

REFERENCES

GIS data sources

Exhibit B-1 (sheets 1 through 8)

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WSDOT (Washington State Department of Transportation). 2006 – 2007. I-405 Staff; existing right-of-way and mileposts.

Exhibit B-2 (sheets 1 through 8)

WSDNR (Washington State Department of Natural Resources), Geology and Earth Resources Division. Surface Geology, 2003.

WSDOT (Washington State Department of Transportation). 2006 – 2007. I-405 Staff; existing right-of-way.

Exhibit B-3 (sheets 1 through 8)

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King County Standard GIS Data Disk, extract June 2006:

1997. Erosion Hazards.

2003. Landslide Hazard Areas.

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Puget Sound LiDAR Consortium, LiDAR, 2002. http://pugetsoundlidar.ess.washington.edu/About_PSLC.htm

2006. Steep Slopes. Created by GeoEngineers, Inc. using the Puget Sound LiDAR Consortium data.

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Base data

All GIS exhibits contain one or more of the following as base layers:

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2005. Streams and Rivers. Data updated by I-405 staff to match fieldwork, 2002 LiDAR, and orthorectified aerial photography.
2005. Trails in King County. Data updated by I-405 staff to match fieldwork, 2002 LiDAR and orthorectified aerial photography.
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- WSDOT. February 2005. "I-405, SR 520 to SR 522-Kirkland Nickel Project Geology, Soils, and Groundwater Discipline Report, Appendix T."
- WSDOT. April 2008. I-405, NE 8th Street to SR 520 Improvement Project Geology and Soils Technical Memorandum.
- WSDOT. August 2010. "Bridge Design Manual, M 23-50.04."
- WSDOT. October 2010. "Environmental Procedures Manual, M 31-11."
- WSDOT. November 2010. "Geotechnical Design Manual, M 46-03.02."

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APPENDIX A METHODOLOGY

How did we collect information on soils and geology for this report?

The I-405 Corridor Team collected information for this technical memorandum by reviewing the following data sources:

- Previous investigations along I-405 conducted by Washington State Department of Transportation (WSDOT) and others, including the borehole logs for these investigations.
- I-405, Kirkland Nickel Project *Phase I, Geotechnical Baseline Report*.
- I-405, Kirkland Nickel Project *Phase II, Geotechnical Baseline Report*.
- I-405, SR 520 to SR 522 - Kirkland Nickel Project, *Soils, Geology, and Groundwater Discipline Report*.
- I-405, NE 8th Street to SR 520 Improvement Project, *Geology and Soils Technical Memorandum*.
- Public data such as LiDAR, stereographic aerial photographs, Soil Conservation Service (now known as the National Resource Conservation Service) soil maps, geologic maps, coal mine maps, and liquefaction susceptibility maps.
- Published articles from the U.S. Geological Survey (USGS), local purveyor reports, Washington State Department of Ecology (Ecology), U.S. Environmental Protection Agency (EPA), King County and other agencies.
- Agency web sites for geology and soil conditions.
- Applicable WSDOT Standards, such as those contained in the WSDOT *Geotechnical Design Manual*.

A complete list of the sources that were reviewed for this report is provided in the References section. In addition to the literature review, we completed a site reconnaissance to observe physical features to aid with interpreting subsurface conditions and to “field truth” the information gleaned from the literature review to the extent possible.

Existing conditions evaluation

Following our compilation of this information, we evaluated existing conditions within the study area. Existing conditions were evaluated directly from the data sources and by evaluating information from multiple sources using standard geologic and geotechnical principles. For example, identifying areas that will likely be underlain by

soft soils by reviewing and compiling published information and evaluating boring logs from previous investigations.

Potential effects evaluation

The methods used to evaluate the project's potential effects included:

- Reviewing the proposed project design concept and likely construction methods.
- Evaluating the potential effects of the soils and geology on the project based on the existing site conditions and standard WSDOT practices.
- Evaluating the potential effects of the project on the soils and geology based on the existing site conditions and standard WSDOT practices.

The evaluations are based primarily on prior experience, expert judgment, and WSDOT practices and sound engineering principles. WSDOT's 2010 *Geotechnical Design Manual* discusses many WSDOT design and construction practices for various geological conditions.

**APPENDIX B SOIL UNITS, SURFACE GEOLOGIC UNITS,
AND GEOLOGIC HAZARD AREAS**

Exhibit B-1: Soils units – sheet 1 of 8

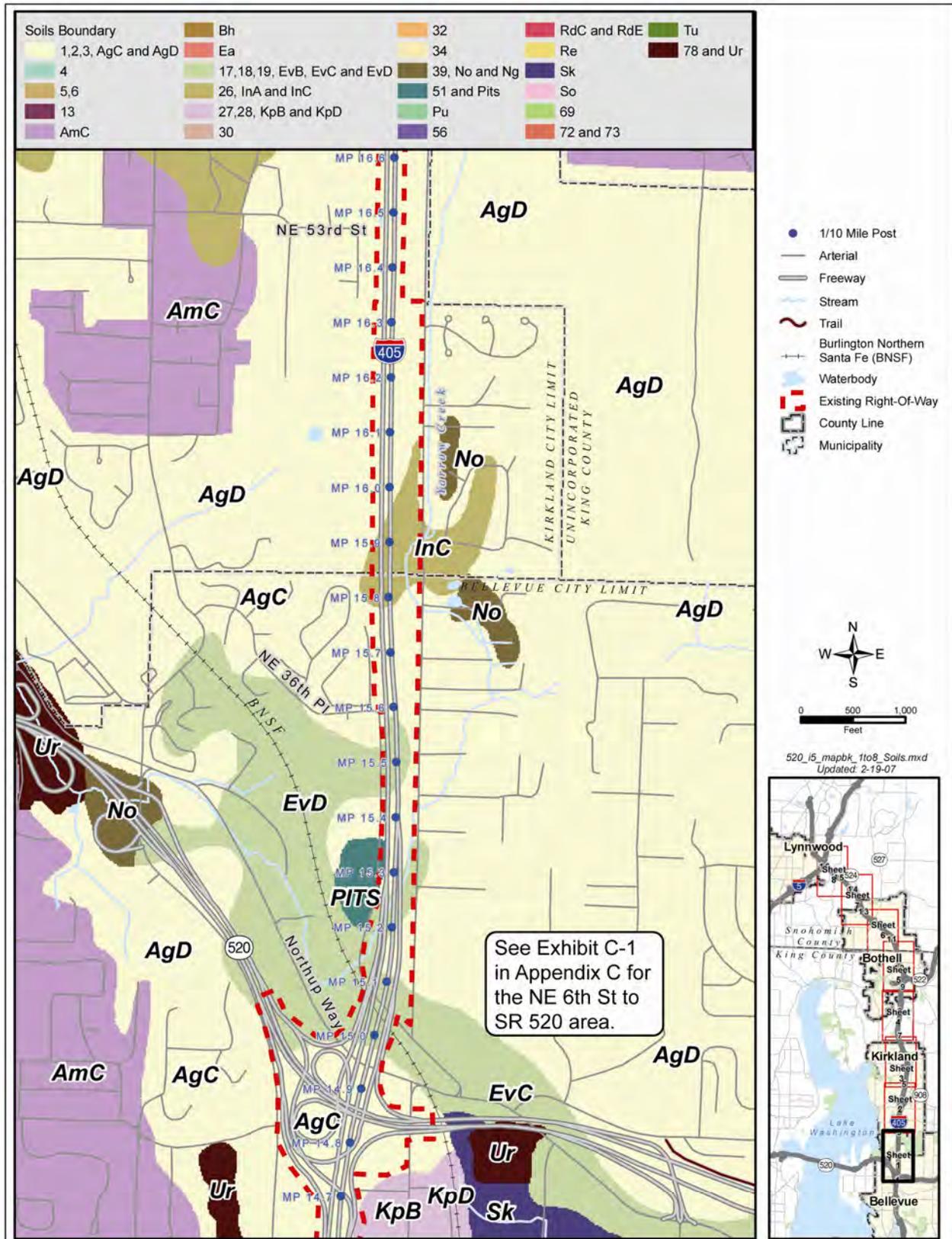


Exhibit B-1: Soils units – sheet 2 of 8

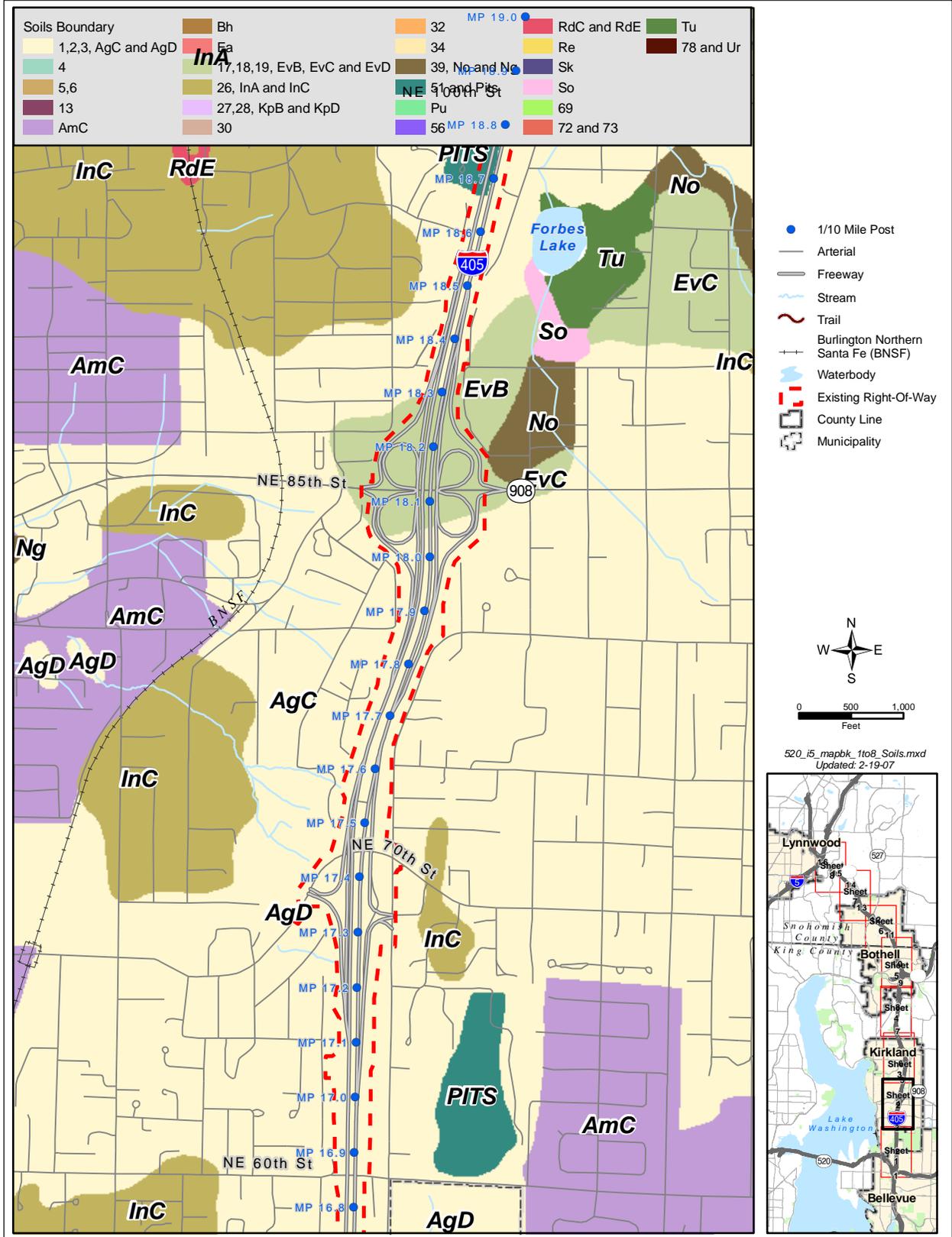


Exhibit B-1: Soil units - sheet 3 of 8

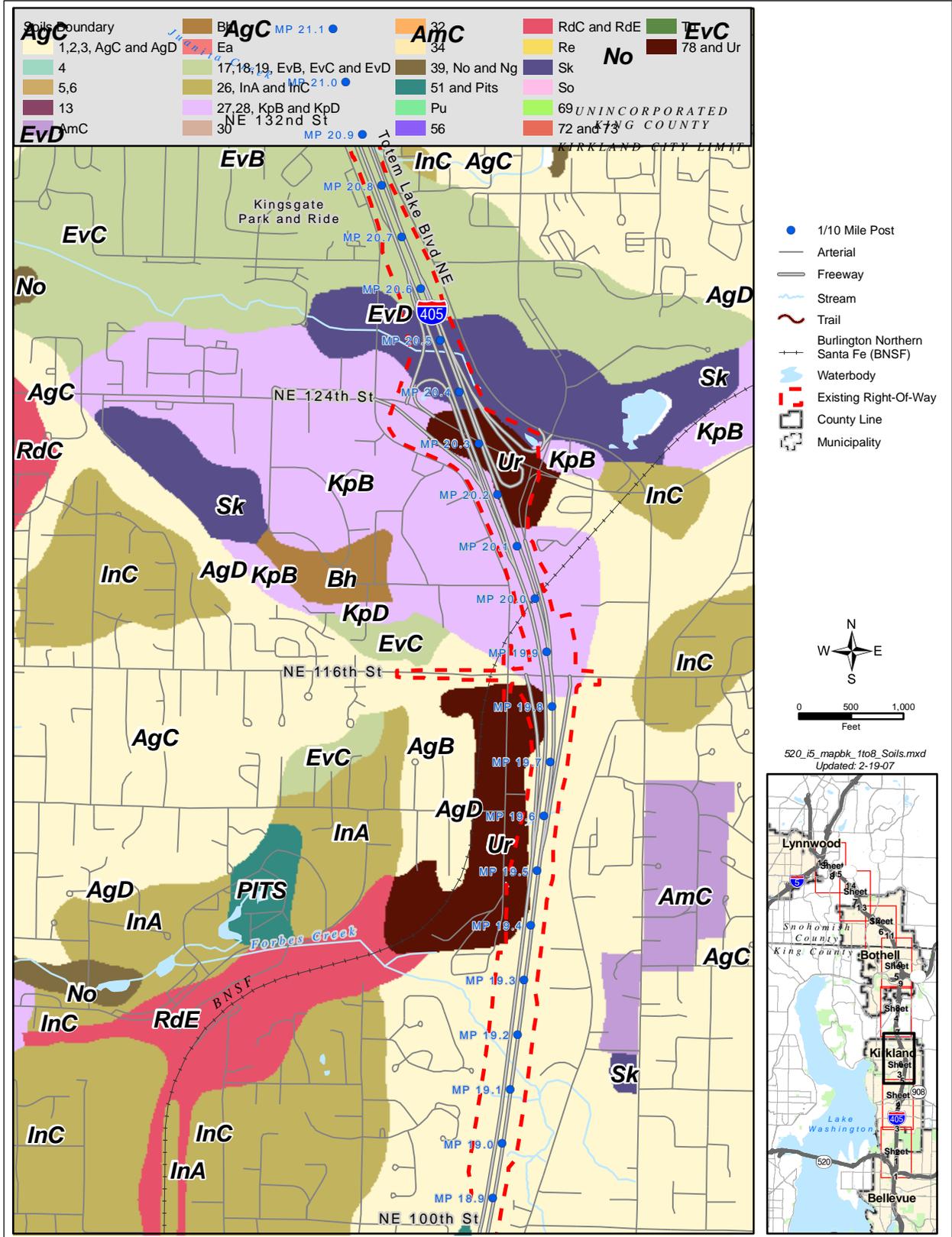


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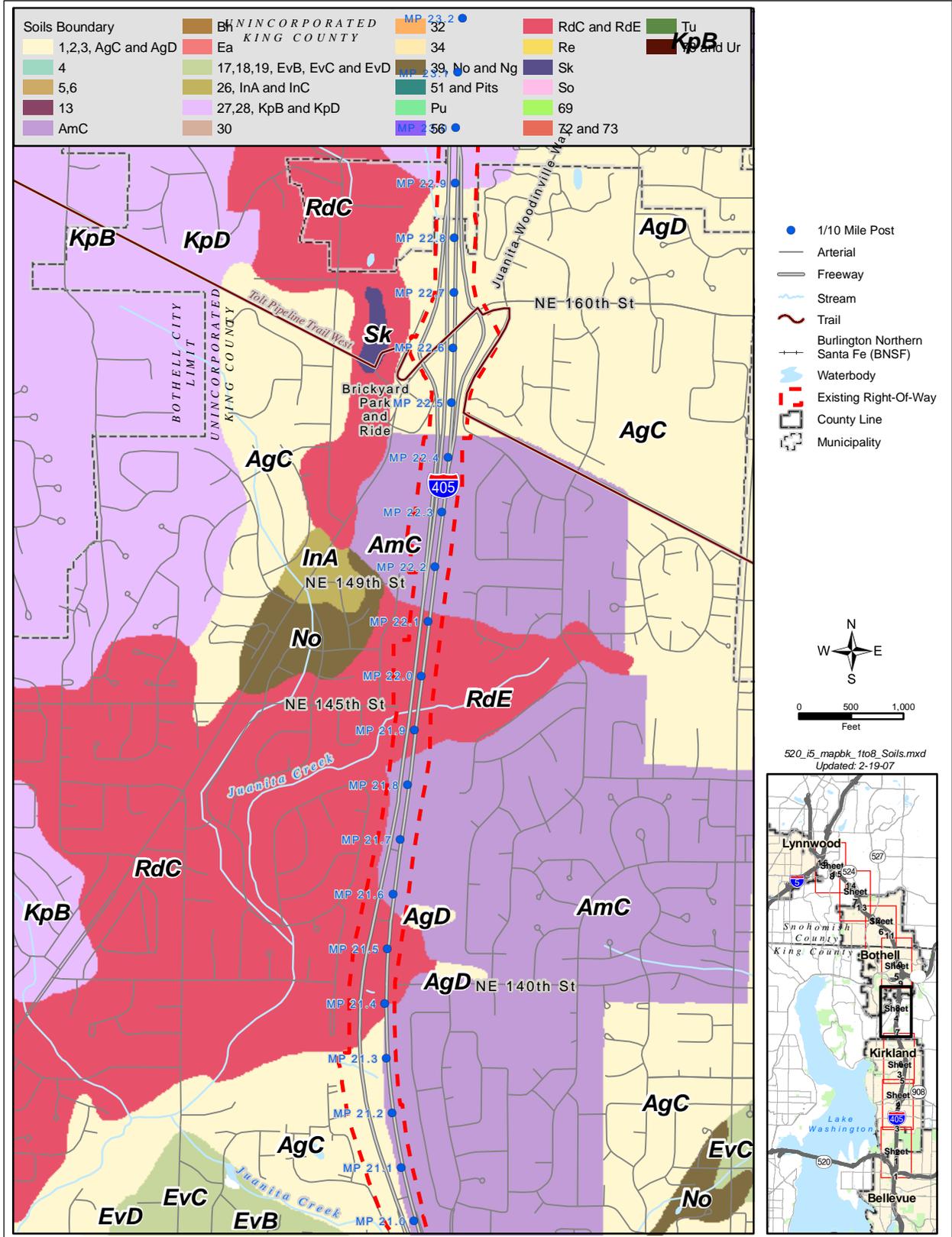


Exhibit B-1: Soil units - sheet 6 of 8

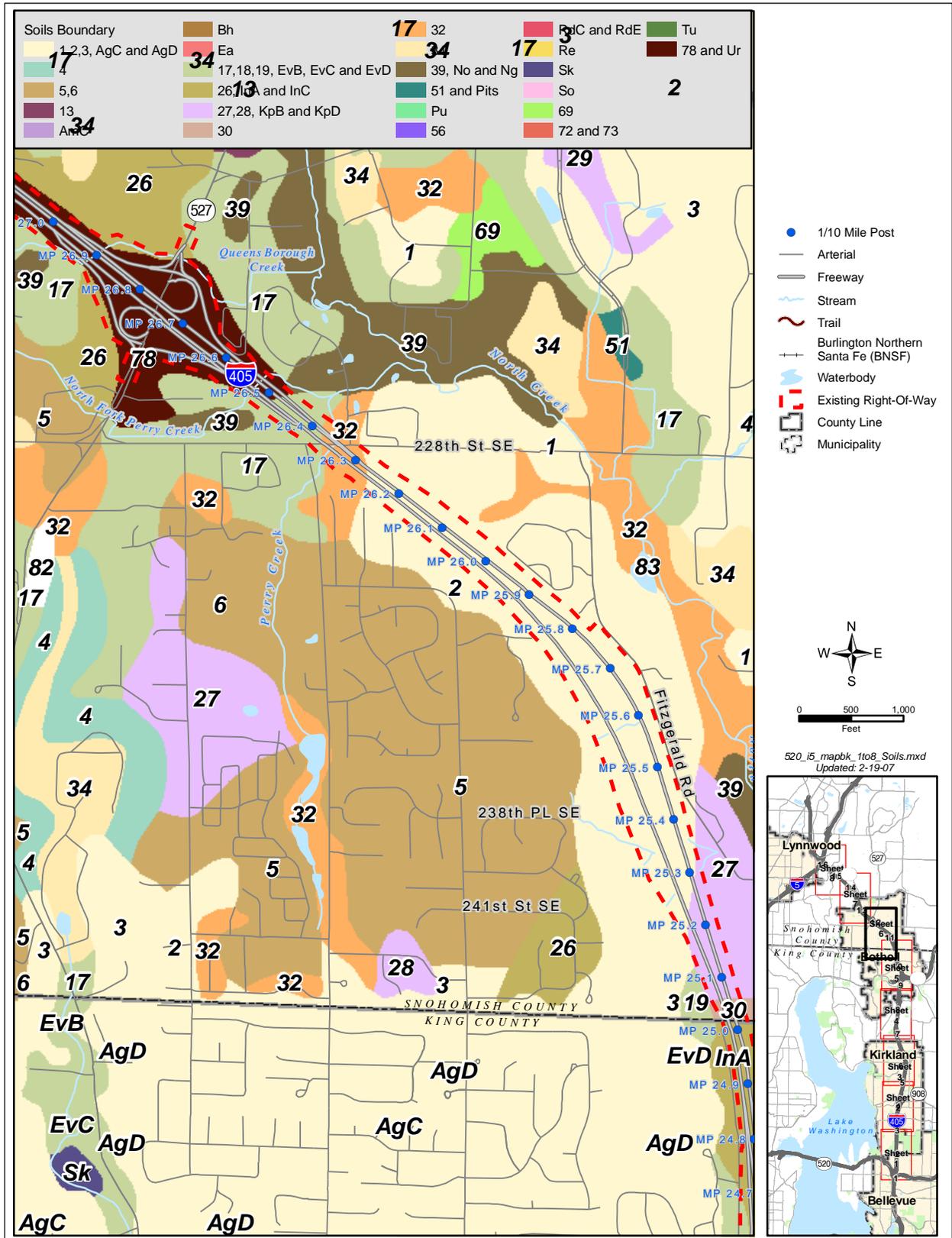


Exhibit B-1: Soil units - sheet 7 of 8

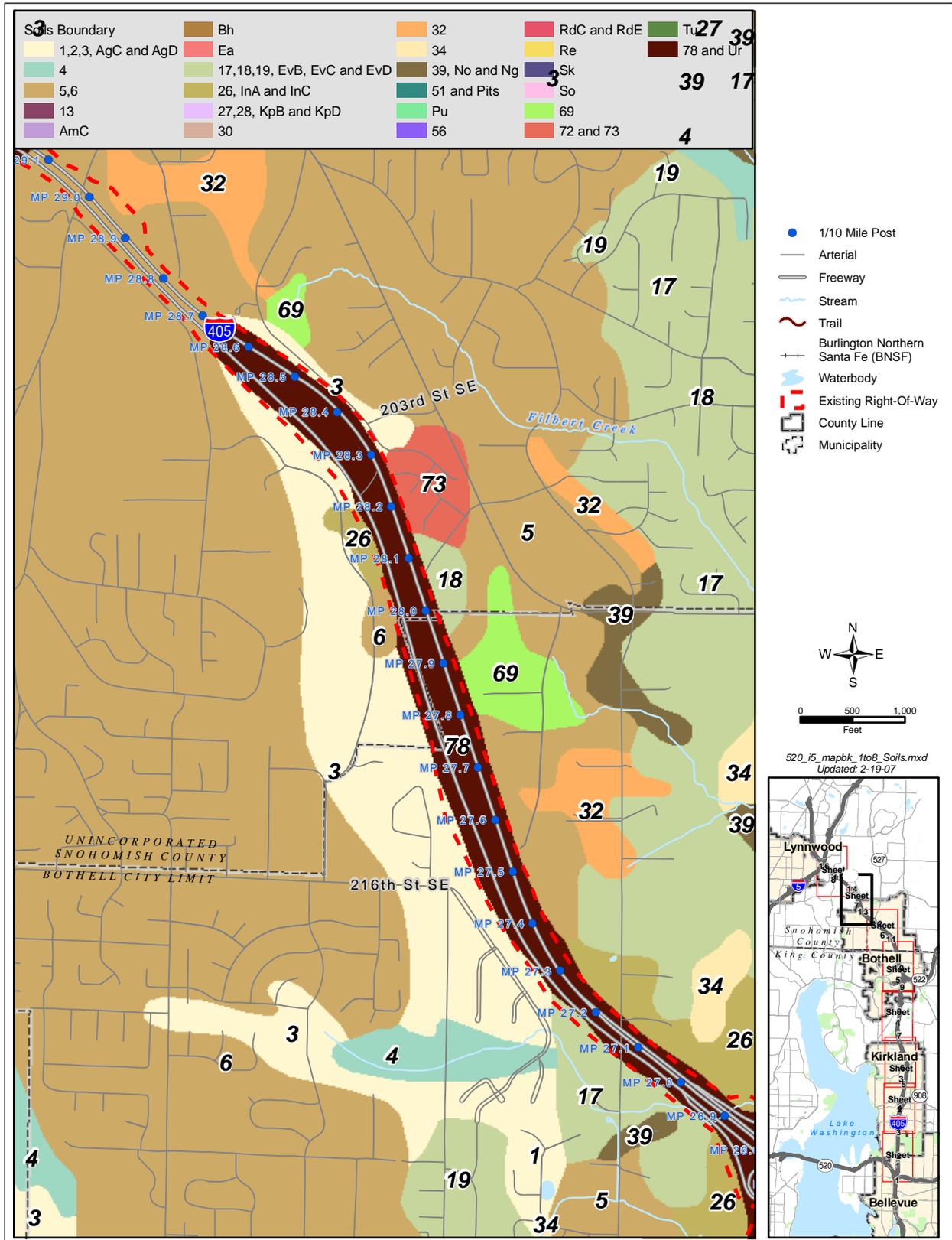


Exhibit B-1: Soil units - sheet 8 of 8

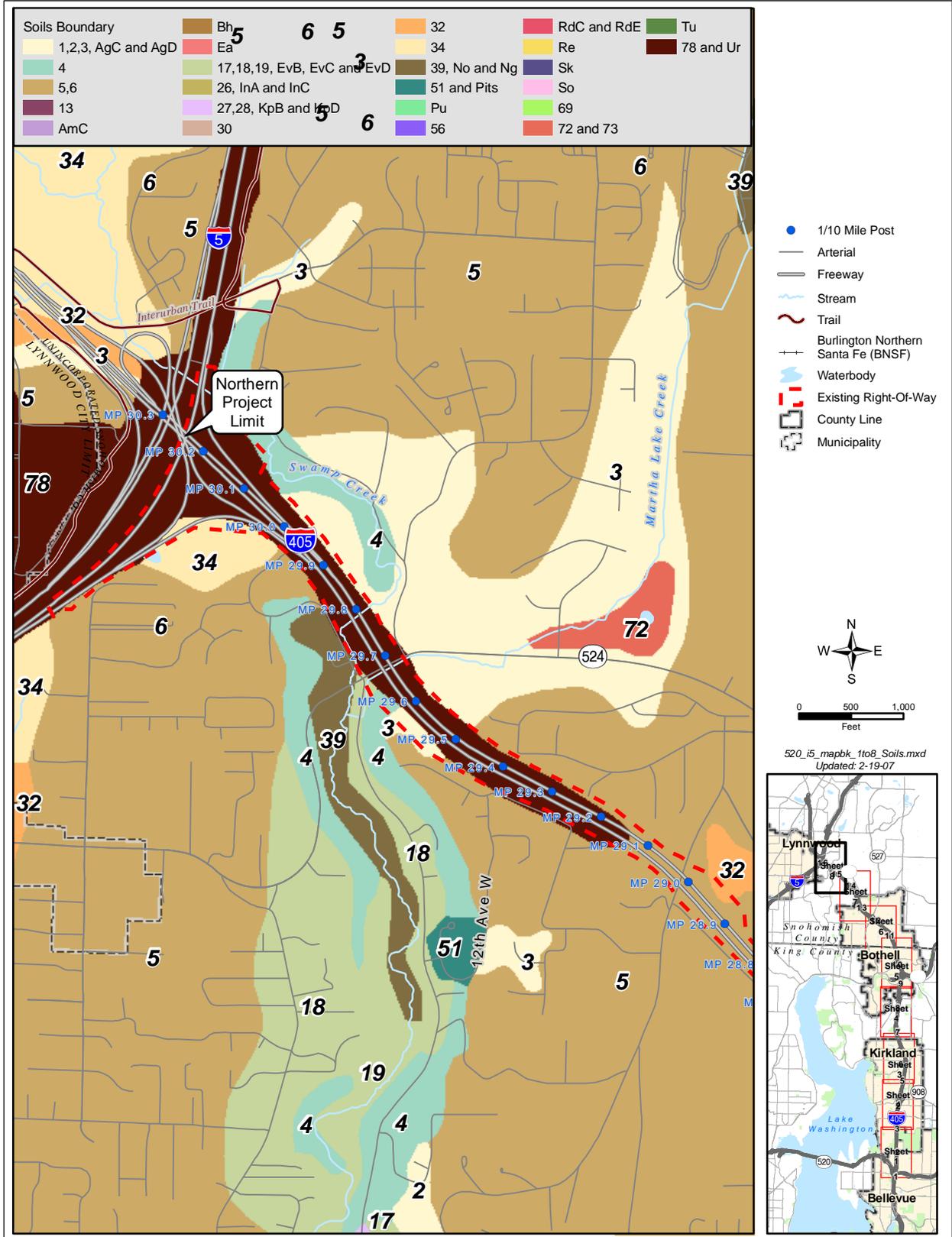


Exhibit B-2: Surficial geologic units - sheet 1 of 8

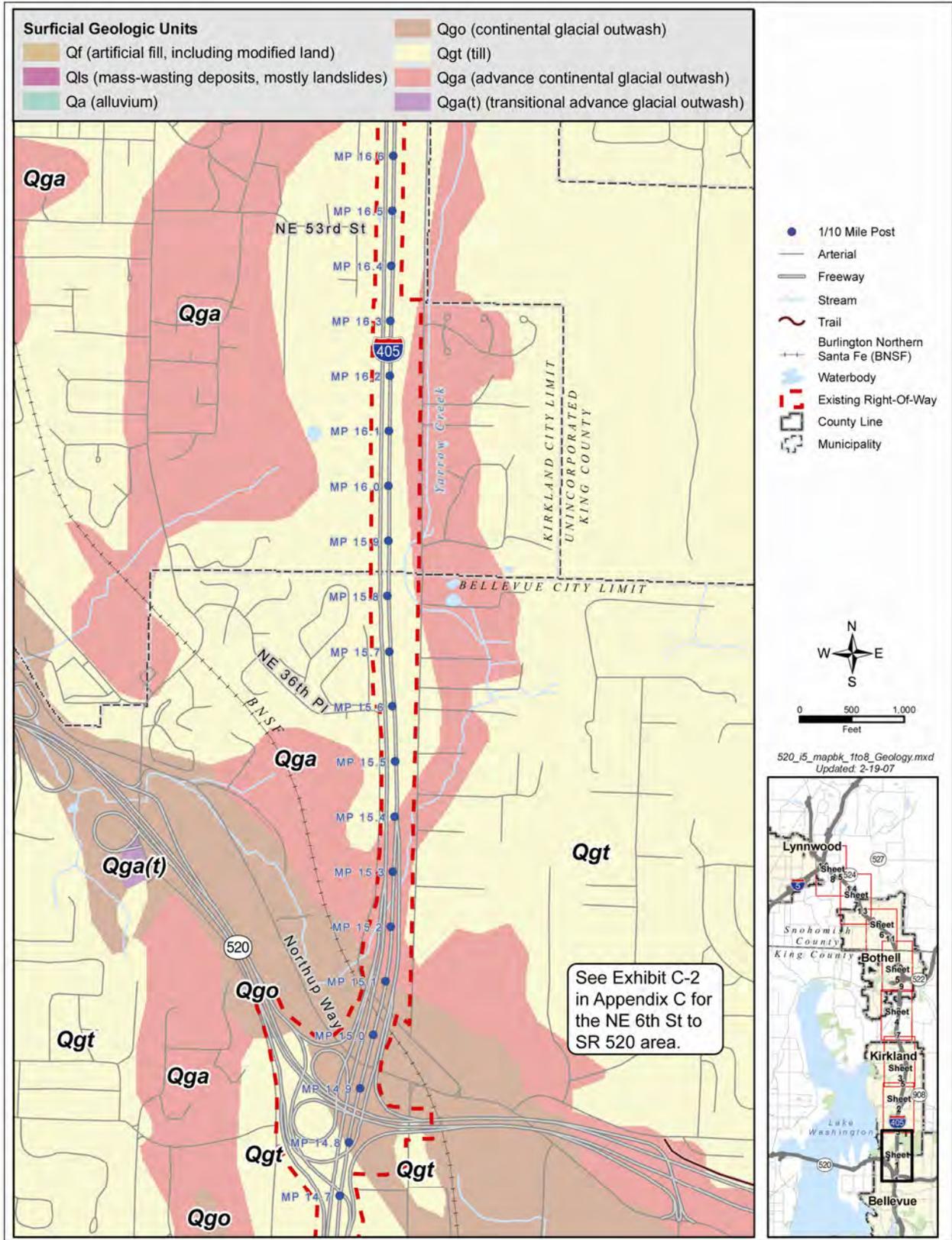


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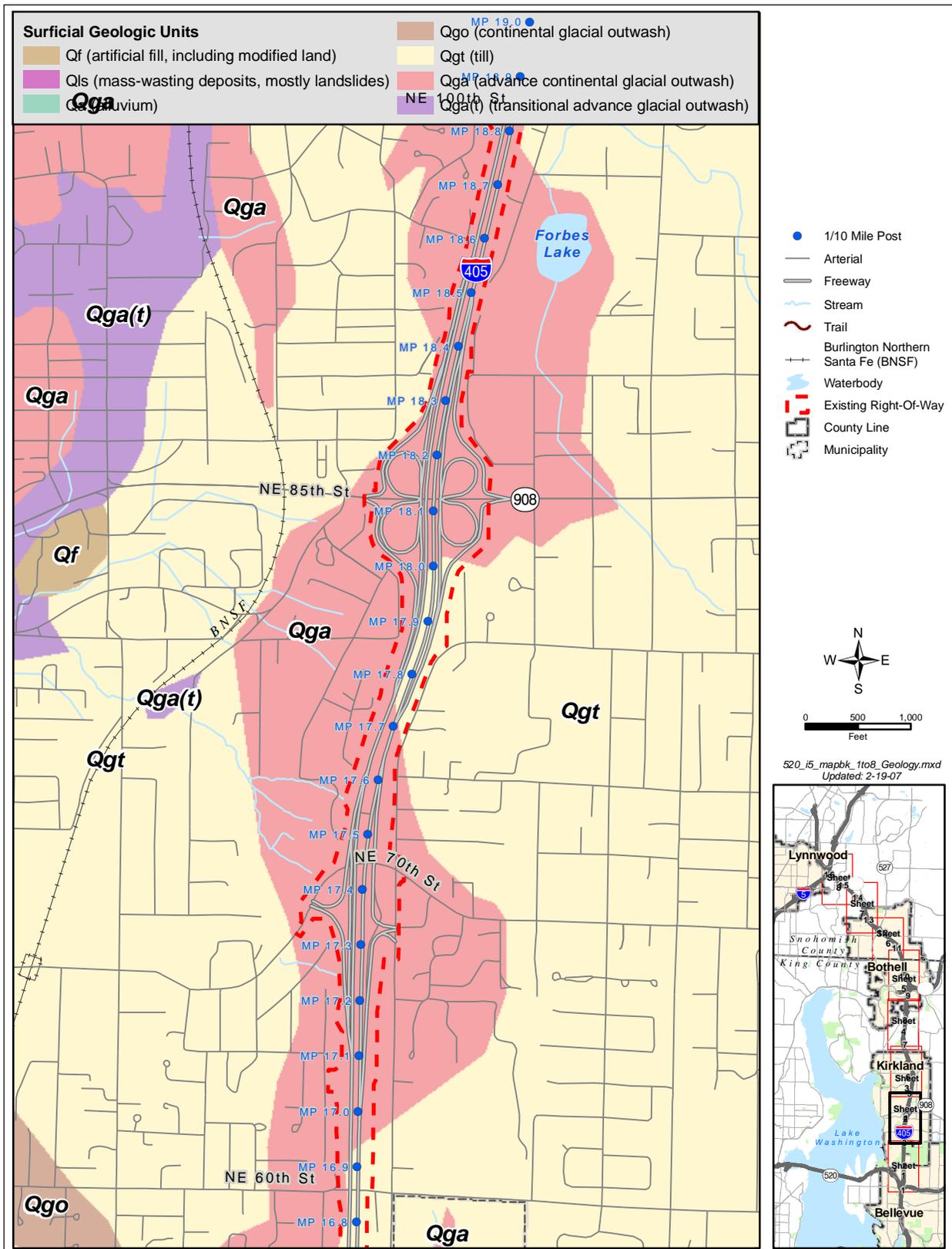


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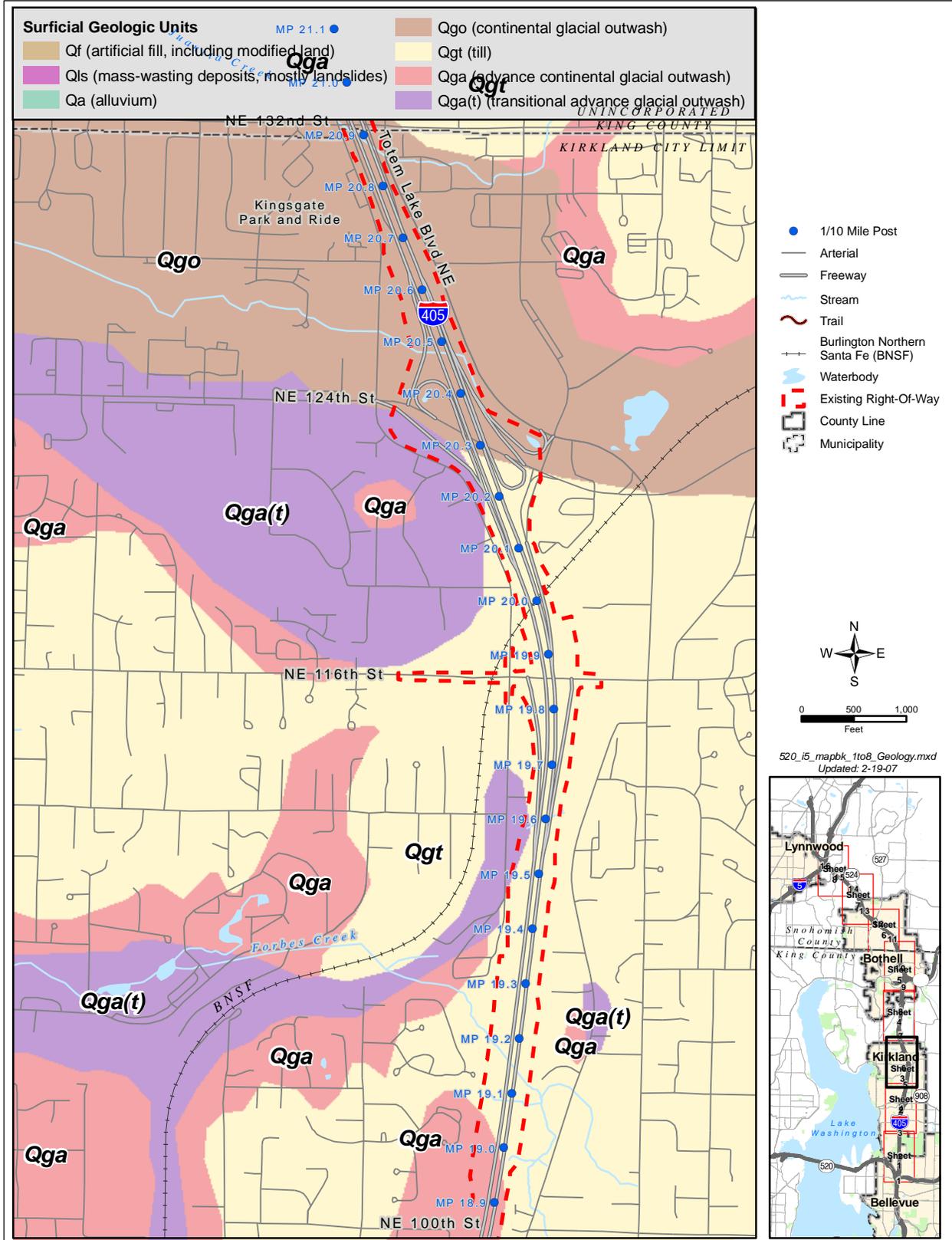


Exhibit B-2: Surficial geologic units - sheet 4 of 8

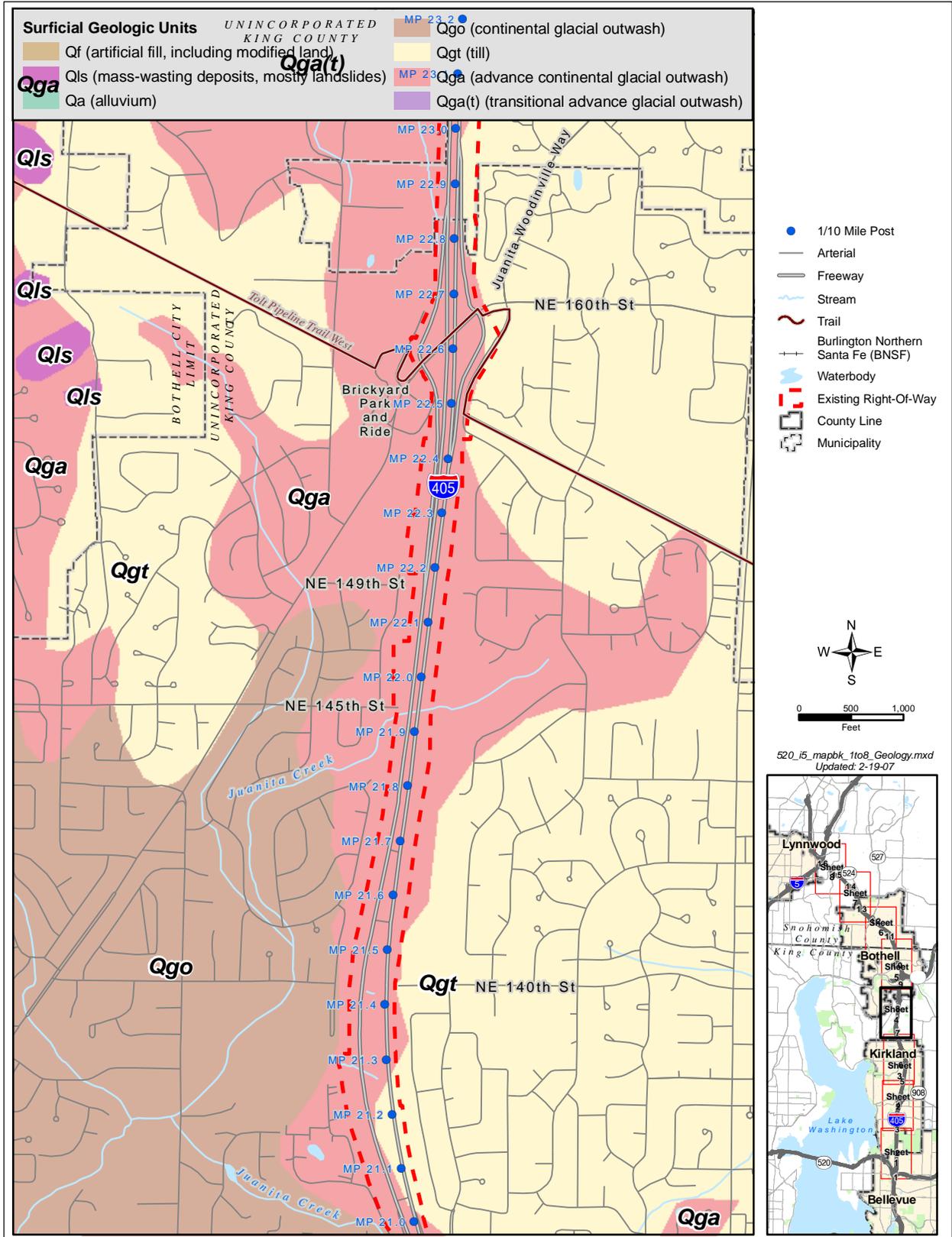


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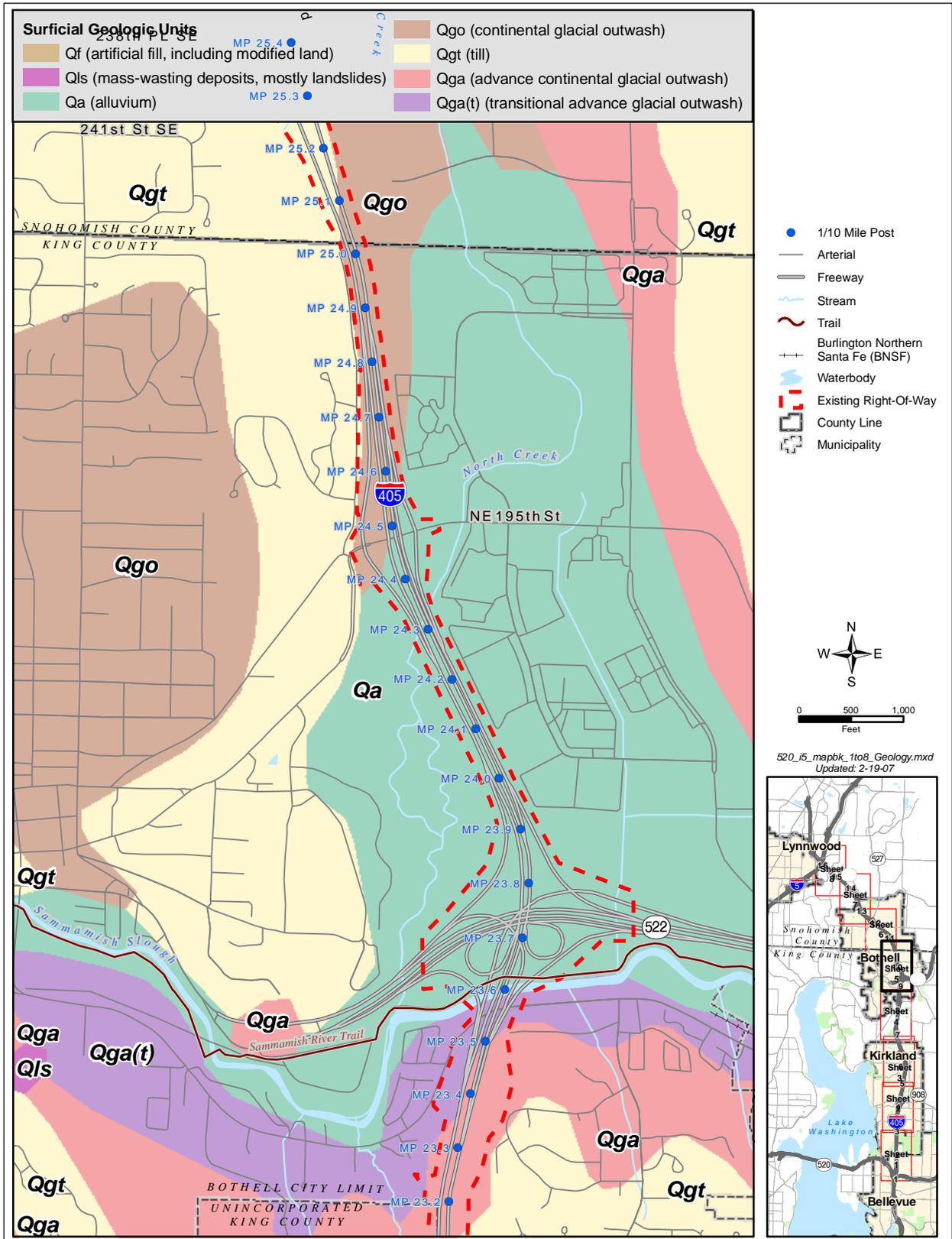


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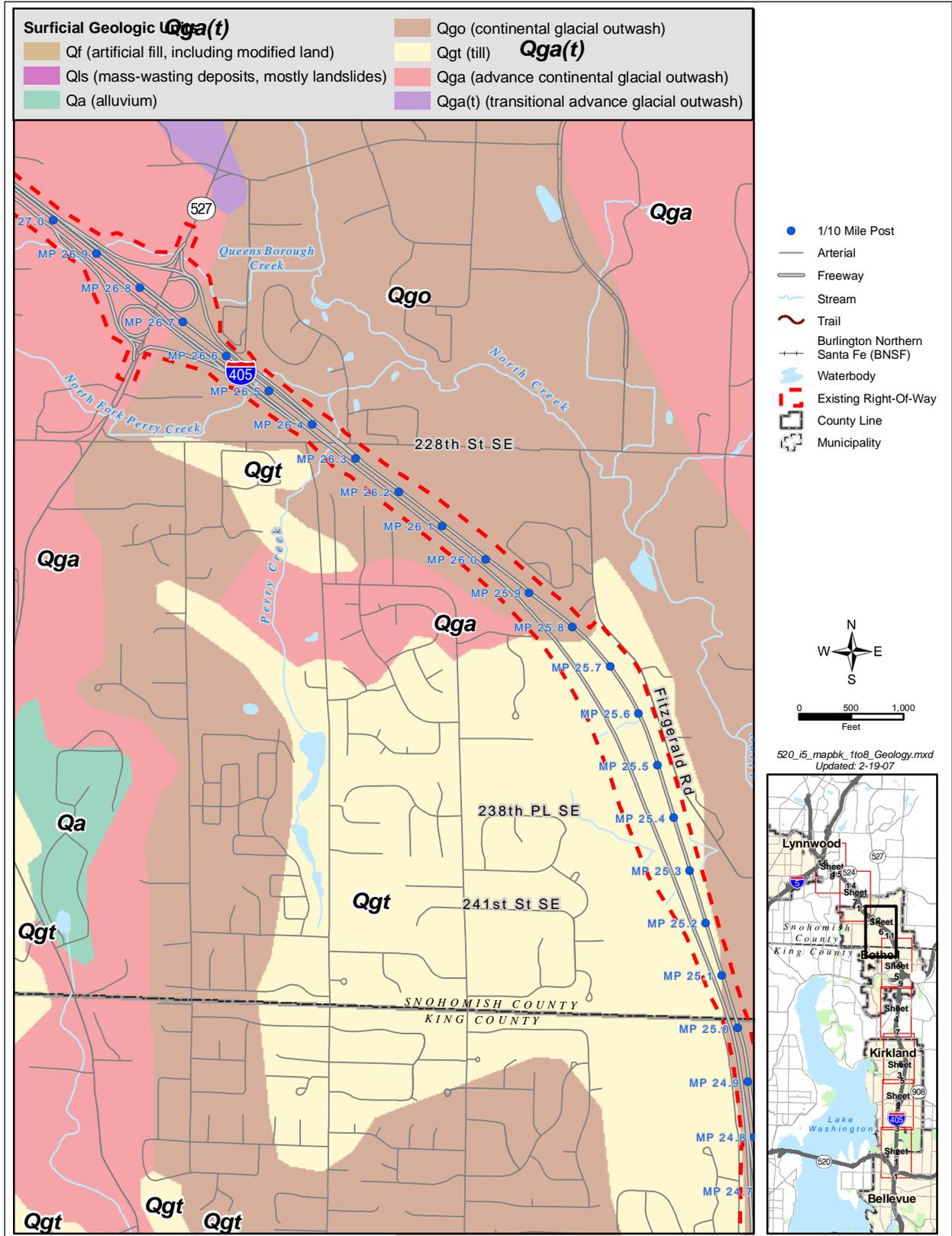


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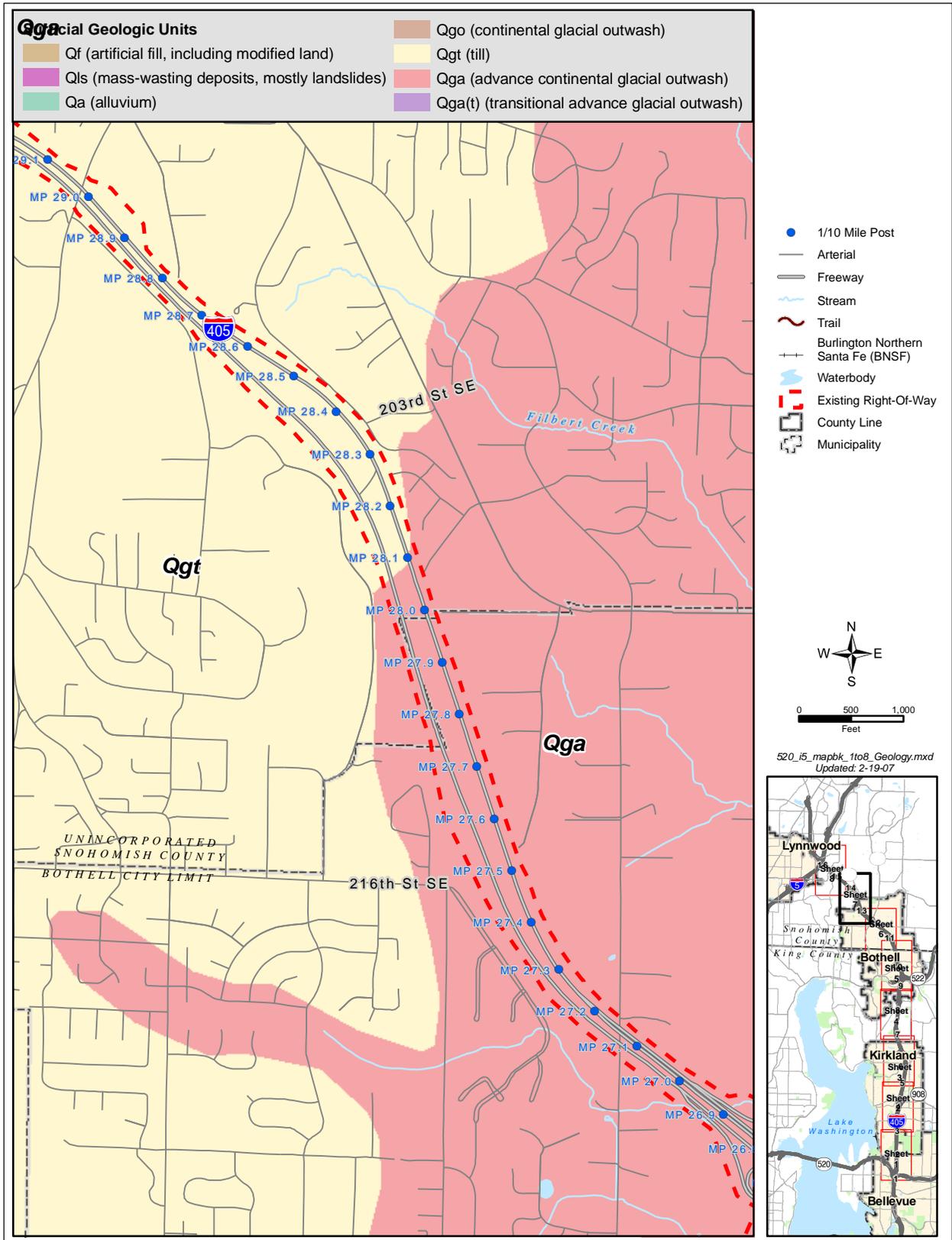


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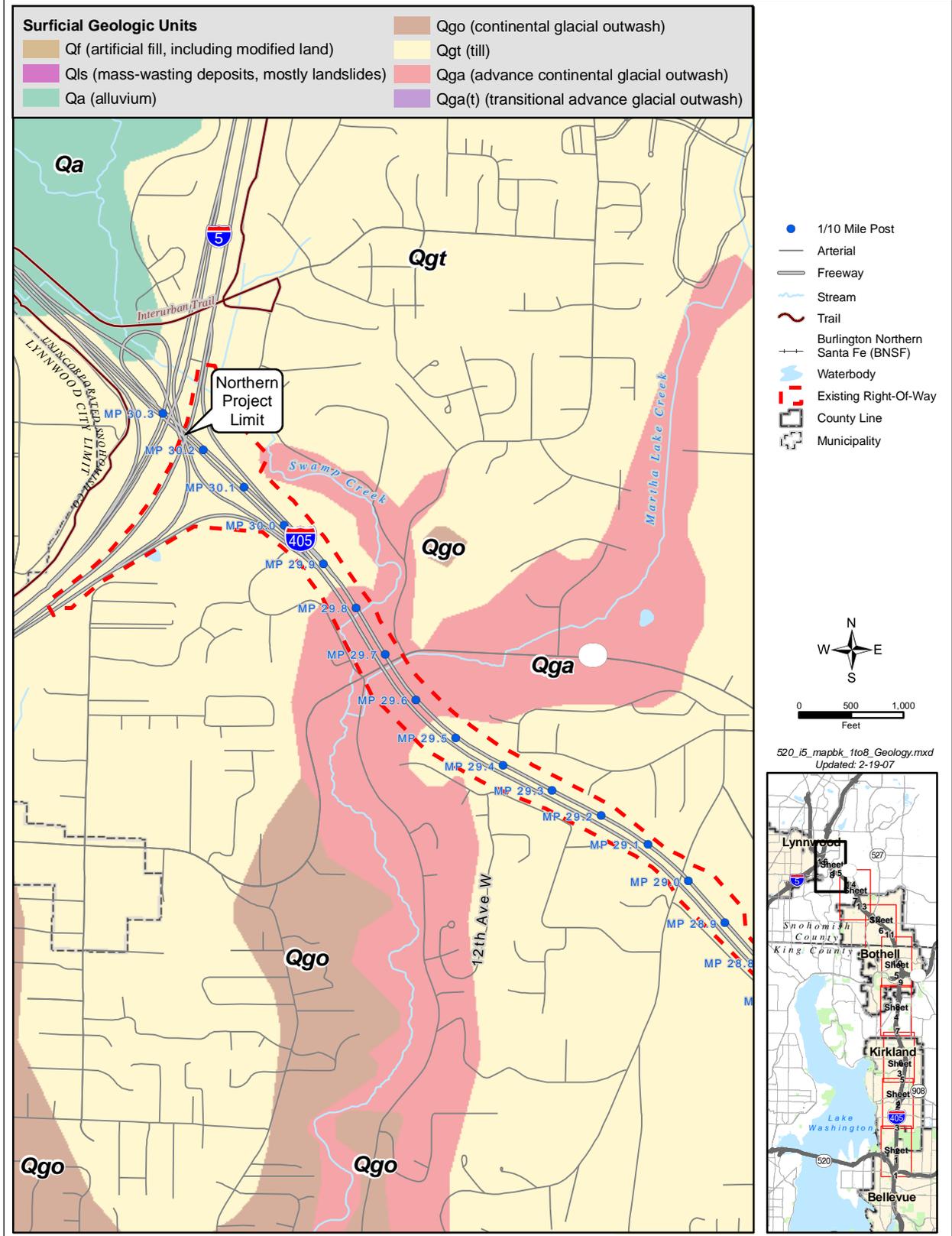


Exhibit B-3: Geologic hazard areas - sheet 1 of 8

