3.10 Air Quality

Many natural and human activities generate air pollutants that can affect human and environmental health. Transportation (including motor vehicles, trucks, and buses) is a major contributor of air pollutants in the Portland-Vancouver metropolitan area. Thus, changes in the transportation network resulting from projects such as the CRC project could influence air quality. This section addresses localized and regional air quality effects, including effects from construction at casting and staging areas and effects from construction and operations at the Ruby Junction maintenance facility. No long-term or temporary air quality effects would result from the modifications to the Steel Bridge. See Chapter 2 for a map of these areas.

Greenhouse gases

For discussion of greenhouse gas emissions and global climate change, please see Section 3.19, Cumulative Effects

This section evaluates the effects of the CRC project on two types of air pollutants:

- Criteria pollutants – These pollutants have federally established limits, which are based on human health and/or environmental criteria.
- Mobile source air toxics – The Clean Air Act identifies 188 air toxics, of which MSATs are the subset emitted by mobile sources. Although MSATs pose potential public health concerns, there are no established regulatory limits for relevant MSAT pollutants.

A comparison of impacts from the LPA and DEIS alternatives is summarized in Exhibit 3.10-3. A more detailed description of the impacts of the DEIS alternatives on air quality is in the DEIS starting on page 3-273 of the DEIS.

Although carbon dioxide and other greenhouse gas emissions are a project concern, these pollutants are important primarily because they contribute to global climate change and are discussed in Section 3.19, Cumulative Effects.

Information presented in this section is based on the CRC Air Quality Technical Report, included as an electronic appendix to this FEIS.

3.10.1 New Information Developed Since the Draft EIS

Since the publication of the DEIS, revised guidance, new research, and updated modeling have been incorporated into the air quality analysis, including:

- New guidance from the FHWA on the list of MSATs to analyze.
- New guidance from ODOT for mitigating construction impacts.
- A revised list of project area intersections with the greatest potential to experience adverse air quality effects.

- Air toxics monitoring data from the Harriet Tubman Elementary School in Portland (see Section 4.2.2 of the Air Quality Technical Report (included as an electronic appendix to this FEIS) for information on the results of this study).
- A study of the temporary impacts of a comparable construction project.
- Updated MSAT emissions and concentrations modeling.

This section primarily focuses on the conclusions of the updated air quality analysis. A detailed discussion of new guidance, research, and modeling methods is provided in the CRC Air Quality Technical Report.

In addition to new information developed since the DEIS, the FEIS includes refinements in design, impacts and mitigation measures. Where new information or design changes could potentially create new significant environmental impacts not previously evaluated in the DEIS, or could be meaningful to the decision-making process, this information and these changes were applied to all alternatives, as appropriate. However, most of the new information did not warrant updating analysis of the non-preferred alternatives because it would not meaningfully change the impacts, would not result in new significant impacts, and would not change other factors that led to the choice of the LPA. Therefore, most of the refinements were applied only to the LPA. As allowed under Section 6002 of SAFETEA-LU [23 USC 139(f)(4)(D)], to facilitate development of mitigation measures and compliance with other environmental laws, the project has developed the LPA to a higher level of detail than the other alternatives. This detail has allowed the project to develop more specific mitigation measures and to facilitate compliance with other environmental laws and regulations, such as Section 4(f) of the DOT Act, Section 106 of the National Historic Preservation Act, Section 7 of the Endangered Species Act, and Section 404 of the Clean Water Act. FTA and FHWA prepared NEPA re-evaluations and a documented categorical exclusion (DCE) to analyze changes in the project and project impacts that have occurred since the DEIS. Both agencies concluded from these evaluations that these changes and new information would not result in any new significant environmental impacts that were not previously considered in the DEIS. These changes in impacts are described in the re-evaluations and DCE included in Appendix O of this FEIS. Relevant refinements in information, design, impacts and mitigation are described in the following text.

3.10.2 Existing Conditions

Air Quality Pollutants and Standards

This section describes the pollutants that were studied, why they are relevant to the CRC project, and how they were analyzed.

CRITERIA POLLUTANTS AND CONFORMITY ANALYSIS

The EPA has developed National Ambient Air Quality Standards (NAAQS, or federal standards) for six pollutants known as "criteria pollutants": carbon monoxide, particulate matter, ozone, nitrogen dioxide, sulfur dioxide, and lead. Washington and Oregon also have State Ambient Air Quality Standards (SAAQS) for these pollutants. Volatile Organic Compounds (VOCs) are also discussed in this section because VOCs and nitrogen dioxide contribute to the creation of ozone. As vehicle emissions are not a big source of lead or sulfur dioxide, these pollutants have not been analyzed for this project.

The CRC air quality study followed well-developed analysis methods to evaluate criteria pollutant air quality impacts. The analysis included a regional estimate (Clark, Multnomah, Washington, and Clackamas Counties) of criteria pollutant emissions as well as corresponding estimates for project subareas (four segments of I-5 affected by the proposed CRC project) for the existing and future build and No-Build alternatives. Carbon monoxide hot spot analyses were performed to estimate concentrations of carbon monoxide at the most congested intersections.

The I-5 CRC project is located within the Portland and Vancouver carbon monoxide maintenance areas. Because of that, both the Oregon Department of Environmental Quality (DEQ) and the Southwest Clean Air Agency (SWCAA) have individual State Implementation Plans (SIPs) that include regulatory procedures to maintain compliance with the NAAQS. Compliance with the Portland Carbon Monoxide Maintenance Plan requires verifying that planned transportation projects will not cause or contribute to a violation of the federal standards for carbon monoxide. This verification process is referred to as *demonstrating conformity*. Demonstrating conformity requires two different analyses:

- A regional analysis: the project must be included in a conforming regional transportation plan and transportation improvement plan.
- A local analysis: the project must analyze the most congested intersections and demonstrate that, if the project is constructed, carbon monoxide levels, including carbon monoxide contributed by the project, will be below the carbon monoxide standards.

Metro prepared a conformity determination for the 2035 Regional Transportation Plan (RTP), and this was circulated for public and technical review and comment. After the 30-day comment period, no comments had been received. Therefore, Metro Council approved and forwarded the air quality conformity determination to the USDOT.

After consultation with EPA, the USDOT reviewed the regional analysis and approved the air quality conformity determination on February 29, 2008. Metro included a placeholder assumption for the CRC project in the regional conformity determination they conducted, and the LPA is consistent with that placeholder assumption. This FEIS also includes the analysis of carbon monoxide levels at congested intersections in Portland and Vancouver and demonstrates compliance with federal and state carbon monoxide standards. Metro adopted the latest update to the 2035 RTP in 2010 and carried out an updated air quality conformity determination. Federal approval for the conformity determination was provided by FHWA and FTA on September 20, 2010.

No regional conformity analysis is required for the Vancouver area.

Car emissions keep getting cleaner

Starting in the early 1970s, EPA regulations have controlled air pollutant emissions from motor vehicles. Recent regulations, including those for fuel formulations, help control emissions from heavy-duty diesel on-road and off-road vehicles. New gasoline reformulation rules should substantially reduce benzene emissions. These standards are expected to continue reducing pollutants in vehicle emissions over the next 25 to 30 years.

MOBILE SOURCE AIR TOXICS

Nationally and locally, concerns have increased about the potential impact on public health from toxic air pollutants. MSATs are the subset of air toxics emitted by mobile sources, as designated by FHWA and based on EPA's rulemaking. The priority MSATs include benzene, 1,3-butadiene, naphthalene, polycyclic organic matter[11], formaldehyde, acrolein, and diesel particulates. Unlike criteria pollutants, MSATs do not have regulatory standards. Also, there is no standardized analysis method for evaluating project-level mobile source impacts. The CRC project team, together with federal and state regulatory and transportation agencies, agreed upon an approach for estimating these emissions from I-5 at the regional and subarea levels.

A comprehensive evaluation of environmental and health impacts associated with air quality involves emissions modeling (to estimate the amount of pollutant discharged), dispersion modeling (to estimate the resulting concentrations of the pollutant), exposure modeling (to estimate human exposure to the estimated concentrations of the pollutant), and a final determination of health impacts based on the estimated exposure. Each step is encumbered by technical shortcomings or uncertain science that prevents a complete determination of the MSAT health impacts. The CRC Air Quality Technical Report includes a full discussion of these limitations.

Due to these limitations in available data and methodology, only general conclusions can be made about MSAT health impacts. Notably, that mobile source analyses for all transportation projects, including the CRC project, have forecast large declines in emissions over time due to emissions control regulations. Reductions in emissions have already occurred, and are projected to continue, due to ongoing advances in cleaner fuels and emission control technologies. As such, potential health risks associated with MSAT emissions should decrease over time in this region.

Existing Pollutant Levels

CRITERIA POLLUTANTS

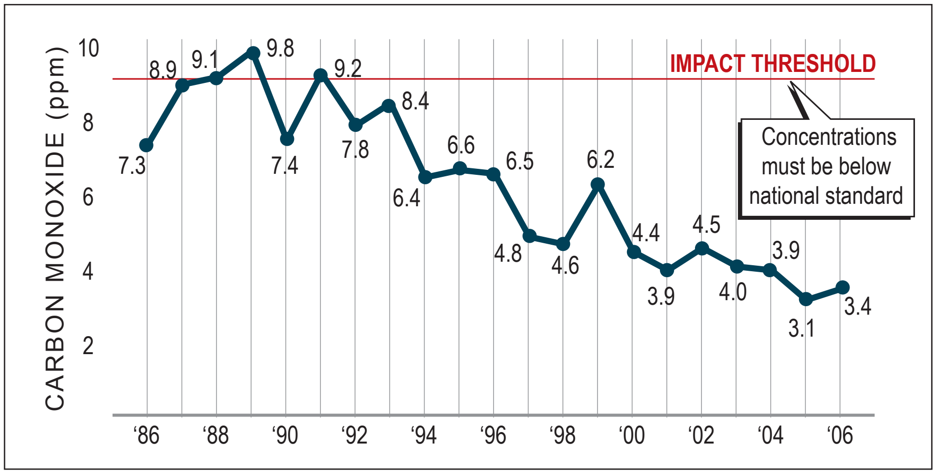
Monitoring stations within the Portland-Vancouver area measure concentrations of some of the criteria pollutants discussed above. The highway contributions to pollutant concentrations in the main project area were developed through an understanding of vehicle emissions from existing and future vehicles, as well as existing and forecast future traffic volumes and speeds. The long-term effects section discusses this further.

During the 1970s, carbon monoxide concentrations in the Portland-Vancouver area exceeded the NAAQS on 1 out of every 3 days, and ozone levels were often as high as 50 percent over the federal standard. Trends in carbon monoxide levels, reported in parts of carbon monoxide per million parts of air (ppm), are illustrated in Exhibit 3.10-1. Since the 1970s, programs and regulations have been put into effect to reduce air pollutant emissions, and substantial improvements have been made. There have been no violations of any of the federal standards in the Portland-Vancouver metropolitan area in nearly 10 years. Still, because of previous violations, the region is a designated

11 For mobile emissions, naphthalene makes up 80 to 90 percent of polycyclic organic matter emissions. As a result, the FEIS uses predicted changes in naphthalene emissions to generally predict changes in polycyclic organic matter emissions.

air quality maintenance area. This means that the region is currently in compliance with the federal standards, but requires the region to develop and implement a maintenance plan to prevent future violations of these standards.

Exhibit 3.10-1
Carbon Monoxide Trends 1986 to 2006



Source: CRC Air Quality Technical Report.

MOBILE SOURCE AIR TOXICS

As part of the Portland Air Toxics Solution (PATS) program, the DEQ (DEQ 2006) performed computer modeling to estimate and assess risks from 19 air toxics in the Portland-Vancouver metropolitan area, including the priority MSATs that the CRC project has evaluated. Although the PATS model is not intended for project-level analysis and is not connected to the CRC project, the PATS regional analysis provides perspective on the CRC results. The PATS study indicated that diesel exhaust, motor vehicles, and burning are important sources of air toxics in Portland. Regional modeling of on-road sources shows elevated benzene levels along freeways, with the highest concentrations in downtown Portland and in the Beaverton/Hillsboro area. Modeled formaldehyde levels show a similar pattern to benzene, except that the peak concentration for combined mobile sources is at PDX. The DEQ model indicated that diesel particulate matter (PM) concentrations from mobile sources peak in downtown Portland and are in the lower concentration range through most of the CRC's main project area.

3.10.3 Long-term Effects

This section compares the long-term air quality impacts of the LPA Option A and LPA Option B to the No-Build Alternative and build alternatives considered in the DEIS. To best assess and avoid adverse long-term impacts and conform to regulatory standards, air quality was analyzed at the regional, subarea, and intersection levels.

Regional Air Quality Impacts

Taken together, Exhibits 3.10-2 and 3.10-3 show that large declines in MSAT emissions are forecast over time for all build alternatives and for the No-Build Alternative. These declines are primarily driven by advances in cleaner fuels and emission control technologies for vehicles, advances that are independent of the CRC project.

Exhibit 3.10-2

Regional MSAT Emissions – Existing and No-Build

Regional MSAT Emissions (Pounds Per Summer Day)	Existing (2005)	No-Build (2030)	Change in Emissions
Benzene	3,787	1,637	-56.8%
1,3-Butadiene	426	201	-52.8%
Formaldehyde	1,049	554	-47.2%
Acetaldehyde[a]	440	382	-13.2%
Acrolein	52	25	-51.9%
Diesel PM	2,383	167	-90.3%
Naphthalene	69.8	44.5	-36.2%

a Acetaldehyde estimates are as reported in the DEIS. Acetaldehyde was not studied in the FEIS because it is no longer considered a priority MSAT by FHWA.

Exhibit 3.10-3

Comparison of Long-term Effects to Air Quality

Regional MSAT Emissions in 2030 (Pounds Per Summer Day)	Locally Preferred Alternative[a]						
	LPA Option A	LPA Option B	No-Build	Alt 2: Repl Crossing with BRT	Alt 3: Repl Crossing with LRT	Alt 4: Suppl Crossing with BRT	Alt 5: Suppl Crossing with LRT
Benzene	1,620	Same as Option A	1,637	1,613	1,614	1,613	1,613
1,3-Butadiene	199	Same as Option A	201	198	198	198	198
Formaldehyde	547	Same as Option A	554	544	544	544	544
Acetaldehyde[b]	N/A	Same as Option A	382	382	383	382	382
Acrolein	25	Same as Option A	Same as LPA	Same as LPA	Same as LPA	Same as LPA	Same as LPA
Diesel PM[c]	166	Same as Option A	167	165	165	165	165
Naphthalene[d]	44.1	Same as Option A	44.5	N/A	N/A	N/A	N/A

a With little difference in peak traffic volumes or speeds, the air quality impacts of the LPA Options A and B – with or without highway phasing – are expected to be very small.

b Acetaldehyde estimates are as reported in the DEIS. Acetaldehyde was not studied in the FEIS because it is no longer considered a priority MSAT by FHWA.

c The FEIS includes more precise estimates of Diesel PM by using more significant digits in rounding than were used for the DEIS modeling; the Diesel PM estimates for Alternatives 2 through 5 from the DEIS have been recalculated using the same number of significant digits as used in calculating the LPA and No-Build Alternative.

d Naphthalene estimates were not prepared for Alternatives 2 through 5 because naphthalene was not considered a priority MSAT by FHWA at the time of DEIS publication.

Differences in 2030 MSAT emissions among the build alternatives (the LPA Options A and B, with or without phasing, and Alternatives 2 through 5) are extremely low—1 percent or less. The LPA's MSAT emissions are the same, or slightly lower than, emissions from the No-Build Alternative. In the context of the very large reductions relative to existing conditions, and given the potential error in available modeling methods, these differences are minor.

In addition to reductions in MSAT pollutants, analysis shows that future (LPA or No-Build Alternative) emissions of criteria pollutants would also be substantially lower than existing emissions for the region. For the LPA Options A and B, specifically, compared to existing conditions, future regional emissions are expected to decline by about 25 percent for carbon monoxide, 75 percent for nitrogen dioxide, 55 percent for VOCs, and 90 percent for particulate matter.

Subarea Air Quality Impacts

To give an indication of whether emissions are expected to affect neighborhoods directly adjacent to I-5 along the project alignment, emissions were analyzed separately in four subareas (see Exhibit 3.10-4):

- NE 99th Street to E 39th Street (Subarea 1)
- E 39th Street to State Route 14 (Subarea 2)
- State Route 14 to Columbia Boulevard (Subarea 3)
- Columbia Boulevard to the I-405 junction (Subarea 4)

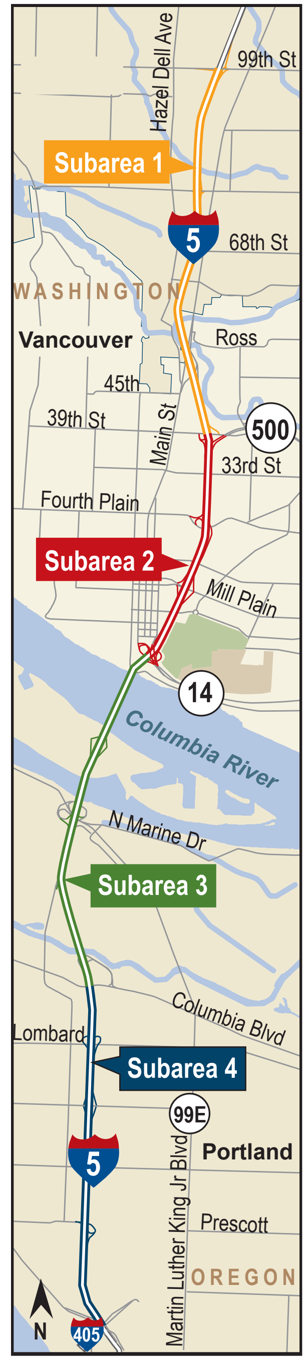
Future emissions in these subareas are projected to be substantially lower than current levels for both the build and No-Build alternatives. As is true at the regional level, expected reductions in subarea emissions are a result of regulations that will continue to reduce air pollutant emissions from motor vehicles over time.

For Subarea 1, Subarea 3, and Subarea 4, all criteria pollutant and MSAT emissions would be lower under the LPA than the No-Build Alternative. Although Subarea 2 shows substantial emissions reductions in the future relative to existing conditions, the LPA would result in less reduction than the No-Build Alternative for some pollutants and in greater reduction than the No-Build Alternative for others. The differences in results can be attributed to how emission rates for specific pollutants vary with vehicle speed and VMT. In Subarea 2, compared to the No-Build Alternative, the LPA would result in less congestion, decreasing some pollutant levels, and greater vehicle miles traveled, increasing some pollutant levels. Specifically, the LPA would result in higher carbon monoxide and nitrogen oxide emissions in Subarea 2 than the No-Build Alternative, although the difference is small (less than 5 percent). For VOCs, particulate matter, and MSATs, LPA emissions in Subarea 2 tend to be slightly lower than or comparable to those under the No-Build Alternative. Detailed emissions data for each subarea is available in the CRC Air Quality Technical Report, included as an electronic appendix to this FEIS.

Intersection Level Air Quality Impacts

In addition to evaluating emissions at the regional and subarea levels, the project team analyzed carbon monoxide concentrations at the intersections that would be most affected by the LPA Options A and B. This intersection analysis, also referred to as hot spot analysis, is part of demonstrating conformity with federal standards. The project team performed a quantitative analysis for the worst congestion conditions at three intersections in Vancouver and three intersections in Portland, as shown on Exhibit 3.10-5.

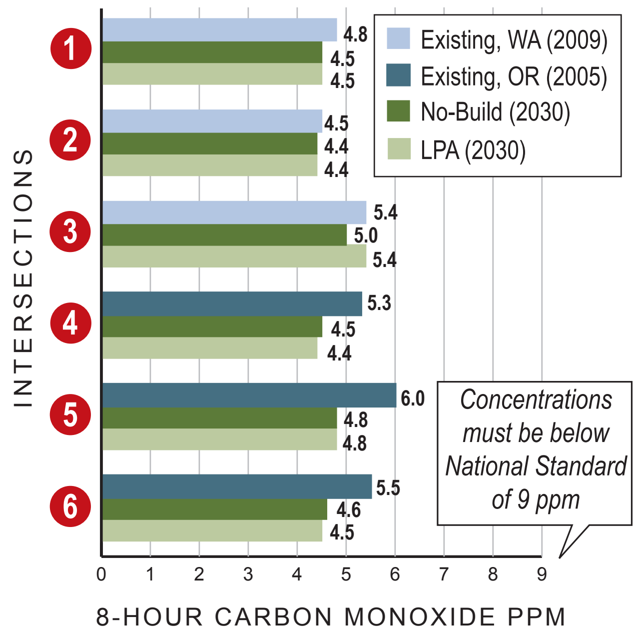
Exhibit 3.10-4
Subareas for Air Quality



Not to Scale.

Exhibit 3.10-5

Air Quality Findings for Specific Intersections



Vancouver

Intersection 1: East 39th Street at Main Street
Intersection 2: Mill Plain Boulevard at C Street
Intersection 3: Mill Plain Boulevard at I-5 Interchange

Portland

Intersection 4: Lombard Street at Interstate Avenue
Intersection 5: Fremont at Martin Luther King Jr. Boulevard
Intersection 6: Lombard Street at Martin Luther King Jr. Boulevard

The intersections were selected to represent locations where carbon emissions would likely be the highest. The selection of intersections analyzed was updated for the FEIS based on changes to the project design since publication of the DEIS. Although the analysis is based on the local traffic impacts of the LPA, the other build alternatives would have similar concentrations, all well below federal standards.

The project team followed the required methods and formulas to estimate carbon monoxide concentrations based on traffic forecasts, and compared these estimated concentrations to the following regulatory standards:

- The maximum 1-hour carbon monoxide concentration cannot exceed 35 ppm.
- The maximum 8-hour carbon monoxide concentration cannot exceed 9 ppm.

The analysis showed that at five of the six intersections, the LPA had similar or lower 1-hour and 8-hour concentrations than exist today or would be expected with the No-Build Alternative. However, the Mill Plain Boulevard and I-5 interchange had the highest modeled 1-hour concentration of any of the hot spot intersections under the LPA, 6.5 ppm. This is approximately 12 percent higher than for the No-Build Alternative but still more than 80 percent below the standard. The Mill Plain Boulevard and I-5 interchange also had the highest modeled 8-hour concentration of any of the intersections, 5.4 ppm, which is approximately 8 percent higher than under the No-Build Alternative but approximately 40 percent below the standard. No violations of the national standards were forecast for existing conditions, the LPA, or the No-Build Alternative. No carbon monoxide hot spot violations are anticipated.

Ruby Junction Maintenance Facility

Under the LPA, maintenance of light rail transit vehicles would require an expansion of the existing facility at Ruby Junction in Gresham, Oregon. Stationary sources of emissions such as this light rail maintenance facility are subject to the permitting regulations of DEQ, regulations that are designed to protect the health of the public. No air quality impacts are expected as a result of expanded maintenance base operations.

Indirect Effects

The indirect effects of the LPA on population and employment distribution and land use patterns are expected to promote more transit-oriented development around the new transit stations and support a minor redistribution of future population and employment growth from outlying areas to the I-5 corridor. This would be expected to reduce total VMT and regional emissions, but could result in minor localized increases in emissions where development densities increase. At the same time, encouraging more transit-oriented and mixed-use development would reduce automobile use.

3.10.4 Temporary Effects

Construction of any of the CRC build alternatives would involve activities that could temporarily affect air quality, such as demolishing existing structures and pavement, operating a wide variety of heavy construction equipment, operating concrete plants, and operations at staging sites where construction materials are temporarily stored or prepared. Traffic congestion would occur on some roadways during construction, and potentially along detour or construction haul routes. Construction impacts would be lowest with the No-Build Alternative and much higher with any of the build alternatives. Construction would cause short-term increases in air pollutant emissions and odors.

Temporary effects have been divided into "on-site" and "off-site" construction effects. On-site refers to construction-related activities within the main project area and at the Ruby Junction Maintenance Facility. Off-site refers to construction activities that would take place at major project casting and staging areas.

On-site Construction

The primary direct impacts of construction would be the generation of dust from demolition, site clearing, excavating, and grading activities; direct exhaust emissions from construction equipment; and increased congestion on the mainline highway and local streets in the project area. Traffic congestion increases vehicle idling times and reduces travel speeds, resulting in increased exhaust emissions. As discussed in greater detail in Section 3.18, Hazardous Materials, demolition may include structures containing lead or asbestos, substances that can impact air quality if released into the air.

To assess the potential for temporary air quality impacts, CRC project staff evaluated air quality monitoring data and analysis conducted on a construction project of similar scale – the Dan Ryan Expressway Reconstruction project in the Chicago area. The Dan Ryan Expressway is the busiest expressway in Chicago and is the major transportation artery from downtown through the City's south side, accommodating over 300,000 vehicles per day at full capacity. In comparison, the I-5 corridor carries about 150,000 vehicles per day. This project had a comparable level of construction to the construction proposed for CRC, specifically, bridge rebuilding, pile driving, earth moving, major amounts of concrete pavement replacement, and traffic.

The Dan Ryan Expressway passes directly through the middle of the south side of Chicago. Air monitoring was conducted at 27 sites, including schools, parks, public housing, and public facilities where the population was expected to be more sensitive to air contaminants, such as those serving children and the elderly. A broad range of air pollutants was monitored, including total dust, silica, lead, asbestos, polycyclic aromatic hydrocarbons, PM_{10} and $PM_{2.5}$. During the monitoring period, air quality standards were maintained and not exceeded. In addition, when increases in concentrations of criteria and non-criteria emissions occurred, they did not appear to be related to project construction. For example, in 2007 there were 14 days with elevated $PM_{2.5}$ levels, all of which appeared to be related to the regional air quality in the Chicago Metropolitan area (EDI 2008).The results of the Dan Ryan Expressway study suggest that CRC construction activities would not be likely to result in any violations of the air quality standards and should not pose an undue health risk to the neighboring communities. This is true of construction activities within the main project area, as well as the smaller scale activities associated with expanding the Ruby Junction maintenance facility. More information on the Dan Ryan Expressway project can be found in the CRC Air Quality Technical Report.

Off-site Staging and Casting

Constructing the river crossing would require at least one large site to stage equipment and materials, and could also require a large site for use as a casting yard for fabricating segments of the new bridges. The potential sites for staging and bridge assembly/casting include the Port of Vancouver Parcel 1A, Red Lion at the Quay, (vacant) Thunderbird Hotel site on Hayden Island, Port of Vancouver Alcoa/Evergreen West, and Sundial. Activities at staging and casting areas are likely to result in emissions. Construction of concrete structures or asphalt paving activities may require equipment or operations that would emit pollutants (e.g., mixing operations). Stationary sources, such as concrete mix and asphalt plants, are generally required to obtain an Air Contaminant Discharge Permit from either DEQ or SWCAA and to comply with regulations for controlling dust and other pollutant emissions.

Under the transportation conformity rules (40 CFR 93.123 (c)(5)), carbon monoxide and particulate matter hot-spot analyses are not required to consider construction-related activities which cause temporary increases in emissions.

Each site affected by construction-related activities is considered separately. Temporary increases are defined as those which occur only during the construction phase and last 5 years or less at any individual site. Since project construction activities are not expected to last more than 5 years at any given site, a carbon monoxide hot spot analysis will not be required. Regulations aside, as discussed above, the air quality analysis associated with the Dan Ryan Expressway project suggests that impacts will not occur and therefore hot-spot analysis is not warranted.

3.10.5 Mitigation or Compensation

Long-term Effects

Air pollutant emissions are expected to be substantially lower in the future than under existing conditions. Future differences between build and No-Build alternatives are small, and long-term air quality impacts are not expected to occur as a result of the project. Mitigation for long-term impacts is not proposed.

Temporary Effects

Construction mitigation will focus on controlling dust and exhaust emissions from demolition and construction activities and on minimizing the effects of traffic congestion. For a project of this magnitude, the contractor will be required to develop a pollution control plan that includes documentation of operational measures that will be used to reduce emissions. Section 290 of the ODOT standard specifications describes requirements for environmental protection, including air pollution control measures.

Stationary sources such as concrete and asphalt mix plants are generally required to obtain air permits from DEQ or SWCAA and to comply with regulations to control dust and other pollutant emissions. As a result, their operations are typically well controlled and do not require additional project-specific mitigation measures.

Contractors are required to comply with ODOT standard specifications (Section 290) for dust, diesel vehicles, and burning activities, as described above. Section 290 requires contractors to comply with ORS 468 and 468A, OAR 340-014 and 340-200 through 340-268, and all other applicable laws. In order to control dust, the project will require all contractors to develop and implement a dust control plan and to maintain air quality permits on all portable equipment.

The OAR regulation provides a list of reasonable precautions that will be taken to avoid dust emissions:

- Use of water or chemicals where possible for the control of dust in the demolition of existing buildings or structures, construction operations, the grading of roads or the clearing of land.;
- Application of asphalt, water, or other suitable chemicals on unpaved roads, materials stockpiles, and other surfaces that can create airborne dusts.
- Not using oil, waste, waste water, or other illegal materials as dust suppressants.

- Full or partial enclosure of materials stockpiles in cases where application of oil, water, or chemicals is not sufficient to prevent particulate matter from becoming airborne.
- Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials.
- Adequate containment during sandblasting or other similar operations.
- When in motion, always covering open-bodied trucks transporting materials likely to become airborne.
- The prompt removal from paved streets of earth or other material that does or may become airborne.

Washington has fewer specific regulations that cover a narrower range of activities than those covered in Oregon. In Vancouver, Washington Administrative Code (WAC) 173-400-040 places limits on fugitive dust that causes a nuisance or violates other regulations. Violations of these regulations can result in enforcement actions and fines. In addition to complying with WAC 173-400-040, WSDOT will voluntarily apply ODOT's Standard Specifications (Section 290) for work completed in Washington. WSDOT and ODOT will also work with neighborhoods and vulnerable populations to address their air quality concerns as the project moves into final design and then into construction.

In 2008, ODOT updated their standard specifications to address diesel emissions. ODOT specified that truck staging areas for diesel-powered vehicles should be located where truck emissions have a minimum impact on sensitive uses such as residences, schools, hospitals and nursing homes. Also, trucks and other diesel-powered equipment should limit idling to 5 minutes when the equipment is not in use or in motion, except as follows:

- When traffic conditions or mechanical difficulties, over which the operator has no control, force the equipment to remain motionless.
- When operating the equipment's heating, cooling or auxiliary systems is necessary to accomplish the equipment's intended use.
- To bring the equipment to the manufacturer's recommended operating temperature:
    - When the outdoor temperature is below 20°F.
    - When needing to repair equipment.
    - Under other circumstances specifically authorized by the engineer.

Whether in Oregon or Washington, diesel construction vehicles and equipment will use ultra-low sulfur diesel or will otherwise comply with any new regulations in place at the time of construction. In addition, the DOTs are evaluating potential additional emission control technologies for construction equipment. The DOTs will continue to monitor and evaluate changes in technology and related regulations. Decisions regarding any additional emission controls will be made during final design.

The CRC project and sponsor agencies are committed to reducing the occurrence and effect of congestion during construction, including taking actions to reduce single-occupancy vehicle trips through the main project area. Some or all of the following congestion reduction strategies will be included in the project:

- Providing alternatives to SOV trips, for example, vanpools and/or increased transit service.
- Providing incentives to reduce automobile trips and encourage mode shifts to non-SOV trips, for example, supporting and/or providing information regarding localized transportation options, including transit, walking, biking, and carpools.
- Managing traffic and lane closures to avoid congestion and delay.
- Providing traveler information at key junctions to encourage traffic diversion from the I-5 corridor and crossing routes.
- Promoting continuous information campaigns to alert motorists of delay times within the corridor and of upcoming traffic pattern changes and detours.
- Incorporating transit priority measures where feasible.
- Working with employers whose employees must commute through the area to promote alternative work schedules.
- Instituting contractor incentives to shorten construction durations and encourage the use of lower-emitting construction equipment.

These congestion reduction strategies are discussed in greater detail in the TDM and TSM Technical Report, included as an electronic appendix to this FEIS.

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