

## **Appendix A – Glossary of Geotechnical Terms**

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| <b>Alluvial</b>                 | Relating to alluvium.  |
| <b>Alluvium</b>                 | Sediment deposited by streams or rivers during recent time.  |
| <b>Angle of repose</b>          | The maximum angle at which a pile of unconsolidated material can remain stable, related to the density, surface area and shapes of particles, and the coefficient of friction of the material. |
| <b>Anticline</b>                | A rock fold that is convex upwards.  |
| <b>Bed</b>                      | A small stratigraphic unit, distinguishable from those above and below it.   |
| <b>Bedrock</b>                  | The solid rock that underlies, soil, sediment, or other surficial material.  |
| <b>Bituminous coal</b>          | A soft coal formed by an intermediate degree of metamorphism and containing 15 to 20 percent volatiles. The most common grade of coal.   |
| <b>Boulder</b>                  | Particle ranging in size larger than 12-inches.  |
| <b>Cascadia Subduction Zone</b> | The subduction zone in the Pacific Northwest where the oceanic plate dives beneath the continental plate.  |
| <b>Clasts</b>                   | A constituent of detrital sediment or sedimentary rock produced by the physical disintegration of a larger mass.   |
| <b>Clay</b>                     | The smallest mineral particle size, less than .004 mm. Also any of a number of hydrous aluminosilicate minerals formed by weathering and hydration of other silicates.                         |
| <b>Coarse-grained</b>           | A sediment composed primarily of sand or larger particles, or crystalline rock in which individual minerals are relatively large.  |
| <b>Cobble</b>                   | Particle ranging in size from 3-inches to 12-inches.   |
| <b>Contact</b>                  | The surface between two types or ages of rock or sediment.   |
| <b>CSZ</b>                      | Cascade Subduction Zone.   |
| <b>Debris flow</b>              | A fast downhill mass movement of soil and rock; generally results in an unsorted deposit.  |
| <b>Depositional</b>             | Pertaining to the process of deposition, or formed by the process of deposition.   |
| <b>Eocene</b>                   | A period of geologic time from 55.8 million and 33.9 million years before present. The Eocene epoch followed the Paleocene epoch and preceded the Oligocene epoch.                             |

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| <b>Erosion</b>          | The set of all processes by which soil and rock are loosened and moved downhill or downwind.                                      |
| <b>Erosional</b>        | Pertaining to or produced by the work of erosion.   |
| <b>Exhumation</b>       | The uncovering or exposure by erosion of a pre-existing surface, landscape or feature that was buried by later deposition.        |
| <b>Fault</b>            | A fracture or fracture zone along which there has been displacement of sides relative to one another .                            |
| <b>Fill</b>             | Man-modified deposits of rock and soil used for building up an area.  |
| <b>Fine-grained</b>     | A sediment composed primarily of silt or clay size particles, or when the individual minerals of a rock are relatively small.     |
| <b>Fluvial</b>          | Pertaining to or deposited by rivers or streams.  |
| <b>Fold belt</b>        | A linear region characterized by compressional tectonics, including folding.  |
| <b>Geotechnical</b>     | Pertaining to practical and engineering aspects of geological sciences.   |
| <b>Glacial deposits</b> | Soils deposited by glaciers.  |
| <b>Glacial outwash</b>  | Sand and gravel deposited by glacial meltwater streams in front of the margin of an active glacier, a glaciofluvial deposit.      |
| <b>Glacial till</b>     | Non-sorted to poorly-stratified sediment deposited by a glacier and consisting of clay, silt, sand, gravel, and boulders.         |
| <b>Glaciation</b>       | The formation, movement, and recession of glaciers or ice sheets.   |
| <b>Glaciofluvial</b>    | Silty sand to well-sorted sand and gravel that was deposited by glacial outwash rivers and streams and subglacial meltwater flow. |
| <b>Gravel</b>           | Rock particles ranging in size from 5 millimeters to 3 inches.  |
| <b>Holocene</b>         | An epoch of the Quaternary period from about 10,000 years ago to present, sometimes referred to as “recent.”                      |
| <b>Incised</b>          | A stream, river, meander or notch that has downcut or entrenched into the surface.  |
| <b>Indurated</b>        | Hardened, generally from soil into rock.  |
| <b>Interbedded</b>      | Occurring as interlayered beds of different material.   |
| <b>Lacustrine</b>       | Pertaining to lakes.  |
| <b>Laminated</b>        | Thinly (less than 3/4-inch) layered.  |

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| <b>Landslides</b>      | The downslope movement, under gravity, of masses of soil and rock material; also referred to as slope failure.  |
| <b>Liquefaction</b>    | Loss of soil strength resulting from shaking of water-saturated soils.  |
| <b>Loam</b>            | A soil composed of relatively equal parts of sand, silt, and clay.  |
| <b>Loess</b>           | Fine sediment scoured and deposited by wind.  |
| <b>Miocene</b>         | A period of geologic time from 25 million to 5 million years before present.  |
| <b>Mudstone</b>        | Rock composed of clay-sized particles.  |
| <b>Overburden</b>      | Unconsolidated sediments overlying bedrock, also referred to in this report as waste rock removed during mining.  |
| <b>Oceanic plate</b>   | A plate the consists mostly of oceanic basalt and sediments.  |
| <b>Outcrop</b>         | The exposure of bedrock or strata projecting through the overlying cover of soil.   |
| <b>Parent material</b> | The underlying rock or sediment from which a soil formed.   |
| <b>Permeability</b>    | The capacity of a sediment or rock to transmit fluid.   |
| <b>Perched</b>         | Unconfined ground water separated from the underlying main body of ground water by unsaturated sediment or rock.  |
| <b>Plate</b>           | A rigid segment of the earth's crust.   |
| <b>Plateau</b>         | An elevated, relatively level stretch of land.  |
| <b>Pleistocene</b>     | A period of geologic time from 2.588 million to 12,000 years before present covering the world's recent period of repeated glaciations (i.e., the last "ice age"). The Pleistocene epoch followed the Pliocene epoch and preceded the Holocene epoch. |
| <b>Pliocene</b>        | A period of geologic time from 5.332 million to 2.588 million years before present. The Pliocene epoch followed the warmer Miocene epoch and preceded the Pleistocene epoch.  |
| <b>Quaternary</b>      | A period of geologic time from 2 millions years to the present.   |
| <b>Redoximorphic</b>   | A soil property associated with wetness which results from the reduction and oxidation of iron and manganese compounds in the soil after saturation with water and desaturation, respectively. Mottles are common redoximorphic features of soils.    |
| <b>Residuum</b>        | Highly weathered rock with soil-like characteristics.   |

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| <b>Rupture</b>             | The surface expression of a fault.   |
| <b>Sand</b>                | Mineral particles ranging from 0.4 mm to 5 mm.   |
| <b>Sandstone</b>           | Rock composed of sand-sized particles.   |
| <b>Sedimentary rock</b>    | Pertaining to or containing sediment, or formed by its deposition.   |
| <b>Seismic</b>             | Pertaining to an earthquake or earth vibration.  |
| <b>Silt</b>                | Mineral particles ranging from .08 mm to .004 mm.  |
| <b>Siltstone</b>           | Rock composed of silt-sized particles.   |
| <b>Creep</b>               | Very slow mass movement of soil that occurs under the influence of gravity, generally on the order of millimeters or centimeters per year. |
| <b>Strata</b>              | Layers in rock or soil.  |
| <b>Subduction</b>          | The process of one crustal plate descending beneath another.   |
| <b>Syncline</b>            | A fold of rock layers that is convex downwards.  |
| <b>Tectonic</b>            | Pertaining to or designating the soil and rock structure and external forms resulting from the deformation of the earth's crust.           |
| <b>Tectonic Plate</b>      | A continental or oceanic plate.  |
| <b>Terrace</b>             | A raised earth bank with a relatively flat top and vertical or steeply sloping sides.  |
| <b>Tertiary</b>            | The period of geologic time from 65 million to 2 million years before present.   |
| <b>Topsoil</b>             | The fertile, dark-colored surface soil containing organic material.  |
| <b>Unconsolidated</b>      | Non-lithified sediment that has no mineral cement or matrix binding its grains.  |
| <b>Volcanic, volcanism</b> | Pertaining to the activities, structures, or soil or rock types of a volcano.  |

## **Technical Appendices**

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Nine technical reports were prepared in support of the City Heights Draft EIS. These are available for review in a separate 3-ring binder at Cle Elum City Hall and at the Cle Elum Library. Electronic files of the Technical Appendices are also on the City Heights Draft EIS CD sent to everyone on the Distribution List and available at City Hall.

- 1 Archaeological Review and Inventory**
- 2 Coal Mine Hazards Risk Assessment**
- 3 Coal Waste Rock Sampling and Analysis**
- 4 Fiscal Analysis**
- 5 Grading, Drainage and Utilities Technical Report**
- 6 Phase I Environmental Site Assessment**
- 7 Preliminary Geology and Geotechnical Evaluation**
- 8 Visual Analysis**
- 9 Wetlands and Wildlife Habitat Report**

