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## 3.2 AIR QUALITY

Air quality is determined with reference to ambient air concentrations of seven major pollutants determined by the U.S. Environmental Protection Agency (USEPA) to be of concern with respect to the health and welfare of the general public. These pollutants, called "criteria pollutants," are carbon monoxide (CO), sulfur dioxide ($SO_2$), nitrogen dioxide ($NO_2$), ozone ($O_3$), suspended particulate matter less than or equal to 10 microns in diameter ($PM_{10}$), fine particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$), and lead.

Ambient air quality is measured by determining the atmospheric concentration of a specific compound that occurs at a particular geographic location. Ambient air quality data are generally reported as a mass per unit volume (e.g., micrograms per cubic meter of air) or as a volume fraction (e.g., parts per million [ppm] by volume). The USEPA has established National Ambient Air Quality Standards (NAAQS) for these pollutants. Areas that violate a Federal air quality standard are designated as non-attainment areas. The USEPA requires each state in which non-attainment areas are present to prepare a State Implementation Plan (SIP), which describes how that state will achieve compliance with NAAQS. A SIP is a compilation of goals, strategies, schedules, and enforcement actions that will lead the state into compliance with all federal air quality standards. Each change to a compliance schedule or plan must be incorporated into the SIP. Federal actions occurring in non-attainment areas are required to demonstrate that they are in conformance with the applicable SIP.

### 3.2.1 Air Quality Standards

The Clean Air Act (CAA) allows States to establish more stringent air quality standards. The NWTRC is located in the offshore and onshore areas of the States of Washington, Oregon, and California. Oregon has adopted the Federal standards and has adopted more stringent standards for $SO_2$. Washington has adopted the Federal standards and has adopted more stringent standards for $SO_2$ and $NO_2$. Washington has not yet rescinded the previous 1-hour standard for $O_3$, the annual standard for $PM_{10}$. Oregon has not rescinded the annual standard for $PM_{10}$. California has established ambient air quality standards for all criteria pollutants.

Table 3.2-1 shows both the Federal and State ambient air quality standards. According to OPNAVINST 5090.1 series, all Navy activities must comply with all applicable Federal, state, and local environmental policies, regulations, and requirements. This guidance would apply to Federal and state ambient air quality standards as well as other applicable requirements. The following notes apply.

- NAAQS (other than $O_3$, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The $O_3$ standard is attained when the fourth highest 8-hour concentration in a year, averaged over three years, is equal to or less than the standard. For $PM_{10}$, the 24-hour standard is attained when 99 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the USEPA for further clarification and current Federal policies.
    - National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.
    - National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

**Table 3.2-1: National and State Ambient Air Quality Standards**

| Pollutant | Averaging Time | NAAQS | | CAAQS | OAAQS | WAAQS |
|---|---|---|---|---|---|---|
| | | Primary | Secondary | | | |
| Ozone ($O_3$) | 1-Hour | - | Same as Primary Standard | 0.09 ppm (180 µg/m$^3$) | - | 0.12 ppm (180 µg/m$^3$) |
| | 8-Hour | 0.08 ppm (157 µg/m$^3$) | | 0.070 ppm (137 µg/m$^3$) | 0.08 ppm (157 µg/m$^3$) | 0.08 ppm (157 µg/m$^3$) |
| Carbon Monoxide (CO) | 8-Hour | 9.0 ppm (10 mg/m$^3$) | None | 9.0 ppm (10 mg/m$^3$) | 9.0 ppm (10 mg/m$^3$) | 9.0 ppm (10 mg/m$^3$) |
| | 1-Hour | 35 ppm (40 mg/m$^3$) | | 20 ppm (23 mg/m$^3$) | 35 ppm (40 mg/m$^3$) | 35 ppm (40 mg/m$^3$) |
| Nitrogen Dioxide ($NO_2$) | Annual Average | 0.053 ppm (100 µg/m$^3$) | Same as Primary Standard | 0.030 ppm (56 µg/m$^3$) | 0.053 ppm (100 µg/m$^3$) | 0.05 ppm (94 µg/m$^3$) |
| | 1-Hour | - | | 0.18 ppm (338 µg/m$^3$) | - | - |
| Sulfur Dioxide ($SO_2$) | Annual Average | 80 µg/m$^3$ (0.03 ppm) | - | - | 52 µg/m$^3$ (0.020 ppm) | 80 µg/m$^3$ (0.03 ppm) |
| | 24-Hour | 365 µg/m$^3$ (0.14 ppm) | - | 0.04 ppm (105 µg/m$^3$) | 260 µg/m$^3$ (0.10 ppm) | 365 µg/m$^3$ (0.14 ppm) |
| | 3-Hour | - | 1300 µg/m$^3$ (0.5 ppm) | - | 1300 µg/m$^3$ (0.50 ppm) | - |
| | 1-Hour | - | - | 0.25 ppm (655 µg/m$^3$) | - | 0.25 ppm (655 µg/m$^3$) |
| Suspended Particulate Matter ($PM_{10}$) | 24-Hour | 150 µg/m$^3$ | Same as Primary Standard | 50 µg/m$^3$ | 150 µg/m$^3$ | 150 µg/m$^3$ |
| | Annual Arithmetic Mean | - | | 20 µg/m$^3$ | 50 µg/m$^3$ | 50 µg/m$^3$ |
| Fine Particulate Matter ($PM_{2.5}$) | 24-Hour | 35 µg/m$^3$ | Same as Primary Standard | - | 35 µg/m$^3$ | 35 µg/m$^3$ |
| | Annual Arithmetic Mean | 15 µg/m$^3$ | | 12 µg/m$^3$ | 15 µg/m$^3$ | 15 µg/m$^3$ |
| Lead (Pb) | 30-Day Average | - | - | 1.5 µg/m$^3$ | - | - |
| | Calendar Quarter | 1.5 µg/m$^3$ | Same as Primary Standard | - | 1.5 µg/m$^3$ | 1.5 µg/m$^3$ |
| Hydrogen Sulfide (HS) | 1-Hour | No Federal Standards | | 0.03 ppm (42 µg/m$^3$) | - | - |
| Sulfates ($SO_4$) | 24-Hour | | | 25 µg/m$^3$ | - | - |
| Visibility Reducing Particles | 8-Hour (10 am to 6 pm, Pacific Standard Time) | | | Note 1 | - | - |
| Vinyl chloride[1] | 24 Hour | | | 0.01 ppm (26 µg/m$^3$) | - | - |

[1]Insufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent.
Source: ODEQ 2007, WDOE 2007, CARB 2007a, USEPA 2005.

- Washington Ambient Air Quality Standard (WAAQS) for $SO_2$ (1-hour) requires 0.4 ppm by volume for a one-hour period more than once per one-year period, and 0.25 ppm by volume average for a one-hour period more than twice in a consecutive seven-day period.

- Oregon Ambient Air Quality Standards (OAAQS) correspond to Federal standards.
- California Ambient Air Quality Standards (CAAQS) for $O^3$, CO (except Lake Tahoe), $SO^2$ (1- and 24-hour), $NO^2$, PM10, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded.
- The California Air Resources Board (CARB) has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

Areas in which ambient air concentrations of a pollutant exceed the State and/or Federal standard are considered to be non-attainment areas for that pollutant. For ozone, non-attainment areas may be classified as basic, serious, severe, or extreme non-attainment areas, depending on the severity and frequency of exceedances of the NAAQS for ozone, and the time allowed by the USEPA for the area to attain and maintain the ozone standard. For CO and $PM_{10}$, non-attainment areas may be classified as moderate or serious. Non-attainment areas are required to develop and execute plans, known as SIPs that show how the area will meet Federal and State air quality standards. Areas that have achieved attainment may be designated as "maintenance areas," which are subject to maintenance plans showing how the area will continue to meet Federal and State air quality standards. All areas affected by Northwest Training Range Complex (NWTRC) activities are in attainment of all NAAQS.

The ambient air quality levels measured at a particular location are determined by the interactions of emissions, chemical properties and reactions that occur in the atmosphere, and meteorology. Emission considerations include the types, amounts, and locations of pollutants emitted into the atmosphere. Chemical reactions can transform pollutant emissions into criteria pollutants. Meteorological considerations include wind and precipitation patterns affecting the distribution, dilution, and removal of pollutant emissions.

### 3.2.2 Pollutant Emissions

Pollutant emissions typically refer to the amount of pollutants or pollutant precursors introduced into the atmosphere by a source or group of sources. Pollutant emissions contribute to the ambient air concentrations of criteria pollutants, either by directly affecting the pollutant concentrations measured in the ambient air or by interacting in the atmosphere to form criteria pollutants. Pollutants such as CO, $SO_2$, lead, and some particulates that are emitted directly into the atmosphere from emission sources are referred to as primary pollutants. Some criteria pollutants such as $O_3$, $NO_2$, and some particulates, are formed through atmospheric chemical reactions that are influenced by meteorology, ultraviolet light, and other atmospheric processes. Criteria pollutants formed through these processes are referred to as secondary pollutants. Emissions that lead to formation of secondary pollutants are considered precursors. Thus, for example, Reactive Organic Gases (ROG) (also referred to as volatile organic compounds, or VOCs) and oxides of nitrogen [$NO_x$] are considered precursors for $O_3$. In general, emissions that are considered precursors to secondary pollutants are evaluated and regulated to control the levels of associated criteria pollutants in the ambient air. $PM_{10}$ and $PM_{2.5}$ are generated as primary pollutants by various mechanical processes (for example, abrasion, erosion, mixing, or atomization) or combustion processes. However, $PM_{10}$ and $PM_{2.5}$ can also be formed as secondary pollutants through chemical reactions or by gaseous pollutants condensing into fine aerosols.

Sources that are regulated under the CAA include both stationary and mobile sources. Stationary sources include sources such as power plants, refineries, manufacturing facilities, and other sources that have operations that result in emissions. These sources are regulated under the CAA through the New Source Review and Federal Operating Permit programs, which require them to quantify and report emissions on a regular basis. Mobile sources include sources such as motor vehicles, aircraft, ships, and locomotives.

These sources are also regulated under the CAA, but are generally subject to emission standards and are not required to obtain permits to operate.

In addition to those pollutants that are designated criteria pollutants, additional pollutants that are considered to have the potential for health effects are categorized as hazardous air pollutants (HAPs) under Section 112 of the CAA. The CAA has identified 188 substances as HAPs. Examples of HAPs include benzene, which is found in gasoline; perchloroethylene, which is emitted from some dry cleaning facilities; and methylene chloride, which is used as a solvent and paint stripper in some industries. HAPs are regulated under the CAA provisions, including the National Emission Standards for Hazardous Air Pollutants, which apply to specific sources of HAPs, and the Urban Air Toxics Strategy, which applies to area sources. The California EPA has also adopted rules governing HAPS, including the Air Toxics "Hot Spots" Information and Assessment Act (AB 2588), and local rules governing toxics new source review. Toxic air pollutants in Washington are covered by the Washington State Department of Ecology (WDOE) under the State air toxics rule. The Oregon Department of Environmental Quality (ODEQ) has established the Oregon State Air Toxics Program to regulate emissions of air toxics.

#### 3.2.2.1 Greenhouse Gas Emissions

Greenhouse gases (GHGs) are gases that trap heat in the atmosphere. These emissions occur from natural processes and human activities. The accumulation of GHGs in the atmosphere regulates the earth's temperature. Scientific evidence indicates a trend of increasing global temperature over the past century due to an increase in GHG emissions from human activities. The climate change associated with this global warming is predicted to produce negative economic and social consequences across the globe.

Recent observed changes due to global warming include shrinking glaciers, thawing permafrost, a lengthened growing season, and shifts in plant and animal ranges (Intergovernmental Panel on Climate Change 2007). Predictions of long-term environmental impacts due to global warming include sea level rise, changing weather patterns with increases in the severity of storms and droughts, changes to local and regional ecosystems including the potential loss of species, and a significant reduction in winter snow pack. Predictions of these effects include exacerbation of air quality problems, a reduction in municipal water supply from the Sierra snowpack, a rise in sea level that would displace coastal businesses and residences, damage to marine and terrestrial ecosystems, and an increase in the incidence of infectious diseases, asthma, and other human health problems (California Environmental Protection Agency 2006).

The most common GHGs emitted from natural processes and human activities include carbon dioxide ($CO_2$), methane ($CH_4$), and nitrous oxide ($N_2O$). Examples of GHGs created and emitted primarily through human activities include fluorinated gases (hydro fluorocarbons and per fluorocarbons) and sulfur hexafluoride. Each GHG is assigned a global warming potential (GWP). The GWP is the ability of a gas or aerosol to trap heat in the atmosphere. The GWP rating system is standardized to $CO_2$, which has a value of one. For example, $CH_4$ has a GWP of 21, which means that it has a global warming effect 21 times greater than $CO_2$ on an equal-mass basis. Total GHG emissions from a source are often reported as a $CO_2$ equivalent ($CO_2e$). The $CO_2e$ is calculated by multiplying the emission of each GHG by its GWP and adding the results together to produce a single, combined emission rate representing all GHGs.

Federal agencies are, on a national scale, addressing emissions of GHGs by reductions mandated in federal laws and Executive Orders, most recently Executive Order 13423. Several states have promulgated laws as a means to reduce statewide levels of GHG emissions. In particular, the California Global Warming Solutions Act of 2006 directs the State of California to reduce statewide GHG emissions to 1990 levels by the year 2020.

In an effort to reduce energy consumption, reduce dependence on petroleum, and increase the use of renewable energy resources in accordance with the goals set by Executive Order 13123 and the Energy

Policy Act of 2005, the DoN and USMC have implemented a number of renewable energy projects (Naval Facilities Engineering Command [NAVFAC] 2006).

The potential effects of proposed GHG emissions are by nature global and cumulative impacts, as individual sources of GHG emissions are not large enough to have an appreciable effect on climate change. Therefore, the impact of proposed GHG emissions to climate change is discussed in the context of cumulative impacts in Chapter 4 of this EIS. Appendix C presents estimates of GHG emissions generated by each alternative.

## 3.2.3 Affected Environment

The EIS Study Area encompasses the Pacific Northwest Ocean surface and subsurface ocean operating area (PACNW OPAREA), over-ocean military airspace, the Darrington Area located within the Puget Sound, and onshore military operating areas (Okanogan, Roosevelt, and Olympic MOAs). The EIS Study Area includes areas that are under the jurisdiction of the Washington Department of Ecology (onshore MOAs and the Darrington Area). Coastal waters within 3 nautical miles (nm) (5.5 kilometers [km]) of a shoreline are part of the same air quality jurisdiction as the contiguous land area. Therefore, the waters within 3 nm (5.5 km) of the State of Washington are within the jurisdiction of the WDOE; the waters within 3 nm (5.5 km) of the State of Oregon are within the jurisdiction of the ODEQ, and the waters within 3 nm (5.5 km) of the State of California are within the jurisdiction of the CARB and the North Coast Unified Air Quality Management District. The NWTRC also includes a small portion of Idaho, which is within the jurisdiction of the Idaho Department of Environmental Quality. Portions of the OPAREAS that lie outside coastal waters and beyond 3 nm (5.5 km) of a coastline are not within any air quality jurisdiction.

### 3.2.3.1 Existing Conditions

The Pacific Northwest region has a mild and varied climate with only rare occurrences of severe weather such as thunderstorms or tornadoes. The normal movement of air masses is from west to east, so most of the systems moving across the region have been moderated by traveling over the Pacific Ocean. As a result, winter minimum temperatures and summer maximum temperatures in the region are greatly moderated. The Pacific Ocean also provides unlimited moisture to air masses traveling across the Pacific, so there is abundant rainfall in western Washington, Oregon, and northwestern California. The weather impacts air quality, as well as influences human activities.

The Washington portion of the NWTRC and the North Coast Air Quality Management District are classified as attainment/unclassified for the NAAQS for all pollutants. The Oregon coastal area, the area of concern to the NWTRC, is in attainment. No emissions from the proposed action would occur in nonattainment or maintenance areas.

There are no stationary sources of emissions within the NWTRC that would be affected by the proposed action.

### 3.2.3.2 Current Requirements and Practices

Equipment used by military organizations within the NWTRC, including ships and other marine vessels, aircraft, and other equipment, are properly maintained in accordance with applicable Navy and Marine Corps requirements, thus reducing potential impacts to air quality. Operating equipment meets Federal and State emission standards, where applicable.

## 3.2.4 Environmental Consequences

### 3.2.4.1 Approach to Analysis

The evaluation of potential air quality impacts includes two separate analyses. Effects of air pollutant emissions from NWTRC activities occurring within U.S. Territory (i.e., within 12 nm of the coastline) are assessed under National Environmental Protection Act (NEPA). Effects of air pollutant emissions from NWTRC activities occurring outside U.S. Territory are assessed under Executive Order (EO) 12114. For the purposes of assessing air quality effects under NEPA, all activities involving the use of aircraft, vessels, and ground equipment at or below 3,000 ft in those areas within U.S. territorial waters were included in the emissions estimates, in accordance with EPA guidance (USEPA 1992), where 3,000 feet above ground level is the default mixing height above which emissions would not affect the ambient air quality. For the purposes of assessing air quality effects under EO 12114, only those aircraft, vessels, and missiles/targets activities occurring at or below 3,000 ft and outside of U.S. territorial waters were considered in the evaluation.

The NEPA analysis involves estimating emissions generated from the proposed activities and assessing potential impacts on air quality, including an evaluation of potential exposures to toxic air pollutant emissions. Trace amounts of air toxics emissions would be generated from combustion sources and use of ordnance. Air toxics emissions include hazardous air pollutants not covered under the ambient air quality standards. Potential hazardous air pollutant sources are associated with missile and target activities and include rocket motor exhaust and unspent missile fuel vapors. These emissions would be minor and would not result in adverse impacts due to the distance from sensitive receptors that could be affected by air toxics and the negligible levels of emissions.

Because the proposed action does not involve activities within a nonattainment area, no CAA General Conformity Analysis pursuant to the General Conformity Rule (40 C.F.R. § 93[B]) is required. The EO-compliant analysis involves estimating emissions generated from the proposed activities and assessing potential impacts on air quality outside U.S. Territory (outside the 12 nm [22.2 km] limit). The General Conformity Rule does not apply because the CAA is not applicable to actions outside the United States.

The data for the air quality analysis is based, wherever possible, on parametric information from the NWTRC participants and training requirements. The primary source is the participants' data as supplemented by additional range data and interviews with subject matter experts (SMEs) on military activities. These data were used to estimate numbers and types of aircraft, surface ships and vessels, submarines, and ordnance that would be involved in each alternative. Each of these constitutes a potential source of air emissions. The approach used to characterize emissions from each of the emission source categories is summarized below. A discussion of emission sources and summary of the approach used to prepare emissions estimates for the No Action Alternative (baseline), Alternative 1, and Alternative 2 is presented below.

#### 3.2.4.1.1 Aircraft Activities

The methodology for estimating aircraft emissions involves evaluating the type of activities for each type of aircraft, the number of hours of operation for each aircraft type, the type of engine in each aircraft, and the mode of operation for each type of aircraft engine. Emissions occurring or that would occur above 3,000 ft (915 m) were considered to be above the atmospheric inversion layer and therefore without impact on the local air quality. Aircraft flights, for the most part originate from onshore air stations, but some are from aircraft carriers offshore. It was assumed that all aircraft would be traveling from their home base to the locations within the NWTRC at an elevation above 3,000 ft (915 m), and that transit to the range would therefore not affect local air quality. Aircraft operations are accounted for in the emission inventories for onshore air stations and are not considered in this analysis.

The types of aircraft and numbers of sorties for the No Action Alternative are derived from the historical data. For Alternatives 1 and 2, operational estimates of future aircraft use percentages were obtained based on evolutionary changes in the Navy force structure and mission assignments. Where there were no major changes in types of aircraft, future activities estimates were based on the percentage distribution of baseline activities.

Time on range for the No Action Alternative was based on calculations of average times derived from range records. To estimate times on range for each aircraft activity in Alternatives 1 and 2, an average time was extrapolated from the data during the baseline year. Estimated altitudes of activities for all aircraft were obtained from SMEs (aircrew members) in operational squadrons. To estimate times in the various air quality zones of interest, the locations of representative activities were analyzed, and their paths plotted. Time in the individual areas was then estimated based upon operational maneuvers and routine flight path analysis.

Emissions were estimated based on times in mode, using the Navy's Aircraft Emission Support Office (AESO) Memorandum Reports for individual aircraft categories (Aircraft Emission Estimates: Landing and Takeoff Cycle and Maintenance Testing, and Aircraft Emission Estimates: Mission Operations). For aircraft for which AESO emission factors were not available (such as the Learjet aircraft), emission factors were obtained from the Federal Aviation Administration's (FAA's) Emission and Dispersion Modeling System (EDMS), which is the FAA's approved model for military airfield and civilian airport operations.

#### 3.2.4.1.2 Surface Ship Activities

Marine vessel traffic in the NWTRC is composed of military ship and boat traffic, including support vessels providing services for military training exercises and tests. A number of non-military commercial vessels and recreational vessels are also regularly present within the NWTRC. These vessels were not evaluated in the air quality analysis as they are not part of the Navy's action. The methodology for estimating marine vessel emissions involves evaluating the type of activity for each type of vessel, the number of hours of operation for each vessel type, the type of propulsion engine in each vessel, and the type of generator used onboard each type of vessel.

The types of surface ships and numbers of activities for the No Action Alternative are derived from the Participants data. For Alternatives 1 and 2, operational estimates of future ship use percentages were obtained based on evolutionary changes in the Navy force structure and mission assignments. Where there were no major changes in types of ships, future activities estimates were based on the percentage distribution of historical activities. Currently, of the ships stationed in the area, two are nuclear-powered aircraft carriers and are not a source of airborne emissions. There are six other Navy ships stationed in Washington that burn fossil fuels.

For surface ships, times for each activity were estimated by taking an average over the total number of activities for each type of training. Detailed estimates for baseline and future activities were obtained based on discussions with fleet SMEs.

To estimate times in the various air quality zones of interest, the locations of representative activities were analyzed, and their paths plotted. Time in the individual areas was then estimated based upon operational maneuvers. The resultant information provided an estimate for baseline and future activities of Navy vessels with respect to time operating on the range and the percentage of the time spent in each part of the NWTRC. In addition, information provided by fleet participants was used to develop a breakdown of time spent at each power level used during range activities in which marine vessels participated.

Emission factors for marine vessels were then obtained from the database developed for Naval Sea Systems Command (NAVSEA) by JJMA Consultants (JJMA 2001). Emission factors were provided for each marine vessel type and operational mode (i.e., power level). The resulting calculations provided information regarding the time spent at each power level in each part of the NWTRC, emission factors for that power level (in pounds [lb] of pollutant per hour), and total emissions for each marine vessel for each operational type and mode.

#### 3.2.4.1.3 Submarine Activities

All tactical submarines in the U.S. Fleet are nuclear powered; submarines may have diesel emergency generators but these generators would not be used on a regular basis. Since no U.S. submarines burn fossil fuel during training activities, there would be no airborne emissions associated with their activities.

#### 3.2.4.1.4 Naval Gunfire and Missile Ordnance

Ordnance emissions emanate from naval gunfire, missiles, bombs, and other types of ordnance used in the various activities. To estimate emissions from use of ordnance, the number and type of ordnance was totaled for each of the activities. Ordnance was classified by category and type. The USEPA's AP-42 emission factor database was used, using emission factors provided in that reference (Chapter 15) for specific types of ordnance. Ordnance emissions were assumed to occur within U.S. Territory.

#### 3.2.4.1.5 Ground Vehicles and Ground Support Equipment (GSE)

Some ground vehicles (pickup trucks) participate in training activities within the NWTRC. Ground vehicle emissions were estimated based on emission factors from EMFAC 2007 (CARB 2007b) for light duty trucks. To estimate emissions for trucks, it was determined that on average each vehicle would operate with four starts per day and would travel 5 miles (8 km) per trip at an average speed of 25 miles per hour (40 km per hour).

#### 3.2.4.1.6 Summary of Training Activities and Emission Sources Analyzed

Table 3.2-2 lists all the training activities that are included in the proposed action. The emissions sources analyzed for each activity are shown.

**Table 3.2-2: Summary of Proposed Training Activities and Emission Sources**

| Range Activity | Emission Sources | | | |
|---|---|---|---|---|
| | Aircraft | Ships / Boats | Ordnance | Ground Vehicles |
| **ANTI-AIR WARFARE (AAW)** | | | | |
| Aircraft Combat Maneuvers | X | | | |
| Air-to-Air (A-A)Missile Exercise* | X | | X | |
| Surface-to-Air (S-A) Gunnery Exercise | X | X | X | |
| S-A Missile Exercise** | X | | X | |
| **ANTI-SURFACE WARFARE (ASUW)** | | | | |
| Surface-to-Surface (S-S) Gunnery Exercise | | X | X | |
| Air-to-Surface (A-S) Bombing Exercise | X | | X | |
| HARM Exercise | X | | | |
| Sink Exercise | X | X | X | |
| **ANTI-SUBMARINE WARFARE (ASW)** | | | | |
| Anti-Submarine Warfare (ASW) Tracking Exercise - MPA | X | | X | |

**Table 3.2-2: Summary of Proposed Training Activities and Emission Sources (continued)**

| Range Activity | Emission Sources | | | |
|---|---|---|---|---|
| | Aircraft | Ships / Boats | Ordnance | Ground Vehicles |
| ASW Tracking Exercise - Extended Echo Ranging (EER) | X | | X | |
| ASW Tracking Exercise - Surface Ship | | X | | |
| ASW Tracking Exercise - Submarine | | | | |
| **ELECTRONIC COMBAT (EC)** | | | | |
| Electronic Combat (EC) Exercises | X | X | | |
| **MINE WARFARE (MIW)** | | | | |
| Mine Countermeasures | X | X | X | |
| Land Demolitions | | | X | X |
| **NAVAL SPECIAL WARFARE (NSW)** | | | | |
| Insertion/Extraction | X | | | |
| NSW Training | | X | | |
| **STRIKE WARFARE (STW)** | | | | |
| HARM Exercise (Non-firing) | X | | | |
| **SUPPORT OPERATIONS** | | | | |
| Intelligence, Surveillance, and Reconnaissance (ISR) | X | | | |
| Unmanned Aerial System(UAS) Research, Development, Test and Evaluation (RDT&E) and Training | X | | | |

### 3.2.4.2 No Action Alternative

The No Action Alternative involves maintaining activities at the baseline levels. The baseline emissions estimates were calculated based on operational scenarios as described by SMEs. Table 3.2-3 lists the emissions by general source. More detailed emissions summaries are provided in Appendix C.

**Table 3.2-3: Summary of Annual Air Emissions for the No Action Alternative**

| Emission Source | Emissions, tons/year | | | | | |
|---|---|---|---|---|---|---|
| | CO | NOx | ROG | SOx | $PM_{10}$ | $PM_{2.5}$ |
| **Within U.S. Territory** | | | | | | |
| Aircraft Activities | 1.35 | 3.68 | 0.21 | 0.19 | 1.87 | 1.85 |
| Marine Vessel Activities | 3.80 | 4.50 | 0.34 | 0.95 | 0.16 | 0.16 |
| Ordnance | 0.92 | 0.06 | 0.00 | 0.00 | 0.09 | 0.09 |
| Ground Vehicles | 1.49 | 0.12 | 0.08 | 0.00 | 0.00 | 0.00 |
| **Total** | **7.56** | **8.36** | **0.63** | **1.13** | **2.12** | **2.10** |
| **Outside U.S. Territory** | | | | | | |
| Aircraft Activities | 4.89 | 21.62 | 1.09 | 1.02 | 10.25 | 10.15 |
| Marine Vessel Activities | 137.98 | 85.70 | 12.43 | 22.57 | 4.65 | 4.60 |
| **Total** | **142.87** | **107.32** | **13.52** | **23.59** | **14.90** | **14.75** |

Under the No Action Alternative, there would be no increase in activities from baseline activities. The emissions levels would remain constant for those emission sources that are not affected by other Federal,

State, or local requirements to reduce air emissions. Emissions associated with motor vehicles may decrease due to the implementation of Federal and State CAA requirements to reduce tailpipe emissions; however, motor vehicles do not constitute a large source of emissions in the EIS Study Area.

Emissions for the No Action Alternative reflect baseline levels that are currently occurring in the NWTRC. Emissions occurring in the offshore areas may be transported onshore and may affect the existing air basins. The impact of emissions occurring offshore is, however, small in comparison with onshore emission sources given the distance transported and the dispersion that occurs during transport. Any impacts to onshore air quality from NWTRC baseline training activities would be reflected only in background emissions in the affected air basins.

The total air emissions associated with the No Action Alternative are presented in Table 3.2-3 for emissions within the NWTRC. Table 3.2-3 presents a breakdown of emissions in the NWTRC subject to NEPA (within U.S. Territory) vs. those subject to EO 12114 (outside U.S. Territory). To evaluate whether the proposed action could have an adverse effect on air quality either within or outside U.S. Territory, emissions associated with the proposed action were evaluated versus the USEPA Prevention of Significant Deterioration emission threshold of 250 tons per year. The net emissions described in the table are well below the major source thresholds for all criteria pollutants. Considering the No Action Alternative's low level of source pollutants, and the dispersion that occurs during transport, these sources would have no significant impact on the State's air quality. There is no increase in emissions above the baseline within U.S. Territory under the No Action Alternative.

As discussed previously, the USEPA has listed 188 HAPs that are regulated under Section 112 of the Clean Air Act, and the State of California has identified additional substances that are regulated under State and local air toxics rule. HAPs are emitted from a variety of processes that are associated with the No Action Alternative, including combustion sources and ordnance use. Trace amount of HAPs are emitted from sources participating in NWTRC activities, including aircraft, marine vessels, ground vehicles, ground support equipment, and ordnance. Emissions of HAPs from NWTRC training activities would be minor and would not result in adverse impacts due to the distance from sensitive receptors that could be affected by air toxics and the negligible levels of emissions.

Emissions of HAPs would occur over the entire range and would be subject to deposition on the water and dispersion due to wind mixing and other dissipation factors. Because the majority of activities occur offshore where no sensitive receptors (i.e., residents, schools, hospitals, etc.) are located, no health effects would be anticipated from emissions of HAPs.

#### 3.2.4.3 Alternative 1

Emissions from the offshore coastal areas also have the potential to affect air quality on shore. As shown in Section 1, the NWTRC OPAREAS are mainly located to the west of the mainland offshore of Washington, Oregon, and northwestern California. Due to the prevailing westerly winds in the region, emissions could be transported onshore from the NWTRC OPAREAS.

The total air emissions associated with Alternative 1 are presented in Table 3.2-4 for emissions within the NWTRC. Table 3.2-4 presents a breakdown of emissions in the NWTRC subject to NEPA (within U.S. Territory) vs. those subject to EO 12114 (outside U.S. Territory). The net emissions described in Table 3.2-4 are well below the major source thresholds for all criteria pollutants. Considering low level of Alternative 1 source pollutants, and the dispersion that occurs during transport, these sources would have no significant impact on the states' air quality.

**Table 3.2-4: Summary of Annual Air Emissions for Alternative 1**

| Emission Source | Emissions, tons/year | | | | | |
|---|---|---|---|---|---|---|
| | CO | NOx | ROG | SOx | $PM_{10}$ | $PM_{2.5}$ |
| **Within U.S. Territory** | | | | | | |
| Aircraft Activities | 1.46 | 3.85 | 0.22 | 0.20 | 1.96 | 1.94 |
| Marine Vessel Activities | 4.12 | 4.91 | 0.37 | 1.03 | 0.17 | 0.17 |
| Ordnance | 1.29 | 0.07 | 0.00 | 0.00 | 0.10 | 0.10 |
| Ground Vehicles | 1.74 | 0.15 | 0.09 | 0.00 | 0.01 | 0.01 |
| **Total** | **8.60** | **8.98** | **0.68** | **1.23** | **2.24** | **2.22** |
| **Net Increase over Baseline** | 1.04 | 0.62 | 0.05 | 0.09 | 0.12 | 0.12 |
| **Outside U.S. Territory** | | | | | | |
| Aircraft Activities | 5.17 | 23.13 | 1.14 | 1.09 | 11.01 | 10.90 |
| Marine Vessel Activities | 151.30 | 93.57 | 13.59 | 24.75 | 5.07 | 5.02 |
| **Total** | **156.47** | **116.70** | **14.73** | **25.84** | **16.08** | **15.92** |
| **Net Increase over Baseline** | **13.60** | **9.38** | **1.21** | **2.25** | **1.17** | **1.17** |

Trace amount of HAPs are emitted from sources participating in Alternative 1 activities, including aircraft, marine vessels, ground vehicles, ground support equipment, and ordnance. Emissions of HAPs from NWTRC training activities would be minor and would not result in adverse impacts due to the distance from sensitive receptors that could be affected by air toxics and the negligible levels of emissions.

#### 3.2.4.4 Alternative 2 (Preferred Alternative)

Alternative 2 includes increased levels of certain activities over the No Action Alternative. It also includes new activities associated with the use of the Portable Undersea Tracking Range (PUTR) and the underwater training minefield (see Sections 2.6.2.2 and 2.6.2.5). Slight increases of air emissions can be attributed to use of the PUTR, but because the minefield is used only by nuclear-powered submarines, its use will not cause any increase in emissions. To evaluate the potential for air quality impacts resulting from emission increases associated with increased activities under Alternative 2, the same thresholds were used as for Alternative 1.

The total air emissions associated with Alternative 2 are presented in Table 3.2-5 for emissions within the NWTRC. Table 3.2-5 presents a breakdown of emissions in the NWTRC subject to NEPA (within U.S. Territory) vs. those subject to EO 12114 (outside U.S. Territory).

Should emissions travel to the shore, emissions would be dispersed and would not affect a single location. Regardless, the net emissions described in Table 3.2-5 are well below the major source thresholds for all criteria pollutants. Considering low level of Alternative 2 source pollutants, and the dispersion that occurs during transport, these sources would have no significant impact on the states' air quality.

Trace amount of HAPs are emitted from sources participating in Alternative 2 activities, including aircraft, marine vessels, ground vehicles, ground support equipment, and ordnance. Emissions of HAPs from NWTRC training activities would be minor and would not result in adverse impacts due to the distance from sensitive receptors that could be affected by air toxics and the negligible levels of emissions.

**Table 3.2-5: Summary of Annual Air Emissions Alternative 2**

| Emission Source | Emissions, tons/year | | | | | |
|---|---|---|---|---|---|---|
| | CO | NOx | ROG | SOx | $PM_{10}$ | $PM_{2.5}$ |
| **Within U.S. Territory** | | | | | | |
| Aircraft Activities | 1.49 | 3.95 | 0.23 | 0.20 | 2.01 | 1.99 |
| Marine Vessel Activities | 10.11 | 9.80 | 1.00 | 2.89 | 0.56 | 0.56 |
| Ordnance | 1.60 | 0.10 | 0.00 | 0.00 | 0.12 | 0.12 |
| Ground Vehicles | 1.74 | 0.15 | 0.09 | 0.00 | 0.01 | 0.01 |
| **Total** | **14.94** | **13.99** | **1.32** | **3.09** | **2.70** | **2.67** |
| **Net Increase over Baseline** | **7.38** | **5.63** | **0.69** | **1.96** | **0.58** | **0.57** |
| **Outside U.S. Territory** | | | | | | |
| Aircraft Activities | 5.74 | 23.83 | 1.25 | 1.12 | 11.37 | 11.26 |
| Marine Vessel Activities | 172.20 | 110.91 | 15.80 | 29.76 | 6.18 | 6.12 |
| **Total** | **177.94** | **134.74** | **17.05** | **30.88** | **17.55** | **17.38** |
| **Net Increase over Baseline** | **35.07** | **27.42** | **3.53** | **7.29** | **2.65** | **2.63** |

#### 3.2.4.5 Mitigation Measures

As described in Sections 3.2.2.3 and 3.2.2.4, emissions and hazardous pollutants produced as a result of the proposed action are well below any thresholds that could impact air quality in any of the affected States. Therefore, no mitigation measures are required to reduce air emissions.

### 3.2.5 Summary of Effects

As shown in Table 3.2-6, emissions associated with implementation of Alternatives 1 and 2 would result in increases in air emissions above baseline (No Action Alternative) conditions. Within U.S. Territory, emission increases are mainly associated with increased activities of aircraft, surface vessels, and ordnance use. Outside U.S. Territory, emission increases are mainly associated with increased surface vessel activities, with additional contributions from aircraft activities. In conclusion, although Alternatives 1 and 2 would result in increases in emissions of air pollutants, it is not anticipated that they would result in exceedances of the air quality standards as discussed previously in this section.

Because all areas affected by Northwest Training Range Complex (NWTRC) activities are in attainment of all NAAQS, the Navy's actions are not subject to the CAA.

**Table 3.2-6: Summary of Effects – Air Quality**

| Alternative | NEPA (On-Land and U.S. Territorial Waters) | EO 12114 (Non-U.S. Territorial Waters) |
|---|---|---|
| **No Action Alternative** | • The No Action Alternative involves maintaining activities at the baseline levels. Emissions for the No Action Alternative reflect baseline levels that are currently occurring. There is no increase in emissions above the baseline within U.S. Territory under the No Action Alternative.<br>• All areas are in attainment.<br>• No significant impacts to study area air quality. | • The No Action Alternative involves maintaining activities at the baseline levels. Emissions for the No Action Alternative reflect baseline levels that are currently occurring. There is no increase in emissions above the baseline outside the U.S. Territory under the No Action Alternative.<br>• No significant harm to study area air quality. |
| **Alternative 1** | • Within U.S. Territory, emission increases are associated with increased marine vessel activities, aircraft activities, ground vehicles, and ordnance use.<br>• Emission increases over baseline for Alternative 1 would result from increased activities. Emission increases would not be considered major and would not result in a significant impact on the air quality. Under Alternative 1, emissions within U.S. Territory would not be expected to result in an exceedance of an air quality standard.<br>• All areas are in attainment.<br>• No significant impacts to study area air quality. | • Outside U.S. Territory, emission increases are mainly associated with increased surface vessel activities, with additional contributions from aircraft activities.<br>• Although Alternative 1 would result in increases in emissions of air pollutants over the No Action Alternative, emissions outside U.S. territorial waters would not be expected to adversely affect offshore air quality and emissions would not exceed air quality standards within U.S. Territory.<br>• No significant harm to study area air quality. |
| **Alternative 2 (Preferred Alternative)** | • Impacts generally the same as Alternative 1.<br>• All areas are in attainment.<br>• No significant impacts to study area air quality. | • Impacts generally the same as Alternative 1. |

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