

WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES  
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# **GEOLOGIC MAP OF WASHINGTON STATE**

**by J. Eric Schuster**

**WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES  
GEOLOGIC MAP GM-53**

**2005**

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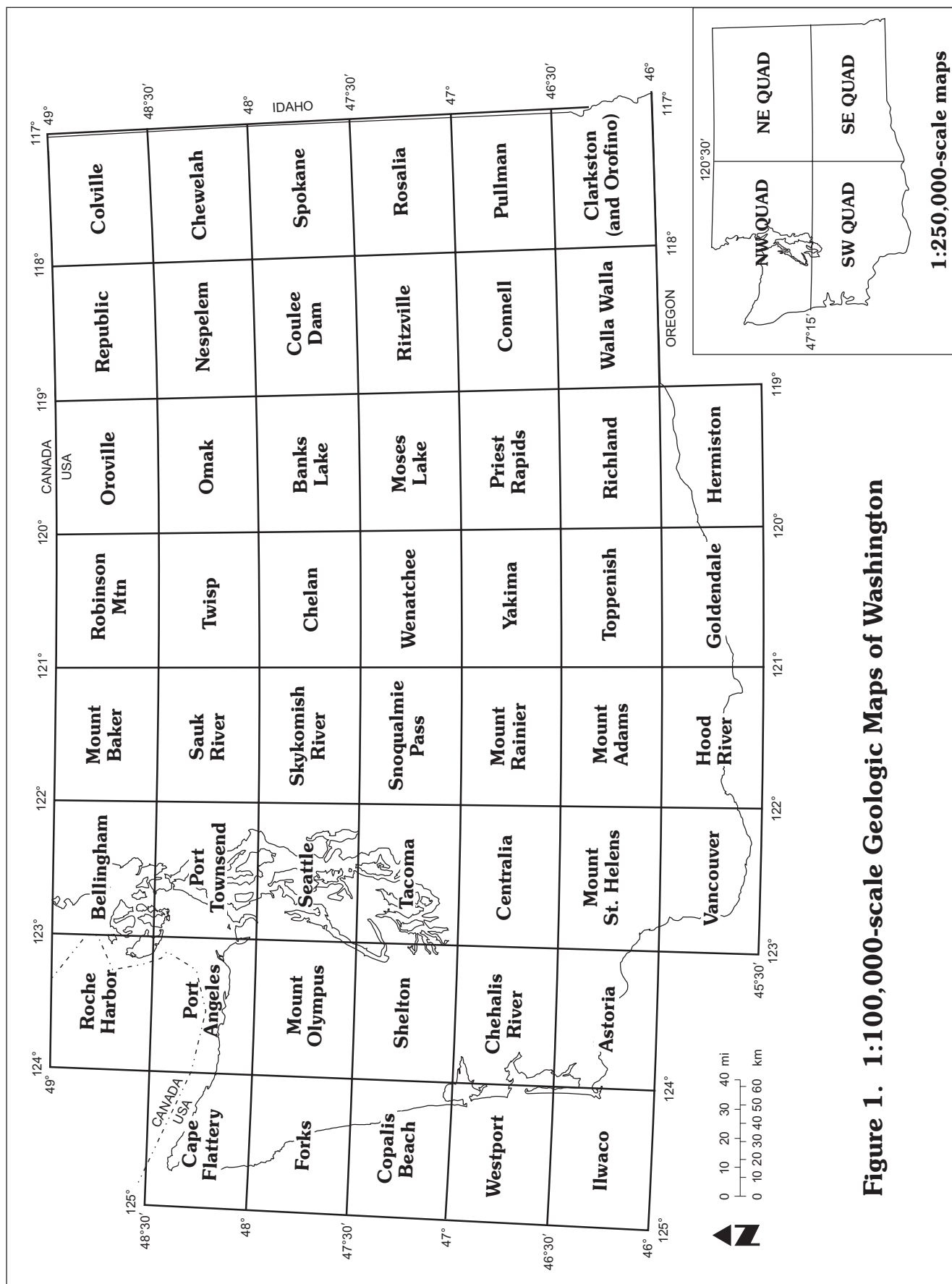
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## PLATE

Geologic map of Washington State and key to geologic units



# GEOLOGIC MAP OF WASHINGTON STATE

by J. Eric Schuster

## MAP COMPILATION AND PRODUCTION

The 1:500,000-scale geologic map of Washington was compiled entirely from the preceding 1:250,000-scale geologic quadrant maps of Washington (Fig. 1) (Walsh and others, 1987; Stoffel and others, 1991; Schuster and others, 1997; Dragovich and others, 2002). The level of detail was simplified by combining the 1:250,000-scale map units into 1:500,000-scale map units that have broader lithologic and age ranges and by deleting small lakes and small polygons of unconsolidated sedimentary map units. Table 1 (p. 12) shows which 1:250,000 units make up each of the 1:500,000 units. The reader will notice that a few 1:250,000 map units listed in Table 1 do not fit entirely within the age range or lithologic range of the 1:500,000 unit. This was done to avoid 1:500,000 units with very limited extents and to reduce the number of 1:500,000 units. Typically, a 1:250,000 unit that does not fit was lumped with an appropriate 1:500,000 lithologic unit, but its age extends outside the range of the 1:500,000 unit. Also, typically, the 'young' end of the age range of the 1:250,000 unit fits within the age range of the 1:500,000 unit, but the 'old' end extends beyond the age range of the 1:500,000 unit. For example, 1:500,000 unit Mmt includes 1:250,000 unit pTog (NE), which extends into the Precambrian, and unit pTog (NW), which extends into the Paleozoic. Although the map units have been simplified for presentation at 1:500,000 scale, the faults, folds, dikes, and eruptive centers generally have not. In complex, crowded areas some folds and some ornaments that identify fault types were omitted to preserve legibility.

The 1:250,000-scale quadrant maps cited above were, in turn, compiled mostly from 1:100,000-scale geologic maps (Fig. 1) compiled by geologists of the Washington Division of Geology and Earth Resources or the U.S. Geological Survey. The 1:100,000-scale maps are referenced in the pamphlets that accompany the 1:250,000-scale quadrant maps. The 1:100,000-scale quadrangle index map (Fig. 1) and lines of latitude and longitude on the 1:500,000-scale geologic map plate are included as an aid to readers who wish to be able to identify which 1:100,000-scale quadrangle(s) contain a geologic feature of interest.

Small index maps of the State of Washington accompany each of the map unit symbols and brief descriptions in the 'Key to Geologic Units' on the plate. Each index map serves two purposes: it shows the color of the map unit, and it shows the distribution of the unit. Showing the distribution of each map unit this way is an idea borrowed from the Pennsylvania geologic map (Miles, 2003), but using the index map to show the color of the unit may be original.

The 1:500,000-scale geologic map of Washington was prepared using digital methods. Digital versions of the 1:250,000-scale geologic quadrant maps were merged and simplified using ArcInfo and ArcGIS. The plate was prepared for publication in Adobe Illustrator, and the pamphlet was first prepared in Microsoft Word, then laid out for printing in Ventura Publisher.

## DESCRIPTIONS OF MAP UNITS

Each map unit description is presented in sections; each section covers the age range of one or more component units of the source 1:250,000-scale geologic quadrant map(s). For example, the description for unit QTc, Quaternary–Tertiary continental sedimentary rocks and deposits, includes sections for Pleistocene–Pliocene, Quaternary–Pliocene, and Quaternary–Miocene components. This approach provides more detailed age information and facilitates presentation of more lithologic information with greater clarity than if the description were presented in a single, summary section. Except as indicated by 'local', 'locally', 'subordinate', or 'rare', the descriptions do not necessarily indicate relative abundance of component lithologies.

All but one of the unit descriptions (unit Qd, dune sand) include an array of numbers, listed by quadrant. Each number links to a named geologic unit in Table 2 (p. 17). Where 'Includes named units:' is used, the unit includes both named and unnamed components. Where 'Consists of named units:' is used, the unit is composed entirely of named components.

### Unconsolidated Sediments

- Qd**     **Holocene dune sand** — **Holocene** well-sorted, fine to medium sand and silt in active and stabilized dunes; locally includes volcanic ash.
- Qa**     **Quaternary alluvium** — **Quaternary** unconsolidated or semiconsolidated alluvial clay, silt, sand, gravel, and (or) cobble deposits; locally includes peat, muck, and diatomite; locally includes beach, dune, lacustrine, estuarine, marsh, landslide, lahhar, glacial, or colluvial deposits; locally includes volcaniclastic or tephra deposits; locally includes modified land and artificial fill. *Includes named units:* **NW** part of 211, part of 256, part of 611, part of 658, part of 670, part of 897, and part of 932; **SW** 4, 187, 413, part of 414, part of 430, part of 670, and 769.
- Qls**     **Quaternary mass-wasting deposits** — **Quaternary** mass-wasting deposits; primarily landslide deposits, but locally includes talus, colluvium, protalus ramparts, and rock glaciers; includes 1980

debris avalanche of Mount St. Helens; locally includes **Pliocene–Miocene** mass-wasting deposits. *Includes named unit: SW 556.*

**Ql** **Quaternary loess** — **Quaternary** eolian silt and fine sand; includes clay, caliche, tephra, and paleosols; locally includes outburst flood deposits. *Includes named units: NE 629; SE 629.*

**Qf** **Pleistocene outburst flood deposits** — **Pleistocene** gravel and sandy gravel deposits with interbedded silt lenses; deposited as benches along the main stem of the Snake River as a result of rapid draining of glacial Lake Bonneville; also widespread silt, sand, gravel, and boulder deposits deposited during multiple catastrophic drainings of glacial Lake Missoula; includes glaciolacustrine deposits. *Includes named units: NE 261 and 589; NW part of 897; SE 61, 330, 523, 638, and 864; SW 520.*

**Qgd** **Pleistocene continental glacial drift** — **Pleistocene** till and outwash clay, silt, sand, gravel, cobbles, and boulders deposited by or originating from continental glaciers; locally includes peat, nonglacial sediments, modified land, and artificial fill. *Includes named units: NW 14, 156, 197, part of 211, 252, part of 256, 493, part of 611, 635, part of 658, part of 670, part of 725, 810, 822, part of 897, and part of 932; SW 155, 348, 617, part of 725, 804, 817, and 896.*

**Qad** **Pleistocene alpine glacial drift** — **Quaternary** till, outwash, and glaciolacustrine sediments; locally includes loess, talus, and lacustrine deposits. *Includes named units: NW part of 133, 210, part of 254, 320, 360, part of 378, part of 414, part of 430, 472, 473, 497, part of 524, 564, 768, 877, part of 920, part of 921, 931, and 957; SW 8, 85, part of 133, part of 254, 285, 343, part of 378, part of 414, part of 430, 455, 461, 503, part of 524, part of 920, part of 921, 940, and 950.*

### Sedimentary Rocks and Deposits

**QTc** **Quaternary–Tertiary continental sedimentary rocks and deposits** — **Quaternary–Pliocene** conglomerate with sandy and silty facies. **Quaternary–Miocene** pebble, cobble, and boulder gravel. **Pleistocene–Pliocene** gravel, sand, silt, and clay; deposits of the ancestral Columbia River. *Includes named units: SE 18, 140, 141, 143, and 311; SW 830 and 871.*

**Tc** **Tertiary continental sedimentary rocks** — **Pliocene** poorly indurated coarse sand and gravel stream terrace deposits; weakly cemented, moderately sorted cobble to pebble gravel with thin sand, silt, clay, and tephra interbeds. **Pliocene–Miocene** conglomerate (Pleistocene and Pliocene in

Stoffel and others, 1991; now known to be Pliocene and Miocene, Schuster and others, 1997), pebble to cobble fanglomerate; fine and coarse semi-indurated fluvial and lacustrine deposits; locally includes mass-wasting deposits, diatomite beds, and tephra beds; locally fossiliferous. **Miocene** sandstone, siltstone, conglomerate, carbonaceous shale, claystone, and debris-flow breccia; commonly tuffaceous; locally includes tuff breccias, lahars, lignite, peat, and diatomite beds. **Oligocene** sandstone, variegated tuffaceous shale, and conglomerate with minor silicic tuff. **Oligocene–Eocene** sandstone, pebble and cobble conglomerate, siltstone, shale, claystone, and coal. **Middle and upper Eocene** feldspathic sandstone, siltstone, shale, conglomerate, and rare crystal-lithic tuff. **Lower and middle Eocene** interbedded shale, feldspathic sandstone and siltstone, and conglomerate; local minor crystal tuff and porphyritic dacite and rhyolite flows. **Eocene** conglomerate, commonly lithofeldspathic to feldspatholithic sandstone, siltstone, shale, mudstone, claystone, and coal; locally interbedded with basaltic to rhyolitic tuffaceous and pumiceous sandstone and tuff, volcanoclastic breccias, and lava flows; local fanglomerate and brackish-water deposits. *Includes named units: NE 68, part of 96, 137, part of 245, part of 396, part of 435, 578, part of 602, part of 704, part of 831, 857, and 925; NW part of 30, 56, part of 79, 134, part of 136, part of 245, 328, 382, part of 576, 667, 699, part of 712, 832, and 858; SE 50, 149, part of 245, part of 435, 443, 447, 476, 677, 690, part of 704, 734, 778, 797, part of 831, part of 849, and 895; SW 92, 112, 186, 224, part of 245, 459, 484, 494, part of 575, 666, part of 712, 792, 825, part of 831, part of 849, and 946.*

**M&c** **Mesozoic continental sedimentary rocks** — **Tertiary and Cretaceous** shale, feldspathic sandstone and siltstone, and conglomerate. **Upper Cretaceous** lithofeldspathic sandstone with siltstone and shale partings; interbedded chert-grain sandstone, black mudstone and siltstone, and conglomerate; conglomerate; subordinate volcanic sandstone and conglomerate. **Cretaceous** lithofeldspathic sandstone to chert-lithic sandstone, siltstone, and conglomerate; cobble conglomerate; chert-pebble conglomerate with minor sandstone and siltstone. **Lower Cretaceous** conglomerate with sedimentary and metavolcanic rock clasts; subordinate feldspathic sandstone, volcanic sandstone, and black mudstone. *Consists of named units: NE part of 512, 639, 652, 784, 900, part of 903, and 953; NW 174, 203, 299, 336, part of 513, 774, part of 850, 901, and part of 952.*

**Tn** **Tertiary nearshore sedimentary rocks** — **Pliocene–Miocene** siltstone, sandstone, and con-

glomerate; fossiliferous, concretionary, and carbonaceous. **Miocene** micaceous feldspathic sandstone and conglomerate with minor siltstone; locally pebbly, bioturbated, and (or) cross-bedded; commonly carbonaceous. **Oligocene–Eocene** nearshore marine to nonmarine basaltic conglomerate, sandstone, tuffaceous siltstone, pumice-lithic lapilli tuff, claystone, and lignite; basaltic sandstone, siltstone, and sandy pebble conglomerate; locally interbedded with basaltic andesite flows; commonly with coal; locally contains mica and quartz pebbles. **Eocene** marine to nonmarine micaceous feldspathic sandstone, siltstone, shale, carbonaceous siltstone, claystone, and thick coal seams; locally interbedded with basalt flows and volcanoclastic rocks. *Consists of named units:* **NW** part of 55, part of 79, 138, 674, 676; **SW** part of 175, 610, 770, and 865.

**Mzn** **Mesozoic nearshore sedimentary rocks — Cretaceous** sandstone, conglomerate, shale, and minor coal. **Cretaceous–Jurassic** volcanic-lithic pebble conglomerate and breccia with siltstone and sandstone interbeds. **Triassic** volcanic-lithic siltstone, sandstone, tuff, conglomerate, breccia, and limestone. *Includes named units:* **NW** 110, 157, 258, 334, 339, 579, 665, and 791

**Tm** **Tertiary marine sedimentary rocks — Miocene** lithofeldspathic or feldspatholithic sandstone and siltstone; common claystone, shale, and mudstone; minor conglomerate and breccia; locally tuffaceous; local basaltic sandstone and poorly sorted basal conglomerate. **Miocene–Oligocene** mudstone to sandy siltstone with calcareous concretions; conglomerate near the base; locally contains micaceous, lithic, and quartzofeldspathic sandstone. **Miocene–Eocene** breccia with lenses and angular blocks of clastic sedimentary rocks and volcanogenic rocks in a matrix of black shale or slate or intensely sheared sandstone and siltstone; lithofeldspathic and feldspatholithic micaceous sandstone, siltstone, and slate, and semischist, slate, and (or) phyllite; locally includes diapiiric muds, fault breccias, and submarine landslide deposits; minor thick-bedded sandstone, and granule and pebble conglomerate; locally metamorphosed to zeolite facies. **Oligocene–Eocene** lithofeldspathic and feldspatholithic micaceous sandstone, siltstone, and slate, semischist and slate or phyllite, tuffaceous siltstone and tuffaceous sandstone; minor conglomerate, breccia, and semischist; local basaltic and glauconitic sandstone beds; locally grades to nonmarine volcanoclastic rocks; locally metamorphosed to zeolite facies. **Eocene** conglomerate, sandstone, pillow basalt, siltstone, mudstone, argillite, breccia, claystone, and shale; local interbeds of basaltic sandstone; minor limestone, tuffaceous siltstone, volcanoclas-

tic rocks, diabase or gabbro sills, and chert pebbles; rare coal stringers; locally interbedded with tuffs and tuff breccias. **Eocene–Paleocene** lithic sandstone, semischist, siltstone, slate, granule or pebble conglomerate, and breccia, weakly metamorphosed. *Includes named units:* **NW** part of 5, part of 20, 23, 39, part of 55, 59, 71, part of 179, part of 246, 308, 361, 362, part of 379, part of 448, 454, part of 475, 483, 490, part of 528, part of 588, 671, 675, 682, 733, part of 783, 907, 908, and part of 930; **SW** part of 20, 144, part of 175, part of 180, 358, part of 379, part of 448, 502, 504, part of 528, 613, 747, 767, 811, 893, and part of 894.

**M&m** **Mesozoic marine sedimentary rocks — Upper Cretaceous** mudstone and siltstone with minor chert-grain sandstone and chert-pebble conglomerate beds; locally abundant white lithofeldspathic sandstone interbeds; local conglomerate composed of argillite, sandstone, volcanic rock fragments, and minor chert. **Cretaceous** feldspathic sandstone, shale, and minor conglomerate composed of pebbles, cobbles, and boulders of plutonic, metamorphic, volcanic, and sedimentary rocks in a feldspathic sandstone matrix. **Lower Cretaceous** feldspathic sandstone, black shale, and minor conglomerate composed of pebbles, cobbles, and boulders of a variety of plutonic, metamorphic, volcanic, and sedimentary rocks in a feldspathic sandstone matrix. **Cretaceous–Jurassic** feldspatholithic and lithofeldspathic sandstone, siltstone, mudstone, black shale, radiolarian chert, greenstone, green tuff, and red shale; local minor conglomerate, limestone, argillite, breccia, marl, and rare coal. **Jurassic** pebble conglomerate, volcanic sandstone, sandstone, siltstone, shale, pelite, and argillite; rare, thin limestone beds. *Includes named units:* **NE** 295, 335, part of 590, part of 630, 884, and part of 903; **NW** 205, part of 264, 276, 338, 399, 481, part of 630, and 888; **SE** 165; **SW** part of 719.

### Volcanic Rocks and Deposits

**Qv** **Quaternary volcanic rocks — Pleistocene–Pliocene** dacite. **Quaternary** rhyodacite, dacite, andesite, and basalt flows, flow breccias, dikes, hypabyssal intrusives, cinder and scoria cones, tephra, bombs, tuff, scoria, breccia, and rubble; local minor basaltic andesite; local agglutinate pyroclastic-flow deposits, olivine basalt, and hyaloclastite. *Includes named units:* **NW** 36, part of 53, 150, 171, 207, 292, part of 422, 429, 434, 436, 533, 632, 650, 657, 820, 834, 837, and 935; **SW** 104, 531, 550, 561, 562, and 854.

**QTV** **Quaternary–Tertiary volcanic rocks — Pleistocene–Pliocene** andesite flows and breccias, ba-

salt and basaltic andesite flows. *Includes named units: SW 26, 44, 63, 357, 449, and part of 758.*

Tv<sub>cr</sub>

**Tertiary volcanic rocks, Columbia River Basalt Group — Miocene** generally fine-grained flood basalt flows; local invasive flood basalt sills and dikes, hyaloclastite, pillowed lava flows, and peperites; local intracanyon flows, saprolites, and pillow-palagonite complexes; local coarsely plagioclase-phyric flood basalt flows; feeder dikes in the Clarkston 1:100,000-scale quadrangle and neighboring areas; commonly interbedded with tuffaceous sandstone, siltstone, and conglomerate, most of which are parts of the Ellensburg and Latah Formations (see unit Tc). *Consists of named units: NE 42, 151, 219, part of 278, part of 309, 329, part of 369, 406, part of 573, part of 662, part of 680, part of 716, part of 722, 795, part of 912, and part of 958; NW part of 309, part of 369, and 370; SE 15, part of 19, 35, 38, 75, 77, 111, 128, 146, 152, 208, 214, 234, 241, part of 242, 253, 265, part of 278, 290, 306, part of 309, 324, 383, 384, 386, 444, 456, 468, 474, 492, 508, 569, 572, 574, 618, 628, 656, 663, 679, 681, 707, 710, 711, 717, 723, 728, 735, 736, 750, 752, 754, 773, 776, 796, 843, 845, 890, 891, 892, 909, 913, 914, 917, 922, 923, 943, 951, and 959; SW part of 19, 90, 153, 198, part of 242, part of 278, part of 309, 571, part of 573, 623, 655, part of 662, 678, part of 680, part of 716, part of 722, 889, part of 912, 942, and part of 958.*

Tv

**Tertiary volcanic rocks — Pliocene** rhyolitic, andesitic, and basaltic altered tuff, volcanic breccia, volcanic sandstone, welded tuff, tuffaceous conglomerate, basalt and basaltic andesite flows, dacite flows and flow breccia, agglomerates, pyroclastic rocks, dikes, domes, obsidian, and lahars; local hypabyssal intrusions. **Miocene** dacite, andesite, basalt, basaltic andesite flows and flow breccia, and rhyolite; locally interbedded with volcanoclastic breccia, tuff, volcanic sandstone, and rare rhyolitic sandstone, siltstone, and coal; minor interbedded laharic breccia, conglomerate, and siltstone; rare welded vitrophyre and local basal unwelded pumice-perlite tuff. **Miocene-Oligocene** andesite flows and flow breccia; lesser interbedded volcanoclastic rocks; includes basaltic andesite and basalt flows, breccia, and well-bedded tuff; also undifferentiated volcanic rocks. **Oligocene** andesite, basaltic andesite, basalt, dacite, and rhyolite flows, flow breccia, lapilli tuff, welded tuff, tuff breccia, dikes, sills, domes, and plugs; locally interbedded volcanoclastic sandstone and conglomerate; local sandstone-block megabreccia. **Oligocene-Eocene** basaltic andesite flows and flow breccias, basalt and basaltic tuffs, and basalt breccia; local andesite, basalt, dacite, gabbro, diabase, greenstone, interbeds of shale,

tuff, volcanic sandstone and conglomerate, and gray or brick-red limestone. **Upper Eocene** dacite and andesite flows and flow breccias with local interbeds of sedimentary or pyroclastic rocks. **Middle and upper Eocene** aphanitic volcanic rocks. **Middle Eocene** tuff, tuff breccia, dacite and andesite flows and flow breccias, and hypabyssal intrusive rocks; minor volcanoclastic and sedimentary rocks and trachyte flows; local interbeds of volcanic conglomerate, sandstone, siltstone, shale, and coal. **Eocene** rhyolite, dacite, andesite, basalt, and basaltic andesite flows, pillowed flows, flow breccia, breccia, tuff, tuff breccia, welded tuffs, domes, and volcanoclastic rocks; locally interbedded with feldspathic sandstone, conglomerate, siltstone, shale, and argillite; local gabbro and diabase; associated plugs and dikes; rare coal. *Includes named units: NE part of 96, part of 289, part of 396, part of 416, 417, part of 627, 642, part of 729, 745, and part of 879; NW part of 5, part of 30, part of 118, part of 136, part of 179, part of 225, part of 246, part of 266, 284, 286, part of 331, 332, part of 355, 371, part of 407, part of 475, part of 541, 547, part of 576, part of 588, part of 651, 755, 818, part of 842, part of 894, and part of 930; SW 49, 172, 202, 204, part of 225, part of 266, 280, part of 302, 303, 318, part of 340, 515, part of 575, part of 601, part of 603, part of 758, 766, 809, 826, 839, part of 842, 851, and 939.*

Tv<sub>c</sub>

**Tertiary volcanic rocks, Crescent Formation — Lower to middle Eocene** dominantly submarine basalt flows and flow breccia; pillows, filled lava tubes, and altered palagonite common; locally contains thin interbeds of basaltic tuff, siltstone, chert, red argillite, volcanoclastic conglomerate, and limestone; local gabbro dikes and sills; rare andesite, dacite, and rhyolite; the marine, pillow-dominated lower part grades into flow-dominated, locally columnar-jointed, partially nonmarine rocks near the top. *Consists of named units: NW part of 179; SW part of 180.*

M&v

**Mesozoic volcanic rocks — Paleocene-Cretaceous** subquartzose and quartzose sandstone interbedded with argillite, chert, metabasalt, pillow basalt, basalt breccia, mudflow breccia, conglomerate, and mélangé. **Pre-Tertiary** altered rhyolite. **Upper Cretaceous** andesite and dacite flows, breccia, tuff, volcanic sandstone, and lithofeldspathic sandstone, with subordinate volcanic conglomerate and sandstone, and minor shale and andesite flows. **Cretaceous** andesite and dacite breccia, tuff, and flows, with minor tuffaceous chert-pebble conglomerate and coarse cross-bedded tuffaceous or volcanoclastic sandstone. **Cretaceous-Jurassic** andesitic and dacitic tuff, tuff breccia, and flows, locally interlayered with thin-

very thick-bedded volcanoclastic or tuffaceous siltstone, sandstone, and conglomerate; local subordinate rhyolitic tuff and tuff breccia; local minor thin lenticular beds of tuffaceous mudstone; local minor limestone; locally includes chert and argillite.

**Jurassic** keratophyre to spilite porphyritic flows, flow breccias, and tuffs; also a greenstone unit consisting of pillowed lavas and minor shale interbeds.

**Jurassic-Permian** greenstone with local pillows and minor tuff and breccia, volcanic-lithic sandstone, argillite, limestone, ribbon chert, and rare gabbro. *Includes named units:* **NE** 52, 73, 394, part of 512, part of 590, 906, and 955; **NW** part of 264, 300, 372, part of 513, 535, and part of 850; **SW** part of 719.

Qvt

**Quaternary fragmental volcanic rocks and deposits (includes lahars) — Holocene** dacitic to andesitic pyroclastic flow deposits of 1980 Mount St. Helens eruptions, mostly poorly sorted, ash-sized, crudely graded deposits of glass shards, pumice, broken phenocrysts, and lithic fragments and lesser lapilli- to block-sized pumice and lithic fragments. **Quaternary** pyroclastic deposits, debris flows, laharic deposits, tephra, ash, pumice, near-vent fragmental deposits, and fluvial gravel, sand, and silt; local rockfall breccia, caldera-collapse megablocks, cross-cutting andesite dikes, welded tuff, and irregular intrusions; minor lacustrine deposits; rare dacite flows. *Includes named units:* **NW** 22, part of 53, 131, 223, 291, 411, part of 422, 471, 510, part of 619, 819, 835, 934, 936, and 937; **SW** 240, 319, 446, 557, 558, 559, 560, 570, part of 619, 631, 649, 866, 870, and 945.

Tvt

**Tertiary fragmental volcanic rocks — Pliocene** poorly consolidated pyroclastic debris, dacitic welded tuff and tuff breccia, and volcanic breccia. **Miocene** rhyolitic, andesitic, and dacitic volcanoclastic breccia and conglomerate, welded and nonwelded tuff, tuff breccia, volcanic sandstone and siltstone, rhyodacitic crystal-lithic ash-flow tuff; minor coal beds; local dacite and rhyolite plugs and flows. **Miocene-Oligocene** rhyolitic to dacitic welded to nonwelded tuff, ash-flow tuff, tuff breccia, and breccia; tuff, tuff breccia; minor silicic lava flows and volcanic conglomerate and sandstone deposited by debris flows, mudflows, pyroclastic flows, and fluvial reworking of volcanic deposits. **Oligocene** rhyolitic, andesitic, dacitic, and basaltic tuff, tuff breccia, and breccia; volcanic siltstone, sandstone, and conglomerate; local dacitic, andesitic, and basaltic flows or plugs. **Oligocene-upper Eocene** welded and nonwelded dacitic(?) tuff and tuff breccia. **Lower Oligocene-upper Eocene** tuff, volcanic sandstone, and conglomerate or breccia, interbedded with basaltic andesite flows and, at base of unit, with feldspathic sandstone, shale, and coal. **Middle and upper**

**Eocene** volcanic conglomerate and tuffaceous sandstone, siltstone, and shale; tuff and tuff breccia; local dacitic and andesitic flows and breccia. Eocene andesitic and basaltic volcanoclastic breccia, tuff, tuff breccia, conglomerate, volcanic sandstone, and siltstone; local andesite flows, pillow lava, marine siltstone, shale, quartzose or feldspathic sandstone, mudflow deposits, impure coal beds, rhyolitic tuff, and welded tuff. **Lower and middle Eocene** tuff, tuffaceous sandstone, siltstone, and volcanic conglomerate; subordinate tuff breccia; local feldspathic sandstone and carbonaceous shale interbeds. *Includes named units:* **NE** part of 96, part of 289, part of 416, 418, 419, part of 602, part of 627, part of 729, and part of 879; **NW** 51, 66, part of 118, 167, part of 179, 226, part of 266, part of 331, part of 355, 423, 428, part of 475, 540, part of 541, 549, 604, part of 651, 689, 714, part of 783, and 873; **SW** 81, 84, part of 175, part of 225, part of 245, part of 302, part of 340, 377, 514, 516, part of 601, part of 603, 625, 640, 687, 688, 788, 789, and 808.

### Intrusive Rocks

Qi

**Quaternary intrusive rocks — Quaternary** andesite and dacite plugs, domes, dikes, and vent complexes. *Includes named units:* **SW** 86, 404, 551, 563, and 874.

QTI

**Quaternary-Tertiary intrusive rocks — Pleistocene-Pliocene** dacite, andesite, and basaltic andesite domes, plugs, and dikes. *Includes named units:* **SW** 297 and 321.

Ti

**Tertiary intrusive rocks — Pliocene** andesite, dacite and dacite breccia, quartz diorite, quartz monzodiorite, granite, granodiorite, quartz monzonite, and diorite stocks, plugs, domes, and dikes. **Pliocene-Miocene** biotite-hornblende-hypersthene dacite plugs and dikes; includes altered breccia and flows. **Miocene** granite, granodiorite, quartz monzonite, diorite, gabbro, quartz diorite, aplite, rhyolite, dacite, andesite, basaltic andesite, basalt, and diabase sills, dikes, plugs, stocks, and cupolas, vitrophyres, and intrusive breccias; minor rhyodacite and alaskite. **Miocene-Oligocene** gabbro, diorite, dacite, granite, granodiorite, tonalite, quartz gabbro, andesite, basalt, and diabase stocks, sills, dikes, dike swarms, domes, and intrusive breccia; local tuffs and breccias with both extrusive and intrusive characteristics; local granophyre and mafic inclusions; minor monzodiorite. **Oligocene** tonalite, quartz diorite, gabbro, diorite, granite, granodiorite, agmatite, granophyre, rhyolite, andesite, and dacite sills, dikes, and stocks; local alaskite and quartz monzodiorite. Eocene dacite, rhyodacite, granite, granodiorite, quartz diorite, diorite, quartz monzonite, tonalite,

monzodiorite, gabbro, quartz gabbro, malignite, shonkinite, pyroxenite, quartz monzodiorite, monzonite, syenite, foyaite, trachyte, rhyolite, andesite, basalt, diabase, and lamprophyre dikes, sills, dike swarms, plugs, stocks, and plutons; local alaskite-aplite-pegmatite and miarolitic cavities.

**Paleocene** tonalite; common alaskite-aplite-pegmatite dikes and sills; locally grades to tonalitic gneiss or trondhjemitite. *Includes named units:* **NE** 32, 69, 82, 148, part of 154, 166, 170, 192, 200, 201, part of 221, 247, 268, 279, 298, 315, 349, 350, 351, 356, 367, 380, part of 396, 401, 412, 452, 458, part of 464, 466, part of 529, 552, 593, part of 621, 732, 739, 746, 756, 806, 812, 836, and 928; **NW** 25, part of 30, 33, 40, 89, 97, 102, 122, 123, 127, 130, 145, 160, 163, 168, 169, part of 179, 191, 199, 215, part of 221, 237, 248, 281, 304, 305, 312, 323, 364, 365, 366, 373, 385, 387, 391, part of 407, 425, 433, 450, 470, 479, 511, 517, 527, part of 529, 537, 539, part of 541, 542, 545, 548, 554, 594, 609, 622, 646, 653, 659, 683, 686, 694, 720, 721, 726, 731, 740, 751, 753, 761, 779, 799, 828, 841, and 869; **SW** 80, 91, 142, 486, 496, 532, 616, 645, 730, 757, 772, 793, 840, 938, and 947.

**TKi Tertiary-Cretaceous intrusive rocks — Tertiary-Cretaceous** granite, granodiorite, quartz monzonite, tonalite, alaskite-aplite-pegmatite, gabbro, and granitic orthogneiss in dikes, sills, pods, and irregular masses; local metagabbro, ultramafic rocks, and quartz monzonite orthogneiss; locally cut by aplite dikes. *Includes named units:* **NE** 13, 16, part of 154, 176, 185, 267, 288, part of 402, part of 408, 409, part of 464, 485, 499, 530, part of 538, part of 555, 567, 612, 813, and 833; **NW** 718, 760, and part of 763.

**M&l Mesozoic intrusive rocks — Tertiary and Cretaceous** diorite. **Pre-Tertiary** granodiorite and granite; gabbro and interlayered mafic tonalite. **Cretaceous** tonalite, granodiorite, granite, quartz monzonite, alaskite to pegmatite gneiss, meta-granodiorite, granodioritic gneiss, alaskite-aplite-pegmatite, muscovite-biotite granite, gabbro, diorite, quartz diorite, porphyritic dacite and andesite dikes and sills, hornblendite, gneissic granodiorite; local trondhjemitite, metatonalite, metadiorite, pegmatite dikes, miarolitic cavities, schist, pyroxenite, ultramafite, anorthosite, quartz gabbro, and gneissic amphibolite inclusions; locally foliated or gneissose. **Cretaceous-Jurassic** granodiorite, quartz diorite, gabbro, quartz monzonite, diorite, monzodiorite, troctolite, gabbro-norite, anorthosite, pyroxenite, and porphyritic rocks; locally subordinate tonalite; local minor alaskite-aplite-pegmatite pods and dikes, marble, gneiss, schist, orthogneiss, and quartz veins. **Jurassic** gabbro, diorite, trondhjemitite, granite, quartz diorite, diabase,

malignite, shonkinite, nepheline syenite, pyroxenite, tonalite, granodiorite, quartz monzonite, metatonalite, metadiabase, metagabbro, metadiorite, metagranodiorite, ultramafic rocks, porphyritic quartz diorite, and metaquartz-diorite; local dacite, andesite, basalt, and monzonite; locally abundant quartz diorite and trondhjemitite dikes; local minor alaskite-aplite-pegmatite pods and dikes; locally includes many other minor lithologies. **Triassic** granodiorite, quartz monzodiorite, metagabbro, metadiorite, greenstone, quartz diorite, tonalite, and metatonalite; local subordinate olivine-bearing metagabbro and metanorite; local quartz monzonite, tonalite gneiss, flaser gneiss, chlorite schist, metadiorite, diorite, and hornblendite. **Mesozoic** gabbro with minor peridotite. *Includes named units:* **NE** 2, 3, 10, 31, 57, 58, 64, 67, 74, 87, part of 93, 94, 103, part of 114, part of 117, part of 132, part of 154, 158, 162, 188, 218, 222, 236, 249, 255, 260, 262, 263, 270, 274, 283, 294, 313, 327, 368, 381, 405, part of 408, 421, 432, 437, 453, 457, 463, part of 464, 498, 506, part of 538, part of 555, part of 606, 633, part of 637, 648, 654, 661, 693, 709, 727, 741, 742, 759, 782, part of 786, 794, 802, 814, part of 824, part of 827, 847, part of 860, 902, part of 910, 919, 933, and 956; **NW** 27, 43, part of 54, 72, part of 93, part of 113, 139, 184, 206, 212, 227, part of 229, part of 230, 250, 251, part of 264, 271, 272, 273, 317, 333, 342, 353, 354, part of 347, part of 392, 403, 445, 467, 478, part of 489, 525, 565, part of 637, 702, 703, 708, 738, 771, part of 821, 838, 846, and part of 929; **SE** 314; **SW** part of 390, 644, and 673.

**Rl Paleozoic intrusive rocks — Mesozoic-Paleozoic** metagabbro, diabase, and tonalite. **Pennsylvanian** gabbro, quartz diorite, and granodiorite. **Ordovician** gabbro and minor greenstone. **Paleozoic** gabbro, diorite, quartz diorite, tonalite, trondhjemitite, diabase, subordinate greenstone, and rare pyroxenite; local orthogneiss and metamorphosed basaltic to silicic dikes. *Includes named units:* **NE** 600 and 878; **NW** part of 867, 875, and part of 960.

**pCi Precambrian intrusive rocks — Proterozoic Z** metagabbro and greenstone; forms abundant dikes and sills in Proterozoic Y and Z metasedimentary rocks. **Proterozoic Y** metadiorite and metagabbro; forms abundant sills in Proterozoic Y metasedimentary rocks.

**M&Ru Mesozoic-Paleozoic ultramafic rocks —** Rocks of uncertain age: dunite, peridotite, pyroxenite, serpentinite, and altered ultrabasic (ultramafic) rocks; locally cut by thin veins of chrysotile asbestos; locally intercalated with greenstone and metatuff. **Pre-Tertiary** dunite, serpentinite, par-

tially serpentinitized dunite, peridotite, pyroxenite, talc schist, and harzburgite. **Jurassic** serpentinite, peridotite, and dunite; locally with layers of chromite; occurs as mélange matrix or as dismembered blocks of ophiolite. *Includes named units:* **NE** 70, part of 132, and 634; **NW** part of 45, part of 230, part of 264, part of 347, part of 392, part of 397, part of 451, 883, and part of 929.

## Metasedimentary and Metavolcanic Rocks

**Mzms Mesozoic metasedimentary rocks — Pre-Tertiary** metaconglomerate; locally interbedded with metasandstone and meta-argillite; locally includes chert-pebble conglomerate. **Cretaceous** metaconglomerate or conglomeratic quartzite, in which boulder to pebble clasts are mostly metachert; locally includes feldspathic metasandstone, minor metasilstone, and rare fossilized wood debris; quartzite locally intercalated with kyanite-staurolite-garnet schist and locally intruded by metatonalite. **Pre-Cretaceous** orthoquartzite with local minor schist, locally metaconglomeratic. **Cretaceous–Jurassic** chert, metachert, metasandstone, cherty metasandstone, argillite, mudstone, and conglomerate; locally contains shaly interbeds, semischist, phyllite, limestone, vesicular pillowed greenstone, tuff, breccia, diabase, gabbro, phyllitic siltstone, and metaconglomerate; rare limy siltstone, serpentinite and marble pods, and concretions. **Jurassic** meta-argillite, slate, phyllitic argillite, volcanic-lithic metasandstone, semischistose sandstone, phyllite, greenschist, blueschist, iron-manganese quartzite, metaconglomerate; locally includes metasandstone, metamorphosed flows and breccias, metachert, marble, serpentinite, cataclastic sandstone, calcareous phyllite, quartzose mica schist, metatuff, magnesian schists, talc schists, metasilite, metawacke, metavolcanic rocks, ironstone, and ferruginous quartzite; locally cut by deformed and brecciated metadacite dikes; locally contains abundant quartz veins or lenses. **Jurassic–Triassic** metamorphosed ribbon chert and metamorphosed tuffaceous siltstone, sandstone, and argillite; locally contains quartzite, meta-argillite, pillow basalt, basaltic tuff, greenstone, phyllitic slate, minor marble, and rare metaconglomerate. **Triassic** limestone, dolomite, phyllite, metalimestone, metadolomite, and metasilite; local interbeds of meta-argillite, quartzite, metaconglomerate, and minor greenstone; local discontinuous bodies of serpentinite and magnesian metadolomite; local carbonaceous beds and coarse reef debris. **Mesozoic** schist to phyllite with local amphibolite, chert, greenschist, marble, hornfels, pyroxenite, peridotite, serpentinite, and semischist. *Includes named units:* **NE** 106, 107, 108, 109, part of 159, part of 244, part of 269, and part of 713; **NW** 28,

161, 181, part of 182, 189, 190, part of 229, part of 233, part of 243, part of 296, part of 347, part of 392, part of 397, part of 451, part of 465, part of 469, 546, 595, 615, 647, 705, 748, 785, 823, part of 863, 904, and part of 929; **SE** 491; **SW** 232.

**Rms**

**Paleozoic metasedimentary rocks — Triassic and Permian** meta-argillite, metasilite, metawacke, and minor metalimestone and chert-pebble metaconglomerate. **Permian** metalimestone, meta-argillite, phyllite, quartzite, metawacke, and chert-pebble metaconglomerate and thin, discontinuous lenses of greenstone. **Permian–Devonian** limestone, marble, metamorphosed volcanic sandstone, siltstone, argillite, conglomerate, tuff, and rare chert. **Pre-Permian** amphibolite, greenschist, blueschist, micaceous quartzite (metachert), mica-quartz schist, and rare marble. **Carboniferous and Devonian** metalimestone, metadolomite, interbedded meta-argillite and phyllite, green phyllite, and gray quartzite; locally includes dolomitic metaconglomerate, metasilite, minor black metachert, minor thin discontinuous lenses of chert-pebble metaconglomerate, and greenstone, and thin layers and lenses of barite. **Carboniferous to Ordovician** metaconglomerate, meta-argillite, phyllite, metachert, quartzite, metawacke, metalimestone, and minor greenstone. **Devonian** metalimestone and metaconglomerate. **Silurian** metasilite and meta-argillite intercalated with metalimestone and metaconglomerate; minor slate. **Ordovician** meta-argillite, metasilite, quartzite, metalimestone, metadolomite, metawacke, metaconglomerate, and phyllite; minor metachert and greenstone. **Ordovician and Cambrian** metalimestone, metadolomite, and argillaceous metalimestone; locally interbedded with meta-argillite, metasilite, and minor quartzite. **Cambrian** metalimestone, metadolomite, phyllite, meta-argillite, and metasilite; locally interbedded with quartzite. **Paleozoic** metaconglomerate and metawacke with minor black slate and phyllite; locally contains small masses of serpentinite and magnesian metadolomite; local meta-argillite, metasilite, quartzite, and discontinuous pods and lenses of metalimestone. *Includes named units:* **NE** 9, 78, part of 173, part of 269, 316, 410, 439, 480, 505, 553, 608, part of 643, 696, and 787; **NW** part of 125, 287, 543, and part of 899.

**RpCms**

**Paleozoic–Precambrian metasedimentary rocks — Ordovician to Proterozoic Y** phyllite, metalimestone, and feldspathic quartzite, generally thermally metamorphosed; feldspathic quartzite intercalated with metasiltstone, locally metamorphosed. **Cambrian and Proterozoic Z** generally interbedded quartzite and meta-argillite and meta-

siltite; minor metaconglomerate and metadolomite. *Consists of named units: NE 1 and 325.*

**pCms Precambrian metasedimentary rocks — Proterozoic Z** metaconglomerate, quartzite, metaargillite, and metasiltite, locally interbedded; local minor metalimestone, greenstone, and metadolomite. **Proterozoic Y** metaargillite, phyllite, metasiltite, quartzite, metadolomite; minor metalimestone, metachert, phyllite, and metaconglomerate, lithologies generally interbedded; locally thermally metamorphosed to schist and hornfels; metadolomite locally magnesian; locally cut by abundant metadiorite and metagabbro sills. **Precambrian** siltite and quartzite; local minor dolomite lenses and (or) beds; local dark argillite partings common. *Includes named units: NE part of 47, 76, part of 83, 195, 235, part of 374, 375, 501, 521, part of 522, 526, 660, 664, 691, part of 692, 700, part of 701, 743, 801, 805, 815, 853, 861, 911, and part of 948; SE part of 47, part of 83, part of 522, part of 692, part of 701, and 816.*

**Mzmt Mesozoic metasedimentary and metavolcanic rocks — Cretaceous** interbedded feldspathic sandstone, tuffaceous rocks, flows, and porphyritic dikes and sills with minor chert-pebble conglomerate and breccia, all metamorphosed to the greenschist facies; conglomerate, amphibolite, hornblende schist, siltstone, gabbro, mica schist, and porphyritic mafic dikes, all metamorphosed to the amphibolite facies. **Cretaceous and Jurassic** metavolcanic rocks intercalated with quartzite and metaargillite; locally thermally metamorphosed. **Jurassic** greenstone, metachert, metaargillite, metasandstone, and serpentinite with minor limestone, metadiabase, and metatuff. **Jurassic-Triassic** greenstone, metadacite, greenschist, greenstone breccia, quartzite, amphibolite, hornblende schist, volcanic metasandstone, chert-rich metaconglomerate, muscovite schist, marble, and tectonic pods or layers of ultramafic rocks. **Triassic** phyllite, greenstone, amphibolite, quartzite (metachert?), volcanic breccia, metabasalt, keratophyre, and volcanic sandstone; local discontinuous bodies of serpentinite and magnesian metadolomite; locally interbedded with shale, tuff, conglomerate, and thin limestone beds; includes pillow basalt, pillow breccia, argillite, and volcanoclastic rocks. *Consists of named units: NE 420 and 495; NW part of 229, part of 233, part of 243, part of 347, part of 469, part of 597, 885, 941, and part of 952; SE 216, 737, and 944.*

**MzRmt Mesozoic-Paleozoic metasedimentary and metavolcanic rocks — Pre-Tertiary** argillite, slate, phyllite, sandstone, semischist, ribbon chert, diorite, tonalite, silicic gneiss, fine-grained epidote-amphibolite gneiss, micaceous quartzite,

quartzite, amphibole schist, greenstone, quartzitic metasedimentary rocks, amphibolitic schist, metagabbro, and plagiogranite; local tectonic blocks of igneous rocks, gneiss, schist, ultramafic rocks, and marble. **Jurassic-Permian** greenstone and metamorphosed tuff, ribbon chert, chert, and limestone with minor metasandstone, serpentinite, metaargillite, and rare metaconglomerate. **Jurassic-Mississippian** greenstone and banded chert with subordinate metamorphosed volcanic-lithic sandstone, argillite (locally phyllitic), and minor diabase, marble, and limestone. **Jurassic-Devonian** greenstone, metamorphosed andesite, sandstone, siltstone, argillite, shale, and minor limestone. **Triassic and Permian** greenstone, metaargillite, chert-rich metawacke, chert-pebble metaconglomerate, and minor metalimestone. *Consists of named units: NW 24, part of 45, 124, 183, 193, 238, part of 867, part of 899, and part of 960.*

**Rmt Paleozoic metasedimentary and metavolcanic rocks — Permian-Devonian** metamorphosed argillite and volcanic sandstone, basalt to rhyolite breccia, tuff, and flows, and silicic hypabyssal rocks, local pebble conglomerate, limestone, gabbro, and rare chert. **Carboniferous and Devonian** phyllite and metaargillite intercalated with quartzite, metalimestone, and greenstone. *Consists of named units: NE part of 269 and part of 643; NW part of 125 and 228.*

**Mzmv Mesozoic metavolcanic rocks — Cretaceous-Jurassic** greenstone, metadiabase, gabbro, quartz porphyry dikes, mafic tuff, argillite, volcanic-lithic sandstone, chert, and greenstone tuff, meta-andesite flows and tuffs, and tectonic blocks of pillowed greenstone in metasedimentary rocks; local minor intercalated metaargillite, metasandstone, and metaconglomerate. **Jurassic** metabasalt and basaltic meta-andesite flows, flow breccias, greenstone, dacite to andesite flows, tuffs, and breccia with argillite interbeds; local intermediate-composition metavolcanic rocks and rare amphibolite; local thin interbeds of volcanic metaconglomerate, metawacke, metaargillite, metasiltite, and metalimestone; local serpentinite, pyroxenite, greenschist, metamorphosed quartz diorite, silicic porphyry, micaceous quartz-feldspar schist, metatuff, tuff breccia, and tuffaceous sandstone, siltstone, and belemnite-bearing marble. **Jurassic-Triassic** metadacite. **Triassic** meta-andesite, metabasalt, and metadiabase. *Includes named units: NE 105, part of 244, part of 597, 626, and part of 713; NW part of 182, 194, part of 230, part of 296, part of 347, part of 392, 462, part of 465, 924, and part of 929; SW part of 719.*

**Rmv Paleozoic metavolcanic rocks — Triassic-Permian** greenstone, metamorphosed pillow ba-

salt, breccia, tuff breccia, mafic tuff, and chert; local quartzite (metachert), meta-argillite, phyllite, metawacke, and metaconglomerate interbeds, local minor pods and lenses of metalimestone. **Permian-Devonian** metamorphosed basaltic, andesitic, dacitic, and rarely rhyolitic to rhyodacitic flows, tuffs, and volcanoclastic rocks. **Carboniferous-Devonian** greenstone and greenschist. **Carboniferous-Ordovician** greenstone with pillow structures locally preserved or greenschist and phyllite. **Ordovician** intercalated greenstone, greenschist, and porphyritic metabasalt; thin, discontinuous interbeds of meta-argillite, quartzite, metawacke, and metalimestone. *Consists of named units: NE* part of 173 and part of 269; **NW** part of 125, 544, and 599.

pCmv **Precambrian metavolcanic rocks — Proterozoic Z** greenstone and amphibolite with minor metaconglomerate. *Consists of named units: NE* part of 374, 376, 441, and part of 948.

### Metamorphic Rocks (Amphibolite Facies and Higher)

Mzhm **Mesozoic heterogeneous metamorphic rocks — Cretaceous** amphibolite, pegmatite, and tonalite; sills and dikes of metadiorite and metaquartz diorite. **Cretaceous-Jurassic** schist, amphibolite, and granofels; quartzite, phyllite, gneiss, metagabbro, metadiorite, quartz diorite, metaperidotite, and serpentinite. **Triassic** schist and gneiss, metavolcanic rocks, amphibolite, metaconglomerate, and marble; local greenschist facies rocks. **Mesozoic** schist, schistose amphibolite, gneiss, and marble; dikes and sills of tonalite and pegmatite. *Includes named units: NW* part of 99, part of 100, part of 113, part of 129, 363, part of 392, 790, and part of 863.

MzRhm **Mesozoic-Paleozoic heterogeneous metamorphic rocks — Pre-Tertiary** quartzite, gneiss, schist, marble, calc-silicate rocks, and amphibolite; local minor pegmatite and migmatite. **Pre-Jurassic** gneiss, schist, quartzite, amphibolite, and marble; local minor marble, calc-silicate rocks, amphibolite, and micaceous quartzite; locally migmatitic; local abundant alaskite-aplite-pegmatite pods and dikes or leucocratic tonalite dikes and sills; local unmapped bodies of metatonalite and gabbro. **Jurassic-Permian** schist, gneiss, amphibolite, quartzite, phyllite, greenschist, and marble; pods and layers of serpentinite, metaperidotite, metapyroxenite, and hornblendite. **Triassic-Permian** amphibolite, quartzite (metachert), schist, and rare marble; local discontinuous lenses of metaperidotite and metaconglomerate; mylonitic and (or) phyllonitic in places; locally abundant tonalite dikes and sills; local minor amphibolite and quartzite. *Includes named units: NE* part of 7, part of 62,

part of 114, part of 159, part of 326, part of 440, part of 477, part of 582, 724, 800, part of 844, 876, and 886; **NW** part of 99, 581, part of 583, 684, and 887; **SW** 460.

pChm **Precambrian heterogeneous metamorphic rocks — Precambrian** amphibolite, gneiss, schist, quartzite, and phyllite; subordinate siltite; minor hornfels; local dikes and irregular masses of alaskite-aplite-pegmatite, granite, and amphibolite; locally migmatitic and locally mylonitic. *Includes named units: NE* 116, 275, 341, 509, and 715.

Mzam **Mesozoic amphibolite — Pre-Tertiary** amphibolite with subordinate gneiss and schist; locally protomylonitic, mylonitic, and (or) ultramylonitic. *Includes named units: NE* 706 and part of 844.

MzRam **Mesozoic-Paleozoic amphibolite — Jurassic** amphibolite, schist, and ultramafic rocks, including serpentinite; subordinate metagabbro and meta-norite; locally brecciated and cut by abundant basalt(?) and granodiorite dikes; rare eclogite and associated greenschist. **Pre-Jurassic** amphibolite with minor mica schist, metadiorite, metagabbro, and tonalite gneiss. *Consists of named units: NE* 17, 34, and 744; **NW** part of 230 and part of 347.

TKgn **Tertiary-Cretaceous gneiss — Tertiary-Cretaceous** schist, paragneiss, gneissose tonalite, tonalite gneiss, amphibole gneiss, and gneissic amphibolite; strongly layered; migmatitic sills and dikes of leucotonalite, granite, and granodiorite; local quartzite, calc-silicate rocks, and marble. *Consists of named units: NW* part of 99, part of 100, part of 583, and part of 763.

Mzgn **Mesozoic gneiss — Pre-Tertiary** banded and migmatitic quartzofeldspathic gneiss and schist, hornblende-biotite gneiss and schist, amphibolite, and garnetiferous alaskite gneiss; strongly foliated to schistose to nonfoliated biotite-oligoclase-quartz gneiss; monzonitic and syenitic gneiss; locally mylonitic; local felsic sills and dikes. **Cretaceous** tonalite to granodiorite gneiss; locally migmatite. **Jurassic** schistose amphibolite to medium- and coarse-grained quartz diorite, layered hornblende gneiss, gneissose quartz diorite, and trondhjemite. *Consists of named units: NE* part of 829, part of 844, and 862; **NW** 29, part of 48, part of 129, part of 229, part of 586, part of 829, and 926.

Rgn **Paleozoic gneiss — Pre-Devonian** quartzose pyroxene gneiss and gabbroic to granitic orthogneiss; rare granite and marble; local metaquartz diorite, pyroxenite, greenstone, meta-andesite, and minor ultramafic rocks; local metamorphosed gabbro, diabase, and tonalite. *Consists of named unit: NW* part of 960.

**TKog Tertiary-Cretaceous orthogneiss — Paleocene** weakly to strongly foliated trondhjemitic biotite orthogneiss; weakly to strongly foliated and lineated leucocratic to mesocratic tonalitic and granodioritic orthogneiss. **Paleocene-Cretaceous** gneissic to mylonitic and locally pegmatitic biotite tonalite. **Tertiary-Cretaceous** heterogeneous tonalite orthogneiss, trondhjemitic orthogneiss, granodiorite orthogneiss, and diorite orthogneiss; commonly migmatitic with fine-grained to pegmatitic dikes and sills; subordinate tonalite and granodiorite; local amphibolite, hornblende schist, quartzite, biotite schist, marble, calc-silicate rocks, and ultramafic rocks. *Includes named units: NE* 426, part of 621, 762, and 915; **NW** 65, 282, 427, 500, 536, 568, 669, 685, part of 763, 803, and 916.

**Mkog Mesozoic orthogneiss — Pre-Tertiary** orthogneiss cut by tonalite dikes and sills; granodioritic and tonalitic orthogneiss with minor alaskite gneiss, pegmatite, and migmatite. **Cretaceous** granodioritic and tonalitic orthogneiss; minor amphibolite; local flaser, schlieren, nonfoliated, cataclastic, mylonitic, and migmatitic textures; minor garnet schist, quartzite, and amphibolite; locally abundant schlieren and dikes of biotite schist, locally riddled by mylonitic shear zones. **Cretaceous-Jurassic** tonalite and granodiorite orthogneiss with locally abundant melanocratic schlieren and inclusions, locally protomylonitic and mylonitic. **Jurassic** tonalitic, granodioritic, quartz dioritic, and quartz monzonitic orthogneiss; partly strongly gneissic and migmatitic and partly directionless to weakly foliated and porphyroblastic; minor amphibolite. **Triassic** tonalite gneiss, quartz diorite gneiss, quartz diorite, granodiorite gneiss, and augen gneiss. **Mesozoic** quartz diorite or granodiorite orthogneiss; local diorite or granite orthogneiss. *Includes named units: NE* 11, 12, part of 41, part of 54, part of 114, 177, 178, 196, 277, part of 326, 438, part of 440, part of 464, part of 477, 507, 519, part of 582, 592, 598, part of 606, 607, 620, 695, part of 824, part of 827, part of 844, 859, part of 860, and 949; **NW** 6, part of 41, part of 48, 220, 239, 257, 345, 431, 442, 488, part of 489, part of 583, part of 586, 587, 641, 697, part of 763, 777, part of 821, and 927; **SW** 352 and part of 390.

**Mkmi Mesozoic migmatite and mixed metamorphic and igneous rocks — Tertiary and Cretaceous** biotite granite and granodiorite with abundant pendants and inclusions of biotite gneiss; local aplite-pegmatite pods and dikes and biotite diorite dikes. **Cretaceous** schist, gneiss, and amphibolite with concordant to discordant layers, pods, and anastomosing dikes and swirls of directionless tonalite and granodiorite; locally gradational into leucocratic orthogneiss. **Cretaceous-Jurassic**

banded biotite-hornblende schist and gneiss, amphibolite, and concordant to discordant layers, pods, and anastomosing dikes and swirls of leucocratic tonalite and granodiorite; or tonalite, quartz diorite, and granodiorite with abundant discontinuous layers, schlieren, and inclusions of gneiss and schist, amphibolite, metagabbro, metadiorite, migmatite, and minor calc-silicate rocks; locally abundant alaskite-aplite-pegmatite dikes and pods, dikes and small bodies of granodiorite and quartz monzonite, and minor agmatite. *Includes named units: NE* part of 7, part of 62, part of 114, part of 117, part of 402, part of 606, 672, part of 786, 798, 807, part of 827, 855, 856, and part of 910; **NW** 60 and 209.

### Tectonic Zones

**tz Tectonic zones** — Areas of intense cataclasis, including mylonitization. *Includes named units: NE* 37 and 872.

### REFERENCES CITED

- Coates, J. A., 1974, Geology of the Manning Park area, British Columbia: Geological Survey of Canada Bulletin 238, 177 p., 9 plates.
- Daly, R. A., 1912, Geology of the North American Cordillera at the forty-ninth parallel: Geological Survey of Canada Memoir 38, Parts 1, 2, and 3, 857 p.
- Dragovich, J. D.; Logan, R. L.; Schasse, H. W.; Walsh, T. J.; Lingley, W. S., Jr.; Norman, D. K.; Gerstel, W. J.; Lapen, T. J.; Schuster, J. E.; Meyers, K. D.; 2002, Geologic map of Washington—Northwest quadrant: Washington Division of Geology and Earth Resources Geologic Map GM-50, 3 sheets, scale 1:250,000, with 72 p. text.
- Dragovich, J. D.; Norman, D. K.; Anderson, Garth, 2000, Interpreted geologic history of the Sedro-Woolley North and Lyman 7.5-minute quadrangles, western Skagit County, Washington: Washington Division of Geology and Earth Resources Open File Report 2000-1, 71 p., 1 plate.
- Dragovich, J. D.; Norman, D. K.; Grisamer, C. L.; Logan, R. L.; Anderson, Garth, 1998, Geologic map and interpreted geologic history of the Bow and Alger 7.5-minute quadrangles, western Skagit County, Washington: Washington Division of Geology and Earth Resources Open File Report 98-5, 80 p., 3 plates.
- Dragovich, J. D.; Norman, D. K.; Lapen, T. J.; Anderson, Garth, 1999, Geologic map of the Sedro-Woolley North and Lyman 7.5-minute quadrangles, western Skagit County, Washington: Washington Division of Geology and Earth Resources Open File Report 99-3, 37 p., 4 plates.
- Gallagher, M. P.; Brown, E. H.; Walker, N. W., 1988, A new structural and tectonic interpretation of the western part of the Shuksan blueschist terrane, northwestern Washington: Geological Society of America Bulletin, v. 100, no. 9, p. 1415-1422.
- Lapen, T. J., 2000, Geologic map of the Bellingham 1:100,000 quadrangle, Washington: Washington Division of Geology and Earth Resources Open File Report 2000-5, 36 p., 2 plates.

- Miles, C. E., compiler, 2003, Geologic shaded-relief map of Pennsylvania: Pennsylvania Bureau of Topographic and Geologic Survey Map 67, 1 sheet, scale 1:500,000.
- Misch, Peter, 1966, Tectonic evolution of the northern Cascades of Washington—A west-cordilleran case history. *In* Canadian Institute of Mining and Metallurgy; and others, A symposium on the tectonic history and mineral deposits of the western Cordillera in British Columbia and neighbouring parts of the United States, Vancouver, 1964: Canadian Institute of Mining and Metallurgy Special Volume 8, p. 101-148, 1 plate.
- Schuster, J. E.; Gulick, C. W.; Reidel, S. P.; Fecht, K. R.; Zurenko, Stephanie, 1997, Geologic map of Washington—Southeast quadrant: Washington Division of Geology and Earth Resources Geologic Map GM-45, 2 sheets, scale 1:250,000, with 20 p. text.
- Stoffel, K. L.; Joseph, N. L.; Waggoner, S. Z.; Gulick, C. W.; Korosec, M. A.; Bunning, B. B., 1991, Geologic map of Washington—Northeast quadrant: Washington Division of Geology and Earth Resources Geologic Map GM-39, 3 sheets, scale 1:250,000, with 36 p. text.
- Tabor, R. W.; Booth, D. B.; Vance, J. A.; Ford, A. B., 2002, Geologic map of the Sauk River 30- by 60-minute quadrangle, Washington: U.S. Geological Survey Geologic Investigations Series Map I-2592, 2 sheets, scale 1:100,000, with 67 p. text.
- Walsh, T. J.; Korosec, M. A.; Phillips, W. M.; Logan, R. L.; Schasse, H. W., 1987, Geologic map of Washington—Southwest quadrant: Washington Division of Geology and Earth Resources Geologic Map 34, 2 sheets, scale 1:250,000, with 28 p. text.
- Whetten, J. T.; Zartman, R. E.; Blakely, R. J.; Jones, D. L., 1980, Allochthonous Jurassic ophiolite in northwest Washington: Geological Society of America Bulletin, v. 91, no. 6, p. 1359-1368.
- Wolfe, E. W.; McKee, E. H., 1972, Sedimentary and igneous rocks of the Grays River quadrangle, Washington: U.S. Geological Survey Bulletin 1335, 70 p.

**Table 1.** List of map units showing 1:250,000-scale units included in each 1:500,000-scale unit. Units are listed alphabetically.

Unit	Included 1:250,000 units (quadrant where unit occurs)	Unit	Included 1:250,000 units (quadrant where unit occurs)
M <sub>am</sub>	pTam Pre-Tertiary amphibolite (NE)	M <sub>m</sub>	KJm Cretaceous and Jurassic marine sedimentary rocks (NE)
M <sub>c</sub>	Kc <sub>2</sub> Cretaceous continental sedimentary rocks (NW)	KJm	Cretaceous and Jurassic marine sedimentary rocks (SW)
	Kc <sub>2</sub> Upper Cretaceous continental sedimentary rocks (NE)	KJm	Cretaceous to Jurassic marine sedimentary rocks (NW)
	Kcg <sub>1</sub> Cretaceous conglomerate (NW)	KJmct	Cretaceous and Jurassic chert-rich marine sedimentary rocks (SW)
	Kcg <sub>1</sub> Lower Cretaceous conglomerate (NE)	Km <sub>1</sub>	Cretaceous marine sedimentary rocks (NW)
	Kcg <sub>2</sub> Cretaceous conglomerate (NW)	Km <sub>1</sub>	Lower Cretaceous marine sedimentary rocks (NE)
	Kcg <sub>2</sub> Upper Cretaceous conglomerate (NE)	Km <sub>2</sub>	Upper Cretaceous marine sedimentary rocks (NE)
	TKc Tertiary and Cretaceous continental sedimentary rocks (NE)	M <sub>mi</sub>	KJmg Cretaceous and Jurassic migmatite (NE)
M <sub>gn</sub>	Jgn Jurassic migmatitic gneiss (NW)	KJmi	Cretaceous and Jurassic mixed metamorphic and igneous rocks (NE)
	Kbg Cretaceous banded gneiss (NW)	KJmi	Cretaceous to Jurassic mixed metamorphic and igneous rocks (NW)
	pCgn Precambrian gneiss (NE)	Kmg	Cretaceous migmatite (NE)
	pTbg Pre-Tertiary banded gneiss (NE)	TKmi	Tertiary and Cretaceous mixed metamorphic and igneous rocks (includes only that part of unit TKmi located adjacent to the Columbia River in southern Ferry County) (NE)
	pTgn Pre-Tertiary gneiss (NE)		
M <sub>hm</sub>	Khm Cretaceous heterogeneous metamorphic rocks (NW)	M <sub>ms</sub>	Jar Jurassic meta-argillite (NW)
	KJhmc Cretaceous to Jurassic heterogeneous chert-bearing metamorphic rocks (NW)	Jcg	Jurassic metaconglomerate (NE)
	M <sub>sc</sub> Mesozoic schist and amphibolite (NW)	Jmm	Jurassic marine metasedimentary rocks (NW)
	T <sub>hm</sub> Triassic heterogeneous metamorphic rocks (NW)	Jph	Jurassic phyllite (NW)
M <sub>l</sub>	Ji Jurassic intrusive rocks, undivided (NW)	Jph	Jurassic phyllite (SW)
	Jia Jurassic acidic intrusive rocks (NE)	Jsh	Jurassic greenschist (NW)
	Jib Jurassic basic (mafic) intrusive rocks (NW)	Jsh	Jurassic schist (SW)
	Jib Jurassic basic (mafic) intrusive rocks (NE)	JTmc	Jurassic to Triassic metachert (NW)
	Jigb Jurassic gabbro (NW)	JTmm	Jurassic to Triassic marine metasedimentary rocks (NW)
	Jigd Jurassic granodiorite (NE)	KJmc	Cretaceous to Jurassic metachert (NW)
	Jik Jurassic alkalic intrusive rocks (NE)	KJmm	Cretaceous to Jurassic marine metasedimentary rocks (NW)
	Jiq Jurassic quartz diorite (NE)	KJms	Cretaceous to Jurassic metasedimentary rocks (NW)
	Jiq Upper Jurassic quartz diorite (SW)	Kmcg	Cretaceous metaconglomerate (NW)
	Jiqm Jurassic quartz monzonite (NE)	M <sub>sh</sub>	Mesozoic schist (NW)
	Jit Jurassic tonalite (NE)	pKq	Pre-Cretaceous quartzite (SE)
	Jit Jurassic tonalite (NW)	pTms	Pre-Tertiary metasedimentary rocks (NW)
	Kia Cretaceous acidic intrusive rocks (NE)	T <sub>cb</sub>	Triassic metacarbonate (NE)
	Kia Cretaceous acidic intrusive rocks (SE)	T <sub>cb</sub>	Triassic metacarbonate (SE)
	Kiaa Cretaceous alaskite pegmatite (NW)	T <sub>mm</sub>	Triassic marine metasedimentary rocks (NE)
	Kiaa Cretaceous alaskite-aplite-pegmatite (NE)	M <sub>mt</sub>	Jmt Jurassic metasedimentary and metavolcanic rocks, undivided (NW)
	Kiat Cretaceous two-mica granite (NE)	JTmt	Jurassic to Triassic metasedimentary and metavolcanic rocks, undivided (NW)
	Kid Cretaceous diorite (NE)	KJmt	Cretaceous and Jurassic metasedimentary and metavolcanic rocks, undivided (NE)
	Kid Cretaceous diorite (NW)	Kmt	Cretaceous metasedimentary and metavolcanic rocks, undivided (NW)
	Kida Cretaceous dacite and andesite (NE)	T <sub>mt</sub>	Triassic metasedimentary and metavolcanic rocks, undivided (NE)
	Kig Cretaceous granite (NE)	T <sub>mt</sub>	Triassic metasedimentary and metavolcanic rocks, undivided (SE)
	Kigb Cretaceous gabbro (NE)	M <sub>mv</sub>	Jmv Jurassic metavolcanic rocks (NE)
	Kigb Cretaceous gabbro (NW)	Jmv	Jurassic metavolcanic rocks (NW)
	Kigd Cretaceous granodiorite (NE)	Jmvd	Jurassic metavolcanic rocks, dacite (NW)
	Kigd Cretaceous granodiorite (NW)	JTmv	Jurassic to Triassic metavolcanic rocks (NW)
	Kigd Cretaceous granodiorite (SE)	KJmv	Cretaceous and Jurassic metavolcanic rocks (NE)
	Kiq Cretaceous quartz diorite (NE)	KJmv	Cretaceous to Jurassic metavolcanic rocks (NW)
	Kiq Cretaceous quartz diorite (NW)	KJmv	Cretaceous to Jurassic metavolcanic rocks (SW)
	Kiqm Cretaceous quartz monzonite (NE)	T <sub>mv</sub>	Triassic metavolcanic rocks (NE)
	Kit Cretaceous tonalite (NE)	M <sub>en</sub>	KJn Cretaceous to Jurassic nearshore sedimentary rocks (NW)
	Kit Cretaceous tonalite (NW)	Kn	Cretaceous nearshore sedimentary rocks (NW)
	Kit Cretaceous tonalite (SE)	T <sub>n</sub>	Triassic nearshore sedimentary rocks (NW)
	KJi Cretaceous to Jurassic intrusive rocks, undivided (SE)	M <sub>og</sub>	Jog Jurassic orthogneiss (NE)
	KJia Cretaceous and Jurassic acidic intrusive rocks (NE)	Jog	Jurassic orthogneiss (SW)
	KJid Cretaceous and Jurassic diorite (NE)	KJog	Cretaceous and Jurassic orthogneiss (NE)
	KJigb Cretaceous and Jurassic gabbro (NE)	KJog	Cretaceous to Jurassic orthogneiss (NW)
	KJigb Cretaceous gabbro (NW)		
	KJigd Cretaceous and Jurassic granodiorite (NE)		
	KJiq Cretaceous and Jurassic quartz diorite (NE)		
	M <sub>igb</sub> Mesozoic gabbro (NE)		
	pTigb Pre-Tertiary gabbro (NW)		
	pTigd Pre-Tertiary granodiorite and granite (NW)		
	TKid Tertiary and Cretaceous diorite (NE)		
	T <sub>ib</sub> Triassic basic (mafic) intrusive rocks (NE)		
	T <sub>igd</sub> Triassic granodiorite (NE)		
	T <sub>iq</sub> Triassic quartz diorite (NW)		
M <sub>m</sub>	Jm Jurassic marine sedimentary rocks (NE)		
	Jm Jurassic marine sedimentary rocks (NW)		
	Jm Jurassic marine sedimentary rocks (SE)		

Unit	Included 1:250,000 units (quadrant where unit occurs)		Unit	Included 1:250,000 units (quadrant where unit occurs)		
Mkog	Kog	Cretaceous orthogneiss (NE)	pCms	Ycb <sub>2</sub>	Proterozoic Y Stensgar Dolomite (NE)	
	Kog	Cretaceous orthogneiss (NW)		Ymm	Proterozoic Y Buffalo Hump Formation (NE)	
	Kogm	Cretaceous mesocratic orthogneiss (NE)		Yms <sub>1</sub>	Proterozoic Y Prichard Formation (NE)	
	Mkog	Mesozoic orthogneiss (NE)		Yms <sub>2</sub>	Proterozoic Y Ravalli Group (NE)	
	pTog	Pre-Tertiary orthogneiss (NE)		Yms <sub>2</sub>	Proterozoic Y Ravalli Group, Revett and Burke Formations, undivided (SE)	
	pTog	Pre-Tertiary orthogneiss (NW)				
	Tog	Triassic orthogneiss (NE)		Yms <sub>3</sub>	Proterozoic Y Wallace Formation (NE)	
	Tog	Triassic orthogneiss (NW)		Yms <sub>4</sub>	Precambrian Missoula Group, Striped Peak Formation (SE)	
	M&Ram	Jam		Jurassic amphibolite (NW)	Yms <sub>4</sub>	
pJam		Pre-Jurassic amphibolite (NE)				
pJam		Pre-Jurassic amphibolite (SW)				
M&Rhm	JPhmc	Jurassic to Permian heterogeneous chert-bearing metamorphic rocks (NW)		Yq	Proterozoic Y quartzite (NE)	
				Zcg	Proterozoic Z metaconglomerate (NE)	
	pJhm	Pre-Jurassic heterogeneous metamorphic rocks (NE)		Zmm	Proterozoic Z marine metasedimentary rocks (NE)	
	pJmb	Pre-Jurassic marble (NE)		Zq	Proterozoic Z quartzite (NE)	
	pJsc	Pre-Jurassic schist (SW)	pCmv	Zmv	Proterozoic Z metavolcanic rocks (NE)	
	pThm	Pre-Tertiary heterogeneous metamorphic rocks (NE)	Rgn	pDgn	Pre-Devonian gneiss (NW)	
	pTmb	Pre-Tertiary marble (NE)	Rl	M&Rl	Mesozoic to Paleozoic intrusive rocks (NW)	
	pTqz	Pre-Tertiary quartzite (NE)		Oigb	Ordovician gabbro (NE)	
	pTsc	Pre-Tertiary schist (NE)		pDi	Pre-Devonian intrusive rocks (NW)	
	TPhmc	Triassic and Permian heterogeneous chert-bearing metamorphic rocks (NE)		PI	Pennsylvanian intrusive rocks (NW)	
				Rib	Paleozoic basic (mafic) intrusive rocks (NE)	
		T&Pmb	Triassic and Permian marble (NE)	Rms	Ccb	Cambrian metacarbonate (NE)
	M&Rmt	JDmt	Jurassic to Devonian metasedimentary and metavolcanic rocks, undivided (NW)		CDcb	Carboniferous and Devonian metacarbonate (NE)
			CDmm		Carboniferous and Devonian marine metasedimentary rocks (NE)	
JMmt		Jurassic to Mississippian metasedimentary and metavolcanic rocks, undivided (NW)			Cmm	Cambrian marine metasedimentary rocks (NE)
JPmt		Jurassic to Permian metasedimentary and metavolcanic rocks, undivided (NW)			COcg	Carboniferous to Ordovician metaconglomerate (NE)
pDmt		Pre-Devonian metasedimentary and metavolcanic rocks, undivided (NW)			COmm	Carboniferous to Ordovician marine metasedimentary rocks (NE)
pTmt		Pre-Tertiary metasedimentary and metavolcanic rocks, undivided (NW)			Dcb	Devonian metacarbonate (NE)
pTmt		Pre-Tertiary metasedimentary and metavolcanic rocks, undivided (SE)			Dcg	Devonian metaconglomerate (NE)
					Oar	Ordovician meta-argillite (NE)
M&Ru	Ju	Jurassic ultramafic rocks (NW)			Ocb	Ordovician metacarbonate (NE)
	pTu	Pre-Tertiary ultramafic rocks (NW)		OCcb	Ordovician and Cambrian metacarbonate (NE)	
	u	Uncertain age ultrabasic (ultramafic) rocks (NE)		Omm	Ordovician marine metasedimentary rocks (NE)	
M&v	JPvs	Jurassic to Permian volcanic and sedimentary rocks, undivided (NW)		Pcb	Permian metacarbonate (NE)	
				PDmb	Permian to Devonian limestone and marble (NW)	
	Jv	Jurassic volcanic rocks (NW)		PDms	Permian to Devonian metasedimentary rocks (NW)	
	KJv	Cretaceous and Jurassic volcanic rocks, undivided (NE)		Pmm	Permian marine metasedimentary rocks (NE)	
				pPsh	Pre-Permian schist (NW)	
				Rmm	Paleozoic marine metasedimentary rocks (NE)	
				Smm	Silurian marine metasedimentary rocks (NE)	
				T&Pmm	Triassic and Permian marine metasedimentary rocks (NE)	
	KJvb	Cretaceous to Jurassic basalt flows (SW)	Rmt		CDmt	Carboniferous and Devonian metasedimentary and metavolcanic rocks, undivided (NE)
	KJvs	Cretaceous and Jurassic volcanic and sedimentary rocks, undivided (NE)			PDmt	Permian to Devonian metasedimentary and metavolcanic rocks, undivided (NW)
	KJvs	Cretaceous to Jurassic volcanic and sedimentary rocks, undivided (NW)				
	KJvt	Cretaceous and Jurassic tuff (NE)	Rmv	CDmv	Carboniferous and Devonian metavolcanic rocks (NE)	
	Kv <sub>2</sub>	Cretaceous volcanic rocks (NW)			COMv	Carboniferous to Ordovician metavolcanic rocks (NE)
	Kv <sub>2</sub>	Upper Cretaceous volcanic rocks, undivided (NE)			Omv	Ordovician metavolcanic rocks (NE)
	Kvs <sub>2</sub>	Upper Cretaceous volcanic and sedimentary rocks, undivided (NE)			PDmv	Permian to Devonian metavolcanic rocks (NW)
				T&Pmv	Triassic and Permian metavolcanic rocks (NE)	
				T&Pmv	Triassic to Permian metavolcanic rocks (NW)	
RKvs	Paleocene to Cretaceous sedimentary and volcanic rocks, undivided (NW)					
pTvr	Pre-Tertiary rhyolite (SW)					
pChm	pCam	Precambrian amphibolite (NE)	RpCms	CZq	Cambrian and Proterozoic Z quartzite (NE)	
	pCbg	Precambrian banded gneiss (NE)		OYmm	Ordovician to Proterozoic Y marine metasedimentary rocks (NE)	
	pChm	Precambrian heterogeneous metamorphic rocks (NE)				
		pCqz	Precambrian quartzite (NE)	Qa	Qa	Quaternary alluvium (NE)
	pCsc	Precambrian schist (SE)	Qa		Quaternary alluvium (NW)	
pCi			Qa		Quaternary alluvium (SE)	
	Yib	Proterozoic Y basic (mafic) intrusive rocks (NE)	Qa		Quaternary alluvium (SW)	
pCms	Zib	Proterozoic Z basic (mafic) intrusive rocks (NE)	Qb	Quaternary beach deposits (NW)		
	Yar	Proterozoic Y meta-argillite (NE)	Qb	Quaternary beach deposits (SW)		
	Yar <sub>1</sub>	Proterozoic Y Togo Formation (NE)	Qc	Pleistocene continental sediments (NW)		
	Yar <sub>2</sub>	McHale Slate (NE)	Qc	Pleistocene continental sediments (SW)		
	Ycb	Proterozoic Y metacarbonate (NE)	Qguc	Quaternary undifferentiated surficial deposits (NW)		
	Ycb <sub>1</sub>	Proterozoic Y Edna Dolomite (NE)	Qla	Quaternary lacustrine and fluvial deposits (SE)		

Unit	Included 1:250,000 units (quadrant where unit occurs)		Unit	Included 1:250,000 units (quadrant where unit occurs)	
Qa	Qla	Quaternary lacustrine deposits (NE)	Qgd	Qgp	Quaternary undifferentiated continental glacial drift of pre-Fraser age (NW)
	Qm	Holocene modified land and fill ( <i>see also</i> unit Qgd) (NW)		Qgpc	Quaternary continental glacial deposits of pre-Fraser age, undifferentiated (NW)
	Qoa	Quaternary older alluvium (NE)		Qgt	Quaternary continental glacial till (NE)
	Qoa	Quaternary older alluvium (NW)		Qgt	Quaternary continental glacial till (NW)
	Qoa	Quaternary older alluvium (SE)		Qgt	Quaternary continental glacial till (SW)
	Qoa	Quaternary older alluvium (SW)		Qml	Holocene modified land and fill ( <i>see also</i> unit Qa) (NW)
	Qp	Quaternary peat (NE)		Qs	Quaternary sediments, undivided (deposits in the Methow Valley) ( <i>see also</i> unit Qa) (NE)
	Qp	Quaternary peat deposits (NW)		Qi	Quaternary intrusive andesite (SW)
	Qp	Quaternary peat deposits (SW)		Qida	Quaternary intrusive dacite (SW)
	Qs	Quaternary sediments, undivided (near Lake Chelan [T27–28N, R21–23E]) ( <i>see also</i> unit Qgd) (NE)		Ql	Quaternary loess (NE)
	Qt	Quaternary terraced deposits (SE)		Ql	Quaternary loess (NW)
	Qt	Quaternary terraced sediments (SW)		Ql	Quaternary loess (SE)
Qad	Qad	Quaternary Late Wisconsinan alpine drift, undivided (NW)		Ql	Quaternary loess (SW)
	Qad	Pleistocene drift (NE)	Qls	RMls	Pliocene and Miocene mass-wasting deposits (NE)
	Qad	Pleistocene, Fraser glaciation and younger, undifferentiated drift (SW)		Qls	Quaternary landslide debris (SW)
	Qao	Late Wisconsinan alpine outwash (NW)		Qls	Quaternary landslide deposits (NW)
	Qao	Pleistocene, Fraser glaciation and younger, outwash deposits (SW)		Qls	Quaternary mass-wasting deposits (NE)
	Qap	Early Wisconsinan alpine drift (NW)		Qls	Quaternary mass-wasting deposits (SE)
	Qap	Pleistocene, pre-Fraser glaciation, undifferentiated drift (SW)		QRls	Quaternary to Pliocene mass-wasting deposits (SE)
	Qapo	Early Wisconsinan alpine outwash (NW)	QTc	QMcg	Quaternary to Miocene continental sedimentary rocks, conglomerate (SE)
	Qapo	Pleistocene, pre-Fraser glaciation, outwash deposits (SW)		QRc	Pleistocene to Pliocene continental sediments (SW)
	Qapw <sub>1</sub>	Older pre-Wisconsinan alpine drift (NW)	QTi	QRcg	Quaternary to Pliocene continental sedimentary rocks, conglomerate (SE)
	Qapw <sub>2</sub>	Younger pre-Wisconsinan alpine drift (NW)		QRida	Pleistocene to Pliocene intrusive dacite (SW)
Qd	Qd	Holocene dune sand (NW)	QTV	QRva	Pleistocene to Pliocene andesite flows (SW)
	Qd	Holocene dune sand (SW)		QRvb	Pleistocene to Pliocene basalt flows (SW)
	Qd	Quaternary dune sand (NE)	Qv	QRvd	Pleistocene to Pliocene dacite flows (SW)
	Qd	Quaternary dune sand (SE)		Qva	Quaternary andesite flows (NW)
Qf	Qf <sub>b</sub>	Quaternary Bonneville flood deposits (SE)	Qvt	Qva	Quaternary andesite flows (SW)
	Qfg	Quaternary outburst flood deposits, gravel (NE)		Qvb	Quaternary basalt flows (NW)
	Qfg	Quaternary outburst flood deposits, gravel (SE)		Qvb	Quaternary basalt flows (SW)
	Qfg	Upper Pleistocene flood gravel (SW)		Qvd	Pleistocene dacite flows (SW)
	Qfs	Quaternary outburst flood deposits, silt and sand (NE)		Qvd	Quaternary dacite flows (NW)
	Qfs	Quaternary outburst flood deposits, silt and sand (SE)		Qvr	Quaternary rhyodacite to dacite (NW)
	Qfs	Upper Pleistocene flood sand and silt (SW)		Qvc	Quaternary volcanoclastic deposits, undivided (SW)
	Qgl	Late Wisconsinan glaciolacustrine deposits (NE)		Qvl	Quaternary lahars (NW)
	Qgl	Quaternary glaciolacustrine deposits (NW)		Qvl	Quaternary lahars (SW)
	Qglf	Late Wisconsinan glaciolacustrine and outburst flood deposits, undivided (NE)		Qvp	Holocene pyroclastic flows (SW)
				Qvp	Quaternary pyroclastic deposits (NW)
				Qvt	Quaternary tuff (NW)
Qgd	Qga	Quaternary continental advance glacial outwash (NW)	Tc	Ec	Eocene continental sedimentary rocks (NW)
	Qga	Quaternary continental advance glacial outwash (SW)		Ec <sub>1</sub>	Continental sedimentary rocks (NE)
	Qgd	Quaternary continental glacial drift (NE)		Ec <sub>1</sub>	Eocene continental sedimentary rocks (SE)
	Qgd	Quaternary undifferentiated continental glacial drift (NW)		Ec <sub>1</sub>	Lower to middle Eocene continental sedimentary rocks (SW)
	Qgd	Quaternary undifferentiated continental glacial drift (SW)		Ec <sub>1</sub>	Lower to middle Eocene continental sedimentary rocks (NW)
	Qgdm	Quaternary continental glaciomarine drift (NW)		Ec <sub>2</sub>	Middle and upper Eocene continental sedimentary rocks (NE)
	Qgd <sub>s</sub>	Quaternary undifferentiated continental glacial drift, Sumas Stade of the Fraser Glaciation (NW)		Ec <sub>2</sub>	Middle to upper Eocene continental sedimentary rocks (SW)
	Qgo	Quaternary continental glacial outwash (NE)		Ec <sub>2</sub>	Middle to upper Eocene continental sedimentary rocks (NW)
	Qgo	Quaternary undifferentiated continental glacial outwash (NW)		Ecg <sub>1</sub>	Lower and middle Eocene conglomerate (NE)
	Qgo	Quaternary undifferentiated continental glacial outwash deposits (SW)		Ecg <sub>1</sub>	Lower to middle Eocene conglomerate and sandstone (NW)
	Qgog	Quaternary continental glacial outwash gravel (NW)		Ecg <sub>2</sub>	Middle and upper Eocene conglomerate (NE)
	Qgog	Quaternary continental glacial outwash gravel (SW)		Ecg <sub>2</sub>	Middle to upper Eocene conglomerate and sandstone (NW)
	Qgos	Quaternary continental glacial outwash sand (NW)		Mc	Miocene continental sedimentary rocks (NE)
	Qgos	Quaternary continental glacial outwash sand (SW)		Mc	Miocene continental sedimentary rocks (NW)
	Qgp	Quaternary continental glacial till (NE)		Mc	Miocene continental sedimentary rocks (SE)
	Qgp	Quaternary undifferentiated continental glacial drift (SW)		Mc	Miocene continental sedimentary rocks (SW)
				Mc <sub>2</sub>	Miocene continental sedimentary rocks (NW)

Unit	Included 1:250,000 units (quadrant where unit occurs)	Unit	Included 1:250,000 units (quadrant where unit occurs)
Tc	Mcg Miocene continental sedimentary rocks, conglomerate (SE)	Ti	MØigb Miocene to Oligocene gabbro (NW)
	Mcg Miocene continental sedimentary rocks, conglomerate (SW)	MØigd	Miocene to Oligocene granodiorite (NW)
Øc	Oligocene continental sedimentary rocks (NE)	MØit	Miocene to Oligocene tonalite (NW)
ØEc	Oligocene to Eocene continental sedimentary rocks (NW)	MØiv	Miocene to Oligocene intrusive-volcanic complex (SW)
Rc	Pliocene continental sediments (SW)	MØix	Miocene to Oligocene breccia (NW)
Rcg	Pliocene continental sedimentary rocks, conglomerate (SE)	ØEian	Oligocene to Eocene pyroxene andesite (NW)
RMa	Pliocene to Miocene alluvium (SE)	ØEida	Oligocene to Eocene dacite (NW)
RMc	Pliocene to Miocene continental sedimentary rocks (SE)	Øian	Oligocene andesite (NE)
RMcg	Pliocene and Miocene conglomerate (NE)	Øian	Oligocene andesite (NW)
RMcg	Pliocene to Miocene continental sedimentary rocks, conglomerate (SE)	Øib	Oligocene basic (mafic) intrusive rocks (NW)
QRcg	Pleistocene and Pliocene conglomerate (now known to be Pliocene to Miocene) (NE)	Øig	Oligocene granite (NW)
		Øigd	Oligocene granodiorite (NW)
Ti	Ei Eocene dikes, undivided (NW)	Øii	Oligocene intermediate intrusive rocks (NW)
	Ei Eocene intrusive rocks, undivided (NE)	Øiq	Oligocene quartz diorite (NW)
Eia	Eocene acidic intrusive rocks (NE)	Øir	Oligocene rhyolite (NW)
Eian	Eocene andesite (NE)	Øit	Oligocene tonalite (NW)
Eian	Eocene andesite (NW)	Rit	Paleocene tonalite (NE)
Eiat	Eocene two-mica granite (NE)	Rit	Paleocene tonalite (NW)
Eib	Eocene basic (mafic) intrusive rocks (NW)	Rian	Pliocene intrusive andesite (SW)
Eib	Eocene basic (mafic) intrusive rocks (SW)	Rida	Pliocene dacite (NW)
Eib	Eocene basic (mafic) intrusive rocks NE	Rida	Pliocene intrusive dacite (SW)
Eid	Eocene diorite (NE)	Rig	Pliocene granite (NW)
Eida	Eocene dacite and andesite (NE)	Rigd	Pliocene granodiorite (NW)
Eida	Eocene intrusive dacite (SW)	Riq	Pliocene quartz diorite (NW)
Eig	Eocene granite (NE)	Riq	Pliocene quartz diorite (SW)
Eig	Eocene granite (NW)	Riqm	Pliocene quartz monzonite (NW)
Eigb	Eocene gabbro (NW)	RMida	Pliocene to Miocene dacite (NW)
Eigd	Eocene granodiorite (NE)		
Eigd	Eocene granodiorite (NW)	TKgn	TKbg Tertiary to Cretaceous banded gneiss (NW)
Eik	Eocene alkaline intrusive rocks (NE)	TKi	TKia Tertiary and Cretaceous acidic intrusive rocks (NE)
Eimd	Eocene monzodiorite (NE)	TKiaa	Tertiary and Cretaceous alkali-feldspar pegmatite (NE)
Eiq	Eocene quartz diorite (NE)	TKiat	Tertiary and Cretaceous two-mica granite (NE)
Eiq	Eocene quartz diorite (NW)	TKig	Tertiary and Cretaceous granite (NE)
Eiqm	Eocene quartz monzonite (NE)	TKig	Tertiary to Cretaceous granite pegmatite (NW)
Eiqm	Eocene quartz monzonite (SW)	TKigd	Tertiary and Cretaceous granodiorite (NE)
Eir	Eocene rhyolite (NE)	TKit	Tertiary and Cretaceous tonalite (NE)
Eir	Eocene rhyolite (NW)	TKi	Tertiary to Cretaceous intrusive rocks (NW)
Eis	Eocene syenite (NE)	TKog	RKog Paleocene to Cretaceous orthogneiss (NW)
Eit	Eocene tonalite (NW)	Rog	Paleocene orthogneiss (NE)
Eitr	Eocene trachyte (NE)	Rog	Paleocene orthogneiss (NW)
Mia	Miocene acidic intrusive rocks (SW)	TKmi	Tertiary and Cretaceous mixed metamorphic and igneous rocks (includes only that part of unit TKmi located to the north of Lake Chelan in Chelan and Okanogan Counties) (NE)
Mian	Miocene andesite (NW)	TKog	Tertiary to Cretaceous orthogneiss (NW)
Mian	Miocene andesite NE	Tm	Em Eocene marine sedimentary rocks (NW)
Mian	Miocene intrusive andesite (SW)	Em <sub>1</sub>	Lower? to middle Eocene marine sedimentary rocks (SW)
Mib	Miocene basic (mafic) intrusive rocks (SW)	Em <sub>1</sub>	Lower to middle Eocene marine sedimentary rocks (NW)
Mid	Miocene diorite (SW)	Em <sub>2</sub>	Middle to upper Eocene marine sedimentary rocks (SW)
Mida	Miocene dacite (NW)	Em <sub>2</sub>	Middle to upper Eocene marine sedimentary rocks (NW)
Mida	Miocene intrusive dacite (SW)	ERm	Eocene to Paleocene marine sedimentary rocks (NW)
Mig	Miocene granite (NW)	MEbx	Miocene to Eocene breccia (NW)
Mig	Miocene granite (SW)	MEem	Miocene to Eocene marine sedimentary rocks (NW)
Migb	Miocene gabbro (NW)	MEmst	Miocene to Eocene marine thick-bedded sedimentary rocks (NW)
Migb	Miocene gabbro (SW)	Mm	Miocene marine sedimentary rocks (NW)
Migd	Miocene granodiorite (NW)	Mm <sub>1</sub>	Lower to middle Miocene marine sedimentary rocks (SW)
Migd	Miocene granodiorite (SW)	Mm <sub>1</sub>	Lower to middle Miocene marine sedimentary rocks (NW)
Miq	Miocene quartz diorite (SW)	Mm <sub>2</sub>	Middle to upper Miocene marine sedimentary rocks (SW)
Miqm	Miocene quartz monzonite (NW)	Mm <sub>2</sub>	Middle to upper Miocene marine sedimentary rocks (NW)
Miqm	Miocene quartz monzonite (SW)	Mmst	Miocene marine thick-bedded sedimentary rocks (NW)
Mir	Miocene intrusive rhyolite (SW)		
Mit	Miocene tonalite (NW)		
Miv	Miocene intrusive-volcanic complex (SW)		
Mix	Miocene intrusive breccia (NW)		
MØian	Miocene to Oligocene andesite (NW)		
MØian	Miocene to Oligocene intrusive andesite (SW)		
MØib	Miocene to Oligocene basic (mafic) intrusive rocks (SW)		
MØid	Miocene to Oligocene diorite (SW)		
MØida	Miocene to Oligocene intrusive dacite (SW)		
MØig	Miocene to Oligocene granite (NW)		

Unit	Included 1:250,000 units (quadrant where unit occurs)
Tm	MØm Miocene to Oligocene marine sedimentary rocks (NW)
	ØEm Oligocene to upper Eocene marine sedimentary rocks (SW)
	ØEm Oligocene to Eocene marine sedimentary rocks (NW)
	ØEmst Oligocene to Eocene marine thick-bedded sedimentary rocks (NW)
Tn	En Middle to upper Eocene nearshore sedimentary rocks (SW)
	Mn Lower Miocene nearshore sedimentary rocks (NW)
	ØEn Oligocene to upper Eocene nearshore sedimentary rocks (SW)
	ØEn Oligocene to upper Eocene nearshore sedimentary rocks (NW)
	RMn Pliocene to Miocene nearshore sedimentary rocks (NW)
Tv	Ev Eocene volcanic rocks (NW)
	Ev Eocene volcanic rocks, undivided (SW)
	Ev <sub>1</sub> Lower and middle Eocene volcanic rocks, undivided (NE)
	Ev <sub>2</sub> Middle and upper Eocene volcanic rocks, undivided (NE)
	Eva Eocene andesite (NW)
	Eva Eocene andesite flows (SW)
	Evb Eocene basalt (NW)
	Evb Eocene basalt flows (SW)
	Evd Eocene dacite (NW)
	Evd <sub>1</sub> Lower and middle Eocene dacite and andesite flows (NE)
	Evd <sub>2</sub> Middle and upper Eocene dacite and andesite flows (NE)
	Evr Eocene rhyolite (NW)
	Evr Eocene rhyolite flows (SW)
	MØv Miocene to Oligocene volcanic rocks (SW)
	MØva Miocene to Oligocene andesite flows (NW)
	MØva Miocene to Oligocene andesite flows (SW)
	Mva Miocene andesite (NW)
	Mva Miocene andesite flows (SW)
	Mvb Miocene basalt flows (SW)
	Mvd Miocene dacite flows (SW)
	Mvr Miocene rhyolite (SW)
	ØEva Lower Oligocene to upper Eocene andesite flows (SW)
	ØEva Oligocene to Eocene andesite (NW)
	ØEvb Oligocene to Eocene basalt (NW)
	Øva Oligocene andesite flows (SW)
	Øvb Oligocene basalt flows (SW)
	Øvd Oligocene dacite (NW)
	Øvd Oligocene dacite flows (SW)
	Øvr Oligocene rhyolite (NW)
	Øvr Oligocene rhyolite flows (SW)
	Rv Pliocene volcanic rocks (NW)
	Rvb Pliocene basalt flows (SW)
	Rvd Pliocene dacite flows (SW)
	Rvr Pliocene rhyolite (SW)
Tv <sub>cr</sub>	Mv <sub>g</sub> Middle Miocene Grande Ronde Basalt (NW)
	Mv <sub>g</sub> Middle Miocene Grande Ronde Basalt (SW)
	Mv <sub>g</sub> Miocene Grande Ronde Basalt (NE)
	Mv <sub>g</sub> Miocene Grande Ronde Basalt (SE)
	Mv <sub>i</sub> Miocene Imnaha Basalt (SE)
	Mvi <sub>g</sub> Middle Miocene Grande Ronde Basalt invasive flows (NW)
	Mvi <sub>g</sub> Middle Miocene Grande Ronde Basalt, invasive flows (SW)
	Mvi <sub>g</sub> Miocene Grande Ronde Basalt, invasive (SE)
	Mvi <sub>g</sub> Miocene Grande Ronde Basalt, invasive flows (NE)
	Mvi <sub>s</sub> Middle Miocene Saddle Mountains Basalt, invasive flows (SW)
	Mv <sub>s</sub> Middle to upper Miocene Saddle Mountains Basalt (SW)
	Mv <sub>s</sub> Miocene Saddle Mountains Basalt (NE)
	Mv <sub>s</sub> Miocene Saddle Mountains Basalt (SE)

Unit	Included 1:250,000 units (quadrant where unit occurs)
Tv <sub>cr</sub>	Mv <sub>w</sub> Middle Miocene Wanapum Basalt (SW)
	Mv <sub>w</sub> Miocene Wanapum Basalt (NE)
	Mv <sub>w</sub> Miocene Wanapum Basalt (SE)
Tv <sub>c</sub>	Ev <sub>c</sub> Lower to middle Eocene Crescent Formation (SW)
	Ev <sub>c</sub> Lower to middle Eocene Crescent Formation (NW)
Tvt	Ev <sub>c</sub> Eocene volcanoclastic rocks (NW)
	Ev <sub>c</sub> Eocene volcanoclastic rocks (SW)
	Ev <sub>c1</sub> Lower and middle Eocene volcanoclastic rocks (NE)
	Ev <sub>c2</sub> Middle and upper Eocene volcanoclastic rocks (NE)
	Evt Eocene tuff (NW)
	Evt Eocene tuff (SW)
	Evt <sub>1</sub> Lower and middle Eocene tuff (NE)
	Evt <sub>2</sub> Middle and upper Eocene tuff (NE)
	MØvc Miocene to Oligocene volcanoclastic rocks (SW)
	MØvt Miocene to Oligocene tuff (NW)
	MØvt Miocene to Oligocene tuff (SW)
	Mvc Miocene volcanoclastic rocks (NW)
	Mvc Miocene volcanoclastic rocks (SW)
	Mvc <sub>2</sub> Miocene volcanoclastic rocks (NW)
	Mvt Miocene tuff (NW)
	Mvt Miocene tuff (SW)
	ØEvc Lower Oligocene to upper Eocene volcanoclastic rocks (SW)
	ØEvt Oligocene to upper Eocene tuff (SW)
	Øvc Oligocene volcanoclastic rocks (NW)
	Øvc Oligocene volcanoclastic rocks (SW)
	Øvt Oligocene tuff (NW)
	Øvt Oligocene tuff (SW)
	Øvx Oligocene volcanic breccia (NW)
	Rvt Pliocene tuff (SW)
	Rvx Pliocene volcanic breccia (NW)
tz	tz Tectonic zone (NE)
	tz Tectonic zone (SW)

**Table 2.** List of Named Units. The reader is referred to the 1:250,000-scale quadrant geologic maps for defining and representative references for named units and for more information on geographic locations of named units. The number of each named unit included in a map unit on this map is given at the end of each map unit description. By looking those numbers up in this table, the reader can determine which named units are included in each map unit. The column headed '1:500,000' gives the symbol or symbols for named units on this map. The column headed '1:250,000' gives the symbol or symbols for named units on the 1:250,000-scale geologic quadrant maps.

The 1:250,000-scale quadrant geologic map on which each named unit is located is listed after the name of the unit in the 'Geologic Unit' column; NE is Stoffel and others (1991), NW is Dragovich and others (2002), SE is Schuster and others (1997), and SW is Walsh and others (1987).

In a unit name, an uppercase 'Formation' or lithologic term denotes a formal name; for example, Addy Quartzite and Aldwell Formation. Lowercase 'formation' or lithologic term denotes an informal name; for example, Hanford formation, Alder Creek stock, and orthogneiss of Alma Creek.

No.	Geologic unit	1:500,000	1:250,000
1	Addy Quartzite (NE)	RpCms	CZq
2	Aeneas Creek pluton (NE)	Ml	Kia Kid
3	Alder Creek stock (NE)	Ml	KJiq
4	Alderton Formation (SW)	Qa	Qc
5	Aldwell Formation (NW)	Tm Tv	Em <sub>2</sub> Evb
6	Alma Creek, orthogneiss of (NW)	Mkog	Kog
7	Alta Lake, amphibolite, schist, and gneiss of (NE)	M&Rhm M&mi	pJhm KJmg
8	Amboy drift (SW)	Qad	Qap Qapo
9	Anarchist Group (NE)	Rms	Pmm Pcb Rmm
10	Anderson Creek pluton (NE)	Ml	KJigd
11	Anglin, orthogneiss of (NE)	Mkog	pTog
12	Antoine Creek, hornblende tonalite gneiss of (NE)	Mkog	Mkog
13	Arbuckle Mountain pluton (NE)	Tki	TKit
14	Arlington Gravel Member, Vashon Drift (NW)	Qgd	Qgog
15	Armstrong Canyon, unit, N <sub>2</sub> Grande Ronde Basalt (SE)	Tv <sub>cr</sub>	Mv <sub>g</sub>
16	Armstrong Mountain, granite west of (NE)	TKi	TKig
17	Ashnola Gabbro (NE)	M&Ram	pJam
18	Asotin Creek gravel (SE)	QTc	QMcg
19	Asotin Member of the Saddle Mountains Basalt (SE) (SW)	Tv <sub>cr</sub>	Mv <sub>s</sub>
19	Asotin Member, Saddle Mountains Basalt (SE)	Tv <sub>cr</sub>	Mv <sub>s</sub>
20	Astoria Formation (NW)	Tm	Mm <sub>1</sub>
20	Astoria Formation (SW)	Tm	Mm <sub>1</sub>
21	Baada Point Member, Makah Formation. See Makah Formation. (NW)		
22	Baekos Creek assemblage, volcanic rocks and deposits of Glacier Peak (NW)	Qvt	Qvl
23	Bahobohosh, sandstone of (NW)	Tm	Em <sub>2</sub>
24	Baker Lake, blueschist of, Bell Pass mélangé (NW)	M&Rmt	JPmt
25	Baker River phase, Chilliwack composite batholith, Index family (NW)	Ti	Øigd
26	Balch Lake, basalt porphyry of (SW)	QTv	QRvb
27	Bald Mountain pluton (NW)	Ml	pTigd
28	Bald Mountain, conglomerate of (NW)	M&ms	pTms
29	Baring Migmatites (NW)	M&gn	Jgn

No.	Geologic unit	1:500,000	1:250,000
30	Barlow Pass Volcanics (NW)	Tc Tv Ti	Ec <sub>2</sub> Eigb Ev Evr
31	Barnaby Creek, granodiorite of (NE)	M <sub>l</sub>	KJia
32	Barstow granodiorite (NE)	Ti	Eigd
33	Basalt Peak, porphyritic dacite of (NW)	Ti	Eir
34	Basic complex (NE)	M <sub>l</sub> Ram	pJam
35	Basin City, basalt of, Ice Harbor Member (SE)	Tv <sub>cr</sub>	Mv <sub>s</sub>
36	Bastile Ridge, andesite of, andesite of Mount Baker (NW)	Qv	Qva
37	Battle Mountain gneiss (NE)	tz	tz
38	Bear Creek flow, Umatilla Member (SE)	Tv <sub>cr</sub>	Mv <sub>s</sub>
39	Bear Creek, siltstone and sandstone of (NW)	Tm	Em <sub>1</sub>
40	Bear Mountain, granite of western, Chilliwack composite batholith, Cascade Pass family (NW)	Ti	Mig
41	Bearcat Ridge plutons (NE)	M <sub>l</sub> og	Kog
41	Bearcat Ridge plutons (NW)	M <sub>l</sub> og	Kog
42	Beaver Creek, basalt of (NE)	Tv <sub>cr</sub>	Mv <sub>g</sub>
43	Beckler Peak stocks, Mount Stuart batholith (NW)	M <sub>l</sub>	Kigd
44	Bee Flat, andesite of (SW)	QTv	QRva
45	Bell Pass mélange, undivided (NW)	M <sub>l</sub> Rmt M <sub>l</sub> Ru	pTmt pTu
45	Bell Pass mélange. Includes and listed under: Elbow Lake Formation, Yellow Aster Complex, Vedder complex, blueschist of Baker Lake, Twin Sisters Dunitite, and metaconglomerate of Sumas Mountain. (NW)		
46	Bellingham Bay Member, Chuckanut Formation. <i>See</i> Chuckanut Formation. (NW)		
47	Belt Supergroup (NE)	pCms	Yms <sub>4</sub> Yms <sub>3</sub> Yms <sub>2</sub> Yms <sub>1</sub>
47	Belt Supergroup (SE)	pCms	Yms <sub>4</sub> Yms <sub>2</sub>
48	Bench Lake, tonalitic gneiss of (NW)	M <sub>l</sub> og M <sub>l</sub> gn	Kog Kbg
49	Bethel Ridge, olivine basalt of (SW)	Tv	Rvb
50	Beverly Member, Ellensburg Formation (SE)	Tc	Mc
51	Big Bosom Buttes, volcanic rocks of (NW)	Tvt	Øvx Øvt
52	Billy Goat Mountain, volcanics of (NE)	M <sub>l</sub> v	KJv
53	Black Buttes, andesite of, andesite of Mount Baker (NW)	Qv Qvt	Qva Qvp
54	Black Peak batholith (NE)	M <sub>l</sub> og	Kog
54	Black Peak batholith, undivided. Also includes Reynolds Peak phase, listed separately. (NW)	M <sub>l</sub>	Kit
55	Blakeley Formation (NW)	Tm Tn	ØEm ØEn
56	Blakely Harbor Formation (NW)	Tc	Mc <sub>2</sub>
57	Blickensderfer Quartz Monzonite (NE)	M <sub>l</sub>	Kiat
58	Blue Goat pluton (NE)	M <sub>l</sub>	Jigd
59	Blue Mountain unit (NW)	Tm	ERm
60	Bob Creek, tonalite of (NW)	M <sub>l</sub> mi	KJmi
61	Bonneville flood deposits (SE)	Qf	Qfb
62	Boot Mountain, plutonic complex of (NE)	M <sub>l</sub> mi M <sub>l</sub> Rhm	KJmi pJhm

TABLE 2. LIST OF NAMED UNITS 19

No.	Geologic unit	1:500,000	1:250,000
63	Boring Lava (SW)	QTv	QRva QRvb
64	Bottle Spring pluton (NE)	Ml	Kia
65	Boulder Creek, orthogneiss of, Skagit Gneiss Complex (NW)	TKog	TKog
66	Boundary Creek, tuff of (NW)	Tvt	Øvt
67	Bowers quartz diorite (NE)	Ml	KJiq KJigd
68	Brays Landing, conglomerate of (NE)	Tc	RMcg
69	Bridge Creek intrusions (NE)	Ti	Eig Eiqm
70	Bridge Creek, ultramafic and mafic rocks near (NE)	M <del>l</del> Ru	u
71	Brownes Creek, siltstone of (NW)	Tm	Em <sub>1</sub>
72	Buck Creek pluton (NW)	Ml	Kigd
73	Buck Mountain Formation (NE)	Mv	KJv KJvs KJvt
74	Buckhorn Mountain pluton (NE)	Ml	KJigd
75	Buckhorn Springs unit, R <sub>1</sub> Grande Ronde Basalt (SE)	Tv <sub>cr</sub>	Mv <sub>g</sub>
76	Buffalo Hump Formation (NE)	pCms	Ymm
77	Buford Member, Saddle Mountains Basalt, Columbia River Basalt Group (SE)	Tv <sub>cr</sub>	Mv <sub>s</sub>
78	Bullfrog Mountain Formation (NE)	Rms	Pmm
79	Bulson Creek, rocks of (NW)	Tc Tn	ØEc ØEn
80	Bumping Lake pluton (SW)	Ti	Mia
81	Bumping River tuff (SW)	Tvt	MØvt
82	Burch Mountain, andesite and dacite of (NE)	Ti	Mian
83	Burke Formation (NE)	pCms	Yms <sub>2</sub>
83	Burke Formation, Ravalli Group (SE)	pCms	Yms <sub>2</sub>
84	Burnt Mountain, tuff of (SW)	Tvt	MØvt
85	Burroughs Mountain Drift (SW)	Qad	Qad
86	Butte Camp dome (SW)	Qi	Qida
87	Button Creek stock (NE)	Ml	Jit
88	Cady Ridge, volcanic rocks of (NW)	Ti	RMida
89	Camas Land, diabase of (NW)	Ti	Eigb
90	Cape Foulweather Basalt (SW)	Tv <sub>cr</sub>	Mv <sub>w</sub>
91	Carbon River stock (SW)	Ti	Migd
92	Carbonado Formation (SW)	Tc	Ec <sub>2</sub>
93	Cardinal Peak pluton (NE)	Ml	Kit
93	Cardinal Peak pluton (NW)	Ml	Kiq Kit
94	Carlton stocks (NE)	Ml	KJiq
95	Carpenters Creek Tuff Member, Makah Formation. <i>See</i> Makah Formation. (NW)		
96	Carter Mountain, dacite of (NE)	Tv Tvt Tc	Evd <sub>1</sub> Evt <sub>1</sub> Ec <sub>1</sub>
97	Cascade Pass dike, Cascade Pass family (NW)	Ti	Mix Mit

No.	Geologic unit	1:500,000	1:250,000
98	Cascade Pass family. Includes and listed under: granite of western Bear Mountain, Cascade Pass dike, Chilliwack composite batholith undivided, Cloudy Pass batholith, Cool Glacier stock, granite of Depot Creek, Downey Mountain stock, granite porphyry of Egg Lake, quartz diorite and quartz monzodiorite of Icy Peak, Lake Ann stock, Mineral Mountain pluton, Mount Buckindy pluton, quartz monzonite and granite of Nooksack Cirque, quartz monzodiorite of Redoubt Creek, Ruth Creek pluton, granite of Ruth Mountain, tonalite of Silver Creek, and stock on Sitkum Creek. (NW)		
99	Cascade River Schist of Misch (1966). <i>See also</i> Napeequa Schist. (NW)	M&Rhm TKgn M&hm	JPhmc TKbg T&hm
100	Cascade River Schist of Tabor and others (2002) (redefined), undivided. <i>See also</i> Napeequa Schist. (NW)	TKgn M&hm	TKbg T&hm
101	Cascade River Schist of Tabor and others (2002) (redefined). Includes: Spider Mountain Schist, listed separately. (NW)		
102	Castle Peak stock (NW)	Ti	Eigd
103	Cathedral batholith (NE)	M&l	Kia
104	Cave Basalt (SW)	Qv	Qvb
105	Cave Mountain Formation, basaltic metavolcanic member of the (NE)	M&mv	T&mv
106	Cave Mountain Formation, dark gray metalimestone member of the (NE)	M&ms	T&cb
107	Cave Mountain Formation, metadolomite and metalimestone member of the (NE)	M&ms	T&cb
108	Cave Mountain Formation, metasilstone member of the (NE)	M&ms	T&mm
109	Cave Mountain Formation, slate and metalimestone member of the (NE)	M&ms	T&mm
110	Cedar District Formation, Nanaimo Group (NW)	M&n	Kn
111	Center Creek unit, R <sub>1</sub> Grande Ronde Basalt (SE)	Tv <sub>cr</sub>	Mv <sub>g</sub>
112	Chambers Creek, beds of (SW)	Tc	Ec <sub>2</sub>
113	Chaval pluton (NW)	M&hm M&l	Khm Kiq
114	Chelan complex (NE)	M&mi M&og M&l M&Rhm	Kmg Kog Kogm Kigb TPhmc TPmb
115	Chelan Complex. <i>See</i> Entiat pluton. (NW)		
116	Chester Creek, gneiss near (NE)	pChm	pChm
117	Chewack River gneiss complex (NE)	M&l M&mi	Kit, KJmi
118	Chikamin Creek, volcanic rocks of (NW)	Tv Tv <sub>t</sub>	Øvr Øvt
119	Chilliwack composite batholith of the Cascade Pass family. Includes and listed under: granite of western Bear Mountain, granite of Depot Creek, granite porphyry of Egg Lake, quartz diorite and quartz monzodiorite of Icy Peak, Lake Ann stock, Mineral Mountain pluton, quartz monzonite and granite of Nooksack Cirque, quartz monzodiorite of Redoubt Creek, Ruth Creek pluton, and granite of Ruth Mountain. (NW)		
120	Chilliwack composite batholith of the Index family. Includes and listed under: Baker River phase, gabbro of Copper Lake, diorite of Ensawkwach Creek, tonalite of Maiden Lake, biotite alaskite of Mount Blum, granodiorite of Mount Despair, Pocket Peak phase, Price Glacier pluton, and Silesia Creek pluton. (NW)		
121	Chilliwack composite batholith of the Snoqualmie family. Includes and listed under: Chilliwack valley phase, Indian Mountain phase, biotite granodiorite of Little Beaver Creek, Mount Sefrit gabbro, and Perry Creek phase. (NW)		
122	Chilliwack composite batholith, undivided, Cascade Pass family (NW)	Ti	Mig Miqm
123	Chilliwack composite batholith, undivided, Index family (NW)	Ti	Øib
124	Chilliwack Group and Cultus Formation, undivided (NW)	M&Rmt	JDmt
125	Chilliwack Group, undivided (NW)	Rmt Rms Rmv	PDmt PDmb PDms PDmv
126	Chilliwack Group. Includes and listed under: sedimentary rocks of Mount Herman and volcanic rocks of Mount Herman. (NW)		
127	Chilliwack valley phase, Chilliwack composite batholith, Snoqualmie family (NW)	Ti	Øit
128	China Creek unit, N <sub>1</sub> Grande Ronde Basalt (SE)	Tv <sub>cr</sub>	Mv <sub>g</sub>

TABLE 2. LIST OF NAMED UNITS 21

No.	Geologic unit	1:500,000	1:250,000
129	Chiwaukum Schist (NW)	M <sub>hm</sub> M <sub>gn</sub>	M <sub>sc</sub> K <sub>bg</sub>
130	Chiwawa River, basaltic plugs and dikes of (NW)	Ti	Eib
131	Chocolate Creek assemblage, volcanic rocks and deposits of Glacier Peak (NW)	Qvt	Qvl
132	Chopaka intrusive complex (NE)	M <sub>l</sub> M <sub>Ru</sub>	Tib u
133	Chow Chow drift (NW)	Qad	Qad Qao Qap Qapo
133	Chow Chow drift (SW)	Qad	Qao
134	Chuckanut Formation (NW)	Tc	Ec
135	Chuckanut Formation. Includes: Bellingham Bay Member, Coal Mountain unit, Governor's Point Member, Maple Falls Member, Padden Member, Slide Member, and Warnick Member. (NW)		
136	Chumstick Formation. Includes the Nahahum Canyon Member, not listed separately. (NW)	Tc Tv	Ec <sub>2</sub> Ec <sub>g2</sub> Evb
137	Chumstick Formation (NE)	Tc	Ec <sub>2</sub> Ec <sub>g2</sub>
138	Clallam Formation (NW)	Tn	Mn
139	Clark Mountain pluton (NW)	M <sub>l</sub>	Kit
140	Clarkston gravel (SE)	Tc	M <sub>cg</sub>
141	Clarkston Heights gravel (SE)	QTc	QM <sub>cg</sub>
142	Clear West complex (SW)	Ti	Mir
143	Clearwater gravel (SE)	QTc	QM <sub>cg</sub>
144	Cliff Point, siltstone of (SW)	Tm	Em <sub>2</sub>
145	Cloudy Pass batholith, Cascade Pass family (NW)	Ti	Mian Mida Mig Migd Mit Mix
146	Cloverland, basalt of, Weissenfels Ridge Member (SE)	Tv <sub>cr</sub>	Mv <sub>s</sub>
147	Coal Mountain unit, Chuckanut Formation. See Chuckanut Formation. (NW)		
148	Cody Lake, hypabyssal intrusive suite of (NE)	Ti	Eida
149	Cold Creek interbed, Ellensburg Formation (SE)	Tc	Mc
150	Coleman Pinnacle, andesite of, andesite of Mount Baker (NW)	Qv	Qva
151	Columbia River Basalt Group (NE)	Tv <sub>cr</sub>	Mv <sub>s</sub> Mv <sub>w</sub> Mv <sub>g</sub> Mvi <sub>g</sub>
152	Columbia River Basalt Group (SE)	Tv <sub>cr</sub>	Mv <sub>s</sub> Mv <sub>w</sub> Mv <sub>g</sub> Mvi <sub>g</sub> Mvi
153	Columbia River Basalt Group (SW)	Tv <sub>cr</sub>	Mv <sub>s</sub> Mv <sub>w</sub> Mv <sub>g</sub> Mvi <sub>s</sub> Mvi <sub>g</sub>
154	Colville batholith (NE)	TKi M <sub>l</sub> Ti	TKia TKig TKiat TKiaa TKid TKigd Eiqm Eimd Eid Eigd Eig
155	Colvos Sand (SW)	Qgd	Qga
156	Colvos Sand Member, Vashon Drift (NW)	Qgd	Qga
157	Comox Formation, Nanaimo Group (NW)	M <sub>n</sub>	Kn
158	Conconully pluton (NE)	M <sub>l</sub>	Kigd
159	Conconully, metamorphic complex of (NE)	M <sub>ms</sub> M <sub>Rhm</sub>	Tmm pJhm pJmb
160	Conglomerate Point, intrusive breccia of (NW)	Ti	Mix
161	Constitution Formation (NW)	M <sub>ms</sub>	KJmm

No.	Geologic unit	1:500,000	1:250,000
162	Cook Lake, porphyritic granite and granodiorite of (NE)	M <sub>kl</sub>	Kia
163	Cool Glacier stock, Cascade Pass family (NW)	Ti	Rigd
164	Cool stock, Cascade Pass family. <i>See</i> Cool Glacier stock. (NW)		
165	Coon Hollow Formation (SE)	M <sub>km</sub>	Jm
166	Cooper Mountain batholith (NE)	Ti	Eigd Eiqm
167	Cooper Pass, volcanoclastic rocks of (NW)	Tvt	M <sub>vc</sub>
168	Copper Lake, gabbro of, Chilliwack composite batholith, Index family (NW)	Ti	Øib
169	Copper Peak pluton (NW)	Ti	Eit
170	Coryell intrusive rocks (NE)	Ti	Eis
171	Cougar Divide, andesite of, andesite of Mount Baker (NW)	Qv	Qva
172	Council Bluff, lava flows of (SW)	Tv	M <sub>va</sub>
173	Covada Group (NE)	R <sub>ms</sub> R <sub>mv</sub>	Omm Ocb Omv
174	Cow Creek, strata of, Virginian Ridge Formation, Pasayten Group (NW)	M <sub>cc</sub>	Kc <sub>2</sub>
175	Cowlitz Formation (SW)	Tm Tn Tvt	Em <sub>2</sub> En Evt
176	Coyote Creek pluton (NE)	TKi	TKig TKiaa
177	Coyote Ridge quartz dioritic gneiss (NE)	M <sub>kog</sub>	KJog
178	Crawfish Lake tonalite gneiss (NE)	M <sub>kog</sub>	pTog
179	Crescent Formation (NW)	Tv Tv <sub>c</sub> Tm Ti Tvt	Ev <sub>c</sub> Em <sub>1</sub> Eib Eigb Evr Evt
180	Crescent Formation (SW)	Tm Tv <sub>c</sub>	Em <sub>1</sub> Ev <sub>c</sub>
181	Crook Mountain, schist of (NW)	M <sub>ms</sub>	M <sub>sh</sub>
182	Cultus Formation (NW)	M <sub>ms</sub> M <sub>mv</sub>	J <sub>Tmm</sub> J <sub>Tmv</sub>
183	Cultus Formation and Chilliwack Group, undivided (NW)	M <sub>Rmt</sub>	JDmt
184	Cyclone Lake pluton (NW)	M <sub>kl</sub>	Kigd
185	Daisy Trail, granite of (NE)	TKi	TKig
186	Dalles Formation (SW)	Tc	M <sub>c</sub>
187	Damon silt (SW)	Qa	Qc
188	Darling Lake gabbro (NE)	M <sub>kl</sub>	M <sub>igb</sub>
189	Darrington Phyllite, Easton Metamorphic Suite (NW)	M <sub>ms</sub>	Jph
190	De Roux unit (NW)	M <sub>ms</sub>	Jar
191	Dead Duck pluton, Grotto batholith, Snoqualmie family (NW)	Ti	MØigd
192	Deadhorse Creek, granite of (NE)	Ti	Eig
193	Deadman Bay Volcanics (NW)	M <sub>Rmt</sub>	T <sub>Pmv</sub>
194	Deer Peak, metavolcanic unit of (NW)	M <sub>mv</sub>	Jmv
195	Deer Trail Group (NE)	pCms	Ymm Ycb <sub>2</sub> Yar <sub>2</sub> Ycb <sub>1</sub> Yar <sub>1</sub>
196	Deerhorn Creek, schist near (NE)	M <sub>kog</sub>	pTog
197	Deming Sand (NW)	Qgd	Qgdm
198	Depoe Bay Basalt (SW)	Tv <sub>cr</sub>	M <sub>Vg</sub> M <sub>Vi</sub> <sub>g</sub>

TABLE 2. LIST OF NAMED UNITS 23

No.	Geologic unit	1:500,000	1:250,000
199	Depot Creek, granite of, Chilliwack composite batholith, Cascade Pass family (NW)	Ti	Mig
200	Devils Elbow pluton (NE)	Ti	Eimd Eid
201	Devils Elbow suite (NE)	Ti	Eimd
202	Devils Horns rhyolite (SW)	Tv	Rvr
203	Devils Pass Member, Virginian Ridge Formation, Pasayten Group (NW)	M <sub>cc</sub>	Kcg <sub>2</sub>
204	Devils Washbasin basalt (SW)	Tv	Rvb
205	Dewdney Creek Formation (NW)	M <sub>em</sub>	Jm
206	Dirtyface pluton (NW)	M <sub>l</sub>	Kit
207	Disappointment Peak, dacite of, volcanic rocks and deposits of Glacier Peak (NW)	Qv	Qvd
208	Dodge, basalt of, Eckler Mountain Member (SE)	Tv <sub>cr</sub>	M <sub>v</sub> <sub>w</sub>
209	Doe Mountain, tonalite of, Rimmel batholith (NW)	M <sub>mi</sub>	KJmi
210	Donkey Creek drift (NW)	Qad	Qapw <sub>1</sub>
211	Double Bluff Drift (NW)	Qgd Qa	Qgpc Qguc
212	Downey Creek pluton (NW)	M <sub>l</sub>	Kigd
213	Downey Creek, sill complex of. <i>See</i> Downey Creek pluton. (NW)		
214	Downey Gulch unit, N <sub>1</sub> Grande Ronde Basalt (SE)	Tv <sub>cr</sub>	M <sub>v</sub> <sub>g</sub>
215	Downey Mountain stock, Cascade Pass family (NW)	Ti	Mit
216	Doyle Creek Formation (SE)	M <sub>mt</sub>	T <sub>mt</sub>
217	Dtokoah Point Member, Makah Formation. <i>See</i> Makah Formation. (NW)		
218	Dubious Creek, granodiorite of (NE)	M <sub>l</sub>	Kiat
219	Duffy Creek, invasive flow of (NE)	Tv <sub>cr</sub>	M <sub>v</sub> <sub>g</sub>
220	Dumbell Mountain pluton (NW)	M <sub>og</sub>	T <sub>og</sub>
221	Duncan Hill pluton (NE)	Ti	Eigd Eig
221	Duncan Hill pluton (NW)	Ti	Eiq
222	Dunn Mountain pluton (NE)	M <sub>l</sub>	KJigd
223	Dusty Creek assemblage, volcanic rocks and deposits of Glacier Peak (NW)	Qvt	Qvl
224	Eagle Creek Formation (SW)	Tc	M <sub>cg</sub>
225	Eagle Gorge, volcanic rocks of (NW)	Tv	M <sub>va</sub>
225	Eagle Gorge, volcanic rocks of (SW)	Tv Tvt	M <sub>va</sub> Mvt
226	Eagle tuff (NW)	Tvt	M <sub>vt</sub>
227	Early Winters Creek, stock south of (NW)	M <sub>l</sub>	Kigd
228	East Sound Group (NW)	R <sub>mt</sub>	PDmt
229	Eastern mélange belt, undivided. Includes volcanic rocks of Whitehorse Mountain, listed separately. (NW)	M <sub>ms</sub> M <sub>gn</sub> M <sub>l</sub> M <sub>mt</sub>	Jar Jgn Jib Jigb Jit JT <sub>mc</sub> JT <sub>mt</sub>
230	Easton Metamorphic Suite, undivided (NW)	M <sub>Ram</sub> M <sub>mv</sub> M <sub>l</sub> M <sub>Ru</sub>	Jam Jmv Jigb Ju
231	Easton Metamorphic Suite. Includes and listed under: Darrington Phyllite, semischist and phyllite of Mount Josephine, and Shuksan Greenschist. Greenstones (units Jmv and Jigb) and ultramafic rocks (unit Ju) north of the Skagit River (T36N R3–5E) are correlated with the Easton Metamorphic Suite by Gallagher and others (1988) and Lapen (2000) and with the Helena–Haystack mélange by Whetten and others (1980) and Dragovich and others (1998, 1999, 2000). (NW)		
232	Easton Schist (SW)	M <sub>ms</sub>	Jph Jsh

No.	Geologic unit	1:500,000	1:250,000
233	Easy Pass, rocks of (NW)	M <sub>ms</sub> M <sub>mt</sub>	Kmcg Kmt
234	Eckler Mountain Member, Wanapum Basalt (SE)	Tv <sub>cr</sub>	Mv <sub>w</sub>
235	Edna Dolomite (NE)	pCms	Ycb <sub>1</sub>
236	Edwards Slough diorite (NE)	M <sub>l</sub>	KJigd
237	Egg Lake, granite porphyry of, Chilliwack composite batholith, Cascade Pass family (NW)	Ti	Rig
238	Elbow Lake Formation, Bell Pass mélange (NW)	M <sub>l</sub> Rmt	JPmt pTmt
239	Eldorado Orthogneiss (NW)	M <sub>og</sub>	Kog
240	Electron Mudflow (SW)	Qvt	Qvl
241	Elephant Mountain flow, Elephant Mountain Member (SE)	Tv <sub>cr</sub>	Mv <sub>s</sub>
242	Elephant Mountain Member of the Saddle Mountains Basalt (SW)	Tv <sub>cr</sub>	Mv <sub>s</sub>
242	Elephant Mountain Member, Saddle Mountains Basalt (SE)	Tv <sub>cr</sub>	Mv <sub>s</sub>
243	Elijah Ridge Schist (NW)	M <sub>mt</sub> M <sub>ms</sub>	Kmt M <sub>sh</sub>
244	Ellemeham Formation (NE)	M <sub>mv</sub> M <sub>ms</sub>	Jmv Jcg
245	Ellensburg Formation (NE)	Tc	Mc
245	Ellensburg Formation (NW)	Tc	Mc
245	Ellensburg Formation (SE)	Tc	Mc Mcg
245	Ellensburg Formation (SW)	Tc Tv <sub>t</sub>	Mc M <sub>vc</sub>
246	Elwha lithic assemblage (NW)	Tm Tv	ØEm ØEmst ØEvb
247	Empire Lakes pluton (NE)	Ti	Eiqm
248	Ensawwatch Creek, diorite of, Chilliwack composite batholith, Index family (NW)	Ti	Øib
249	Entiat pluton (NE)	M <sub>l</sub>	Kit Kigb
250	Entiat pluton, Chelan Complex (NW)	M <sub>l</sub>	Kiaa Kit Kid
251	Esmeralda Peaks diabase, Ingalls Tectonic Complex (NW)	M <sub>l</sub>	Jib
252	Esperance Sand Member, Vashon Drift (NW)	Qgd	Qga
253	Esquatzel Member, Saddle Mountains Basalt (SE)	Tv <sub>cr</sub>	Mv <sub>s</sub>
254	Evans Creek Drift (NW)	Qad	Qad Qao
254	Evans Creek Drift (SW)	Qad	Qad Qao
255	Evans Lake pluton (NE)	M <sub>l</sub>	Kia
256	Everson Glaciomarine Drift (NW)	Qgd Qa	Qgd Qgd Qgo Qguc
257	Excelsior Mountain, gneissic tonalite of (NW)	M <sub>og</sub>	Kog
258	Extension Formation, Nanaimo Group (NW)	M <sub>n</sub>	Kn
259	Falls Creek unit, Makah Formation. <i>See</i> Makah Formation. (NW)		
260	Fan Lake Granodiorite (NE)	M <sub>l</sub>	Kia
261	Fancher Field, gravel of (NE)	Qf	Qfg
262	Fawn Peak stock (NE)	M <sub>l</sub>	Kid
263	Felix Creek, granite of (NE)	M <sub>l</sub>	Kig
264	Fidalgo Complex (NW)	M <sub>l</sub> M <sub>l</sub> u M <sub>v</sub> M <sub>m</sub>	Ji Jigb Ju Jv KJm KJvs

TABLE 2. LIST OF NAMED UNITS 25

No.	Geologic unit	1:500,000	1:250,000
265	Fields Spring unit, N <sub>2</sub> Grande Ronde Basalt (SE)	Tv <sub>cr</sub>	Mv <sub>g</sub>
266	Fifes Peak Formation (NW)	Tv Tv <sub>t</sub>	Mva Mvt
266	Fifes Peak Formation (SW)	Tv	Mva
267	Fifteenmile Creek pluton (NE)	TKi	TKia
268	Fire Mountain pluton (NE)	Ti	Eiqm Eig
269	Flagstaff Mountain sequence (NE)	Rms Rmv Rmt M <sub>ms</sub>	CDmm CDmv CDmt T <sub>mm</sub> T <sub>cb</sub>
270	Flowery Trail Granodiorite (NE)	M <sub>l</sub>	T <sub>igd</sub>
271	Foam Creek stock (NW)	M <sub>l</sub>	K <sub>igd</sub>
272	Fortune Creek, stock near (NW)	M <sub>l</sub>	Kit
273	Fourth Creek gabbro, Ingalls Tectonic Complex (NW)	M <sub>l</sub>	Jib
274	Frazer Creek complex (NE)	M <sub>l</sub>	KJiq KJigb
275	Freeman, quartzite near (NE)	pChm	pCqz
276	Freezeout Creek, strata of, Harts Pass Formation, Three Fools Creek sequence (NW)	M <sub>m</sub>	Km <sub>1</sub>
277	French Valley, gneissic granodiorite of (NE)	M <sub>og</sub>	pTog
278	Frenchman Springs Member of the Wanapum Basalt (NE)	Tv <sub>cr</sub>	Mv <sub>w</sub>
278	Frenchman Springs Member of the Wanapum Basalt (SW)	Tv <sub>cr</sub>	Mv <sub>w</sub>
278	Frenchman Springs Member, Wanapum Basalt (SE)	Tv <sub>cr</sub>	Mv <sub>w</sub>
279	Friedlander Meadows pluton (NE)	Ti	Eimd
280	Frost Mountain, basalt of (SW)	Tv	Evb
281	Fuller Mountain plug (NW)	Ti	Eigd
282	Gabriel Peak, orthogneiss of (NW)	TKog	RKog
283	Galena Point Granodiorite (NE)	M <sub>l</sub>	Kia
284	Gamma Ridge, volcanic rocks of (NW)	Tv	Rv
285	Garda Drift (SW)	Qad	Qad
286	Garfield Mountain, volcanic rocks on (NW)	Tv	Qvd
287	Garrison Schist (NW)	Rms	pPsh
288	George Creek, granite of (NE)	TKi	TKia
289	Gerome andesite (NE)	Tv Tv <sub>t</sub>	Evd <sub>1</sub> Evt <sub>1</sub>
290	Ginkgo, basalt of, Frenchman Springs Member (SE)	Tv <sub>cr</sub>	Mv <sub>w</sub>
291	Glacier Peak tephra, volcanic rocks and deposits of Glacier Peak (NW)	Qvt	Qvp
292	Glacier Peak, volcanic rocks and deposits of, undivided (NW)	Qv	Qvd
293	Glacier Peak, volcanic rocks and deposits of. Includes and listed under: Baekos Creek assemblage, Chocolate Creek assemblage, dacite of Disappointment Peak, Dusty Creek assemblage, Glacier Peak tephra, Kennedy Creek assemblage, Suiattle fill, White Chuck assemblage, White Chuck cinder cone, White Chuck fill, and White Chuck tuff. (NW)		
294	Gleason Mountain, monzogranite of (NE)	M <sub>l</sub>	Kiat
295	Goat Creek Formation (NE)	M <sub>m</sub>	Km <sub>1</sub>
296	Goat Island terrane (NW)	M <sub>ms</sub> M <sub>mv</sub>	KJms KJmv
297	Goat Mountain plug (SW)	QTi	QRida
298	Goat Mountain porphyry (NE)	Ti	Eida

No.	Geologic unit	1:500,000	1:250,000
299	Goat Wall unit, undivided, Pasayten Group (NW)	M <sub>kc</sub>	Kc <sub>2</sub>
300	Goat Wall unit, volcanic rocks of, Pasayten Group (NW)	M <sub>kv</sub>	Kv <sub>2</sub>
301	Goat Wall unit. Includes and listed under: volcanic rocks of Goat Wall unit and Ventura Member of the Midnight Peak Formation. (NW)		
302	Goble Volcanics (SW)	Tv Tv <sub>t</sub>	ØEva ØEvc
303	Goble Volcanics Member of the Cowlitz Formation (SW)	Tv	Evb
304	Goblin Peak stock, Index batholith, Index family (NW)	Ti	Øigd
305	Golden Horn batholith (NW)	Ti	Eig
306	Goose Island, basalt of, Ice Harbor Member (SE)	Tv <sub>cr</sub>	Mv <sub>s</sub>
307	Governor's Point Member, Chuckanut Formation. <i>See</i> Chuckanut Formation. (NW)		
308	Grand Valley lithic assemblage (NW)	Tm	ME <sub>m</sub> ME <sub>mst</sub>
309	Grande Ronde Basalt (NE)	Tv <sub>cr</sub>	Mv <sub>g</sub> Mvi <sub>g</sub>
309	Grande Ronde Basalt (SW)	Tv <sub>cr</sub>	Mv <sub>g</sub> Mvi <sub>g</sub>
309	Grande Ronde Basalt, Columbia River Basalt Group (SE)	Tv <sub>cr</sub>	Mv <sub>g</sub> Mvi <sub>g</sub>
309	Grande Ronde Basalt, undivided (NW)	Tv <sub>cr</sub>	Mv <sub>g</sub>
310	Grande Ronde Basalt. Includes and listed under: invasive flow of Howard Creek. (NW)		
311	Grande Ronde River gravel (SE)	QT <sub>c</sub>	QM <sub>c</sub> g
312	Granite Falls stock and associated plutons (NW)	Ti	Eigd
313	Granite Pass, monzogranite of (NE)	M <sub>l</sub>	Kiat
314	Granite Point, granodiorite of (SE)	M <sub>l</sub>	Kigd
315	Grant Lake, intrusive complex north of (NE)	Ti	Ei
316	Grass Mountain sequence (NE)	R <sub>ms</sub>	CD <sub>mm</sub> CD <sub>cb</sub>
317	Grassy Point stock (NW)	M <sub>l</sub>	Kit
318	Grays River volcanic rocks (SW)	Tv	Evb
319	Greenwater lahar (SW)	Qvt	Qvl
320	Grisdale drifts (NW)	Qad	Qad Qao Qap
321	Gross Mountain, dacite dome of (SW)	QT <sub>i</sub>	QR <sub>ida</sub>
322	Grotto batholith, Snoqualmie family. Includes and listed under: Dead Duck pluton, Monte Cristo stock, and granite of San Juan Creek. (NW)		
323	Grotto batholith, undivided, Snoqualmie family (NW)	Ti	MØig MØigb MØit
324	Grouse Creek unit, R <sub>2</sub> Grande Ronde Basalt (SE)	Tv <sub>cr</sub>	Mv <sub>g</sub>
325	Gypsy Quartzite (NE)	RpC <sub>ms</sub>	CZ <sub>q</sub>
326	Hall Creek, paragneiss and orthogneiss of (NE)	M <sub>tog</sub> M <sub>rh</sub> m	pTog pThm
327	Hall Mountain, granodiorite of (NE)	M <sub>l</sub>	Kiat
328	Hammer Bluff Formation (NW)	T <sub>c</sub>	M <sub>c</sub>
329	Hammond, invasive flow of (NE)	Tv <sub>cr</sub>	Mvi <sub>g</sub>
330	Hanford formation (SE)	Qf	Qfs Qfg
331	Hannegan Volcanics (NW)	Tv Tv <sub>t</sub>	Rv Rvx
332	Hanson Lake, rhyolite of (NW)	Tv	Evr
333	Harding Mountain, tonalite of, Mount Stuart batholith (NW)	M <sub>l</sub>	Kit

TABLE 2. LIST OF NAMED UNITS 27

No.	Geologic unit	1:500,000	1:250,000
334	Haro Formation (NW)	M <sub>h</sub> n	T <sub>h</sub> n
335	Harts Pass Formation (NE)	M <sub>h</sub> m	Km <sub>1</sub>
336	Harts Pass Formation, conglomerate of, Three Fools Creek sequence (NW)	M <sub>h</sub> c	Kcg <sub>1</sub>
337	Harts Pass Formation, Three Fools Creek sequence. Includes and listed under: strata of Freezeout Creek and conglomerate of Harts Pass Formation. (NW)		
338	Harts Pass Formation, undivided, Three Fools Creek sequence (NW)	M <sub>h</sub> m	Km <sub>1</sub>
339	Haslam Formation, Nanaimo Group (NW)	M <sub>h</sub> n	Kn
340	Hatchet Mountain Formation (SW)	Tv Tvt	ØEva ØEvc
341	Hauser Lake Gneiss (NE)	pChm	pCbg
342	Hawkins Formation, Ingalls Tectonic Complex (NW)	M <sub>h</sub> l	Jib
343	Hayden Creek Drift (SW)	Qad	Qap Qapo
344	Haystack Creek leucotondhjemitic orthogneiss. <i>See</i> Haystack Creek, orthogneiss of. (NW)		
345	Haystack Creek, orthogneiss of (NW)	M <sub>h</sub> og	Kog
346	Haystack terrane. <i>See</i> Helena–Haystack mélange. Greenstones (units Jmv and Jigb) and ultramafic rocks (unit Ju) north of the Skagit River (T36N R3–5E) are correlated with the Easton Metamorphic Suite by Gallagher and others (1988) and Lapen (2000) and with the Helena–Haystack mélange by Whetten and others (1980) and Dragovich and others (1998, 1999, 2000). (NW)		
347	Helena–Haystack mélange (NW)	M <sub>h</sub> Ram M <sub>h</sub> mt M <sub>h</sub> l M <sub>h</sub> ms M <sub>h</sub> mv M <sub>h</sub> Ru	Jam Jmt Jigb Jit Jmm Jmv Ju
348	Helm Creek drift (SW)	Qgd	Qgp
349	Henry Creek diorite (NE)	Ti	Eimd
350	Herron Creek intrusion (NE)	Ti	Eiqm
351	Herron Creek suite (NE)	Ti	Eiqm Eig
352	Hicks Butte, tonalite gneiss of (SW)	M <sub>h</sub> og	Jog
353	Hidden Lake stock (NW)	M <sub>h</sub> l	Kigd
354	High Pass pluton (NW)	M <sub>h</sub> l	Kigd
355	Hobuck Lake, sedimentary and basaltic rocks of (NW)	Tv Tvt	Evb Evc
356	Hodgson Creek monzonite (NE)	Ti	Eiqm
357	Hogback Mountain, mafic rocks of (SW)	QTv	QRvb
358	Hoh Assemblage (SW)	Tm	Em <sub>1</sub>
359	Hoh lithic assemblage. <i>See</i> Hoh rock assemblage. (NW)		
360	Hoh Oxbow drift (NW)	Qad	Qad Qao
361	Hoh rock assemblage (NW)	Tm	MEm MEmst MEbx Mm Mmst ØEm ØEmst
362	Hoko River Formation, lower Twin River Group (NW)	Tm	Em <sub>2</sub>
363	Holden area, younger gneissic rocks of the (NW)	M <sub>h</sub> hm	T <sub>h</sub> hm
364	Holden Lake pluton (NW)	Ti	Eit
365	Holden, hornblende biotite tonalite near (NW)	Ti	Eit
366	Holden, biotite granodiorite and granite near (NW)	Ti	Eigd
367	Horse Lake Mountain, hornblende andesite porphyry complex of (NE)	Ti	Øian
368	Horseshoe Mountain pluton (NE)	M <sub>h</sub> l	Kiqm

No.	Geologic unit	1:500,000	1:250,000
369	Howard Creek, invasive flow of (NE)	Tv <sub>cr</sub>	Mvi <sub>g</sub>
370	Howard Creek, invasive flow of, Grande Ronde Basalt (NW)	Tv <sub>cr</sub>	Mvi <sub>g</sub>
371	Howson andesite (NW)	Tv	Mva
372	Hozomeen Group (NW)	M <sub>lv</sub>	JPvs
373	Hozomeen stock (NW)	Ti	MØit
374	Huckleberry Formation (NE)	pCmv pCms	Zmv Zcg
375	Huckleberry Formation, conglomerate member of the (NE)	pCms	Zcg
376	Huckleberry Formation, greenstone member of the (NE)	pCmv	Zmv
377	Huckleberry Mountain, volcanic rocks of (SW)	Tvt	Øvc
378	Humptulips drift (NW)	Qad	Qapw <sub>2</sub>
378	Humptulips drift (SW)	Qad	Qap Qapo
379	Humptulips Formation (NW)	Tm	Em <sub>2</sub>
379	Humptulips Formation (SW)	Tm	Em <sub>2</sub>
380	Hungry Mountain stock (NE)	Ti	Eiq
381	Hungry Mountain, monzogranite of (NE)	M <sub>l</sub>	Kiat
382	Huntingdon Formation (NW)	Tc	ØEc
383	Huntzinger, basalt of, Asotin Member (SE)	Tv <sub>cr</sub>	Mv <sub>s</sub>
384	Ice Harbor Member, Saddle Mountains Basalt (SE)	Tv <sub>cr</sub>	Mv <sub>s</sub>
385	Icy Peak, quartz diorite and quartz monzodiorite of, Chilliwack composite batholith, Cascade Pass family (NW)	Ti	Riq
386	Imnaha Basalt, Columbia River Basalt Group (SE)	Tv <sub>cr</sub>	Mvi
387	Index batholith, undivided, Index family (NW)	Ti	Øigd
388	Index batholith. Includes and listed under: Goblin Peak stock, Sunday Creek stock, and metaporphry on Troublesome Mountain. (NW)		
389	Index family. Includes and listed under: Baker River phase, biotite alaskite of Mount Blum, Chilliwack composite batholith undivided, gabbro of Copper Lake, diorite of Ensawkwatch Creek, Goblin Peak stock, Index batholith undivided, tonalite of Maiden Lake, granodiorite of Mount Despair, Pocket Peak phase, Price Glacier pluton, Sauk ring dike, Shake Creek stock, Silesia Creek pluton, Squire Creek stock, Sunday Creek stock, and metaporphry on Troublesome Mountain. (NW)		
390	Indian Creek complex (SW)	M <sub>l</sub> M <sub>og</sub>	Jiq Jog
391	Indian Mountain phase, Chilliwack composite batholith, Snoqualmie family (NW)	Ti	Øigd
392	Ingalls Tectonic Complex, undivided (NW)	M <sub>ms</sub> M <sub>hm</sub> M <sub>l</sub> M <sub>mv</sub> M <sub>ru</sub>	Jar KJhmc Jib Jmv Ju
393	Ingalls Tectonic Complex. Includes and listed under: Esmeralda Peaks diabase, Fourth Creek gabbro, Hawkins Formation, and Peshastin Formation. (NW)		
394	Isabella Ridge, andesite of (NE)	M <sub>lv</sub>	KJv
395	Isabella Ridge, andesite of. See Lookout Mountain unit of the Newby Group. (NW)		
396	Island Mountain, volcanics of (NE)	Tv Tc Ti	Evd <sub>1</sub> Ev <sub>1</sub> Ec <sub>1</sub> Eida Eian
397	Jack Mountain Phyllite (NW)	M <sub>ms</sub> M <sub>ru</sub>	M <sub>sh</sub> pTu
398	Jackita Ridge unit, Three Fools Creek sequence. Includes and listed under: strata of Majestic Mountain and conglomeratic strata of Two Buttes Creek. (NW)		
399	Jackita Ridge unit, undivided, Three Fools Creek sequence (NW)	M <sub>m</sub>	Km <sub>1</sub>
400	Jansen Creek Member, Makah Formation. See Makah Formation. (NW)		

TABLE 2. LIST OF NAMED UNITS 29

No.	Geologic unit	1:500,000	1:250,000
401	Joe Moses Creek, granodiorite of (NE)	Ti	Eigd
402	Johnny George, plutonic complex of (NE)	TKi M <sub>mi</sub>	TKia TKmi
403	Jordan Lakes pluton (NW)	M <sub>l</sub>	Kigd
404	Kalama River dome (SW)	Qi	Qida
405	Kaniksu batholith (NE)	M <sub>l</sub>	Kia Kig Kigd Kiat Kiaa
406	Keane Ranch, basalt of (NE)	Tv <sub>cr</sub>	Mv <sub>g</sub>
407	Keechelus Andesitic Series (NW)	Tv Ti	ØEva ØEian
408	Keller Butte suite (NE)	TKi M <sub>l</sub>	TKia TKig TKigd TKiat TKiaa TKid
409	Keller Butte, porphyritic granite of (NE)	TKi	TKig
410	Kelly Hill phyllite (NE)	Rms	CDmm
411	Kennedy Creek assemblage, volcanic rocks and deposits of Glacier Peak. Includes Dusty Creek and Baekos Creek assemblages, also listed separately. (NW)	Qvt	Qvl
412	Kettle Crest pluton (NE)	Ti	Eimd
413	Kitsap Formation (SW)	Qa	Qc
414	Kittitas Drift (NW)	Qad	Qap Qapo
414	Kittitas Drift (SW)	Qad Qa	Qap Qapo Qt
415	Klachopis Point Member, Makah Formation. <i>See</i> Makah Formation. (NW)		
416	Klondike Mountain Formation (NE)	Tv Tvt	Evd <sub>2</sub> Ev <sub>2</sub> Evt <sub>2</sub> Evc <sub>2</sub>
417	Klondike Mountain Formation, basalt member of the (NE)	Tv	Evd <sub>2</sub>
418	Klondike Mountain Formation, middle member of the (NE)	Tvt	Evc <sub>2</sub>
419	Klondike Mountain Formation, Tom Thumb Tuff member of the (NE)	Tvt	Evc <sub>2</sub>
420	Kobau Formation (NE)	M <sub>mt</sub>	T <sub>mt</sub>
421	Kruger alkaline body (NE)	M <sub>l</sub>	Jik
422	Kulshan caldera, rocks of, undivided. Includes ignimbrite of Swift Creek, listed separately. (NW)	Qv Qvt	Qvr Qvt
423	Kyes Peak, breccia of (NW)	Tvt	Mvc
424	Ladner Group. <i>See</i> Dewdney Creek Formation. (NW)		
425	Lake Ann stock, Chilliwack composite batholith, Cascade Pass family (NW)	Ti	Rigd
426	Lake Juanita leucogneiss (NE)	TKog	Rog
427	Lake Juanita, leucogneiss of, Skagit Gneiss Complex (NW)	TKog	TKog
428	Lake Keechelus tuff member, Ohanapecosh Formation (NW)	Tvt	Øvt
429	Lake Shannon, basalt of (NW)	Qv	Qvb
430	Lakedale Drift (NW)	Qad	Qao Qad
430	Lakedale Drift (SW)	Qad Qa	Qad Qao Qt
431	Lamb Butte, trondhjemite of (NW)	M <sub>kog</sub>	KJog
432	Lane Mountain pluton (NE)	M <sub>l</sub>	Jia
433	Larch Lakes pluton (NW)	Ti	Eigd
434	Lasiocarpa Ridge, andesite of, andesite of Mount Baker (NW)	Qv	Qva

No.	Geologic unit	1:500,000	1:250,000
435	Latah Formation (NE)	Tc	Mc
435	Latah Formation (SE)	Tc	Mc
436	Lava Divide, andesite of, andesite of Mount Baker (NW)	Qv	Qva
437	Leader Lake quartz monzonite (NE)	Ml	Kiqm
438	Leader Mountain granodioritic gneiss (NE)	Mkog	KJog Mkog
439	Ledbetter Slate (NE)	Rms	Oar
440	Leecher Metamorphics (NE)	MkRhm Mkog	pJhm Mkog
441	Leola Volcanics (NE)	pCmv	Zmv
442	Leroy Creek pluton (NW)	Mkog	Kog
443	Levey interbed, Ellensburg Formation (SE)	Tc	Mc
444	Lewiston Orchards, basalt of, Weissenfels Ridge Member (SE)	Tv <sub>cr</sub>	Mv <sub>s</sub>
445	Lightning Creek stocks (NW)	Ml	Kid
446	Lily Creek Formation (SW)	Qvt	Qvl
447	Lime Hill, sediments of (SE)	Tc	Mcg
448	Lincoln Creek Formation (NW)	Tm	ØEm
448	Lincoln Creek Formation (SW)	Tm	ØEm
449	Lincoln Plateau, basalt of (SW)	QTV	QRvb
450	Little Beaver Creek, biotite granodiorite of, Chilliwack composite batholith, Snoqualmie family (NW)	Ti	Øigd
451	Little Jack unit (NW)	Mkms MkRu	Mksh pTu
452	Little Moses Mountain, diorite of (NE)	Ti	Eid
453	Little Roundtop pluton (NE)	Ml	Kig
454	Lizard Lake, basaltic sandstone and conglomerate of (NW)	Tm	Em <sub>1</sub>
455	Logan Hill Formation (SW)	Qad	Qapo
456	Lolo, basalt of, Priest Rapids Member (SE)	Tv <sub>cr</sub>	Mv <sub>w</sub>
457	Lone Frank pluton (NE)	Ml	Kiq
458	Long Alec Creek pluton (NE)	Ti	Eiqm Eig
459	Lookout Creek sandstone (SW)	Tc	Ec <sub>2</sub>
460	Lookout Mountain Formation (SW)	MkRhm	pJsc
461	Lookout Mountain Ranch Drift (SW)	Qad	Qap
462	Lookout Mountain unit, Newby Group (NW)	Mkmv	Jmv
463	Loomis pluton (NE)	Ml	Tigd
464	Loon Lake granite (NE)	Ml Mkog TKi Ti	Kia Kig Kigd Kiat Kiaa Kog TKia TKiaa Eia Eiqm Eimd Jia
465	Lopez structural complex (NW)	Mkms Mkmv	KJmm KJmv
466	Lost Peak stock (NE)	Ti	Eigd
467	Lost Peak stock (NW)	Ml	Kigd
468	Lower Monumental Member, Saddle Mountains Basalt (SE)	Tv <sub>cr</sub>	Mv <sub>s</sub>

No.	Geologic unit	1:500,000	1:250,000
469	Lummi Formation (NW)	M <sub>mt</sub> M <sub>ms</sub>	J <sub>mt</sub> K <sub>Jmm</sub>
470	Lyall Ridge, porphyries and breccias of (NW)	Ti	Mix
471	Lyman lahar (NW)	Qvt	Qvl
472	Lyman Rapids drift (NW)	Qad	Qap
473	Lyman Rapids outwash (NW)	Qad	Qapo
474	Lyons Ferry, basalt of, Frenchman Springs Member (SE)	Tv <sub>cr</sub>	Mv <sub>w</sub>
475	Lyre Formation (NW)	Tm Tv Tv <sub>t</sub>	Em <sub>2</sub> Em Eva Evt
476	Mabton member, Ellensburg Formation (SE)	Tc	Mc
477	Mad River terrane, heterogeneous schist and gneiss of the (NE)	M <sub>Rhm</sub> M <sub>og</sub>	T <sub>Phmc</sub> T <sub>Pmb</sub> Kog
478	Magic Mountain Gneiss (NW)	M <sub>l</sub>	Tiq
479	Maiden Lake, tonalite of, Chilliwack composite batholith, Index family (NW)	Ti	Øit
480	Maitlen Phyllite (NE)	R <sub>ms</sub>	C <sub>mm</sub> C <sub>cb</sub>
481	Majestic Mountain, strata of, Jackita Ridge unit, Three Fools Creek sequence (NW)	M <sub>m</sub>	Km <sub>1</sub>
482	Makah Formation, middle Twin River Group. Includes: Baada Point Member, Carpenters Creek Tuff Member, Dtokoah Point Member, Falls Creek unit, Jansen Creek Member, Klachopis Point Member, and Third Beach Member. (NW)		
483	Makah Formation, undivided, middle Twin River Group (NW)	Tm	ØEm
484	Manastash Formation (SW)	Tc	Ec <sub>1</sub>
485	Manila Creek, porphyritic granodiorite of (NE)	TKi	TKia
486	Mann Butte, rhyolite of (SW)	Ti	Mir
487	Maple Falls Member, Chuckanut Formation. See Chuckanut Formation. (NW)		
488	Marble Creek Orthogneiss, Skagit Gneiss Complex (NW)	M <sub>og</sub>	Kog
489	Marblemount pluton. Includes the Marblemount Meta-Quartz Diorite, not listed separately. (NW)	M <sub>l</sub> M <sub>og</sub>	Tiq T <sub>og</sub>
490	Marrowstone Shale (NW)	Tm	ØEm
491	Martin Bridge Limestone (SE)	M <sub>ms</sub>	T <sub>cb</sub>
492	Martindale, basalt of, Ice Harbor Member (SE)	Tv <sub>cr</sub>	Mv <sub>s</sub>
493	Marysville Sand Member, Vashon Drift (NW)	Qgd	Qgos
494	Mashel Formation (SW)	Tc	Mc
495	McClure Mountain unit (NE)	M <sub>mt</sub>	K <sub>Jmt</sub>
496	McCoy Creek quartz diorite (SW)	Ti	Miq
497	McDonald Ridge drift (SW)	Qad	Qad
498	McFarland Creek stock (NE)	M <sub>l</sub>	Kid
499	McGinnis Lake, garnet-bearing granite of (NE)	TKi	TKiaa
500	McGregor Mountain, migmatitic orthogneiss of, Skagit Gneiss Complex (NW)	TKog	TKog
501	McHale Slate (NE)	pC <sub>ms</sub>	Yar <sub>2</sub>
502	McIntosh Formation (SW)	Tm	Em <sub>1</sub> Em <sub>2</sub>
503	McNeely Drift (SW)	Qad	Qad
504	Megler, sandstone of (SW)	Tm	Em <sub>1</sub>
505	Metaline Formation (NE)	R <sub>ms</sub>	O <sub>Ccb</sub>
506	Meteor, granite and granodiorite near (NE)	M <sub>l</sub>	K <sub>Jia</sub>

No.	Geologic unit	1:500,000	1:250,000
507	Methow gneiss (NE)	Mkog	KJog
508	Meyer Ridge unit, R <sub>2</sub> Grande Ronde Basalt (SE)	Tv <sub>cr</sub>	Mv <sub>g</sub>
509	Mica Peak, gneiss of (NE)	pChm	pCbg pCqz
510	Middle Fork Nooksack River, lahar of the (NW)	Qvt	Qvl
511	Middle Peak, heterogeneous tonalite and granodiorite of, Chilliwack Composite batholith, Index family (NW)	Ti	Øit
512	Midnight Peak Formation (NE)	M <sub>2</sub> c M <sub>2</sub> v	Kc <sub>2</sub> Kv <sub>2</sub> Kvs <sub>2</sub>
513	Midnight Peak Formation, undivided. Includes Ventura Member of the Midnight Peak Formation, listed separately. (NW)	M <sub>2</sub> c M <sub>2</sub> v	Kc <sub>2</sub> Kv <sub>2</sub>
514	Midway, tuff at (SW)	Tvt	Rvt
515	Milk Creek, olivine basalt of (SW)	Tv	Øvb
516	Milk Creek, tuff of (SW)	Tvt	Øvt
517	Mineral Mountain pluton, Chilliwack composite batholith, Cascade Pass family (NW)	Ti	Mig
518	Mission argillite (NE)	R <sub>2</sub> ms R <sub>2</sub> mv	COcg COmm Ocb Omm Omv
519	Mission Creek, gneissic porphyritic granodiorite of (NE)	Mkog	pTog
520	Missoula flood deposits, glacial Lake (SW)	Qf	Qfg Qfs
521	Missoula Group (NE)	pCms	Yms <sub>4</sub>
522	Missoula Group, Belt Supergroup (SE)	pCms	Yms <sub>4</sub>
523	Missoula, glacial lake, deposits (SE)	Qf	Qfs Qfg
524	Mobray drift (NW)	Qad	Qapw <sub>2</sub>
524	Mobray drift (SW)	Qad	Qap
525	Money Creek gabbro (NW)	M <sub>2</sub> l	pTigb
526	Monk Formation (NE)	pCms	Zmm
527	Monte Cristo stock, Grotto batholith, Snoqualmie family (NW)	Ti	MØigd
528	Montesano Formation (NW)	Tm	Mm <sub>2</sub>
528	Montesano Formation (SW)	Tm	Mm <sub>2</sub>
529	Monument Peak stock (NE)	Ti	Eig
529	Monument Peak stock (NW)	Ti	Eig
530	Moses Mountain pluton (NE)	TKi	TKia TKiaa
531	Mount Adams, andesites of (SW)	Qv	Qva
532	Mount Aix volcanic complex (SW)	Ti	MØiv
533	Mount Baker, andesite of, undivided (NW)	Qv	Qva
534	Mount Baker, andesite of. Includes and listed under: andesite of Bastile Ridge, andesite of Black Buttes, andesite of Coleman Pinnacle, andesite of Cougar Divide, andesite of Lasiocarpa Ridge, andesite of Lava Divide, andesite of Pinus Lake, andesite of The Portals, andesite of Swift Creek, and andesite of Table Mountain. (NW)		
535	Mount Ballard, volcanic breccia of, Virginian Ridge Formation, Pasayten Group (NW)	M <sub>2</sub> v	Kv <sub>2</sub>
536	Mount Benzarino, orthogneiss of (NW)	TKog	RKog
537	Mount Blum, biotite alaskite of, Chilliwack composite batholith, Index family (NW)	Ti	Øig
538	Mount Bonaparte pluton (NE)	TKi M <sub>2</sub> l	TKia TKiaa TKid
539	Mount Buckindy pluton, Cascade Pass family (NW)	Ti	Mit Mix

TABLE 2. LIST OF NAMED UNITS 33

No.	Geologic unit	1:500,000	1:250,000
540	Mount Catherine Rhyolite Member, Naches Formation (NW)	Tvt	Evt
541	Mount Daniel, volcanic rocks of (NW)	Tv Tvt, Ti	Øvd Øvr Øvt Øian Øir
542	Mount Despair, granodiorite of, Chilliwack composite batholith, Index family (NW)	Ti	Øigd Øii
543	Mount Herman, sedimentary rocks of, Chilliwack Group (NW)	Rms	PDms
544	Mount Herman, volcanic rocks of, Chilliwack Group (NW)	Rmv	PDmv
545	Mount Hinman, granite of, Snoqualmie batholith, Snoqualmie family (NW)	Ti	MØig
546	Mount Josephine, semischist and phyllite of, Easton Metamorphic Suite (NW)	Mms	Jph
547	Mount Persis, volcanic rocks of (NW)	Tv	Ev Eva
548	Mount Pilchuck stock (NW)	Ti	Eig
549	Mount Rahm, volcanic rocks of (NW)	Tvt	Øvx
550	Mount Rainier, andesites of (SW)	Qv	Qva
551	Mount Rainier, vent complexes on (SW)	Qi	Qian
552	Mount Rathdrum granite (NE)	Ti	Eiat
553	Mount Roberts Formation (NE)	Rms	Pmm
554	Mount Sefrit gabbro, Chilliwack composite batholith, Snoqualmie family (NW)	Ti	Migb
555	Mount Spokane granite (NE)	Ml TKi	Kiat TKiaa
556	Mount St. Helens 1980 debris avalanche (SW)	Qls	Qls
557	Mount St. Helens 1980 lahars (SW)	Qvt	Qvl
558	Mount St. Helens 1980 pumice flows (SW)	Qvt	Qvp
559	Mount St. Helens pre-1980 lahars (SW)	Qvt	Qvl
560	Mount St. Helens pre-1980 volcanoclastic deposits (SW)	Qvt	Qvc
561	Mount St. Helens, andesites of (SW)	Qv	Qva
562	Mount St. Helens, basalts of (SW)	Qv	Qvb
563	Mount St. Helens, Holocene domes on (SW)	Qi	Qida
564	Mount Stickney, drift of (NW)	Qad	Qap
565	Mount Stuart batholith, undivided (NW)	Ml	Kid Kigb Kigd Kit
566	Mount Stuart batholith. Includes and listed under: Beckler Peak stocks and tonalite of Harding Mountain. (NW)		
567	Mount Tolman, quartz porphyry of (NE)	TKi	TKig
568	Mount Triumph, orthogneiss of (NW)	TKog	TKog
569	Mt. Horrible unit, R <sub>2</sub> Grande Ronde Basalt (SE)	Tv <sub>cr</sub>	Mv <sub>g</sub>
570	Muddy River lahar (SW)	Qvt	Qvl
571	N <sub>1</sub> magnetostratigraphic unit of the Grande Ronde Basalt (SW)	Tv <sub>cr</sub>	Mv <sub>g</sub>
572	N <sub>1</sub> magnetostratigraphic unit, Grande Ronde Basalt (SE)	Tv <sub>cr</sub>	Mv <sub>g</sub>
573	N <sub>2</sub> magnetostratigraphic unit of the Grande Ronde Basalt (NE)	Tv <sub>cr</sub>	Mv <sub>g</sub> Mvi <sub>g</sub>
573	N <sub>2</sub> magnetostratigraphic unit of the Grande Ronde Basalt (SW)	Tv <sub>cr</sub>	Mv <sub>g</sub>
574	N <sub>2</sub> magnetostratigraphic unit, Grande Ronde Basalt (SE)	Tv <sub>cr</sub>	Mv <sub>g</sub>
575	Naches Formation (SW)	Tc Tv	Ec <sub>2</sub> Ev Evb Evr
576	Naches Formation, undivided. Includes Guye Sedimentary Member, not listed separately. (NW)	Tc Tv	Ec <sub>2</sub> Ev Evb Evr

No.	Geologic unit	1:500,000	1:250,000
577	Naches Formation. Includes and listed under: Mount Catherine Rhyolite Member. (NW)		
578	Nahahum Canyon Member of the Chumstick Formation (NE)	Tc	Ec <sub>2</sub>
579	Nanaimo Group, undivided (NW)	M <sub>n</sub>	Kn
580	Nanaimo Group. Locally divided into and listed under: Cedar District Formation, Comox Formation, Extension Formation, Haslam Formation, and Protection Formation. (NW)		
581	Napeequa River area, rocks of the. <i>See also</i> Napeequa Schist. (NW)	M <sub>R</sub> hm	JPhmc
582	Napeequa River area, rocks of the (NE)	M <sub>R</sub> hm M <sub>og</sub>	TPhmc TPmb Kog
583	Napeequa Schist (NW)	M <sub>R</sub> hm M <sub>og</sub> TKgn	JPhmc pTog TKbg
584	Napeequa Schist. Defined by Tabor and others (2002) to include: rocks of the Napeequa River area, Rainbow Lake Schist, Twisp Valley Schist, and part of Cascade River Schist of Misch (1966). (NW)		
585	Napeequa unit. <i>See</i> Napeequa Schist. (NW)		
586	Nason Ridge Migmatitic Gneiss (NW)	M <sub>gn</sub> M <sub>og</sub>	Kbg Kog
587	Needle, The, orthogneiss of, Skagit Gneiss Complex (NW)	M <sub>og</sub>	Tog
588	Needles–Gray Wolf lithic assemblage (NW)	Tm Tv	ØEm ØEmst ØEvb
589	Nespelem Silt (NE)	Qf	Qgl Qglf
590	Newby Group (NE)	M <sub>v</sub> M <sub>m</sub>	KJvs KJvt KJm KJv Jm
591	Newby Group. Includes and listed under: Lookout Mountain unit. (NW)		
592	Newman Lake Gneiss (NE)	M <sub>og</sub>	Kog
593	Noname stock (NE)	Ti	Eigd
594	Nooksack Cirque, quartz monzonite and granite of, Chilliwack composite batholith, Cascade Pass family (NW)	Ti	Riqm
595	Nooksack Formation, undivided (NW)	M <sub>ms</sub>	KJmm
596	Nooksack Formation. Includes and listed under: Wells Creek volcanic member. (NW)		
597	North Creek Volcanics (NE)	M <sub>mv</sub>	KJmv
597	North Creek Volcanics (NW)	M <sub>mt</sub>	Kmt
598	North Fork Camp hybrid gneiss (NE)	M <sub>og</sub>	Jog
599	North Peak, metavolcanic rocks of (NW)	R <sub>mv</sub>	PDmv
600	North Star Creek, metadiorite near (NE)	R <sub>I</sub>	R <sub>ib</sub>
601	Northcraft Formation (SW)	Tv Tvt	Eva Evc ØEva ØEvc ØEvt
602	O'Brien Creek Formation (NE)	Tvt Tc	Evt <sub>1</sub> Evc <sub>1</sub> Ecg <sub>1</sub>
603	Ohanapecosh Formation (SW)	Tv Tvt	Øva Øvc Øvr
604	Ohanapecosh Formation, undivided (NW)	Tvt	Øvc
605	Ohanapecosh Formation. Includes and listed under: Lake Keechelus tuff member. (NW)		
606	Okanogan batholithic complex (NE)	M <sub>l</sub> M <sub>og</sub> M <sub>mi</sub>	Kit Kigd KJog KJmi
607	Old Baldy pluton (NE)	M <sub>og</sub>	KJog
608	Old Dominion Limestone (NE)	R <sub>ms</sub>	OCcb
609	Old Gib volcanic neck, dacite of (NW)	Ti	Eir
610	Olequa Creek Member of the Cowlitz Formation (SW)	Tn	En

No.	Geologic unit	1:500,000	1:250,000
611	Olympia beds (NW)	Qa Qgd	Qc Qgpc Qguc
612	Omak Lake, porphyritic granodiorite southwest of (NE)	TKi	TKigd
613	Omeara Point, siltstone and sandstone at (SW)	Tm	Em <sub>2</sub>
614	Orcas Chert. <i>See</i> Orcas Formation. (NW)		
615	Orcas Formation (NW)	M <sub>ms</sub>	J <sub>Tmc</sub>
616	Ordway Creek stock (SW)	Ti	Eiqm
617	Orting Drift (SW)	Qgd	Qgp
618	Ortley unit, N <sub>2</sub> Grande Ronde Basalt (SE)	Tv <sub>cr</sub>	Mv <sub>g</sub>
619	Osceola Mudflow (NW)	Qvt	Qvl
619	Osceola Mudflow (SW)	Qvt	Qvl
620	Osoyoos batholith (NE)	M <sub>kog</sub>	T <sub>kog</sub>
621	Oval Peak batholith (NE)	Ti TKog	Rit Rog
622	Oval Peak pluton (NW)	Ti	Rit
623	Pack Sack Lookout, basalt of (SW)	Tv <sub>cr</sub>	Mv <sub>s</sub> Mvi <sub>s</sub>
624	Padden Member, Chuckanut Formation. <i>See</i> Chuckanut Formation. (NW)		
625	Palisades, welded tuff of The (SW)	Tvt	Mvt
626	Palmer Mountain Greenstone (NE)	M <sub>mv</sub>	T <sub>mv</sub>
627	Palmer volcanics (NE)	Tv Tvt	Evd <sub>1</sub> Evc <sub>1</sub> Evc <sub>2</sub>
628	Palouse Falls, basalt of, Frenchman Springs Member (SE)	Tv <sub>cr</sub>	Mv <sub>w</sub>
629	Palouse Formation (NE)	Ql	Ql
629	Palouse Formation (SE)	Ql	Ql
630	Panther Creek Formation (NE)	M <sub>m</sub>	Km <sub>1</sub>
630	Panther Creek Formation (NW)	M <sub>m</sub>	Km <sub>1</sub>
631	Paradise debris flow (SW)	Qvt	Qvl
632	Park Butte, basalt of (NW)	Qv	Qvb
633	Park granite stock (NE)	M <sub>l</sub>	Kig
634	Parmenter Creek, serpentine near (NE)	M <sub>Ru</sub>	u
635	Partridge Gravel, Vashon Drift (NW)	Qgd	Qgo Qgos
636	Pasayten Group (Daly, 1912; Coates, 1974; R. A. Haugerud and R. W. Tabor, USGS, written commun., 2000). Includes and listed under: strata of Cow Creek, Devils Pass Member of the Virginian Ridge Formation, Goat Wall unit undivided, volcanic rocks of the Goat Wall unit, volcanic breccia of Mount Ballard, Slate Peak Member of the Virginian Ridge Formation, volcanic rocks of Three A M Mountain, Ventura Member of the Midnight Peak Formation, Virginian Ridge Formation undivided, and Winthrop Formation undivided. (NW)		
637	Pasayten stock (NE)	M <sub>l</sub>	Kigd
637	Pasayten stock (NW)	M <sub>l</sub>	Kigd
638	Pasco gravels (SE)	Qf	Qfg
639	Patterson Lake conglomerate (NE)	M <sub>c</sub>	Kcg <sub>1</sub>
640	Pe Ell Volcanics Member of the Cowlitz Formation (SW)	Tvt	Evt
641	Pear Lake, gneissic tonalite of (NW)	M <sub>kog</sub>	Kog
642	Pend Oreille Andesite (NE)	Tv	Evd <sub>1</sub>
643	Pend Oreille sequence (NE)	R <sub>ms</sub> R <sub>mt</sub>	CDmm CDmt

No.	Geologic unit	1:500,000	1:250,000
644	Peninsula tonalite (SW)	M <sub>l</sub>	Jiq
645	Peoh Point, andesite of (SW)	Ti	Eida
646	Perry Creek phase, Chilliwack composite batholith, Snoqualmie family (NW)	Ti	MØit
647	Peshastin Formation, Ingalls Tectonic Complex (NW)	M <sub>ms</sub>	Jar
648	Phillips Lake Granodiorite (NE)	M <sub>l</sub>	Kiat
649	Pine Creek lahar (SW)	Qvt	Qvl
650	Pinus Lake, andesite of, andesite of Mount Baker (NW)	Qv	Qva
651	Pioneer Ridge, volcanic rocks of (NW)	Tv Tv <sub>t</sub>	Øvd Øvx
652	Pipestone Canyon Formation (NE)	M <sub>c</sub>	TKc
653	Pocket Peak phase, Chilliwack composite batholith, Index family (NW)	Ti	Øig
654	Pogue Mountain quartz monzonite (NE)	M <sub>l</sub>	Kiqm
655	Pomona Member of the Saddle Mountains Basalt (SW)	Tv <sub>cr</sub>	M <sub>v<sub>s</sub></sub> M <sub>vi<sub>s</sub></sub>
656	Pomona Member, Saddle Mountains Basalt (SE)	Tv <sub>cr</sub>	M <sub>v<sub>s</sub></sub>
657	Portals, The, andesite of, andesite of Mount Baker (NW)	Qv	Qva
658	Possession Drift (NW)	Qgd Qa	Qgpc Qguc
659	Price Glacier pluton, Chilliwack composite batholith, Index family (NW)	Ti	Øiq
660	Prichard Formation (NE)	pCms	Yms <sub>1</sub>
661	Priest Lake, granodiorite of (NE)	M <sub>l</sub>	Kigd
662	Priest Rapids Member of the Wanapum Basalt (NE)	Tv <sub>cr</sub>	M <sub>v<sub>w</sub></sub>
662	Priest Rapids Member of the Wanapum Basalt (SW)	Tv <sub>cr</sub>	M <sub>v<sub>w</sub></sub>
663	Priest Rapids Member, Wanapum Basalt (SE)	Tv <sub>cr</sub>	M <sub>v<sub>w</sub></sub>
664	Priest River Group (NE)	pCms	Yar Yq Ycb
665	Protection Formation, Nanaimo Group (NW)	M <sub>n</sub>	Kn
666	Puget Group (SW)	Tc	Ec <sub>2</sub>
667	Puget Group, undivided (NW)	Tc	Ec <sub>2</sub>
668	Puget Group (locally subdivided into and listed under: Renton Formation, Tiger Mountain Formation, and Tukwila Formation) (NW)		
669	Purple Creek, orthogneiss of, Skagit Gneiss Complex (NW)	TKog	TKog
670	Puyallup Formation (NW)	Qa Qgd	Qc Qgpc
670	Puyallup Formation (SW)	Qa	Qc
671	Pysht Formation, upper Twin River Group (NW)	Tm	MØm
672	Quartz Mountain area, granodiorite gneiss complex of the (NE)	M <sub>mi</sub>	KJmi
673	Quartz Mountain quartz diorite (SW)	M <sub>l</sub>	Jiq
674	Quillayute Formation (NW)	Tn	RMn
675	Quimper Sandstone (NW)	Tm	ØEm
676	Quinault Formation (NW)	Tn	RMn
677	Quincy interbed, Ellensburg Formation (SE)	Tc	M <sub>c</sub>
678	R <sub>1</sub> magnetostratigraphic unit of the Grande Ronde Basalt (SW)	Tv <sub>cr</sub>	M <sub>v<sub>g</sub></sub>
679	R <sub>1</sub> magnetostratigraphic unit, Grande Ronde Basalt (SE)	Tv <sub>cr</sub>	M <sub>v<sub>g</sub></sub>

TABLE 2. LIST OF NAMED UNITS 37

No.	Geologic unit	1:500,000	1:250,000
680	R <sub>2</sub> magnetostratigraphic unit of the Grande Ronde Basalt (NE)	Tv <sub>cr</sub>	Mv <sub>g</sub> Mvi <sub>g</sub>
680	R <sub>2</sub> magnetostratigraphic unit of the Grande Ronde Basalt (SW)	Tv <sub>cr</sub>	Mv <sub>g</sub>
681	R <sub>2</sub> magnetostratigraphic unit, Grande Ronde Basalt (SE)	Tv <sub>cr</sub>	Mv <sub>g</sub>
682	Raging River Formation (NW)	Tm	Em
683	Railroad Creek pluton (NW)	Ti	Eigd
684	Rainbow Lake Schist. <i>See also</i> Napeequa Schist. (NW)	M <del>R</del> hm	JPhmc
685	Rainbow Mountain, orthogneiss of, Skagit Gneiss Complex (NW)	TKog	TKog
686	Rampart Mountain pluton (NW)	Ti	Eig
687	Randle laharic breccia-conglomerate (SW)	Tvt	Mvc
688	Rattlesnake Creek tuff (SW)	Tvt	M <del>O</del> vt
689	Rattlesnake Mountain, volcanic rocks of (NW)	Tvt	<del>O</del> vc
690	Rattlesnake Ridge Member, Ellensburg Formation (SE)	Tc	M <del>c</del>
691	Ravalli Group (NE)	pCms	Yms <sub>2</sub>
692	Ravalli Group, Belt Supergroup (SE)	pCms	Yms <sub>2</sub>
693	Red Shirt gabbro (NE)	M <del>l</del>	KJigb
694	Redoubt Creek, quartz monzodiorite of, Chilliwack composite batholith, Cascade Pass family (NW)	Ti	Miqm
695	Reed Creek quartz dioritic orthogneiss (NE)	M <del>o</del> g	M <del>o</del> g
696	Reeves Limestone Member of the Maitlen Phyllite (NE)	Rms	Ccb
697	Rommel batholith, undivided (NW)	M <del>o</del> g	KJog
698	Rommel batholith. Includes and listed under: tonalite of Doe Mountain. (NW)		
699	Renton Formation, Puget Group (NW)	Tc	Ec <sub>2</sub>
700	Revett Formation (NE)	pCms	Yms <sub>2</sub>
701	Revett Formation, Ravalli Group (SE)	pCms	Yms <sub>2</sub>
702	Reynolds Peak phase, Black Peak batholith (NW)	M <del>l</del>	Kit
703	Riddle Peaks pluton (NW)	M <del>l</del>	Kigb
704	Ringold Formation (NE)	Tc	QRcg (now RMcg)
704	Ringold Formation (SE)	Tc	RMc RMcg
705	Rinker Ridge, slate of (NW)	M <del>l</del> ms	Jph
706	Roaring Creek, greenstone near (NE)	M <del>l</del> am	pTam
707	Robinet Mountain, basalt of, Eckler Mountain Member (SE)	Tv <sub>cr</sub>	Mv <sub>w</sub>
708	Rock Creek stock (NW)	M <del>l</del>	Kigd
709	Rogers Bar, granodiorite of (NE)	M <del>l</del>	KJigd
710	Rogersburg unit, R <sub>1</sub> Grande Ronde Basalt (SE)	Tv <sub>cr</sub>	Mv <sub>g</sub>
711	Rosalia, basalt of, Priest Rapids Member (SE)	Tv <sub>cr</sub>	Mv <sub>w</sub>
712	Roslyn Formation (NW)	Tc	Ec <sub>2</sub>
712	Roslyn Formation (SW)	Tc	Ec <sub>2</sub>
713	Rosslund Group (NE)	M <del>l</del> mv M <del>l</del> ms	Jmv Jcg
714	Round Lake, breccia of (NW)	Tvt	<del>O</del> vx

No.	Geologic unit	1:500,000	1:250,000
715	Round Mountain, gneiss near (NE)	pChm	pChm
716	Roza Member of the Wanapum Basalt (NE)	Tv <sub>cr</sub>	Mv <sub>w</sub>
716	Roza Member of the Wanapum Basalt (SW)	Tv <sub>cr</sub>	Mv <sub>w</sub>
717	Roza Member, Wanapum Basalt (SE)	Tv <sub>cr</sub>	Mv <sub>w</sub>
718	Ruby Creek heterogeneous plutonic belt (NW)	TKi	TKi
719	Russell Ranch Formation (SW)	M <sub>em</sub> M <sub>kmv</sub> M <sub>kv</sub>	KJm KJmct KJmv KJvb pTvr
720	Ruth Creek pluton, Chilliwack composite batholith, Cascade Pass family (NW)	Ti	Migd
721	Ruth Mountain, granite of, Chilliwack composite batholith, Cascade Pass family (NW)	Ti	Rig
722	Saddle Mountains Basalt (NE)	Tv <sub>cr</sub>	Mv <sub>s</sub>
722	Saddle Mountains Basalt (SW)	Tv <sub>cr</sub>	Mv <sub>s</sub> Mvi <sub>s</sub>
723	Saddle Mountains Basalt, Columbia River Basalt Group (SE)	Tv <sub>cr</sub>	Mv <sub>s</sub>
724	Salmon Creek schists and gneisses (NE)	M <sub>z</sub> Rhm	pJhm pJmb
725	Salmon Springs Drift (NW)	Qgd	Qgp Qgpc
725	Salmon Springs Drift (SW)	Qgd	Qgp
726	San Juan Creek, granite of, Grotto batholith, Snoqualmie family (NW)	Ti	MØig
727	Sand Creek, monzogranite of (NE)	M <sub>l</sub>	Kig
728	Sand Hollow, basalt of, Frenchman Springs Member (SE)	Tv <sub>cr</sub>	Mv <sub>w</sub>
729	Sanpoil Volcanics (NE)	Tv Tv <sub>t</sub>	Evd <sub>1</sub> Evt <sub>1</sub> Ev <sub>1</sub>
730	Saturday Rock pluton (SW)	Ti	Mid
731	Sauk ring dike, Index family (NW)	Ti	ØEida
732	Scatter Creek Rhyodacite (NE)	Ti	Eida
733	Scow Bay, sandstone of (NW)	Tm	Em <sub>1</sub>
734	Selah Member, Ellensburg Formation (SE)	Tc	Mc
735	Sentinel Bluffs unit, N <sub>2</sub> Grande Ronde Basalt (SE)	Tv <sub>cr</sub>	Mv <sub>g</sub>
736	Sentinel Gap, basalt of, Frenchman Springs Member (SE)	Tv <sub>cr</sub>	Mv <sub>w</sub>
737	Seven Devils Group (SE)	M <sub>z</sub> mt	Tmt
738	Seven Fingered Jack pluton (NW)	M <sub>l</sub>	Kit
739	Seventeenmile Mountain, quartz monzonite of (NE)	Ti	Eiqm
740	Shake Creek stock of Squire Creek stock, Index family (NW)	Ti	Øit
741	Shankers Bend alkalic complex (NE)	M <sub>l</sub>	Jik
742	Shasket Creek, intrusive rocks of (NE)	M <sub>l</sub>	Jik
743	Shedroof Conglomerate (NE)	pCms	Zcg
744	Sheep Mountain area, hornblende gneisses of the (NE)	M <sub>z</sub> Ram	pJam
745	Shellrock Point volcanics (NE)	Tv	Evd <sub>1</sub>
746	Sheppard Granite (NE)	Ti	Eig
747	Shoalwater Bay, siltstone at (SW)	Tm	Em <sub>2</sub>
748	Shuksan Greenschist, Easton Metamorphic Suite (NW)	M <sub>z</sub> ms	Jsh
749	Shuksan Metamorphic Suite. <i>See</i> Easton Metamorphic Suite. (NW)		

No.	Geologic unit	1:500,000	1:250,000
750	Shumaker Creek, basalt of, Eckler Mountain Member (SE)	Tv <sub>cr</sub>	Mv <sub>w</sub>
751	Silesia Creek pluton, Chilliwack composite batholith, Index family (NW)	Ti	Øit
752	Sillusi, basalt of, Umatilla Member (SE)	Tv <sub>cr</sub>	Mv <sub>s</sub>
753	Silver Creek, tonalite of, Cascade Pass family (NW)	Ti	Mit
754	Silver Falls, basalt of, Frenchman Springs Member (SE)	Tv <sub>cr</sub>	Mv <sub>w</sub>
755	Silver Pass Volcanic Member, Swauk Formation (NW)	Tv	Evd
756	Silver Point Quartz Monzonite (NE)	Ti	Eia
757	Silver Star pluton (SW)	Ti	Mid Migd Miq
758	Simcoe Mountains, volcanic rocks of (SW)	Tv QTv	Rvr QRvb
759	Similkameen composite pluton (NE)	Ml	Jia Jik
760	Sisters Creek pluton (NW)	TKi	TKig
761	Sitkum Creek, stock on, Cascade Pass family (NW)	Ti	Migd
762	Skagit Gneiss (NE)	TKog	TKmi
763	Skagit Gneiss Complex, undivided (NW)	TKgn TKi TKog Mkog	TKbg TKig TKog Tog
764	Skagit Gneiss Complex. Includes and listed under: orthogneiss of Boulder Creek, leucogneiss of Lake Juanita, Marble Creek Orthogneiss, migmatitic orthogneiss of McGregor Mountain, orthogneiss of The Needle, orthogneiss of Purple Creek, orthogneiss of Rainbow Mountain, and orthogneiss of Stehekin. (NW)		
765	Skagit Volcanics. <i>See</i> volcanic rocks of Mount Rahm. (NW)		
766	Skamania volcanic rocks (SW)	Tv	Øva
767	Skamokawa Creek, siltstone of (SW)	Tm	Em <sub>2</sub>
768	Skokomish Gravel (NW)	Qad	Qapo
769	Skokomish Gravel (SW)	Qa	Qoa
770	Skookumchuck Formation (SW)	Tn	En
771	Skymo complex (NW)	Ml	KJigb
772	Skyscraper Mountain complex (SW)	Ti	Miv
773	Slack Canyon unit, N <sub>2</sub> Grande Ronde Basalt (SE)	Tv <sub>cr</sub>	Mv <sub>g</sub>
774	Slate Peak Member, Virginian Ridge Formation, Pasayten Group (NW)	Mec	Kc <sub>2</sub>
775	Slide Member, Chuckanut Formation. <i>See</i> Chuckanut Formation. (NW)		
776	Slippery Creek, basalt of, Weissenfels Ridge Member (SE)	Tv <sub>cr</sub>	Mv <sub>s</sub>
777	Sloan Creek plutons (NW)	Mkog	Kog
778	Snipes Mountain, conglomerate of, Ellensburg Formation (SE)	Tc	Mcg
779	Snoqualmie batholith, undivided, Snoqualmie family (NW)	Ti	Mig Migd Mit MØig MØigb MØigd MØix
780	Snoqualmie batholith. Includes and listed under: granite of Mount Hinman. (NW)		
781	Snoqualmie family. Includes and listed under: Chilliwack valley phase of the Chilliwack composite batholith, Dead Duck pluton, Grotto batholith undivided, Indian Mountain phase of the Chilliwack composite batholith, biotite granodiorite of Little Beaver Creek, Monte Cristo stock, granite of Mount Hinman, Mount Sefrit gabbro, Perry Creek phase of the Chilliwack composite batholith, granite of San Juan Creek, and Snoqualmie batholith undivided. (NW)		
782	Soap Lake Mountain, granodiorite of (NE)	Ml	Kigd
783	Sooes River area, sandstone of (NW)	Tm Tvt	MEbx ØEm Em <sub>2</sub> Em <sub>1</sub> Em Evc

No.	Geologic unit	1:500,000	1:250,000
784	Sophie Mountain Formation (NE)	M <sub>lc</sub>	Kcg <sub>2</sub>
785	South Creek, metaconglomerate of (NW)	M <sub>lms</sub>	Kmcg
786	Spanish Camp gneiss complex (NE)	M <sub>lmi</sub> M <sub>li</sub>	KJmi Kit
787	Spectacle Formation (NE)	R <sub>ms</sub>	Pcb Pmm
788	Spencer Creek, sandstone of (SW)	Tvt	Øvc
789	Spencer Creek, welded tuff at (SW)	Tvt	Evt
790	Spider Mountain Schist. <i>See also</i> Cascade River Schist. (NW)	M <sub>lhm</sub>	T <sub>lhm</sub>
791	Spieden Group (NW)	M <sub>ln</sub>	KJn
792	Spiketown Formation (SW)	Tc	Ec <sub>2</sub>
793	Spirit Lake pluton (SW)	Ti	Mia Migd Miq Miqm
794	Spirit pluton (NE)	M <sub>li</sub>	Kig Kiaa
795	Sprague Lake, basalt of (NE)	Tv <sub>cr</sub>	Mv <sub>s</sub>
796	Sprague Lake, basalt of, (equivalent to basalt of Lewiston Orchards?) (SE)	Tv <sub>cr</sub>	Mv <sub>s</sub>
797	Squaw Creek Member, Ellensburg Formation (SE)	Tc	M <sub>c</sub>
798	Squaw Mountain, plutonic and metamorphic complex of (NE)	M <sub>lmi</sub>	KJmi
799	Squire Creek stock, undivided, Index family. Includes Shake Creek stock, listed separately. (NW)	Ti	Øiq Øit
800	St. Peters Creek, metamorphic rocks of (NE)	M <sub>lhm</sub> M <sub>lRhm</sub>	pThm pTmb pTsc
801	St. Regis Formation (NE)	pCms	Yms <sub>2</sub>
802	Starvation Flat Quartz Monzonite (NE)	M <sub>li</sub>	Kia
803	Stehekin, orthogneiss of, Skagit Gneiss Complex (NW)	TKog	TKog
804	Steilacoom Gravel (SW)	Qgd	Qgog
805	Stensgar Dolomite (NE)	pCms	Ycb <sub>2</sub>
806	Stepstone Creek, granite of upper (NE)	Ti	Eig
807	Stevens Lake, plutonic complex west of (NE)	M <sub>lmi</sub>	KJmi
808	Stevens Ridge Formation (SW)	Tvt	MØvt Mvt
809	Stevenson Ridge lavas (SW)	Tv	Mva
810	Stillaguamish Sand Member, Vashon Drift (NW)	Qgd	Qgos
811	Stillwater Creek Member of the Cowlitz Formation (SW)	Tm	Em <sub>2</sub>
812	Storm King Mountain, monzonite east of (NE)	Ti	Eiqm
813	Storm King pluton (NE)	TKi	TKia
814	Stranger Creek, gabbro near (NE)	M <sub>li</sub>	KJigb
815	Striped Peak Formation (NE)	pCms	Yms <sub>4</sub>
816	Striped Peak Formation, Missoula Group (SE)	pCms	Yms <sub>4</sub>
817	Stuck Drift (SW)	Qgd	Qgp
818	Sugarloaf Peak, andesite of (NW)	Tv	Mva
819	Suiattle fill, volcanic rocks and deposits of Glacier Peak (NW)	Qvt	Qvl
820	Sulphur Creek, basalt of (NW)	Qv	Qvb
821	Sulphur Mountain pluton (NW)	M <sub>li</sub> M <sub>log</sub>	Kigd Kog

TABLE 2. LIST OF NAMED UNITS 41

No.	Geologic unit	1:500,000	1:250,000
822	Sumas Drift (NW)	Qgd	Qgds
823	Sumas Mountain, metaconglomerate of, Bell Pass mélange (NW)	M <sub>ms</sub>	pTms
824	Summit Creek pluton (NE)	M <sub>l</sub> M <sub>og</sub>	Kit KJog
825	Summit Creek sandstone (SW)	Tc	Ec <sub>2</sub>
826	Summit Creek, basalt of (SW)	Tv	Evb
827	Summit-Frazer trondhjemitic gneiss (NE)	M <sub>l</sub> M <sub>og</sub> M <sub>mi</sub>	Kit KJog KJmi
828	Sunday Creek stock, Index batholith, Index family (NW)	Ti	Øigd
829	Swakane Biotite Gneiss (NE)	M <sub>gn</sub>	pCgn (now pre-Tertiary)
829	Swakane Biotite Gneiss (NW)	M <sub>gn</sub>	pTgn
830	Swale Creek valley, sedimentary deposits of (SW)	QTc	QRc
831	Swauk Formation (NE)	Tc	Ec <sub>1</sub>
831	Swauk Formation (SE)	Tc	Ec <sub>1</sub>
831	Swauk Formation (SW)	Tc	Ec <sub>1</sub>
832	Swauk Formation, undivided. Includes Silver Pass Volcanic Member, listed separately. (NW)	Tc	Ec <sub>1</sub> Ecg <sub>1</sub>
833	Swawilla Basin, granite of (NE)	TKi	TKia TKiat
834	Swift Creek, andesite of, andesite of Mount Baker (NW)	Qv	Qva
835	Swift Creek, ignimbrite of, rocks of Kulshan caldera (NW)	Qvt	Qvt
836	Swimptkin Creek pluton (NE)	Ti	Eimd
837	Table Mountain, andesite of, andesite of Mount Baker (NW)	Qv	Qva
838	Tamarack Peak, stock near (NW)	M <sub>l</sub>	Kigd
839	Taneum Formation (SW)	Tv	Eva
840	Tatoosh pluton (SW)	Ti	Mia Mig Migd Miq Miqm
841	Teanaway dike swarm (NW)	Ti	Eib Eigb
842	Teanaway Formation (NW)	Tv	Evb Evr
842	Teanaway Formation (SW)	Tv	Evb
843	Teepee Butte Member, R <sub>1</sub> Grande Ronde Basalt (SE)	Tv <sub>cr</sub>	Mv <sub>g</sub>
844	Tenas Mary Creek, metamorphic rocks of (NE)	M <sub>hm</sub> M <sub>am</sub> M <sub>gn</sub> M <sub>og</sub> M <sub>Rhm</sub>	pThm pTam pTsc pTmb pTqz pTbg pTog
845	Tenmile Creek, basalt of, Weissenfels Ridge Member (SE)	Tv <sub>cr</sub>	Mv <sub>s</sub>
846	Tenpeak pluton (NW)	M <sub>l</sub>	Kit
847	Texas Creek stock (NE)	M <sub>l</sub>	Kigd Kid
848	Third Beach Member, Makah Formation. See Makah Formation. (NW)		
849	Thorp Gravel (SE)	Tc	RMcg
849	Thorp Gravel (SW)	Tc	Rc
850	Three A M Mountain, volcanic rocks of, Winthrop Formation, Pasayten Group (NW)	M <sub>lv</sub> M <sub>c</sub>	Kv <sub>2</sub> Kc <sub>2</sub>
851	Three Corner Rock, lava flows of (SW)	Tv	Mva

No.	Geologic unit	1:500,000	1:250,000
852	Three Fools Creek sequence (R. A. Haugerud and R. W. Tabor, USGS, written commun., 2000). Includes and listed under: strata of Freezeout Creek, Harts Pass Formation undivided, conglomerate of the Harts Pass Formation, strata of Majestic Mountain, conglomeratic strata of Two Buttes Creek, and Jackita Ridge unit undivided. (NW)		
853	Three Sisters Formation (NE)	pCms	Zq
854	Tieton Andesite (SW)	Qv	Qva
855	Tiffany complex (NE)	M <sub>2</sub> mi	KJmi
856	Tiffany Mountain, gneissic trondhjemite of (NE)	M <sub>2</sub> mi	KJmi
857	Tiger Formation (NE)	Tc	Ec <sub>g2</sub>
858	Tiger Mountain Formation, Puget Group (NW)	Tc	Ec <sub>2</sub>
859	Tillman Mountain tonalitic gneiss (NE)	M <sub>2</sub> og	Tog
860	Toats Coulee pluton (NE)	M <sub>2</sub> og M <sub>2</sub> l	Jog KJiq
861	Togo Formation (NE)	pCms	Yar <sub>1</sub>
862	Tonasket Gneiss (NE)	M <sub>2</sub> gn	pTbg
863	Tonga Formation (NW)	M <sub>2</sub> hm M <sub>2</sub> ms	M <sub>2</sub> sc M <sub>2</sub> sh
864	Touchet Beds (SE)	Qf	Qfs
865	Toutle Formation (SW)	Tn	ØEn
866	Toutle River lahars (S4W)	Qvt	Qvl
867	Trafton sequence (NW)	M <sub>2</sub> Rmt RI	JMmt PI
868	Trafton terrane. <i>See</i> Trafton sequence. (NW)		
869	Troublesome Mountain, metaporphyr on, Index batholith, Index family (NW)	Ti	Øian
870	Trout Lake mudflow (SW)	Qvt	Qvl
871	Troutdale Formation (SW)	QTc	QRc
872	Tuckaway Lake gneiss (NE)	tz	tz
873	Tukwila Formation, Puget Group (NW)	Tvt	Evc
874	Tumtum Mountain, Pleistocene dome at (SW)	Qi	Qida
875	Turtleback Complex (NW)	RI	pDi
876	Twentyfive Mile Creek, amphibolite and schist of (NE)	M <sub>2</sub> Rhm	TPhmc
877	Twin Creeks drift (NW)	Qad	Qad Qao
878	Twin Lakes, mafic intrusive rocks near (NE)	RI	Oigb
879	Twin Peaks, andesite of (NE)	Tv Tvt	Evd <sub>1</sub> Evt <sub>1</sub>
880	Twin River Group, lower. <i>See</i> Hoko River Formation. (NW)		
881	Twin River Group, middle. <i>See</i> Makah Formation. (NW)		
882	Twin River Group, upper. <i>See</i> Pysht Formation. (NW)		
883	Twin Sisters Dunite, Bell Pass mélange (NW)	M <sub>2</sub> RU	pTu
884	Twisp Formation (NE)	M <sub>2</sub> m	Jm
885	Twisp River valley, plagioclase porphyry of (NW)	M <sub>2</sub> mt	Kmt
886	Twisp Valley schist (NE)	M <sub>2</sub> Rhm	TPhmc
887	Twisp Valley Schist. <i>See also</i> Napeequa Schist. (NW)	M <sub>2</sub> Rhm	JPhmc
888	Two Buttes Creek, conglomeratic strata of, Jackita Ridge unit, Three Fools Creek sequence (NW)	M <sub>2</sub> m	Km <sub>1</sub>

No.	Geologic unit	1:500,000	1:250,000
889	Umatilla Member of the Saddle Mountains Basalt (SW)	Tv <sub>cr</sub>	Mv <sub>s</sub>
890	Umatilla Member, Saddle Mountains Basalt (SE)	Tv <sub>cr</sub>	Mv <sub>s</sub>
891	Umatilla, basalt of, Umatilla Member (SE)	Tv <sub>cr</sub>	Mv <sub>s</sub>
892	Umtanum unit, N <sub>2</sub> Grande Ronde Basalt (SE)	Tv <sub>cr</sub>	Mv <sub>g</sub>
893	Unit A of Wolfe and McKee (1972) (SW)	Tm	Em <sub>1</sub>
894	Unit B of Wolfe and McKee (1972) (SW)	Tm Tv	Em <sub>2</sub> Evb ØEm
895	Vantage Member, Ellensburg Formation (SE)	Tc	Mc
896	Vashon Drift (SW)	Qgd	Qga Qgd Qgo Qgog Qgos Qgt
897	Vashon Drift, undivided. Includes Lawton Clay Member and Pilchuck Clay Member, not listed separately. (NW)	Qgd Qf Qa	Qga Qgd Qgl Qgo Qgog Qgos Qgt Qguc
898	Vashon Drift. Includes and listed under: Arlington Gravel Member, Colvos Sand Member, Esperance Sand Member, Marysville Sand Member, Partridge Gravel, and Stillaguamish Sand Member. (NW)		
899	Vedder complex, Bell Pass mélange (NW)	Rms M <sub>2</sub> Rmt	pPsh pTmt
900	Ventura member of the Midnight Peak Formation (NE)	M <sub>2</sub> c	Kc <sub>2</sub>
901	Ventura Member, Midnight Peak Formation, Goat Wall unit, Pasayten Group (NW)	M <sub>2</sub> c	Kc <sub>2</sub>
902	Virginia Lake, equigranular granite of (NE)	M <sub>2</sub> l	Kig Kiaa
903	Virginian Ridge Formation (NE)	M <sub>2</sub> m M <sub>2</sub> c	Km <sub>2</sub> Kcg <sub>2</sub>
904	Virginian Ridge Formation, undivided, Pasayten Group (NW)	M <sub>2</sub> ms	Kmcg
905	Virginian Ridge Formation. Includes and listed under: strata of Cow Creek, Devils Pass Member, volcanic breccia of Mount Ballard, and Slate Peak Member. (NW)		
906	Volcanic member of the Midnight Peak Formation (NE)	M <sub>2</sub> v	Kv <sub>2</sub> Kvs <sub>2</sub>
907	Waatch Point, siltstone of (NW)	Tm	Em <sub>2</sub>
908	Waatch Quarry, siltstone and sandstone of (NW)	Tm	Em <sub>2</sub>
909	Wahluke, basalt of, Wilbur Creek Member (SE)	Tv <sub>cr</sub>	Mv <sub>s</sub>
910	Wakefield, orthogneiss near (NE)	M <sub>2</sub> l M <sub>2</sub> mi	Kit KJmi
911	Wallace Formation (NE)	pCms	Yms <sub>3</sub>
912	Wanapum Basalt (NE)	Tv <sub>cr</sub>	Mv <sub>w</sub>
912	Wanapum Basalt (SW)	Tv <sub>cr</sub>	Mv <sub>w</sub>
913	Wanapum Basalt, Columbia River Basalt Group (SE)	Tv <sub>cr</sub>	Mv <sub>w</sub>
914	Wapshilla Ridge unit, R <sub>2</sub> Grande Ronde Basalt (SE)	Tv <sub>cr</sub>	Mv <sub>g</sub>
915	War Creek gneiss (NE)	TKog	Rog
916	War Creek, gneiss of (NW)	TKog	Rog
917	Ward Gap flow, Elephant Mountain Member (SE)	Tv <sub>cr</sub>	Mv <sub>s</sub>
918	Warnick Member, Chuckanut Formation. <i>See</i> Chuckanut Formation. (NW)		
919	Wauconda pluton (NE)	M <sub>2</sub> l	KJigd
920	Weatherwax formation (NW)	Qad	Qapw <sub>1</sub> Qapw <sub>2</sub>
920	Weatherwax formation (SW)	Qad	Qapo
921	Wedekind Creek formation (NW)	Qad	Qapw <sub>1</sub>
921	Wedekind Creek formation (SW)	Qad	Qapo

No.	Geologic unit	1:500,000	1:250,000
922	Weissenfels Ridge Member of the Saddle Mountains Basalt (NE)	Tv <sub>cr</sub>	Mv <sub>s</sub>
923	Weissenfels Ridge Member, Saddle Mountains Basalt (SE)	Tv <sub>cr</sub>	Mv <sub>s</sub>
924	Wells Creek volcanic member, Nooksack Formation (NW)	M <sub>mv</sub>	Jmvd
925	Wenatchee Formation (NE)	Tc	Øc
926	Wenatchee Ridge, banded gneiss of (NW)	M <sub>gn</sub>	Kbg
927	Wenatchee Ridge, light-colored gneiss of (NW)	M <sub>og</sub>	Kog
928	West Fork, intrusive rhyolite near (NE)	Ti	Eir
929	Western mélange belt (NW)	M <sub>l</sub> M <sub>Ru</sub> M <sub>ms</sub> M <sub>mv</sub>	Jib Jit Ju KJmc KJmm KJmv pTigb
930	Western Olympic lithic assemblage (NW)	Tm Tv	MEm MEmst ØEm ØEmst ØEvb
931	Whale Creek drift (NW)	Qad	Qapw <sub>2</sub>
932	Whidbey Formation (NW)	Qa Qgd	Qc Qgpc Qguc
933	Whiskey Mountain pluton (NE)	M <sub>l</sub>	KJigd KJiq
934	White Chuck assemblage, volcanic rocks and deposits of Glacier Peak (NW)	Qvt	Qvl Qvt Qvp
935	White Chuck cinder cone, volcanic rocks and deposits of Glacier Peak (NW)	Qv	Qvb
936	White Chuck fill, volcanic rocks and deposits of Glacier Peak (NW)	Qvt	Qvl Qvt
937	White Chuck tuff, volcanic rocks and deposits of Glacier Peak (NW)	Qvt	Qvt
938	White River pluton (SW)	Ti	Migd
939	White River rheoignimbrite (SW)	Tv	Mvr
940	White Salmon drift (SW)	Qad	Qap
941	Whitehorse Mountain, volcanic rocks of, Eastern mélange belt (NW)	M <sub>mt</sub>	JTmt
942	Wilbur Creek Member of the Saddle Mountains Basalt (SW)	Tv <sub>cr</sub>	Mv <sub>s</sub>
943	Wilbur Creek Member, Saddle Mountains Basalt (SE)	Tv <sub>cr</sub>	Mv <sub>s</sub>
944	Wild Sheep Creek Formation (SE)	M <sub>mt</sub>	Tmt
945	Wildcat Creek, tuffaceous rocks of (SW)	Qvt	Qvc