

## 3.10 AIR QUALITY

This section characterizes existing air quality in the site area. Potential impacts to air quality from the Proposed Action, Alternative 1 and the No Action Alternative are evaluated. This section is based on the July 2005 Air Quality Analysis, prepared by Landau Associated (see **Appendix J**)

### 3.10.1 Affected Environment

#### **Air Pollutants of Concern**

Air pollutants associated with transportation and development projects in Washington State primarily are particulate matter (PM) and carbon monoxide (CO). Particulate matter is a primary concern for projects in Thurston County, where concentrations have previously either approached or exceeded air quality standards.

#### Particulate Matter

Air pollution in the form of particulate matter includes small particles of dust, soot, and organic matter suspended in the atmosphere. Particulate matter can affect human health, visibility, and plant growth materials. The two classes of particulate matter are PM<sub>10</sub> (coarse particulate matter less than 10 microns in aerodynamic diameter), and PM<sub>2.5</sub> (fine particulate matter 2.5 microns or less in aerodynamic diameter). Both consist of many different types of particles that vary in their chemical activity and toxicity. PM<sub>2.5</sub> tends to be a greater health risk since it cannot be removed from the lungs once it is deeply inhaled and could potentially lead to respiratory diseases and cancer. Particulate matter may carry absorbed toxic substances and the particle itself may be inherently toxic. Sources of particulate include motor vehicles; industrial boilers; wood stoves; open burning, crushing, and grinding associated with mines and quarries; wildfires; dust from paved and unpaved roads; agriculture and forestry; and construction activities. High particulate matter concentrations can occur in fall and winter during periods of air stagnation and when wood is burned more frequently for heat.

#### Carbon Monoxide

Carbon monoxide (CO) is a colorless, odorless, and poisonous gas that reduces the blood's capacity to carry oxygen to organs and tissue. The effects of CO include drowsiness, headaches, increased heart disease, and increased infant mortality. Major sources of CO are vehicle exhaust, industrial heating, wood stoves, and outdoor burning. CO from vehicle exhaust results from incomplete combustion of fuel and is emitted directly from vehicle tailpipes. CO levels are generally highest near roadways, at interchange and intersections with high vehicle volumes, slow speeds, and higher congestion. CO concentrations are highest during late autumn and winter, during periods with light wind and cold temperatures. Emissions creating CO from vehicles' exhaust have been reduced in most areas as a result of federal new vehicle emission standards and vehicle inspection and maintenance (I&M) programs.

#### Ozone

Ozone (O<sub>3</sub>) is a secondary pollutant formed in the atmosphere by the interaction of sunlight with precursor chemicals generated primarily in large metropolitan areas. Because the

photochemical process takes several hours, communities downwind of the large urban areas are where the highest concentrations are measured. Ozone is a pulmonary irritant that affects lung tissues and respiratory functions. Ozone impairs the normal function of the lungs and at higher concentrations causes lung tightness, coughing, and wheezing. People with chronic respiratory problems, such as asthma, seem most sensitive to ozone. Studies show that ozone also damages forests, particularly since ozone levels tend to be higher at the mountain elevations. O<sub>3</sub> levels in the region are generally within the National Ambient Air Quality Standards (NAAQS) and regional standards, in part because the mild climate in the region does not feature many of the hot, sunny days favorable for ozone formation.

### Nitrogen Oxides

Nitrogen oxides, or NO<sub>x</sub> (a combination of NO<sub>2</sub> and other particulates in the air which are a precursor to ozone and smog), is the generic term for a group of highly reactive gases, all of which contain nitrogen and oxygen in varying amounts. One common pollutant, nitrogen dioxide (NO<sub>2</sub>), along with particulates in the air can often be seen as a reddish-brown layer over many urban areas (EPA website 2005). NO<sub>x</sub> and the pollutants formed from NO<sub>x</sub> can be transported over long distances and are not confined to areas where it is emitted. Controlling NO<sub>x</sub> is often most effective if done from a regional perspective, rather than focusing on sources in one local area.

Nitrogen oxides form when fuel is burned at high temperatures, as in a combustion process. The primary manmade sources of NO<sub>x</sub> are motor vehicles, electric utilities, and other industrial, commercial, and residential sources that burn fuels. NO<sub>x</sub> is one of the main ingredients involved in the formation of ground-level ozone (smog), which can have serious health effects. NO<sub>x</sub> also contributes to the formation of acid rain, which can deteriorate water quality and also can contribute to poor health.

### **Air Quality Standards**

Air quality in the site vicinity is regulated by the U.S. Environmental Protection Agency (EPA), Washington State Department of Ecology (Ecology), and the Olympic Region Clean Air Agency (ORCAA). EPA establishes air quality standards nationally, while Ecology is responsible for implementing state air quality laws and regulations. Locally within Thurston County, and more specifically the City of Tumwater, ORCAA is one of seven regional air pollution agencies that have air quality regulatory and enforcement authority in Washington State. Under the federal Clean Air Act, EPA established the National Ambient Air Quality Standards (NAAQS), which are health based standards that specify maximum concentrations for carbon monoxide (CO), particulate matter less than 10 microns in diameter (PM<sub>10</sub>), particulate matter less than 2.5 microns (PM<sub>2.5</sub>), ozone (O<sub>3</sub>), and nitrogen oxides (NO<sub>x</sub>). These regulated pollutants are referred to as criteria pollutants. The NAAQS apply to outdoor air quality and specify both a concentration and exposure time, such as 1 hour or 1 day. Washington State has adopted the federal air quality standards; therefore, they apply in the City of Tumwater, which includes the site vicinity. **Table 3.10-1** summarizes the NAAQS standards that are relevant to the proposed project.

**Table 3.10-1  
SUMMARY OF AMBIENT AIR QUALITY STANDARDS**

Criteria Pollutant	National Ambient Air Quality Standard <sup>1</sup>
Carbon Monoxide (CO)	
1-Hour Average (not to be exceeded more than once per year)	35 ppm
8-Hour Average (not to be exceeded more than once per year)	9 ppm
PM <sub>10</sub>	
Annual Arithmetic Mean	50 µg/m <sup>3</sup>
24-Hour Average Concentration	150 µg/m <sup>3</sup>
PM <sub>2.5</sub>	
Annual Arithmetic Mean	15 µg/m <sup>3</sup>
24-Hour Average Concentration	65 µg/m <sup>3</sup>
Ozone (O <sub>3</sub> )	
1-Hour Average (not to be exceeded more than once per year)	0.12 ppm
8-Hour Average	0.08 ppm
Nitrogen Dioxide (NO <sub>2</sub> )	
Annual Arithmetic Mean	0.053 ppm

Source: Landau Associates, 2005.

<sup>1</sup> Washington State and the local air quality agency ORCAA have adopted the federal NAAQS.

Sources: 40 United States Code of Federal Regulations Part 50 (1997).

Washington Administrative Code Chapters 173-470, 173-474, 173-175 (1987).

Ppm = Parts per million.

µg/m<sup>3</sup> = Micrograms per cubic meter.

## Existing Air Quality

Thurston County is a federally-designated maintenance area for PM<sub>10</sub>, and an attainment area for CO, O<sub>3</sub>, and all other criteria pollutants. A maintenance area is a geographical region that has had concentrations of a criteria pollutant previously above the NAAQS, but recently has achieved compliance with the NAAQS for that pollutant. Portions of Thurston County were designated as nonattainment areas for PM<sub>10</sub> in the late 1980s. Significant sources of residential woodsmoke and open burning in the area were the major contributing factors during this period. Restrictions on outdoor burning and limitations on wood burning stoves were implemented to decrease the PM<sub>10</sub> emissions. In 1997, Thurston County, ORCAA, and Ecology developed an Air Quality Maintenance Plan (AQMP) and applied for a redesignation in air quality status from the EPA, based on the improved PM<sub>10</sub> conditions. In 2000 Thurston County was upgraded to

an air quality maintenance area for PM<sub>10</sub>. No violation of the NAAQS for PM<sub>10</sub> has been recorded at the closest monitoring station to the site over the last 16 years.

### Conformity Findings

As stated above, Thurston County is a maintenance area for PM<sub>10</sub>. Currently, air pollutants associated with transportation sources account for the majority of PM emissions in Thurston County. Because the City is in a PM<sub>10</sub> maintenance area, EPA's transportation conformity regulations apply. Conformity is a means by which air quality at a specific project location is evaluated. Conformity is demonstrated by showing that the project will not cause or contribute to any new violation, will not increase the frequency or severity of any existing violation, and will not delay timely attainment of the NAAQS. Because the proposed project is located within a PM<sub>10</sub> maintenance area, it must be evaluated for conformity to the AQMP for PM<sub>10</sub>. CO or O<sub>3</sub> conformity determinations are not required because the site vicinity is in attainment for these pollutants and all other criteria pollutants.

### 3.10.2 Impacts

#### **Proposed Action**

##### **Construction**

Construction activities, if not properly mitigated, could temporarily generate PM<sub>10</sub> and small amounts of other pollutants. Fugitive dust could escape from the construction site and from soil blown from uncovered trucks carrying construction materials. Vehicles leaving the site could deposit mud on public streets, which would become a source of airborne dust after it dries. CO, PM<sub>10</sub>, and NO<sub>x</sub> would be emitted from construction equipment. Construction emissions would be greatest during the excavation phase because most emissions are associated with removal of dirt from the site. No EPA accepted model is currently available to predict air pollutant concentrations during construction.

Particulate emissions would be associated with land clearing, ground excavation, and cut-and-fill operations. Emissions would vary from day to day, depending on the level of activity, specific operations, and weather conditions, and the quantity of particulate emissions would be proportional to the area of the construction operations and the level of activity. Any air quality construction impacts from the proposed project would be temporary or short-term.

In addition to PM<sub>10</sub> emissions, heavy trucks and construction equipment powered by gasoline and diesel engines would generate CO and NO<sub>x</sub> in exhaust emissions. These emissions would be temporary and limited to the immediate area surrounding the proposed construction site. Construction vehicles would be a small fraction of the City's total overall traffic. Thus, emissions generated by construction equipment would contribute a small amount of CO compared to the existing automobile traffic in the site vicinity.

Some phases of construction would result in short-term odors, particularly during paving operations using asphalt. Odors might be detectable to some people near the project site and would be diluted as distance from the proposed site vicinity increases.

With implementation of the proposed mitigation measures, potential construction emissions would be lowered and construction impacts on air quality would not be significant.

## **Operation**

Currently, air quality concentrations within Thurston County are lower than federal, state, and local air quality standards for all criteria pollutants. PM<sub>10</sub>, PM<sub>2.5</sub>, CO, and NO<sub>x</sub> emissions or any other criteria pollutant concentration would not increase above the NAAQS and would not contribute to any significant air quality impacts during daily operation of the proposed retail store or based on traffic associated with the proposed retail store.

The proposed retail store would be located within the Thurston County maintenance area for PM<sub>10</sub>; therefore, the proposed project must meet the conformity regulations for emissions. Conformity is defined as eliminating or reducing potential violations of the NAAQS and achieving attainment. However, there are currently no EPA approved models or methodology available to analyze individual projects for their potential to cause or contribute to PM<sub>10</sub> or PM<sub>2.5</sub> concentrations. Therefore, EPA requires PM<sub>10</sub> emissions during construction and operation from the proposed project to be mitigated by implementation of best management practices (BMP) measures during construction (see **Section 3.10.3, Mitigation Measures**, below) (EPA, 2004). With implementation of the proposed mitigation measures to control PM<sub>10</sub> emissions, the proposed project would not result in an increase in the frequency or severity of any existing violations of the PM<sub>10</sub> standard, nor would it create a new violation of the NAAQS for PM<sub>10</sub>.

Because the site vicinity is currently in attainment with the CO and O<sub>3</sub> standards, the proposed project does not have to meet the conformity regulations for these pollutants, and according to the EPA, a project-level analysis of these pollutants is not required (KJS 1995). The proposed project would not be expected to result in increased CO and O<sub>3</sub> levels above the NAAQS. The transportation analysis conducted for this EIS predicts that project traffic would contribute to delays at the Littlerock Road/South Costco Driveway intersection (a shared driveway) and at Kingswood Drive/Southwest Project Driveway. Such delays would result in an increase in idling cars and would increase CO levels; however, it is not expected that either would result in exceedance of the NAAQS. As discussed in **Section 3.9, Transportation**, a traffic signal is proposed for Littlerock Road/South Costco Driveway which would result in that intersection meeting the City's level of service (LOS) standard, and reduce the level of delay at the intersection. See **Section 3.9, Transportation** of this EIS for discussion of transportation impacts. Overall, air quality concentrations from the operation of the proposed retail store would be expected to remain within the federal, state, and local air quality standards.

## **Alternative 1**

Air quality under Alternative 1 would be similar to that described for the Proposed Action. With implementation of mitigation measures, construction-related air quality impacts would be minimal. No significant operational impacts would be expected, and conformance with air quality standards would be maintained.

## **No Action Alternative**

The No Action Alternative would result in no potential for construction or operational air quality impacts; however, development could occur on the site in the future with associated potential for construction and operational air quality impacts.

### 3.10.3 Mitigation Measures

#### **Construction**

- Reasonable and/or appropriate precautions would be taken to prevent fugitive particulate material from becoming airborne, consistent with ORCAA regulations, Sections 9.05(c) and Ecology regulations in the Washington Administrative Code (WAC) Sections 173-400-040, 050, 060, and 070 and TMC 18.40.
- Construction impacts would be mitigated by incorporating best management practices (BMPs) into the project's construction plans and specifications using both Ecology and ORCAA regulations. The following source control BMP mitigation measures would be implemented to control PM<sub>10</sub>, deposition of particulate matter, and emissions during construction:
  - Lowering speed limits in the construction area. High vehicle speeds increase the amount of dust stirred up from unpaved roads.
  - As soon as feasible, upgrading unpaved road surfaces and truck haul routes by installing base course crushed rock or paving.
  - Spraying water or applying chemicals during land clearing operations, construction operations, and road grading to reduce emissions and deposition of particulate matter.
  - Covering open bodied trucks transporting materials, wet materials in trucks, or provide adequate freeboard (space from the top of the material to the top of the truck) to reduce dust and deposition of particulates during transportation.
  - Providing wheel washers to remove particulate matter from wheels, wheel wells, fenders, tailgates, and running boards that would otherwise be carried offsite by vehicles and trucks. This would decrease deposition of particulate matter on area roadways.
  - Sweeping of public roadways regularly to remove particulate matter deposited on paved roads and subsequent wind blown dust.
  - Constructing stabilized construction entrances where trucks enter public roads, to reduce mud track-out.
  - Planting vegetative cover as soon as possible after grading would reduce windblown particulate matter in the area.
  - Requiring appropriate emission-control devices on construction equipment powered by gasoline or diesel fuel would reduce CO, NO<sub>x</sub>, and PM<sub>10</sub> emissions in exhaust. Using relatively new, well-maintained equipment also would reduce emissions.

#### **Operation**

- The proposed project would conform to all applicable air quality regulations.
- A traffic signal would be installed at the Littlerock Road/S Costco Driveway intersection to bring the intersection into compliance with the City of Tumwater intersection level of service standard (see **Section 3.9**, Transportation).

### 3.10.4 Significant Unavoidable Adverse Impacts

None would be expected.