
3.18 Hazardous Materials

When construction activities use hazardous substances, disturb hazardous materials during demolition, or encounter contaminated soils or groundwater, contamination can be released into air, soil, or water. Exposure to such contamination can adversely affect construction worker and public safety and lead to diminished quality of natural resources, and project responses to deal with this contamination can increase project costs and cause project delays. At the same time, there can be long-term benefits to human health and the environment when construction activities result in identifying and remediating soils or groundwater that are already contaminated with hazardous materials.

This section identifies, describes, and evaluates potential short-term and long-term hazardous materials-related effects resulting from the construction and operation of the CRC project. This section also describes measures to help avoid or mitigate adverse effects. A comparison of the impacts of the LPA and the DEIS alternatives is summarized in Exhibit 3.18-4. The impacts of the DEIS alternatives on hazardous materials are further detailed and analyzed in the DEIS, starting on page 3-405.

Areas of effect include the main project area, the casting and staging areas, the Ruby Junction Maintenance Facility, and the Steel Bridge (see Chapter 2 for a map of these areas). The information presented in this section is based on the CRC Hazardous Materials Technical Report, which is included as an electronic appendix to this FEIS.

Prior to construction, the CRC project must obtain a variety of permits and approvals in regard to hazardous materials. These permits and approvals are regulated by federal, state, and local agencies and pertain to:

- Cleanup of hazardous materials
- Handling, storing, using, and transporting hazardous materials
- Surface and groundwater quality
- Worker safety

Required permits and approvals overlap with those required for natural resource impacts described in other sections of this FEIS.

3.18.1 New Information Developed Since the Draft EIS

The following project information has been developed or refined since the preparation of the DEIS and has been included in the evaluation for this FEIS:

- Updated property acquisition estimates
- Refinements to proposed construction activities and techniques
- Updated federal and state regulatory database searches

- Additional historical land use review
- Review of DEQ's list of identified priority hazardous material sites
- Review of Ecology's list of identified priority hazardous material sites
- Review of applicable and relevant federal, state, and/or city codes, permits, and approvals

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.

3.18.2 Existing Conditions

A database search identified 238 hazardous materials sites in or near the main project area that may possibly contain recognized environmental conditions (RECs),¹² 122 in Washington and 116 in Oregon. To better assess potential future project impacts, the identified hazardous materials sites were ranked from a scale of 1 (low) to 5 (high) for their potential to cause adverse effects. Sites ranked 4 have a known or suspected release of a hazardous substance or petroleum product, but are inactive or have received a No Further Action (NFA) determination by a federal or state agency. Releases at these sites typically stem from leaking underground storage tanks (LUSTs) or spills. Sites ranked 5 also have a known or suspected release of a hazardous substance or petroleum product, but are in an active phase of investigation, cleanup, or long-term action. Therefore, there is a higher likelihood of encountering hazardous materials at sites ranked 5. Within the project area, a majority of sites ranked 4 or 5 are located in downtown Vancouver, on Hayden Island, or near the North Portland Harbor.

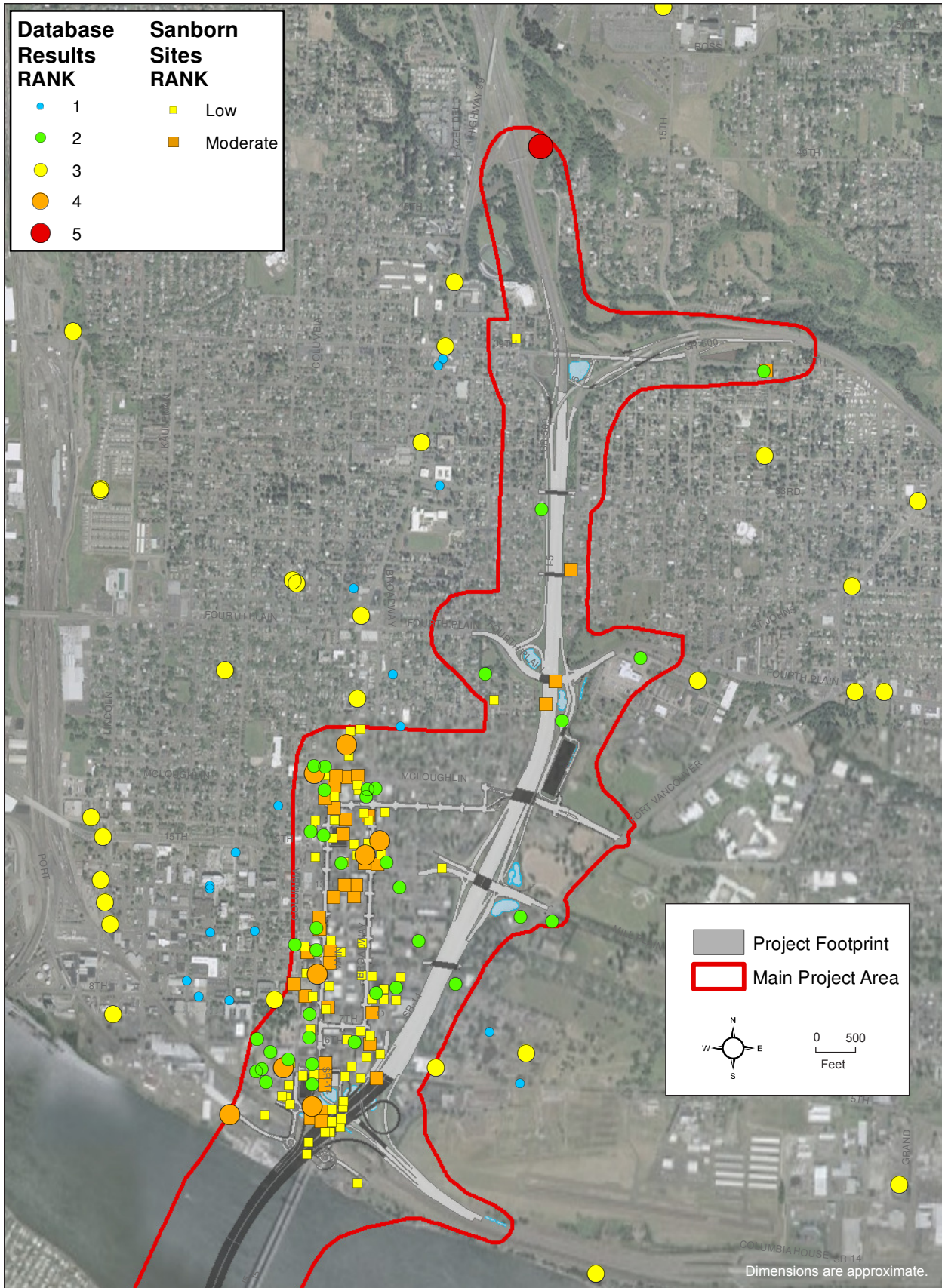
In order to determine the location of historical RECs, a review of past land uses was conducted by reviewing historical Sanborn Fire Insurance Maps. This review identified 117 historic sites with RECs in the main project area. Of these sites, 85 were thought to have a moderate potential to cause adverse environmental effects (77 in Washington and 8 in Oregon). The locations of potential existing RECs (identified through the database search) and historical RECs (identified through the Sanborn maps review) are shown in Exhibits 3.18-1 through 3.18-3.

¹² The term "recognized environmental condition" is defined by ASTM E-1527 as:

"...the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater or surface water of the property."

Exhibit 3.18-1

Identified Hazardous Materials Site Location Map – Vancouver

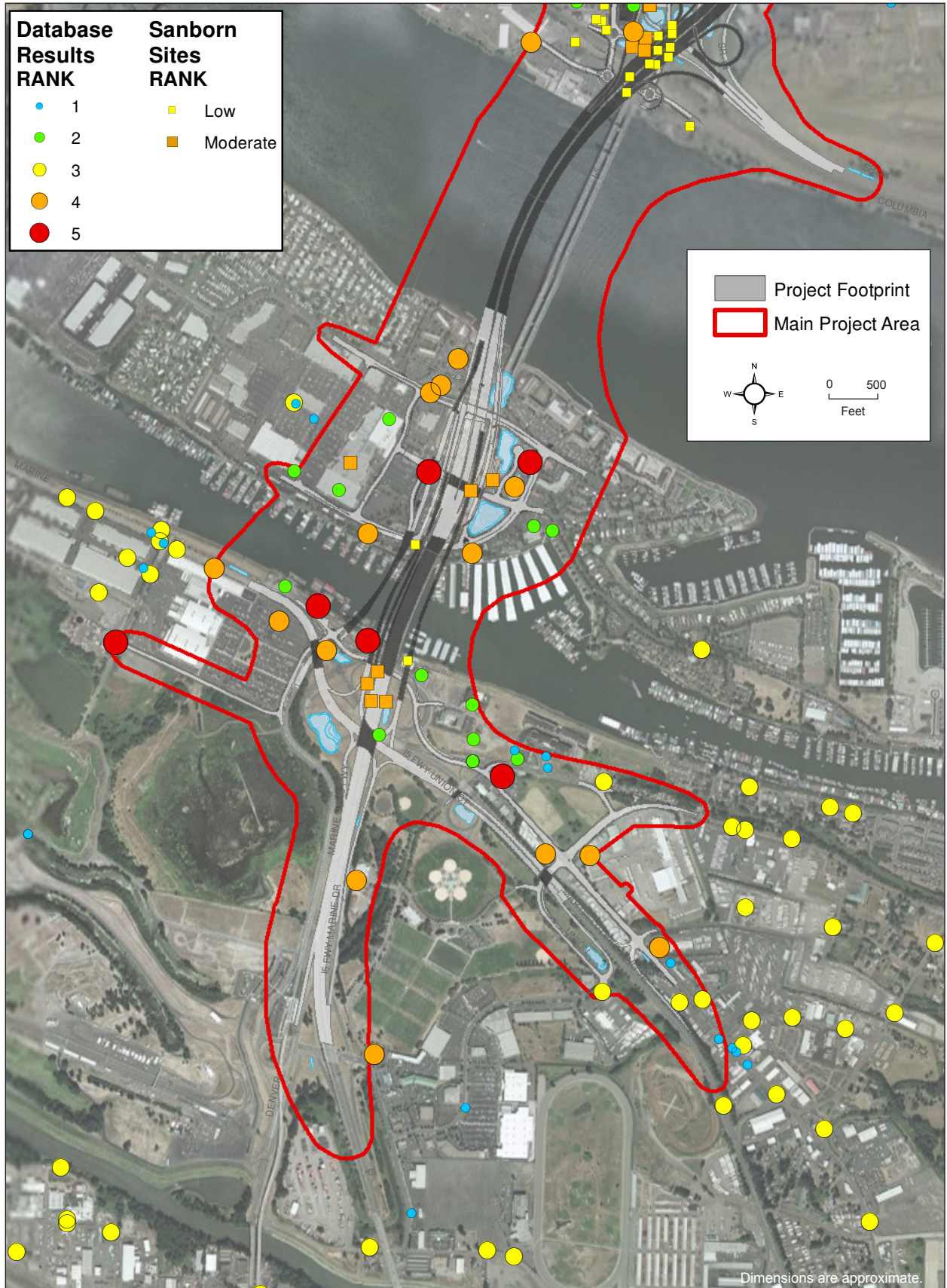


Source: Parcel Insight 2009. Parcel Insight Corridor Report. 200.40. March 3, 2009. Columbia River Crossing WA & OR 98118.

Note: The hazardous materials site rank shows the relative potential for an identified site to cause an adverse environmental effect(s).

Exhibit 3.18-2

Identified Hazardous Materials Site Location Map – Hayden Island and North Portland



Source: Parcel Insight 2009. Parcel Insight Corridor Report. 200.40. March 3, 2009. Columbia River Crossing WA & OR 98118.

Note: The hazardous materials site rank shows the relative potential for an identified site to cause an adverse environmental effect(s).

Exhibit 3.18-3

**Identified Hazardous Materials Site Location Map –
Casting and Staging Areas and Ruby Junction (1 of 2)**

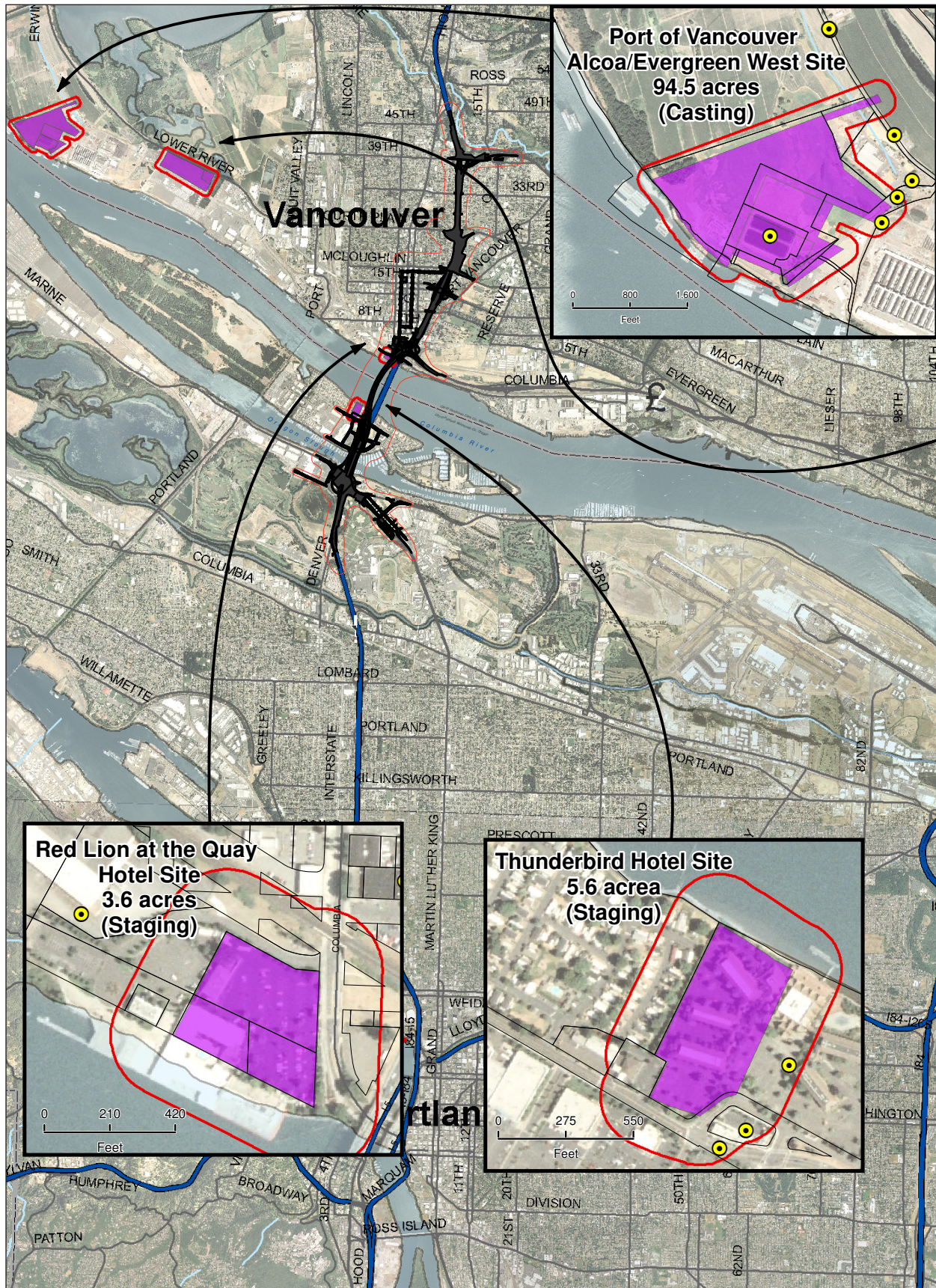
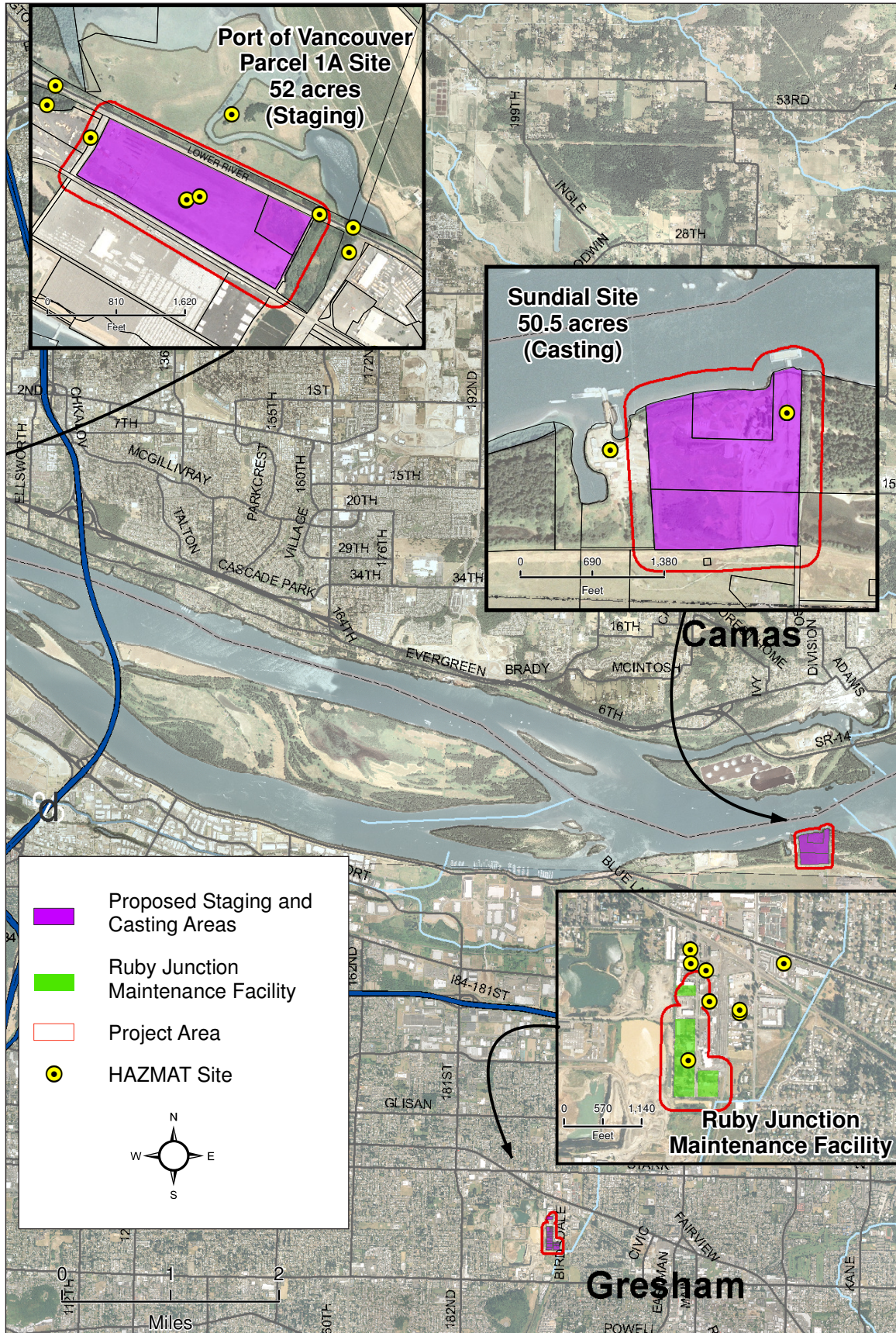


Exhibit 3.18-3

Identified Hazardous Materials Site Location Map – Casting and Staging Areas and Ruby Junction (2 of 2)



3.18.3 Long-term Effects

Exhibit 3.18-4 compares the long-term effects of the LPA to the other build and No-Build alternatives. As shown in the exhibit, the LPA Options A and B and Alternatives 2 and 3 would expose the project to higher levels of risk by acquiring more hazardous materials sites than Alternatives 4 and 5. The No-Build Alternative would have no increased risk to the project because no property acquisition would occur. However, the LPA and Alternatives 2 and 3 also provide the greatest environmental benefits by reducing the likelihood of spills related to vehicular accidents and acquiring (and likely remediating) more existing hazardous materials sites. As discussed below, although they defer some improvements, the LPA with highway phasing options have similar beneficial and adverse effects as the full LPA.

Exhibit 3.18-4

Comparison of Long-term Effects on and from Hazardous Materials

Type of Effect	Locally Preferred Alternative ^a			Alt 2: Repl Crossing with BRT	Alt 3: Repl Crossing with LRT	Alt 4: Suppl Crossing with BRT	Alt 5: Suppl Crossing with LRT
	LPA Option A	LPA Option B	No-Build				
Property acquisition	Greater possibility for remediation of contaminated areas. Moderate potential for adverse effects from acquiring hazardous materials sites.	Same as Option A	No remediation of contaminated areas results from this project alternative. No increase in liability.	Same as LPA	Same as LPA	Lower possibility for remediation of contaminated areas. Lower potential for adverse effects from acquiring fewer hazardous materials sites.	Lower possibility for remediation of contaminated areas. Lower potential for adverse effects from acquiring fewer hazardous materials sites.
Surface water and groundwater quality	Greater beneficial effects from updates in stormwater conveyance and treatment. (Similar, but slightly higher improvement in surface water quality).	Same as Option A	Continued adverse effects from untreated stormwater.	Similar to LPA	Similar to LPA	Similar to LPA	Similar to LPA
Hazardous materials spill potential	Greater reduction in spill risk due to reduced congestion and collisions. (Similar, but slightly lower, reduction in spill risk).	Same as Option A	No improvement in existing spill risks.	Similar reduction in congestion and collision-related spill risk to LPA, although BRT has slightly higher spill risk than LRT.	Same as LPA	Some reduction in spill risk from lower congestion and collisions. BRT has slightly higher spill risk than LRT.	Some reduction in spill risk from lower congestion and collisions.

Source: CRC Hazardous Materials Technical Report.

Note: The impacts for the LPA are relative to No-Build and existing conditions.

a Text in parentheses indicates impacts if the LPA Option A or B is constructed with highway phasing.

Long-term effects from the construction, operation, and maintenance of the LPA are assessed qualitatively based on the project team's current understanding of the natural and built environments.

Property Acquisition

Acquisition of properties currently impacted by hazardous materials or petroleum products will result in an increased rate of cleanup within the project area over time. Cleanup of existing hazardous materials or petroleum products is a long-term benefit to the environment. However, long-term liability to the project can also result from acquiring a property that is undergoing investigation or remediation and/or that is subject to requirements associated with the long-term operation of a clean-up action. Compared to the No-Build Alternative, the LPA has moderate potential for long-term beneficial effects in the form of cleanup of acquired properties, but also a moderate potential for long-term adverse effects in the form of liability from property acquisition.

The potential liability to the project from acquiring contaminated property can be minimized with appropriate due diligence procedures. Although for this FEIS, existing hazardous materials sites were evaluated for potential risks to project construction and operation, further due diligence would be required prior to property acquisition. A Phase I Environmental Site Assessment (ESA) conducted consistent with ASTM 1527-05, or equivalent, would be performed for any industrial or commercial property that is planned for any level of acquisition. A Phase I ESA would include activities such as on-site inspections and interviews with property owners and operators, activities that are not standard practice in developing FEIS documents. Residential properties planned for acquisition may only require a property transaction screen conducted by an environmental professional, as appropriate for the property being acquired. Acquiring temporary or permanent easements may also require some level of due diligence.

A Phase II ESA (a more intrusive investigation than a Phase I ESA) would be conducted for properties where the Phase I ESA report or property transaction screen indicates that potential contamination may be present based on site history, regulatory status, or site observations. This additional investigation would be necessary to establish the presence or absence of contamination in order to satisfy due diligence requirements under federal law and to qualify for landowner liability protections. The assessment would also help in the determination of a potential cleanup action and cost.

The design of LPA Option A requires a larger number of property acquisitions and property easements than LPA Option B. However, LPA Options A and B would result in the acquisition of, or entail easements onto, a similar number of properties identified as hazardous materials sites with RECs; 55 and 52 properties, respectively. Please see Section 3.3 for more information on property acquisitions.

A records search also indicates potential well sites within the project footprint. Further analysis and consideration of well decommissioning would occur prior to construction. Well decommissioning activities would be consistent with state guidelines (OAR 690-220 or WAC 173-160-381, as appropriate).

TERMS & DEFINITIONS

Due diligence

Due diligence means taking appropriate precautions before a property is acquired to determine the presence or potential presence of environmental hazards associated with that property. Due diligence is important, as the purchaser of a property may be exposed to liability for environmental hazards associated with the property, liability that can adversely impact a project's cost and budget. The laws affecting legal liability for the purchasers of contaminated property differ between Oregon and Washington.

Although the highway phasing options defer some highway improvements, the deferrals have only a small impact on the total acreage to be acquired by the project, and no impact on the number of hazardous materials sites to be acquired. All the LPA options have similar risks and benefits associated with property acquisition.

Spills and Leaks

Operating and maintaining highway, bridge, and transit facilities may result in spills and leaks of hazardous substances or petroleum products. Rain can carry these materials from the highway to surface water or to the water table, where they can persist and accumulate for long periods of time and cause harm to species and their habitats. The frequency and severity of spills and releases are anticipated to be lower for the LPA than for the No-Build Alternative, as the LPA would include updated roadway and bridge designs, decreasing the number of crashes and spills. Moreover, added highway shoulders and decreased congestion would provide for better response times to manage any spills that do occur. Finally, the updated stormwater management system design of the LPA would provide for better containment and management of spills and increased treatment of stormwater runoff.

Like the full LPA options, the highway phasing options would address most of the existing non-standard features of I-5 in the main project area. All LPA options would remove the lift spans on the Columbia River bridges, resulting in substantially improved vehicle and freight safety. However, by retaining an existing short (substandard) weave movement at the Victory Boulevard interchange, the highway phasing options would result in a smaller improvement in crash and spill risks.

Stormwater Conveyance System and Treatment Facilities

Groundwater and surface water quality can be diminished by petroleum, salts, and other materials contained in stormwater runoff from roadways and bridges. Compared to the No-Build Alternative, the LPA (Options A and B) would have beneficial effects on stormwater quality, because stormwater would be managed and treated prior to infiltration into soil or being released to surface waters. This is considered significant due to the beneficial uses of surface water and groundwater, as described more fully in Section 3.14, Water Quality and Hydrology and Section 3.17, Geology and Soils. The LPA highway phasing options have similar effects on groundwater quality as the full LPA options, and similar but slightly higher reductions in surface water pollutants.

Legacy Hazardous Materials Sites

Legacy hazardous materials sites, such as Superfund sites, are sites where significant long-term cleanup actions are in progress with oversight from regulatory agencies. Two legacy hazardous materials sites, the Boise Cascade cleanup site and the Harbor Oil Superfund Site, are located within the main project area. Regulatory agencies may require these sites, or newly identified sites, to conduct long-term cleanup actions, and these actions may affect project operations and maintenance. In special cases, cleanup of hazardous materials sites, independent of the CRC project, could require ongoing access across the highway or transit way, for example, for trucks carrying loads of

contaminated soil from the site to an off-site disposal area. Such activities have the potential to have long-term impacts on any of the CRC build alternatives.

Ruby Junction Maintenance Facility

The LPA includes the expansion of light rail maintenance infrastructure at the TriMet Ruby Junction Maintenance Facility in Gresham, Oregon. This expansion would include 15 property acquisitions. State regulatory information sources indicate that one of these properties is listed in environmental databases. Potential effects may include cleanup and liability issues related to property acquisitions.

Indirect Effects

For this FEIS, indirect effects include future development and redevelopment activities that occur independent of the CRC project. These activities could be influenced by the project's direct effect on transportation access, mobility and behavior. The LPA would likely indirectly promote redevelopment of existing structures and/or paved areas as opposed to development of natural areas. Redevelopment in older urban areas is more likely to encounter existing contamination; as a result, the LPA, compared to the No-Build Alternative, has a greater potential for indirect adverse effects during construction. However, because redevelopment would remediate known or discovered hazardous materials on-site, the LPA's induced land use changes are more likely to have long-term beneficial effects than the No-Build Alternative.

3.18.4 Temporary Effects

Temporary effects from hazardous materials include the risk of exacerbation of and/or exposure to existing contamination, accidental release of hazardous substances, and generation of hazardous and/or non-hazardous waste during construction. The risk of these types of adverse effects has been evaluated for both on-site project construction and off-site staging and casting activities.

On-site Construction

EXACERBATION OF EXISTING HAZARDOUS MATERIALS

Contaminated soils, sediments, surface water, stormwater, and groundwater can be disturbed during construction, creating the potential to impact human health or the environment, raise liability issues, increase project costs, and/or cause schedule delays. Resources that may currently be contaminated and/or realize increased contamination from construction activities are discussed below. In general, the potential of temporary adverse effects is higher for the LPA than for the No-Build Alternative.

Focused site assessments would be conducted prior to construction to characterize and evaluate existing impacts to soil, sediment, and groundwater that could be exacerbated as a result of the construction process. An agency-approved work plan would outline the goals, objectives, and procedures for conducting each focused site assessment.

Surface and Subsurface Soils

It is likely that below-grade construction activities would encounter existing contamination in soils. Exacerbation of existing soil contamination would

most likely occur on hazardous materials sites ranked as 4 or 5 and the historic RECs (identified in Exhibits 3.18-1 through 3.18-3), as well as from the construction of the Marine Drive, Hayden Island, and SR 14 interchanges and construction of the downtown Vancouver light rail track and associated park and rides.

Sediment

Sediment quality within North Portland Harbor and in the vicinity of Hayden Island is suspected of being impacted from historic industrial, commercial, and residential activities. In addition, stormwater runoff from upland sources and the I-5 bridges and surrounding roadway may have contributed to sediment contamination.

Surface Water

Surface water quality can be adversely affected by near-water or in-water construction activities. The LPA includes modifications to embankments and pile installation and removal in areas of North Portland Harbor and on Hayden Island in proximity to hazardous materials sites where known or suspected releases of contamination have occurred in soil, sediment, and/or groundwater.

Stormwater

Stormwater quality can be adversely affected due to erosion of exposed contaminated surfaces from wind and precipitation. If erosion is not adequately mitigated for during construction, temporary adverse stormwater quality effects could occur.

Groundwater

Part of the Troutdale Aquifer is located under the project area. The Washington portion of this aquifer is designated by the EPA as a sole source aquifer, and the City of Vancouver is dependent on this aquifer as a critical resource (see Section 3.17, Geology and Soils, for additional information on the Troutdale Aquifer and details regarding project compliance with EPA sole source aquifer regulations, as well as the Troutdale Sole Source Aquifer Report which is included as Appendix E of the Hazardous Materials Technical Report). Based on the best available information, the nature and extent of existing contamination in the aquifer consists of low concentrations of dissolved phase solvents, metals, and petroleum products within the shallow aquifer.

Groundwater at City of Vancouver Water Stations 1 and 3 is currently treated for microbiological constituents by chlorination, and groundwater at Water Station 1 is treated for volatile organic compounds by aeration. Groundwater at these stations is periodically monitored by the City of Vancouver to ensure that water quality meets drinking water standards. Ongoing monitoring of groundwater by the City will help verify that the project does not impact Vancouver's drinking water supply.

Most of the LPA's construction activities pose little risk of exacerbating existing groundwater contamination. However, under the LPA, exacerbation could result from excavation and drilling activities associated with construction of the new I-5 bridges and the Marine Drive, North Portland Harbor, Hayden

Island, SR 14, and Mill Plain interchanges. There is a risk that deep shafts and excavations could create pathways for the migration of existing soil contamination to groundwater. The CRC Hazardous Materials Technical Report, included as an electronic appendix to this FEIS, evaluates the risks to groundwater from specific construction activities at nine locations. As detailed in the technical report, without mitigation and minimization measures, proposed construction activities at two of the sites are thought to have low risk of exacerbating existing groundwater contamination, and seven sites are thought to have moderate risk. The risk factors include depth of foundations and piles, depth of groundwater, and distances to priority hazardous materials sites.

ACCIDENTAL RELEASE OR GENERATION OF WASTE

Spills and Releases

Construction equipment can release fuels or vehicle fluids from spills. Other pollutants such as paints, acids for cleaning masonry, solvents, and concrete-curing compounds are typically present at construction sites and have the potential to be released to the environment. Released material can migrate to soil, surface water, or groundwater. Below-ground placement of new structures and construction materials (for example, subsurface pouring of wet cement) can also result in localized impacts to groundwater quality.

Lead- and Asbestos-containing Materials

Exposure to materials containing lead and asbestos has resulted in documented health effects to humans. Buildings and structures that have lead or asbestos containing materials (ACM) would require proper abatement procedures prior to any demolition, renovation, or repair activities. The use of asbestos in buildings and structures was common prior to 1980. EPA issued a ban and phase out rule for asbestos in 1989. At least 23 of the properties to be acquired by the LPA have structures built prior to 1980 and are planned for demolition. In a similar fashion, materials that contain lead (such as some types of paint) must be handled carefully during demolition and must be disposed of at an approved site.

Hazardous and Non-hazardous Wastes

Hazardous and non-hazardous waste can be generated during construction activities when hazardous materials are encountered. Waste can consist of contaminated soils; sediments; groundwater generated from excavation, drilling, and dewatering activities; and building materials containing lead or asbestos exposed by demolition activities. Wastes can be harmful to human health and/or the environment and may require management in accordance with applicable federal and state regulations. Characterizing, managing, storing, and disposing of waste can increase project costs or cause schedule delays, and are a source of potential liability to the project.

The LPA would include work on the Steel Bridge to enable higher travel speeds for light rail vehicles. Although the bridge was constructed in 1912, the work would entail modifications to modern elements of the bridge, such as the existing light rail tracks, decreasing the likelihood of encountering hazardous materials and generating hazardous or non-hazardous wastes.

TERMS & DEFINITIONS

Asbestos

Asbestos was used extensively in building materials in the early and mid-20th century. It is a known carcinogen, and is extremely *friable*—that is, it crumbles easily. Demolition of buildings or other structures that contain asbestos can release small particles of asbestos into the air, and these particles in turn can lodge in the lungs of people who breathe this air. Proper caution and *abatement procedures* can reduce or eliminate this hazard to human health.

Off-site Staging and Casting

STAGING AREAS

Three potential off-site staging areas are being considered to support construction of the river crossing: the Port of Vancouver Parcel 1A, Red Lion at the Quay, and former Thunderbird Hotel sites. Staging areas would be used for material lay down yards, equipment storage, and fabrication. Review of the staging areas indicates that only the former Thunderbird Hotel site has an existing environmental issue likely to affect its immediate use as a staging area. This location is the site of the former Hayden Island Landfill and a former automotive service station. Activities at this site may have resulted in contamination of subsurface soils and groundwater, contamination that could be impacted by staging activities; however, excavation at this site is unlikely.

CASTING YARDS

If the river crossing is built using pre-cast concrete sections, then an off-site casting yard would be required. Two potential casting yard sites have been identified: the Sundial Site and the Port of Vancouver Alcoa/Evergreen Site. Preliminary review of the two proposed casting areas indicates that both sites have existing environmental issues. The Alcoa/Evergreen Site has been identified by Ecology to have impacts to soils, sediments, and groundwater, which could affect the construction of barge ramps necessary to transport concrete sections. RECs have also been identified at the Sundial Site; however, preliminary review suggests that the contamination here has less potential for adverse impacts than at the Alcoa Site.

3.18.5 Mitigation or Compensation

The following describes measures to mitigate adverse effects for the LPA.

Effects to the Environment from Construction Activities

CONSTRUCTION STORMWATER POLLUTION PREVENTION PLANS (SWPPPs)

Control plans would be prepared to prevent or minimize soil or sediment from being carried into surface water by erosion (wind and stormwater runoff).

Plans would be prepared in a manner that is consistent with all state, federal, and local requirements.

NPDES CONSTRUCTION GENERAL STORMWATER PERMITS

National Pollutant Discharge Elimination System (NPDES) permits would be prepared to cover all ODOT and WSDOT construction activities that would disturb more than 1 acre and that would discharge stormwater to surface waters.

STORMWATER CONVEYANCE SYSTEM AND TREATMENT FACILITIES MONITORING PLAN

A stormwater monitoring plan would be prepared to evaluate the long-term performance and effectiveness of the updated stormwater conveyance and treatment systems.

Effects on Construction from Hazardous Materials

HEALTH AND SAFETY PLANS (HASPs)

A site-wide construction HASP would be prepared to minimize exposure of construction and excavation workers to hazardous wastes and to reduce the risk to human health and the environment.

SPILL CONTROL AND PREVENTION PLANS (SCPPs)

SCPPs would address the use, storage, and disposal of asphalt, fuel, raw concrete, striping paint, solvents, spray paint, landscaping chemicals, and other such materials.

CONTAMINATED MEDIA MANAGEMENT PLANS (CMMPs)

CMMPs would be prepared to properly characterize, manage, store, and dispose of contaminated materials encountered during construction activities.

LEAD AND ASBESTOS SURVEYS AND ABATEMENT PROGRAM

A lead and asbestos survey of each building or structure would be conducted prior to its acquisition by the project. Based on survey results, abatement would be conducted prior to demolition, renovation and/or repair. Disposal of lead and ACM would be conducted at applicable Subtitle C or D solid waste facilities.

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