Prepared in Cooperation with the
San Juan County Board of Commissioners

Base from U.S. Geological Survey
Orcas Island, Richardson 1:62:500, 1957,
Sucia Island, 1973, Stuart Island, 1953,
Waldron Island, 1954, Roche Harbor, 1954,
Friday Harbor, 1954, False Bay, 1:24,000,
1954.

OCCURRENCE, QUALITY, AND USE OF GROUND WATER IN ORCAS, SAN JUAN, LOPEZ, AND SHAW ISLANDS, SAN JUAN COUNTY, WASHINGTON

Known Thickness of Glacial Drift

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The accompanying map provides data on the known thickness of glacial drift as determined from well drillers' records. The data include both known depth to bedrock, where wells penetrate the full thickness of the drift, and the depth of penetration in drift without encountering bedrock. Where the penetrated thickness is sufficiently great and consistent over broad areas, contours have been drawn to show the general pattern and areal extent of the drift's known thickness. Where drift has great local variations in thickness no attempts were made to delineate patterns of thickness. It must be emphasized that the values in most places do not represent the entire thicknesses, only the depths penetrated by wells.

Information on the thickness of the glacial drift, if known over broad areas, can be combined with other data to provide important hydrologic information. A map showing the saturated thickness of glacial drift, computed from the difference between the altitude of the water table and the bottom elevation of the drift, would provide part of the information needed to determine ground-water availability in the glacial-drift aquifer. Because few wells penetrate the full thickness of the drift, it was not possible to generate a map that would show the full saturated thickness of this aquifer. Only in the central part of Lopez Island was it possible to define areally a pattern of known glacial-drift thickness. This is shown by isopachs—lines connecting points of equal thickness.

A knowledge of the minimum thickness of the drift, however, can be useful locally in some aspects of planning of developments on the land surface. Where homes are situated in areas underlain by drift with thicknesses of 10 feet or more, septic tanks and drain fields will generally function properly (fig. 1). Conversely, where homes are situated on bedrock or on a veneer of soil or drift, drainage may be inadequate for such purposes or may result in septic discharge appearing at land surface a short distance downslope. Proper functioning of a septic-tank system, however, does not eliminate the potential for water-quality problems from septic-tank effluent.

The depth to water in the glacial drift on Lopez Island, as measured during April 1981, is shown in figure 2. As can be seen, depth to water generally exceeds 50 feet in most of the area and reaches a maximum of about 250 feet in the central part of the island. This information can be useful in evaluating the thickness of unsaturated material through which any possible contaminant must percolate before reaching the water table.

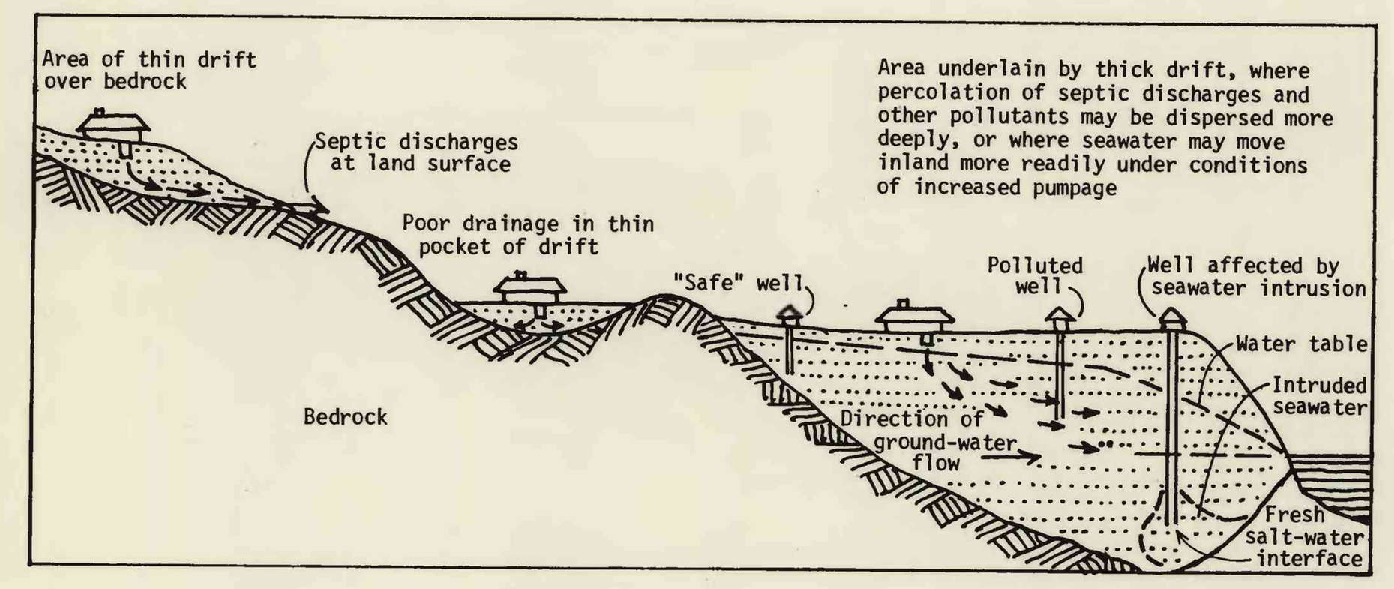

Figure 1. Examples of potential ground-water quality in areas underlain by glacial drift of various thicknesses.

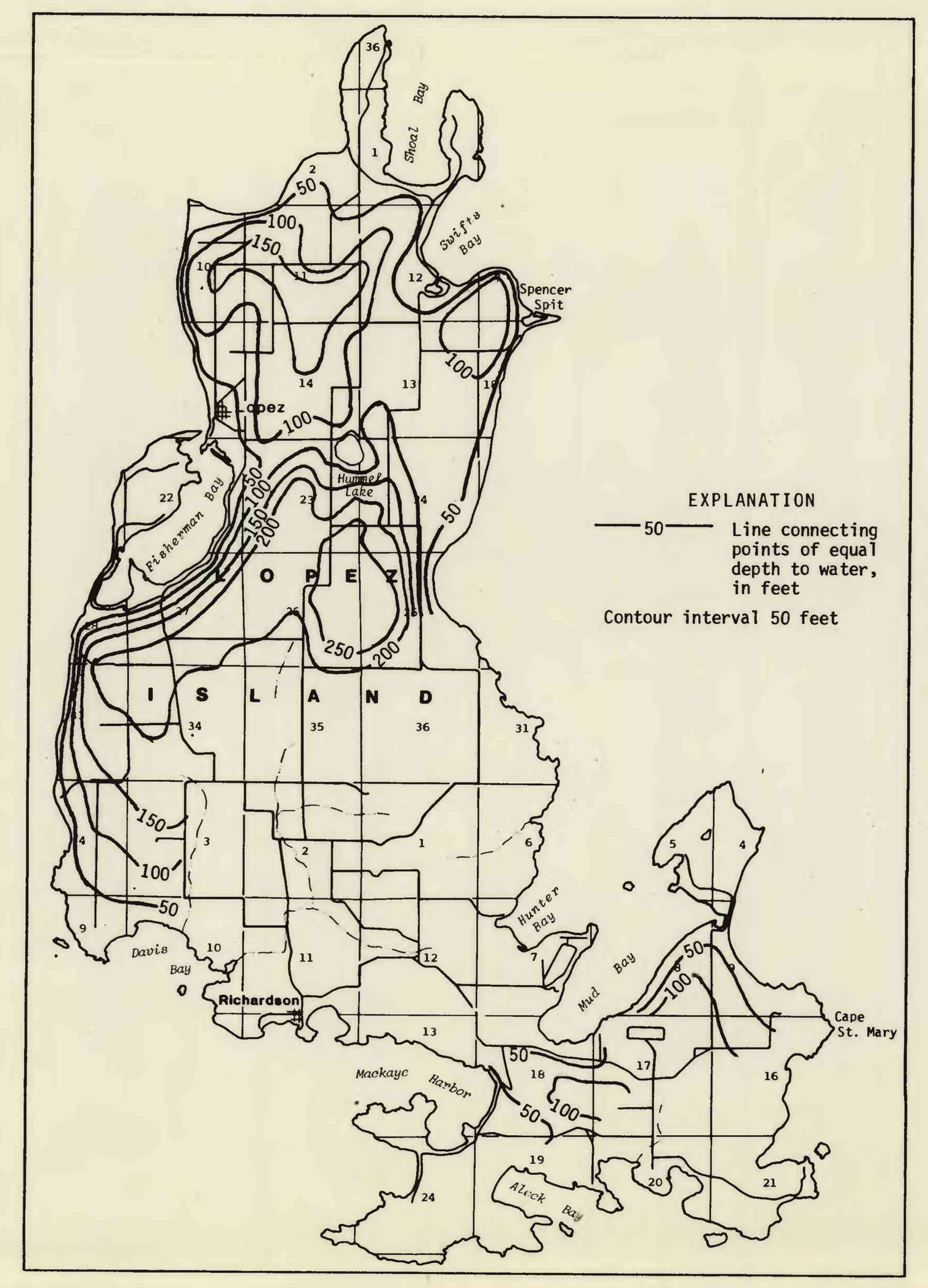

Figure 2. Contours showing depth to water in glacial drift underlying parts of Lopez Island, April 1981.