3.2 AIR QUALITY

This section describes the air quality conditions on the New Whatcom site and in the site area. Potential impacts to air quality from redevelopment under the EIS Alternatives are evaluated. This section is based on the *Air Quality Technical Report* (December 2007) prepared by Landau Associates, Inc. The full report is included as **Appendix E** to this EIS.

3.2.1 Affected Environment

Air quality is generally assessed in terms of whether concentrations of air pollutants are higher or lower than ambient air quality standards set to protect human health and welfare. Three agencies have jurisdiction over the ambient air quality in the New Whatcom area: the United States Environmental Protection Agency (EPA), Washington State Department of Ecology (Ecology) and the Northwest Clean Air Agency (NWCAA). These agencies establish standards that govern both the concentrations of pollutants in the outdoor air and contaminant emissions from air pollution sources. Applicable local, state and federal ambient air quality standards are described in detail in the *Air Quality Technical Report* in **Appendix E** and displayed in **Table 3.2-1**, Summary of National and Regional Ambient Air Quality Standards.

Ecology and NWCAA maintain a network of air quality monitoring stations throughout the region to measure existing air quality. Based on monitoring information collected by EPA, Ecology and NWCAA over a period of years, regions are designated as "attainment" or "non-attainment" areas for particular air pollutants. Attainment status indicates that air quality in an area complies with the National Ambient Air Quality Standards (NAAQS), which are intended to protect human health with a margin of safety. Whatcom County is located in an attainment area for all air pollutants regulated by the NAAQS and the state air quality standards.

Within the greater Puget Sound region, emission control programs have created a substantial improvement in regional air quality following implementation of the Clean Air Act. Air quality standards are occasionally exceeded in the more urban counties of Snohomish, King, and Pierce; however, exceedances in Whatcom County have not been recorded or reported in more than 16 years (Franzmann, A., 2007, NWCAA, personal communication).

Provisions in the 1990 amendments to the federal Clean Air Act and the Washington Clean Air Act require that regional transportation plans and individual projects within these plans in non-attainment or maintenance areas, demonstrate conformity with Clean Air Act requirements for non-exempt transportation projects. However, because the New Whatcom site is located in an attainment area, conformity analysis is not required.

Typical existing sources of air pollution in the site area include automobile and truck traffic, railroad activity and locomotives, large and small marine vessel traffic, including those at the Bellingham Shipping Terminal (BST), and a variety of industrial sources including the PSE Encogen facility and Georgia-Pacific (GP) operations. Automobile and truck traffic, locomotive exhaust, marine traffic and development-related truck traffic are issues of relevance in this Draft EIS analysis. With exhaust from diesel locomotives and diesel trucks, the air pollutants of primary concern are typically small particulate matter (PM_{10} and $PM_{2.5}$) and general odors. With other vehicular traffic, the primary pollutant of concern is carbon monoxide (CO), although internal combustion engines also emit hydrocarbons and nitrogen oxides, which are precursors

Table 3.2-1
SUMMARY OF NATIONAL AND REGIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	National Primary Standard	National Secondary Standard	Ecology Standard	NWCAA Local Standard
CO One-Hour Average (Not to be exceeded more than once per year)	35 ppm	None	35 ppm	35 ppm
8-Hour Average (Not to be exceeded more than once per year)	9 ppm	None	9 ppm	9 ppm
PM_{10} Annual Arithmetic Mean (Attainment based on three-year average)	50 µg/m^3	50 µg/m^3	50 µg/m^3	50 µg/m^3
24-Hour Average Concentration	150 µg/m^3	150 µg/m^3	150 µg/m^3	150 µg/m^3
$PM_{2.5}$ Annual Arithmetic Mean (Attainment based on 3-year average of annual mean concentrations from single or multiple community-oriented monitors)	15 µg/m^3	15 µg/m^3	15 µg/m^3	15 µg/m^3
24-Hour Average Concentration	65 µg/m^3	65 µg/m^3	65 µg/m^3	65 µg/m^3
NO_2 Annual Arithmetic Mean (Should never be exceeded)	0.053 ppm	0.053 ppm	0.05 ppm	0.053 ppm
Ozone 1-Hour Average (to lapse after demonstration based upon existing standard, not to be exceeded more than once per year)	0.12 ppm	0.12 ppm	0.12 ppm	0.12 ppm
8-Hour Average	0.08 ppm	0.08 ppm	0.08 ppm	0.08 ppm

Source: EPA, 2006
Units: ppm = Parts per million
µg/m^3 = Micrograms per cubic meter of air

to ground-level ozone. Vehicle traffic also generates small amounts of PM_{10} and $PM_{2.5}$ due to exhaust and tire friction on pavement (or unpaved areas), and trace amounts of sulfur and nitrogen oxides.

Local Climate and Terrain

Weather is one of several variables that influence air quality. Atmospheric conditions, such as wind speed and direction and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersion of air pollutants and consequently affect air quality. Periods with stable high pressure systems and periods that include nighttime thermal inversions due to the low solar heating of the land in winter create stable atmospheric conditions. It is during these very stable atmospheric conditions, when little vertical dispersion occurs, that monitoring instruments measure high concentrations of air pollutants emitted at ground level. Such ground-level emitted pollutants primarily include CO from motor vehicles

and particular matter from vehicles and woodstoves. Predominant winds at the site are from the south to south-southwest and from the east-northeast.

In some instances, terrain can also influence air quality. The site is located in the Puget Sound lowlands, a north-south topographical depression bordered on the east by the Cascade Mountains and the west by the Olympic Mountains and Vancouver Island. The site is located in an area known as the Mountain View upland. The climate at the site is influenced by marine air that flows east from the Pacific Ocean and through the Straits of Georgia and Juan de Fuca, and occasional cold, dry continental air flows from the east-northeast through the Fraser River canyon.

Existing Ambient Air Quality

The NWCAA operates monitoring sites for a variety of air pollutants within Whatcom County to assure that long-term air quality complies with the NAAQS criteria. Pollutants monitored by or reported to the NWCAA include sulfur dioxide (SO_2), PM_{10}, $PM_{2.5}$ and ozone. Data are reported as micrograms per cubic meter (µg/m3) and/or as an air quality index (AQI). Levels are characterized as good, moderate, unhealthy for sensitive groups, or unhealthy.

Ozone

Ozone is a highly reactive form of oxygen created by sunlight-activated chemical transformations of nitrogen oxides and volatile organic compounds (VOCs) (hydrocarbons) in the atmosphere. Unlike CO concentrations that tend to occur very close to the emission source (s), ozone problems tend to be regional. Transportation sources are one of a number of sources that produce the precursors to ozone.

Ozone is monitored at one location in Whatcom County. The maximum reported 1-hour average concentration in 2002 was 0.07 parts per million (ppm), which is less than the NAAQS standard of 0.12 ppm. The maximum reported 8-hour average concentration in 2002 was 0.06 ppm, which is less than the NAAQS standard of 0.08 ppm.

Lead

Lead is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been motor vehicles (such as cars and trucks) and industrial sources. Metals processing plants, smelters, waste incinerators, utilities, lead-acid battery manufacturers and high traffic volume urban areas are also sources of lead in air emissions.

As a result of the EPA's regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector have dramatically declined (95 percent between 1980 and 1999), and levels of lead in the air have decreased by 94 percent between 1980 and 1999. Due to the low occurrences of any industrial facilities that may contribute lead to the air environment, this pollutant is not monitored within the Whatcom County area.

Carbon Monoxide (CO)

Carbon monoxide (CO) is the product of incomplete combustion. It is generated by transportation sources and other fuel-burning activities like residential space heating, especially heating with solid fuels like coal or wood. CO is usually the pollutant of greatest concern related to roadway transportation sources because it is the pollutant emitted in the greatest quantity for which short-term health standards exist. The highest ambient concentrations of CO usually occur near congested roadways and intersections during wintertime periods of air stagnation. CO typically has a localized impact as concentrations diminish within a short distance of roads.

Due to the nearshore location, lack of substantial traffic congestion in the Whatcom County area and a history of minimal CO concentrations within the County, CO is not monitored at any air quality stations within the area on an ongoing basis.

Particulate Matter (PM10 and PM2.5)

Particulate matter air pollution is generated by industrial activities and operations, fuel combustion sources such as residential wood burning, motor vehicle engines and tires, and other sources. Federal, state, and local regulations set limits for particle concentrations in the air based on the size of the particles and the related potential threat to health.

At present, there are standards for PM_{10}, or particles less than or equal to about 10 micrometers (microns) in diameter as well as for $PM_{2.5}$, or particulate matter less than or equal to 2.5 microns in diameter. The latter size fraction is now thought to represent the size fraction of airborne particulate matter most dangerous to human health because such small particles (e.g., a typical human hair is about 100 microns in diameter) can be breathed deeply into the lungs.

AQI data for $PM_{2.5}$ and PM_{10} is collected continuously at Bellingham's downtown Yew Street monitoring station. For 2006, the maximum 24-hour $PM_{2.5}$ concentration was 22 µg/m3. For 2005, the maximum 24-hour $PM_{2.5}$ concentration was 21 µg/m3. For 2005 and 2006, the maximum 1-month $PM_{2.5}$ average was 11 µg/m3. Based on the data collected, $PM_{2.5}$ concentrations have been translated into AQI classifications for each calendar day. Based on the AQI in 2006, 354 days were considered to have good air quality, 7 days were considered to have moderate air quality, and there were no unhealthy for sensitive group days or unhealthy days (4 days in 2006 are unaccounted for due to missed sampling). For 2005, the maximum 24-hour PM_{10} concentration was 26 µg/m3. This 24-hour concentration falls well below the national, state, and local primary standard of 150 µg/m3.

Nitrogen Oxides (NOx)

Nitrogen oxides (NO_x) is the generic term for a group of highly reactive gases, all of which contain nitrogen and oxygen in varying amounts. NO_x form when fuel is burned at high temperatures, as in a combustion process. The primary manmade sources of NO_x are motor vehicles, electric utilities, and other industrial, commercial, and residential sources that burn fuels. NO_x contributes to the formation of ground-level ozone, nitrate particles, acid aerosols and NO_2 which can cause respiratory problems. NO_x also contributes to the formation of acid rain, nutrient overload in surfaces waters that deteriorate water quality, atmospheric particles that impair visibility, and can contribute to global climate change.

NO_x and the pollutants formed from NO_x can be transported over long distances, following the pattern of prevailing winds. Problems associated with NO_x are not confined to areas where NO_x are emitted. Therefore, controlling NO_x is often most effective if done from a regional perspective, rather than focusing on sources in one local area. The national and state standards for NO_2, are being met in the Whatcom County and throughout Washington, and the latest pollutant trends suggest that these standards would not be exceeded in the foreseeable future. There are no monitoring stations collecting NO_x data within the area.

Sulfur Dioxide (SO2)

Sulfur dioxide (SO_2) belongs to the family of sulfur oxide (SO_x) gases. These gases dissolve easily in water. Sulfur is prevalent in raw materials, including crude oil, coal, and ore that contain common metals like aluminum, copper, zinc, lead, and iron. SO_x gases are formed when fuel containing sulfur, such as coal and oil, is burned, when gasoline is extracted from oil, or when metals are extracted from ore. SO_2 dissolves in water vapor to form acid, and interacts with other gases and particles in the air to form sulfates and other products that can be harmful to people and their environment.

More than 65 percent of SO_2 released to the air in the U.S., or more than 13 million tons per year, comes from electric utilities, especially those that burn coal. Other sources of SO_2 are industrial facilities that derive their products from raw materials like metallic ore, coal, and crude oil, or that burn coal or oil to produce process heat. Examples are petroleum refineries, cement manufacturing, and metal processing facilities. Also, locomotives, large ships, and some non-road diesel equipment currently burn high sulfur fuel and release SO_2 emissions to the air in large quantities.

Concentrations of SO_2 are monitored by NWCAA at a site west of Ferndale, Washington. For 2005, the maximum 24-hour SO_2 concentration was 24 µg/m3, well below the 260 µg/m3 24-hour NAAQS standard.

Air Toxics

Any other air pollutants that are not criteria pollutants, and that may be emitted into the air in quantities that can cause adverse health effects, can be classified as air toxics. These health effects cover a wide range of conditions from lung irritation to birth defects to cancer. Air toxics come from a wide variety of sources, including traditional industrial and utility sources, smaller manufacturing and commercial sources, on-road mobile sources (such as cars, trucks, and buses), residential activities (such as oil burning for home heating and painting houses), and non-road mobile sources such as construction equipment.

There are no NAAQS for these pollutants, but the 1990 Clean Air Act Amendments listed almost 200 of these air toxics and directed the EPA to develop control technology standards for sources that emit them.

Odors

Odors are one of the most obvious forms of air pollution to the general public. While offensive odors seldom cause physical harm, they can present a significant problem for both the source and the surrounding community. Offensive odors may cause agitation, anger, and concern to the public about the possibility of health effects, especially in residential neighborhoods located

near sources. Most people respond to offensive odors as objectionable if they are sensed over the duration of a single human breath, typically two to five seconds. Odors are regulated by the NWCAA.

Over the past 10 years, the NWCAA has received several odor-related complaints in the downtown Bellingham area and has given several notices of violation to various facilities for being out of compliance. Violations in the downtown area have been primarily due to charred wood particulate from wood-working industries and nitrogen oxide emissions from the Puget Sound Energy Encogen facility on the New Whatcom site.

Sensitive Receptors

Sensitive receptors are population groups (children, the elderly, athletes, or the acutely and chronically ill) that are more likely to experience adverse health effects associated with air quality impacts. Facilities or land uses typically associated with sensitive receptors include residential areas, schools, retirement homes, convalescent homes, hospitals, and medical clinics.

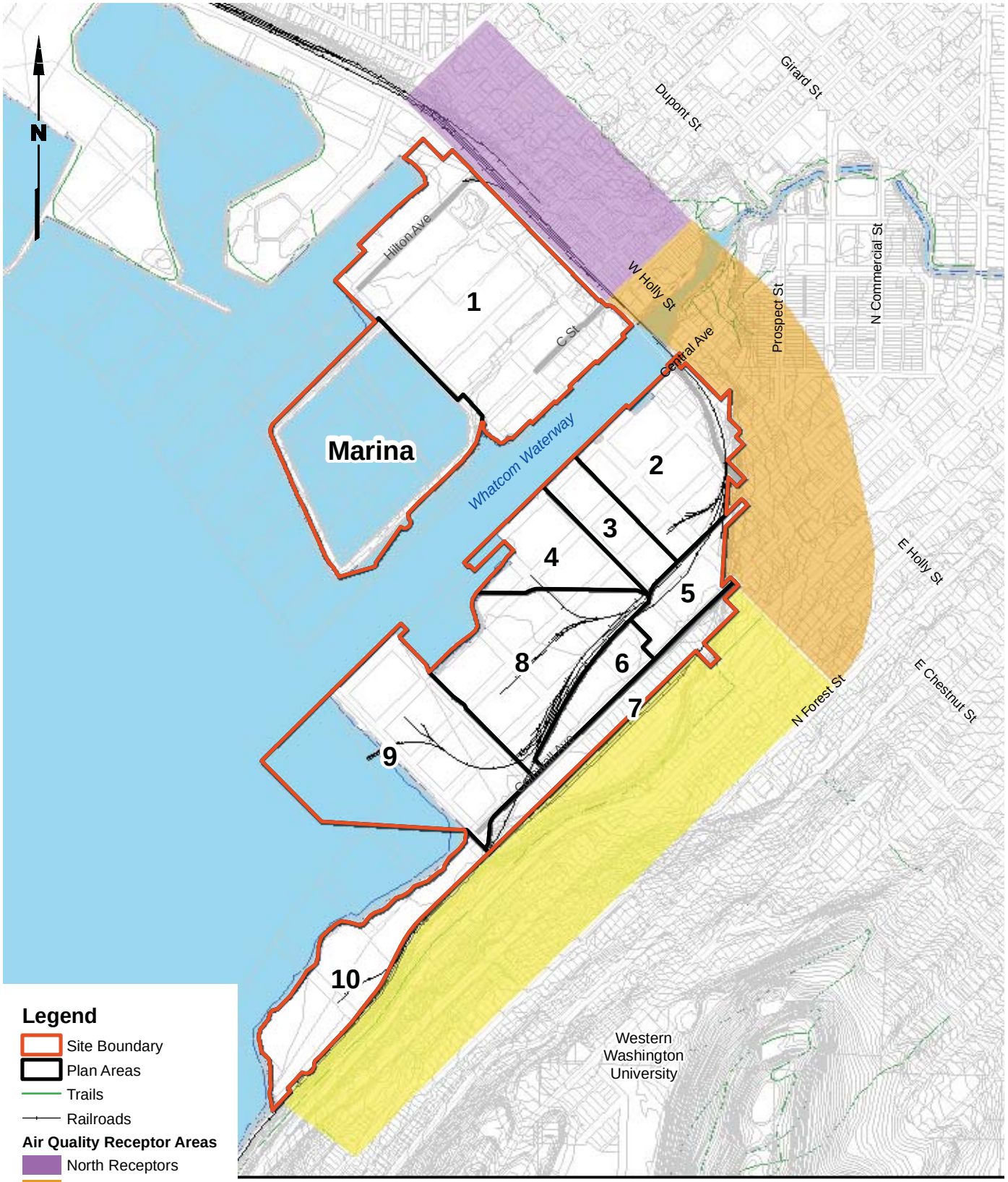
For purposes of the air quality analysis in this EIS, a study area extending to at least 500 feet beyond the site has been established. It was determined that significant air quality impacts would not occur beyond this 500-foot distance due to ambient conditions, dispersion and/or topographic changes. The major sensitive receptors surrounding the site have been loosely grouped into four areas: North, Downtown, South and Onsite Receptors (see **Figure 3.2-1**, Air Quality Receptor Areas).

- North Receptors – Single and multi-family residential uses north of C Street to Broadway Avenue are referred to as the North Receptors. The North Receptors are located on a bluff approximately 250 feet or more from the New Whatcom site.

- Downtown Receptors - The Downtown Receptors include the Central Business District core, where people shop, eat, work, and use park facilities in proximity of the area from Maple Street to C Street.

- South Receptors - The South Receptors include the single and multi-family residential uses located south of Cornwall Avenue and west of Maple Street. The majority of residences are situated on a vegetated bluff located 300 to 1,000 feet from the site boundary and at an elevation of nearly 70 to 100 feet above the elevation of the site. The analysis of air quality considers this area because some proposed New Whatcom features would include improvements to or redevelopment of roadway infrastructure within the immediate area of these South Receptors. With the exception of the condominium and apartment residents located at the northern end of the South Receptor area, topographic features would generally limit project-related air quality effects from reaching most of the receptors in this area.

- Onsite Receptors - Additionally, the mix of residential and commercial uses at New Whatcom would create future onsite sensitive receptors.



Source: CollinsWoerman (2007); LAI (2007)

BLUMEN CONSULTING GROUP, INC

Figure 3.2-1
Air Quality Receptor Areas

New Whatcom Redevelopment EIS

Sources of Air Pollution in the Project Area

Air pollutant emissions in the Bellingham area are from point, area, and mobile sources. Point sources are stationary sources that include, but are not limited to, industrial sources and power plants. Area sources include consumer products and smaller stationary sources, such as dry cleaners. Mobile sources consist of on-road sources and non-road sources. On-road sources include cars and trucks. Non-road sources include, but are not limited to, lawn mowers and other landscaping equipment, construction equipment, trains, water vessels, and agriculture equipment.

The main contributing sources of emissions within the area of the New Whatcom site are point sources, mobile on-road vehicles and non-road sources including trains and marine vessels.

Point Sources

The NWCAA prepares an annual emission inventory of criteria and toxic air pollutants for the larger point sources in its jurisdiction. There are 15 Title V Air Operating Permit sources (i.e., "major sources," as defined by EPA) within the Whatcom, Island and Skagit County area including Alcoa Primary Metals, British Petroleum, Conoco Phillips, Darigold, and the Puget Sound Energy Encogen (Encogen) facility that contribute to the air quality within the general region. The NWCAA requires each source to report certain process and emissions information each year. Between 2004 and 2005, emission reductions ranging from 0.5 percent to more than 23 percent of PM_{10}, SO_2, NO_x, VOCs, and CO were achieved (i.e., air pollutant emissions in 2005 were 0.5 to 23 percent less than those reported in 2004). It is expected that the emissions from such industrial sites would continue to decline with improvements in technology and based on strict federal regulations aimed at addressing global climate change. The Encogen facility is analyzed in greater detail due to its location within the New Whatcom site and its proximity to the North, South, Downtown and new Onsite Receptors.

The Encogen facility is located on Cornwall Avenue within Redevelopment Area 6 of the site. Encogen is a 163-net-megawatt (MW), combined cycle, natural gas-fired power generating plant. Encogen uses natural gas as the primary fuel source, but distillate fuel oil is available as a backup to allow continued generation of power in the event of a natural gas shortage. Fuel oil is used for periodic readiness testing of the turbines. Air emissions from the Encogen facility are currently regulated by NWCAA Air Operating Permit No. 004R1, which was issued August 18, 2006.

Air pollutants emitted by Encogen include PM_{10}, anhydrous ammonia (NH_3), SO_2, CO, NO_X, VOCs, and formaldehyde. Maximum emission rates allowed under Encogen's air operating permit and 5 years of actual emission quantities for Encogen are highlighted in **Table 3.2-2** below.

Air emissions from Encogen constitute only a small amount of Whatcom County's total emissions. **Table 3.2-3** below shows Encogen's pollution contribution compared to all major sources and other various minor source contributors in Whatcom County in 2005.

A number of other point sources are currently operating on the site including the Georgia-Pacific Tissue Mill and a number of small industrial and marine businesses. It is anticipated that the Tissue Mill will cease operations by December 2007. The industrial and marine industrial uses in Area 1 are expected to continue in the near term.

Table 3.2-2
ENCOGEN EMISSIONS QUANTITIES: MAXIMUM ALLOWABLE AND ACTUAL

		Actual Emissions Inventory Data				
Pollutant	**Maximum Allowable (Tons/Yr)**	**2001**	**2002**	**2003**	**2004**	**2005**
PM_{10}	32.85	11	16	9	6	6
NH_3	79.75	36	33	28	13	--
SO_2	18.25	12	8	7	4	5
CO	131.04	38	26	22	13	14
NO_X	175	144	100	82	51	51
VOCs	66.07	3	1	1	1	0
Formaldehyde*	--	1.4	0.9	0.8	0.5	--
* Formaldehyde is not regulated under the air operating permit; however, it is reported for the purposes of maintaining a regional emissions inventory.						

Source: NWCAA, 2007

Table 3.2-3
ENCOGEN ANNUAL EMISSIONS COMPARED TO EMISSION TOTALS FOR WHATCOM COUNTY

	PM_{10}	**SO_2**	**NO_X**	**VOCs**	**CO**
Whatcom County's totals (Tons)	450	3,676	3,793	1,359	12,586
ENC totals (Tons)	6	5	51	<1	14
ENC's contribution (as a percentage of Whatcom County's totals)	1.3%	0.1%	1.3%	<0.1%	0.1%

Source: NWCAA, 2007

On-Road Vehicles

On-road motor vehicles contribute significantly to air pollution, accounting nationwide for 51 percent of the CO, 30 percent of the CO_2, 34 percent of the NO_x, nearly one-third of VOCs emitted in the United States, and 10 percent of fine particulate matter ($PM_{2.5}$).

In the Pacific Northwest, car and truck emissions are a higher percentage of total emissions than the national averages, primarily because there are fewer stationary industrial sources. Within Whatcom County, the current growth forecast for the area estimates that the number of on-road vehicles will continue to increase each year through 2026.

Non-Road Sources

Non-road sources of emissions include, but are not limited to construction equipment, trucks, trains, water vessels and agricultural equipment. While emissions from some major non-road

sources such as power plants and light duty vehicles have been on the decline in recent years, emissions from other major sources such as commercial marine vessels and aircraft have increased over the past 20 years.

As a result of reductions in some major non-road emission sources, freight transportation is contributing a larger percentage of total emissions for some pollutants. Most freight trucks, locomotives, and ships are powered by diesel engines. At the same time these emission sources are increasing, there is a heightened concern about the health and environmental effects of diesel engine emissions (a major source of emissions of NO_x and PM). Freight transportation is also a large and growing source of greenhouse gas emissions, particularly carbon dioxide (CO_2), that contribute to global climate change. These concerns, and the implementation of the federal 8-hour ozone and fine particulate ($PM_{2.5}$) standards, will require many regions across the country to find new ways to control NO_x and PM emissions from freight transportation sources.

Rail

In 1998, the EPA established emission standards for NO_x, hydrocarbons, CO, PM and smoke for newly manufactured and remanufactured locomotives and locomotive engines, which had previously been unregulated. The applicability of each standard (Tier 0, Tier 1 and Tier 2) is based on the manufacturing date of the locomotive.

- The first set of standards (Tier 0) apply to locomotives and locomotive engines originally manufactured from 1973 through 2001, and any remanufactured in calendar year 2000 or later. The regulations require that post-1972 locomotives be covered by an EPA Certificate of Conformity when they are remanufactured. The certificate certifies that the locomotive was remanufactured in a specific manner so that it complies with the EPA's emission standards.

- The second and third sets of standards (Tier 1 and Tier 2) apply to locomotives and locomotive engines originally manufactured on or after January 1, 2002 and January 1, 2005, respectively. These locomotives and locomotive engines are also required to meet the same standards at each subsequent remanufacture. The EPA has also established a rigorous emission testing program to make sure that locomotives comply with these standards for the life of the locomotive.

Based on discussions with Burlington Northern Santa Fe (BNSF) railway, an average of four freight trains make round-trip circuits through the Bellingham area each day enroute to and from Canada. Other train activity includes three local freight trains serving businesses within the City of Bellingham, and one night freight train from Bellingham to Everett. Passenger service along the BNSF railway is operated by Amtrak. The nearest station is the transit center south of the New Whatcom site, located at 401 Harris Avenue in Bellingham. Amtrak's Cascades route provides service along the BNSF railway from Vancouver, British Columbia to Eugene, Oregon. Amtrak operates four daily trains with two southbound trains and two northbound trains.

Marine Vessels

From small recreational runabouts to large ocean-going vessels, marine diesel engines are significant contributors to air emissions (including NO_x and PM) in many locations. Marine diesel engines produced today must meet EPA-established emissions limits.

The EPA is also addressing emissions from marine engines through the implementation of fuel standards. In May 2004, as part of the Clean Air Non-Road Diesel Rule, the EPA finalized new requirements for non-road diesel fuel that will decrease the allowable levels of sulfur in fuel used in marine vessels by 99 percent. These fuel improvements, which begin to take effect in 2007, will create immediate and significant environmental and public health benefits by reducing PM from new and existing engines.

Current marine vessel traffic in the area includes large vessels that navigate along the Whatcom Waterway and in Bellingham Bay, associated with industrial uses and BST operations, and recreational and commercial vessels that navigate around Bellingham Bay to and from the existing Port of Bellingham Squalicum Marina immediately north of the New Whatcom site and other boat facilities. (Subsequent to the U.S. Congress' approved deauthorization of the inner portion of the Whatcom Waterway, large vessel use in the waterway will be reduced; see Section 2.2 of **Chapter 2** for more information.) The Squalicum Marina currently serves recreational vessels and provides a boat launch area for users wishing to haul in and haul out.

3.2.2 Impacts

Redevelopment of the site under the EIS Alternatives could result in air quality and odor impacts over the assumed 20-year buildout period. Air emissions during the construction phase would be intermittent and phased over time. Operational air quality emissions would generally result from added traffic associated with the New Whatcom redevelopment, as well as from rail operations and marine vessels.

3.2.2.1 Construction Impacts

All EIS alternatives are expected to have some level of ongoing, phased construction as the area transitions from an industrial site to a mixed-use development site. For purposes of this Draft EIS, it is assumed that infrastructure improvements would be generally similar for all Redevelopment Alternatives, although Alternative 1, the Higher Density Alternative, would entail the largest level of infrastructure improvements. Each of the Redevelopment Alternatives would include similar forms of construction activities such as clearing, grading, excavating, demolition, material supply delivery and heavy equipment usage. Each of the alternatives includes various forms of new roadway development, marina and in-water development, and park and recreational development (parks and trails) that would be implemented over an interim (2016) phase and completed over 20 years (by 2026). Alternatives 1, 2 and 2A also assume the relocation of a portion of the BNSF railroad corridor. (If permits for the railroad relocation are pursued in the future, a specific air quality construction permit may need to be obtained by BNSF or the Washington State Department of Transportation.)

Construction activities resulting in soil disturbance, dust emissions, combustion pollutants from onsite construction equipment and from offsite trucks hauling dirt, cement or building materials, would create a temporary addition of pollutants and odors to the local air shed. Emissions and odors would also be generated during finish construction, such as during application of paints or other coatings on buildings. These emissions would vary in both time and place as the construction activities vary by phase and specific onsite location. Due to the temporary and variable nature of emissions associated with construction activities, it is not possible to quantitatively model the impacts of these activities on surrounding air quality. Each phase of construction would require different types and scales of construction equipment operating at

different locations within the New Whatcom site. Due to the unknown timing and specific quantity of construction activities, it is not possible to define which individual construction activity would be likely to produce the highest offsite or onsite concentrations for the different pollutants or average time periods (i.e. 1-hour or 8-hour) that govern ambient air quality standards.

Experience shows that construction activities would primarily produce PM and NO_x emissions associated with diesel-exhaust combustion emissions and earthwork. Lesser amounts of CO, SO_2, and VOC emissions would also be generated by construction-related activities such as temporary portable power generation or the operation of support vehicles.

Construction activities would generate emissions from the exhaust of combustion engines, which contribute to atmospheric loading of both NO_2 and $PM_{10}/PM_{2.5}$. These emissions typically result from:

- Exhaust from the diesel construction equipment used for site preparation, grading, excavation, and construction of onsite structures;
- Exhaust from water trucks used to control construction dust emissions;
- Exhaust from pickup trucks and diesel trucks used to transport workers and materials around the construction site;
- Exhaust from diesel trucks used to deliver soil, concrete, equipment, and construction supplies to the construction site; and
- Exhaust from automobiles used by workers to commute to the construction site.

Additional PM_{10} and $PM_{2.5}$ (fugitive dust) emissions from earth-moving and related activities are expected from:

- Site preparation and finish grading/excavation at the construction site;
- Onsite equipment and vehicular traffic on unpaved surfaces;
- Aggregate and soil loading and unloading operations; and
- Wind erosion of areas disturbed during construction activities.

Emissions similar to those described above are also expected from any in-water work efforts from diesel-powered tugs and marine construction vessels and any work involving the construction of new infrastructure/utilities and new parks/trails.

Exposure of workers and the general public to hazardous substances, contaminated soil or soil vapors from demolition and construction activities could also result. Compliance with site cleanup institutional controls and applicable regulations would preclude significant air quality impacts to both workers and the general public (refer to Section 3.5, **Environmental Health**, for more information on site remediation and institutional controls).

The emissions and odors created from onsite construction are not expected to pose a significant risk due to the distance of the North, Downtown, and South sensitive receptors from the site, the location of the site adjacent to Bellingham Bay and the effective local air mixing zone. The greatest potential for short-term impacts to existing North, Downtown and South receptors would likely occur during the construction of roadway connection improvements, where new onsite roadways would intersect with offsite roadway features.

Although new onsite sensitive receptors would be created as part of all EIS Alternatives, individual construction projects would be phased over time and would occur in a variety of

redevelopment areas, thus removing the risk of long-term, construction-related air quality effects on any one receptor location or the creation of any chronic construction-related air impacts. Further, construction activities would be typical of such activities in urban areas. Additionally, the construction of new buildings and roadways, trenching for new utility lines, and development of parks and trails often require restricting access to pedestrians, thus removing sensitive receptors from the immediate vicinity where emissions are at their highest concentration.

Alternative 1 (Higher Density Alternative)

Redevelopment under Alternative 1 would involve the construction of the most extensive infrastructure, roadway, and utility systems. For this reason, Alternative 1 presents the greatest potential for construction-related air quality impacts throughout the duration of construction. See Section 2.8, **Description of Alternatives**, for more information about features included in Alternative 1.

From an air quality perspective, the combination and timing of the onsite roadway improvements among the Redevelopment Alternatives (Alternatives 1 through 3) do not pose substantial differences, and on an overall basis have limited ability to significantly impact the North, South, and Downtown receptors. It is assumed that the new roadway connections to the existing City street network pose the greatest potential for short-term construction impacts to the existing sensitive receptors due solely to proximity. Planned localized improvements to the existing City roadway network under Alternative 1 include:

- Improvements at Central Avenue to allow access to Chestnut Street (Area 2)
- New bridge connection at Bay Street (Area 2)
- New bridge connection at Commercial Street (Area 5)
- New bridge connections at Cornwall Avenue and Laurel Street (Area 7)
- New fly-over at Wharf Street to provide connection to the intersection of North State and North Forest Street (Area 9).

The above-noted roadway improvements have the greatest potential to impact the existing sensitive receptors in the area. However, as these improvements would be phased over the long-term and would be temporary in nature, only short-term air quality impacts would result during construction; such impacts are not anticipated to be significant.

As noted under **Affected Environment**, the maximum detected air pollutant concentrations in 2005, the most recent year of reported air quality data in Whatcom County, are 6 to 10 times less than the NAAQS. With such good air quality, it is expected that construction activities conducted consistent with typical air quality control measures required by local regulations would not result in any adverse air quality impacts. Exceedances of the NAAQS beyond the boundaries of the construction sites would not result. As such, no significant air quality impacts to offsite receptors are anticipated in conjunction with construction activities.

Alternative 2, 2A and 3

Construction under Alternatives 2, 2A and 3 is expected to be phased and temporary in duration, similar to Alternative 1. Generally, less construction activity would occur resulting in less potential for air quality impacts, as compared to Alternative 1. Construction-related air quality impacts are not expected to be significant.

3.2.2.2 Operational Impacts

This section addresses potential operational impacts resulting from criteria air pollutant emissions associated with the assumed mixed-use redevelopment. Operational emissions and related potential air quality impacts, could result from the primary air polluting sources in the area, including on-road (vehicles) and non-road (trains and marine vessels) sources. Emissions and potential impacts associated with each source category are described below.

Under the Redevelopment Alternatives (Alternatives 1 through 3), decommissioning of the Encogen facility is assumed to occur by 2026. The result of this effort would be removal of up to approximately 76 tons (according to 2005 reported emissions) of criteria pollutants entering the atmosphere per year at this specific location, as identified in **Table 3.2-2**. (It should be noted that it is possible that the Encogen facility could relocate to another site in the Bellingham area.) Based on the transition of the site from industrial operations to a mixed-use neighborhood, and the assumed removal of the Encogen facility from the site, a reduction in criteria pollutants associated with implementation of New Whatcom redevelopment would result in a net benefit to air quality in the site area.

Alternative 1 (Higher Density Alternative)

2016

On-Road Emissions

Alternative 1 would provide the most intensive improvements to the roadway infrastructure network by 2016. Improvements to Cornwall Avenue and the development of the Laurel and Bay Street bridges, as well as the planned roadway network in Redevelopment Area 1, would increase travel and the distribution of traffic within this previously industrial area. Traffic on the new roadway network would not be expected to pose significant air quality impacts to existing sensitive receptors within the area due mainly to ambient air quality in the area and the distance of the majority of roadways (more than 500 ft.) to the existing receptor groups (South, Downtown and North Receptors).

Despite the growing population, increased traffic within the area and an increase in general growth, Whatcom County is in attainment for all air quality criteria pollutants. There are currently no recorded air quality violations on or near the New Whatcom site. Development of the roadway improvements and related infrastructure on the site, and operational impacts resulting from the land uses completed during the interim 2016 phase, would provide for a relatively small contribution to the regional concentrations of criteria pollutants (PM, CO, and O_2). Because the area is in attainment for CO, a “hot spot” analysis is not warranted for this project; however, preliminary CO screening is described below, for discussion purposes.

Although projections indicate that traffic within the downtown roadway network surrounding the site would generally increase through 2016 with or without New Whatcom redevelopment, air quality modeling has shown that, compared to the existing conditions, CO concentrations throughout the entire Puget Sound region, including within Bellingham, are expected to continue to decrease (EPA, 2005). The potential for air quality impacts from on-road sources throughout the general site area over the 2016 and 2026 time periods is expected to be offset by an increase in efficiency of future vehicles and the availability of cleaner fuels and fuel options to

consumers. Based on this general trend in efficiency, air quality following the interim phase of redevelopment would remain in compliance and would be expected to improve with the development of new fuels and technologies.

To demonstrate this further, data from the *Transportation Discipline Report* (see **Appendix N**) were reviewed and the three worst-performing intersections (greatest amount of vehicles and vehicular idle time) within the existing offsite roadway network were analyzed for future CO emissions through use of the Washington State Intersection Screening Tool (WASIST). The WASIST is a computerized screening model used to estimate worst-case carbon monoxide (CO) concentrations near signalized intersections and metered roadways. The results from WASIST are based on EPA-approved models MOBILE6 version 2.03 (EPA 2003) and CAL3QHC (EPA 1995).

The three signalized intersections included in the screening analysis for 2016 represent intersections within the greater downtown area with the worst expected traffic delays (Level of Service E or F) in the future from an air quality perspective. Traffic conditions at these intersections could result in greater amounts of idling time, which could increase CO emissions. To select the worst performing intersections, a review of the Transportation Report completed for this Draft EIS ruled out consideration of certain intersections (some of which are located closer to the site). These include intersections that support higher volumes of vehicles but with better Levels of Service (LOS), intersections with reduced LOS that will remain unsignalized in the future, and/or unsignalized intersections with longer delays. The appropriate method for evaluating worst-case air quality (CO) impacts focuses on signalized intersections with the highest amount of vehicles idling at a signal for the longest period of time. Therefore, three signalized intersections that would experience the above-described conditions were evaluated and include:

- North State Street/Ohio Street
- North State Street/James Street/Iowa Street
- Birchwood Avenue/Meridian Street.

The screening analysis results indicate that acceptable air quality conditions would result. Worst-case air quality concentrations for the worst-case receptor conservatively placed only 10 feet from the intersection) at each of the three intersections would be below the 1-hour average NAAQS for CO of 35 ppm and the 8-hour average standard of 9 ppm; the modeled results indicate a maximum 1-hour concentration of 7.8 ppm and an 8-hour concentration of 6.8 ppm in 2016. All three of these intersections would conform to both the 1-hour and 8-hour NAAQS.

As indicated, vehicle delay times at other intersections, both on the New Whatcom site and offsite within the existing roadway network, would be less than at the intersections analyzed above; therefore, it is reasonable to infer that mobile source CO emissions would conform to the NAAQS at all onsite and offsite intersections. It is concluded that vehicular traffic would not result in unacceptable, operational air quality impacts to the North, Downtown, South or onsite, newly created receptors, or at any other location in the site area.

Additionally, some air pollutants, such as ozone, result from the buildup and chemical interaction of multiple pollutants from multiple sources, including oxides of nitrogen (NO_x) and VOCs. Therefore, ozone impacts must be evaluated by regional air quality planning agencies, rather than on a project-by-project basis. The NWCAA has documented the area's compliance

with the ozone NAAQS and plans to maintain that compliance in the Ozone State Implementation Plan.

Point Source Emissions

The existing Encogen facility has been permitted in accordance with federal, state, and local regulations that protect ambient air quality with respect to potential occupational and residential receptors. Therefore, as the New Whatcom site transitions from an industrial to a mixed-use development, unacceptable levels of exposure to new onsite receptors would not result. The emissions allowed under Encogen's current air permit are considered protective of human health for all receptors, including residential uses. No significant impacts to onsite uses would result from ongoing Encogen operations.

Non-Road Emissions

Rail. In March 2007 the EPA proposed a revised three-part program that would significantly reduce emissions from diesel locomotives of all types: line-haul, switch, and passenger rail. This proposal would set new exhaust emission standards and idle reduction requirements for locomotives that would begin in 2009. The proposal would also tighten emission standards for existing locomotives when they are remanufactured; these standards would take effect as soon as certified systems are available (as early as 2008 but no later than 2010). Finally, the proposal would set long-term Tier 4 standards for newly built engines based on the application of high-efficiency catalytic, post-combustion technology, beginning in 2015 for locomotives.

Officials at BNSF have indicated that rail industry traffic in the Bellingham area is expected to increase minimally by one to two round-trip trains per day over the long-term. Three of the four Redevelopment Alternatives assume that a portion of the current railroad corridor on the site would be relocated to the eastern and southern border of the site. Alternative 1 assumes the relocation of the railroad corridor by 2016. Under Alternative 1, a portion of the railway would move approximately 500 feet to the east and south. This relocation would position the rail line adjacent to the bluff, similar to the current configuration near the North Receptors. Although this move could increase the NO_x and PM concentrations for some receptors, the limited frequency of trains in the area and the distance to receptors following the relocation (the closest receptor would be at least 150 feet from the rail line) would limit the duration of potential exposure. Specific effects resulting from the railway relocation would vary depending on the proximity to sensitive receptors and orientation to the railroad emissions. Because only a portion of the rail line would be relocated, it is expected that residences located near Laurel Street would likely be the only receptors that could experience potential impacts from the relocation. The existing operation of the rail line immediately adjacent to some of the Downtown Receptors and North Receptors has not resulted in any reported air quality concerns or known impacts. Therefore, given the EPA's proposed regulations to improve locomotive emissions, relocating the rail line in the eastern and southern portion of the site is not anticipated to result in any significant impacts. The railroad corridor relocation would be subject to a specific permitting and environmental review process that could be undertaken by BNSF/Washington State Department of Transportation in the future. A review of air quality impacts would likely be part of that environmental review process.

Marine Vessels. Although marine vessels have only been loosely regulated for air quality emissions in the past, a March 2007 EPA proposal provides for a new emission control program that would significantly reduce emissions from most marine diesel engines over time. These

include marine propulsion engines used on vessels from recreational and small fishing boats to yachts, tugs, and freighters, and marine auxiliary engines ranging from small generator sets to large generators on ocean-going vessels. The proposal aims to cut PM emissions from these engines by 90 percent and NO_x emissions by 80 percent. The proposal would set new exhaust emission standards that would take effect in 2009 for the smallest marine diesel engines and in 2012 for most engines. The EPA proposal would also set long-term standards for newly built large marine diesel engines based on the application of high-efficiency catalytic, after-treatment technology beginning in 2014. The proposal also explores a remanufacturing program for existing large marine diesel engines similar to the locomotive program. A final rule is anticipated by early 2008.

Under Redevelopment Alternatives 1 through 3, a new marina (Marina Concept A) would be developed at the ASB on the New Whatcom site (see description of Marina Concept A under Section 2.8.2 in **Chapter 2**). Marina Concept A includes up to 460 slips for moorage of recreational vessels and the relocation of a haul-in and haul-out boat launch, currently operating at the Squalicum Marina immediately north of the New Whatcom site. Marina Concept A would provide an increased capacity for recreational boat moorage in the Bellingham Bay area; under Alternative 1, fewer slips would be constructed than the marina concept under the No Action Alternative (Marina Concept B). The development of the marina, however, could add to the recreational boating appeal of the area, thus increasing travel patterns of smaller marine vessels to and from the area. An increase in the number of recreational boaters hauling in or out of the marina via the boat launch would also be expected. Although the number of small recreational vessels would increase, large marine vessel traffic is expected to decrease under Redevelopment Alternatives 1 through 3, as industrial activities are removed from the site and site area. An overall net increase or decrease in air quality emissions generated by marine vessels would not likely be significant in the short term; however, smaller vessels tend to have lower, cleaner emission outputs with main engines that are more regularly maintained than large marine vessels. In addition, smaller vessels typically have a shorter life span than large marine vessels and could be expected to be replaced with vessels that benefit from technological and manufacturing improvements designed to reduced emission output. These factors could lead to a net improvement in air quality emissions from marine vessels over the long-term. Neither the smaller marine vessels under Marina Concept A, nor those brought to and from the site via the boat launch, would be expected to result in any significant air quality impacts, as similar facilities have already been operating without significant impacts at the adjacent Squalicum Marina and at other marinas in the Whatcom County area.

2026

On-Road Emissions

Following the phased redevelopment under Alternative 1, a higher density mixed-use development supporting jobs, housing, and goods and services, would be located in a former industrial area.

Newly developed residential and commercial uses would bring residents and visitors to the area, some of whom could be located within close proximity to the roadway network, creating new onsite sensitive receptors. The same three intersections included in the analysis of potential air quality impacts at 2016 were also evaluated for 2026 in order to determine whether there would be any long-term potential impacts to the existing offsite receptors and the newly created onsite receptors. These signalized intersections were selected as they represent

intersections that would have the worst expected traffic delays and volumes within the existing roadway network.

The screening analysis of the intersections in 2026 yielded similar output results as seen for 2016. A maximum 1-hour average of 7.0 ppm of CO and an 8-hour average of 6.5 ppm of CO were observed at each of the worst-case receptors at the three intersections. These results show a reduction for both the 1-hour concentration of CO and the 8-hour concentration of CO from 2016 to 2026. Despite the 10 years of added traffic growth in the area, CO emissions are not expected to increase or result in any significant impacts to the existing South, Downtown, or North receptors or the newly created receptors on the New Whatcom site at 2026. These results indicate that emissions from vehicles would not be expected to pose an environmental health hazard to those who live or work within the site or in the surrounding area.

Various features have been assumed as part of the Redevelopment Alternatives that would help to reduce single occupant vehicle trips and encourage the use of mass transit, thus reducing emissions generated and the exposure to receptors within the area. New Whatcom redevelopment is intended to accommodate dense urban housing in and near existing commercial and business areas. The mixed-use development is designed to encourage pedestrian and bicycle use and reduce vehicle use by providing housing, employment, education, shopping, recreation, and support facilities within convenient proximity to one another, and by including an onsite park and trail network with connections to offsite trails. Redevelopment could also locate higher density residential uses within walking distance of transit opportunities. Higher density residential use would be within walking distance to on and offsite recreational uses, as well as the marina and other recreational activities.

Point Source Emissions

As mentioned above, improved air quality would also be realized following the closure of the Encogen facility by 2026, which is assumed to occur under Alternatives 1 through 3. This closure could result in the removal of 76 tons of criteria pollutants from the New Whatcom site area. Again, it is possible that the Encogen facility would relocate elsewhere within the Bellingham area.

In Area 1, light industrial/marine industrial uses could locate in proximity to onsite residential and commercial uses. Light industrial and marine industrial uses would be subject to federal, state, and local air quality regulations. The regulatory framework for air quality requires compliance with standards that are protective of human health, taking into consideration the potential presence of sensitive populations. Therefore, industrial activities associated with the New Whatcom redevelopment would not be expected to result in unacceptable air quality impacts to on or offsite receptor populations.

Non-Road Emissions

In 2026, the potential for air quality impacts from rail and marine-related sources would be similar to 2016 conditions described above. Given the added onsite population, the potential for impacts to onsite uses could be greater; however, due to expected improvements in emissions from such sources through implementation of federal standards, such impacts would not be expected to be significant.

Alternatives 2, 2A and 3

2016

Alternative 2 would result in similar air emissions as those described under Alternative 1. This alternative would not include some of the roadway infrastructure adjacent to Redevelopment Areas 5, 6, and 7, near the South and Downtown receptors. This could reduce emissions for the South Receptors that are located on or near Laurel Street relative to Alternative 1. Under Alternative 2, both point source and railroad and marine vessel traffic and emissions are expected to generate the same types and levels of emissions as described for Alternative 1; significant air quality impacts are not anticipated.

Alternative 2A would result in similar air quality impacts as described for Alternative 1 and Alternative 2 above; however, any potential air quality impacts resulting from the relocation of the railway corridor would not occur during the interim phase of redevelopment (2016). The operation of the railway corridor would continue in its current location until a latter phase of redevelopment. Newly created onsite receptors would be in closer proximity to the railroad emissions until the relocation of the railway was completed. This proximity, however, is not expected to pose any significant risks as the railway currently runs adjacent to a number of receptors (Downtown Receptors) without incident. No significant impacts would be anticipated.

Of all the Redevelopment Alternatives, Alternative 3 would result in the least potential air quality emission impacts within the site and site area. All emissions would be expected to be less than those described under Alternative 1, and significant impacts would not be anticipated.

2026

Alternative 2 would result in a moderately-dense mixed-use redevelopment at the site. In comparison to Alternative 1, this reduction in density, both in residential dwellings and office/commercial facilities, would reduce the potential for air quality effects to new residents, employees and visitors to the site. Due to the distance from the New Whatcom site, the similarities of the redevelopment, and limited changes in overall traffic volumes throughout the area relative to Alternative 1, the South, Downtown, and North receptors would not experience significant changes in air quality as a result of Alternative 2. Significant air quality impacts would not be expected.

Under Alternative 2A, relocation of the railway corridor by 2026 would lessen any potential air quality impacts to newly established onsite receptors. Potential rail emission impacts to the South Receptors would be similar to impacts discussed under Alternative 1. The railway corridor currently operates through areas that are in proximity to sensitive receptors without significant impacts; further, changes in fuel emissions and regulations are expected to provide for substantial emission reductions from rail sources by 2026. Under these assumptions, no significant impacts would be anticipated. The railroad relocation would require specific permitting and environmental analysis by BNSF or the Washington State Department of Transportation in the future.

The buildout of Alternative 3 would provide the lowest density redevelopment of all the Redevelopment Alternatives. The potential for air quality impacts would be similar to or less than under Alternatives 1 and 2. Additionally, under Alternative 3, the railroad would remain in

its current location. As with the higher density Redevelopment Alternatives, no significant impacts would be anticipated.

No Action Alternative

If the Proposed Actions are not approved, the No Action Alternative assumes redevelopment of approximately 1.1 million sq. ft. of new industrial uses plus reuse of approximately 1.1 million sq. ft. of existing building spaces on the New Whatcom site. Limited infrastructure development would also occur, and it is assumed that no new parks or amenities would be constructed. See Section 2.8, **Description of Alternatives**, in **Chapter 2** for more information about features included under the No Action Alternative.

In relationship to the Redevelopment Alternatives, the No Action Alternative is expected to have the potential for the least construction-related impacts on air quality, due to the lesser amount of construction activity.

Under the No Action Alternative, emissions similar to existing conditions would be expected at the North Receptors due to the existing onsite roadway and infrastructure and industrial uses within Redevelopment Area 1.

Under this alternative, Marina Concept B would be developed and the boat ramp would be relocated. Marina Concept B would provide a greater number of boat slips (600 slips) than under Marina Concept A (provided under Redevelopment Alternatives 1 through 3). Emissions from recreational boats, therefore, would be marginally greater than under the Redevelopment Alternatives; however, no significant impacts would be expected. In addition, emissions from large vessels would continue, as large vessel traffic would not likely materially decrease under the No Action Alternative.

It is assumed that the Encogen facility would remain in its current location and operation would continue beyond 2026. The current 76 tons of criteria pollutants emitted from this facility annually would continue. Further, the increase in industrial activities on the New Whatcom site could increase air emissions from such activities, as well as emissions associated with large truck traffic onsite and within the surrounding offsite roadways, as compared to the Redevelopment Alternatives. The increase in industrial activities has the potential to result in an increase in pollutant loading within the area airshed. However, under the No Action Alternative it is assumed that each of the industrial operations would obtain and comply with all necessary air quality permits and, therefore, no significant air quality impacts would be expected.

3.2.2.3 Indirect/Cumulative Impacts

New Whatcom redevelopment would be consistent with the City of Bellingham's plans to encourage future housing and employment in areas that have available capacity for services and utilities. New Whatcom redevelopment would also provide waterfront parks, trails and amenities that would attract visitors. Overall, there would be an increase in vehicular and truck traffic. Additionally, although the number of large marine vessels would be expected to decrease under the Redevelopment Alternatives, small recreational marine vessel traffic in the area would increase.

Air quality impacts related to general growth in the site area, including the separate off-site projects described in Chapter 2, would be expected to add to the number of area emission sources on a cumulative basis. Area sources are defined as small, stationary sources that usually do not emit large amounts of criteria pollutants or air toxics and include: dry cleaners, printers, machine shops, gasoline service stations, and automobile painting and repair shops. Consumers who use household items are another area source.

Other residential, commercial, recreational and infrastructure construction projects in the New Whatcom site area that occur over the long-term, could produce temporary cumulative air quality impacts, if construction occurs concurrently with construction at the New Whatcom site. Cumulative temporary air quality impacts associated with construction activities would not be expected to be significant with implementation of typical construction mitigation measures described below.

A planned project that is separate from New Whatcom redevelopment, but within the site boundary (Redevelopment Area 9), is the construction of two new piers at the Bellingham Shipping Terminal. The new piers may potentially be utilized as a research docking facility for the National Oceanic and Atmospheric Administration (NOAA). As part of the operations of this docking facility, four home-ported vessels may be housed and serviced at the site. Although NOAA continually refines their operational schedules, it is anticipated that these vessels would depart in the late spring for Alaska and return in the late fall. An additional four transient vessels are also possible, arriving from other home bases for shipyard work or data transfer operations. NOAA vessels often participate in cooperative operations with other state and federal government vessels which may also utilize the facility. The added NOAA vessels could increase the PM and NO_x emissions within the site area. However, each of the NOAA vessels would be required to conform to applicable EPA regulations and would not be expected to create any significant air quality impacts.

3.2.3 Mitigation Measures

Construction

Mitigation measures to reduce the potential for air quality impacts during construction include measures for reducing both exhaust emissions and fugitive dust. The construction contractor(s) would be required to comply with all relevant federal, state, and local air quality regulations, including the preparation of a plan for minimizing dust and odors. The *Associated General Contractors of Washington's Guide to Handling Fugitive Dust from Construction Projects* provides practical examples of suggested best management practices necessary to comply with air quality regulations pertaining to the construction process. The following is a list of possible mitigation measures specified in the guide that could be implemented to reduce potential air quality impacts during construction:

- Use only equipment and trucks that are maintained in optimal operational condition;
- Require all off-road equipment to be retrofitted with emission reduction equipment (i.e., require participation in Puget Sound Region Diesel Solutions by project sponsors and contractors);
- Use biodiesel or other lower-emission fuels for vehicles and equipment;
- Use carpooling or other trip reduction strategies for construction workers;

- Implement restrictions on construction truck idling (e.g., limit idling to a maximum of 5 minutes);
- Locate construction equipment away from conduits to sensitive receptors such as fresh air intakes to buildings, air conditioners, and sensitive populations. Locate construction staging zones where diesel emissions would not be noticeable to the public or in direct proximity to sensitive populations such as the elderly and the young;
- Spray exposed soil with water or other suppressant to reduce emissions of PM_{10} and deposition of particulate matter;
- Pave or use gravel on staging areas and roads that would be exposed for long periods;
- Cover all trucks transporting materials, wet materials in trucks, or provide adequate freeboard (space from the top of the material to the top of the truck bed), to reduce PM_{10} emissions and deposition during transport;
- Provide wheel washers to remove particulate matter that would otherwise be carried offsite by vehicles to decrease deposition of particulate matter on area roadways;
- Remove particulate matter deposited on paved, public roads, sidewalks, and bicycle and pedestrian paths in the site area to reduce mud and dust; sweep and wash streets continuously to reduce emissions;
- Cover dirt, gravel, and debris piles as needed to reduce dust and wind-blown debris; and
- Route and schedule construction trucks to reduce delays to traffic during peak travel times to reduce air quality impacts caused by a reduction in traffic speeds.

Refer to Section 3.5, **Environmental Health**, for measures related to potential exposure to hazardous substances and contamination during construction.

Operation

The most effective air quality emission control measures for the New Whatcom redevelopment would include transportation management measures and indirect source control. Transportation management measures include reducing vehicle trips, use, miles traveled and traffic congestion. Indirect sources are those facilities that generate or attract mobile sources that can result in emissions of pollutants for which there is a federal or state ambient air quality standard. These facilities and uses include offices, shopping centers, institutional uses and residential uses, etc.

Operational emissions from the increased number of vehicles traveling to and from the site would not be expected to cause exceedances of established thresholds for any criteria pollutants. However, in order to promote a healthy and cleaner air environment, certain transportation management measures could be implemented including:

- Provide preferential parking spaces for employee carpools and vanpools;
- Provide on-street bus shelters and well-lit paths that are located away from intersections;
- Schedule truck deliveries and pickups for off-peak hours when feasible;
- Work with the City of Bellingham to implement or contribute to public outreach programs that promote alternative methods of transportation; and

- Require that delivery trucks turn off their engines if the anticipated duration of idling exceeds 3 minutes.

Emissions from railroad operations and marine vessels would not be expected to significantly impact air quality conditions at the site or in the site vicinity. Further, emissions from railroad and marine vessels would be required to adhere to all applicable existing or future federal and state regulations for air emissions. Additionally, future industrial uses at the site may need to apply for individual permits from the NWCAA and adhere to the emission standards outlined for operations. No additional mitigation would be warranted.

3.2.4 Significant Unavoidable Adverse impacts

None would be anticipated.