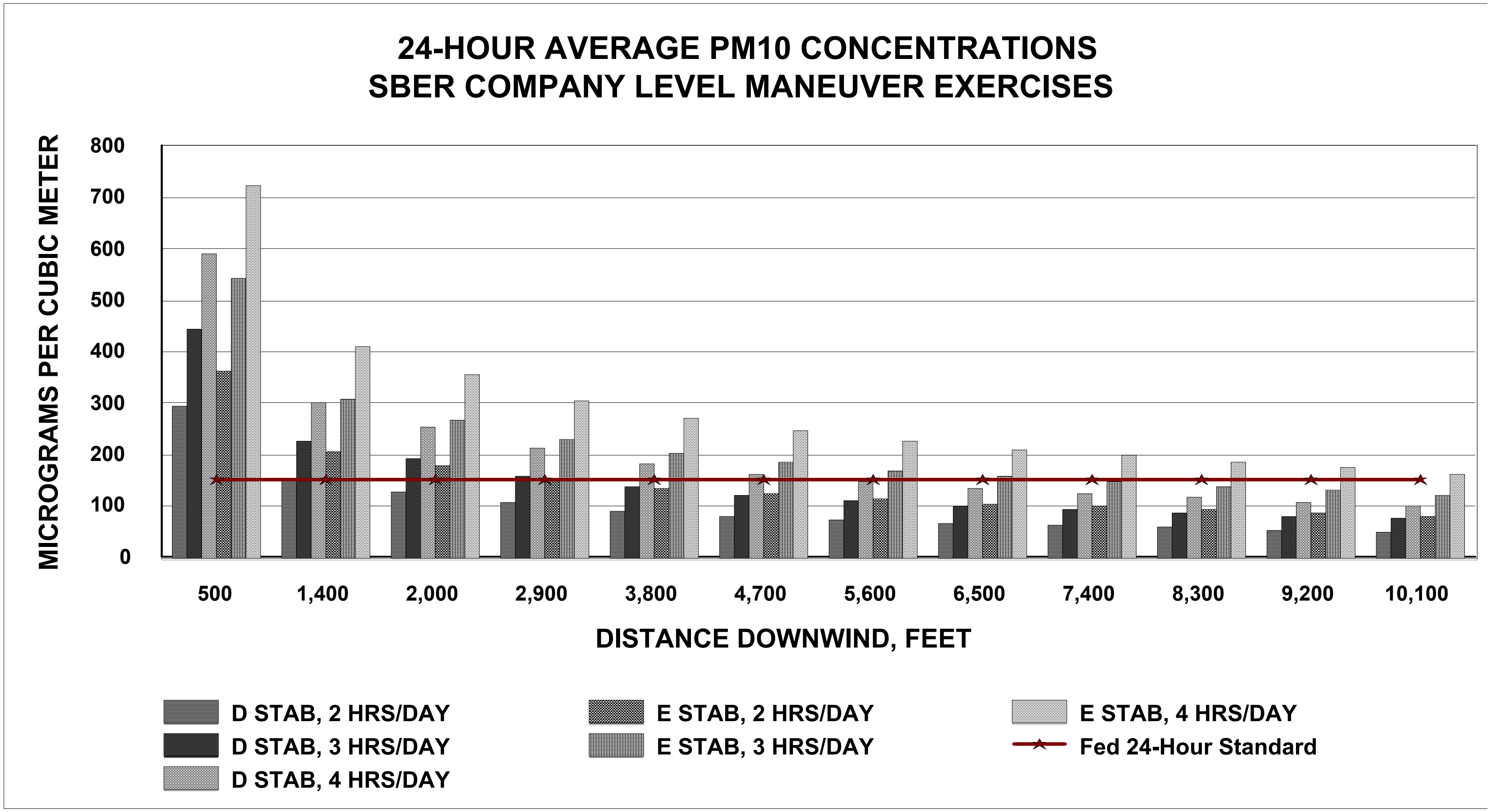
Figure 5-11. Potential PM_{10} Concentrations Along HMR Trail With Proposed Dust Control Mitigation Program company level exercises are likely to be the largest vehicle maneuver events that would occur with any regularity at SBER. Modeling results for a company level exercise are presented in Figure 5-12. Small unit maneuvers are not expected to involve sufficient vehicle activity to create off-post PM_{10} problems.

As was the case for the military vehicle trail modeling, the analysis assumes that ground surface conditions are dry. In reality, ground surface conditions are likely to have sufficient moisture to substantially reduce fugitive dust emissions. If a full company level exercise were conducted when ground surface conditions were dry, then there would be a strong probability that PM_{10} concentrations would exceed the level of the state and federal PM_{10} standards in nearby off-post residential areas. Mitigation of this potential impact would require developing management programs through DuSMMoP that adjust the size and design of vehicle maneuver training at SBER to prevailing soil moisture conditions. Full company level training exercises might have to be deferred or moved to other installations during extended periods of dry weather at SBER. Implementing such a management program would reduce fugitive dust impacts from vehicle maneuver training exercises to a less than significant level.

Helemanō Trail already is planned as a gravel road, with paved sections where necessary to control erosion problems. The gravel surface has been taken into account in the fugitive dust emission estimates. Asphalt or concrete paving of the entire trail would further reduce dust generation from vehicle travel, but might involve unacceptable costs.

Regulatory and Administrative Mitigation 1. The Army will develop and implement a DuSMMoP for the training area. The plan will address measures such as, but not limited to, restrictions on the timing or type of training during high risk conditions, vegetation monitoring, dust monitoring, soil monitoring, and buffer zones to minimize dust emissions in populated areas. The plan will determine how training will occur in order to keep fugitive dust emissions below CAA standards for PM_{10} and soil erosion and compaction to a minimum. The Army will monitor the impacts of training activities to ensure that emissions stay within the acceptable ranges as predicted and environmental problems do not result from excessive soil erosion or compaction. The plan will also define contingency measures to mitigate the impacts of training activities which exceed the acceptable ranges for dust emissions or soil compaction.

The Army will continue to implement land restoration measures identified in the INRMP. Mitigation measures include, but are not limited to, implementing the ITAM program to identify and inventory land condition using a GIS database; coordinating between training planners and natural resource managers; implementing land rehabilitation measures identified in the INRMP; monitoring the effectiveness of the land rehabilitation measures; evaluating erosion modeling data to identify areas in need of improved management; and implementing education and outreach programs to increase user awareness of the value of good land stewardship.



Note: Chart shows potential PM_{10} concentrations under two atmospheric stability conditions (neutral D stability and mild inversion E stability) and varied durations of vehicle maneuver activity during one or two company level exercise events in a single calendar day.

Figure 5-12. Potential PM_{10} Concentrations Downwind of Company Level Vehicle Maneuver Exercise Activity at SBER

To reduce fugitive dust associated with the use of military vehicle trails, the Army will implement dust control measures, such as applying dust control chemicals, using washed gravel for surfacing, spraying water, or paving sections of trails. The extent of gravel washing would have to balance dust reduction goals with engineering requirements for achieving a stable roadway surface. The appropriate dust control products would be selected based on testing alternative products on dirt and gravel road segments. Based on general characteristics and performance elsewhere, environmentally friendly synthetic polymers (such as polyvinyl acetate and vinyl acrylic) and hygroscopic salt solutions (such as calcium chloride or magnesium chloride) appear to be the most promising groups of dust control agents. The Army will monitor road surface conditions and will apply palliatives as necessary. If moisture levels are adequate to suppress dust, then application of dust palliatives would not be necessary. To the extent possible, the Army would plan dust suppressant applications to be scheduled to immediately precede periods of significant convoy traffic.

Less than Significant Impacts

Emissions from construction activities. The Proposed Action would include 12 construction projects at SBMR, with construction activities occurring from 2004 into 2009. Construction projects would include four training range facilities, a military vehicle trail between SBMR and HMR, and seven building or infrastructure facility construction projects. New training range facilities would include a BAX, QTR1 and QTR2, and a UACTF. UXO cleanup would be required at the BAX, QTR1, and UACTF sites prior to the start of facility construction. Building and infrastructure construction projects would include a range control building, virtual fighting facility, motor pool facility, vehicle wash facility, nine FTI towers, and apron improvements and a multiple deployment facility at WAAF.

Construction contractors will comply with the provisions of Hawai'i Administrative Rules, Sec. 11-60.1-33, on fugitive dust as part of the requirements of construction contracts.

Most individual construction projects would be completed in a one or two year time frame, although some would occur over three calendar years. Figure 5-13 summarizes estimated emissions from the 12 construction projects according to current construction schedules. Nitrogen oxide emissions from construction equipment would be 100 tons (91 metric tons) in 2004, 149 tons (135 metric tons) in 2005, and less than 58 tons (53 metric tons) per year from 2006 through the end of the construction period in 2009. This increase associated with the Proposed Action would produce too small a net increase in ozone precursor emissions to have a measurable effect on ozone levels and would not change the attainment status of the area. Consequently, construction-related emissions under the Proposed Action would have a less than significant air quality impact.

Emissions from ordnance use. Ordnance use at SBMR under the Proposed Action would occur at new training range facilities (BAX, QTR1, QTR2, and UACTF) as well as at other range facilities. The total estimated ordnance use by the 25th ID(L) at all USARHAW installations would increase by about 25 percent under the Proposed Action, from about slightly less than 16 million rounds per year to slightly less than 20 million rounds per year. Approximately 96

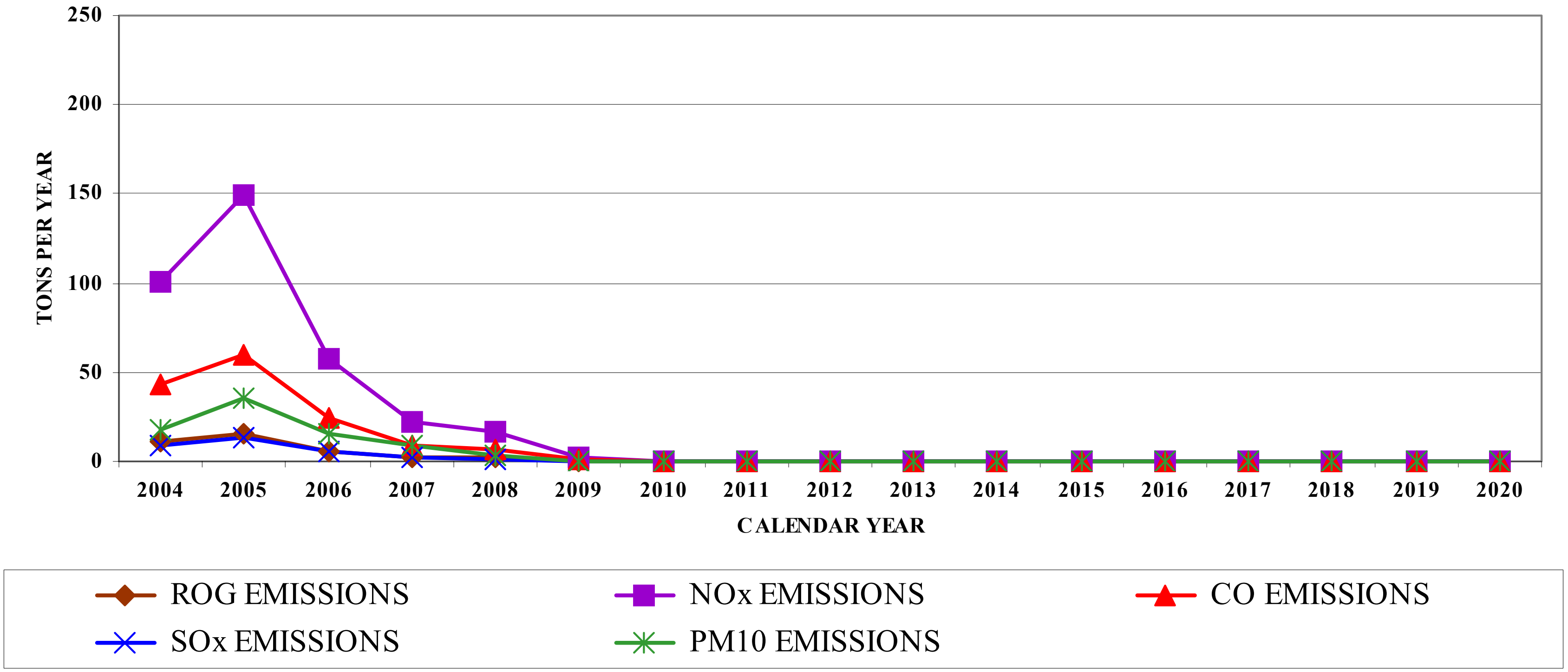


Figure 5-13. Annual Construction Emissions, Schofield Barracks, Proposed Action

percent of the annual ordnance use would consist of small arms ammunition, each item of which has only a very small propellant charge. Ordnance items with explosive or pyrotechnic components (such as mortars, artillery, mines, demolition charges, smoke devices, flares, or blast simulator) would represent about four percent of the annual ordnance use.

Emissions from ordnance use have not been quantified. However, the literature on emissions from ordnance firing and detonations clearly establishes that the detonation process is fundamentally different from normal combustion processes in terms of generating air pollutant emissions. Unconfined detonations are essentially a decomposition process in which molecular constituents are broken down into simpler byproducts, and few if any molecules more complex than the starting molecules are formed (Mitchell and Suggs 1998). Instead, most of the energetic material is converted into simple gaseous products such as carbon dioxide, carbon monoxide, water vapor, nitrogen gas, nitric oxide, and nitrogen dioxide. Very small quantities of simple hydrocarbons are generated, with the most commonly detected compounds being ethane, propane, butane, acetylene, ethylene, propane, benzene, and toluene. Trace quantities of undetonated energetic materials and small quantities of particulate matter also are released. Most of the metal content in airborne particulate matter released by detonations comes from the energetic material itself rather than from volatilization of the metal casing of the ordnance item. Pyrotechnic materials generally have a higher metals content than do explosive materials or propellants, as well as a higher chlorine content. Most of the chlorine is converted initially to hydrogen chloride, which may subsequently react with other compounds in the air.

Based on the general nature of detonation processes and the very low emission rates that have been published in studies of munitions firing and open detonations, emissions associated with ordnance use at SBMR pose very little risk of creating adverse air quality impacts. Consequently, air quality impacts from munitions use under the Proposed Action are considered less than significant.

Engine emissions from military vehicle use. The Proposed Action would increase the number of tactical and support vehicles at SBMR from 659 to 1,005. Vehicle use would be distributed among different installations, but all vehicles would be based at SBMR. Estimated annual use of military vehicles at SBMR would increase by 47 percent in vehicle miles traveled (VMT) and by 50 percent in vehicle operating hours. Annual military vehicle emissions would increase by 86.5 percent, compared to No Action, but would result in too small a net increase in ozone precursor emissions to have a measurable effect on ozone levels and would not affect the attainment status of the area. Figure 5-14 summarizes the estimated net increase in annual engine emissions from military vehicle use at SBMR under the Proposed Action. The net increase in military vehicle engine emissions would be 3 tons (2.7 metric tons) per year for reactive organic compounds, 28.5 tons (25.9 metric tons) per year for nitrogen oxides, 8.8 tons (8 metric tons) per year for carbon monoxide, 0.3 ton (0.3 metric ton) per year for sulfur oxides, and 2.6 tons (2.3 metric tons) per year for PM_{10}. Because the increase in emissions for any pollutant would result in too small a net increase in ozone precursor emissions to have a measurable effect on ozone levels they would not affect the attainment status of the area. Therefore, emissions from increased military vehicle use at SBMR would be a less than significant impact.

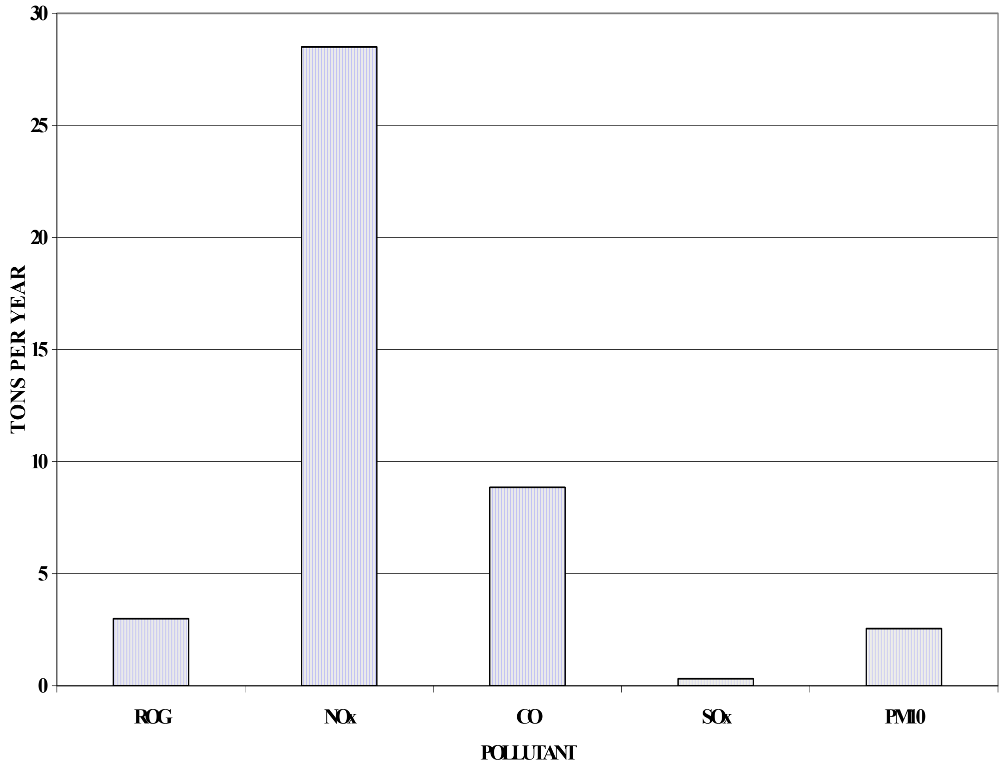


Figure 5-14. Net Change in Military Vehicle Emissions for the Proposed Action: Schofield Barracks

Wind erosion from areas disturbed by military vehicle use. Off-road vehicle activity can reduce or eliminate vegetation cover in affected areas, resulting in increased susceptibility to wind erosion. The amount of off-road vehicle activity at SBMR would increase by 64 percent under the Proposed Action. This increase in off-road vehicle activity would reduce vegetation cover in the affected maneuver areas. However, because wind speeds above the wind erosion threshold of 15 mph (24 kph) are very infrequent, there would not be any substantial wind erosion from affected areas. An estimated 0.5 ton (0.5 metric ton) per year of PM_{10} would be generated by wind erosion from the affected areas, a net increase of about 0.2 ton (0.2 metric ton) per year. Consequently, wind erosion from disturbed areas would be a less than significant impact.

Emissions from increased aircraft operations. Under the Proposed Action, WAAF would be upgraded to better accommodate C-130 use of the airfield, but no substantial change to helicopter flight operations at WAAF would occur. Flight operations at WAAF are dominated by helicopter activity; fixed wing aircraft use (C-130 and C-17 aircraft) is a very small fraction of flight operations. Modest increases in fixed wing flight activity at WAAF would not have a substantial effect on total annual aircraft emissions. Consequently, the increase in aircraft emissions at WAAF under the Proposed Action would be a less than significant impact.

Emissions from wildfires. Tracers, flares, and pyrotechnics have the potential for starting wildfires on training range areas. It is difficult to predict the frequency and size of wildfires on training areas with any accuracy, since weather conditions are an important controlling factor. For purposes of this EIS, wildfire emissions have been estimated by assuming 150 acres (61 hectares) burn each year at SBMR, with a fuel density of 19 tons (17 metric tons) per acre. Resulting emissions would be as follows:

- 0.44 ton carbon monoxide (0.40 metric ton);
- 0.01 ton nitrogen oxide (0.01 metric ton); and
- 0.05 ton PM_{10} (0.05 metric ton).

These emission quantities would not produce any significant air quality impacts in the ROI. Consequently, emissions from wildfires on range areas are considered a less than significant impact.

In addition to accidental wildfires on training areas, controlled burns are sometimes used to manage vegetation on range areas or to prepare areas for UXO clearance. Controlled burns are not frequent events, and so the resulting emissions have not been estimated. These emissions would be considered in the prescribed burn plans prior to the actual burns.

Other emissions from personnel increases. The Proposed Action would increase the number of military personnel at SBMR by 810. This represents a 5.5 percent increase in combined military and civilian personnel. Estimated annual personal vehicle emissions associated with the net increase in commute vehicle traffic would include approximately the following:

- 8.2 tons (7 metric tons) of reactive organic compounds;
- 67 tons (61 metric tons) of carbon monoxide;
- 7.5 tons (7 metric tons) of nitrogen oxides;
- 0.05 ton (0.05 metric ton) of sulfur oxides; and
- 11.3 tons (10.3 metric tons) of PM_{10}.

These emissions would create too small a net increase in ozone precursor emissions to have a measurable effect on ozone levels and would not affect the attainment status of the area. Consequently, emissions from increased commute traffic at SBMR would be a less than significant impact under the Proposed Action.

Existing stationary emission sources at SBMR would remain in use under the Proposed Action. Existing incinerators are being phased out and replaced with other methods of document destruction. The change in personnel numbers at SBMR would be too small to affect other stationary source operations. Because diesel and jet propulsion fuels have a low volatility, there would not be a substantial change in emissions associated with fuel storage and handling under the Proposed Action. No significant air quality impacts are anticipated from continued operation of stationary sources.

Reduced Land Acquisition

Reduced Land Acquisition would result in the same impacts on air quality as the Proposed Action, with minor differences as discussed below.

Significant Impacts Mitigable to Less Than Significant

Impact 1: Fugitive dust from military vehicle use. Vehicle numbers for the 2nd Brigade would be the same under Reduced Land Acquisition as discussed for the Proposed Action. Vehicle maneuver activities would occur on fewer acres. The resulting increase in relative intensity of vehicle disturbance would produce greater impacts on vegetation and a slight increase in fugitive dust generation. Resulting PM_{10} emissions would be approximately 1,686 tons (1,529 metric tons) per year, an increase of almost 826 tons (749 metric tons) per year compared to No Action. Approximately 59 percent of the net increase in fugitive PM_{10} emissions would be associated with vehicle travel on unpaved roads, with the remaining 41 percent from off-road vehicle maneuver activity. Dispersion modeling analyses discussed under the Proposed Action indicate that fugitive dust emissions from vehicle travel on unpaved roads and from vehicle operations in off-road maneuver areas have the potential for violating the federal 24-hour PM_{10} standard at off-post locations. The substantial increase in fugitive PM_{10} emissions from military vehicle use at SBMR, the potential for exceeding the federal 24-hour PM_{10} standard, and the potential impacts on quality of life to surrounding communities result in a significant air quality impact at SBMR under the RLA Alternative. The impact from fugitive dust emissions would be reduced to a less than significant level through mitigation programs that include using washed gravel on military vehicle trails; periodically applying dust control chemicals; monitoring ambient PM_{10} concentrations; and/or developing an adaptive management program to manage training area lands and modifying training procedures as necessary to ensure compliance with federal air quality standards.

Regulatory and Administrative Mitigation 1. The mitigation measures for fugitive dust from off-road vehicle maneuver activity would be the same as those discussed under the Proposed Action.

Less than Significant Impacts

Emissions from construction activities. Reduced Land Acquisition would require most of the same construction projects as discussed under the Proposed Action. QTR2, however, would be constructed at PTA instead of at SBMR. Even without construction of QTR2 at SBMR, nitrogen oxide emissions from construction equipment would increase by 100 tons (91 metric tons) in 2004 and 126 tons (114 metric tons) in 2005 (Figure 5-15). Nitrogen oxide emissions are of concern primarily as an ozone precursor. Even though the construction emissions would increase, annual emissions of ozone precursors from construction activities associated with the RLA Alternative would be too small a net increase to have a measurable effect on ozone levels and would not change the attainment status of the area. Consequently, construction-related emissions under the RLA Alternative would have a less than significant air quality impact.

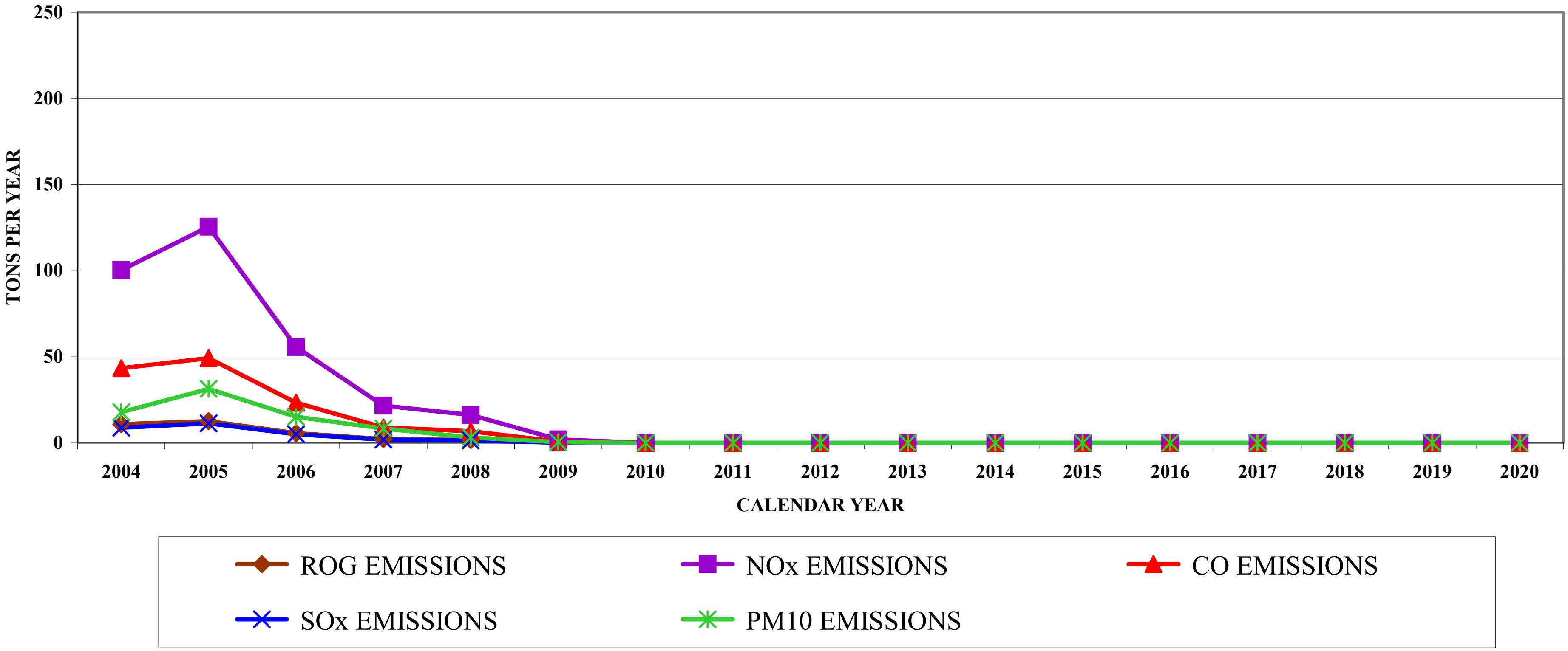


Figure 5-15. Annual Construction Emissions, Schofield Barracks, Reduced Land Acquisition

Emissions from ordnance use. Ordnance use at SBMR under Reduced Land Acquisition would be somewhat less than under the Proposed Action because QTR2 would be constructed at PTA rather than at SBMR. Annual munitions use at SBMR would increase by about 11 percent, compared to No Action (from about 10.1 million rounds per year to about 11.3 million rounds per year). Approximately 95 percent of the annual munitions use would be small arms ammunition. As discussed for the Proposed Action, emissions associated with ordnance use pose very little risk of creating adverse air quality impacts. Consequently, air quality impacts from munitions use under Reduced Land Acquisition are considered less than significant.

Engine Emissions From Military Vehicle Use. Military vehicle use at Schofield Barracks under Reduced Land Acquisition would be essentially the same as discussed for the Proposed Action. As illustrated previously in Figure 5-12, the net increase in military vehicle engine emissions would be 3 tons (2.7 metric tons) per year for reactive organic compounds, 28.5 tons (25.9 metric tons) per year for nitrogen oxides, 8.8 tons (8 metric tons) per year for carbon monoxide, 0.3 ton (0.3 metric ton) per year for sulfur oxides, and 2.6 tons (2.3 metric tons) per year for PM_{10}. These emissions would create too small a net increase in ozone precursor emissions to have a measurable effect on ozone levels and would not affect the attainment status of the area. Consequently, emissions from military vehicle use at Schofield Barracks would be a less than significant impact under the Proposed Action.

Wind Erosion From Areas Disturbed by Military Vehicle Use. Wind erosion from vehicle maneuver areas at Schofield Barracks would be slightly higher under the RLA Alternative than discussed for the Proposed Action. An estimated 0.6 tons (0.5 metric tons) per year of PM_{10} would be generated by wind erosion from the affected areas, a net increase of about 0.3 tons (0.3 metric tons) per year compared to No Action. Consequently, wind erosion from disturbed areas would be a less than significant impact under Reduced Land Acquisition.

Emissions From Increased Aircraft Operations. Reduced Land Acquisition would have the same minimal effect on emissions from aircraft operations at WAAF as discussed for the Proposed Action. Consequently, the increase in aircraft emissions at WAAF under Reduced Land Acquisition would be a less than significant impact.

Emissions From Wildfires. Wildfire and controlled burn conditions at Schofield Barracks would be the same under Reduced Land Acquisition as under the Proposed Action. As discussed for the Proposed Action, emissions from wildfires and controlled burns would be a less than significant impact.

Other Emissions From Personnel Increases. Changes in personnel numbers would be the same under Reduced Land Acquisition as under the Proposed Action. Emissions from added commute traffic would be the same as discussed under the Proposed Action. These emissions would create too small a net increase in ozone precursor emissions to have a measurable effect on ozone levels and would not affect the attainment status of the area. Consequently, emissions from increased commute traffic at Schofield Barracks would be a less than significant impact under the Proposed Action. Existing stationary emission sources at Schofield Barracks would remain in use under Reduced Land Acquisition. No significant air quality impacts are anticipated from continued operation of existing stationary sources.

No Action

Less than Significant Impacts

Emissions from ordnance use. Overall ordnance use under No Action would be about 19 percent less than under the Proposed Action. Based on the general nature of detonation processes and the very low emission rates that have been identified in studies of munitions firing and open detonations, emissions associated with ordnance use at SBMR pose very little risk of creating adverse air quality impacts. Consequently, air quality impacts from current munitions use under No Action are considered less than significant

Engine emissions from military vehicle use. The military vehicle fleet would remain at 659 vehicles under No Action. Estimated annual emissions from vehicle engine operations would be approximately the following:

- 3.5 tons (3.1 metric tons) of reactive organic compounds;
- 33 tons (30 metric tons) of nitrogen oxides;
- 10 tons (9.3 metric tons) of carbon monoxide;
- 0.4 ton (0.3 metric ton) of sulfur oxides; and
- 2.9 tons (2.7 metric tons) of PM_{10}.

These emission quantities would create too small a net increase in ozone precursor emissions to have a measurable effect on ozone levels and would not affect the attainment status of the area. Consequently, military vehicle engine emissions would have a less than significant impact under No Action.

Fugitive dust from military vehicle use. Vehicle numbers and estimated annual use levels would remain unchanged under No Action. Fugitive dust PM_{10} emissions from military vehicle use at SBMR would remain at the current level of about 877 tons (796 metric tons) per year. Because conditions at SBMR have not led to any known violations of state or federal ambient air quality standards, fugitive dust from military vehicle use at SBMR would have a less than significant impact under No Action.

Wind erosion from areas disturbed by tactical vehicle use. Vehicle maneuver activity at SBMR would remain the same under No Action. An estimated 0.2 ton (0.2 metric ton) per year of PM_{10} would be generated by wind erosion from the affected areas. Consequently, wind erosion from disturbed areas would be a less than significant impact under No Action.

Emissions from increased aircraft operations. Aircraft operations at WAAF would not change under No Action. Consequently, there would be no increase in aircraft emissions. Because there would be no change in conditions that have not created any known violations of state or federal ambient air quality standards, emissions from aircraft operations under No Action would have a less than significant impact on air quality.

Emissions from wildfires. The use of tracer rounds or pyrotechnics and the resultant risk of wildfires on training ranges at SBMR would not change under No Action. Emissions from wildfires under No Action are unlikely to produce significant air quality impacts in the ROI. Consequently, emissions from wildfires on range areas are considered a less than significant impact under No Action.

Other emissions from personnel increases. Personnel numbers at SBMR would not change under No Action. Emissions from commute traffic under No Action would remain the same. Stationary emission sources at SBMR would remain in use under No Action. Existing incinerators are being phased out and replaced with other methods of document destruction. Because there would be no change from conditions that have not created any known violations of state or federal ambient air quality standards, emissions from these sources would have a less than significant impact under No Action.

No Impact

Emissions from Construction Activities. No construction projects are associated with No Action, so there would be no air quality impact from construction under No Action.