DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGY AND EARTH RESOURCES

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PRELIMINARY GEOLOGIC MAP OF THE UTSLADY QUADRANGLE SKAGIT AND SNOHOMISH COUNTIES, WASHINGTON

By
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INTRODUCTION

Geologic investigations leading to the compilation of this preliminary geologic map began in 1976 under a research grant sponsored by the U.S. Geological Survey. This map shows the distribution, structure, and relative ages of geologic units within the Utsalady 7.5-minute quadrangle in Skagit and Snohomish Counties, Washington. The following text discusses the occurrence of mineral resources within the study area. This map provides geologic information primarily for use by geologists, but it may also be of interest to local and regional land-use planners, engineers, scientists, Washington residents, and others interested in the geology of the area.

Thanks go to Ernest R. Artim, who contributed many helpful suggestions throughout the project.

ECONOMIC GEOLOGY

Mineral occurrences within the Utsalady 7.5-minute quadrangle are all nonmetallic and consist of crushed and broken stone, sand and gravel, fill material, and peat.

Crushed and Broken Stone

Tertiary conglomerates (Tc) have been quarried in the past for crushed and broken stone. These rocks have potential for such uses as riprap, fill, or aggregate base; however, they may be unsuitable for concrete aggregate because they contain a large percentage of silica-rich clasts which may be alkali-reactive. No conglomerate was quarried within the quadrangle during the field investigation; however, two quarries are located in sec. 9, T. 33 N., R. 3 E., and one quarry is located in sec. 12, T. 33 N., R. 3 E.

Mesozoic graywackes (Mms) have potential for use as road surfacing, riprap, ballast, road bases, fill, and other applications for crushed and broken stone. Its suitability for concrete aggregate is unknown at present. Associated with the graywackes are beds of argillite, which are suitable for limited uses of crushed stone.

Sand and Gravel

Sand and gravel have been intermittently excavated for local use as fill and road-surfacing material. The only known deposit of sand and gravel occurs in Vashon recessional outwash (Qvr) and is located in sec. 9, T. 33 N., R. 3 E.

Small deposits of mostly sand may be found in Recent alluvium (Qal) along the Skagit River, but they are believed to have no economic value at present.

Fill Material

Vashon till (Qvt) has good potential as a source of fill material. However, excavation of the till may be difficult because of its compactness and content of large boulders.

Vashon recessional outwash (Qvr) is also a satisfactory source of fill material.

Peat

Accumulations of organic material in bogs, ponds, swamps, and other poorly drained areas are present within the quadrangle, but are not considered to be an important resource of peat. These deposits are thought to be less than 1.5 meters in thickness, and are probably too small and thin for commercial development.

MAP SYMBOLS

Contact; solid where exposed; dashed where approximately located; dotted where inferred

Strike and dip of beds

Gravel pit

Inactive rock quarry

REFERENCE

Hopkins, W. S., 1962, The geology of a portion of the Skagit Delta area, Skagit County, Washington: University of British Columbia M.S. thesis, Vancouver, B. C., 135 p.

EXPLANATION

QUATERNARY — HOLOCENE

Qtf, Qal, Qpm, Q's, Qaf

Recent surficial deposits

Qtf, Tidal flat deposits; soft, unconsolidated, poorly drained, salt-water-saturated clay, silt, and sand. Gray or mottled in color; locally contains lenses of shells and(or) pebbles and layers of organic (peaty) material. Unit consists of estuarine-beach sediments comprising tidal flats, which interfinger with and grade into Recent alluvium. Contact with Recent alluvium is arbitrarily placed at manmade dikes along coast.

Qal, Recent alluvium; soft, unconsolidated, irregularly interstratified, generally well-sorted clay, silt, sand, and pebbles. Contains some organic material, and interbedded marine and estuarine deposits. Unit consists mainly of floodplain sediments derived from the Skagit River and its distributaries.

Qpm, Peat and muck; sediments containing large amounts of organic (peaty) material, with lesser amounts of clay, silt, and sand. Formed in ponds, bogs, swamps, and other poorly drained areas. Smaller, unmapped occurrences of peat and muck may exist.

Qls, Landslide debris; unsorted mixtures of locally derived materials deposited by mass-wasting processes.

Qaf, Artificial fill; rock fragments, gravel, sand, silt, and clay. Mapped where thickness exceeds approximately 2 meters. Dikes on tidal flats almost wholly composed of materials dredged from area adjacent to dikes.

QUATERNARY — PLEISTOCENE — FRASER GLACIATION, VASHON STADE

Qvr

Vashon recessional outwash

Stratified, unconsolidated, cross-laminated sand and gravel deposited by glacial outwash streams; may include some ice-contact deposits. Grains are usually well rounded to subrounded, and they are well to moderately sorted in individual beds. May contain shells and shell fragments in places.

Qvt

Vashon till

Unsorted and nonstratified mixture of glacial debris with particle sizes ranging from clay to boulders. Light bluish-gray and compact on fresh surfaces; weathered till appears less compact and is oxidized to brown or yellow in color. Cobbles and boulders may be striated, grooved, or faceted. May contain, or grade into, small lenses of crudely stratified sand and gravel. Includes unconsolidated ablation till.

UNCONFORMITY

TERTIARY — PALEOCENE(?) EOCENE(?)

Tc

Tertiary conglomerates (unnamed)

Primarily nonmarine conglomerates, sandstones, and siltstones, in decreasing order of abundance. Contains subangular to well-rounded clasts up to 40 cm in size. Clasts are composed of various igneous, metamorphic, and sedimentary rocks. Lower part is massive basal conglomerate, which is greenish in color; upper part is mostly massive, reddish-orange conglomerates, with interbeds of sandstone and siltstone containing carbonized plant fragments. May be locally fractured or sheared. Stipple pattern indicates discontinuous cover of Vashon till usually less than 1.5 meters thick overlying bedrock; till cover shown by stipple pattern may be locally somewhat thicker.

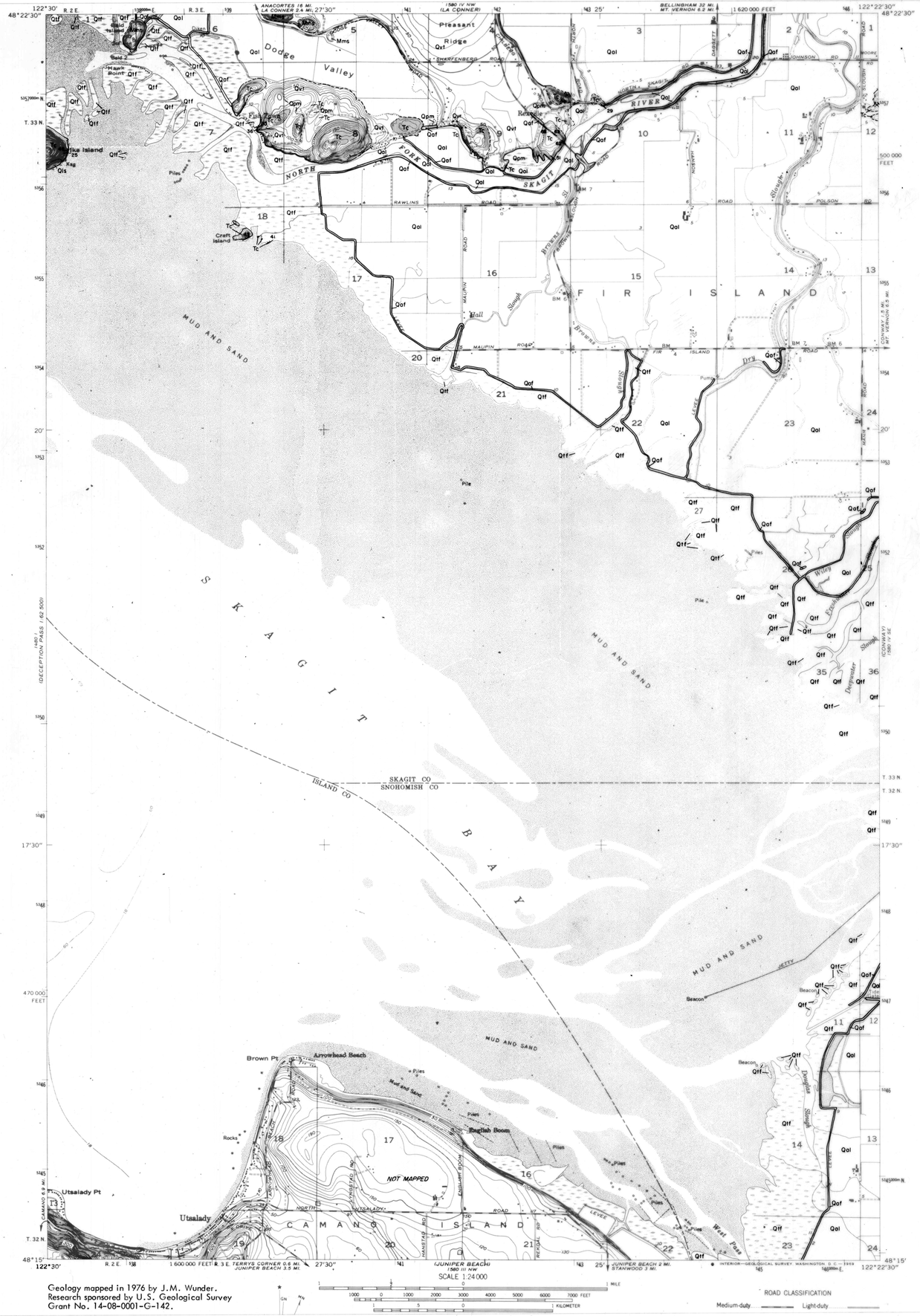
UNCONFORMITY

MESOZOIC (?)

Mms

Mesozoic(?) metasedimentary sequence (unnamed)

Massive, gray to dark-gray or greenish-gray graywacke, and black to dark blue-gray siltstone and argillite, in decreasing order of abundance. May locally contain thin sedimentary laminations, penecontemporaneous slump structures, and graded bedding suggestive of deposition by turbidity currents. Unit has been regionally metamorphosed to a very low grade, and is characteristically intensely sheared and fractured. Some fine-grained beds are phyllitic in texture and may exhibit slickensides and slaty cleavage. Stipple pattern indicates discontinuous cover of Vashon till usually less than 1.5 meters thick overlying bedrock; till cover shown by stipple pattern may be locally somewhat thicker.



Geology mapped in 1976 by J.M. Wunder.
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ROAD CLASSIFICATION
Medium-duty ——— Light-duty - - - -