Chapter 4 The Natural Environment – Effects on Ecosystems and Natural Resources

What is addressed in this chapter?

This chapter describes the community’s existing natural environment and how the alternatives may impact those resources. This chapter specifically addresses the following elements:

▪ Earth
▪ Hazardous Materials
▪ Water
▪ Plants and Animals
▪ Climate Change

Several exhibits within this chapter identify the locations and/or conditions of natural resources. The mapping information used to create these exhibits came from a variety of sources, are intended only as general depictions, and may not be accurate to the parcel level. During the MPD process, natural resources will be analyzed at a parcel level.
Earth

Geology, Topography, and Soils

1 What are the geologic conditions in the area?

The Lawson Hills MPD lies along the east edge of the Puget Lowlands, within the till ridges and outwash valleys of the Covington Drift Plain to the west and the Cascade Foothills to the east. Bedrock in the Black Diamond area extends westward out from the Cascade Foothills. Many of the coal seams commercially mined in the Black Diamond area are found in this deposit. Coal mines underlying the site are discussed in more detail below.

The near surface geology of the Main Property consists of Puget Group bedrock overlain by thin glacial sediments (till and outwash) and fill. The depth to bedrock is variable but is generally less than 5 feet. Fill thicknesses of up to 100 feet are mapped in the north end of Upper Lawson Hills where waste rock fill was placed to reclaim two open pits of the Section 12 surface coal mine. Fill mapped along Lawson Creek consists of waste rock and coal debris left over from the abandoned Lawson mine.

Geologic deposits in the North Triangle are similar to the Main Property; however, because no coal mining occurred in the North Triangle there are no significant fill deposits. The Puget Group bedrock underlies the North Triangle property approximately 4 feet below the ground surface in the northwest portion of the site and was not encountered in test pits in the upper southeast portion of the site.

2 What are the topographic conditions in the area?

The Main Property is characterized by two distinct parts; Upper and Lower Lawson. Upper Lawson is located southeast of Lawson Street. Lower Lawson (also referred to as the Corridor) is located to the west, between SR 169 and the Lawson Street (Exhibit 4-1). Upper Lawson is situated on a generally west to northwest facing hill that ranges in elevation from about 1,085 feet at the southeast end of the site to about 750 feet at the west end. The hillside slopes are generally uniform, ranging from approximately 15 to 25 percent. Lower

Kaye Property – old pier for mine coal carts; coal was brought up from mines in carts to the old deck on the piers and sent off via rail or loaded onto trucks.
Lawson also generally slopes to the west, ranging in elevation from about 800 feet in the east to 635 feet in the west. The eastern half is relatively flat, averaging slopes of about 1 to 2 percent. The western half is steeper with slopes between 10 and 20 percent, and localized slopes as steep as 50 percent.

The North Triangle includes three distinct topographic areas: an upland area ranging in elevation from between 640 and 670 feet, which slopes gently towards the northwest; a northeast-southwest trending slope bisecting the triangle ranging from approximately 640 feet to 600 feet in elevation; and a nearly flat lowland area to the northwest with elevations ranging from approximately 600 feet to 574 feet. Slopes in the upland area range from between approximately 2 and 20 percent. Localized areas of the slope bisecting the North Triangle exceed 40 percent. The lowland area generally slopes to the southwest, with slopes ranging from less than 1 percent to localized short slopes of approximately 20 percent.

3 What are the soil conditions in the study area?

The United States Department of Agriculture’s (USDA) Natural Resources Conservation Service (NRCS) maps identify a total of three soil-mapping units within the boundaries of the study area. The soils underlying the site are mapped as Alderwood gravelly sandy loam, Everett gravelly sandy loam, and Beausite gravelly sandy loam. These units are further broken down into subunits, based on the general slope in the vicinity (Exhibit 4-2).

The Alderwood gravelly sandy loam unit is described as a moderately well drained soil on till plains, with a hardpan layer at about 30 inches. The Alderwood soil series is characterized by slow to medium runoff rates with moderately rapid permeability above the hardpan and very slow in the hardpan. The main limitation of this soil series affecting homesites is the seasonal wetness, and erosion is a hazard in steeper areas.

The Everett gravelly sandy loam unit is described as very deep, somewhat excessively drained soil on terraces and outwash plains. Permeability is rapid in Everett soils; runoff is slow and the hazard of water erosion is slight. This unit is suited to homesites; however cut banks are not stable and can be subject to sloughing. Because of the permeability, irrigation is typically needed for lawns and ornamental plantings in summer.
Exhibit 4-1
Topography

Exhibits in this EIS are intended to provide a general graphical depiction of built and natural environment conditions and may not be accurate to the parcel level.
Exhibit 4-2
Soils

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>AgC</td>
<td>Alderwood gravelly sandy loam 6-15%</td>
<td></td>
</tr>
<tr>
<td>AgD</td>
<td>15-30%</td>
<td></td>
</tr>
<tr>
<td>BeC</td>
<td>Beausite gravelly sandy loam 6-15%</td>
<td></td>
</tr>
<tr>
<td>BeD</td>
<td>15-30%</td>
<td></td>
</tr>
<tr>
<td>EvC</td>
<td>Everett gravelly sandy loam 5-15%</td>
<td></td>
</tr>
</tbody>
</table>

Exhibits in this EIS are intended to provide a general graphical depiction of built and natural environment conditions and may not be accurate to the parcel level.
The Beausite unit is made up of well-drained soils that are underlain by sandstone bedrock at a depth of 24 to 40 inches. These soils are typically found on foothills, exhibit moderate permeability, and runoff rates that are medium to rapid. The hazard of water erosion is moderate to severe. Beausite soils have severe limitations on recreational and engineering uses due to the thinness of the soil over the sandstone and the erosion/slippage potential in steeper classes.

Soils sampled throughout the study area are similar to the descriptions of the Alderwood, Everett, and Beausite units.

4 What risks are associated with geology, topography, and soils?

Risks associated with geology, topography, and soils generally include erosion hazards, landslide hazards, seismic hazards, volcanic eruptions, and other geologic events. Areas with certain characteristics – for example, specific types of soil or combinations of soils and topography – may be prone to failure and can pose hazards to the health and safety of citizens. This typically happens when incompatible commercial, residential, or industrial development is sited in areas of significant hazard.

Erosion hazard areas typically include those areas that the USDA’s Natural Resources Conservation Service (NRCS) has identified as having a moderate to severe, severe, or very severe rill and inter-rill erosion hazard.

Landslide hazard areas are potentially subject to landslides based on a combination of geologic, topographic, and hydrologic factors. This includes areas susceptible to landslides because of combinations of bedrock, soil, slope, slope-facing direction, structure, hydrology, or other factors.

Seismic hazard areas include areas subject to severe risk of damage as a result of an earthquake-induced ground shaking, slope failure, settlement, soil liquefaction, or surface faulting. The primary cause of earthquake damage in Washington State is ground shaking.

Volcanic hazard areas are areas subject to lava flows, debris avalanches, inundation by debris flows, mudflows, or related flooding resulting from volcanic activity.
5 What are mine hazard areas?

Mine hazard areas are those areas underlain by, adjacent to, or affected by mine workings, such as mine tunnels and air shafts. Mine hazard areas are generally divided into classifications of low hazard, moderate hazard, and severe hazard. These classifications are applied based on the depth below ground of the mine, the presence of sinkholes, and the presence of publically accessible openings, such as mine entries, portals, and mine shafts. The presence of mine waste rock – natural materials discarded as a part of the coal mining process – can also pose risks to the public and affect the hazard classification.

Significant portions of the Main Property are underlain by abandoned underground coal mines (Exhibit 4-3). Although all of the Main Property contains coal seams, only the Upper Lawson property contains abandoned mines. There was no evidence that the coal seams on Lower Lawson were mined. Upper Lawson Hills is underlain by three abandoned underground coal mines, the Lawson Mine, the New No. 12 Mine, and the Maks Mine. The largest and most significant of these mines is the Lawson Mine, which operated from 1885 to 1910. The New No. 12 Mine (1880s) and the Maks Mine (1950s) were smaller operations developed in the north end of Upper Lawson. Surface coal mining operations in the 1980s, known as the McKay-Section 12 Surface Coal Mine, were developed over the top of the New No. 12 Mine.

The exact condition of the Lawson Mine and other smaller mines is not known. The research and subsurface explorations completed to date seem to suggest that the abandoned mines have substantially collapsed; however, additional studies and explorations completed in accordance with the City’s SAO will be needed for specific development in defined hazard areas.

Abandoned underground coal mines pose risks to structures and people above them, as well as to those entering mines or nearing mine openings. These hazards include ground subsidence and collapse, and the presence of methane gas or low oxygen environments generally associated with mine openings. However, no mine openings have been documented on or adjacent to the Lawson Hills site.
*Boundaries of the abandoned coal mines are approximate. The 200ft buffer is included to show the potential locations of the mine boundaries.

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6 How will the alternatives impact geology, topography, and soils?

Erosion Hazard
Shallow surface soils on the Main Property have been mapped as Alderwood and Beausite series soils. In areas with slopes steeper than 15 percent, these soils series are considered to have severe erosion potential. Shallow surface soils on the upland portion of the North Triangle have also been mapped as the Alderwood soils series. These soils are found on slopes steeper than 15 percent on the hillside that bisects the triangle property. Exhibit 4-4 displays potential erosion hazard areas within Lawson Hills.

Erosion potential is highest during construction activity, when the vegetative and topsoil layers have been removed, exposing soils directly to precipitation and wind. Alternative 2 includes the construction of stormwater facilities on the Main Property, and the North Triangle. Stormwater facilities involving discharge on even moderate slopes can result in severe overland erosion and rilling. Development under any of the alternatives could result in changes to the stormwater flow regime (timing, volume, peak flows, and duration) that could increase erosion in Lawson Creek and the unnamed stream.

The approximate acreages of disturbance to erosion hazard areas associated with each alternative are summarized in Exhibit 4-5 (page 4-11).

What are the City’s Requirements for Erosion Hazards?
The City’s Sensitive Area Ordinance (BDMC19.10.410) provides an approach to erosion hazards that emphasizes site design and construction practices to minimize impacts.

Structures are required to be located on the least sensitive portion of the site and clustered where possible to reduce disturbance and removal of vegetation.

Grading is required to minimize alterations to the natural contour of the slope. Stepped/tiered foundations are to conform to existing topography and must include retaining walls.

Drainage systems are to be designed to avoid erosion hazard areas. Overland dispersion systems are prohibited from discharging onto slopes in excess of 5 percent.
Potential Erosion Hazard Areas

Exhibit 4-4

Exhibits in this EIS are intended to provide a general graphical depiction of built and natural environment conditions and may not be accurate to the parcel level.

*Erosion hazard mapping based on the City of Black Diamond Sensitive Areas Ordinance; modified by Icicle Creek Engineers and Parametrix using updated base map topography.
What are the City’s Requirements for Landslide Hazards?

The City’s Sensitive Areas Regulations (BDMC19.10.410) prohibits most activities on landslide hazard areas except in cases where reasonable development cannot be accommodated on portions of the site not subject to landslide hazards and if analysis by a qualified professional establishes compliance with standards to minimize risk.

Buffer requirements include:
- A buffer from the top of a slope to protect persons and property from damage due to catastrophic slope failure and slope retreat over the lifetime of the use and provide an area of vegetation to promote shallow stability, control erosion and promote multiple benefits to wildlife and other resources. The dimension of the buffer generally is equal to the height of the slope.
- Buffers from the toe and side of the slope.

Buffers may be modified based on specific criteria.

### Landslide Hazard

Landslide hazard areas are shown in Exhibit 4-6. The potential for landslides can be increased by development activity, including cutting that removes material holding the toe of a slope in place or additional stormwater runoff from impervious surfaces. Development also can place areas of human habitation or activity in areas subject to damage from naturally occurring or human induced landslides.

Most of the landslide hazard areas on the Main Property, including coal waste stockpiles and the incised Lawson Creek ravine, fall in proposed open space areas under Alternative 2. For the other alternatives, general development areas are presumed to be similar to Alternative 2, although the type and intensity of uses may change.

Most of the North Triangle does not fall into a landslide area; landslide hazard areas on the North Triangle are restricted to the hillside that bisects the triangle. The proposed through roadway in the North Triangle under alternative 2 is located adjacent to this landslide hazard area, which will require additional site-specific analysis.

The approximate acreages of disturbance to landslide hazard areas associated with each alternative are summarized in Exhibit 4-5.
Exhibit 4-6
Landslide Hazard Areas

*Landslide hazard mapping based on the City of Black Diamond Sensitive Areas Ordinance; modified by Icicle Creek Engineers and Parametrix using updated base map topography.

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What are the City's Requirements for Seismic Hazards?
The City's Sensitive Areas Regulations (BDMC19.10.445) provides an approach to seismic hazards that emphasizes identification of potential hazards and design practices to minimize impacts.

Where hazards are identified, an assessment report may be required to evaluate geologic characteristics and their susceptibility to damage during a seismic event, as well as describe and evaluate the best available engineering and geological practices that either eliminates or minimizes the risk of structural damage or injury resulting from seismic forces.

Seismic Hazard
The Lawson Hills study area is located in a region of moderate-to-high earthquake activity, in terms of both the size and frequency of earthquakes. The most significant earthquake related concern, as it relates to the study area, is soil liquefaction. Soil liquefaction occurs because of a loss of soil strength due to strong shaking, and results in a transition of the soil from a solid state to a liquefied state.

The Main Property and upland portion of the North Triangle are not considered susceptible to soil liquefaction during an earthquake. The exception may be the thick fill present in the McKay Section 12 Mine, which has not been evaluated in sufficient detail for liquefaction potential to be assessed. The lowland area of the North Triangle has low liquefaction potential based on the native soil and groundwater.

Volcanic Hazard
The most severe potential volcanic hazards (lateral blasts, lava flows, ballistic debris, and pyroclastic flows) are not likely to occur in the Black Diamond area due to the distance from Mount Rainier. Lahar flows – dense slurries of water-saturated debris including rock, soils, and trees – are also low, as Black Diamond is not in a valley or low lying area through which semiliquid debris would be transported from a volcanic eruption of Mount Rainier.

Based on analysis of prevailing wind patterns, the United States Geologic Service (USGS) has rated the Black Diamond areas as having a very low annual probability of significant ash accumulation. Therefore, ash-related human health and property concerns are not significant for any of the alternatives.
7 What are the City’s requirements for mine hazards?

The City’s SAO Regulations emphasize identification of potential mine hazards and either avoidance or design practices to minimize impacts to human health and property.

Areas of severe mine hazard are those that pose a significant risk of catastrophic ground surface collapse (including mines that are less than one hundred fifty feet from the surface), have publicly accessible openings, and/or have sinkholes. The preferred uses of severe mine hazard areas are open space and passive recreation facilities. Vulnerable facilities, including schools, nursing homes, hospitals, and emergency response facilities are prohibited in severe mine hazard areas.

Moderate mine hazard areas pose significant risks of property damage that may be mitigated (including mines at a depth of 150 feet to 300 feet), and have no publicly accessible openings or sinkholes within 100 feet. Development is allowed in moderate mine hazard areas if a detailed hazard assessment documents that risks are no greater than those facing properties that are not located above mines. Vulnerable facilities are not allowed in moderate hazard areas if there is a feasible alternative location.

Areas of low mine hazard include locations with mines at a depth of more than 300 feet (or where potential subsidence is limited to specific standards) and no accessible openings or sinkholes within 100 feet. Development in low hazard areas is allowed if risks are no greater than those facing properties that are not located above mines. Vulnerable facilities are not allowed in low hazard areas if there is a feasible alternative location.

Mine hazard areas may be declassified based on a detailed, site-specific mine study documenting that mine hazards are equivalent to lands not situated above mines.
8 How do mine hazard areas impact the alternatives?

Mine hazard areas are shown in Exhibit 4-7. Hazards associated with abandoned coal mines include mine collapse and ground subsidence as well as fire risk resulting from methane gas generation. The potential for coal mine collapse and ground subsidence is influenced primarily by the height of the mine tunnels and shafts, the depth and the strength of the rock roof, and the type and amount of roof support within the mine.

Two types of ground effects can result from mine subsidence: sinkholes and sag. Sinkholes are characterized by an abrupt sinking or collapse of the surface, resulting in a steep-sided feature often resembling a cone or crater. Sinkholes are almost always associated with a former underground mine opening such as a portal, air shaft, or timber chute. Sag subsidence is a more gentle and gradual settling of the surface over a larger area. Sag subsidence is a function of the strength of the overburden mantle of bedrock relative to the extent of the mine void. In general, deeper mines are more likely to result in sag subsidence if conditions warrant, while sinkholes are only expressed from the collapse of more shallow mines. Shallow mines pose the greatest hazards for two reasons. They are more likely to result in sinkholes and the abrupt nature of collapse is more likely to cause catastrophic damage. Most sag subsidence has in all likelihood already occurred due to the long time period since the mine’s closure and abandonment. However sinkholes can sometimes develop even years after a mine’s abandonment if the associated portal, air shaft, or timber chute were not properly plugged. Sinkhole development is often associated with collapses caused by wet soil conditions, when supersaturated soils grow heavy and put added pressure on an un-reclaimed former opening, or when previous capping structures (for example, wooden covers) fail.

All build alternatives risk mine collapse and subsidence to the extent to which development is proposed over or near abandoned mines and the extent of mine exploration and assessment done to reduce hazards. The extent to which mine hazard areas impact each alternative is described on page 4-17.
Exhibit 4-7
Mine Hazard Areas

*Coal mine hazard mapping based on the City of Black Diamond Sensitive Areas Ordinance; modified by Icicle Creek Engineers, Inc. using updated base map topography.

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**Alternative 1**

Alternative 1 assumes that the Lawson Hills properties will develop consistent with current zoning. This type of development would be characterized by residential development occurring slowly and incrementally, and avoiding impacts to all regulated sensitive areas. In regard to mine hazard areas, Alternative 1 assumes that severe mine hazard areas would be preserved in open space, and that low and moderate mine hazard areas would be developed with residential uses. Utilizing these assumptions, approximately 107 acres of low and moderate risk mine hazard areas will be developed under Alternative 1.

**Alternative 2**

Alternative 2 represents the Applicant’s proposal under the City’s MPD Ordinance, and includes development of approximately 122 acres of land categorized as potential mine hazard areas (including low, moderate, and severe). However, the majority of areas mapped as potential severe hazard areas are designated as open space on the conceptual land use plan. The area identified as a coal mine waste stockpile is also located within designated open space areas under this Alternative.

Two major roads and utility corridors cross the potential mine hazard area, and are permitted in accordance with the requirements of the SAO. Roads and utilities are susceptible to damage from subsidence that can affect road surface usability and result in bending or breaking of utility lines such as water, sewer, and gas.

**Alternative 3**

Alternative 3 also assumes that severe mine hazard areas would be preserved in open space, and that low (and to some extent) moderate mine hazard areas would be developed with residential uses. Utilizing these assumptions, approximately 85 acres of low and moderate risk mine hazard areas will be developed under Alternative 3.

**Alternative 4**

Alternative 4 would be similar to Alternatives 2 and 3, and was not further studied in this section.
9 What policies and standards address geologic hazards?

The City of Black Diamond regulates geologically hazardous areas through its SAO regulations. This includes landslide hazard areas, erosion hazard areas, mine hazard areas, and seismic hazard areas. The City also maintains a map that indicates the approximate location and extent of known geologically hazardous areas.

There are two basic strategies for management of geological hazards, depending on the potential risk to life and property: avoidance and management.

- Avoidance is the primary strategy for landslide hazards and the most severe mine hazards.
- Management is the prescribed strategy for erosion hazards and seismic hazards as well as less severe landslide and mine hazards.

The City requires field investigation and reports accompany any proposal for development in geologically hazardous areas, as outlined in the SAO.

Generally, activities not typically associated with high levels of ground invasion or disturbance, such as passive outdoor recreation, are permitted in geologically sensitive areas. Certain activities that could increase the level of hazard or increase the potential for exposure to hazards, such as trail construction, may be permitted under specific conditions. Some activities are not permitted in geologically sensitive areas at all unless it is proven the activities cannot be located elsewhere, and the proposal will not increase the hazard and the risk to life and property.

In mine hazard areas, where risks have been reduced through documented collapse of subsurface mine features or through remediation such as filling voids, such areas can be declassified (reclassified as not hazardous). In order to characterize hazards and appropriate strategies for remediation and/or management, additional subsurface exploration will be necessary.
10 What measures reduce or avoid impacts on geology and soils?

All of the alternatives include construction of residential uses within geologic hazard areas of varying levels of risk, and have similar potential to directly impact geology and soils. Under all of the alternatives there is also the potential to eliminate or relocate uses that would otherwise concentrate large numbers of persons, or vulnerable populations, into relatively less risky areas.

The alternatives involve similar areas of ground disturbance and therefore have similar potential for construction-related erosion. The City of Black Diamond has the authority under the SAO to require changes in buildable areas and buffers that can mitigate potential hazards under all of the Alternatives. Discussion of measures to mitigate for specific impacts to geology and soils is included in the following pages.

Erosion Hazards

Soil erosion can be addressed during site design and construction. During construction, the use of silt fences, hay bales, temporary sediment ponds, truck wash areas, regular road cleaning, and straw mulch or rock coverings can minimize risks associated with erosion. In addition, major earth moving and grading can be limited to the “dry season,” between May and September, to avoid water quality impacts from erosion due to wet soils.

With additional impervious surfaces the total volume of water discharged to streams and the duration of flows will be increased, which has the potential to increase erosion. However, stormwater management can minimize increased risks of stream erosion by utilizing detention facilities that avoid increases in peak stream flows. Protecting stream banks from disturbance can also reduce the adverse impacts of stream erosion in cases where vegetation is an effective means of stabilizing stream banks. Utilizing bridges or appropriately sized culverts for roadway crossings of streams can allow peak-flow high-water events to pass unimpeded and also preserve some normal stream processes.
Designing stormwater facilities to avoid discharging concentrated stormwater flows on moderate and steep slopes is also a very effective strategy for avoiding severe land erosion.

**Landslide Hazards**

The most reliable means of avoiding landslide hazards is avoidance of the area and utilizing sufficient setbacks to increase the safety of nearby human uses. Potential landslide hazard areas on the Main Property, such as the incised Lawson Creek ravine, are proposed for open space uses. If variation to standard setbacks is proposed under any alternative, site-specific geotechnical evaluations may be necessary to determine whether such variation constitutes a potential hazard.

Management of stormwater and groundwater to avoid increases in overland flow or infiltration in areas of potential slope failure can also help avoid water-induced landslides. Extreme care must be taken when considering the location of stormwater ponds, other detention facilities, and stormwater infiltration systems near potential landslide areas.

**Seismic Hazards**

Thick, water saturated, loose fill may be susceptible to liquefaction. The thick fill present in the McKay Section 12 Mine has not been evaluated for liquefaction potential. Because the water table elevation in this area is unknown and because soils testing indicated fill in the area is dense, a liquefaction evaluation should be done prior to placing any structures on the fill. In general, the potential effects of liquefaction can also be mitigated through engineering and design.

**Mine Hazards**

Mine hazards to structures and road and utility crossings can be avoided by designating the most severe hazard areas as open space and by routing roads and utilities to avoid such areas. Even in open space areas, actions may be necessary to avoid hazards to persons using the areas for recreational purposes. Where avoidance is not feasible or where hazards are less severe, risks can be reduced through remediation measures. Remediation measures may include filling mine tunnels and shafts, designing structures to avoid failure if settlement occurs, and utilizing flexible utility lines.
It is difficult to accurately characterize risk for shallow and moderately deep mine tunnels and shafts. In order to document hazards and identify appropriate remediation measures, drilling as required by the SAO may be needed to determine whether mines have collapsed. This is very expensive and involves inherent risks. The inaccuracies in mine surveys make it difficult to ensure that drill holes encounter tunnels and shafts and don’t simply drill through pillars retained as part of the mine. In addition, below ground conditions are very variable and documentation that mines have collapsed in one area may not be indicative of conditions a relatively short distance away.
Hazardous Materials

1 Are there any potentially contaminated sites in the study area?

Many chemical wastes are persistent in the environment, are harmful to the environment and/or human health, and remain toxic for a very long time. Some of these wastes can also become more concentrated in the tissues of animals higher in the food chain over time, a process known as bio-accumulation. In Washington, about 7,000 facilities and businesses produce more than 117 million pounds of hazardous waste annually.

The Washington State Department of Ecology maintains an identification tool, which includes information on potentially hazardous facilities or sites that are currently or have been of interest to Ecology, and have been or are currently regulated by Ecology. These facilities or sites may include state cleanup sites, voluntary cleanup sites, federal Superfund sites, hazardous waste generators, soil waste facilities, underground storage tanks, dairies, and locations where enforcement actions have occurred. A search of this database indicates there are twelve facilities/sites of interest in the Lawson Hills vicinity; all twelve are located in the area on or around the Main Property. There are no sites in the facility/site atlas shown on or immediately adjacent to the North Triangle.

Of the twelve facilities/sites in the vicinity, only five are still active or include active components. Of these active facilities, only one (the Johnston Property) is within the Lawson Hills boundaries (on the Main Property). This site is classified as a voluntary cleanup site, and cleanup activities are nearly complete (Exhibit 4-8).

*Hazardous waste facilities* are those that generate any quantity of a dangerous waste (“hazardous waste generator”), or facilities that are required to register with Ecology but do not directly manage or generate hazardous waste (“hazardous waste other”). Hazardous waste transporters are an example of a facility that would be categorized as “hazardous waste other.” Hazardous waste facilities may also include businesses that store or use certain quantities of hazardous chemicals at any one time (“hazardous waste tier 2”).

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*What are “persistent” chemicals?*

Dioxin, mercury, toxic flame retardants (PBDEs), DDT, and PCBs are among a class of chemicals called persistent toxic chemicals. These chemicals are toxic in small amounts, are long lasting in the environment, and build up in foods, animals, and people.
Exhibits in this EIS are intended to provide a general graphical depiction of built and natural environment conditions and may not be accurate to the parcel level.
State cleanup sites include those sites undergoing formal cleanup under state oversight. Underground storage tank sites include the sites with underground storage that Ecology regulates, including gas stations, industries, commercial properties, and government entities. “Leaking” underground storage tank sites are underground storage tank sites that have or have had leaks at one time. Voluntary cleanup sites are those sites where Ecology staff has reviewed independent cleanup reports and provided a written decision about the adequacy of cleanup actions taken. Enforcement sites are those sites where voluntary compliance was not achieved and Ecology has pursued enforcement.

2 How do the alternatives relate to hazardous materials sites?

The impacts of developing on or near hazardous sites or facilities is related to the type and location of the waste, the nature of the development, sensitive uses (such as drinking water wells) in the area, and efforts taken to minimize risk. In many cases, hazardous materials can be removed from a site prior to construction, minimizing future risk to human health.

Of the twelve facilities/sites, only five are still active or include active components. Of these active facilities, only one is within the Lawson Hills boundaries (on the Main Property). This site is classified as a voluntary cleanup site, signifying that cleanup activities have occurred.

As outlined above, a major concern with hazardous sites or facilities is their proximity to public drinking water sources and wellhead protection areas. As the one active facility within the Main Property does not fall within an established wellhead protection area, none of the alternatives is likely at risk of significant impacts from hazardous waste sites.

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What is a wellhead protection area?
Designated wellhead protection areas are the surface and subsurface areas surrounding a well or well field, supplying a public water system with over 1,000 connections, through which contaminants are reasonably likely to move toward and reach such water well or well field. Designated wellhead protection areas are approved by the Washington State Department of Health.