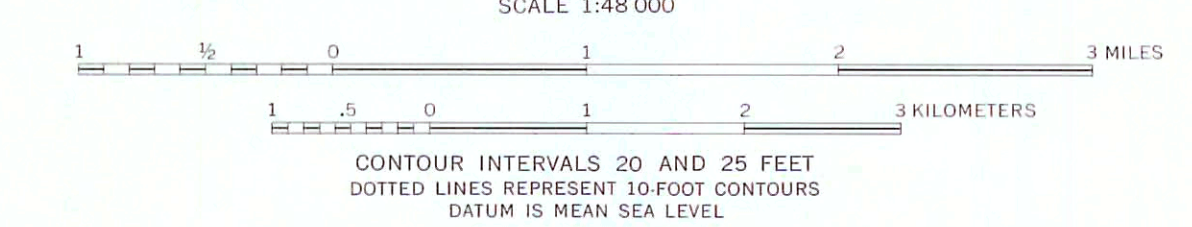


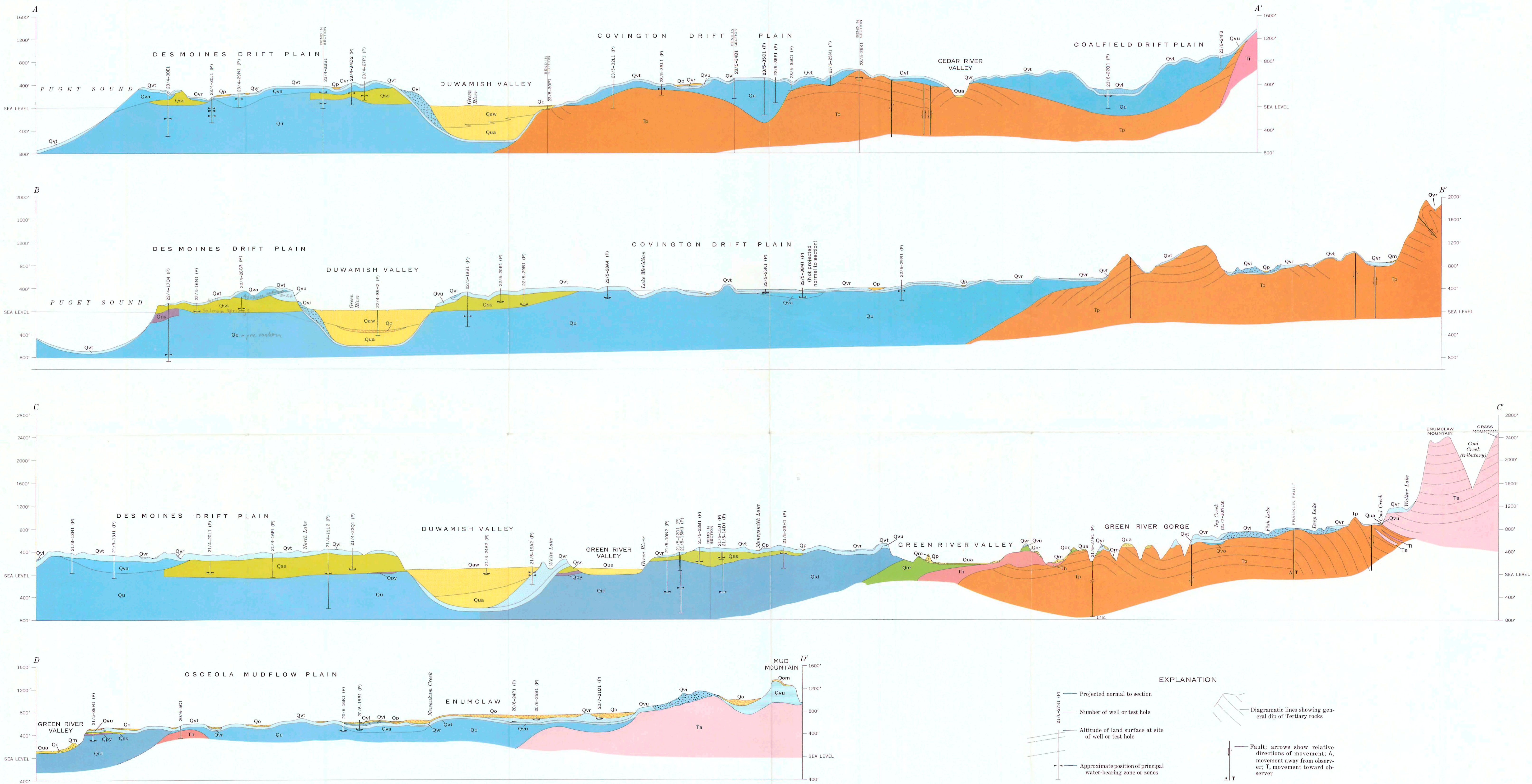
- CREDIT FOR GEOLOGY**
- D. R. Crandell (1963); surficial geology
 - H. D. Gower and A. A. Wanek (1963); bedrock geology
 - J. E. Lutzner; surficial geology
 - D. R. Mullineux (1961, 1963 a, b, c); surficial and bedrock geology
 - J. D. Vine (1962); bedrock geology
 - H. H. Waldron (1961, 1962); surficial and bedrock geology
 - W. C. Warren and others (1945); bedrock geology
- Note: quadrangles are indicated by diagonal names

EXPLANATION

- UNCONFORMITY**
- Salmon Springs Drift**
Chiefly oxidized (yellowish-brown color) sand and pebble-cobble gravel; locally includes beds of very fine sand, silt, and clay, clay, clay loam, and some unoxidized silts. Maximum thickness more than 200 feet in Duwamish Valley; generally 50 to 100 feet elsewhere. In White River valley west of Duwamish, Salmon Springs Drift probably makes up the upper part of deposits mapped as pre-Vashon drift, undifferentiated.
 - Parashul(?) Formation**
Chiefly fine to medium light-gray sand, but includes mudflats, peat, peat with clay, gravel, and volcanic ash deposited during relatively warm interglacial climate. Thickness generally less than 50 feet; maximum thickness known, 100 feet.
 - Intermediate drift**
Includes two bluish-gray clayey till sheets separated by 20 to 125 feet of blackish-gray lacustrine sand, silt, and clay, and fluvial sand and gravel. Upper till sheet generally overlain by lacustrine silt and clay. Thickness more than 200 feet. Includes small exposures on west side of Duwamish Valley near Pacific mapped by Waldron (1961) as Stack Drift. These deposits are at least 80 feet thick and consist of compact oxidized till, sand and gravel, and minor amounts of silt. In White River Valley, intermediate drift probably makes up lower part of sequence mapped as pre-Vashon drift, undifferentiated.
 - Pre-Vashon drift, undifferentiated**
Exposures in Cedar River valley, include at least four layers of oxidized till overlain and underlain by fluvial sand and gravel, lacustrine sand, silt, clay, and peat. In Duwamish Valley near Pacific mapped by Waldron (1961) as Stack Drift. These deposits are at least 80 feet thick and consist of compact oxidized till, sand and gravel, and minor amounts of silt. In White River Valley, intermediate drift probably makes up lower part of sequence mapped as pre-Vashon drift, undifferentiated.
 - Orting Drift**
Chiefly oxidized lacustrine sand, fluvial sand and gravel, and till; contains three or more till sheets or lenses. Thickness more than 200 feet.
 - Hammer Bluff Formation**
Brownish-green to brown clayey volcanic sand and gravel underlain by light-gray quartzite sand and lacustrine clay deposited on volcanic ash of Puget Group; includes some highly compressed sandy lignite. Diverse fluvial to highly overbank. Maximum thickness more than 200 feet. Includes small deposits near Duwamish having a lithology and stratigraphic position comparable to the type Hammer Bluff Formation. These deposits are probably contemporaneous but may or may not have been deposited with the Hammer Bluff Formation of the type section.
 - Puget Group**
Light-gray to light-brown, fine to medium-grained, arkosic, micaceous sandstone and interbedded shale and silt. Consolidated. In Rainier-Taylor Mountains district, includes thick sequences of volcanic sandstone and conglomerate, tuffaceous siltstone, tuff-breccia, and lava flows (interior). Includes three small exposures of pre-Puget volcanic rocks in Duwamish Valley north of Allentown.
- QUATERNARY**
- Vashon Drift**
Qv, recessional outwash, auto-ventated sand and pebble-cobble deposited chiefly as outwash plains and valley trains; as mapped, may include minor dells, scumbrine, and ice-marginal deposits. Includes outwash outwash to NW 1/4 sec. 8, T. 23 N., R. 3 E. Thickness ranges from 10 to more than 50 feet.
 - Qv, lacustrine deposits: chiefly clay, silt, and fine sand. Thickness highly variable; maximum thickness about 120 feet in Issaquah Creek valley.**
 - Qv, ice-contact deposits: silt and pebble-cobble gravel deposited chiefly as lenses and lens terraces; may include large boulders, traces of till, and lenses of silt and clay. Characterized by strong vertical and lateral changes in grain size, degree of sorting and stratification. Thickness generally less than 100 feet, but may exceed 200 feet in large lens terraces on east side of Duwamish Valley.**
 - Qv, till: composed mainly of gravel and occasional boulders in a gray clay, silt and matrix. Includes sand and gravel lenses within and on top of till. Upper 2 to 3 feet usually noncompact. Thickness generally 10 to more than 50 feet.**
 - Qv, outwash outwash: sand and pebble-cobble gravel beneath Duwamish drift plain. Pebble-cobble gravel predominant elsewhere; may include very fine sand and laminated silt. Thickness generally less than 200 feet, but may exceed 300 feet in bluffs adjacent to Puget Sound.**
 - Qv, Vashon Drift, undifferentiated: chiefly till and outwash. Includes drift of pre-Vashon age in recessional areas at Mt. Rainier base.**
- TERTIARY**
- Andesitic volcanic rocks**
Heterogeneous assemblage of volcanic breccia, tuff, lapilli tuff, tuff-breccia, conglomerate, sandstone, shale, and lava flows. Chiefly marine in Rainier-Taylor Mountains district and continental in Elsie-Duwamish-Exumelau district. Interstratified with upper part of Puget Group.
 - Porphyritic intrusive igneous rocks**
- UNCONFORMITY**
- Unconformity**
- SYMBOLS**
- Contact**
approximately located
 - Fault**
Long-dashed where approximately located; short-dashed where inferred; dotted where concealed; quartered where doubtful. D, downthrown side; D, downthrown side. Arrows show relative horizontal movement.
 - Anticline**
Showing trace of axial plane and direction of plunge of axis. Long-dashed where approximately located; short-dashed where inferred; dotted where concealed.
 - Syncline**
Showing trace of axial plane and direction of plunge of axis. Long-dashed where approximately located; short-dashed where inferred; dotted where concealed.
 - Strike and dip of beds**
 - Strike and dip of beds in coal mine**
 - Strike and dip of overturned beds**
 - Strike of vertical beds**
 - Well or test hole with driller's log (tables 9 and 10). Those in NW 1/4 sec. 24, T. 23 N., R. 4 E., are shown on plate 5.**
 - Test hole for coal or oil with information on depth to bedrock or thickness of surficial deposits (table 9).**
 - Note: numbering system for wells and test holes is described in appendix.**
 - Panoramic view in frontispiece**

GEOLOGIC MAP OF SOUTHWESTERN KING COUNTY, WASHINGTON

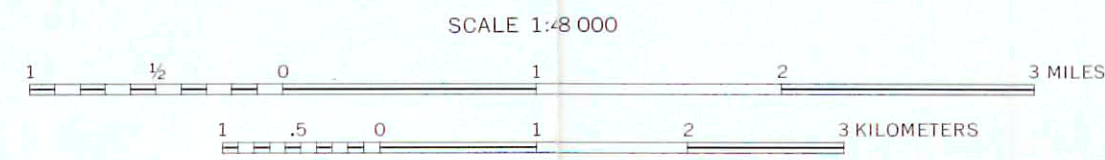


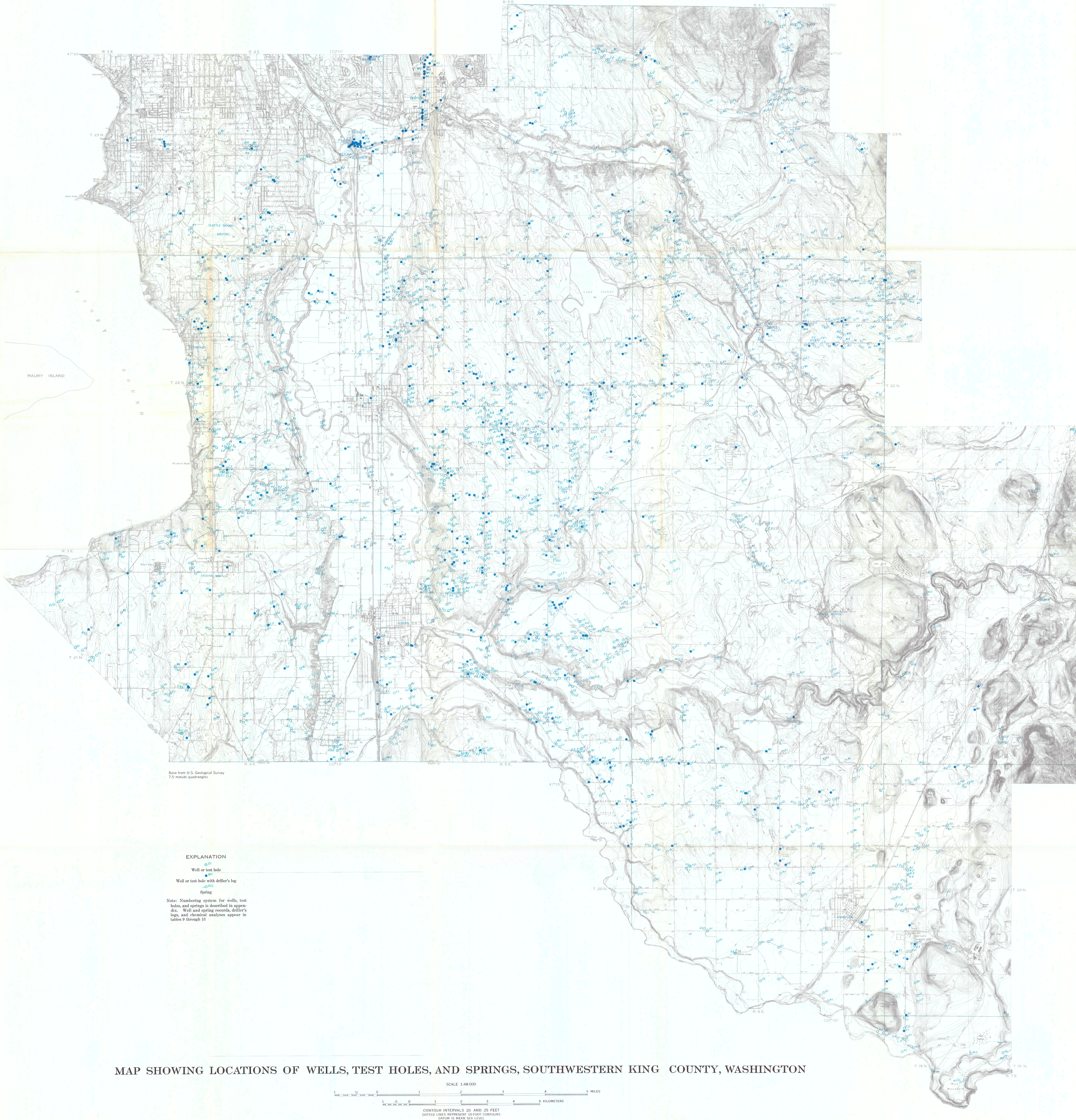


EXPLANATION

- Projected normal to section
- Number of well or test hole
- Altitude of land surface at site of well or test hole
- Approximate position of principal water-bearing zone or zones
- Diagrammatic lines showing general dip of Tertiary rocks
- Fault; arrows show relative directions of movement; A, movement away from observer; T, movement toward observer

GEOLOGIC SECTIONS OF SOUTHWESTERN KING COUNTY, WASHINGTON





MAP SHOWING LOCATIONS OF WELLS, TEST HOLES, AND SPRINGS, SOUTHWESTERN KING COUNTY, WASHINGTON