WASHINGTON STATE DEPARTMENT OF
Natural Resources
Jennifer M. Belcher - Commissioner of Public Lands

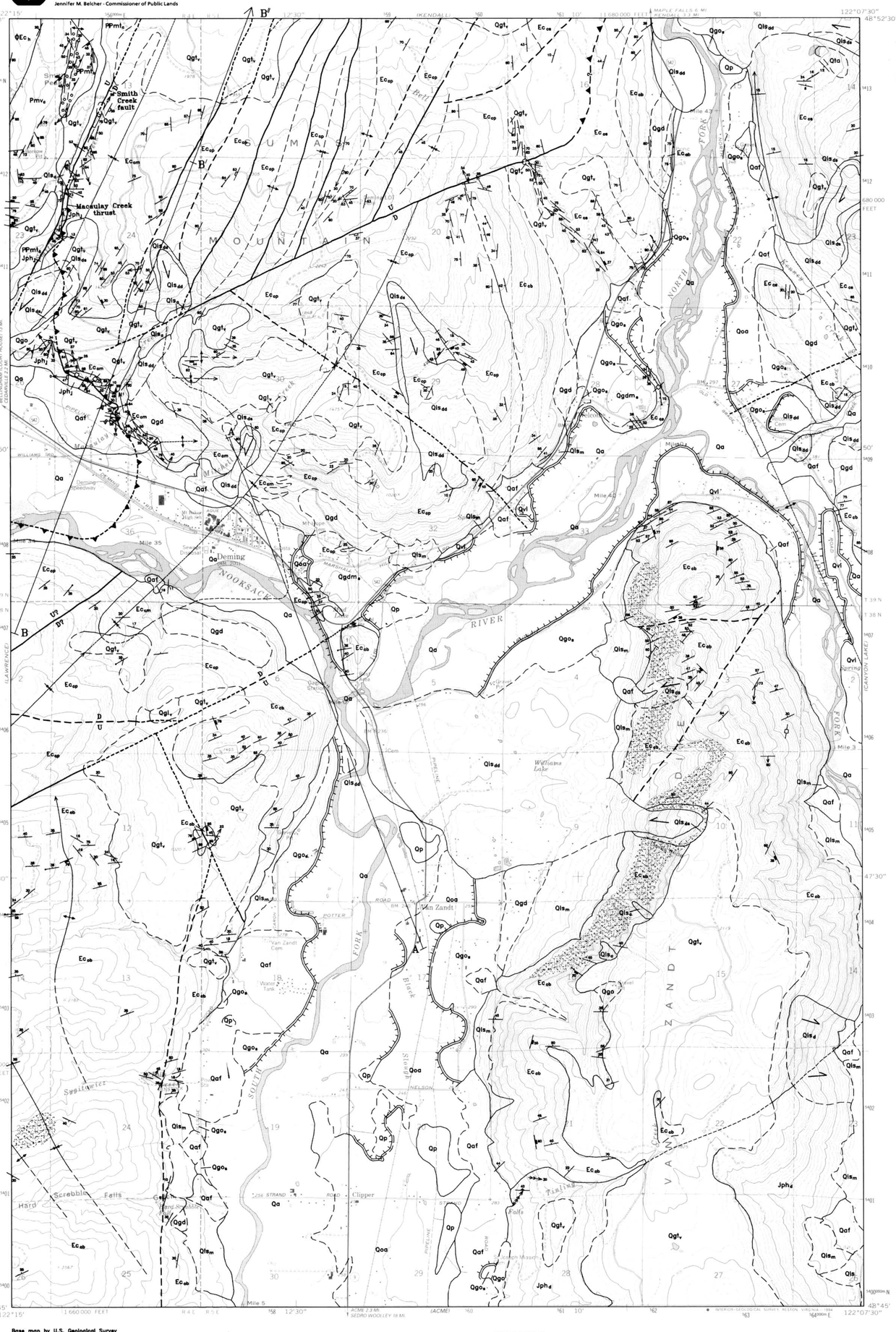
WASHINGTON DIVISION OF GEOLOGY AND EARTH RESOURCES
Raymond Lasmanis, State Geologist

PLATE 2
OPEN FILE REPORT 97-2
GEOLOGIC MAP AND INTERPRETED GEOLOGIC HISTORY OF
THE KENDALL AND DEMING 7.5-MINUTE QUADRANGLES,
WESTERN WHATCOM COUNTY, WASHINGTON

Geologic Map of the Deming 7.5-minute Quadrangle, Washington

by

Joe D. Dragovich, David K. Norman, Ralph A. Haugerud,
and Patrick T. Pringle
1997



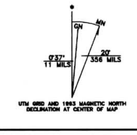
Base map by U.S. Geological Survey
Control by USGS and NOS/NOAA
Topography by photogrammetric methods from aerial photographs taken in 1972 AND 1989. Field checked 1993
Polyconic projection. 1927 North American datum
10,000-foot grid based on Washington coordinate system, north zone
1000-meter Universal Transverse Mercator grid ticks, zone 10
Land lines had not been established for this area at time of base map production
Cartographic design and production by Keith G. Ikerd, Washington Division of Geology and Earth Resources

QUADRANGLE LOCATION

SCALE 1:24,000

1 .5 0 1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 .5 0 1 KILOMETER

CONTOUR INTERVAL 40 FEET
DATUM IS MEAN SEA LEVEL



UTM GRID AND 1993 MAGNETIC NORTH DECLINATION AT CENTER OF MAP

Geologic Units

SEDIMENTARY AND VOLCANIC DEPOSITS AND ROCKS

Quaternary Sedimentary Deposits

Nonglacial Deposits

- Qs — Surficial deposits, undivided (cross sections only)
- Qa — Alluvium; gravel, sand, silt, clay; peat (Holocene)
- Qoa — Undivided older alluvium and overbank deposits; sand, silt, and clay (Holocene)
- Qp — Peat (Holocene)
- Qta — Talus; bouldery cobbly gravel; local diamicton (Holocene)
- Qls_a — Rock to debris avalanche deposits; diamicton (Holocene)
  - Areas of recent to active rock avalanche, debris slide, or debris avalanche
- Qaf — Alluvial fan deposits; diamicton (Holocene and Pleistocene?)
- Qls_m — Mass-wastage deposits, undivided; diamicton; may locally include glacial deposits; locally grades to alluvial fan deposits, rock or debris avalanche deposits, or talus (Holocene and Pleistocene?)
- Qls_{ds} — Deep-seated landslide main scarp; exposes adjacent geologic units (Holocene and Pleistocene?)
- Qls_{dd} — Deep-seated landslide deposits; diamicton (Holocene and Pleistocene?)
- Qls — Landslide deposits, undivided; diamicton (Holocene and Pleistocene?)

Volcanic Deposits

- Qvl — Middle Fork Nooksack River lahar from Mount Baker; diamicton (Holocene)

Glacial Deposits, Fraser Glaciation (Pleistocene)

Sumas Stade

- Qgo_s — Outwash; sandy gravel, gravel and minor gravelly sand; rare silt and clay

Everson Interstade

- $Qgdm_e$ — Bellingham and/or Kulshan glaciomarine drift of Easterbrook (1962); silt, clay, and diamicton
  - * Deming Sand of Easterbrook (1962)

Vashon Stade

- Qgt_v — Till; diamicton

Fraser Age Glacial Deposits, undivided

- Qgd — Till of Vashon Stade and/or glaciomarine drift of Everson Interstade
- Qgo — Outwash of the Vashon Stade or Everson Interstade (Van Zandt Dike upland occurrences)
- Qgl_v — Lacustrine deposits; varved silty sand, silt and clay; locally includes outwash deposits

Tertiary Sedimentary Rocks

Huntingdon Formation (Oligocene to upper Eocene?)

- ϕEc_h — Fluvial lithofacies, dominantly northern clast derivation; conglomerate with lesser arkosic, sub-arkosic to lithic arenite, siltstone and claystone and rare crystal lithic tuffs

Chuckanut Formation (Oligocene? to Eocene)

- Ec_{cm} — Maple Falls Member; conglomerate, litharenites to feldspathic litharenite with lesser bouldery cobbly diamictite, siltstone, and shale
- Ec_{cp} — Padden Member; conglomerate, conglomeratic sandstone, arenite, arkosic to lithic arenite, siltstone, and shale with lesser coal
- Ec_{cs} — Slide Member; arkose, siltstone, shale, coal and rare polymictic conglomerate
- Ec_{cb} — Bellingham Bay Member; polymictic conglomerate, arkose, siltstone, shale, and coal

LOW-GRADE LAYERED METAMORPHIC ROCKS OF THE NORTHWEST CASCADE SYSTEM

Mesozoic Metamorphic Rocks of the Shuksan Nappe of Tabor and others (1994)

Easton Metamorphic Suite (Jurassic)

- Jph_d — Darrington Phyllite
- Jph_j — Semischist, phyllite, and serpentinite of Mount Josephine

Paleozoic Metamorphic Rocks of the Excelsior Nappe of Tabor and others (1994)

Chilliwack Group (Permian to Devonian)

- Pmv_c — Metavolcanic rocks; dacitic to basaltic flows (tuffs?)
- $PPmt_c$ — Metamorphosed volcanic sandstone, volcanic wacke, tuff, breccia; locally contains significant argillite;
  - locally contains conglomerate

Geologic Structure Symbols

Strike and dip of bedding (may be combined with other symbols)

- inclined
- upright
- vertical

Trend and plunge of fold axes

- Minor fold axis (undifferentiated); arrow indicates the direction of plunge
- Minor fold axis (folded penetrative tectonic foliation); arrow indicates the direction of plunge
- Overturned minor fold axis (folded penetrative tectonic foliation); arrow indicates the direction of plunge

Strike and dip of tectonic foliation (may be combined with other symbols)

Penetrative tectonic foliation, undifferentiated

- inclined

Strike and dip of fractures and joints (may be combined with other symbols)

Joint, undifferentiated

- inclined

Systematic spaced fracture or cleavage

- inclined

Subsidiary minor fault or slickensided fracture plane

- inclined
- vertical

Subsidiary minor fault (commonly with gouge zone)

- inclined

Veins (common in mylonites and tectonites and adjacent to thrusts)

- inclined

Parting or fine jointing in sedimentary rocks

- inclined

Trend and plunge of tectonic lineations

Lineation, undifferentiated (mostly stretching lineations and prominent slickenlines; rarely pencil lineations or boudins); arrow indicates the direction of plunge

- inclined

Slickenline on slickensided fracture, fault, or cataclastic to mylonitic foliation; arrow indicates the direction of plunge

- inclined

Stretching lineation; arrow indicates the direction of plunge

- inclined

Geologic Map Symbols

- Contact — Dashed where inferred; dotted where concealed
- High-angle fault — Dashed where inferred; dotted where concealed; U, upthrown block; D, downthrown block; half arrows in cross section indicate direction of relative motion
- Thrust fault — Dashed where inferred; dotted where concealed; sawteeth on upper plate
- Anticline — Dashed where inferred; dotted where concealed; arrow shows direction of plunge
- Syncline — Dashed where inferred; dotted where concealed; arrow shows direction of plunge
- Terrace scarps — Hachures on scarp side
- Relative direction of landslide movement