STATE OF WASHINGTON
DANIEL J. EVANS, Governor

DEPARTMENT OF WATER RESOURCES
H. MAURICE AHLQUIST, Director

Water-Supply Bulletin No. 29

GEOLOGY AND RELATED GROUND-WATER OCCURRENCE, SOUTHEASTERN MASON COUNTY, WASHINGTON

By
Dee Molenaar and John B. Noble

Prepared in cooperation with
UNITED STATES GEOLOGICAL SURVEY
Water Resources Division

1970

ERRATA SHEET

DEPARTMENT OF WATER RESOURCES

Water Supply Bulletin No. 29

"Geology and Related Ground Water Occurrence of Southeastern Mason County, Washington"

The following changes should be made to your copy of the geologic map of southeast Mason County:

1. Along south shore of Skookum Inlet, in Sections 10 and 11, T. 19 N., R. 3 W., the Qss is purple, but should be pink.

2. Along east shore Pickering Passage (west edge of Hartstene Island), in Sections 27 and 34, T. 21 N., R. 2 W., and Section 3, T. 20 N., R. 2 W., Qss should be pink.

3. Along east shore Oakland Bay, pink Qs should be orange.

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Price $4.00, Department of Water Resources, Olympia, Washington

FOREWORD

Publication of Water Supply-Bulletin No. 29 represents fulfillment of a major segment of the Department of Water Resources' program designed to inventory and understand the ground water resources of the State of Washington. Department publications or open-file reports are now available which review and describe geohydrologic conditions of most of the Puget Lowlands, a strip area which extends from the Canadian border to the Columbia River and which constitutes the most highly developed and most densely populated area of the State of Washington.

Although the major thrust of this report is to provide technical data and information to assist public and private agencies and individuals with developing water supplies, the material is presented in a way that it serves as an important reference for those who must evaluate and resolve problems associated with subsurface foundation conditions, drainage problems, sources of sand, gravel and other construction materials, as well as land slides, and other geologic hazards that present-day geologists and engineers must concern themselves with when selecting sites and routes for today's major engineering projects.

Comment and assistance by our primary cooperator, the U. S. Geological Survey, is respectfully recognized on behalf of the Department of Water Resources.

-Robert H. Russell
Chief, Basic Data Section
Division of Planning & Development
Department of Water Resources

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By

Dee Molenaar and John B. Noble

ABSTRACT

Mason County occupies about 970 square miles of land area in the west-central part of the State of Washington. The northwestern part of the county lies in the Olympic Mountains and the remainder lies in the Puget Sound lowland. The 324-square-mile area covered by the present investigation is almost entirely within the Puget Sound lowland and consists principally of glacial drift plains separated by stream valleys and marine embayments.

Rocks exposed in the project area range in age from Eocene to Holocene. Tertiary volcanic rocks, with some consolidated sedimentary rocks, form the Black Hills. The major part of the area is underlain by a thick sequence of unconsolidated glacial and nonglacial deposits of Pleistocene age. These include, from oldest to youngest, the Salmon Springs Drift and older undifferentiated sediments, Kitsap Formation, Skokomish Gravel, and Vashon Drift.

The ground water supplying most of the water needs in the area is obtained principally from the coarser phases of Salmon Springs Drift, Skokomish Gravel, and Vashon Drift. The older undifferentiated sedimentary deposits locally provide large yields to deep industrial and municipal wells.

The annual precipitation at Shelton averages 64 inches. Most of the rainfall occurs from October to May, and the summers are relatively dry.

The ground-water reservoir in southeastern Mason County is recharged almost entirely from precipitation upon the land surface. Water levels in wells are generally within 50 feet of land surface. Well yields range from less than 10 gpm (gallons per minute) to more than 4,000 gpm. Present ground-water use is principally for domestic and public supply.

The ground water is generally of good chemical quality. Only four wells are known to have yielded water with a hardness of greater than 180 mg/l (milligrams per liter). Three wells yield water with chloride content of greater than 300 mg/l; this amount of chloride resulted from salt-water encroachment from nearby marine waters. As much as 1.6 mg/l of iron is present in ground water locally, although the average iron content of sampled waters is 0.14 mg/l.

INTRODUCTION

PURPOSE AND SCOPE OF THE INVESTIGATION

The investigation was conducted by the Washington State Department of Water Resources, in cooperation with the U.S. Geological Survey, as part of a continuing program of geologic mapping, and the related collection and interpretation of basic data concerned with the ground-water resources of the State of Washington. The study of southeastern Mason County represents an extension of the geohydrologic mapping into the southwestern margin of the Puget Sound lowland.

The increasing population of the Puget Sound lowland has resulted in a growing need for information on the area's geology where related to the occurrence of ground water of satisfactory quality and quantity for present and future demands of municipalities, industries, individual homes, and farms. Because the project area offers great potential for increased development of residential homesites in a rural environment, an increasing amount of ground water will be developed to supply group and community domestic needs. Accordingly, the report evaluates the following aspects of the area's ground-water resources:

1. Identification and differentiation of geologic units relative to their areal and stratigraphic extent and to their water-bearing characteristics.
2. General ground-water conditions for individual land owners desiring domestic supplies.
3. Designation of areas where the ground-water reservoir can yield large supplies for community and municipal supplies and for industrial requirements of the future.

The study was made under the immediate supervision of Robert H. Russell of the Planning and Development Division of the State Department of Water Resources. Most of the geologic mapping and well canvassing were accomplished by John B. Noble during parts of 1962, 1963, and 1964. Dee Molenaar completed the fieldwork in 1965 and prepared the report. Most of the fieldwork was done in the lowlands where the major ground-water supplies are presently developed. The margins of the Black Hills and outlying forested parts of the report area were studied only by reconnaissance because of the lack of ground-water data and exposures of geologic units.

LOCATION AND EXTENT OF THE AREA

The area covered by this investigation, shown in figure 1, contains about 324 square miles in the southeastern part of Mason County, Washington, and includes the city of Shelton as the major center of population and industry. The study covers about one-third of the county which occupies a land area of about 970 square miles. The project area lies almost entirely within the Puget Sound lowland and is bounded on the north by Hood Canal, on the east and southeast by the marine waterways of Puget Sound (Case Inlet, Dana Passage, Squaxin Passage, and Totten Inlet), on the south by the Mason-Thurston County line (lat 47°05'N.)

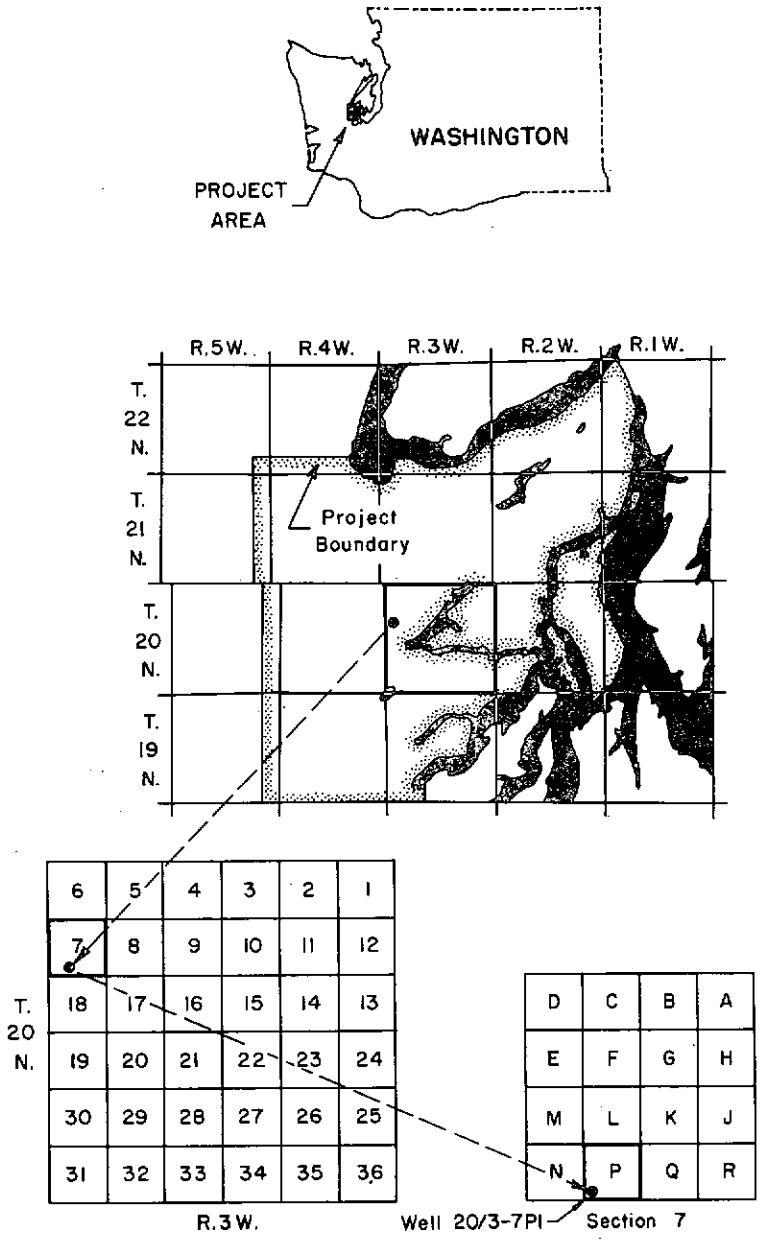

Figure 1 - Index map of project area and diagram showing well- and location-numbering system.

and on the west by the eastern tier of sections of Range 5 West Willamette Meridian (approximately long 123°16'W.).

PREVIOUS INVESTIGATIONS

Earlier geologic investigations included a study of the unconsolidated deposits and related Pleistocene glaciation of the Puget Sound lowland by Bretz (1910, 1913) and an examination of the consolidated rocks in the Black Hills by Weaver (1916, p. 137-143). A soil survey by the U.S. Soil Conservation Service (Ness and Fowler, 1960) provides maps of the county's soil types and gave recommendations on their management and use.

Results of geologic mapping and ground-water investigations in the northeastern parts of Mason County by Molenaar (1965) were of value to the present study in correlation of stratigraphic units. Geohydrologic mapping by Noble in adjacent Thurston County (Noble and Wallace, 1966) allowed further correlation with Pleistocene formations found in the project area.

ACKNOWLEDGMENTS

The authors appreciate the information received from landowners and tenants contracted during the canvass of wells. This provided basic data necessary for an understanding of ground-water conditions. Drillers gave freely of their time in compiling and submitting well logs which supplied information on the water-bearing properties of subsurface materials. Cooperative in this regard were drillers William Russell, Harold Hillman, and Lawrence Bedell. Robinson, Roberts and Associates, ground-water consultants of Tacoma, supplied detailed logs and reports on wells drilled for Rayonier, Inc. and for the State Department of Institutions at Shelton.

Roy D. Hurlbert of the Soil Conservation Service and Joseph McAlfrey of the Agricultural Stabilization and Conservation Service in Shelton made available their file of aerial photographs. These were of particular value in mapping the geology.

Officials of Rayonier, Inc. and Simpson Timber Company were helpful in supplying quantitative data on the past and present use of water from industrial wells and surface-water supplies, and chemical analyses of water from their numerous wells. They also furnished precipitation records maintained at the weather station in Shelton. Patrick Byrne, City Engineer for the city of Shelton, provided statistics on the withdrawals from the two city wells and spring.

Technical review of the manuscript by R. C. Newcomb and K. L. Walters provided suggestions that were of benefit to the report.

WELL- AND LOCATION-NUMBERING SYSTEM

In this report wells and locations are designated by symbols that indicate their locations according to the official rectangular public-land survey (see fig. 1). For example, in the symbol 20/3-7P1, representing one of the city of Shelton's wells, the part preceding the hyphen indicates successively the township and range

(T. 20 N., R. 3 W.) north and west of the Willamette Meridian and Baseline. Because the report area lies entirely north and west of the Willamette Baseline and Meridian the letters indicating the directions north and west are omitted. The first number following the hyphen indicates the section (sec. 7), and the letter "P" gives the 40-acre subdivision of the section. The numeral "1" indicates that this well is the first one listed within the subdivision. For convenience, this numbering system also is used to designate locations of geologic outcrops and geographic features mentioned in the text. Where used for this purpose, the final numeral in the symbol is omitted.

TOPOGRAPHY AND GEOGRAPHIC SUBAREAS

Except for about 58 square miles occupied by the Black Hills in the southwestern part of the project area, southeastern Mason County lies in the topographic basin of the Puget Sound lowland. The land surface consists of a relatively flat to gently rolling drift plain[1/] which is segmented by steep-sided embayments of Puget Sound and by east- and northeasterly-trending valleys. Hartstene and Squaxin Islands are drift plains whose edges are bounded by escarpments that descend to marine waters. In the northwestern part of the project area, Skokomish River occupies a broad alluvium-floored valley 300 to 400 feet below the adjacent drift plains. The highest altitude attained by drift plains is 640 feet, in the area northwest of Mason Lake.

Most of the project area is drained either northward into Hood Canal or eastward into Puget Sound waterways. An area of about 10 square miles in the Black Hills is drained southwesterly to the Chehalis River via Cloquallum River.

For convenience of discussion, the various parts of southeastern Mason County are differentiated into eight subareas, as outlined in figure 2.

PRECIPITATION

Southeastern Mason County has a mild, equable maritime climate generally typical of the Puget Sound lowland. The climate is characterized by mild, wet winters and dry summers. Prevailing southwesterly storms that carry moisture-laden air from the Pacific Ocean bring 82 percent of the annual precipitation during the 6-month period of October through March. Like most of the Pacific Northwest, Mason County receives most of its annual precipitation during the period of least water demand.

Precipitation differs within the project area, owing to the effects of irregular topography and altitude upon the temperature and upon air movement. In the northwestern corner of the project area, adjacent to the foothills of the Olympic Mountains, precipitation averages about 100 inches annually, while on the eastern

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[1/] The term "plain" is used for these land surfaces with certain relaxation of the exact physiographic terminology, which would classify them as plateaus of low elevation. The term "drift plain" as used herein applies to these low plateaus that are underlain by glacial drift.

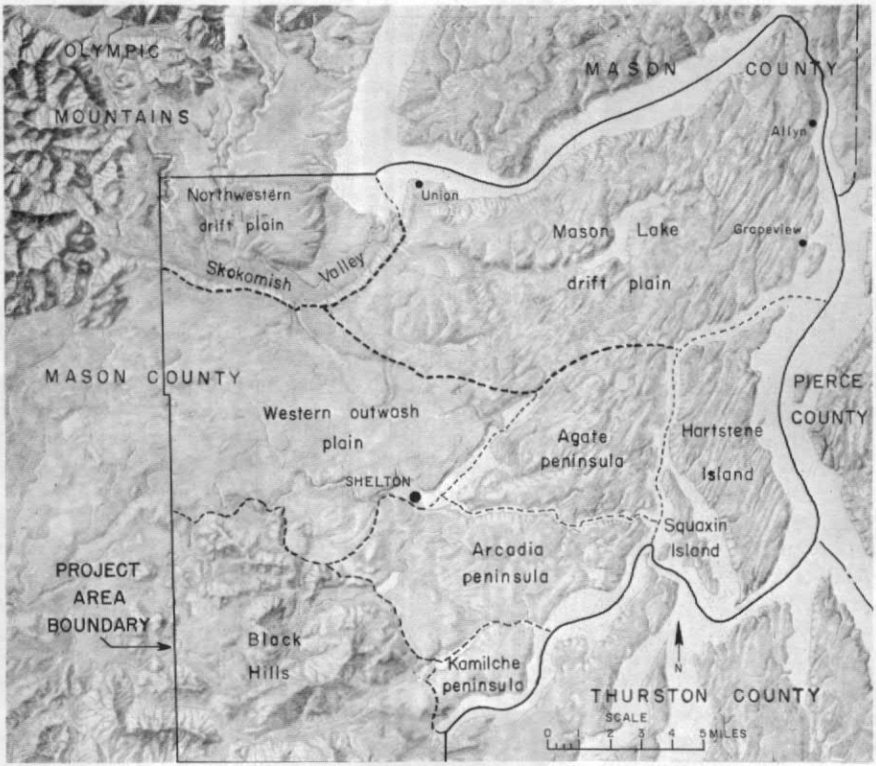

Figure 2 - Map showing geographic subareas in southeastern Mason County.

margin, along Case Inlet, annual precipitation averages 50 inches (fig. 3). Torrential downpours are rare and most rainfall comes as a drizzle. The greatest annual precipitation recorded at Shelton during the period 1932-65 was 85.11 inches in 1956; the least annual precipitation for the same period was 44.86 inches in 1944. Average annual and monthly precipitations at three weather stations in the project area are shown in figure 3.

GEOLOGY

The rocks exposed in southeastern Mason County range in age from Eocene to Holocene (pl. 1). Eocene basalt of the Crescent Formation forms the Black Hills in the southwestern part of the project area. The basalt is overlain principally by Oligocene to Miocene marine sedimentary rocks which are exposed in the western part of the Black Hills outside the project area; these rocks probably occur at depth beneath the area mapped for this report.

Pleistocene deposits, derived from at least three continental glaciations, including one or more mountain glaciations, and two nonglacial intervals, underlie

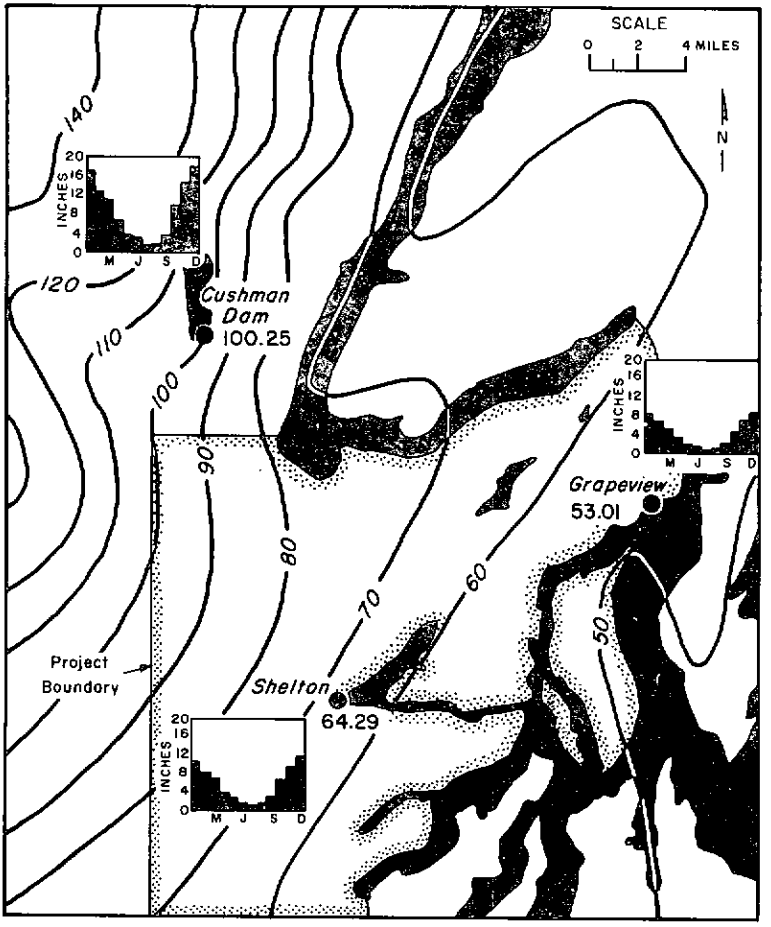

Figure 3 - Isohyetal map of part of Mason County, showing average annual precipitation for the area and average monthly precipitation at three weather stations, for period 1931-65.

most of the area (fig. 4, p. 10) and contain water-bearing zones (aquifers). The oldest Pleistocene deposits known in the area generally occur below sea level and are not differentiated in this report. The youngest glacial drift found in the area is that laid down during the Vashon Stade of the Fraser Glaciation (Armstrong and others, 1965). Below the Vashon Drift a distinct difference in lithology occurs between materials underlying the eastern and western parts of the study area. Beneath an area extending for about 15 miles southeasterly from the foothills of the Olympic Mountains is found a distinctive sequence of oxidized gravels apparently interbedded with Pleistocene nonglacial units. Much of the ground water beneath this area is found in this extensive gravel formation.

GEOLOGIC HISTORY

A knowledge of the geologic history of the project area provides an understanding of the lateral extent, stratigraphic position, and thickness of the major geologic formations and aquifers. When the mode, sequence of deposition, and water-bearing characteristics of the formations are understood at one place, they might be deduced over a wider area.

Tertiary Period

The only event of the Tertiary Period that is of importance to the occurrence of ground water in the project area took place at the close of Tertiary time. Late during the Pliocene Epoch, a north-south uplift produced the present Cascade and Olympic Mountains, while an accompanying downwarp between formed the present Puget Trough (Fenneman, 1931, p. 450). Into this downwarp were deposited the unconsolidated materials that today form the ground-water reservoir of southeastern Mason County.

Quaternary Period

Pleistocene Epoch

During the Pleistocene Epoch (the "Ice Age" of geologic record) glacial ice originating in the Coast Range of British Columbia pushed lobes several times into the lowlands of the Puget Trough. A fluctuating climate caused the ice mass alternately to grow and advance, and melt and "retreat" several times during Pleistocene time, until the ice disappeared from the study area approximately 14,000 years ago. In its maximum advance the margin of the glacier extended into southeastern Mason County. Only the upper parts of the Black Hills rose above the ice which was probably between 2,000 and 1,200 feet in maximum thickness across the project area. Of the sequence of four glacial and three nonglacial intervals defined by Armstrong and others (1965), only the Salmon Springs and Fraser Glaciations and the Olympia Interglaciation are represented in the project area by materials exposed at the surface.

Drift of the Salmon Springs Glaciation is the oldest unconsolidated material that is found well exposed in the project area. Pleistocene deposits older that Salmon Springs generally occur below sea level and are therefore not differentiated in this report.

The pattern of deposition and erosion during glacial and nonglacial intervals determined the stratigraphic position of various water-bearing materials found today. For this reason the discussion below describes the sequence of events that followed the Salmon Springs Glaciation.

As the Salmon Springs glacier front retreated northward in the Puget Sound lowland the drift became subject to erosion, reworking, and partial leveling by the glacier's melt-water streams and by streams from the adjacent Olympic Mountains and Cascade Range. In the Mason County area, coarse basaltic sand and gravel from the Olympic Mountains fromed broad alluvial fans that coalesced

with finer grained flood-plain deposits which covered much of the lowland. The deposits of this Olympia Interglaciation are the oldest interglacial materials found widely exposed in the project area; they include the Kitsap Formation and the lower part of a unit herein named the Skokomish Gravel.

At the close of the Olympia Interglaciation a cooling climate introduced the Fraser Glaciation, and much of North America again became covered by vast ice sheets. A large glacier from the mountains of British Columbia flowed southward into the Puget Sound lowland.

As the ice of the Vashon Stade of the Fraser Glaciation pushed southward across the lowland, streams issuing from its terminus carried and deposited great quantities of silt, sand, and gravel as advance outwash. Both the advancing ice and stream-laid deposits blocked drainages that had developed on the interglacial topography. In the temporary lakes thus formed, clay was first deposited; the clay was then covered by fine sand which, in turn, was overlain by coarser sand and gravel as the glacier front approached.

As the ice mass encroached upon the landscape, it overrode the topography that had been formed by the glacier's advance-outwash streams. Locally the ice scraped off parts of these and older, underlying materials. A heterogeneous mixture of clay, sand, gravel and cobbles thus became incorporated in the basal part of the ice mass. This material, known as till, was "smeared" along by the ice across the landscape. As observed today, the till forms an undulating stratum that both caps and truncates the underlying advance outwash and older deposits.

At its maximum height the Vashon glacier rode up the flanks of the Black Hills to locations that are today 1,200 feet above sea level. Except for the highest parts of the northern flanks of the Black Hills, the glacier covered most of the project area.

Warming of the climate toward the close of the Fraser Glaciation resulted in melting of the Vashon ice. The rock debris within the melting glacier was either dumped with very little sorting as morainal deposits, or it was reworked and stratified by melt-water streams and deposited across the landscape as recessional outwash. In the project area extensive deposits of coarse sand and gravel of this recessional outwash were spread across the western outwash plain. Deltas, such as the Shelton delta, were also formed where the heavy-laden, south-flowing streams terminated along the north shores of glacial lakes.

Troughs that had been deeply cut by the Vashon glacier became lakes as the ice melted. Recession of the ice northward opened up successively more troughs until eventually there existed an extensive, many-armed lake. Bretz (1910) applied the name Lake Russell to this body of impounded glacial water. Evidence of the lake's extent into the study area is found at a few localities along low shore cliffs; there, Lacustrine silt and clay occur as well-bedded strata.

When the Vashon glacier had receded to where the Strait of Juan de Fuca was free of ice blockage, the water of Lake Russell was released through that outlet. Marine waters then replaced the fresh water of the glacial lake and formed the embayments of Puget Sound and Hood Canal as we know them today.

Holocene Epoch

In Holocene (Recent) time extensive deltas formed at the mouths of the larger streams that discharge into Hood Canal and Puget Sound. Where the stream valleys are filled to above sea level with fluvial sediment, they form the present broad river bottomlands of Skokomish Valley and the less-pronounced alluvial delta lands at the heads of Hammersley Inlet, Oakland Bay, Skookum Inlet, and Oyster Bay. Peat and silt deposits accumulated in ponds that developed on the irregular surface of the drift plains and a relatively thin soil mantle has developed over most of the area.

STRATIGRAPHIC UNITS AND THEIR WATER-BEARING CHARACTERISTICS

A diagrammatic summary of the stratigraphic units underlying southeastern Mason County is shown in figure 4. Table 1 summarizes the principal characteristics and water-bearing properties of the units.

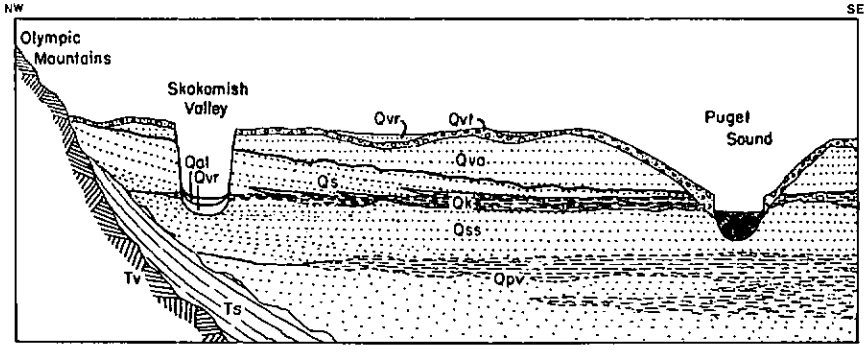

Figure 4 - Diagrammatic northwest-southeast geologic section through project area.

Tertiary Rocks

The oldest rocks exposed in southeastern Mason County are basaltic flows of Eocene age which are correlative to rocks that have been reassigned to the Crescent Formation by Gower (1960). The Crescent Formation is exposed only in the southern part of the project area, and forms the Black Hills and a few isolated outliers immediately to the north (fig. 2). In the subsurface, the volcanic rocks are overlain by sedimentary rocks (fig. 4). Because of their general lack of permeability, Tertiary rocks contain no aquifers of significance to the ground-water resources of southeastern Mason County.

Quaternary Deposits

Except for the Black Hills, the project area is underlain by unconsolidated sedimentary materials, chiefly gravel, sand, silt, clay, and till of Quaternary age (pl. 1). The maximum thickness of these unconsolidated deposits exceeds the 926-foot depth of well 20/3-20E1, the deepest recorded in this report.

Nearly all ground water developed in southeastern Mason County is derived from materials of Quaternary age.

The Quaternary deposits were laid down within four major depositional environments that are represented by the following materials:

1. Widespread and thick deposits of sand, gravel, clay , and till that were laid down by glacial ice and related meltwater streams.
2. Flood-plain type deposits composed primarily of fine sand and silt with some clay, and including some peat interbeds.
3. Predominantly coarse sand and gravel presumably deposited during a stage of development of alpine glaciers in the Olympic Mountains.
4. Holocene (Recent) alluvial deposits underlying stream channels and flood plains.

Pleistocene Sedimentary Deposits

Pre-Vashon deposits, undifferentiated

Overlying the Tertiary volcanic and sedimentary rocks at depths that range from 200 to more than 900 feet below sea level is a thick sequence of unconsolidated materials presumed by the authors to be of Pleistocene age. Because these materials are not exposed at the surface and their depth and character is determined only from drillers' logs, their relationship to exposed and defined formations mapped at the surface (pl. 1) is not well known. In this report and in figure 4 the unconsolidated deposits underlying the Salmon Springs Drift are grouped under the name pre-Vashon deposits, undifferentiated.

Although the aquifers in the undifferentiated pre-Vashon deposits underlying the Salmon Springs Drift have been tapped by only a few wells the large yields of water obtained from them indicate that the aquifers have great potential for meeting future industrial and municipal needs. Beneath Shelton Valley and the immediately adjacent uplands several industrial wells and two municipal-supply wells tap aquifers between 200 and 900 feet below sea level. Yields of 1,000 to more than 2,000 gpm have been pumped with very little drawdown. Large specific capacities are reported from wells tapping those deep aquifers beneath other parts of the project area. Although a well (21/1-8R1) tapping an aquifer 533 feet below sea level on Stretch Island has been pumped at the moderate rate of 60 gpm, the small drawdown recorded during the pumping indicates that a considerably higher yield is possible from that aquifer. Near the head of the east arm of Hood Canal, artesian conditions provide flows of 100 gpm or more from aquifers more than 200 feet below sea level.

Table 1 - Summary of characteristics of principal

SYSTEM	SERIES		STRATIGRAPHIC UNIT	CHARACTER AND EXTENT	BEST EXPOSURES	MAXIMUM THICKNESS (feet)
QUATERNARY	Holocene		Alluvium	Fine grained silt and sand with some clay and peat; found in lowland valleys, floodplains and depressions in drift plains.	Skokomish Valley	100+
	Pleistocene	Vashon Stade of Fraser Glaciation	Recessional outwash	Poorly sorted, discontinuously bedded loose gravel with some sand, silt and clay. Overlies till in depressions on drift plains; deltaic bedding along north sides of some valleys.	Shelton delta, western outwash plain	150
			Till	Coarse cobbles in silt-clay matrix; extensively mantles drift plains in most of study area; underlies recessional gravel in western outwash plain.	At surface of most drift plains; at top of sea cliffs.	50+
			Advance outwash	Discontinuous strata of unconsolidated gravel, sand and silt; underlies till in most of area.	Beneath till near top of sea cliffs; along upper slopes of east arm of Hood Canal.	200+
			Skokomish Gravel	Generally coarse reddish gravel with sand, silt, clay and some peat strata; beneath drift plains in western two-thirds of area.	Above road along lower Skokomish River Valley and from Union to Twanoh State Park.	300+
			Kitsap Formation	Well stratified, horizontally bedded silt and fine sand with some clay and peat; found beneath Vashon Drift in eastern part of report area; appears to thin and interbed with Skokomish Gravel to west.	Part way up sea cliffs along eastern marine inlets.	50
			Salmon Springs Drift and pre-Vashon deposits, undifferentiated	Coarse sand, gravel and some till; underlies Kitsap Formation in eastern parts, and Skokomish Gravel in western parts of report area.	Base of sea cliffs along eastern marine inlets.	Thickness below sea level not determined.
TERTIARY	Eocene		Volcanic rocks	Basalt; underlies Black Hills.	Black Hills	Unknown beneath report area.

stratigraphic units underlying southeastern Mason County.

WATER-BEARING PROPERTIES	AREAS WHERE UNIT MOST PRODUCTIVE	CHEMICAL QUALITY OF GROUND WATER
Yields small quantities (6-10 gpm) to driven wells, moderate quantities (50-350 gpm) to screened and larger diameter wells, in combination with recessional outwash.	Skokomish Valley	Good; locally may be high in iron.
Yields small to moderate supplies where occurring in sufficient thickness below local water table; combined with alluvium in some areas, produces 50 to 350 gpm.	Skokomish Valley	Good.
Essentially impervious but may yield small supplies of perched ground water; also serves as aquiclude to confined ground water at some localities near sea level.	Perched aquifers on drift plains	Good (very few samples collected).
Yields small to large quantities (20-800 gpm), depending upon thickness of coarser material below regional water table; sandy phases require screening.	Drift plains and western outwash plain	Good.
Yields small to large supplies with increasing depth (30 to over 500 gpm); may be major producer for deep industrial wells in area.	Western outwash plain; Mason Lake drift plain; Agate and Arcadia peninsulas	Generally good, with some increase in hardness and conductance in wells below sea level.
Poor permeability except for few gravel lenses; serves as aquiclude to underlying confined ground water along shoreline areas.	None noted	Generally high in iron and in places yield "swamp gas"; a few reports of flammable gas.
Salmon Springs Drift yields generally small to moderate (10-100 gpm), but some wells produce several hundred gallons per minute. Some wells in deeper, older sediments produce more than 4000 gpm.	Shorelines of eastern and southern parts of area; Shelton Valley (deep wells)	Soft to moderately hard water; several deep wells yield water high in chloride.
Generally dense and impermeable and of little importance as aquifer.	None noted	No samples collected.

Salmon Springs Drift

The Salmon Springs Drift, lying unconformably upon older Pleistocene sediments, represents the oldest glacial deposits definitely recognized at surface exposures (pl. 1). This sequence of coarse stream-laid gravel and sand with pods of till was mapped in adjacent Kitsap Peninsula (Molenaar, 1965) and Thurston County (Noble and Wallace, 1966) as only tentatively correlative to the type Salmon Springs Drift as mapped and named in Pierce County by Crandell and others (1958). Subsequent tracing and comparison between units exposed in adjacent parts of Pierce County (Walters and Kimmel, 1968), Thurston County (Noble and Wallace, 1966), and Kitsap and Mason Counties (Molenaar, 1965), have shown the unit to be correlative in age to the type Salmon Springs Drift, and the unit is so designated herein.

As in the adjacent counties already studied, the Salmon Springs Drift is exposed chiefly at the base of beach bluffs and unconformably underlies the Kitsap Formation of the Olympia Interglaciation. The drift represents the latest glacial deposits laid down by the Puget lobe prior to the Fraser Glaciation.

The Salmon Springs Drift is recognized chiefly as a gravel sequence with some minor amount of till. Moderate surface weathering generally suggests that is is older than deposits of the Vashon Drift. Oxidation is normally only surficial and the pebbles are not noticeably decomposed. The Salmon Springs Drift contains a mineral assemblage derived from rocks in the northern Cascade Range and the Coast Range of British Columbia; the mineral assemblage further distinguishes the drift from deposits locally derived from rocks of the Olympic Mountains and the southern Cascade Range.

The Salmon Springs Drift is present along all channels of Puget Sound bordering southeastern Mason County (pl. 1). Its presence inland and westward is inferred to be at least as extensive within this area as the deposits of the Fraser Glaciation.

The drift is best exposed at the base of sea cliffs in the eastern part of Hammersley Inlet, on both sides of the northern part of Pickering Passage, and along the east shore of Hartstene Island. Along the south shore of the east arm of Hood Canal, drift believed to be of Salmon Springs age lies beneath thick sand deposits of the Vashon advance outwash.

As the base of the Salmon Springs Drift is nowhere exposed in Mason County, the thickness of the formation can be inferred only from well logs. The drift rises to a maximum of about 50 feet above sea level where exposed along sea cliffs, but its base may extend to as much as 200 feet below sea level. A detailed petrographic examination of materials obtained during drilling will be necessary to differentiate between the Salmon Springs Drift and older Pleistocene deposits underlying the area.

The Salmon Springs Drift lies generally beneath the main water table in the eastern part of the project area and contains the major aquifers tapped by wells near marine shorelines. Wells 4 to 6 inches in diameter produce 10 to 20 gpm from drift for individual domestic supplies, and more efficiently developed 8- to 12-inch wells produce over 100 gpm for larger community domestic supplies. Pump-test data suggest that some deeper wells tapping lower parts or greater

thicknesses of the drift can yield as much as 600 gpm.

In some shoreline areas, where Vashon till or clay beds form a confining layer above the Salmon Springs aquifers, water flows from wells under artesian conditions. Flowing wells tapping Salmon Springs aquifers have been drilled along the south shore of Hood Canal east of Twanoh State Park, along the north shore of Oakland Bay, and along the west shore of North Bay near the head of Case Inlet.

Present development of ground water from the Salmon Springs Drift has been principally for individual and small community domestic supplies, although deep industrial and public-supply wells in the Shelton area may produce, at least in part, from lower aquifers in this drift.

Kitsap Formation

The Kitsap Formation was originally named the Kitsap Clay Member by Sceva (1957) for the upper of two members within the Orting Gravel as exposed along Colvos Passage in southeastern Kitsap County. Subsequently, Molenaar (1965) revised the rank of the Kitsap to the Kitsap Formation to describe the peat-bearing silts and clays deposited during the Olympia Interglaciation (Armstrong and others, 1965). As described by Molenaar (1965) in Kitsap Peninsula and by Noble and Wallace (1966) in Thurston County, these fine-grained deposits unconformably overlie the Salmon Springs Drift and underlie the Vashon Drift. In the Kitsap Peninsula the formation was described as interbedded with the "unnamed gravel" of Olympic Mountain derivation, herein named the Skokomish Gravel.

The Kitsap Formation is composed chiefly of silt and clay with some sand. Lenses of gravelly sand are present in some places within the sequence of finer-grained materials. The hypersthene-rich mineral assemblage indicates an origin from rocks of the Mount Rainier region and the southern Cascade Range, probably by way of the Nisqually and Puyallup River drainages. Garnets; characteristic of Puget lobe drift, are not found in the formation.

The Kitsap Formation is best exposed in the sea cliffs in the northern end and along the east shore of Hartstene Island (pl. 1). There it appears part way up the bluffs, and is generally underlain by the Salmon Springs Drift and overlain by Vashon advance outwash. At only a few places along Hartstene Island does the formation exceed a thickness of 50 feet; it generally is 10 to 15 feet thick. The Kitsap Formation is also found along the south shore of Hammersley Inlet a mile west of Arcadia, and south of Arcadia along the west shore of Totten Inlet. It thins and disappears westward beyond the heads of Hammersley, Skookum and Totten Inlets; its presence beneath the uplands in the west-central part of the area is inferred only from the existence of peat deposits reported in this interval in a few drillers' logs. To the east of the project area, in the Kitsap Peninsula, the formation is more consistently exposed and thickens toward the center of the Puget Sound lowland where it is closer to the Cascade Range, the major source of the flood-plain deposits.

The characteristically fine-grained sediments that compose most of the Kitsap Formation make the unit unimportant as an aquifer. The relative impermeability of the formation, however, makes it important as an aquiclude, both as a base for semiperched unconfined ground water above it and as a confining layer for

ground water in the Salmon Springs Drift and older materials below. The relatively thin and discontinuous sand and gravel lenses within the Kitsap Formation yield small supplies of water to wells but the water generally contains some iron in solution and has an unpleasant taste; some wells yield "swamp gas."

Skokomish Gravel

The name Skokomish Gravel is here introduced to refer to a thick and widespread sequence of stream-laid detritus derived from the Olympic Mountains. The Skokomish Gravel contains a preponderance of basaltic pebbles originating from the Eocene Crescent Formation. Garnets and granite pebbles are present in a few places, but in a very small quantity, and doubtless have come from re-working of Cordilleran glacial deposits of early Wisconsin age. Silt, clay and sand of reddish-brown color are common as discontinuous beds as much as 5 feet thick. The gravel unit normally is highly oxidized at the surface, but materials removed during drilling of wells are less oxidized. The gravel generally is poorly sorted, with cobble through clay sizes commonly in close proximity. Peat and lignite beds occur locally.

The Skokomish Gravel is best exposed in the bluffs along the south side of the Skokomish Valley from U.S. 101 at 21/4-22D to about 3 miles east of the town of Union on Hood Canal. It is also exposed along the scarp above the railroad track between 20/3-20K and 20M, south of the Simpson-Rayonier industrial complex in Shelton. General distribution of the Skokomish Gravel is shown on plate 1.

A composite stratigraphic section measured in the escarpment in the lower Skokomish Valley is selected as the type locality of the Skokomish Gravel. The section includes several readily correlated exposures along the road down the escarpment, from the upland at 21/4-13B to the road near river level at 21/4-12H. The upper 144 feet of this 434-foot section is composed of Vashon till and advance outwash directly overlying the Skokomish Gravel. Below the till and outwash, from an altitude of 290 feet to 78 feet above sea level, is a 212-foot sequence of oxidized gravels and sands with interbeds of clay and silt. Below the altitude of 78 feet a 78-foot sequence of chiefly buff-colored silt and clay, with two distinctive peat-bearing horizons, all within the Skokomish, is exposed to below road level. The base of the Skokomish is not exposed here.

A principal characteristic of the Skokomish at its type locality is the contrast between the oxidized deposits of Skokomish Valley lithology and the overlying younger deposits of northern Cascades and British Columbia provenance. The authors interpret the lower 75 to 80 feet of peat-bearing, predominantly finer-grained sands and silts to be time-correlative to the Kitsap Formation deposited during the Olympia Interglaciation. Immediately above these fine sediments, the presence of some granitic pebbles in gravels and sands suggests reworking and redeposition of the Salmon Springs Drift. Above these sediments are found decreasing amounts of pebbles of northern derivation and, between the altitudes of about 130 and 290 feet, the materials are poorly to well-sorted oxidized gravel and sand with some silt and clay lenses.

The type locality shows that the top of the Skokomish Gravel is at least 200 feet or more above sea level in the northwest part of the report area. As the

top of the unit declines in altitude at increasing distances from the Olympic Mountains, which would be the common characteristic of this alluvial-fan type of deposition, the gravel thins southeasterly across the project area, as shown diagrammatically in figure 4. Exposures of the gravel become less numerous and the exposed beds become thinner eastward along the shore of Hood Canal and finally disappear entirely. Similarly, the gravels thin and are not exposed along sea cliffs in the southeastern part of the area. Beneath the drift plains the presence and thickness of the Skokomish Gravel must be inferred only from drillers' logs.

In the project area most exposures of the predominantly reddish gravel and sand indicate that it was laid down during the Olympia Interglaciation and possibly during early phases of the Fraser Glaciation. The deposits have been tentatively correlated with part of the Kitsap Formation on the basis of what appears to be lateral interbedding of these Olympic Mountains deposits with westward extensions of the Kitsap Formation beneath the project area.

At some localities, exposures of lithologically similar but older deposits are found between the Salmon Springs Drift and the Kitsap Formation. This indicates that gravel of Olympic Mountains derivation was deposited across the report area whenever strongly flowing, sediment-laden streams drained the mountains, and that, therefore, the gravels are not restricted to any single glaciation or nonglacial interval. However, the name Skokomish Gravel is restricted to those materials from the Olympic Mountains that occur both partly interbedded with and partly overlying, the Kitsap Formation.

Along Hood Canal between Union and Twanoh State Park, the Skokomish Gravel contains the principle aquifers that supply domestic wells and springs. Reddish silt and clay in the formation immediately above the highway there serve to divert ground water to numerous springs where the water is used for individual and community domestic systems. Shallow wells yield domestic supplies near sea level and aquifers as deep as 100 feet below sea level supply the community needs of the town of Union.

The depth of Skokomish Gravel beneath Shelton Valley has not been determined, hence all aquifers deeper than 200 feet below sea level are assigned to undifferentiated pre-Vashon deposits. However, several deep industrial wells there, and Shelton's municipal wells to the north, may tap aquifers in materials that are a part of the Skokomish Gravel.

Present utilization of ground water from the Skokomish Gravel has not diminished the quantity believed available from the formation. Because of the widespread extent and thickness of these materials below the regional water table, the formation has a potential for providing the major ground-water supplies to be utilized as population and industrial development increase in the project area.

Vashon Drift

The Vashon Drift was named the Vashon till by Willis (1898, p. 126) and includes the extensive till sheet and associated outwash sand, gravel, and clay deposited in the Puget Sound lowland during the advance and recession of the Vashon glacier during the Vashon Stade of the Fraser Glaciation.

Outwash is material which was deposited beyond the ice front by glacial melt-water streams. Near the ice front, poorly sorted and roughly stratified gravel and coarser sand were deposited while, at greater distances from the glacier front, finer grained and more evenly stratified sand, silt, and clay were deposited. The materials deposited ahead of the advancing glacier and subsequently over-ridden by the ice are termed advance outwash, whereas materials deposited during the recession of the glacier and consequently laid down across the till surface exposed by the retreating ice are termed recessional outwash. In places these two stratified drift units are separated by the intervening stratum of glacial till, which is normally an unsorted mixture of gravel and cobbles in a matrix of sand, clay, and silt. The conglomerate-like deposit was laid down generally as a basal deposit beneath the moving ice sheet.

Included with the Vashon Drift in this report is a thin unit of younger clay and silt. This material was deposited during late Vashon time in glacial Lake Russell (Bretz, 1913, p. 122-166).

Advance outwash. In most of southeastern Mason County the advance outwash consists of a sequence of poorly to well-bedded gravel and coarse sand with, locally, small lenses of silt and clay. The basal part of the advance outwash, particularly in the northeastern part of the project area, includes chiefly sand and clay.

The mineral and rock assemblage of the outwash is composed almost entirely of materials derived from the mountains of British Columbia and the northern Cascades. Granitic and associated metamorphic pebbles form a major part of the coarser fragments of the deposit. Garnet and epidote commonly are found in detailed studies of the finer sediments.

The advance outwash materials generally are grayish in color and fresh in appearance. Locally, along ground-water discharge zones, iron-bearing water has imparted a superficial oxide coating to the materials.

The outwash is exposed in most of the higher sea cliffs along Hood Canal, Case Inlet, and Pickering Passage in the eastern part of the area. Thick exposures of gravel and sand in the upper parts of the bluffs along Hood Canal indicate that the unit is at least 200 feet thick beneath the northern part of the Mason Lake drift plain. Sandy facies of the outwash are more common in the eastern part of this province; drillers' logs of wells in the vicinity of Devereaux Lake north of Allyn show that here the sand extends to great depths. In nearly all other parts of the project area, with the exception of the unglaciated upper slopes of the Black Hills, the advance outwash is present beneath the Vashon till.

In most of the area the Vashon advance outwash overlies the Skokomish Gravel. The contact is both unconformable and gradationally conformable, depending upon the varying degrees of erosion or lack of erosion of the older gravels prior to deposition of the outwash. East of the extent of the Skokomish Gravel, the advance outwash in most places overlies the Kitsap Formation. Where the Kitsap Formation also is missing the outwash overlies the Salmon Springs Drift. The basal contact of the outwash is indistinct in many places, as though some of the older formations were eroded, reworked, and redeposited with the first deposition of the advance outwash.

Vashon advance outwash deposits are highly permeable and have such a widespread occurrence beneath the drift plains and peninsulas of the project area that the formation must be considered one of the most important for individual and small-community domestic supplies. As the top of the formation occurs generally at altitudes well above the main water table, however, penetration of moderate thicknesses of unsaturated materials may be necessary in some areas to reach ground water in the most permeable parts of this outwash. Where underlain by less permeable members of the Kitsap Formation and Salmon Springs Drift, rather extensive bodies of semiperched water are tapped by wells located on upland plains. The outwash is the chief source of ground-water supply on the Arcadia peninsula, Mason Lake drift plain and the western outwash plain. Quantities of 25 to 50 gpm are commonly obtained, and some wells have been tested at rates of 500 gpm or more. Nearly all domestic wells along the shorelines of Mason and Island Lakes tap advance outwash underlying a thin mantle of till. Along North Bay, artesian flows are obtained from shallow wells drilled into advance outwash beneath the Vashon till.

Beneath some areas, particularly in the eastern part of the Mason Lake drift plain north of Allyn, the advance outwash includes a thick sand sequence beneath the gravel, correlative to the Colvos Sand of the Kitsap Peninsula (Molenaar, 1965). There, several wells have failed to produce the desired amount of water possibly because of lack of efficient screening at sand aquifers.

Till. The drift plains are underlain nearly everywhere by 10 feet or more of compact glacial till (commonly called "hardpan"). This is correlative to the Vashon till mapped elsewhere in the Puget Sound lowland and represents the basal deposit laid down directly beneath the Vashon glacier.

The till generally is gray to bluish gray in color, and is a compact and unsorted mixture of cobbles and pebbles in a binder of sand, silt, and clay; these materials are predominantly of northern provenance. The deposit characteristically forms a capping shaped by the topography over which the ice sheet advanced. In places where the glacier overrode sandy materials, the till is generally sandy and relatively friable, with no chemical or mechanical decomposition of rock and mineral components. In places, however, ground-water seepage along spring zones has given the till a coating of iron oxide, and the joint cracks in the upper few feet beneath the soil are oxide stained.

The till is well exposed in sea cliffs which border drift plains in the project area. Owing to the nature of deposition by the southward moving ice, the till has greater thickness beneath some of the southern "lee" slopes. At Cape Horn on the north shore of Hammersley Inlet, at 20/2-20 and 21, the till is more than 50 feet thick. Beneath some of the drift plains mapped as till (pl. 1), a thin veneer of recessional outwash may cover the more compact till sheet but, because the outwash is thin and lies above the water table, it is not mapped as significant to the ground-water conditions. Farther west, beneath the western outwash plain, the till is covered by an increasing thickness of recessional outwash. There the continuity of the Vashon till as a subsurface strata is inferred from well logs and from exposures in deeper roadcuts and stream gorges. Thin layers of till are found as high as 700 feet above sea level on the north flanks of the Black Hills.

In some places along low shore cliffs the Vashon till extends below sea

level and locally is covered by thin deposits of lacustrine clay or beach deposits. At the north side of the entrance to Hammersley Inlet, Vashon till is well exposed at the base of the beach cliff.

Because of its compact, dense, and impermeable character, the Vashon till is not an important water-bearing unit. Small amounts of water can be obtained from sandy or gravelly strata within the till, generally enough for domestic use. The till is of most importance as an aquiclude; it serves both as a capping layer to ground water confined in sands and gravels beneath areas near marine shorelines, and as a base for perched ground water in overlying recessional outwash. Where the till mantles a steeply sloping upland surface it causes both an increase in surface runoff and a reduction in the loss of confined ground water to springs.

Morainal deposits. In the southwestern part of the project area, where the Vashon glacier terminated, the drift consists of coarse, poorly sorted deposits of cobbles, gravel and sand. The topography over these materials is hummocky and irregular and has some kame and kettle features. The deposits, considered morainal deposits, show that little sorting was accomplished by melt-water streams, hence these materials are inferred to have been dumped by the stagnated melting ice. As mapped on plate 1, morainal deposits are found in the vicinity of the Lost Lake, Mud Lakes, Lystair (locally known as Star) Lake and Goose Prairie. Because this material is thin it contains little ground water in storage. However, because it contains little clay it allows rapid infiltration of precipitation to recharge aquifers in underlying formations.

Recessional outwash. Vashon recessional outwash forms the predominating sedimentary sequence underlying the western outwash plain between Shelton and the Skokomish Valley. The outwash is composed chiefly of poorly sorted sand, gravel, and clay of Puget lobe derivation, with minor amounts of basaltic gravel of Olympic Mountains origin. Although generally less than 30 feet thick across the study area, the deposits evidently attain a thickness of more than 100 feet in the Shelton delta, beneath the north slopes of Shelton Valley and Oakland Bay. The driller's log of well 20/4-18B1 indicates the deposits are more than 163 feet thick beneath the western outwash plains. Foreset bedding characteristic of deltaic deposits is found where the outwash is being quarried in the gravel pit west of Shelton, at 20/4-24F. Recessional outwash occurs also as local pockets of sand and gravel that fill depressions in the Vashon till.

Where the recessional outwash occurs in considerable thickness below the water table, particularly in places adjacent to a body of surface water, moderate quantities of ground water can be obtained. The western outwash plain and the lower Skokomish Valley are the major areas in which ground water is withdrawn from these materials. In the latter area, relatively shallow gravels, in combination with overlying alluvium, yield water to wells at rates of 150 to 350 gpm.

In most places on the drift plains, where the recessional outwash occurs largely as local pockets of sand and gravel, the water-bearing capacity of these deposits is restricted both by limited thickness and areal extent, and by its position above the regional water table. Even where the outwash occurs in greater thickness and lateral extent, as on the western outwash plain, most wells bypass these materials to obtain ground water from underlying advance outwash and older sedimentary materials.

The loose sand and gravel of the Shelton delta allow ground water to move readily southward toward Shelton Valley and Oakland Bay. Few wells are recorded as utilizing the aquifers there, however, and the Shelton springs provide the only major development of ground water from the recessional outwash.

Lacustrine silt and clay. Isolated exposures of finely bedded lacustrine silt and clay occur in a few places along marine inlets. The fine-grained materials were deposited as sediments in glacial Lake Russell (Bretz, 1910, 1913) during waning of the Vashon Stade of the Fraser Glaciation.

Where exposed, the silt and clay deposits are generally 10 to 15 feet thick and overlie Vashon till and recessional outwash. The 4- to 6-inch beds are generally flat lying but in places are found draped, with gentle dips, over the underlying materials. These fine-grained deposits were mapped at only a few places (pl. 1), for example, along the north shore of Skookum Inlet (19/3-9 and 10), at the south end of Squaxin Island (20/2-35), and at the entrance to Hammersley Inlet (20/2-21K). At the latter location the deposits are particularly well exposed overlying Vashon till. Because of their poor permeability, limited thickness and areal extent, and position generally above the water table, the silt and clay deposits do not contain water-yielding materials.

Holocene Alluvium

Alluvium includes stream-laid gravel, sand, and silt of Holocene (Recent) age. These materials are thickest and most extensive in the floodplain and delta of lower Skokomish Valley. Alluvial deposits also underlie Egypt Valley, Shelton Valley, Isabella Valley and Kamilche Valley, and the heads of most marine embayments. Locally, beach sand and gravel have been mapped (plate 1) with the alluvium. At many places, such as in kettle lakes and marshy depressions, the drift plains, clay and peat deposits are incorporated with the alluvium and have not been mapped separately.

Where the water table is in hydraulic continuity with adjacent surface streams, alluvial silts and sands of Holocene age yield small to moderate supplies of ground water to shallow wells. Deeper penetration into underlying coarser sand and gravel beneath the alluvium is generally required to obtain yields for larger irrigation supplies. As noted earlier, yields of up to 350 gpm are obtained from a combined section of the coarser alluvium and recessional deposits in Skokomish Valley.

GROUND WATER

HYDROLOGIC SETTING

Ground-Water Recharge

The major source of ground-water recharge in Mason County is precipitation. This is demonstrated by (1) the fluctuation of ground-water levels with variation in input of water from precipitation, (2) the water-budget computations for the ground water, and (3) the absence of other established sources of recharge. Part

of the precipitation falling on the land surface generally drains off as surface runoff, part returns to the atmosphere by evaporation and transpiration from plants, and part percolates downward into the soil. Some of the soil water descends by capillary transfer, and eventually reaches a saturated zone where it becomes ground water. The ground-water body is replenished also by downward and lateral seepage from surface ponds, lakes, and rivers.

The extent to which precipitation will infiltrate the surface and descend to a ground-water body varies from place to place because of differences in the character of subsurface materials through which the water must pass. In places underlain by impermeable consolidated rocks such as in the Olympic Mountains foothills and the Black Hills, much of the precipitation that falls on the land becomes surface runoff. In such places, streams exhibit great fluctuations in seasonal flow and some are dry during late summer. By contrast, in lowland drift plains underlain by more permeable unconsolidated deposits, a larger part of the precipitation percolates to the underground reservoir. This ground water in turn discharges to streams at a slow but steady rate, resulting in a more uniform streamflow throughout the year.

Ground-Water Discharge

Most ground-water discharge in the project area takes place beneath the surface of streams, lakes and surrounding marine waters. Minor amounts of ground water are discharged to the surface as springs where some aquifers are intersected by valley sides, sea cliffs, and road cuts. The movement of ground water toward discharge points is roughly in the direction of the general slope of the land surface.

All perennial streams in the area carry contributions of ground water from beneath lands adjacent to their channels. During late summer the flow of all streams is largely of ground-water origin except that of the Skokomish River, which is mostly snowmelt from the Olympic Mountains.

The Water Table

The main water table, as represented by water levels in wells across the project area, rises away from marine waterways and major stream valleys, and generally has a configuration similar to the rising land surface. In most places the water table is within 50 feet of land surface.

Where ground water occurs under perched or semiperched conditions, one or more higher water tables may exist locally above the main water table. Under such conditions the depths to water beneath some upland areas are relatively shallow.

Water levels in individual wells fluctuate both seasonally and from year to year, as well as in response to pumping. The hydrograph in figure 5 shows fluctuations of the water levels over the period 1963-65, as measured monthly in six observation wells. Also shown is the timelag relationship between precipitation as measured at Shelton and water-level change in these wells. For example, well 21/4-24G1, which taps an aquifer 50 to 80 feet deeper below land surface than those of the other wells, shows about a month greater timelag of ground-water recharge. At this well, the lag may be in part due to the area being underlain by

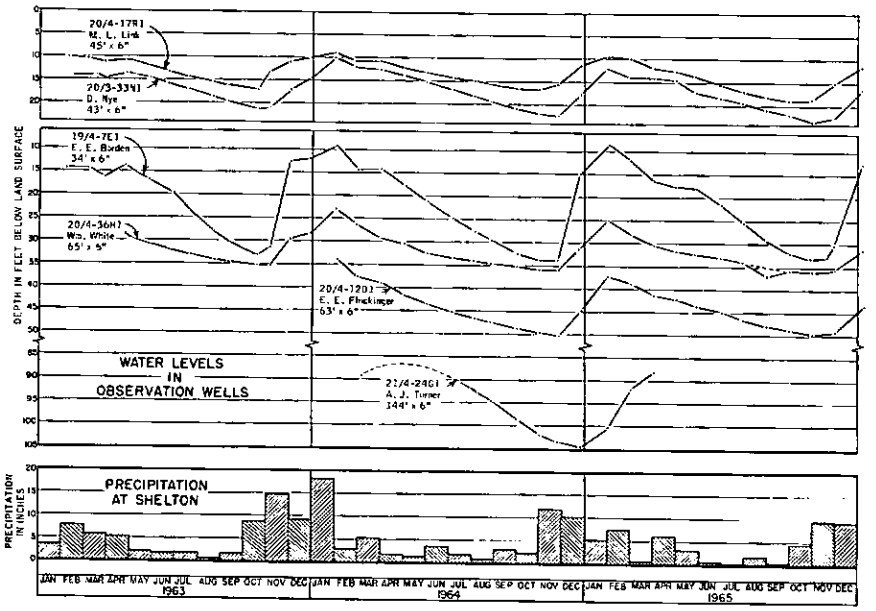

Figure 5 - Hydrograph of water levels in observation wells, and precipitation at Shelton during period 1963-65.

relatively impermeable till or clay strata; these may impede the percolation of infiltrated precipitation to the water table.

AREAL OCCURRENCE AND DEVELOPMENT OF GROUND WATER

Plate 2 shows locations of wells for which pertinent data were obtained during the area-wide well canvass and from drillers' logs. Information on 658 wells is presented in table 2. Drillers' logs for 237 of the wells (shown by solid dot on pl. 2) are listed in table 3. A distribution of the potential capacities of wells, as calculated from pump-test data, is shown in figure 6.

Black Hills

All 43 wells canvassed in the Black Hills are in the valleys and lowlands between the more rugged parts of the subarea. The hilly uplands are undeveloped except for scattered logging roads, and few if any wells have been drilled or dug there.

The most recent development of ground-water supplies in the Black Hills subarea is near the shoreline of Lost Lake. The lakefront homes obtain adequate domestic supplies from semiperched aquifers tapped by 30- to 40-foot wells whose water levels are at about the altitude of the lake surface. A few 90- to 120-foot wells, whose water levels are between 20 and 40 feet below lake level, probably

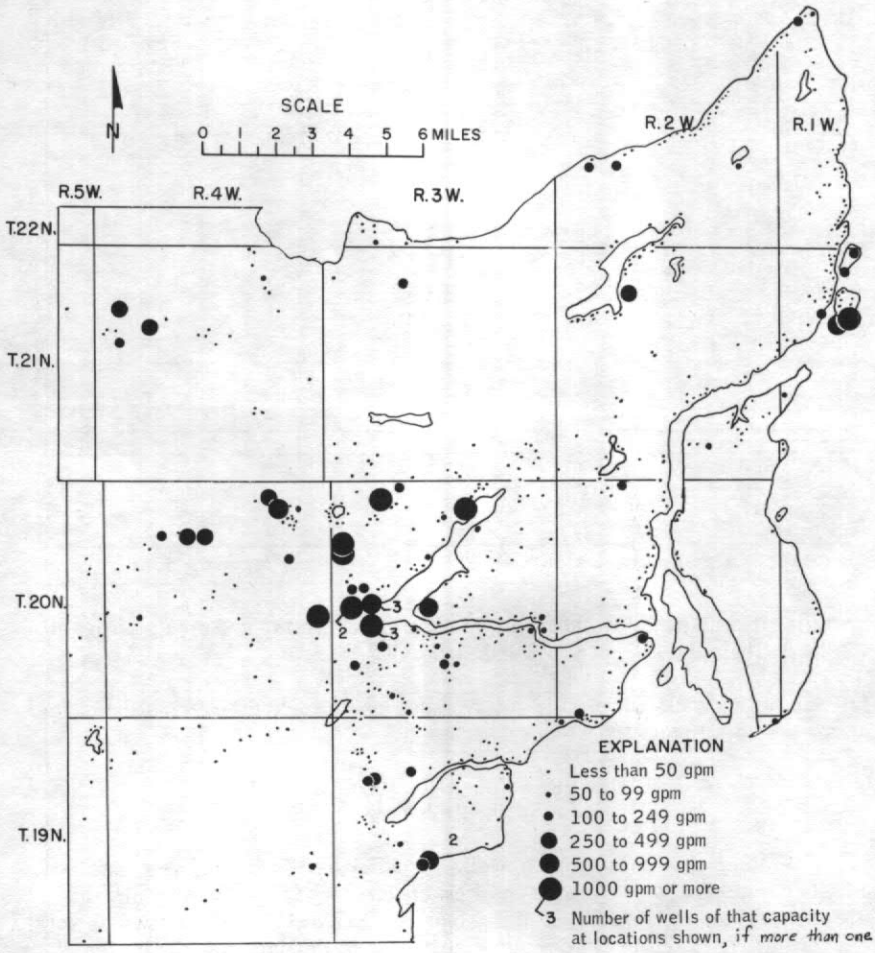

Figure 6 - Map showing capacities of wells in project area.

tap aquifers beneath the regional water table. Yields of wells beside Lost Lake range generally from 5 to 15 gpm, but larger yields can probably be obtained from deeper wells that penetrate several water-bearing zones.

In Isabella Valley several domestic- and stock-supply wells were drilled through alluvium to tap coarser sand and gravel in Vashon recessional outwash. Water levels stand near the level of Gosnell Creek.

Kamilche Valley is underlain by a thick sequence of fine-grained alluvial sand and clay which provides small quantities of water to large-diameter dug wells. Those wells tap semiperched aquifers at or slightly above creek level. Two deeper wells were drilled through the fine-grained materials to obtain water in gravel in the

recessional outwash and possibly in the Salmon Springs Drift. At Kamilche, near the mouth of Kamilche Creek, several 30- to 55-foot wells have been drilled near the base of the bedrock hillside. The wells obtain domestic supplies from thin beds of sand in the recessional outwash which overlies the Tertiary volcanic rock.

Kamilche Peninsula

Most of the 27 wells canvassed on the Kamilche peninsula are near the shorelines of Oyster Bay, Totten Inlet and Skookum Inlet. Land surface at the wells is generally less than 50 feet above sea level and the wells tap ground water whose level stands at altitudes of 0 to 25 feet. Most wells near the shoreline obtain water from gravel of the Salmon Springs Drift. Although these wells are drilled chiefly for domestic supplies, pump-test data indicate that the more efficient ones can yield 40 gpm and more. Above the north shore of Oyster Bay several wells drilled for oyster-processing plants yield from 20 to 40 gpm with very little drawdown; pump tests suggest that yields of 200 to at least 400 gpm might be obtained from efficiently constructed wells.

A few domestic wells are on the higher interior parts of the Kamilche peninsula. Those drilled to depths that intersect the water table 50 to 75 feet above sea level obtain adequate domestic supplies from Vashon advance outwash. A few shallow dug and drilled wells have obtained small domestic supplies from perched aquifers in Vashon till.

Arcadia Peninsula

The demand for ground water on the Arcadia peninsula is principally for domestic use for homes and cabins near marine shorelines and for homes and small farms on the interior of the drift plain. The periphery of the peninsula is characterized by relatively high sea cliffs and the tops of about one-third of the 143 wells canvassed on the peninsula are 100 to 200 feet above sea level. For this reason most wells have been drilled 50 to 200 feet deep to reach the main water table.

Drillers' logs indicate that most wells located on the upland interior of the peninsula tap ground water in the advance outwash. Along the western parts of Hammersley Inlet domestic wells commonly yield 10 to 50 gpm from the Skokomish Gravel. Farther east the Skokomish Gravel is absent and the principle aquifers are in the Salmon Springs Drift which is more permeable than the Skokomish Gravel. Pumping tests indicate that yields of 30 to 200 gpm can be obtained there from efficiently developed wells that tap aquifers in the drift.

In the Mill Creek valley south of Shelton, a Rayonier test well was drilled to a depth of 790 feet (680 feet below sea level) into sand and gravel of undetermined age. According to the driller's record, the only water-bearing materials were penetrated between 26 and 36 feet above sea level. The pump test indicated a capacity in excess of 225 gpm. On the drift plain to the south, 65- to 140-foot wells located along the Olympia-Shelton freeway and 40- to 70-foot wells along the Brumbaugh County Road tap Vashon advance outwash for yields of 10 to 30 gpm, although pump tests suggest that some wells have potentials of more than 100 gpm.

Agate Peninsula

The major areas of ground-water use on the Agate peninsula are along Hammersley Inlet and Pickering Passage. About half the 75 wells of record are located within 50 feet of sea level. Because the interior upland of the peninsula is sparsely inhabited, only a few domestic wells supply the needs of the widely spaced homes along county roads and near the shores of Lake Spencer and Phillip Lake. Above the southeastern shoreline of Oakland Bay and the shoreline of Chapman Cove are a few homes that are served by shallow wells.

The most productive aquifers underlying the peninsula are in the Vashon advance outwash where it occurs below the regional water table, the Salmon Springs Drift near and below sea level beneath the eastern half of the peninsula, and the Skokomish Gravel near and below sea level along Oakland Bay and the western part of Hammersley Inlet. Most of the wells tapping these materials are fitted with pumps that produce from 10 to 20 gpm, but potentially greater yields are indicated by some drawdown tests. Well 20/3-21B1, on the upland above Munson Point, taps Skokomish Gravel slightly above sea level; a pumping test indicates that its potential yield is greater than 500 gpm.

Hartstene-Squaxin Islands

Ground-water supplies on Hartstene Island have been developed principally near the shoreline, where domestic quantities are obtained chiefly from aquifers at sea level in the Salmon Springs Drift. Well capacities of 50 to 95 gpm are indicated by pump tests of some efficiently constructed wells. On the interior upland of the island, a few scattered drilled wells obtain domestic supplies from Vashon advance outwash or, if drilled to near sea level, from the Salmon Springs Drift. As there has been little, if any, drilling much below sea level, the water-yielding characteristics of pre-Salmon Springs materials underlying the island are unknown. It is possible that future water requirements of residential growth on the island may be met either by more extensive development of aquifers in the Salmon Springs Drift, or by tapping deeper aquifers that may be continuous from the mainland beneath Pickering Passage.

Except for three test wells dug and bored for Squaxin Island Marine Park at the south end of Squaxin Island, no known development of ground water has been initiated on this sparsely inhabited Indian reservation. Located within 25 feet of sea level the test holes penetrated 24 to 68 feet of chiefly clay and silt without obtaining more than slight seepage. Any future development of ground-water supplies on the island may require test drilling at sites located higher above sea level in the northern part of the island; there, greater thicknesses of advance outwash gravels below till may offer better possibilities of ground-water storage above sea level. Large supplies also might be obtained by wells drilled far below sea level to intercept aquifers continuous from the mainland beneath the intervening marine channel.

Hope Island (0.15 sq mi) and McMickin Island (0.03 sq mi), lying off of Squaxin Island and Hartstene Island, respectively, have each a dug well which obtains a hand-pumped domestic supply from a shallow permeable zone in the Vashon till.

Mason Lake Drift Plain

Ground-water beneath the Mason Lake drift plain has been developed primarily near the marine shorelines of Hood Canal, Case Inlet, and Pickering Passage, and on higher ground near Mason, Prickett (locally known as Trail's End), Devereaux, and Benson Lakes.

Water supplies for homes and communities located above the east end of Hood Canal and above North Bay and Pickering Passage are obtained principally from sea-level aquifers in Salmon Springs Drift. Also, many wells near sea level in these localities obtain flowing artesian water at relatively shallow depths where a mantle of Vashon till or impermeable layers of the Kitsap Formation form a confining aquiclude. These flowing wells, in general, obtain water from aquifers between 30 and 40 feet below sea level. Well tests suggest capacities ranging from 20 and 100 gpm, although most wells are equipped with pumps of only 10- to 20-gpm capacities.

Several deep flowing wells have been drilled near the head of Hood Canal southwest of Belfair. Well 22/1-6B1, 15 feet above sea level, had a flow of 100 gpm in 1946 from an aquifer 245 to 248 feet below sea level. The aquifer is probably in older sedimentary strata beneath the Salmon Springs Drift. Nearby, well 22/1-6B2 had a flow of 35 gpm from an aquifer 353 feet below sea level. Such flows and well tests indicate that the area has a potential for greater development by large-capacity community-supply systems. Increased ground-water pumpage in some near-shore areas may require care, however, owing to a possibility of local salt-water intrusion.

From Twanoh State Park west along Hood Canal toward Alderbrook Inn (2 miles east of Union), domestic requirements of waterfront homes and small communities are met chiefly by small streams and numerous springs that issue from the hillside above the highway. The Skokomish Gravel is well exposed there and includes silt and clay beds which serve as perching layers above which the springs occur. A few shallow dug and drilled wells provide domestic supplies from aquifers in the Skokomish Gravel near sea level. These include the well at Twanoh State Park which has a pump-tested capacity of at least 100 gpm.

At the town of Union the community of 58 customers (in 1965) is served by two wells that tap aquifers both above and below sea level in the Skokomish Gravel. A privately owned well in Union (22/3-31A1) obtains a small artesian flow from a depth of 188 feet below sea level. The water requirements of the Alderbrook community on Hood Canal are partly met by well 21/3-4N1 which is at the golf club 2 miles inland. With the top of the well at an altitude of 520 feet (highest well recorded in the entire project area), the 292-foot well obtains a yield of 156 gpm, probably from aquifers in Vashon advance outwash.

Ground-water supplies for homes and cabins near the shorelines of the larger lakes on the drift plain are obtained generally from relatively shallow wells. Most of the wells above Mason Lake are less than 50 feet deep and tap aquifers in Vashon advance outwash at about lake level. On the upland above the south side of the lake, at about 125 feet above lake surface a 245-foot community-supply well (21/2-8A1) has a potential yield of about 300 gpm on the basis of a pumping test.

Reach Island (locally known as Treasure Island) and Stretch Island, located in Case Inlet immediately offshore from the Mason Lake drift plain, are supplied from several relatively deep aquifers which undoubtedly are in hydraulic continuity with those beneath the adjoining mainland. The needs of the Treasure Island community are adequately met by two wells (21/1-5A1 and 5H1) which tap aquifers from 145 to 180 feet below sea level, probably in Salmon Springs Drift. The pump tests show yield potentials of 100 to 200 gpm from these aquifers.

On Stretch Island ground water is obtained from both the Salmon Springs Drift and older materials. Pump tests of two wells indicate a yield potential of between 450 and 600 gpm from a zone 90 to 110 feet below sea level (well 21/1-8Q2) and a potential of over 1,000 gpm from aquifers 533 to 550 feet below sea level (well 21/1-8R1).

Western Outwash Plain

The major industrial and municipal ground-water supplies utilized in the report area are developed from deep aquifers underlying lower Shelton Valley, in the southeastern part of the western outwash plain. Several wells which in the past have supplied the industrial demands of Rayonier, Inc. and Simpson Timber Company were drilled to depths of 400 to more than 900 feet below sea level. Several of those wells have pump-tested potential yields of more than 2,000 gpm from undifferentiated pre-Vashon deposits.

Although most of the city of Shelton's municipal supply is obtained from a large spring at 20/3-18C, the yield from the spring is augmented during the summer months by withdrawal from two wells drilled north of the spring. The spring flows from Vashon recessional gravels of the Shelton delta, but the two wells (20/3-7L1 and 7P1) are each more than 700 feet deep and bottom in undifferentiated pre-Vashon deposits. Pump tests reported at the time of drilling indicate that their potential yields are each several thousand gallons per minute.

On the outwash plain north of Shelton several test wells have been drilled for Rayonier, Inc., and large potential yields are indicated by pump tests. Well 20/3-5F1 was reported by the driller to be capable of producing 2,500 gpm from several aquifers between 87 feet above and 245 feet below sea level (probably in the Skokomish Gravel, Salmon Springs Drift and undifferentiated pre-Vashon deposits). Also, two other Rayonier test wells about a mile to the north (21/3-31A1 and 31F1) were each reported by ground-water consultants to have a potential yield of 2,500 gpm. The wells tap aquifers ranging from 190 feet above to 213 feet below sea level, the major producers probably being in lower parts of the Skokomish Gravel and in the Salmon Springs Drift.

At the State Department of Institutions Correction Center several deep wells and test holes were drilled. Four wells range in depth from 178 to 632 feet and obtain ground water from the Skokomish Gravel and underlying sediments. Well capacities were only moderately large, ranging from 140 to 400 gpm during the pump tests. A half mile west of the Correction Center, well 20/4-8G1 had an artesian flow in 1962 of 70 gpm from a depth of 60 feet. This well and several other flowing domestic wells obtain ground water from aquifers in either the Vashon advance outwash or the Skokomish Gravel or both; apparently the water is confined

beneath Vashon till. Ground-water beneath higher land to the north provides the pressure head for the artesian flow.

On the outwash plain above the shoreline of Island Lake numerous 45- to 70-foot wells tap aquifers in Vashon advance outwash. A few of the wells have water levels below lake level, which suggests that Island Lake may be semiperched in recessional deposits and that both the lake and the nearby ground water are perched over Vashon till. Near U.S. Highway 101 and the Shelton Airport, several trailer courts and small stores are served by wells that are closely spaced; the wells are all within the depth range of 60 to 75 feet, and their water levels are 55 to 65 feet below land surface. These wells are generally pumped at rates of 15 to 30 gpm, although they would yield more as indicated by pump tests.

Flowing conditions exist in the upper reach of the gorge of Goldsborough Creek west of Shelton and near the head of Shelton Valley. Well 20/4-15L1 taps an aquifer at 172 feet below sea level and flowed 40 gpm when drilled. Well 20/4-26N1 flowed 60 gpm in 1953 from an aquifer 66 to 99 feet below sea level; the flow has since decreased to 5-10 gpm.

Domestic supplies for homes and small farms near the head of Oakland Bay are obtained from wells that tap both confined and unconfined aquifers. Along the lower slopes north of the bay several 15- to 20-foot dug wells tap perched zones in Vashon till; other, deeper, flowing wells tap zones confined beneath the till.

Skokomish Valley and Northwestern Drift Plain

All wells on the flood plain of the Skokomish Valley tap unconfined ground water in Quaternary gravels that probably include both Holocene alluvium and Vashon recessional deposits. Most dug wells and a few driven wells are 9-22 feet deep. Drilled wells are generally 20 to 45 feet deep; three reportedly are 66 to 96 feet deep. The water table is within 10 feet of land surface. Because these wells are primarily for domestic and stock supplies, only small-capacity pumps have been installed in most cases; their potential has not been determined.

Streams meet most of the limited demands for irrigation in the Skokomish Valley; however, large-capacity irrigation wells presumably could be drilled if surface sources become depleted. Irrigation wells 21/4-7K1 and 17C1, each 30 feet deep and 8 inches in diameter, presently yield 350 gpm each with reportedly very little drawdown.

At the base of the bluff on the south side of Skokomish Valley wells flow. Well 21/4-18K1, which serves the State Game Department fish hatchery, taps a confined aquifer probably within the Skokomish Gravel. This 78-foot well flows 52 gpm and is pumped at its capacity of 140 gpm. The artesian head occurs within aquifers beneath the high and extensive western outwash plain to the south of Skokomish Valley.

Because of the deep dissection into the drift plain above the north side of the Skokomish Valley by several peripheral streams, the regional water table probably occurs at considerable depth below the land surface. Because the upland is underlain by Vashon till, small quantities of perched ground water may be available to shallow wells; drilling to near sea level probably will be required to tap aquifers

in Vashon advance outwash or the Skokomish Gravel.

SUMMARY OF PRESENT USES OF GROUND WATER

Most wells within the project area are used for single-unit domestic supplies (fig. 7). Most are 6-inch drilled wells fitted with jet pumps that generally yield between 6 and 10 gpm. These pumps are adequate for the 50- to 75-foot depth range of most wells in this area.

Many 15- to 20-gpm wells serve small-community domestic systems of three to five homes each, and several wells of larger capacity (50-100 gpm) serve platted real-estate developments. The estimated total withdrawal from individual and small-group domestic wells is about 1,000 acre-feet a year.

The city of Shelton is served by two deep wells that augment the supply from the Shelton spring during the summer months. In 1963 the metered use by the city of 6,600 persons amounted to 640,000 gallons per day or 715 acre-feet.

The largest producing wells in Mason County are those which supply the industrial requirements of Rayonier, Inc. and Simpson Timber Company in Shelton. During 1965 these two companies withdrew a total of 2,800 acre-feet.

The use of ground water for irrigation in Mason County is minor. As of 1966, only 14 wells were used for irrigation of one or more acres, mostly in the Skokomish Valley.

Numerous minor industries use ground water; these include oyster processing and canning, wine production, gravel washing, fish rearing, mink raising, tree farming, log-pond maintenance, and dairy production. Ground water also supplies the county fairground, several schools, fire stations, nursing homes, restaurants, and service stations.

CHEMICAL QUALITY OF GROUND WATER

In all, 136 chemical analyses of ground water were available for study. Of these, three were complete to the extent that all the common anions and cations are known, and 133 are partial analyses in that only some of the major constituents were determined. In table 4 are listed the results of the 3 complete analyses and 21 partial analyses, and in table 5 are listed the remaining 112 partial analyses. From some wells, more than one sample was taken; the tables list samples collected from 119 wells and 1 spring.

Explanation of Water-Quality Data

In most ground water the principle dissolved constituents are silica (SiO_2), calcium (Ca), magnesium (Mg), sodium (Na), potassium (K), bicarbonate (HCO_3), sulfate (SO_4), and chloride (Cl). Other constituents that are present in appreciable concentrations in some waters are iron (Fe), carbonate (CO_3), fluoride (F), nitrate (NO_3), and orthophosphate (PO_4).

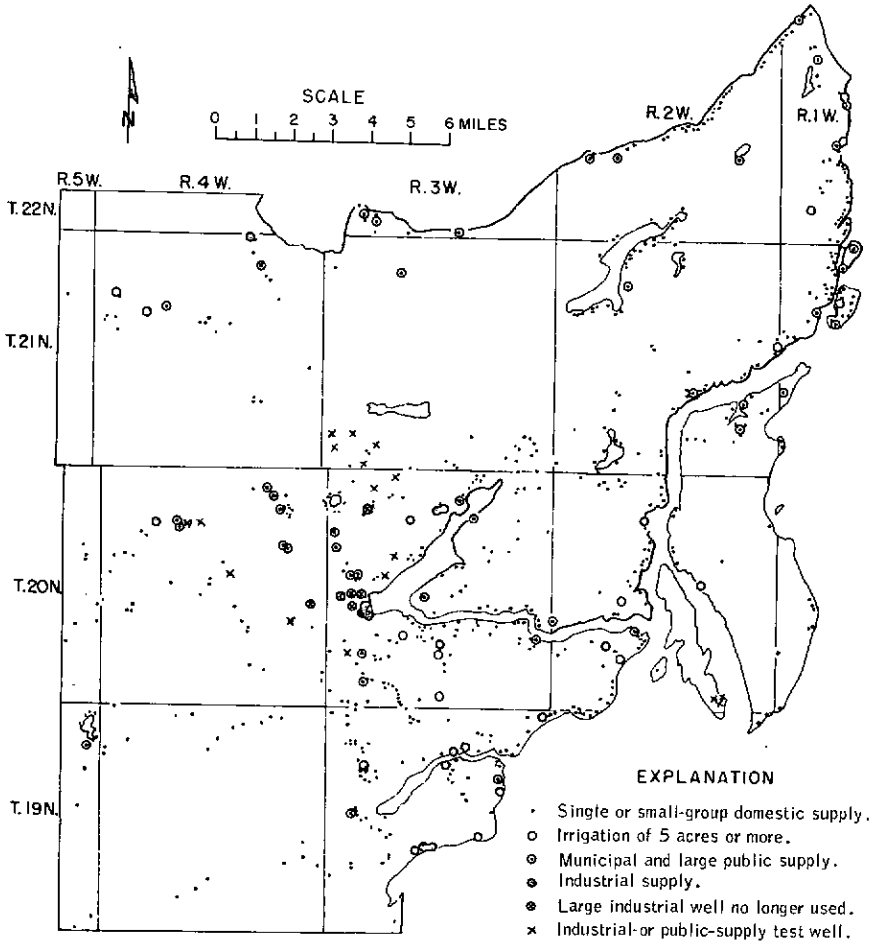

Figure 7 - Map showing distribution of types of uses of ground water within project area.

Concentrations of the chemical constituents, as well as water hardness, are reported in mg/l (milligrams per liter). Specific conductance, a measure of the ability of water to conduct electrical current, is expressed in micromhos per centimeter at 25°C (Celsius, or Centigrade). The electrical conductance is in most cases related to the amount of dissolved solids present. As a general rule, the dissolved solids (in mg/l) is 55 to 75 percent of the conductance, in micromhos.

The hardness of water has commonly been considered as a measure of its soap-consuming qualities and is most often determined by measuring the combined concentrations of calcium and magnesium. These two constituents also are the ones chiefly responsible for deposition of scale in hot-water lines and water-heating equipment. Hardness of water is reported in terms of the calcium-carbonate equivalent of calcium plus magnesium.

Water-Quality Standards

The suitability of ground water (in a native, or untreated, form) for domestic, agricultural, or industrial use is dependent on the concentrations of several dissolved constituents and upon other properties. For this reason, the U. S. Public Health Service (1962) has established recommended maximum concentrations for several constituents of drinking water. Values for the more commonly determined constituents are summarized below.

Constituent	Recommended maximum concentration (mg/l)
Iron (Fe)	0.3
Sulfate (SO_4)	250
Chloride (Cl)	250
Fluoride (F)	0.8 - 1.7 2/
Nitrate (NO_3)	45
Dissolved solids	500

2/ Maximum recommended limit varies with mean annual temperature on the assumption that in warmer areas people tend to drink more water--hence ingest more fluoride.

A determination of the hardness of water is important in considering the water for industrial and domestic use. The U.S. Geological Survey has classified hardness of water in the following manner:

Hardness (mg/l)	Classification	Usability
0-60	Soft	Suitable for many uses without further softening.
61-120	Moderately hard	Usable except in some industrial applications.
121-180	Hard	Softening required by laundries and some other industries.
More than 180	Very hard	Softening desirable for most purposes.

Areal Variations in Ground-Water Quality

Except locally, where contamination by saline water has occurred, ground water in the project area can be classified as good. In water from most wells, calcium, magnesium, and bicarbonate make up more than 50 percent of the common constituents. The water from very shallow wells is not markedly different from that of springs. For example, the water from well 20/4-2F1, from a depth of 44 to 136 feet, is almost identical chemically to the water from the spring at 20/3-18C.

In general, there is a direct relationship between bicarbonate and hardness. This is to be expected because the solubility of the common hardness-inducing constituents, calcium and magnesium, is increased by the presence of carbon dioxide.

Although dissolved-solids content was not determined as a part of the analyses listed in table 5, electrical conductivity was determined and, from this, approximate values of dissolved solids can be estimated (Hem, 1959, p. 40). For three analyses in table 4, in which both dissolved solids and electrical conductively were determined, the average ratio is 0.73. For several analyses of ground water in Pierce County, the ratio averages about 0.76 (Walters and Kimmel, 1968, p.68). Therefore, applying a ratio of 0.75 to the partial chemical analyses in table 5 (most of which include electrical conductivity), 75 are of water whose estimated dissolved-solids content is 100 mg/l or less.

Of the ground waters whose analyses are recorded in tables 4 and 5, iron content was determined for 111 of the samples. The iron content, most of which was determined in simple field tests, ranges from 0 to 1.6 mg/l (well 20/4-16R2). In water from only 15 samples was the iron content high enough (0.3 mg/l or higher) to be considered as troublesome to the user. Ground water that contains more than a minimal quantity of iron appears to originate from aquifers interbedded with organic material such as peat, a common association especially in glacial deposits (J. H. Feth, written comm., 1968).

The chloride content of ground water in the project area generally is low; in water from most wells it is less than 5 mg/l. In water from some wells, the chloride content ranges from 10 to about 30 mg/l. Such waters may be affected by incipient contamination although, more probably, they represent a distinct type which cannot be defined on the basis of data now available. For example, the water of fairly high chloride content, as much as 32 mg/l, that occurs in some aquifers in the older sedimentary deposits that underlie the Kamilche, Isabella, Shelton, and Goldsborough Creek valleys probably does not represent a mixture with present-day marine water. Rather, it suggests that the materials were deposited in marine waters from which the saline water has not been completely flushed.

When the chloride content is a few hundred milligrams per liter, such as 670 mg/l in well 20/2-21B1 and 400 mg/l in well 20/2-28B1, it doubtless results from saline-water intrusion. The high chloride content in the waters of these two wells shows that sea-water intrusion has occurred at least locally on both north and south sides of the entrance to Hammersley Inlet. There, the marine waters doubtless are in hydraulic continuity with aquifers tapped by the wells. A similar condition may exist in the aquifers beneath the land on the north side of Oyster Bay, where water with a chloride content of 324 mg/l was obtained from well 19/3-21H1. However, the low magnesium content, relative to the calcium content and lack of sulfate, does not confirm contamination by marine water.

Geologic Variations in Ground-Water Quality

Where possible, the waters from wells tapping similar stratigraphic units were grouped, and the concentrations of hardness and chloride, and electrical conductivity, were averaged. Figure 8 shows the relationship between maximum and median concentrations and in the chemical-quality variations between the units tapped. Some generalizations can be made concerning these relationships. For example, water from alluvium is the most dilute, whereas water from the stratigraphically lower units is higher in dissolved solids (as estimated from electrical conductivity) and in hardness. Water from aquifers below sea level has a higher chloride content, but it generally has less concentrations of dissolved solids than does water from the same formations above sea level.

The differentiation of the chemical quality of ground water stratigraphically is not conclusive because some of the water originating in the older units may have been grouped with younger units, or vice versa, because of inadequate data on zones of perforation and resulting misinterpretations. Of interest, however, is the

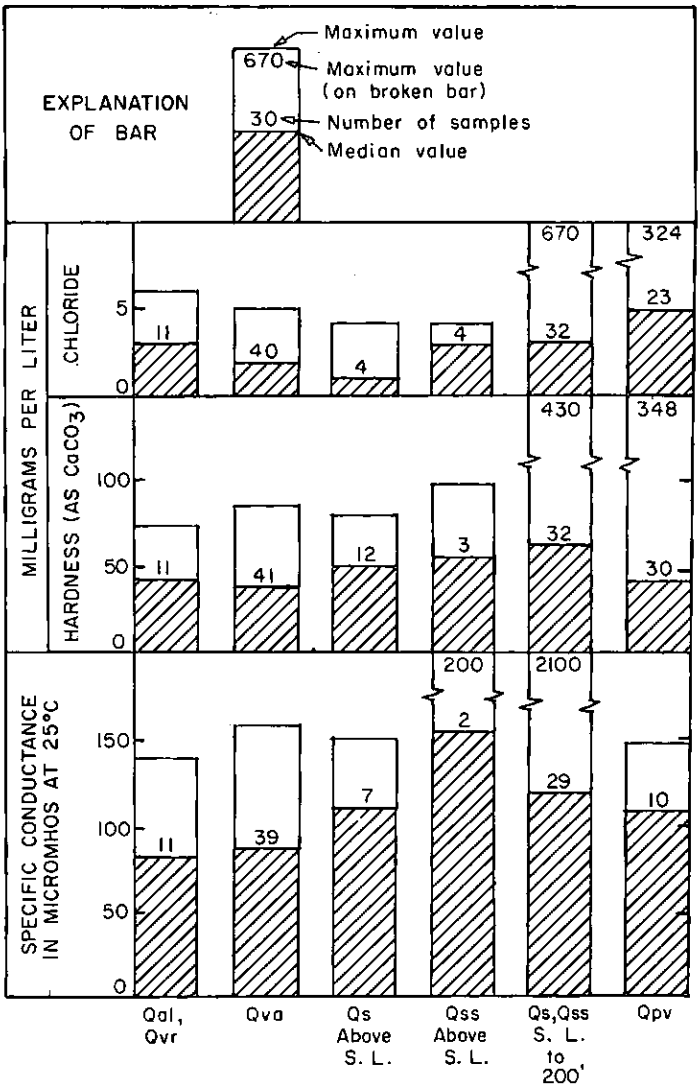

Figure 8 - Graph showing median and maximum values of important chemical characteristics of ground water from various stratigraphic units.

analysis of water from well 20/3-20E1. This water originates in pre-Vashon deposits at a depth range of 865 to 918 feet below sea level, and is the deepest water sampled, in the project area. The water is rich in sodium and is the softest water analyzed. Whether this water is typical of very deep aquifers in Mason County is purely conjectural, as only the one analysis (table 4) is available.

Quality Problems

Although present withdrawal of ground water has not approached the point of overdraft on the aquifers in most parts of the project area, some wells near marine shorelines have occasionally drawn in saline water during periods of heavy pumping. These have been wells that derive water from aquifers in the range between sea level and about 200 feet below sea level. In the future, as the need for water of dependable quality increases, more care will be necessary when withdrawing water from aquifers susceptible to salt-water intrusion. Optimum yields of wells that tap zones in question should be determined by hydrologic investigations which include periodic chemical analyses of the ground water.

Heavy withdrawal of water from high-yield wells that tap the deeper aquifers in the lower Shelton Valley has resulted in increases of the chloride content of the water. The following table shows that, during the summer when wells

Well No.	Date of collection	Chloride (mg/l)	Dissolved solids (mg/l)	Hardness (mg/l)	Calcium (mg/l)
20/3-19H1	5- -37	293	695	348	98
	1-27-47	8.5	97	26	9.6
	6-30-47	15	97	21	10
20/3-20M1	1-27-47	21	135	51	20
	6-30-47	41	--	54	21
20/3-20M2	1-27-47	17	130	47	18
	6-30-47	32	126	43	17

20/3-20M1 and 20M2 were pumped heavily, a marked increase in chloride took place. On the other hand, when well 20/3-19H1 was pumped less, from 1937 to 1947, the chloride content of the water pumped from the well decreased, even though gross contamination already had occurred. Whether the observed contamination was from sea water or from native saline water from adjacent, hydraulically related aquifers cannot now be determined. That saline intrusion is a reversible process has been shown elsewhere (Piper, Garrett, and others, 1953, p. 125). In the area underlain by the Shelton delta, north of Shelton Valley, contamination of ground water has occurred in the past as a result of infiltration of industrial waste. Prior to installation of the waste-disposal evaporating system at the plant in about 1946, the industrial effluent from Rayonier, Inc., was piped to Goose Lake (20/4-12N) and sprayed over the lake surface. This practice was discontinued in about 1944 because it resulted in noticeable contamination of the water in wells located south of the lake. The results indicated that ground water moving southward through the relatively coarse delta gravels and sands was

susceptible to contamination. Future large-scale residential development of the upland north of Shelton Valley must therefore be accompanied by a recognition of the possibility of contamination by septic wastes, and by a program to control contamination and to monitor the quality of the ground water.

Contamination of ground water can occur in areas currently being developed for lakefront homesites. Rapid concentration of new homes around existing lakes is being accompanied by the platting of new housing subdivisions around artificial lakes created by the damming of streams at numerous places on the interior of the uplands. Unless steps are taken to insure adequate sewage treatment and waste disposal for such subdivisions, effluent from septic drainfields can not only contaminate underlying ground-water reservoirs but can cause undesirable pollution of the lakes themselves.

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TABLE 2 - RECORDS OF WELLS

Table 2.--Records of wells.

Well locations shown on Plate 3.

Explanation:
Well No.: See Figure 1 for well-numbering system.
Alt.: Altitude of land surface above mean sea level, interpolated from topographic maps.
Type of well: B, bored; Dg, dug; Dn, driven; Dr, drilled.
Water-bearing zone(s): aquifer(s) tapped by well; excludes aquifer(s) in which water lacks hydraulic continuity with water in well.
Water level: Measurement in feet and decimal fractions were made by Department of Water Resources or U.S. Geological Survey; those in whole numbers were reported by owner, tenant, or driller.
Type of pump: C, centrifugal; J, jet; N, none; P, piston; S, submersible; T, turbine.
Use of water: D, domestic; Ind, industrial; Irr, irrigation; NU, not used; PS, public supply; S, stock; T, test well.
Remarks: C, chemical analysis in Table 4, Cp, partial chemical analysis in Table 5, dd, drawdown; gpm, gallons per minute; L, driller's log in Table 3, Obs, observation well, hydrograph in Figure 5; perf, perforations.

Well No.	Owner or tenant	Well					Water-bearing zone(s)		Water level		Pump		Use of Water	Remarks
		Alt. (feet)	Type	Diam. (inches)	Depth (feet)	Casing depth (feet)	Material	Depth interval (feet)	Below land surface (feet)	Date	Type	H.P.		
T. 19 N., R. 2 W.														
1A1	Harry Craft	32	Dr		67	-	-	-	28.32	8-29-63	-	-	D	Pumped 50 gpm.
1B1	R. A. Shephard	90	Dr	8	84	-	-	-	-	-	J	-	D	Pumped 25 gpm.
5C1	W. T. Bucey	100	Dr	6	103	-	Gravel	94-103	70	5- -62	J	½	D,Irr	Pumped 15 gpm; dd 10 ft; L.
5C2	R. W. Bogrand	140	Dr	6	212	-	-	-	-	-	-	5	D	Peat at 180 ft; deepest well in immediate area.
6A1	H. H. Unger	120	Dr	6	170	-	-	-	120	-	J	½	D	
6B1	Davis	40	Dr	6	100±	-	-	-	-	-	-	-	D	
6B2	H. Eigenman	15	Dr	6	37	-	-	-	10	-	J	½	D	Pumped 16 gpm.

6D1	Helen McCann	80	Dr	6	128	-	Fine sand	-	40	5- -59	J	½	D	
6D2	D. A. Stroup	140	Dr	6	163	153	Gravel, sand	-	70	1-23-64	-	-	D	Bailed 40 gpm, no dd; L.
							T. 19 N., R. 3 W.							
1A1	E. L. Smith	25	Dr	6	200	-	-	-	25	-	J	½	D,Ind	Driller reports excellent supply.
1C1	Fred Silva	145	Dr	6	252	-	-	at 252	142	-	P	2	D	Casing perforated at bottom.
1L1	K. N. Anthony	75	Dr	-	138	-	-	-	-	-	J	1½	D	
1N1	Larry Oliver	110	Dr	6	179	-	-	-	105.00	7-24-64	S	1½	D	Supplies 3 homes; water sandy since earthquake of April, 1965.
2L1	Leslie Collins	50	Dg	36	17	4	Gravel, sand	6-17	7.33	10-30-62	C	½	D	L.
2M1	J. M. Shrum	155	Dr	8	54	-	-	-	35.28	10-29-62	J	1	D,S	
2M2	William Marcy	140	Dr	-	72	-	-	-	20	-47	J	1	D, Irr	
2P1	R. H. Mattson	75	Dr	6	97	-	-	-	-	-	J	1	D	Cp.
3F1	R. H. Neurert	80	Dg	36	12	12	-	-	8.08	10-30-62	C	½	D	Can be pumped dry.
3Q1	Edwin Braz	90	Dr	6	124	-	-	-	109	-	S	3/4	D	
3Q2	Ira Stansbury	45	Dr	8	107	-	-	-	25	-	J	1	D,Ind	Water used for oyster processing.
3R1	Joe Silva	68	Dg	48	26	26	"Hardpan," gravel	8-25	7.67	10-29-62	C	3/4	D	Water contains iron; L.
4D1	Gerald Coleman	150	Dr	6	50	-	-	-	28.43	10-30-62	J	1	D	
4F1	L. J. Morris	168	Dr	6	62	62	Gravel, sand	42-62	31	9- -62	J	½	D,S	L.
4F2	W. S. McGee	164	Dr	6	59	-	Gravel	47-57	-	-	J	½	D	L.

Table 2 - Records of wells - Continued

Well No.	Owner or tenant	Well					Water-bearing zone(s)		Water level		Pump		Use of Water	Remarks
		Alt. (feet)	Type	Diam. (inches)	Depth (feet)	Casing depth (feet)	Material	Depth interval (feet)	Below land surface (feet)	Date	Type	H.P.		
T. 19 N., R. 3 W. (continued)														
4F3	Walter Stansbury	175	Dr	6	71	71	Sand, gravel	63-71	54	7-24-65	J	-	D	Bailed 20 gpm, no dd; L.
4G1	Floyd Weddle	160	Dr	6	45	45	"Hardpan"	30-45	-	-	J	½	D,S	
5P1	W. J. Russell	200	Dr	6	107	-	-	-	87	12- -61	J	3	D	Pumped 30 gpm.
6A1	W. R. Moultrop	190	Dr	4½	98	-	Gravel	90-98	70	-	J	1	D	Pumped 10 gpm; L.
6B1	L. L. Beerbower	205	Dr	6	89	-	-	-	30	-	J	1	D	Pumped 20 gpm.
6G1	D. B. Kelley	190	Dr	6	90	-	-	-	-	-	-	-	D	Blue clay at 90 ft, screened above.
6Q1	V. Rodgers	238	Dr	6	78	-	-	-	-	-	J	1	D	Nearby dug well has 8 ft water level.
6Q2	Bryce Campbell	243	Dr	6	150	-	Gravel	-	80	-	S	3/4	D	Bailed 25 gpm.
6Q3	G. Swayze	238	Dr	6	148	-	-	-	75.2	7-30-64	S	3/4	D	Pumped 10 gpm, dd 18 ft, 20 min, recovery complete in 24 min.
6R1	R. J. Nutt	235	Dr	6	175	-	-	-	90	8- -62	S	1	D	
6R2	R. J. Nutt	230	Dg	48	15	-	Rusty till "hardpan"	-	12.29	11-2-62	N		NU	
7H1	John Blanten	220	Dr	6	99	99	Gravel, sand	90-99	83	6-5-62	-		D	Bailed 12 gpm, dd 3 ft.; L.

8D1	Botts Nursing Home	205	Dr	6	104	-	Gravel	-	24	12- -47	S	3/4	D	Supplies nursing home and 3 trailers; L.
8D2	Mrs. Miller	205	Dr	6	98	-	-	-	80.3	10-23-62	J	2	D	
8L1	Ted Hile	200	Dr	6	>120	-	-	-	-	-	J	1	D,S	
8M1	Ralph Brewer	190	Dr	10	53	53	Sand,gravel	40-50	30.6	5-27-63	T J	5 ½	D,S, Irr	Pumped 200 gpm, dd 4 ft, 24 hrs, 5 min recovery; Cp, L.
8M2	Skyline Drive-In Theatre	200	Dr	6	136	131	Sand,gravel	122-136	90	-	-	-	PS	Bailed 10 gpm, dd 20 ft; L.
8N1	E. S. Becker	195	Dr	4	>100	-	-	-	>60	10-29-62	J	1	D	
8N2	R. F. Pendergraft	195	Dg	-	65	-	-	-	52.36	10-29-62	J	½	D,S	
8N3	E. W. Taylor	190	Dr	6	110	-	-	-	65	-	S	1	PS	Supplies restaurant and service station.
8N4	E. W. Taylor	198	Dr	6	110	-	-	-	-	-	J	-	D	
8P1	Dick LaFond	200	Dr	6	81	81	Gravel	67-81	67	-	J	-	D	Bailed 10 gpm, dd 1 ft; L.
9E1	H. H. Leonard	180	Dr	6	200	-	Sand	112-115, 164	44.42	5-29-64	J	½	D	Pumped 18 gpm, dd 20 ft; L.
9H1	Cecil Blackwelder	15	Dr	6	40-50	-	-	-	Flows	5-28-64	J	½	D	Flows 0.10 gpm. Supplies 2 homes, dairy. Water contains iron.
10B1	H. G. Nelson	35	Dr	6	42	-	-	-	-	-	J	1	D,Irr	Water contains iron.
10C1	D. J. Lynch	15	Dr	6	89	-	-	-	-	-	J	½	D,Ind	Water used for oyster processing.
10D1	Margaret Bishop	35	Dr	6	35	-	-	-	6.96	10-29-62	C	1	D	Water used for oyster processing.
10F1	Dan Brown	95	Dg	24	28	-	-	-	23	-	J	½	D,S	

Table 2 - Records of wells - Continued

Well No.	Owner or tenant	Well					Water-bearing zone(s)		Water level		Pump		Use of Water	Remarks
		Alt. (feet)	Type	Diam. (inches)	Depth (feet)	Casing depth (feet)	Material	Depth interval (feet)	Below land surface (feet)	Date	Type	H.P.		
T. 19 N., R. 3 W. (continued)														
10F2	Jack Hisata	42	Dr	6	135	-	-	-	-	-	C	½	D,Ind	Flows in winter; water used for oyster processing.
10L1	Pearl Brownfield	120	Dr	4	"deep"	-	-	-	-	-	C	½	D	Shallow water level. Water hard, contains iron; Cp.
10L2	Ira Workman	133	Dr	6	93	-	-	-	78.3	10-23-62	N	-	NU	
10P1	Lloyd Clark	230	Dr	6	165	-	-	-	-	-	J	1	D	Water slightly hard, contains iron.
10P2	Delmar Brownfield	205	Dr	6	150	-	-	-	133.38	5-27-64	J	1	D	
10R1	Fred Clark	160	Dr	6	160	-	Gravel	141-160	-	-	S	1	D,Irr	Flammable gas at 140 ft, iron 7.5 ppm. Unsuitable for laundry; L.
11A1	Robert Marcy	60	Dr	6	83	83	Gravel	73-83	59.22	7-24-64	J	1	D	Bailed 40 gpm, dd 8 ft; L.
11B1	R. F. Wallin	15	Dr	6	100	-	-	-	14.75	10-30-62	J	3/4	D	
11D1	W. S. Allen	75	Dg	36	-	7	-	-	0	10-30-62	C	½	D	
11G1	O. R. Taylor	40	Dr	6	105	-	-	-	30.82	10-23-62	J	½	D	Sulphur smell, otherwise good water; Cp.
11G2	O. R. Taylor	40	Dg	36	24	8	Gravel	at 24	20.45	10-22-62	-	-	NU	Water contains iron; bad taste Clay most of depth.

11G3	Al Taylor	25	Dr	6	105	-	Gravel, sand	100-105	15	-	J	1	D	L.
11Q1	Kamilche Shores, Inc.	103	Dr	8	127	119	Gravel, sand	117-127	101	7- -64	T	5	PS	Bailed 35 gpm, dd 2 ft; L.
12D1	J. A. Sells	50	Dr	6	149	149	Sand	75-149	-	-	J	1	D	Water contains iron; inadequate supply; Cp.
14B1	Ernest Dahman	12	Dr	6	87	-	-	-	7.58	5-27-64	P	2	D,Ind	Water used for oyster processing.
14L1	A. H. Fagergren	30	Dr	6	40-45	-	Gravel	-	-	-	J	1	D	
15B1	----	240	Dg	36	30	-	-	-	22.34	10-22-62	C	1	D	
15H1	Walt Bloomfield	185	Dg	36	30	-	-	-	22.93	5-27-64	C	1½	D,S	
17N1	Alvin Nagle	45	Dg	72	17.5	17.5	-	-	16.73	10-23-62	C	½	D	Water contains iron.
17R1	Edward Sigo	15	Dg	36	18	-	Gravel	-	12	-	C	1	D	Will pump dry, but water level recovers rapidly.
18J1	Marshall White	130	Dr	6	44	40	Sand, rock	33-43	28	-	-	-	D	Bailed 8 gpm, dd 2 ft; L.
18R1	Lloyd Clark	45	Dr	6	37	-	-	at 37	17.50	10-23-62	J	½	D	Cp.
18R2	Kamilche School	45	Dr	6	45	-	Gravel	39-45			J	1	PS	Water contains iron.
18R3	Chester Marshall	120	Dr	6	55	54	Sand, gravel	45-55	20.67	8-5-64	J	1/3	D	Bailed 7 gpm, dd 12 ft; L.
18R4	Al Nagel	40	Dr	6	40	40	Sand, gravel	39-40	18	-	-	-	D	Bailed 12 gpm, dd 2 ft; L.
20C1	O. Landberg	160	Dg	48	14	-	-	-	Flows	5-13-64	C	3	D,S	Flows 2 gpm. Supplies mink pens.
20D1	C. F. Blackwelder	65	Dr	6	200	200	-	at 200	50.00	10-29-62	T	1½	D	Reportedly first water at 30 ft., artesian water at bottom; Cp.
20G1	W. C. Frye	240	Dr	6	141	-	Bedrock	105-141	61.39	10-23-62	J	1	D	Pumped 15 gpm, dd 10 ft; L.

Table 2 - Records of wells - Continued

Well No.	Owner or tenant	Well					Water-bearing zone(s)		Water level		Pump		Use of Water	Remarks
		Alt. (feet)	Type	Diam. (inches)	Depth (feet)	Casing depth (feet)	Material	Depth interval (feet)	Below land surface (feet)	Date	Type	H.P.		
							T. 19 N., R. 3 W. (continued)							
20G2	A. C. Kelley	200	Dr	6	55+	-	-	-	12.36	5-13-64	J	1	D	
20Q1	Clifton Barnes	240	Dg	36	20±	-	-	-	9.40	10-22-62	C	½	D	Inadequate supply.
20Q2	Clifton Barnes	235	Dr	6	70	70	-	at 70	15.65	10-22-62	J	1	D	Barely supplies 2 homes; Cp.
21H1	Olympia Oyster Company	10	Dr	8	264	255	Sand, gravel	248-264	7	4-21-52	-	-	Ind	Pumped 76 gpm, dd 18 ft; C, L.
21H2	Olympia Oyster Company	42	Dr	6	75	-	Sand, gravel	32-75	25	4- -64	T	3	Ind	Pumped 40 gpm, dd 4 ft, 4 hr; L.
21L1	J. J. Brenner Oyster Company	85	Dr	6	110	110	Gravel	32-36	32	9-8-55	J	1	Ind	Pumped 19 gpm, dd 2 ft, 5 hr; temp 9°C; Cp. L.
23E1	Nat Waldrip	30	Dr	6	51	-	Coarse sand	30-51	30	-	J	1	D,Ind	Pumped 20 gpm, dd 6 ft; water used for oyster processing; L.
29B1	Denis August	215	Dg	12	14	-	-	-	-	-	C	½	D	
30B1	Max Waldburger	100	Dr	6	117	99	Sand, silt	97-110	+1	11-2-62	J	½	D,S	Flow ½ gpm 11/2/62; Cp, L.
30B2	Lester Waldburger	110	Dr	6	70	70	Gravel, sand	56-70	40	8-2-65	J	-	D,S	Bailed 10 gpm, dd 23 ft; L.
30E1	E. E. Taylor	90	Dg	48	11.3	-	-	-	5.49	11-2-62	C	1/3	NU	
32J1	Raymond Rose	75	Dr	6	59	52	-	-	15	-	J	1	D	Pumps sand. 10-ft screen at bottom.

2F1	H. A. Loertscher	165	Dr	6	110	110	Gravel	62-66	17.46	3-6-62	J	½	D	Cp, L.
2G1	D. M. Saeger	195	Dr	6	67	-	-	-	30.11	2-8-63	J	½	D	
2H1	Francis Olson	158	Dr	6	49	-	Gravel	at 49	16	2-8-63	J	3/4	D,S	Supplies 2 homes and dairy.
3J1	R. W. Mitchell	160	Dg	36	20	-	-	-	3.00	2-8-63	C	½	D	
3K1	Ralph Weddle	210	Dr	6	23	23	Gravel, sand	18-23	12	-	-	-	D	Pumped 4 gpm, dd 6 ft; L.
3N1	B. L. Huisingh	170	Dr	6	99	-	-	-	-	-	J	1	D, pool	Flows after heavy winter rains; Cp.
4E1	Clarence Suther	410	Dr	6	14	-	-	-	-	-	-	-	NU	Basalt at 3 ft.
4G1	Florian Florek	320	Dr	6	19	-	-	-	2.40	2-8-63	C	½	D	
6C1	Ethel Galbraith	420	Dr	6	60	-	-	-	-	7-1-65	-	-	-	Dry hole; L.
6R1	Willis Tibbits	500	Dr	6	47	-	Gravel	-	13.11	2-8-63	J	3/4	D	Overlying "hardpan" at least 20 ft thick; dd at least 15 ft.
7D1	Clyde Norris	505	Dr	6	74	-	-	-	-	-	J	½	D	
7E1	E. E. Borden	504	Dr	6	34	-	-	-	14.20	2-8-63	N	-	NU	Reported very little dd when used; Obs.
9A1	C. W. Clanton	200	Dr	6	45	28	Gravel	23-28	6.00	2-8-63	J	½	D	Pumped 10 gpm; L.
24L1	A. H. Stoehr	60	Dg	-	20	-	-	-	8	-	C	1	D	
24P1	Wes Whitener	80	Dr	-	147	-	Gravel	143-147	31.06	11-1-62	J	½	D	Pumped 25 gpm, dd 30 ft., 25 hr; supplies 2 homes; Cp, L.

Table 2 - Records of wells - Continued

Well No.	Owner or tenant	Well					Water-bearing zone(s)		Water level		Pump		Use of Water	Remarks
		Alt. (feet)	Type	Diam. (inches)	Depth (feet)	Casing depth (feet)	Material	Depth interval (feet)	Below land surface (feet)	Date	Type	H.P.		
T. 19 N., R. 4 W. (continued)														
25A1	Richard Durkin	100	Dg	48	9	-	-	-	1.86	11-2-62	C	1	D	
26A1	Stephen Swantak	75	Dg	36	13	13	-	5-13	5	-	C	1/3	D,S	Pumps dry in summer; water hard, Cp.
28J1	Angus Ellison	160	Dr	6	52	-	Sand	47-52	-	-	J	3/4	D	5-ft screen at bottom.
28Q1	C. E. Buxton	130	Dg,Dr	6	100	-	"Pea gravel"	80-100	80	-	J	½	D	Supplies 3 homes; L.
33D1	H. O. Villines	158	Dr	6	64	-	-	-	29	-	J	½	D	
T. 19 N., R. 5 W.														
1G1	Jim Sauer	484	Dg	6	36	6	Gravel	0-6	3	-	C	1/3	D	Supplies 2 cabins.
1G2	Aberdeen Y.M.C.A.	499	Dr	6	96	-	-	-	59.98	5-6-63	J	3/4	PS	Reportedly has low yield.
1H1	Clay McCartney	493	Dr	6	33	-	-	-	13.0	5-6-63	C	½	D	
1L1	A. G. Carlson	495	Dr	6	89	87	Gravel, sand	70-89	67	9-17-63	-	-	D	Bailed 14 gpm, dd 1 ft; L.
1R1	R. S. Bolduc	497	Dr	6	117	-	-	at 60	32.20	6-20-63	J	½	D	Supplies 2 homes.
12B1	Elma Country Club	486	Dr	6	73	-	-	at 73	31.10	6-20-63	J	1	PS	Supplies 24 cabins; Cp.
12K1	Joe Fruichantie	465	Dr	6	80	-	-	-	-	-	J	1	D,S	Supplies dairy.
13L1	George Leboki	465	Dr	6	112	-	-	-	30±	-	J	1	D	Pumped 12 gpm, dd 44 ft, 15 min; Cp.

36J1	Brown	400	Dg	36	15	-	-	-	14	-	N	-	D	Water obtained by winch and bucket.
36P1	Richard Antilla	363	Dr	6	33	-	-	-	13.73	7-29-64	C	1/3	D	
							T. 20 N., R. 1 W.							
6M1	A. B. Carson	25	Dg	60	50	-	-	-	-	-	-	-	D	
19A1	J. J. Lohrer	20	Dr	6	56	-	-	-	18.64	7-14-65	J	1	D	Bailed 20 gpm, dd 2 ft.
19R1	Mary Adams	50	Dr	6	75	-	-	-	-	-	J	-	D	
20E1	L. H. Jerrells	20	Dr	6	57	-	Sand, gravel	28-57	16.14	7-14-65	S	1/3	D	Bailed 15 gpm, dd 3 ft; Cp, L.
20E2	L. H. Jerrells	20	Dg	48	23	-	Black sand	22-23	15.74	8-29-63	J	½	D	L.
20E3	Paul Chaffee	30	Dr	6	59	-	-	-	-	-	J	½	D	
20N1	Wilmott Ragsdale	25	Dn	1½	18	18	-	-	15	-	S	-	D	
30M1	Dorothy Smith	240	Dr	6	419	-	Sand	409-419	234.60	8-29-63	P	1	D	Pumped 14 gpm; serves 2 homes; L.
31N1	H. W. Lister	31	Dr	6	67	67	Gravel	53-67	27	-	J	½	D	Pumped 30 gpm; L.
							T. 20 N., R. 2 W.							
3M1	J. M. Peterson	12	Dr	6	94	-	Sand, gravel	50-94	8	-	-	-	D	L.
3P1	G. B. Howard	20	Dr	6	61	-	Gravel	58-61	20.70	8-28-63	J	3/4	D	Pumped 16 gpm, dd 35 ft.; Cp, L.
3P2	G. T. Waite, Sr.	30	Dg	18	13	-	-	-	5.49	8-28-63	P	¼	D	
4A1	Besse Anderson	30	Dr	6	90±	-	-	-	16.35	6-21-63	J	1	D	

Table 2 - Records of wells - Continued

Well No.	Owner or tenant	Well					Water-bearing zone(s)		Water level		Pump		Use of Water	Remarks
		Alt. (feet)	Type	Diam. (inches)	Depth (feet)	Casing depth (feet)	Material	Depth interval (feet)	Below land surface (feet)	Date	Type	H.P.		
T. 20 N., R. 2 W. (continued)														
4H1	Leroy Fuller	15	Dr	6	103	103	Sand,gravel	61-103	7	-	-	3/4	D	Pumped 16 gpm, dd 31 ft; L.
4K1	Clive Troy	35	Dg	-	12+	-	"Hardpan"	2-9	2	-	-	-	D	
5A1	Samuel Magruder	200	Dr	6	110	110	Sand	75-110	35	-	J	½	D	Pumped 10 gpm, dd 1 ft, 4 hr, temp 10°C, L.
5A2	Gary Probert	200	Dr	6	80	-	-	-	30	-	J	1	D	Iron problem; Cp.
5B1	H. G. Wheeler	195	Dr	6	54	-	Sand,gravel	40-54	20	9-23-61	J	3/4	D	Pumped 15 gpm, dd 11 ft; L.
5C1	L. E. Brewer	200	Dr	6	73	68	Sand,gravel	53-73	-	-	J	-	D	L.
5C2	Jay Noll	200	Dr	-	49	-	-	at 49	18.58	9-10-63	J	3/4	D	Cp.
5G1	Noel Bentley	25	Dr	6	115	-	-	-	-	-	-	-	D	Hand-pumped; water contains iron.
6A1	C. L. Dougherty	180	Dr	6	48	-	-	at 48	6.08	5-29-63	C	½	D	Cp.
9B1	DGTGOC Water System, Inc.	40	Dr	6	144	144	Sand	140-144	35.50	6-11-63	S	1	PS	Pumped 20 gpm, dd 37 ft. Cp, L.
9B2	Werberger Winery	12	Dr	8	68	-	Gravel	-	-	-	T	1	Ind	
9J1	Myron Massey	15	Dr	6	113	-	Gravel	at 113	-	-	J	1	D	
9Q1	Lilly Cameron	24	Dg	36	23	none	"Hardpan"	-	17.99	9-5-63	C	½	D	

9Q2	James Cameron	18	Dr	6	59	-	-	-	8.60	9-5-63	C	¼	D	Supplies 2 homes.
10P1	S. M. Baunsgard	20	Dg	48	24	-	-	-	-	-	P	1	D	
10P2	Nels Baunsgard	12	Dg	36	12	-	-	-	9½	-	P	¼	D	
12A1	Hugo Glaser	10	Dg	36	22	22	-	-	-	-	C	1	D	
14B1	James McAuliffe	175	Dr	6	118	113	Sand,gravel	102-118	80	8-27-63	J	1	D	Pumped 16 gpm, dd 20 ft; Cp, L.
14N1	Lawrence Saeger	20	Dr	6	53	-	Gravel	49-53	-	-	J	3/4	D,Ind	Pumped 25 gpm, slight dd; water used for oyster processing; L.
15C1	Gordon Simmons	18	Dg	48	20	-	-	-	-	-	C	3/4	D	
16B1	Albert Schneider	10	Dr	8	28	28	-	-	-	-	C	½	D	Pumped 16 gpm.
16B2	G. R. Anderson	30	Dr	6	43	41	Gravel,sand	40-41	27	7-22-65	J	-	D	Bailed 8 gpm, slight dd; L.
16B3	William Leveque	15	Dr	6	94	94	Sand,clay	84-94	12	3-24-65	-	-	D	Bailed 15 gpm, dd 30 ft; L.
16F1	M. A. Smith	65	Dr	6	79	79	Gravel,sand	74-79	60	8-16-65	J	-	D	Bailed 15 gpm, dd 2 ft; L.
16M1	Phil Chapman	90	Dg	48	20	10	"Hardpan"	-	6.34	6-11-63	C	½	D	
16M2	Martin Auseth	125	Dr	6	127	-	Sand,gravel	109-127	115	-	J	1½	D	Peat at 100 ft; Cp, L.
16P1	Wm. McLaughlin	20	Dg	48	18	3	"Quicksand"	16-18	6.0	6-11-63	C	½	D	Pumped 10 gpm, can be pumped dry; L.
17P1	Jalmer Auseth	170	Dr	-	86	-	Sand,gravel	67-86	67	5- -46	J	½	D	Pumped 22 gpm, dd 20 ft; L.
19N1	c/o Waterfront Realty	30	Dr	8	100	-	-	-	-	-	J	1½	PS	Serves 4 homes.
20A1	H. O. Rowe	95	Dr	8	-	-	-	-	84.64	6-7-63	S	5	D,Irr	
20G1	----	75	Dg	48	12	2	Sand	-	3.00	6-11-63	-	-	NU	

Table 2 - Records of wells - Continued

Well No.	Owner or tenant	Well					Water-bearing zone(s)		Water level		Pump		Use of Water	Remarks
		Alt. (feet)	Type	Diam. (inches)	Depth (feet)	Casing depth (feet)	Material	Depth interval (feet)	Below land surface (feet)	Date	Type	H.P.		
T. 20 N., R. 2 W. (continued)														
20H1	W. E. Nyberg	80	Dr	8	120	-	-	115-120	76.50	6-11-63	S	1½	D	Stet
21B1	Irvin McArthur	25	Dr	6	60	-	-	at 60	-	-	J	½	D	Pumped 15 gpm; water has salty taste; Cp.
21P1	Arkada Park Subdivision	50	Dr	8-6	183	183	Sand	124-183	72	-	S	5	PS	Pumped 80 gpm, dd 28 ft; Cp, L.
25M1	M. A. Olson	10	Dr	6	38	-	Gravel	22-38	9.69	8-28-63	J	½	D	Pumped 13 gpm; L.
25M2	Mrs. James Weaver	16	Dr	6	134(?)	-	-	-	8.38	8-28-63	N	-	D	
28B1	B. N. Collier	15	Dr	6	172	-	-	at 172	14.15	2-21-63	S	1½	D	First water at 75 ft; Cp.
28C1	Rex Barnard	25	Dr	6	60	-	-	-	-	-	J	½	D	
28C2	C. W. Teagle	60	Dr	6	96	-	-	68 and 86	56.11	2-21-63	J	1	D	Blue clay at bottom; perf 68 ft and 86 ft; water reported hard.
28C3	L. J. Munson	27	Dr	6	65	-	-	-	-	-	J	½	D	Cp.
28F1	A. R. Stewart	30	Dr	6	76	-	-	-	-	-	J	1	D	Water reported hard.
28R1	Robert Munns	30	Dg	-	-	-	-	-	-	-	P	1	NU	Only well on Hope Island.
29D1	Roy Castle	145	Dg	36	20	-	-	-	14.57	7-23-64	C	3/4	D	
29G1	Jim Buzzard	215	Dr	10	24	-	-	-	6.80	7-23-64	P	1	D,Ind	

29H1	Lloyd Kimmerly, Jr.	185	Dg	48	6	-	-	-	1.00	7-23-64	C	½	D	
29J1	H. W. McClary	175	Dr	12	210	-	-	-	-	-	T	7½	D,Irr	Water contains iron.
29P1	Joe Glassey	220	Dr	6	76	-	Sand	at 35 at 75	14.37	2-21-63	J	1	D	Pumped 10 gpm.
30F1	Fred White	150	Dr	6	150	-	Gravel	142-150	133	-	S	3/4	D	Pumped 17 gpm, dd 9 ft; L.
30M1	J. W. Boone	135	Dg	36	20	-	-	-	11.95	7-23-64	J	½	D	
31Q1	H. A. Bloeser	75	Dr	6	39	-	-	-	17.50	5-19-65	J	½	D	Pumped 6 gpm.
31Q2	Vern LaMarsh	70	Dr	6	92	92	Gravel, sand	89-92	57	6-9-65	J	-	D	Pumped 15 gpm, dd 3 ft; L.
32G1	Wm. Bowen	110	Dr	6	120	-	-	-	-	-	J	1	D	Water reported hard; contains iron; Cp.
32G2	A. P. Hulder	112	Dr	6	132	-	-	-	104.00	7-23-64	J	1	D	Water contains iron.
32K1	Fred Barker	75	Dg	48	20	-	Sand	1-20	1.00	2-21-63	C	½	D	L.
32L1	V. A. Satterthwaite	160	Dr	6	32	-	-	-	18.20	7-23-64	J	½	D	
32L2	V. A. Satterthwaite	160	Dr	6	171	-	-	-	-	-	-	-	NU	Water contains iron.
32Q1	Robert Mitchell	35	Dg	60	12	-	-	-	1.00	2-21-63	C	½	D	Water level low in summer; mostly clay throughout.
35K1	State Parks Commission	14	B	4	68	-	-	66-68	66	6-2-65	-	-	T	L.
35K2	State Parks Commission	22	Dr, B	4	49	-	-	-	17	6-2-65	-	-	T	L.
35Q1	State Parks Commission	10	Dr, Dn,B	4	24	-	Silt, Sand	15-23	3.00	6-2-65	-	-	T	L.

Table 2 - Records of wells - Continued

Well No.	Owner or tenant	Well					Water-bearing zone(s)		Water level		Pump		Use of Water	Remarks
		Alt. (feet)	Type	Diam. (inches)	Depth (feet)	Casing depth (feet)	Material	Depth interval (feet)	Below land surface (feet)	Date	Type	H.P.		
T. 20 N., R. 3 W.														
1E1	M. M. Stroud	105	Dr	6	101	101	Sand, gravel	99-101	90	7-18-65	-	-	D	Bailed 10 gpm, dd 1 ft; L.
1E2	M. M. Stroud	100	Dr	6	82	82	Gravel, sand	75-82	76	7-15-64	-	-	D	Bailed 10 gpm, dd 1 ft; L.
1F1	Gordon Brown	128	Dr	6	90	-	-	-	-		J	1	D	Water reportedly hard.
1G1	O. W. Anthony	135	Dr	6	62	62	Sand	at 62	5.30	8-26-64	J	3/4	D	Pumps sand, later filled back to 47 ft; L.
1M1	E. G. Gillette	90	Dg	-	27	-	-	11-27	11.18	3-8-63	J	1/3	D	Cp.
2D1	O. T. Moran	20	Dg	-	-	-	-	-	15.43	5-25-65	C	-	D	
2D2	S. T. Sagmiller	20	Dg	36	20	-	-	-	-	-	C	1/3	D	
3A1	Ray Kratcha	25	Dr	6	78	-	Gravel	-	Flows	5-25-65	J	1	D	Pumped 5 gpm.
3A2	F. Minor	25	Dr	8	110	110	-	-	Flows	5-25-65	J	½	D	
3G1	A. S. Ogg	18	Dg	36	17	-	-	-	12.95	6-25-65	J	-	D	Supplies 5 homes.
3H1	Leo Bishop	20	Dr	6	89	-	-	-	11.00	5-25-65	J	½	D	
3K1	Bayshore, Inc.	25	Dr	8	254	-	Gravel, sand	87-124, 178-245	Flows	5-25-65	T	7½	PS	Pumped 240 gpm, dd 20 ft; supplies 12-20 homes, 10 cabins and store. Flows 4-5 gpm at high tide; Cp, L.
3N1	Kelley Henderson	160	Dr	6	168	-	-	-	123.50	1-30-63	J	1	D	

3N2	Mason County Shops	190	Dr	6	235	-	-	-	181.50	1-30-63	S	2	Ind	Cp.
3N3	State Highway Department	180	Dr	6	171	-	Sand, gravel	141-171	117	5-31-62	-	-	Ind	Bailed 40 gpm, dd 26 ft; L.
4M1	C. P. Boysen	205	Dr	6	59	-	-	-	22.98	3-8-63	J	1	D	
5A1	Rayonier, Inc.	213	Dr	6	383	-	Gravel	23-41, 207-221, 275-300	-	-	-	-	T	Pumped 140 gpm, dd 21 ft; C, L.
5F1	Rayonier, Inc.	209	Dr	6	500	-	Sand, gravel	Below 122 (See Table 3)	118	2- -48	-	-	T	Driller reports well has potential of 2500 gpm; C, L.
5J1	Rayonier, Inc.	190	Dg	36	10	-	-	-	1.00	3-8-63	-	-	NU	
5J2	O. E. Lee	200	Dr	6	102	102	Gravel, sand	100-102	70	8-16-65	J	-	D	Bailed 5 gpm, dd 11 ft; L.
5L1	S. R. Steehler	220	Dr	6	28	-	-	-	-	-	C	½	D	
5L2	S. R. Steehler	228	Dr	6	32	-	Sand, gravel	25-32	10	2-17-64	J	½	D	Bailed 20 gpm, dd 2 ft; L.
5N1	Robert Hodgson	245	Dr, Dg	6	62	-	-	at 62	-	-	J	½	D	Cp.
5N2	Rayonier, Inc.	243	Dr	6	460	-	Gravel	93-112 135-166	-	-	-	-	T T	"No aquifer below 165 ft"; L.
6B1	L. S. Rutherford	230	Dn	4	32	32	Gravel	29-32	22.00	8-25-64	C	1	D	Pumped 16 gpm; water contains iron; L.
6E1	Bud Franklin	250	Dr	6	49		Gravel	at 49	21.54	3-7-63	J	½	D	Cp.
6E2	J. A. Tobler	250	Dr	6	69	69	Gravel, sand	60-69	24	5-27-63	-	-	D	Bailed 17 gpm, dd 15 ft; L.
6F1	W. E. Conklin	260	Dr	6	56	-	-	-	-	-	J	1	D	Pumped 13 gpm; supplies 2 homes.

Table 2 - Records of wells - Continued

Well No.	Owner or tenant	Well					Water-bearing zone(s)		Water level		Pump		Use of Water	Remarks
		Alt. (feet)	Type	Diam. (inches)	Depth (feet)	Casing depth (feet)	Material	Depth interval (feet)	Below land surface (feet)	Date	Type	H.P.		
T. 20 N., R. 3 W. (continued)														
6K1	R. C. Sargent	255	Dr	6	46	-	-	-	18.80	3-7-63	J	1	D	
6M1	J. Richert	245	Dr	6	70	-	-	-	-	-	J	3/4	D	Supplies 2 homes.
6N1	W. D. Fox	240	Dr	6	72	72	Gravel, sand	60-72	12.00	5-11-65	S	1/3	D	Bailed 10 gpm, dd 2 ft; L.
6P1	R. H. Lamb	240	Dr	6	65	65	Sand, gravel	58-65	15	4-13-65	J	-	D	Bailed 20 gpm, dd 2 ft; L.
7L1	City of Shelton Well 2	235	Dr	12 8	708	682	Gravel, sand	Below 205 (See Table 3)	115.1	5-13-53	T	60	PS	Pumped 905 gpm, dd 25 ft; L.
7P1	City of Shelton Well 1	210	Dr	20 16 12	745	316 297 745	Sand, gravel	515-540 670-725	150.00	4-20-48	T	125	PS	Pumped 1485 gpm, dd 27 ft; Cp, L.
8J1	H. E. Wilson	220	Dg	-	14	-	-	-	11.70	9-24-63	C	½	D	
9D1	Port of Shelton	202	Dr	8	155	-	Gravel, sand	108-155	81.50	8-25-64	S	-	Ind	Pumped 240 gpm, dd 48 ft; L.
9Q1	B. B. Thomas	20	Dr	6	81	-	-	-	Flows	-	-	-	D	Pumped 60 gpm, little dd; L.
10A1	Peninsula Development Co., Inc.	105	Dr	6	233	233	Sand, gravel	154-233	102.45	6-6-63	S	-	PS	Bailed 40 gpm, dd 12 ft; L.
10E1	Martin Stevens	18	Dr	6	97	-	Coarse gravel	-	12	-	C	½	D	Supplies 2 homes; reportedly obtained flowing saline water at 68 ft during drilling.

11N1	Pete Vanderwal	50	Dg	6	11	-	-	-	7.70	6-6-63	P	½	D	
11P1	Floyd Rice	35	Dg	36	20	10	Sand	-	7.77	6-6-63	J	½	D	
11R1	Eugene Anderson	125	Dr	6	43	-	-	-	16.51	6-6-63	J	½	D	Cp.
12D1	Louis Raymond	160	Dg	48	18	-	-	-	-	-	J	½	D	Supply inadequate in summer.
12H1	Oscar Bertelsen	200	Dr	6	42	-	-	-	-	-	J	½	D	Pumped 13 gpm.
12M1	H. P. Hamilton	145	Dg	36	18	-	"Hardpan"	-	-	-	C	½	D	Flows at times.
13N1	Agate Grocery	150	Dr	-	42	-	-	-	7.89	6-6-63	J	½	D	Water contains iron.
14C1	Al Hartman	30	B	12	12	11	-	-	2	-	P	1/3	D	Pumped 5 gpm, dd 8 ft.
15E1	S. S. Waterman	35	Dr	6	66	-	-	-	-	-	J	3/4	D	Cp.
15F1	M. A. Longan	16	Dr	6	45	-	-	-	15.35	6-6-63	C	½	D	Water contains iron.
15F2	Oscar Berntsen	25	Dr	6	39	-	Gravel	34-39	25	7-1-65	-	-	D	Bailed 10 gpm, dd 2 ft; L.
15Q1	Clyde Robb	120	Dr	6	148	-	Gravel	140-148	113.00	6-6-63	S	-	D, S	Pumped 13 gpm; dd 17 ft; Cp, L.
15Q2	Dean Doyle	95	Dr	6	112	112	Sand, gravel	54-65, 108-112	90	9-2-63	-	-	D	Bailed 10 gpm, dd 2 ft; L.
16B1	Frank Pearce	23	Dr	6	-	-	-	-	-	-	J	½	D	
16C1	Andy Beil	75	Dg	48	16	-	Sand	-	12.00	8-26-64	C	½	D	Water contains iron.
16C2	Norville Bina	80	Dr	6	55+	-	-	at 55	-	-	J	½	D	Water contains iron.
16C3	Wilfred White	15	Dr	6	50	-	-	-	Flows	8-26-64	C	1	D	Reports 1 gpm flow; Cp.
17A1	Rayonier, Inc.	195	Dr	-	485	-	Sand, gravel	(See Table 3)	-	-	-	-	T	L.

Table 2 - Records of wells - Continued

Well No.	Owner or tenant	Well					Water-bearing zone(s)		Water level		Pump		Use of Water	Remarks
		Alt. (feet)	Type	Diam. (inches)	Depth (feet)	Casing depth (feet)	Material	Depth interval (feet)	Below land surface (feet)	Date	Type	H.P.		
T. 20 N., R. 3 W. (continued)														
17K1	Rayonier, Inc.	195	Dr	-	500	-	Sand, gravel	(See Table 3)	-	-	-	-	T	L.
17L1	Einar Matson	163	Dr	6	50	-	-	-	-	-	J	1½	D	Supplies 3 homes.
17L2	Omer Noble	168	Dr	6	152	-	Gravel	150-152	123.30	9-24-63	S	3/4	D	Screen at bottom; Cp.
18F1	John Kangas	185	Dr	6	75±	-	Pebbles	-	53.16	9-24-63	J	1	D	
18G1	Jay Abel	190	Dr	6	149	-	Gravel	143-149	127	4- -51	P	1	D	Pumped 5 gpm; Cp, L.
18J1	Fred Peste	220	Dr	6	92	-	-	90-92	38.67	9-24-63	S	1	D	Cp.
18J2	L. J. Anderson	200	Dg	36	43	3	Gravel	-	31.22	7-15-64	J	½	D	Will pump dry overnight.
18J3	L. J. Anderson	200	Dr	8	103	102	Gravel	97-103	35	-64	S	3	PS	Pumped 60 gpm, dd 10 ft; supplies 10 homes; L.
18K1	B. T. Winiecki	198	Dr	8	164	164	Gravel	160-164	138	8-1-58	T	5	PS, Irr	Pumped 60 gpm, dd 3 ft in 4 hr, immediate recovery; L.
18K2	Winiecki	198	Dr	6	66	-	-	-	55.00	9-24-63	J	½	NU	
19A1	Rayonier, Inc. Well 5	20	Dr	26 18	883	135 883	Sand, gravel	(See Table 3)	-	-	-	-	NU	Pumped 2980 gpm, dd 75 ft. well caved in 1940; L.
19C1	Simpson Timber Co. (formerly Rayonier, Inc. Well 4)	37	Dr	26 20	735	450 735	Gravel, sand	Below 197 (See Table 3)	Flows	1937 1947	T	200	Ind	Pumped 4160 gpm, dd 63 ft; C, L.

19H1	Simpson Timber	19	Dr	26 14	750	345 700	Gravel, sand	Below 150 (See Table 3)	-	-	-	-	Ind	Flows 200 gpm; flowed 100 gpm in 1947; C, L.
20D1	Rayonier, Inc. Well 7	18	Dr	30 20 18	270	98 180 270	Gravel, sand	(See Table 3)	Flows	8-22-51	T	50	Ind	Flowed 90 gpm 8/9/51, pumped 315 gpm, dd 31 ft, 9 hr., recover 4 ft, ½ hr; L.
20D2	Rayonier, Inc. Well 8	18	Dr	12 8	301	287 286	Gravel, sand	289-292, 294-300	Flows	8-21-51	T	50	Ind	Flowed 125 gpm 9/10/51; pumps 700 gpm, dd 105 ft, 6 hr; L.
20E1	Simpson Timber Company Well 2	8	Dr	16 12 10	926	293 873 926	Gravel, sand	873-926	8	8-27-56	T	100	Ind	Drilled to 1021 ft, filled back; pumped 1500 gpm, dd 60 ft; temp 13°C; C, L.
20M1	Rayonier, Inc. Well 2	40	Dr	18 16 12	600	84 484 600	Gravel	Below 186 (See Table 3)	20	10- -35	T	-	Ind	Reportedly 1100 gpm flow; pumped 3300 gpm, dd 32 ft, yield later decreased to 600-1000 gpm; only well now in use; C, L.
20M2	Rayonier, Inc. Well 3	56	Dr	18 16 10	770	77 431 263	-	Below 199	-	-	-	-	NU	Reportedly steady yield of 1390 gpm. C.
21B1	Shorecrest, Inc.	245	Dr	8	249	-	Gravel	230-249	205	6-4-64	-	-	PS	Pumped 230 gpm, dd 4 ft, 5½ hr; L.
21J1	E. Weaver	40	Dg	72	6	-	-	-	0.50	6-6-63	C	½	NU	
21L1	O. J. Ashford	10	Dr	6	60±	-	-	-	-	-	J	1	D,Irr	Pumped 8 gpm.
21M1	Harry Johnson	36	Dr	6	58	58	Gravel	53-58	36.00	1948	-	-	D,Irr	Pumped 14 gpm, dd 6 ft; L.
21Q1	Dick Sauliere	40	Dr	6	13(?)	-	-	-	6.00	7-18-63	C	½	D	Supplies duplex.
21Q2	G. R. Quimby	15	Dr	6	50	-	-	-	-	-	J	1	D	
21Q3	C. Swenson	25	Dr	6	42	42	Gravel, sand	38-42	20	7-21-65	-	-	D	Bailed 10 gpm, dd 15 ft; L.

Table 2 - Records of wells - Continued

Well No.	Owner or tenant	Well					Water-bearing zone(s)		Water level		Pump		Use of Water	Remarks
		Alt. (feet)	Type	Diam. (inches)	Depth (feet)	Casing depth (feet)	Material	Depth interval (feet)	Below land surface (feet)	Date	Type	H.P.		
T. 20 N., R. 3 W. (continued)														
21R1	Bert Hurst	23	Dr	6	76	70	-	70-76	18.60	7-17-64	P	1/6	D	Pumped 1 gpm, dd 2 ft.
22C1	John Whetham	120	Dr	6	150(?)	-	-	-	-	-	J	1	D	2 homes.
22K1	G. H. Butler	16	Dr	6	40	-	-	-	3.00	-	J	½	D	Water reportedly hard and has sulphur odor.
22N1	R. H. Ferris	32	Dr	6	100	-	-	-	-	-	J	½	D	Water has sulphur odor.
22P1	Vernon Chambers	165	Dg	36	23	-	-	-	-	-	C	1	D	
22R1	R. E. Stoy	195	Dr	6	143	140	Gravel	136-143	119.20	11-8-62	S	1	D	Pumped 20 gpm, dd 20 ft; Water contains iron; L.
23E1	J. D. Goodro	20	Dr	6	89	-	Sand at bottom	-	-	-	J	1	D	Reports 20 gpm yield.
23F1	C. H. Grunert	15	Dr	6	48	-	-	-	-	-	J	½	D	Has supplied 3 homes; water contains iron; Cp.
23F2	Jack Shero	35	Dr	6	51	48	Gravel, sand	46-51	30	8-1-63	-	-	D	Bailed 20 gpm, dd 2 ft; L.
23H1	Mrs. Harry Westland	30	Dr	6	86	-	-	-	11.66	3-8-63	J	1	D	Pumped 13 gpm.
23M1	A. D. Bakke	47	Dr	6	54+	-	-	-	39.40	7-13-65	J	1	D	
23M2	E. J. Mell	23	Dr	6	70	-	-	-	16.10	7-13-65	J	1	D	Supplies 3 homes.

23Q1	Joe Gruver	47	Dr	6	93	88	Sand	88-93	-	-	J	1½	D	Water hard, contains iron; Cp.
24F1	J. W. Fadden	15	Dr	6	70	66	Gravel, sand	56-70	10	3-18-64	J	-	D	Bailed 40 gpm, dd 26 ft; L.
24G1	Ray Drebis	10	Dr	6	70	-	Silt, sand	-	3-5	-	J	1	D	Plugged back to 30 ft.
24K1	R. W. Young	45	Dr	6	73	-	-	-	28.95	6-7-63	J	1	D	Pumped 7 gpm, dd 4½ ft, 15 min, recovers in 5 min, 6/7/63.
24K2	B. D. Stroud	25	Dr	6	80(?)	-	-	-	8	-	J	1	D	
24L1	Russell Hovind	55	Dr	6	76	-	Gravel	65-76	54	1- -59	S	-	D	Pumped 17 gpm, dd 6 ft; L.
24M1	E. L. Irwin	41	Dr	6	84	-	-	-	-	-	J	1	D	
24M2	C. V. Derosier	20	Dr	8	168	-	-	-	15	-	T	1½	D	
25B1	R. C. Brigham	60	Dr	8	151	-	-	-	44	7-16-64	T	5	PS	Supplies 18 homes.
25B2	Paul Dunbar	75	Dr	-	98	-	Sand	90-98	65	-	-	-	D	L.
25D1	Vern Schuffenhauer	120	Dr	6	59	-	-	-	15.10	7-17-64	J	½	D	
25D2	M. J. Swayze	117	Dr	6	48	-	-	-	14.50	7-17-64	J	½	NU	
25G1	George Bevis	75	Dg	36	15	-	-	-	10.39	7-18-63	C	½	D	
25G2	Paul Dunbar	90	Dr	6	90	-	-	-	59.85	7-17-64	J	1	D	
26B1	D. J. Hardie	120	Dr	6	60	60	Gravel, sand	54-60	Flows	3-1-65	-	-	D	Bailed 23 gpm, dd 4 ft; L.
27C1	Buckley	175	Dr	6	185	-	-	-	156.71	7-16-64	S	1	D	
27E1	Jack Palmer	175	Dr	6	116	116	Sand, gravel	98-112	48.00	3-26-55	J	5	D, Ind	Pumped 29 gpm, dd 18 ft, 5 hr; log pond; L.
27E2	Nat Holman	175	Dr	6	125	-	Sand	-	57.20	7-16-64	J	1	D	Pumped 8 gpm. Some sand in water. Originally 40-ft dug well.

Table 2 - Records of wells - Continued

Well No.	Owner or tenant	Well					Water-bearing zone(s)		Water level		Pump		Use of Water	Remarks
		Alt. (feet)	Type	Diam. (inches)	Depth (feet)	Casing depth (feet)	Material	Depth interval (feet)	Below land surface (feet)	Date	Type	H.P.		
T. 20 N., R. 3 W. (continued)														
27L1	F. C. Marler	180	Dr	6	91	-	Gravel, sand	89-91	55	7-5-65	J	-	D	Pumped 15 gpm, dd 5 ft; L.
27M1	Arlo Wetter	165	Dr	10	44	44	Sand, gravel	29-41	27.00	3-30-52	T	5	D, Irr	Pumped 110 gpm, dd 11 ft; L.
27N1	R. E. Barnes	150	Dg	48	22	-	-	-	16.98	7-16-64	C	1/3	D	
28A1	L. H. Lewis	160	Dr	6	118	-	Gravel	116-118	60.00	2- -53	-	-	D, Irr	Pumped 7 gpm, dd 6 ft; L.
28B1	Luther Rodgers	130	Dr	6	32	-	-	-	-	-	T	1	D	Has pumped dry some years.
28B2	Vera Hoosier	128	Dr, Dg	6	75±	-	-	-	47.27	7-18-63	J	½	D	
28B3	R. L. Rickerts	130	Dr	6	100±	-	-	-	-	-	J	1	D	
28D1	B. E. Evans	215	Dr	6	60	60	Gravel	43-47	24.00	6-15-47	J	1	D, Irr	Pumped 20 gpm, dd 15 ft; L.
29C1	R. E. Mason	160	Dr	6	112	112	Gravel, sand	36-39	98	3-5-64	-	-	D	Pumped 83 gpm, dd 3 ft; L.
29H1	Roy Petty	120	Dr	6	49	-	-	-	-	-	J	½	D	
29H2	J. H. Ruttledge	125	Dr	6	42±	-	-	-	27.48	7-18-63	J	½	D	Pumped 4 gpm, dd 5.83 ft, 2 hr.
29J1	Fred Campbell	150	Dg	48	22	-	-	-	22.09	11-8-62	C	1	D	
29L1	Joe Grassl	155	Dr	4	129	-	Sand, gravel	125-129	54	-	J	1	D	L.

29M1	Mill Creek Motel	135	Dr	6	70	-	-	-	42.70	11-8-62	J	1½	PS	Serves 15 units, Cp.
29P1	Larry Godwin	160	Dr	6	125	125	Sand, gravel	-	80	7-16-65	-	-	D	Bailed 20 gpm, dd 5 ft; L.
29Q1	Lester LaMarsh	160	Dg	-	27	-	-	-	16.65	11-8-62	C	1	D	
30B1	Melvine Lane	245	Dr	6	205	205	Gravel	195-205	185.00	6-1-64	S	1½	D	Bailed 15 gpm, dd 4 ft; L.
30K1	Rayonier, Inc. Test well 2	110	Dr	-	790	-	Gravel, sand	74-84	-	-	-	-	T	Pumped 225 gpm, dd 22 ft; C, L.
30M1	E. R. Willis	245	Dr	6	75±	-	-	-	55±	-	P	3/4	D	
30R1	Vern Davidson	210	Dr	8	113	-	Gravel, sand	87-113	90.00	-	J	2	D	L.
31M1	T. L. Skillman	190	Dr	6	87	-	-	-	68.04	2-8-63	J	1	D	
31Q1	Leroy Boad	150	Dg	48	6	-	-	-	2.00	11-2-62	C	1	D	Supplies 2 homes and trailer park; Cp.
31Q2	I. L. Chapman	185	Dg	48	42	-	-	-	38.00	8-20-64	J	½	D	Inadequate supply.
31R1	Cleave Robinson	198	Dr	6	77	77	Gravel	at 77	70.30	11-2-62	J	1	D, Irr	L.
32D1	Lester Spilseth	170	Dr	6	55	-	-	-	30.00	-	P	1	D	Water contains iron; Cp.
32E1	Merv Smith	175	Dr	6	65	-	-	-	-	-		½	D	
32E2	B. R. Bell	175	Dr	6	72	72	Gravel, sand	69-72	52.00	3-11-65	S	1½	PS	Gas pocket at 54 ft; pumped 30 gpm, dd 5 ft, 20 min; supplies trailer court; L.
32F1	A. L. Bell	175	Dr	6	49	-	-	-	42.30	10-30-62	J	½	D	
32G1	Omar Senn	190	Dr	6	47	47	-	-	20	-	J	½	D	Pumped 8 gpm.
32G2	Glenn Roller	190	Dr	6	66	66	Gravel, sand	62-64	43	12-3-64	-	-	D	Bailed 60 gpm, dd 2 ft; L.
32H1	Dan Cormier	200	Dr	6	69	69	Gravel, sand	62-69	45	8-5-64	-	-	D	Bailed 30 gpm, dd 3 ft; L.

Table 2 - Records of wells - Continued

Well No.	Owner or tenant	Well					Water-bearing zone(s)		Water level		Pump		Use of Water	Remarks
		Alt. (feet)	Type	Diam. (inches)	Depth (feet)	Casing depth (feet)	Material	Depth interval (feet)	Below land surface (feet)	Date	Type	H.P.		
							T. 20 N., R. 3 W. (continued)							
32J1	Ken Chamberlin	160	Dr	6	100(?)	-	-	-	21.35	6-1-64	J	1	D	
32K1	Lloyd Ellis	195	Dr	6	71	71	Sand, gravel	51-71	51.00	11- -53	J	1	D	Pumped 13 gpm, dd 10 ft; water slightly hard; L.
32P1	Harry Craig	200	Dr	6	42	-	-	-	Flows	11-2-62	J	1	D	Cp.
33N1	Don Nye	160	Dr	6	43	43	Gravel	at 40	20.90	10-30-62	J	½	D	Serves 2 homes; Cp; Obs.
33N2	Vern LaMarsh	160	Dr	6	62	-	-	-	30	8-14-64	-	-	D	Pumped 30 gpm, dd 4 ft.
33N3	Gene Nye	160	Dr	6	42	42	Gravel, sand	31-42	25	9-13-65	-	-	D	Bailed 10 gpm, dd 1 ft; L.
33N4	J. J. Makoviney	155	Dr	6	54	54	Gravel, sand	48-54	10	12-30-64	J	-	D	Bailed 30 gpm, dd 3 ft; L.
33Q1	Henry Cook, Jr.	148	Dr	6	28	-	-	-	21.22	10-30-62	J	½	D	
34C1	C. W. Bailey	120	Dr	6	125	-	Gravel	120-125	73.00	-	J	1	D, S	Pumped 25 gpm, dd 10 ft; L.
34M1	Cook Plant Farm	128	Dr	6	100	100	-	80-100	50.00	-	J	1½	Irr	Water reported hard and has sulphur odor; Cp.
							T. 20 N., R. 4 W.							
1N1	Edna Johnson	280	Dr	6	60	60	Gravel, sand	58-60	45	10-16-43	J	½	D	Bailed 15 gpm, dd 21 ft; L.
1N2	Edna Johnson	280	Dr	6	62	62	Gravel, sand	57-62	47	7-10-55	J	1½	D	Bailed 15 gpm, dd 3 ft; L.

1N3	Edna Johnson	280	Dr	6	66	62	Gravel, sand	55-66	44	8-6-65	S	2	D	Bailed 30 gpm, dd 2 ft; L.
1N4	Jennings Miklethun	280	Dr	6	83	73	Gravel, sand	65-83	50	9-7-65	S	1	D	Bailed 90 gpm, dd 3 ft; supplies trailer court; L.
1R1	Les Fields	235	Dr	6	56	50	Gravel	50-56	-	-	J	½	D	
1R2	Lou Cowles	220	Dr	6	55	-	-	-	19.74	7-7-64	J	½	D	
1R3	Lawrence Starr	220	Dr	6	53	53	Gravel, sand	44-53	32	8-18-64	J	-	D	Bailed 15 gpm, dd 2 ft; L.
2E1	John Swanson	280	Dr	6	60	60	Gravel, sand	42-60	42	5-24-65	J	-	D	Bailed 20 gpm, dd 2 ft; L.
2F1	Port of Shelton (Airport)	295	Dr	10	136	136	Gravel, sand	44-136	43.60	5-29-43	T	15	PS	Pumped 212 gpm, dd 5(?) ft, 24 hr; C, L.
2J1	J. G. MacRae	260	Dr	6	50	50	Gravel	6-50	6.00	6-2-62	C	½	D	
2K1	City of Shelton Port Commission	300	Dr	8	142	-	-	-	43.00	-	T	7½	PS	Pumped 150 gpm, dd 20 ft.
2R1	T. L. Savage	280	Dr	6	80	-	-	-	46.70	8-25-64	J	2	PS	Serves 40 apartments, formerly served airport.
8G1	R. E. Grossman	280	Dr	8	60	-	Gravel	45-60	Flows	3-9-62	-	-	Ind	Flowed 70 gpm 3/9/62 (with 6 lbs shut-in pressure). Pumps 180 gpm, dd 45 ft; Cp, L.
8L1	Ceab Combs	255	Dg	48	10	10	-	-	7.30	2-15-63	C	½	D	
8M1	Dave Walker	280	Dg	36	6	6	-	-	Flows	6-2-64	C	½	D	Flows 5 gpm.
9E1	State Department of Institutions Well 3	267	Dr	12	184	162	Sand, gravel	157-178	16.50	5-1-62	T	15	PS	Pumped 140 gpm, dd 114 ft, 8 hr; C, L.
9E2	State Department of Institutions Well 4	276	Dr	12	178	162	Gravel, sand	164-177	31.00	6-18-62	T	25	PS	Pumped 178 gpm, dd 103 ft, 8 hr; L.

Table 2 - Records of wells - Continued

Well No.	Owner or tenant	Well					Water-bearing zone(s)		Water level		Pump		Use of Water	Remarks
		Alt. (feet)	Type	Diam. (inches)	Depth (feet)	Casing depth (feet)	Material	Depth interval (feet)	Below land surface (feet)	Date	Type	H.P.		
T. 20 N., R. 4 W. (continued)														
9E3	State Department of Institutions Well 5	276	Dr	16 12	46	31	Sand	32-41	17.00	9- -63	T	25	PS	Pumped 383 gpm, dd 12 ft, 8 hr, 10 sec recovery; Cp, L.
9F1	State Department of Institutions Well 1	287	Dr	12	402	209	Sand, gravel	at 209	39.70	2- -63	-	-	NU	L.
9G1	State Department of Institutions Well 2	293	Dr	12	632	632	-	-	262	4-10-62	-	-	T	Pumped 80 gpm, dd 82+ ft; Cp, L.
11R1	Mason County Fair Association	260	Dr	8 6	501	202 501	Gravel, sand	(See Table 3)	304	1964	S	5	PS,S	Pumped 30 gpm, dd 27 ft. deepened after reported contaminated from pulp liquor, to 353 ft; L.
12C1	E. E. Swanson	270	Dr	6	52	-	-	-	34.45	7-7-64	J	½	D	
12D1	E. E. Fluckinger	280	Dr	6	63	-	-	-	47.78	9-25-63	J	3/4	D	Supplies store, hamburger stand, home; Cp, Obs.
12D2	L. F. Kiefer	280	Dr	6	63	-	-	-	34.45	7-7-64	J	1½	PS	Supplies restaurant and pool.
12D3	Airport Home Tracts Water Association	280	Dr	8	60	-	Gravel	30-60	45.44	9-25-63	T	2	PS	Pumped 30 gpm; serves 6 units; L.
15F1	V. G. Barrington	270	Dr	6	65	-	-	-	23.64	5-19-64	J	1/3	D	Water contains iron.

15L1	Rayonier, Inc. Test Well 1	200	Dr	-	404		Sand, gravel	372-404	Flows	4-16-63	N	-	T	Flows 40 gpm; C, L.
16R1	Robert Leman	260	Dr	6	70	-	Sand	-	51.83	2-11-63	J	½	D	Pumps some sand.
16R2	T. J. Baze	235	Dr	6	67	-	-	-	23.55	2-11-63	J	½	D	Water contains iron; Cp.
17R1	M. L. Link	280	Dr	6	45	-	Beneath "hardpan"	45	10.27	2-11-63	J	½	D	Cp, Obs.
18A1	Louise Riechel	254	Dg, Dr	48 -	4 8	4	-	-	9.54	2-15-63	C	3/4	D	
18B1	Lemke's Store	260	Dr	6	163	-	Gravel	155-163	Flows	2-11-63	J	1	D	Flow 8.4 gpm 2/15/63, pumps 25 gpm, dd 10 ft; Cp, L.
18C1	B. J. Rishel	320	Dr	6	-	-	-	-	Flows	9-12-63	J	1	D	Flow 2 gpm 9/12/63.
18L1	Warren Williams	275	Dr	6	19	-	-	10-19	9.77	2-14-63	J	1	D	Supplies 2 homes. Water extremely acid and corrosive; Cp.
19E1	Harold Kidd	240	Dg	48	13+	-	-	-	9.18	6-2-64	C	½	D	Frequently pumps dry.
19H1	Delmar Schur	234	Dr	6	58	-	Gravel, sand	30-58	6.17	6-2-64	J	1	D	Bailed 80 gpm, dd 1 ft. Supplies 2 homes and dairy; L.
19J1	Darl Goldy	230	Dg	48	16(?)	-	-	-	2.65	6-2-64	C	½	D	Has gone dry.
19J2	Darl Goldy	230	Dr	6	16	-	Gravel, sand	12-24	-	-	N	-	D	L.
21B1	Dick Leonard	245	Dg	36	20	-	-	-	4.00	12-2-63	P	½	D	Water level low in summer.
22G1	J. J. Goodchild	360	Dr	6	189	-	-	-	132.32	2-11-63	S	1	D	Cp.
22Q1	H. P. Lund	400	Dg	-	20	5	"Hardpan"	-	16	-	C	3/4	D	Will pump dry.
24G1	Simpson Timber Co (formerly Rayonier, Inc. Well 6)	74	Dr	26	742	742	Sand, gravel	(See Table 3)	Flows	7- -42	T	60	Ind	Reportedly pumped 1100 gpm, dd 86 ft; Cp, L.

Table 2 - Records of wells - Continued

Well No.	Owner or tenant	Well					Water-bearing zone(s)		Water level		Pump		Use of Water	Remarks
		Alt. (feet)	Type	Diam. (inches)	Depth (feet)	Casing depth (feet)	Material	Depth interval (feet)	Below land surface (feet)	Date	Type	H.P.		
T. 20 N., R. 4 W. (continued)														
24N1	Rayonier, Inc. Test well 3	90	Dr	10 8	436	-	None	-	-	-	-	-	T	No good water-bearing strata; L.
24Q1	Hubert Gullet	115	Dg	36	16	-	-	-	8.43	2-11-63	C	1/3	D	Limited supply in summer; water contains iron.
26N1	Mason County Fair Association	110	Dr	6	209	209	Gravel	176-209	Flows	3-7-63	C	-	PS,S	Flow 12 gpm 3/27/63; reportedly 60 gpm and 131 lbs shut-in pressure 9/8/53; Cp, L.
27A1	Clyde Ruddell	390	Dg	-	10	-	-	-	3.50	2-11-63	C	1/3	D	Will pump dry; water soft.
27A2	E. M. Franklin	398	Dr	6	90	84	"Quicksand"	50-90	4	-	J	½	D	Flowed when drilled, bailed 23 gpm, dd 4 ft; L.
35C1	L. P. Konigsfeld	100	Dr	6	-	-	-	-	-	-	C	1	D,S	Supplies herd of 80 cattle.
36A1	Stewart Nutt	200	Dg	36	5	-	-	-	-	-	C	½	D	
36H1	William White	240	Dr	6	65	-	Sand,gravel	48-65	29.75	2-8-63	J	1	D	Cp, Obs.
T. 20 N., R. 5 W.														
12Q1	G. K. Johnson	400	Dg	36	21	-	-	-	19.03	9-12-63	N	-	NU	Bucket withdrawal, ceased using owing to yellow color of water.

13B1	Alan Ford	350	Dr	6	-	-	-	-	-	-	J	½	D	
13G1	C. A. Kidd	340	Dr	6	81	81	Gravel	-	25	-	J	1	D	Well bottoms in gravel below 3 layers of "hardpan" and much sand.
24H1	H. L. Kidd	240	Dr	6	65	-	Gravel, sand	20-45	-	-	J	-	D	L.
24P1	Ned Jacobson	450	Dg	36	3	-	-	-	0	6-2-64	C	½	D	
24R1	John Smith	235	Dr	6	125	-	-	-	12	-	C	½	D	
25E1	H. L. Kidd	410	Dg	48	35	15	-	-	26.40	6-2-64	J	1	D	Well had gone dry one year from October to December.
							T. 21 N., R. 1W.							
5A1	Treasure Island Country Club Well 2	50	Dr	8	227	217	Sand, gravel	215-227	47(?)	-	T	5	PS	Pumped 80 gpm, dd 50 ft; serves about 100 people; Cp, L.
5B1	L. E. Soule	10	Dr	6	352	352	-	60 & 80	Flows	2-20-51	J	1	D	Quicksand 225-350 ft; perf 60 and 80 ft; Cp.
5B2	O. L. Soule	13	Dr	6	60	55	-	55-60	2	-	J	½	D	Pumped 33 gpm; screen 55-60 ft.
5B3	C. Deggeller	20	Dg	48	19	-	Gravel	15-19	17.03	6-2-65	N	-	D	Bucket withdrawal; never dry; L.
5F1	Charles Schwinn	50	Dr	6	36	-	-	-	-	-	S	-	D	
5G1	C. J. Baulig	15	Dr	5	39	-	Sand	37-39	3.20	5-28-65	-	-	D	L.
5H1	Treasure Island Country Club Well 1	15	Dr	8	168	158	Sand	154-168	8	-	T	10	PS	Pumped 100 gpm, dd 84 ft; serves about 100 people; L.

Table 2 - Records of wells - Continued

Well No.	Owner or tenant	Well					Water-bearing zone(s)		Water level		Pump		Use of Water	Remarks
		Alt. (feet)	Type	Diam. (inches)	Depth (feet)	Casing depth (feet)	Material	Depth interval (feet)	Below land surface (feet)	Date	Type	H.P.		
T. 21 N., R. 1 W. (continued)														
5K1	----	25	Dg	48	25	-	-	-	19.40	5-28-65	J	1/3	D	
5K2	H. E. Somers	40	Dr	-	60	-	-	-	40	1961	S	-	D	
5P1	Spooner-Stock-Burkhart	40	Dr	6	64	-	-	-	35.57	7-11-63	J	1	D	Serves 3 homes.
7A1	Mary Nelson	195	Dr	6	32	-	-	30-32	-	-	J	½	D	Older 45-ft dug well 100 ft NE totally dry; Cp.
7R1	----	130	Dg	36	7	-	Gravel	-	2.85	2-20-51	N	-	NU	
8A1	H. P. Hillman	50	Dr	6	180	180	-	-	30	-	S	3	D	Pumped 37 gpm, dd 20 ft; serves 3 homes, 2 ac.
8B1	I. F. Rowe	15	Dr	6	67	-	Sand, gravel	42-67	13.61	7-11-63	S	1	D	Quicksand at bottom; L.
8B2	R. F. Ellison	12	Dr	6	110	110	-	-	11.02	7-28-64	J	1	D	Serves home and factory; water contains iron.
8B3	Leslie Rice	5	Dr	6	120	-	-	-	-	-	-	-	D	Slight flow at high tide.
8C1	Grapeview Store c/o Russ Wells	47	Dr	6	67	67	-	-	-	-	J	-	D	Serves 2 homes and store.
8C2	E. R. Park	12	Dr	6	300	-	Sand	80-90	Flows	-	-	-	D	"Hardpan" to 20 ft; flows at high tide; water level 3-4 ft at low tide; serves 4 homes.

8C3	Grapeview Fire Station	45	Dr	6	277	-	Sand	-	2	4- -65	-	-	Fire	Hardpan and much sand; required screen.
8C4	E. W. Phelps	35	Dg	36	11	-	-	-	3.60	5-28-65	S	½	D	
8D1	Roy Fredericks	25	Dg	-	10	-	-	-	3.30	5-28-65	S	-	D	
8E1	H. J. Engen	60	Dr	6	67	-	-	-	34.53	7-11-63	J	1	D, S	
8G1	Orville Kager	30	Dr	6	150	-	-	-	-	-	J	1/3	D	Cp.
8G2	Orville Kager	28	Dn	1½	50(?)	-	-	-	-	-	P	-	D	Garden use only.
8G3	St. Charles Winery	8	Dr	6	65(?)	-	-	-	-	-	S	1	Ind	
8H1	O. R. Buckingham	60	Dr	6	165	-	-	-	38.00	2-20-51	P	½	D	Pumped 3 gpm.
8J1	Lloyd Richey	60	Dr	6	550	-	-	at 550	-	-	T	5	D	Serves 3 homes; Cp.
8M1	Robert Lorentz	100	Dr	8	142	137	Sand	133-142	76	-	S	5	PS	Pumped 100 gpm, dd 12 ft; to serve community; L.
8P1	----	15	Dg	36	15+	None	Till	-	15	-	J		D	
8Q1	J. E. Carlson	70	Dr	3	225	-	Sand	-	60	-	P	3/4	D	Previously dug to 40 ft.
8Q2	Vineyard Cove Corporation	50	Dr	8	161	155	Sand, gravel	140-161	-	-	T	5	PS	Pumped 100 gpm, dd 11 ft, 5 hr; complete recovery 20 sec; screen 155-161 ft; L.
8R1	R. G. Wells	60	Dr	6	610	594	Sand	593-610	40	10- -62	S	1½	D	Mostly clay to 600 ft; pumped 60 gpm, dd 10 ft; Cp, L.
18D1	Laura Hanson	30	Dg	48	37	-	-	-	30.10	7-10-63	J	1/3	D	
18E1	Oscar Sund	25	Dg	48	18	4	Till	-	8.60	7-11-63	P	-	D	Cased to top of till.
18F1	Swan Maki	12	Dg	36	13	-	"Hardpan"	-	2.00	7-11-63	C	½	D	

Table 2 - Records of wells - Continued

Well No.	Owner or tenant	Well					Water-bearing zone(s)		Water level		Pump		Use of Water	Remarks
		Alt. (feet)	Type	Diam. (inches)	Depth (feet)	Casing depth (feet)	Material	Depth interval (feet)	Below land surface (feet)	Date	Type	H.P.		
T. 21 N., R. 1 W. (continued)														
19N1	Weyerhaeuser Properties, Inc.	100	Dr	8	158	170	Sand, gravel	121-158	112	5-26-64	N	-	PS	Tested 95 gpm, dd 35 ft, 2½ min recovery 4/27/64; casing cut off at 170 ft, back-filled to 158 ft; L.
31D1	D. D. Peush	15	Dr	6	39	-	-	-	14	-	J	1	D	Pumped 33 gpm.
31D2	Stieg Gabrielson	18	Dr	6	81	77	Sand, gravel	63-81	16	-	J	½	D	Bailed 15 gpm, dd 7 ft, 1 hr; pumped 45 gpm, dd 27 ft, 1 hr; Cp, L.
T. 21 N., R. 2 W.														
3D1	Mason County Fire District 5	283	Dr	6	99	-	Sand, gravel	69-99	69.35	8-20-64	-	-	Fire	Bailed 15 gpm, dd 10 ft; L.
3L1	T. R. Sladek	230	Dr	6	40	-	Gravel, sand	37-40	20	-	J	½	D	Cp, L.
3L2	Francis McDonald	237	Dr	6	41	-	Gravel	35-41	26	-	J	½	D	Pumped 5 gpm; L.
4B1	Jerry Hill	220	Dr	6	41	-	Gravel	38-41	29.87	9-6-63	J	½	D	Pumped 25 gpm; Cp, L.
4C1	J. F. Northrup	212	Dr	6	28	-	Gravel	27-28	18	-	-	-	D	Bailed 10 gpm, dd 2 ft; L.
4D1	John Severa	214	Dr	6	42	-	Gravel, sand	38-42	20	6-26-65	J	½	D	Bailed 10 gpm, dd 5 ft; L.
4D2	Thomas Aarhus	205	Dr	6	33	33	Gravel, sand	32-33	15	9-22-65	-	-	D	Bailed 20 gpm, dd 4 ft; L.

5F1	Gladys Vary	215	Dr	6	55	55	Sand, gravel	30-55	22	5-10-63	J	½	D	Bailed 10 gpm, dd 6 ft; L.
5H1	P. R. Lewis	205	Dr	6	122	122	Gravel, sand	108-122	90	7-21-63	S	1	D	Bailed 20 gpm, dd 3 ft; L.
5H2	A. P. Golden	220	Dr	6	42	42	Gravel, sand	24-42	24	7-14-62	-	-	D	Bailed 30 gpm, dd 4 ft; L.
5J1	P. M. Poppelreiter	205	Dr	6	40±	-	-	-	-	-	J	-	D	
5J2	Olson	205	Dr	6	38	-	-	-	-	-	-	-	D	Pumped 13 gpm.
7Q1	Anthony Botelho	212	Dr	6	43	-	Sand, gravel	40-43	18	7-27-60	-	-	D	Bailed 15 gpm, dd 8 ft, 1 hr. L.
7Q2	Donald Welsh	220	Dr	6	42	42	Gravel, sand	38-41	25	6-21-65	-	-	D	Bailed 10 gpm, dd 2 ft; L.
7R1	Whitehouse	220	Dr	6	38	38	Gravel	28-38	15	-	J	-	D	Pumped 7 gpm; L.
8A1	C. B. Coselman	320	Dr	8	245	245	Gravel	214-240	167	-	S	7½	PS	Pumped 230 gpm, dd 43 ft, 7 hr; Cp, L.
8J1	Grant	200	Dr	6	38	38	Sand	-	2	-	-	-	D	Perf bottom.
8K1	D. C. Block	220	Dr	6	60	60	Sand, gravel	-	25	6-4-65	J	-	D	Bailed 20 gpm, dd 4 ft; L.
8M1	E. J. Burke	214	Dr	6	43	43	Gravel	34-43	20	-	J	½	D	Pumped 16 gpm; L.
8M2	William Knight	216	Dr	6	45	-	Gravel	30-45	-	-	-	-	D	L.
8M3	J. M. Stopherd	215	Dr	6	59	59	Gravel	48-49	20	4-2-65	-	-	D	Bailed 10 gpm, dd 28 ft;
8Q1	Watkins	193	Dg	4	12	12	-	-	10.69	9-6-63	N	-	D	
8Q2	Watkins	193	Dr	6	27	-	Sand, gravel	10-27	10	-	J	½	D	Pumped 20 gpm.
13F1	Emmett Johnson	160	Dr	6	203	-	Gravel	-	-	-	S	1	D	Much sand, clay to bottom.
13H1	J. Britton	45	Dr	6	60	-	-	-	39.24	7-10-63	J	1	D	

Table 2 - Records of wells - Continued

Well No.	Owner or tenant	Well					Water-bearing zone(s)		Water level		Pump		Use of Water	Remarks
		Alt. (feet)	Type	Diam. (inches)	Depth (feet)	Casing depth (feet)	Material	Depth interval (feet)	Below land surface (feet)	Date	Type	H.P.		
T. 21 N., R. 2 W. (continued)														
13J1	E. T. Pettersen	78	Dr	6	95	-	Sand, gravel	70-78, 84-87	° 70	12-17-48	J	1	D,Irr	Pumped 10 gpm, dd 10 ft; L.
13R1	E. H. Fredricks	28	Dr	6	89	84	Sand	84-89	-	-	J	1	D	Screen 84-89 ft; Cp.
14H1	E. Dringman	190	Dg	24 6	25	-	-	-	19.23	7-13-65	J	½	D	
16K1	Herbert Hipkins	140	Dg	6	6	-	-	-	5	-	P	-	D	Deepened spring.
16K2	Marvin Rench	165	Dg	-	20	-	Gravel	at 20	18	-	C	-	D	Blue gravel beneath clay.
20R1	Mrs. E.G. Trexler	110	Dr	6	40	-	-	-	-	-	J	3/4	D,S	Supplies dairy.
20R2	Mrs. E.G. Trexler	112	Dg	48	13	-	-	-	6.14	6-21-63	N	-	NU	
22G1	Art Nicklaus	100	Dr	6	72(?)	-	-	-	24.97	7-3-63	J	1	D	
22Q1	Madings, Inc.	35	Dr	8	72	-	Gravel	-	-	-	J	3/4	PS	Pumped 8 gpm; 20 outlets.
22Q2	L. N. Rensing	30	Dr	6	120	120	Gravel	117-120	4	10-20-61	J	1	D	Pumped 30 gpm, pumps some sand; Cp, L.
22Q3	L. N. Rensing	40	Dr	6	101	-	-	-	-	-	-	-	D	
23M1	Oak Adams	40	Dr	6	65	-	-	-	25	-	J	1	D	
23M2	McTee	50	Dr	6	65	-	-	-	43.44	2-20-51	P	-	D	Water reportedly has hardness of 52 mg/l, chloride 7 mg/l.

23M3	Bruhahn	60	Dr	6	121	-	Sand, gravel	118-121	40	-	-	-	D	Bailed 15 gpm, dd 20 ft; L.
24C1	Joel Bengtson	78	Dr	6	80	-	-	-	60.64	7-10-63	J	½	D	Will pump dry at 5 gpm.
24E1	M. A. Polk	46	Dr	6	85	85	Sand	80-85	45	-	J	1	D	Pumps sand during heavy use; perf 80-85 ft; Supplies 2 homes.
24E2	Dan Pennebera	30	Dr	6	67	-	-	-	-	-	J	1	D	
24P1	Irvie Wingert	78	Dr	6	101	-	"Hardpan"	77-78	75.24	9-13-63	J	1	D	Cp, L.
25D1	Jarrell Cove State Park	55	Dg	36	-	-	-	-	-	-	P	-	PS	
25F1	Phil Rogers	65	Dr	6	260	-	-	-	59.58	9-13-63	N	-	NU	Quicksand heaved into casing.
25G1	Arlow Wingert	80	Dg,B	8	80	-	Sand, clay	-	15.00	9-13-63	C	½	D	Much "hardpan".
25M1	Gunnar Johnson	55	Dr	4	80	-	-	-	40	-	J	½	D	
25M2	Martin Goetsch	55	Dr	6	168	-	Gravel	at 168	60	-	J	1	D	Till to 60 ft, then blue clay nearly to bottom; serves 2 homes.
25M3	Hartstene Island Comm. Center	60	Dr	6	99	99	Sand, gravel	50-58, 83-99	43	-	-	-	PS	Pumped 10 gpm, dd 15 ft; pumped 20 gpm, dd 40 ft; L.
25N1	G. T. Waite, Jr.	135	Dr	6	100+	-	-	-	84.90	9-13-63	J	1	D	Supplies 2 homes.
26A1	Ted Ness	12	Dg	36	13	-	-	-	3.70	2-14-63	P	½	D	Supplies campground and marina.
26H1	H. L. Symans	23	Dg	36	22	-	-	-	4.89	2-14-63	C	1/3	D	Water level low in summer.
27E1	Butler	15	Dg	36	6	-	-	-	1.53	6-21-63	C	1	D	Flows occasionally; serves 3 homes.
29G1	C. R. Gudger	235	Dr	-	164	-	Sand	130-164	87.60	6-21-63	S	3/4	D	Pumped 16 gpm, dd 20 ft; L.

Table 2 - Records of wells - Continued

Well No.	Owner or tenant	Well					Water-bearing zone(s)		Water level		Pump		Use of Water	Remarks
		Alt. (feet)	Type	Diam. (inches)	Depth (feet)	Casing depth (feet)	Material	Depth interval (feet)	Below land surface (feet)	Date	Type	H.P.		
T. 21 N., R. 2 W. (continued)														
29P1	T. T. Westby	190	Dr	6	113	-	Gravel	52-90	39	-	J	1	D	Pumps some sand, serves resort; L.
30Q1	Gordon Costa	242	Dr	6	135	-	-	130-135	91.67	5-29-63	J	½	D	Cp.
31N1	J. C. Raymond	180	Dr	6	35+	-	-	-	0.00	8-26-64	C	½	D	
32A1	Essie Gibler	179	Dr	6	52	-	Sand, gravel	50-52	Flows	5-29-63	J	½	D,PS	Serves motel and tavern; Cp.
32A2	Roy Bowman	172	Dr	6	43	-	-	-	3.44	9-10-63	C	3/4	D	
32F1	Margaret Smith	175	Dr	-	55	-	Blue clay	-	-	-	-	-	D	
32K1	J. H. Gray	183	Dr	6	176	-	-	170-176	90.69	1-23-64	J	1½	D	12 gpm pump; water contains iron; Cp.
32M1	Ralph Endicott	176	Dg	-	12	-	-	-	5.16	5-29-63	C	½	D	Will pump dry in summer.
32N1	R. A. Snider	176	Dg	36	12	-	Sand	-	8.00	9-10-63	C	½	D	Inadequate supply in summer.
33F1	George Carlson	150	Dg	36	5	5	-	-	2.00	6-21-63	C	¼	D	
33H1	R. O. Yeager	40	Dr	8	53	53	Gravel, sand	48-53	Flows	6-21-65	N	-	D	Flow 1 gpm 6/21/63, tested 25 gpm, dd 40 ft; Cp, L.
33H2	Leander Geist	12	Dr	6	65	-	-	-	Flows	-	N	-	D	Pumps dry at 10 gpm.
33R1	Amos Babcock	45	Dg	-	30	-	"Hardpan"	-	25	-	C	3/4	D	Pumps dry in autumn.

34A1	L. F. Rigney	175	Dg	48	8	3	"Hardpan"	-	0	2-14-63	C	½	D	Limited supply.
34B1	C. Michaelson	158	Dg	-	14	-	-	-	1	2-14-63	C	1/3	D	
35A1	Stanley Yates	145	Dg	-	18	-	-	-	-	-	C	1/3	D	Limited supply.
35D1	J. Meeks	98	Dr	-	102	-	Gravel	93-102	69.10	2-14-63	J	1	D	Pumped 13 gpm, dd 5 ft; L.
							T. 21 N., R. 3 W.							
4N1	Alderbrook Inn, Inc.	520	Dr	10	292	287	Sand, gravel	218-292	220.5	10-1-64	T	-	PS, Irr	Pumped 156 gpm, dd 65 ft; serves Inn complex and golf course; Cp, L.
6P1	R. O. Ross	10	Dg	36	22	-	-	-	6	-	C	1	D	
31A1	Rayonier, Inc. Test well 8	225	Dr	-	452	-	Gravel	134-187, 212-300	108.50	4-10-48	N	-	T	Driller reports well has 5000-gpm capacity; C, L.
31C1	Rayonier, Inc. Test well 9	225	Dr	10	258	-	-	-	-	-	-	-	T	L.
31F1	Rayonier, Inc. Test well 11	225	Dr	-	444	-	Sand, gravel	(See Table 3)	121	7-15-48	-	-	T	Pumped 360 gpm, dd 5 ft, 2 hr; L.
31R1	George Plews	225	Dn	3½	33	-	Gravel	-	24	-	J	½	D	
32F1	Rayonier, Inc. Test well 10	235	Dr	10	264	264	-	-	130	6- -48	-	-	T	L.
32M1	D. D. McCormick	225	Dn	1	16+	16+	-	-	-	-	C	3/4	D	
32M2	D. D. McCormick	218	Dg	24	4	4	Gravel	-	1.50	9-27-63	C	3/4	D	
32N1	Rayonier, Inc. Test well 7	222	Dr	10 8 6	658	111 478 658	Gravel	(See Table 3)	-	-	-	-	T	C, L.

Table 2 - Records of wells - Continued

Well No.	Owner or tenant	Well					Water-bearing zone(s)		Water level		Pump		Use of Water	Remarks
		Alt. (feet)	Type	Diam. (inches)	Depth (feet)	Casing depth (feet)	Material	Depth interval (feet)	Below land surface (feet)	Date	Type	H.P.		
T. 21 N., R. 3 W. (continued)														
33P1	W. Milton	245	Dr	6	78	-	-	-	-	-	J	-	D	
34A1	D. H. Knutson	200	Dr	6	68	68	Sand	57-68	22	9-1-64	-	-	D	Bailed 20 gpm, dd 5 ft; L.
34L1	W. A. McCoy	200	Dr	6	76	-	-	-	65±	-	J	1	D	Cp.
34Q1	R. D. Blake	205	Dr	6	55	-	-	-	22.90	9-27-63	J	½	D	
34Q2	Owen Modlin	190	Dg	36	20	5	Gravel	5-20	6.20	9-27-63	N	-	D	Bucket withdrawal; water contains iron.
35J1	Lawrence Gosser	25	Dr	6	92	-	-	-	Flows	5-25-65	J	1	D	
36B1	James Baxter	38	Dg	-	14	-	-	-	7.31	9-10-63	C	½	D	Water of poor sanitary quality.
36C1	D. A. Johnson	50	Dr	6	56	-	-	-	18.58	9-10-63	J	½	D	Supplies 2 homes.
36C2	J. O. Okonek	20	Dr	6	101	-	-	-	Flows	-	C	1	D	Flows ½ gpm; several neighboring wells also flow; Cp.
36E1	Norman Castle	25	Dg	36	14	-	Gravel, sand	10-14	10.75	6-4-63	C	3/4	D	Cp.
36E2	R. E. Nation	50	Dr	6	83	-	Gravel	82-83	Flows	8-26-64	J	½	D	Flows 1 gpm; L.
36G1	Bruce Pagel	40	Dr	6	64	-	-	-	Flows	5-29-63	-	½	D	Flows ½ gpm.
36G2	R. L. Fitchitt	15	Dr	6	48	48	Gravel, sand	41-48	12	6-9-68	J	-	D	Bailed 20 gpm, dd 5 ft; L.
36M1	William Jussila	10	Dr	6	53	-	-	-	2.39	9-10-63	C	½	D	

36N1	Glen Pettijohn	25	Dr	6	67	-	-	-	Flows	8-26-64	J	1	D	Small flow at high tide; water contains iron.
36Q1	Don Bowman	160	Dr	6	56	-	-	40-56	40.08	3-8-63	J	1	D	Cp.
							T. 21 N., R. 4 W.							
2D1	State Highway Dept.	40	Dr	6	66	65	Sand	65-66	-	-	T	5	D,Ind	Screen 65-66 ft.
2D2	Leslie Smith	25	Dr	6	46(?)	-	-	-	3.27	7-30-64	C	1	D	
2E1	Al Jensen	27	B	6	18	-	-	-	16	-	C	1	D,PS	Serves small shopping center.
2P1	Mason County School Dist. 404	15	Dr	8	68	-	-	-	8	-	S	-	PS	Cp.
7K1	Ted Richert	45	Dr	8	30	-	Gravel	6-30	6	-	T	25	Irr	Pumped 360 gpm.
7K2	Ted Richert	45	Dg	-	18	-	-	-	6	-	C	3/4	D	
8R1	Skokomish Valley School	45	Dr	6	31	-	-	-	7.28	5-9-63	J	1	PS	
11B1	R. C. Snyder	15	Dr	6	30	30	Gravel, sand	25-30	-	-	-	-	D	L.
11C1	Tom Pulsifer	25	Dr	8	28	-	Sand, gravel	3-28	3	-	C	½	D	Water contains iron; L.
11J1	John Miller	15	Dr	6	26	-	-	-	6.50	7-30-64	P	¼	D	
15E1	Albert Bearden	36	Dn	1½	-	-	-	-	-	-	C	½	D	
15G1	William Bourgault	28	Dr	8	96	96	Gravel	90-96	10	-	C	¼	D	Cp.
15M1	George Barkley	38	Dn	4	12	12	-	-	4	-	C	½	D	Water contains iron.
16G1	D. R. Doak	41	Dr	10	45	-	-	-	-	-	C	½	D, S	
16H1	Stan Johnson	37	Dr	6	27	-	-	-	8	-	J	1	D, S	Supplies dairy.

Table 2 - Records of wells - Continued

Well No.	Owner or tenant	Well					Water-bearing zone(s)		Water level		Pump		Use of Water	Remarks
		Alt. (feet)	Type	Diam. (inches)	Depth (feet)	Casing depth (feet)	Material	Depth interval (feet)	Below land surface (feet)	Date	Type	H.P.		
T. 21 N., R. 4 W. (continued)														
17C1	Ted Richert	50	Dr	8	30	-	-	-	7	-	T	15	D,Irr	Pumped 350 gpm, dd 2½ ft.
18B1	Jim Daily	45	Dg	36	12	-	Gravel,sand	8-12	8	-	C	1	D	Cp.
18C1	H. D. Allen	44	Dn	1½	-	-	-	-	-	-	P	1/3	D	
18C2	Jim Daily	48	Dg	18	9	-	-	-	6	-	N	-	D	
18K1	State Game Dept.	75	Dr	8	78	49	Gravel	49-54	Flows	6- -63	-	-	D	Flow 52 gpm; test pumped 140 gpm, dd 45 ft; well filled back to 54 ft depth; supplies buildings of fish hatchery; Cp, L.
24G1	A. J. Turner	365	Dr	6	144	144	Gravel	136-144	86.86	4-4-63	J	½	D	L; Obs.
26E1	John Rae	245	Dr	6	30	-	-	-	-	-	J	-	D	
26E2	H. F. Rae	245	Dg	24	22	-	-	-	10	-	J	1	D	
26F1	Mingus Motel	245	Dg	10	23	-	Gravel	23	15.18	4-4-63	C	1/3	D	Serves 5 motel units; Cp.
T. 21 N., R. 5 W.														
12L1	Vern Hill	85	Dr	6	28	-	-	at 20	-	-	C	½	D	

6A1	H. W. Lohman	22	Dg	36	8	-	-	-	3.45	8-20-64	C	1	D	Water contains iron.
6B1	C. R. Callow	15	Dr	6	263	-	Gravel, sand	260-263	Flows	5-22-63	J	½	D	Flowed 100 gpm 9/20/46, pumped 30 gpm 6/12/51; Cp, L.
6B2	W. D. Griffith and H. W. Lohman	10	Dr	6	363	363	Gravel, sand	at 363	Flows	7-29-65	-	-	PS	Flows 35 gpm; L.
6L1	Oyster House Restaurant	25	Dr	6	285	-	Sand, gravel	at 285	Flows	(high tide)	P	1	D	Supplies restaurant and 2 homes.
6M1	C. V. Shepard	30	Dr	-	214	200	Silt, sand, gravel	130-214	Flows	-	-	-	D	Flows 12 gpm; bails 48 gpm, dd 15 ft; L.
6N1	M. S. Davis	60	Dr	6	221	216	Sand	170-221	50	10- -64	J	1	D	Bails 8 gpm, dd 125 ft; L.
6N2	Baccetti	20	Dr	6	218	-	-	-	Flows	-	C	1	D	Flows 1/10 gpm at low tide; pumped 28 gpm, dd 160 ft.
6R1	Doug Corliss	228	Dr	6	100	95	Sand	95-100	60.70	7-14-64	J	½	D	Screen 95-100 ft.
6R2	Doug Corliss	240	Dr	6	310	305	Sand	300-310	206.10	7-14-64	S	2	D	Bails 18 gpm; screen 305-310 ft; L.
8D1	North Mason High School	295	Dr	8 6	224	50 209	Sand	180-224	180	8- -57	S	3½	PS	Pumped 25 gpm, dd 25 ft, full recovery in 100 sec; Cp, L.
8M1	Lakewood Manor Association	255	Dr	6	364	-	-	-	118.70 (?)	5-23-63	P	5	PS	Yields 6 gpm.
8N1	Girl Scouts of America	265	Dr	6	-	-	-	-	40.69	5-22-63	J	1½	PS	
17B1	L. A. Allen	10	Dg	36	28±	-	Sand, gravel	to 28±	Flows	5-15-63	C	½	D, Ind	Flows ¼ gpm; Water used for oyster processing.

Table 2 - Records of wells - Continued

Well No.	Owner or tenant	Well					Water-bearing zone(s)		Water level		Pump		Use of Water	Remarks
		Alt. (feet)	Type	Diam. (inches)	Depth (feet)	Casing depth (feet)	Material	Depth interval (feet)	Below land surface (feet)	Date	Type	H.P.		
T. 22 N., R. 1 W. (continued)														
17B2	W. M. Baker	55	Dr	6	230	-	Sand, gravel	220-230	-	-	C	½	D	Fine sand almost to bottom, water level near top when drilled; Cp.
17H1	Sargent Oyster Co.	10	Dr	6	91	-	Sand, gravel	90-91	Flows	-	C	2	D, Ind	Flows 1 gpm; bails 36 gpm, dd 18 ft, 1 hr; L.
18R1	Robert Anderson	220	Dg	48	32	8	Sand, gravel	-	3.00	4-3-63	C	1/3	D	4 ft water-bearing beneath till.
19A1	H. E. Niepoth	195	Dg	48	18	4	-	-	7.00	4-3-63	C	1/3	D	Water has high bacteria count.
19H1	V. C. Anderson	155	Dg	-	20	-	-	-	3.00	4-3-63	C	½	D	Will go dry.
20G1	Fred Stock	20	Dr	6	169	-	-	-	20	-	J	1½	PS	Serves 9 homes and businesses.
20G2	Tacoma Pump & Drilling Co.	10	Dr	6	51	47	Sand	46-51	Flows	5-28-64	J	1	D	Flows ¼ gpm; L.
20H1	G. R. Kirk Co.	8	Dr	6	288	-	-	-	Flows	5-15-63	T	3	PS, Ind	Serves 9 units and evergreen plant; Cp.
20K1	John Mead	8	Dr	6	110	-	Sand	61-93	Flows	7-17-63	-	-	D	Flows 6½ gpm 7/17/63; Cp, L.
20N1	D. W. Beeson	20	Dr	6	46	-	Sand	-	10	-	N	-	D	Tested 5 gpm; Cp.
20P1	Fred Stock	12	Dr	8	70	-	Sand, gravel	63-70	8	4-17-61	C	¼	D	Bailed 30 gpm, dd 19 ft; L.
20Q1	Mrs. Chris Zietner	25	Dr	6	66	-	-	-	23.51	7-17-63	J	1	D	Serves 3 homes.

20Q2	Paul McKay	20	Dr	6	66	-	Sand,gravel	58-66	11	9-4-59	J	3/4	D	Bailed 16 gpm, dd 21 ft, 1 hr; L.
29B1	John Glenn	10	Dr	6	31	-	Sand,gravel	-	4	-	J	½	D	Pumped 10 gpm from sand, gravel below "hardpan".
29B2	William Payette	10	Dr	6	72	-	Sand,gravel	60-72	7½	7-23-65	-	-	D	Bailed 20 gpm, dd 47 ft; L.
29F1	Fred Lockwood	90	Dr	6	65	-	-	-	35(?)	-	J	½	D	Serves 2 homes.
29F2	LeRoy Dishon, Jr.	102	Dr	6	112	-	-	-	50+	7-17-63	J	1	D	
29H1	R. A. Benson	15	Dr	6	273	-	-	-	Flows	7-17-63	J	2	D	Cp.
29M1	R. W. Sharer	75	Dr	6	65	-	-	-	-	-	J	1	D	Serves 2 homes; bad iron.
29M2	Ed Piland	94	Dr	6	92	-	-	-	62.57	5-28-64	J	1	D	Water contains iron.
29R1	L. C. Morse	20	Dg	48	16	-	-	-	11	-	C	½	D	
29R2	Wilma Nelson	35	Dr	6	595	595	-	-	5	-	C	1	D	
31A1	R. H. Harding	155	Dg	48	15	-	Sand	-	4.51	7-17-63	C	1	D,Irr	Fire truck pumps dry in 45 min, 2-hr recovery.
32A1	M. O. Barnard	20	Dr	6	71	71	Sand,gravel	36-54	14	7-3-63	P	-	D	Bailed 20 gpm, dd 20 ft; L.
32A2	W. L. Guiles	21	Dr	6	78	74	Sand,gravel	68-78	20.25	9-9-65	J	-	D	Bailed 15 gpm, dd 9 ft; L.
32A3	Wally Waugh	20	Dr	6	58	-	Sand	20-58	-	-	-	-	D	L.
32B1	R. W. Eldredge	20	Dg	-	19		"Hardpan"	to 19	16.32	6-2-65	C	-	D	All "hardpan".
32G1	C. J. Holl	40	Dr	6	75	72	-	-	30.00	7-11-63	J	2	D	Pumped 16 gpm, dd 9 ft, 15 min; water had increase in chloride content after heavy pumping.
32H1	E. A. Middleton, Jr.	38	Dr	6	84	-	-	-	33.79	7-11-63	J	3/4	D	Pumped 10 gpm, dd less than 2 ft, 24 hrs.

Table 2 - Records of wells - Continued

Well No.	Owner or tenant	Well					Water-bearing zone(s)		Water level		Pump		Use of Water	Remarks
		Alt. (feet)	Type	Diam. (inches)	Depth (feet)	Casing depth (feet)	Material	Depth interval (feet)	Below land surface (feet)	Date	Type	H.P.		
T. 22 N., R. 1 W. (continued)														
32J1	A. V. Richards	30	Dr	6	66	-	-	-	-	-	C	-	D	Serves 2 homes.
32J2	Jack Milner	34	Dr	-	61	-	-	-	32.29	6-2-65	J	-	D	
32P1	G. S. Lewis	70	Dr	6	77	-	-	-	45.03	7-11-63	J	½	D	Cp.
32Q1	W. G. Clayton	25	Dr	6	38	-	Gravel, sand	36-38	23.25	6-2-65	J	-	D	Serves 2 homes; L.
T. 22 N., R. 2 W.														
1R1	J. E. Wilson	15	Dg	36	30(?)	-	-	-	-	-	P	¼	D	Goes dry occasionally.
12A1	A. G. Purdom	10	Dr	6	23	-	Gravel	-	7.58	6-10-65	J	-	D	
12G1	H. C. Stirling	12	Dr	6	40	39	Gravel, sand	35-40	10	8-23-61	J	1	D	Bailed 24 gpm, dd 17 ft; Cp, L.
12G2	George Lovett	60	Dg	-	14	-	-	-	4.00	6-10-65	C	-	D	Water contains iron.
14B1	C. A. Williams	10	Dg	48	40	-	-	-	-	-	P	½	D	
14B2	Tom Breiten	12	Dr	6	125	-	-	-	Flows	At high tide	-	-	D	Serves 2 homes.
14B3	J. P. Taylor	15	Dr	6	28	28	Sand, gravel	14-28	10	-	-	-	D	Bailed 16 gpm, dd 6 ft; L.
14B4	Lyle Rarey	15	Dr	6	37	-	Sand, gravel	18-37	12	-	-	-	D	Bailed 24 gpm, dd 12 ft, 1 hr; L.

14L1	Frank Perri	16	Dg	72	25	25	-	-	-	-	C	½	D	Water near surface.
14M1	G. H. Lecair	12	Dr	6	37	-	-	-	Flows	At high tide	-	-	D	
14M2	Arpod Masley	15	Dr		54	49	Sand,gravel	45-54	8	-	-	-	D	Bailed 8 gpm; L.
14M3	A. S. Anderson	15	Dr	-	38	38	Sand,gravel	15-38	Flows	-	-	-	D	Flows 8 gpm; bailed 24 gpm, dd 15 ft; L.
14N1	A. S. Miller	10	Dr	6	43	43	Gravel,sand	42-43	Flows	-	-	-	D	Bailed 30 gpm, dd of artesian head 6 ft; L.
14N2	Will Green	10	Dr	6	40	-	Sand,gravel	11-40	Flows	-	-	-	D	Flows 8 gpm; serves 3 homes; Cp, L.
15R1	Debritz	35	Dr	-	44	44	Gravel,clay	39-44	Flows	-	-	-	D	Pumped 10 gpm, dd 34 ft; L.
19R1	State Parks Commission (Twanoh State Park)	15	Dr	12	75	-	Sand,gravel	10-70	4½	-	C	5	PS	Pumped 117 gpm, dd 44 ft; Cp, L.
20J1	G. T. Belland	8	Dr	6	107	107	Gravel	at 107	Flows	8-29-58	J	1½	D	Flow 5 gpm 8/29/58; pumps 25 gpm, dd 40 ft, 2 hrs, 15 min recovery; L.
20M1	Thomas Snyder,Sr. (restaurant well)	10	Dr	-	80	-	Sand	70-80	7	-	C	½	D	Pumped 15 gpm, dd 35 ft; L.
20Q1	Twanoh Tides, Inc.	190	Dr	8	128	128	Gravel	100-124	93.23	9-27-63	S	5	PS	Pumped 24 gpm, dd 4 ft; Cp, L.
21E1	Ray Orr	15	Dr	6	67	67	Sand,gravel	55-67	1	8-19-65	-	-	D	Bailed 15 gpm, dd 36 ft; L.
21H1	Hazel Ohrner	20	Dg	36	24	-	-	-	19	-	-	-	D	
21H2	Cherry	15	Dr	6	76	70	Gravel	72-76	4	-	-	-	D	Tides affect water level; L.
22B1	E. R. Hosher	12	Dr	6	33	-	-	-	-	-	J	1	D	Serves 2 homes.

Table 2 - Records of wells - Continued

Well No.	Owner or tenant	Well					Water-bearing zone(s)		Water level		Pump		Use of Water	Remarks
		Alt. (feet)	Type	Diam. (inches)	Depth (feet)	Casing depth (feet)	Material	Depth interval (feet)	Below land surface (feet)	Date	Type	H.P.		
T. 22 N., R. 2 W. (continued)														
22B2	Happy Hollow Store	10	Dr	6	70	-	-	-	Flows	-	-	-	D	
22B3	Gullo	10	Dr	6	118	-	-	-	7.34	6-10-65	J	-	D	
22C1	J. T. Carlen	20	Dr	6	150	-	-	-	Flows	-	-	-	D	
22C2	J. A. Watson	20	Dr	-	39	-	Gravel	36-39	18	-	-	-	D	Bails 36 gpm, dd 5 ft; L.
22D1	Wagner	10	Dr	6	28	-	-	-	9.30	6-10-65	C	½	D	
23R1	South Kitsap Investment Co.	320	Dr	6	60	-	-	-	30	-	T	-	PS	Pumped 60 gpm, with little dd
32Q1	C. A. Cooley	220	Dg	48 12	12	12	-	9-12	8	8-26-61	J	1	D	Pumped 9 gpm, dd 3 ft; perf 9-12 ft; serves 3 homes.
32Q2	Fred Lammers	209	Dr	6	57	57	Gravel	48-57	-	-	J	-	D	Cp, L.
32Q3	C. B. Luckey	204	Dg	48	25	-	-	-	-	-	C	½	D	
33G1	L. G. Mendenhall	225	Dr	6	71	-	Gravel, sand	(see log)	30	9-26-62	-	-	D	Bailed 6 gpm, dd 12 ft; L.
33Q1	J. H. Hill	200	Dr	6	25	-	-	-	5.10	9-6-63	J	1	D	
33R1	J. Magee	235	Dr	6	50	-	Gravel	48-50	35	9-27-65	-	-	D	Bailed 7 gpm, dd 6 ft; L.
34C1	H. P. Buhl	230	Dr	6	106	106	Gravel, sand	74-89, 100-106	35	5-17-63	J	-	D	Bailed 13 gpm, dd 15 ft; L.

34E1	Frank Sovereign	215	Dr	6	53	-	Gravel	51-53	39	10-22-64	-	-	D	Bailed 20 gpm, dd 2 ft; L.
34E2	P. N. Krueger	240	Dr	6	88	88	Gravel, sand	76-88	42	-	-	-	D	Bailed 23 gpm, dd 10 ft; L.
34M1	Carl Haggstrom	230	Dr	6	44	-	Sand, gravel	41-44	32	3-2-65	-	-	D	Bailed 16 gpm, dd 1 ft; L.
							T. 22 N., R. 3 W.							
31A1	Dick Buechel	10	Dr	6	198	-	"Hardpan"	-	Flows	At high tide	J	1½	D, PS	Supplies Town of Union in emergency, also serves garage.
32E1	Mason County P. U. D.	120	Dr	10	156	151	Gravel	76-95 108-150	56	-	S	1½	PS	Pumped 25 gpm. Supplies 58 customers in Town of Union; L.
32F1	Steve Morris	160	Dr	6	128	-	Gravel	at 128	93.40	9-27-63	J	2	D	All "hardpan" except gravel at bottom; 15-gpm steady supply for 2 homes; Cp.
32L1	Town of Union	240	Dr	10	146	146	-	-	-	-	T	-	PS	Serves 58 outlets; Cp.
32M1	M. P. Fassio	240	Dg	60	10	-	"Hardpan"	2-10	2	-	S	1/3	D	Pumped 8 gpm, dd 4 ft, 5 hrs.
32P1	M. M. Miller	205	Dr	6	265	-	-	-	9.10	4-4-63	S	-	D	Red sands and clays; pumped 12 gpm, dd 1 ft, 15 min; water contains iron; Cp.
33N1	W. S. Chase	40	Dg	36	12	-	Gravel	-	4.00	9-26-63	C	1/3	D	Will pump dry.
34Q1	Eric Bergquist	12	Dr	6	109	-	Gravel	98-109	4	-	T	1½	PS	Penetrates 2 or 3 alternating layers of "hardpan" and water-bearing sand, gravel; pumps 33 gpm, with little dd; serves 12 motel units.

Table 3 - Drillers' logs of representative wells

Materials	Thickness (feet)	Depth (feet)
19/2-5C1. W. T. Bucey. Drilled by Evergreen, May, 1962.		
Clay, yellow	18	18
Clay, blue	47	65
"Hardpan"	29	94
Gravel, water-bearing	9	103
19/2-6D2. D. A. Stroup. Drilled by Russell, January, 1964.		
Existing depth	93	93
Clay and sand	29	122
Gravel and sand, hard	9	131
Sand, water-bearing	1	132
Sand and gravel, hard	19	151
Sand, water-bearing	1	152
Gravel and sand, hard	7	159
Gravel and sand	4	163
19/3-2L1. Leslie Collins. Dug by owner.		
"Surface"	4	4
"Hardpan"	2	6
Sand and gravel, water-bearing	11	17
19/3-3R1. Joe Silva. Dug by Meister, previous owner, 1939.		
"Hardpan" and gravel, water-bearing 8-25 ft	25	25
Clay, blue	1	26
19/3-4F1. L. J. Morris. Drilled by Evergreen, October, 1960.		
Gravel	3	3
"Hardpan"	39	42
"Pea gravel" and sand, loose, water-bearing	20	62
19/3-4F2. W. S. McGee. Drilled by Evergreen, May, 1963.		
"Hardpan"	47	47
Gravel, water-bearing	12	59
19/3-4F3. Walter Stansbury. Drilled by Russell, July, 1965.		
Gravel, cemented	42	42
Sand and gravel	21	63
Sand and gravel, water-bearing	8	71
19/3-6A1. W. R. Moultrop. Drilled by 1936.		
Gravel	80	80
"Hardpan"	10	90
Gravel, water-bearing	8	98
19/3-7H1. John Blanten. Drilled by Russell, June, 1962.		
Gravel, sand and dirt	8	8

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
19/3-7H1 - Continued		
Gravel, cemented	82	90
Gravel and sand, water-bearing	7	97
Gravel, cemented	1	98
Gravel and sand, water-bearing	1	99
19/3-8D1. Botts Nursing Home. Drilled by Webber, Dec. 1947.		
"Hardpan"	70	70
Clay, blue, with some gravel streaks	34	104
19/3-8M1. Ralph Brewer. Drilled by Erdman, by 1950.		
Clay, sandy	20	20
Sand and gravel, water-bearing 31-53 ft	33	53
Casing perforated 40-50 ft.		
19/3-8M2. Skyline Drive-In Theatre. Drilled by Russell, January, 1964.		
Gravel	3	3
Gravel, cemented	45	48
Sand	7	55
Gravel, cemented	45	100
Sand and gravel, green	2	102
Clay and sand, blue	20	122
Sand and gravel, green, water-bearing	5	127
Sand and gravel, water-bearing	9	136
19/3-8P1. Dick LaFond. Drilled by Russell, August, 1965.		
Clay and gravel	5	5
Gravel, cemented, water-bearing at 67 ft	76	81
19/3-9E1. H. H. Leonard. Drilled by Bedell, 1951.		
Soil	3	3
"Hardpan"	6	9
Sand and gravel	13	22
Clay, red	15	37
Clay, blue	70	107
Clay, blue	23	130
Clay	30	160
Sand and clay, dirty	40	200
Casing perforated 112-115, 164 ft.		
19/3-10R1. Fred Clark. Drilled by Kincy.		
Existing dug well	19	19
Clay, blue, and coarse gravel	41	60
Clay, blue	5	65
Sand and gravel	1	66
Clay, blue	19	85
Clay and gravel	2	87

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
19/3-10R1 - Continued		
Clay, blue, with flammable gas at 140 ft	54	141
Gravel, heavy	19	160
19/3-11A1. Robert Marcy. Drilled by Russell, April, 1964.		
Soil	2	2
Gravel and boulders, cemented	20	22
Clay, blue	33	55
Gravel, cemented	1	56
Gravel and sand, water-bearing	4	60
Gravel, cemented	13	73
Sand and gravel, water-bearing	10	83
19/3-11G3. Al Taylor. Drilled by Webber, 1960.		
Clay, with log and clam shells at 70 ft	70	70
"Hardpan"	30	100
Gravel and sand, water-bearing	5	105
19/3-11Q1. Kamilche Shores, Inc. Drilled by Patterson, July, 1964.		
Sand and clay	6	6
Gravel and clay	32	38
Clay, blue	21	59
Clay, brown, and silt with some peat	38	97
Gravel, cemented	20	117
Gravel and sand, water-bearing	10	127
Casing: 6-inches to 119 ft; slot-perforated pipe 119-127 ft.		
19/3-18J1. Marshall White. Drilled by Russell, September, 1965.		
Sand, clay and gravel	28	28
Sand	5	33
Sand and rock, water-bearing	10	43
Rock	1	44
Casing: 6 inches to 38 ft; screen 38-43 ft.		
19/3-18R3. Chester Marshall. Drilled by Russell, July, 1964.		
Soil	2	2
Gravel, cemented	13	15
Sand	20	35
Clay	10	45
Sand, gravel and rock, water-bearing	10	55
Slot-perforated pipe 49-54 ft.		
19/3-18R4. Al Nagel. Drilled by Russell, September, 1965.		
Gravel, sand and clay	18	18
"Hardpan"	4	22
Sand and gravel	7	29
Clay, blue	8	37

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
19/3-18R4 - Continued		
Clay, yellow, and gravel	2	39
Sand and gravel, water-bearing	1	40
19/3-20G1. W. C. Frye. Drilled by Bedell, 1948.		
Soil	3	3
Gravel, cemented, with "hardpan" streaks	102	105
Bedrock, broken, water-bearing	36	141
19/3-21H1. Olympia Oyster Company. Drilled by Patterson, April, 1952.		
Fill dirt	5	5
Gravel, sand and clay	20	25
Gravel, cemented	5	30
Sand, gravel and clay, water-bearing	19	49
Clay, blue	38	87
Clay, blue, with sand and gravel	77	164
Clay and sand, broken	26	190
Clay and gravel, blue	19	209
Clay, gravel and sand	39	248
Gravel and sand, water-bearing	16	264
Screen 253½-259½ ft.		
19/3-21H2. Olympia Oyster Company. Drilled by Evergreen, April, 1964.		
Clay and "hardpan"	32	32
Gravel and sand, water-bearing	18	50
Sand, coarse, and gravel, water-bearing	25	75
Screen 70-75 ft.		
19/3-21L1. J. J. Brenner Oyster Company. Drilled by Webber, May, 1955.		
Soil	4	4
Gravel, cemented, hard	26	30
Gravel, medium fine, water-bearing	6	36
Gravel, cemented	21	57
Clay, blue, and silt, with vegetation	23	80
Gravel, blue, cemented, very hard	18	98
Clay, blue, soft, water-saturated	12	110
Basalt, black	at	110
Casing perforated 30-36 ft.		
19/3-23E1. Nat Waldrip. Drilled by Bedell, 1959.		
Gravel	8	8
Gravel, cemented, water-bearing	22	30
Sand and clay, water-bearing	15	45
Sand, coarse, water-bearing	6	51
Screen 46-51 ft.		

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
19/3-30B1. Max Waldburger. Drilled by Patterson, winter 1961-62.		
Clay and sand, brown	6	6
Clay, blue	19	25
Clay, gravel and sand	18	43
Gravel and blue clay	4	47
Clay, blue	27	74
Clay, brown	20	94
Clay, blue, with layers of sand and silt; artesian flow at 97 ft	16	110
Clay, blue	7	117
19/3-30B2. Lester Waldburger. Drilled by Russell, August, 1965.		
Clay, red	10	10
Clay and rocks	12	22
Gravel, blue, cemented	34	56
Gravel, sand and clay, water-bearing	14	70
Casing perforated 57-70 ft.		
19/4-2F1. H. A. Loertscher. Drilled by Bedell, "1947-50".		
Clay, red	20	20
Clay, blue	42	62
Gravel, water-bearing	4	66
Clay, blue	44	110
Casing perforated 62-66 ft.		
19/4-3K1. Ralph Weddle. Drilled by Freese.		
Existing well	18	18
Gravel and sand, water-bearing	5	23
19/4-6C1. Ethel Galbraith. Drilled by Russell, July, 1965.		
Soil and clay	3	3
Gravel, cemented, and rock	9	12
Clay, green, and rocks	24	36
Clay, red, and gravel	13	49
Rock	11	60
19/4-9A1. C. W. Clanton. Drilled by Evergreen, 1960.		
Soil	23	23
Gravel, water-bearing	5	28
Clay, blue	17	45
19/4-24P1. Wes Whitener. Drilled by Bedell.		
"Shot clay"	10	10
Clay, blue	133	143
Gravel, water-bearing	4	147

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
19/4-28Q1. C. E. Buxton. Drilled by Webber (?).		
Gravel	20	20
Clay in layers, with gravel	60	80
"Pea gravel", water-bearing	20	100
19/5-1L1. A. G. Carlson. Drilled by Russell, September, 1963.		
Gravel and dirt	11	11
Gravel and sand, hard	9	20
Gravel and sand	12	32
Gravel, sand and clay, hard	38	70
Gravel and sand, water-bearing	19	89
20/1-20E1. L. H. Jerrells. Drilled by Patterson, July, 1964.		
Sand	8	8
"Hardpan"	20	28
Sand and gravel, water-bearing	29	57
20/1-20E2. L. H. Jerrells. Dug by owner.		
Soil	4	4
"Hardpan"	18	22
Sand, black, water-bearing	1	23
20/1-30M1. Dorothy Smith. Drilled by Bedell, January, 1954.		
Soil	2	2
"Hardpan"	73	75
Gravel, cemented	97	172
Clay, red, hard	14	186
Gravel, cemented	124	310
Gravel, blue, cemented	68	378
"Hardpan", blue	13	391
Clay and sand, blue; with some water	18	409
Sand, water-bearing	10	419
20/1-31N1. H. W. Lister. Drilled by Evergreen, 1960.		
"Hardpan", water-bearing 40-42 ft	53	53
Gravel, water-bearing	14	67
20/2-3M1. J. M. Peterson. Drilled by Webber, August, 1965.		
"Hardpan"	50	50
Clay and sand, water-bearing	44	94
Gravel, water-bearing	at	94
20/2-3P1. G. B. Howard. Drilled by Bedell, about 1960.		
"Shot clay"	10	10
"Hardpan"	30	40
Clay, blue	18	58
Gravel, water-bearing	3	61

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
20/2-4H1. Leroy Fuller. Drilled by Bedell, by 1950.		
Soil and clay, red	4	4
"Hardpan"	33	37
Clay, blue	24	61
Clay, blue, and gravel, with some water	16	77
Sand with some water	24	101
Sand and gravel, water-bearing	2	103
20/2-5A1. Samuel Magruder. Drilled by Bedell, August, 1958.		
"Hardpan"	75	75
Sand, fine, with some water	25	100
Sand, clean, water-bearing	10	110
Screen 105-110 ft.		
20/2-5B1. H. G. Wheeler. Drilled by Evergreen, September, 1961.		
Soil	4	4
"Hardpan"	30	34
Sand and gravel, with little water	6	40
Sand and gravel, water-bearing	9	49
Sand, fine, water-bearing	5	54
Casing perforated 47-54 ft.		
20/2-5C1. L. E. Brewer. Drilled by Evergreen.		
"Hardpan"	53	53
Sand and gravel, water-bearing	20	73
20/2-9B1. DGTGOC Water System, Inc. Drilled by Bedell, April, 1961.		
"Shot clay"	4	4
"Hardpan"	64	68
"Hardpan" with streaks of blue clay	12	80
Clay and sand, red, with wood 105-118 ft	50	130
Clay and sand, blue	10	140
Sand, blue, water-bearing	4	144
20/2-14B1. James McAuliffe. Drilled by Bedell, August, 1963.		
"Shot clay"	25	25
Sand and clay	34	59
Gravel, sand and clay	14	73
Clay, blue	29	102
Clay, blue, with sand and gravel	10	112
Clay, blue, and water-bearing gravel	2	114
Gravel and sand, water-bearing	4	118
Screen 113-118 ft.		
20/2-14N1. Lawrence Saeger. Drilled by Bedell, January, 1961.		
Soil	3	3

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
20/2-14N1 - Continued		
Gravel, cemented	22	25
Clay	8	33
Clay, hard	12	45
Gravel, blue, cemented	4	49
Gravel, water-bearing	4	53
20/2-16B2. G. R. Anderson. Drilled by Russell, July, 1965.		
Clay and rock	6	6
Gravel, cemented	34	40
Gravel and sand, water-bearing	1	41
Clay	2	43
20/2-16B3. William Leveque. Drilled by Tacoma Pump, March, 1965.		
Clay and soil, brown	3	3
"Hardpan", gravelly	15	18
"Hardpan", sandy, medium soft	13	31
Sand, gravel and clay, with some water	5	36
Sand, gravel and clay	5	41
Clay, blue	22	63
Sand and clay	4	67
Sand and clay with some water	1	68
Clay and gravel, hard	6	74
Clay and sand, medium hard	10	84
Sand, mostly fine, water-bearing	10	94
Screen 84-88 ft.		
20/2-16F1. M. A. Smith. Drilled by Russell, August, 1965.		
Clay and sand	3	3
Sand, gravel and clay	14	17
Clay, blue	26	43
"Hardpan" with some water 59-70 ft	31	74
Gravel and sand, water-bearing	5	79
20/2-16M2. Martin Auseth. Drilled by Davidson.		
"Hardpan"	3	3
Clay, blue, with silty black peat at 100 ft	106	109
Sand and gravel, cemented, water-bearing	18	127
20/2-16P1. William McLaughlin. Dug by owner.		
"Hardpan"	15	15
Clay, blue	1	16
"Quicksand"	2	18
20/2-17P1. Jalmer Auseth. Drilled by Davidson, May, 1946.		
Soil	2	2
"Hardpan"	19	21
Gravel	2	23

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
20/2-17P1 - Continued		
"Hardpan"	12	35
Clay, blue	6	41
Sand, water-bearing 67-85 ft	44	85
Gravel, water-bearing	1	86
20/2-21P1. Arkada Park Subdivision. Drilled by Bedell, January, 1961.		
Clay	12	12
"Hardpan"	15	27
Clay, red to blue	52	79
Clay, blue, with gravel and sand	6	85
Clay, gray	23	108
Sand and clay	16	124
Sand, water-bearing	7	131
Sand and clay, water-bearing	42	173
Sand, water-bearing	10	183
Screen at bottom.		
20/2-25M1. M. A. Olson. Drilled by Evergreen, December, 1961.		
"Hardpan"	22	22
Gravel, water-bearing	16	38
20/2-30F1. Fred White. Drilled by Bedell, 1960.		
Soil	2	2
Clay, red	6	8
"Hardpan" or gravel, cemented	34	42
Gravel, cemented, with some water	6	48
Clay, blue, with streaks of hard clay	72	120
Sand, clay and gravel, blue, tight	22	142
Gravel, water-bearing	8	150
20/2-31Q2. Vern LaMarsh. Drilled by Russell, June, 1965.		
Soil and clay, black	6	6
Clay	41	47
Gravel, cemented	23	70
Clay, gray	6	76
"Hardpan", brown	13	89
Sand, gravelly, water-bearing	1	90
Gravel and sand, water-bearing	2	92
20/2-32K1. Fred Barker. Dug by owner.		
Sand, cemented	20	20
Clay, blue	at	20
20/2-35K1. State Parks Commission. Bored by Parnella, June, 1965.		
Silt and clay, brown	4	4
Clay, silt and gravel, brown and gray	8	12

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
20/2-35K1 - Continued		
Clay, silty, with some gray gravel	3	15
Clay and some silt, gray	15	30
Clay, gray	20	50
Clay and some sand seams, gray, moist	18	68
20/2-35K2. State Parks Commission. Bored by Parnella, June, 1965.		
Sand, silt and gravel, brown	11	11
Sand and silt, brown	6	17
Clay, silt, and some pebbles and gravel	6	23
Sand, gravel and silt, grayish brown	2	25
Clay, gray, silty, with seams of sand and silty gravel	14	39
Clay, gray, silty	10	49
20/2-35Q1. State Parks Commission. Bored by Parnella, June, 1965.		
Sand and some pebbly brown silt	12	12
Silt, brown, clayey	3	15
Silt, with seams of clay and sand, some water	8	23
Clay, gray	1	24
20/3-1E1. M. M. Stroud. Drilled by Russell, July, 1965.		
Soil and clay	6	6
Gravel, cemented	29	35
Clay, blue	53	88
Gravel, cemented	1	89
Gravel and clay, with logs and sticks	7	96
Gravel, blue, cemented	3	99
Gravel and sand, water-bearing	2	101
20/3-1E2. M. M. Stroud. Drilled by Russell, July, 1964.		
Clay, red	5	5
Gravel, cemented	35	40
Sand and gravel	3	43
Gravel, cemented	6	49
Sand and gravel, tight	3	52
Clay, blue	9	61
Gravel, cemented	14	75
Gravel and sand, water-bearing	7	82
20/3-1G1. O. W. Anthony. Drilled by Bedell, 1950.		
"Shot clay"	2	2
Gravel, cemented	12	14
Clay, blue, with wood at 60 ft	48	62
Sand, water-bearing	at	62
20/3-3K1. Bayshore, Inc. Drilled by Bedell, September, 1960.		
Clay and gravel	76	76

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
20/3-3K1 - Continued		
"Hardpan" and gravel, cemented	11	87
Clay, sandy, with some water	37	124
Clay, blue	54	178
Clay, sand and gravel, blue, water-bearing	67	245
Clay, blue, water-bearing	9	254
Casing perforated 104-254 ft.		
20/3-3N3. State Highway Department. Drilled by Harbor, May, 1962.		
Soil	2	2
Sand and gravel, loose	65	67
Sand, brown, dry	14	81
Sand and hardpan, gravelly, with some seepage 93-105 ft	60	141
Clay and sand, blue, laminated, water-bearing	29	170
Sand, fine to coarse, and gravel, water-bearing	1	171
20/3-5A1. Rayonier, Inc. Drilled by Sylte, February, 1948.		
Sand	3	3
Gravel and sand, with some water	38	41
Sand	2	43
Gravel and clay	40	83
Clay and sand	17	100
Gravel and clay	23	123
"Hardpan"	40	163
Gravel, water-bearing, with alternating clay layers	187	350
Sand	10	360
Gravel	4	364
"Hardpan"	19	383
Casing perforated 23-41, 207-221, 275-300 ft.		
20/3-5F1. Rayonier, Inc. Drilled by Gaudio, February, 1948.		
Gravel and sand	27	27
Clay	2	29
Boulders and "hardpan"	39	68
Gravel and sand, dry	5	73
Clay and "pea gravel"	6	79
Clay	11	90
Clay, sand and gravel, alternating layers and mixtures, with cemented gravel 201-207, 239-250, 379-399, "shale", 302-311, 399-403, 473-493 ft	410	500
Casing perforated 122-146, 151-168, 250-259, 286-302, 311-321, 403-416, 437-454 ft.		
20/3-5J2. O. E. Lee. Drilled by Russell, August, 1965.		
Gravel	27	27
"Hardpan"	11	38

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
20/3-5J2 - Continued		
Gravel and sand, with seepage	1	39
"Hardpan"	25	64
Gravel and sand, water-bearing	1	65
Clay and gravel, blue	29	94
"Hardpan", blue	6	100
Gravel and sand, water-bearing	2	102
20/3-5L2. S. R. Steehler. Drilled by Russell.		
Soil and gravel	3	3
Gravel, cemented	22	25
Gravel and sand, water-bearing	7	32
20/3-5N2. Rayonier, Inc. Drilled by Richardson, February, 1948.		
"Hardpan"	43	43
Gravel and sand	42	85
"Hardpan"	8	93
Gravel, water-bearing	12	105
Gravel and sand	7	112
Gravel, cemented	18	130
Clay	5	135
Gravel, water-bearing	8	143
Sand and gravel, water-bearing	23	166
Clay and sand, with wood at 172 ft	27	193
Gravel, clay and sand	24	217
Clay, gravel and "rotten vegetation"	14	231
Clay and sand	22	253
Clay, sand and gravel	30	283
Clay and gravel, yellow	68	351
Gravel, cemented	12	363
Clay, sand and gravel	17	380
Gravel	5	385
Clay, sand and gravel	75	460
Casing perforated 93-105, 135-143 ft.		
20/3-6B1. L. S. Rutherford. Driven by owner.		
Gravel	18	18
"Hardpan", two layers	11	29
Gravel, water-bearing	3	32
20/3-6E2. J. A. Tobler. Drilled by Russell, May, 1963.		
Gravel and boulders	8	8
Sand and gravel	4	12
Gravel, cemented	33	45
Gravel and clay	15	60
Gravel and sand, water-bearing	9	69
20/3-6N1. W. D. Fox. Drilled by Russell, May, 1965.		
Gravel and dirt	6	6

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
20/3-6N1 - Continued		
Gravel, cemented	2	8
Gravel, loose, and sand	2	10
Gravel, loose	10	20
Clay, blue, and gravel	10	30
Clay, blue, and sand	30	60
Sand, brown, water-bearing	5	65
Sand, blue, water-bearing	3	68
Gravel and sand, yellow, water-bearing	4	72
20/3-6P1. R. H. Lamb. Drilled by Russell, April, 1965.		
Rock and dirt	10	10
Gravel, cemented	20	30
Sand and clay, blue	28	58
Sand and gravel, water-bearing	7	65
20/3-7L1. City of Shelton Well 2. Drilled by Bach, log by Robinson & Roberts, May, 1953.		
Gravel and boulders	20	20
Sand and gravel, water-bearing	23	43
Gravel, coarse	17	60
Sand, blue, fine	20	80
Clay, blue, and gravel, water-bearing	7	87
Sand, water-bearing	3	90
Clay, blue, and sand	13	103
Gravel, coarse	12	115
Clay, with gravel	33	148
Sand and gravel, coarse	20	168
Clay, yellow to brown, with coarse gravel	14	182
Clay, yellow, and fine sand	13	195
"Hardpan" and cobbles	10	205
Gravel and sand, water-bearing 205-212, 230-237 ft	37	242
"Hardpan", alternating with gravel and sand; water-bearing 257-265 ft	38	280
Clay, blue, sandy	17	297
Gravel and sand, blue	13	310
Sand, fine, and blue clay	20	330
Sand and fine gravel	2	332
Clay	29	361
Gravel, muddy	4	365
Clay, with shaly streaks	18	383
Gravel and sand, brown and muddy	22	405
Clay and fine sand	15	420
Gravel, coarse, muddy	23	443
"Hardpan"	22	455
Clay, blue	9	464
Gravel, water-bearing, and clay	11	475
Clay and sand, muddy	12	487
Gravel and sand, fine	21	508
Clay, brown, sandy	7	515
Gravel, coarse, and loose rock, water-bearing	35	550

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
20/3-7L1 - Continued		
Gravel, with some clay	15	565
Clay	41	606
Gravel and sand, with "hardpan" 622-630 ft	57	663
Gravel with some clay	13	676
Clay, sandy	27	703
Gravel, muddy	5	708
Casing perforated 205-278, 515-565, 630-637, 663-673 ft.		
20/3-7P1. City of Shelton Well 1. Drilled by Jannsen, April, 1948.		
Sand, coarse, and boulders	60	60
Clay, blue	25	85
Gravel and sand, hardpacked at top	15	100
Clay and gravel, hardpacked	75	175
Rock	5	180
Clay, brown	20	200
Gravel, fine to coarse, with some sand and mud	100	300
Clay, sandy to sticky	28	328
Gravel, fine, water-bearing, with some clay	57	385
Gravel, loose	15	400
Sand and gravel, fine, dry	40	440
Clay, black, sandy to coarse black sand	40	480
Gravel, hardpacked	28	508
Rock, brown	7	515
Gravel	25	540
Sand, black, coarse, with clay streaks	30	670
Gravel, muddy	55	725
Clay, sandy	20	745
Casing perforated 515-725 ft.		
20/3-9D1. Port of Shelton. Drilled by Bedell, July, 1964.		
Clay, gravelly, cemented ("hardpan")	45	45
Clay, sandy, with some water	32	77
Clay with some gravel	6	83
Clay, blue	25	108
Gravel, cemented, with "blue water"	32	140
Clay, gravelly, and sand, with some water	15	155
Casing perforated 140-153 ft.		
20/3-9Q1. B. B. Thomas. Drilled by Bedell, 1955.		
Existing well	61	61
"Hardpan", blue, with "16 ft cavern at 80 ft"	20	81
20/3-10A1. Peninsula Development Company, Inc. Drilled by Harbor, February, 1961.		
Soil	3	3

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
20/3-10A1 - Continued		
Clay, sand and gravel, brown	15	18
Clay, brown	25	43
Sand, blue, and gravel, with seepage	14	57
Sand, brown, and gravelly "hardpan"	19	76
Sand and gravel, and blue clayey "hardpan"	11	87
Sand, brown, and gravelly "hardpan"	23	110
Sand, blue, and gravel, with seepage	44	154
Sand, fine, water-bearing	67	221
Sand and gravel, water-bearing	12	233
Screen 228-233 ft.		
20/3-15F2. Oscar Berntsen. Drilled by Tyee Division, Tacoma Pump, July, 1965.		
Clay and soil, brown	8	8
Clay, brown, with sand and gravel	17	25
Clay, blue	9	34
Gravel, water-bearing	5	39
20/3-15Q1. Clyde Robb. Drilled by Bedell, 1963.		
Soil	10	10
Clay, red	30	40
Clay, blue	48	88
Gravel, cemented	22	110
Clay, blue	30	140
Gravel, water-bearing	8	148
20/3-15Q2. Dean Doyle. Drilled by Russell, September, 1963.		
Dirt and rocks	3	3
Gravel, cemented	5	8
Sand and clay	37	45
Gravel and clay, cemented	9	54
Sand and gravel, water-bearing	6	60
Gravel, water-bearing	5	65
Gravel, cemented	10	75
Clay and gravel	12	87
Gravel and sand	3	90
Clay	5	95
Clay and gravel	13	108
Gravel and sand, water-bearing	4	112
20/3-17A1. Rayonier, Inc. test well. Drilled by Gaudio, log by Robinson & Roberts, March, 1953.		
Sand and gravel, loose	16	16
"Hardpan"	28	44
Sand and gravel, with clay streaks 44-50 ft	23	67
"Hardpan"	8	75

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
20/3-17A1 - Continued		
Gravel, clay, and sand, blue	25	100
"Hardpan", and cemented gravel	63	163
Sand and gravel	10	173
"Hardpan", brown to blue	16	189
Sand and gravel, red, coarse, loose	6	195
Sand and gravel, red, cemented	6	201
"Hardpan", blue	23	224
Clay and gravel, brown	3	227
Sand, with some gravel	166	393
"Hardpan"	2	395
Sand and gravel, dark, loose	18	413
Clay and "hardpan"	14	427
Clay, blue to green, sandy to sticky	58	485
Aquifers tested: 163-173, 183-201, 227-280, 293-310, 371-393, 395-413 ft.		
20/3-17K1. Rayonier, Inc. test well. Drilled by Gaudio, log by Robinson & Roberts, July, 1953.		
"Hardpan", brown	72	72
Gravel and sand, gray	26	98
"Hardpan" and gravel, cemented	15	113
Sand and gravel, with some clay	136	249
"Hardpan", gray-brown	16	265
Sand and gravel	25	290
Gravel, with streaks of clay, muddy	30	320
Sand and gravel	11	331
Clay, blue	19	350
"Hardpan"	5	355
Clay, green	15	370
"Hardpan"	1	371
Sand and gravel	19	390
Clay and some sandy clay	110	500
Aquifers tested: 265-273, 283-331, 371-390 ft.		
20/3-18G1. Jay Abel. Drilled by Bedell, April, 1951.		
Clay and gravel, some "hardpan" at bottom	28	28
Clay, blue	31	59
Gravel, cemented, with some water	4	63
Clay, blue, with streaks of "hardpan"	50	113
"Hardpan", red	30	143
Gravel, cemented, water-bearing	5	148
Gravel, water-bearing at bottom	1	149
20/3-18J3. L. J. Anderson. Drilled by Russell, June, 1964.		
"Hardpan"	42	42
Clay, blue, and gravel	2	44

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
20/3-18J3 - Continued		
Gravel, sand and clay	10	54
Clay, blue	20	74
Gravel, gray, cemented	3	77
Gravel and sand, water-bearing	2	79
Gravel, cemented	18	97
Gravel and sand, water-bearing	6	103
Casing perforated 98-103 ft.		
20/3-18K1. B. T. Winiecki. Drilled by Bedell, by 1958.		
"Shot clay", and red gravel	14	14
Clay, blue, with some water at bottom	34	48
Clay and gravel, red	8	56
Gravel, blue, cemented	13	69
Gravel, cemented, with some water	14	83
Clay and peat, with some water	13	96
Gravel, red, cemented	12	108
Clay, blue, and gravel	33	141
Clay, red, and gravel, with some water	19	160
Gravel, water-bearing	4	164
20/3-19A1. Rayonier, Inc. well 5. Drilled 1938.		
Clay and gravel (fill)	15	15
Sand	145	160
Clay, gravel, and sand in alternating layers	120	280
Gravel and clay in alternating layers	313	593
Sand	13	606
Gravel and clay in alternating layers	83	689
Clay and sand	55	744
Gravel and clay, with little sand	82	826
Gravel, cemented	57	883
Casing perforated 260-405, 528-560, 648-671, 744-770, 795-826 ft.		
20/3-19C1. Simpson Timber Company (formerly Rayonier, Inc. well 4) Drilled by Jannsen, February, 1942.		
Gravel	60	60
Gravel and shale	34	94
Boulders and shale	42	136
Gravel, wet	15	151
Shale, green and brown	51	202
Gravel, water-bearing	61	263
Shale, gray and green	53	316
Gravel and clay, water-bearing	80	396
Shale	40	436
Gravel and sand, water-bearing	21	457
Shale, blue	35	492
Clay and gravel, water-bearing	46	538
Clay and shale	47	585

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
20/3-19C1 - Continued		
Gravel, water-bearing	56	641
Clay and gravel	32	673
Gravel, water-bearing	62	735
Casing perforated 197-261, 301-399, 431-470, 485-542, 580-645, 673-732 ft.		
20/3-19H1. Simpson Timber Company (formerly Rayonier, Inc. well 1). Drilled by Jannsen, September, 1934.		
Sand and gravel	74	74
Clay and sand	66	140
Gravel and clay, with little sand	202	342
Sand and gravel, with some clay	105	447
Gravel	22	469
Gravel, cemented	12	481
Gravel, with clay	59	540
Gravel, cemented	9	549
Gravel, with clay	61	610
Gravel, cemented	9	619
Clay and gravel, with some sand	131	750
Casing perforated 286-306, 342-410, 418-439, 447-469, 488-540, 557-579, 629-642, 689-721 ft.		
20/3-20D1. Rayonier, Inc. well 7. Drilled by Gaudio, August, 1951.		
Sand and clay	4	4
Gravel, water-bearing	6	10
Clay and gravel	10	20
Sand and gravel, reddish	30	50
Clay, peaty at top, blue below	43	93
Sand and gravel, water-bearing	13	106
"Hardpan"	3	109
Sand and gravel, water-bearing	3	112
Clay, green	11	123
Sand and gravel	4	127
Clay	53	180
Sand and gravel, water-bearing	9	189
Clay	37	226
Sand and gravel, water-bearing	26	252
Casing perforated 180-189, 227-238 ft.		
20/3-20D2. Rayonier, Inc. well 8. Drilled by Gaudio, September, 1951.		
"Same as well 7 to 239 ft"	239	239
Sand	8	247
Clay, blue	37	284

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
20/3-20D2 - Continued		
"Hardpan"	5	289
Sand and gravel, water-bearing	3	292
Clay and gravel	2	294
Sand and gravel, water-bearing	6	300
Clay	1	301
Casing perforated 285½-301 ft.		
20/3-20E1. Simpson Timber Company. Drilled by Gaudio, log by Robinson & Roberts, August, 1956.		
Sand and gravel	7	7
"Hardpan"	9	16
Sand and gravel	52	68
Sand and sandy clay	115	183
"Hardpan"	17	200
Gravel, sand and clay	37	237
Gravel, cemented, and "hardpan"	21	258
Clay, with some gravel and sand	67	325
Gravel, cemented, alternating with clay and some sand	192	517
"Hardpan"	13	530
Clay, sand, gravel, and "hardpan" in alternating layers	158	688
Sand	15	703
Gravel, cemented	7	710
Clay, sand, with some gravel	61	771
Gravel, cemented with clay and gravel	15	786
"Hardpan", sandy clay, and cemented gravel in alternating layers	91	877
Gravel and sand, alternating layers	49	926
Casing perforated 873-926 ft.		
20/3-20M1. Rayonier, Inc. well 2. Drilled by Jannsen, October, 1935.		
Gravel	63	63
Sand	93	156
Clay	34	190
Gravel, water-bearing	18	208
Clay	30	238
Gravel, water-bearing	19	257
Clay	8	265
Gravel	7	272
Clay	44	316
Clay and sand	37	353
Gravel, water-bearing	61	414
Clay	19	433
Gravel, water-bearing	28	461
Clay	100	561
Gravel, water-bearing	28	589
Sand	11	600
Gravel and clay continue to 792-ft depth tested below production well. Casing perforated 180-220, 240-260, 360-390, 440-460, 560-580 ft.		

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
20/3-21B1. Shorecrest, Inc. Drilled by Bedell, June, 1964.		
"Shot clay" and cemented gravel ("hardpan")	28	28
Gravel and sand	13	41
Gravel, cemented	7	48
Sand, clay and gravel	22	70
Sand and clay, with some water	21	91
Clay, red	5	96
Gravel, cemented, with little water	32	128
Sand, fine gravel, and clay, with some water	23	151
Clay, blue, sticky	12	163
Clay, blue, and sand	37	200
Gravel, red, cemented, with some water	30	230
Gravel, water-bearing, and clay, soft	19	249
Casing perforated 230-246 ft.		
20/3-21M1. Harry Johnson. Drilled by Bedell, 1948.		
Clay, dry	11	11
"Hardpan", dry	31	42
Gravel, cemented, with some water	11	53
Gravel, coarse, water-bearing	5	58
20/3-21Q3. C. Swenson. Drilled by Russell, July, 1965.		
Sand and clay	10	10
Clay, sand and gravel	25	35
Clay, sand and gravel, green	3	38
Gravel and sand, water-bearing	4	42
20/3-22R1. R. E. Stoy. Drilled by Bedell, about 1960.		
Clay	8	8
"Hardpan"	39	47
Clay, blue	89	136
Clay, blue, and water-bearing gravel	4	140
Gravel, water-bearing	3	143
20/3-23F2. Jack Shero. Drilled by Russell, August, 1963.		
Open hole, existing	34	34
Gravel, cemented	9	43
Clay, blue, and gravel	3	46
Gravel and sand, water-bearing	5	51
20/3-24F1. J. W. Fadden. Drilled by Russell, March, 1964.		
Soil and rocks	6	6
Sand and clay	20	26
Gravel, cemented	30	56
Gravel and sand, water-bearing	10	66
Sand and gravel, water-bearing	4	70
Screen 65-70 ft.		

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
20/3-24L1. Russell Hovind. Drilled by Bedell, January, 1959.		
Clay, red and gravel	35	35
Clay, blue	30	65
Clay, blue, and water-bearing gravel	8	73
Gravel, water-bearing	3	76
20/3-25B2. Paul Dunbar. Drilled by Bedell.		
"Shot clay"	10	10
Clay, red	13	23
Clay, blue, and gravel	35	58
Clay, red	6	64
Sand and clay	26	90
Sand, water-bearing	8	98
Screen at bottom.		
20/3-26B1. D. J. Hardie. Drilled by Russell, March, 1965.		
Sand fill	3	3
Clay and sand	7	10
Gravel, cemented, and clay	10	20
Clay, sand and gravel	4	24
Clay and rocks	10	34
Clay, blue	20	54
Gravel and sand, water-bearing	6	60
20/3-27E1. Jack Palmer. Drilled by Webber, October, 1949.		
Gravel, cemented, hard	32	32
Gravel, water-bearing	1	33
Gravel, cemented	65	98
Sand, coarse, and "pea gravel", water-bearing	18	116
Casing perforated 108-112 ft.		
20/3-27L1. F. C. Marler. Drilled by Russell, July, 1965.		
Soil	3	3
Gravel, cemented	35	38
Sand, clay and gravel	51	89
Gravel and sand, water-bearing	2	91
20/3-27M1. Arlo Wetter. Drilled by Webber, March, 1952.		
Soil and "shot clay"	4	4
Clay, yellow	6	10
Gravel, cemented, hard	19	29
Sand and some gravel, with water	6	35
Sand and gravel, clean, water-bearing	6	41
Sand, with brown clay, little water	2	43
Clay, brown, dry	1	44
Casing perforated 35-40 ft.		

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
20/3-28A1. L. H. Lewis. Drilled by Bedell, February, 1953.		
Soil and "shot clay"	7	7
"Hardpan"	18	25
Gravel, cemented	7	32
Clay, blue, wet	9	41
"Hardpan", blue	16	57
Clay, blue	51	108
Gravel, cemented, with blue clay bond	8	116
Gravel, water-bearing	2	118
20/3-28D1. B. E. Evans. Drilled by Ellis, June, 1947.		
Soil	3	3
Gravel, cemented, hard	40	43
Gravel, coarse, water-bearing	4	47
Clay, blue	13	60
Casing perforated 44-46 ft.		
20/3-29C1. R. E. Mason. Drilled by Russell, March, 1964.		
Soil	3	3
Clay, blue	13	16
Gravel, cemented	4	20
Gravel, cemented, and blue clay	16	36
Gravel and sand, water-bearing	3	39
Clay, blue	67	106
Gravel and sand	6	112
20/3-29L1. Joe Grassl. Drilled by Webber, 1941.		
"Hardpan"	60	60
Clay, blue	65	125
Sand and gravel, water-bearing	4	129
20/3-29P1. Larry Godwin. Drilled by Russell, July, 1965.		
Dirt, rock and clay	6	6
Clay and rocks, cemented	9	15
Gravel, cemented	22	37
Clay, brown	5	42
Clay, blue	38	80
Clay, blue, and gravel	20	100
Clay and sand, blue	24	124
Sand, brown, and gravel	1	125
20/3-30B1. Melvine Lane. Drilled by Russell, December, 1963.		
Dirt and rocks	3	3
Gravel, cemented	82	85
Sand and gravel	36	121

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
20/3-30B1 - Continued		
Gravel, cemented	8	129
Clay, blue	5	134
"Hardpan", yellow	21	155
Gravel, cemented	40	195
Gravel, water-bearing	10	205
20/3-30K1. Rayonier, Inc. test well 2. Drilled by Gaudio.		
Soil	2	2
Sand and gravel, with some clay	19	21
Gravel, cemented	6	27
Gravel, cemented to loose, with some sand; water-bearing 74-84 ft	80	107
Clay, blue, sandy, with some gravel	57	164
Clay, blue, sandy to tough, with some cemented gravel, alternating layers	121	285
Sand and gravel, loose to cemented, with some clay	85	370
Clay and streaks of sand	30	400
Gravel, cemented to loose, with sand and some clay seams	122	522
Clay, blue, with some gravel	41	563
Sand, coarse, and gravel	37	600
Clay, hard, and gravel	25	625
Gravel, cemented	1	626
Clay, hard, with some cemented sand and gravel	86	712
Sand, coarse, clay and shells	16	728
Clay, sandy, and shale	62	790
20/3-30R1. Vern Davidson. Drilled by owner, 1945.		
Soil	3	3
"Hardpan"	84	87
Gravel, with some sand, water-bearing	26	113
20/3-31R1. Cleave Robinson. Drilled by Webber, 1949.		
"Hardpan"	35	35
Clay, blue, with wood	42	77
Gravel, water-bearing	at	77
Casing perforated at bottom.		
20/3-32E2. B. R. Bell. Drilled by Webber, May, 1960.		
Clay, yellow, and gravel	11	11
Clay, blue, and gravel, with gas pocket at 54 ft in peaty blue clay	58	69
Sand, gravelly, water-bearing	3	72
Screen 66-72 ft.		
20/3-32G2. Glenn Roller. Drilled by Russell, December, 1964.		
Gravel, cemented	14	14
Clay and gravel, cemented	22	36

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
20/3-32G2 - Continued		
Gravel, cemented	22	58
Gravel and sand	4	62
Gravel and sand, water-bearing	2	64
Clay, blue	2	66
Casing perforated 62-66 ft.		
20/3-32H1. Dan Cormier. Drilled by Russell, August, 1964.		
Soil	1	1
Gravel, cemented	3	4
Clay, sand and gravel	45	49
Gravel and sand	10	59
Gravel, cemented	3	62
Gravel and sand, water-bearing	7	69
20/3-32K1. Lloyd Ellis. Drilled by owner, November, 1953.		
Soil	4	4
"Hardpan"	8	12
Gravel, fine	39	51
Sand, with some gravel, water-bearing	20	71
Casing perforated 51-71 ft.		
20/3-33N3. Gene Nye. Drilled by Russell, September, 1965.		
Clay	3	3
"Hardpan"	28	31
Gravel and sand, water-bearing	11	42
20/3-33N4. J. J. Makoviney. Drilled by Russell, December, 1964.		
Gravel and sand, hard	6	6
Gravel, cemented	42	48
Gravel and sand, water-bearing	6	54
20/3-34C1. C. W. Bailey. Drilled by Bedell, 1959.		
Clay	17	17
"Hardpan"	22	39
Clay, blue	81	120
Gravel, water-bearing	5	125
20/4-1N1. Edna Johnson. Drilled by Webber, October, 1943.		
Soil	3	3
Gravel, loose	21	24
Gravel, cemented	34	58
Gravel and sand, water-bearing	2	60

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
20/4-1N2. Edna Johnson. Drilled by Webber, July 1955.		
Soil	2	2
Gravel, loose	18	20
"Hardpan"	37	57
Gravel and sand, water-bearing	5	62
20/4-1N3. Edna Johnson. Drilled by Russell, August, 1965.		
Soil	1	1
Gravel, loose	23	24
"Hardpan"	31	55
Gravel and sand, water-bearing	11	66
20/4-1N4. Jennings Miklethun. Drilled by Russell, September, 1965.		
Soil	2	2
"Hardpan"	11	13
Gravel, loose	13	26
"Hardpan"	39	65
Gravel and sand, water-bearing	18	83
Screen 73-83 ft.		
20/4-1R3. Lawrence Starr. Drilled by Russell, August, 1964.		
Soil and rock	3	3
Gravel and sand, hard	9	12
"Hardpan"	32	44
Gravel and sand, water-bearing	9	53
20/4-2E1. John Swanson. Drilled by Russell, May, 1965.		
Soil and gravel	6	6
Gravel, cemented	19	25
Sand and gravel, dry	17	42
Gravel and sand, water-bearing	18	60
20/4-2F1. Port of Shelton (airport). Drilled by Jannsen, May, 1943.		
Soil	2	2
Gravel, gray, coarse, hard, and sand	90	92
Boulders and gravel, with sand at bottom	44	136
20/4-8G1. R. E. Grossman. Drilled by Bedell.		
Peat and soil	2	2
Gravel	28	30
Clay, blue	15	45
Clay, red, and gravel, water-bearing	5	50
Gravel, water-bearing	10	60
Casing perforated 55-60 ft.		

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
20/4-9E1. State Department of Institutions well 3. Drilled by Gaudio, log by Robinson & Roberts, April, 1962.		
Gravel	6	6
"Hardpan"	12	18
Sand and clay	25	43
Clay, blue	18	61
Gravel, water-bearing	2	63
Clay and gravel	9	72
"Hardpan"	6	78
Clay and gravel, water-bearing 113-115 ft	37	115
"Hardpan"	37	152
Clay, blue, and gravel	5	157
Sand and gravel, dirty, water-bearing	21	178
Clay, blue	6	184
Screen 163-178 ft.		
20/4-9E2. State Department of Institutions well 4. Drilled by Gaudio, log by Robinson & Roberts, May, 1962.		
Gravel	3	3
"Hardpan"	16	19
Gravel and sand, water-bearing	16	35
Sand, clean, coarse	9	44
Clay, brown, silty	19	63
Silt, brown	15	78
Clay, blue	18	96
Gravel and clay, with some water	28	124
Silt, brown	16	140
Gravel, water-bearing	2	142
Silt, brown	8	150
Clay and gravel, blue	10	160
Gravel, water-bearing	2	162
Clay, sand and gravel	2	164
Gravel and sand, water-bearing	13	177
Clay, blue	1	178
Screen 165-178 ft.		
20/4-9E3. State Department of Institutions well 5. Drilled by Gaudio, log by Robinson & Roberts, September, 1963.		
Gravel and clay	10	10
Clay, gravel and sand, hard, water-bearing	17	27
Clay	5	32
Sand, coarse, water-bearing	9	41
Clay	5	46
Screen 31-41 ft.		

Table 3 - Drillers' Logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
20/4-9F1. State Department of Institutions well 1. Drilled by Gaudio, log by Robinson & Roberts, November, 1961.		
Soil and fill	3	3
"Hardpan"	8	11
"Hardpan", sandy, with layers of sand and gravel	34	45
Sand and gravel, with some water, and layers of "hardpan"	19	64
Clay, silt and sand	39	103
"Hardpan", cobbly to fine	12	115
Gravel, basaltic, with silt and sand	49	164
Clay, dark blue, silty	13	177
Sand, black, with some "hardpan" layers and gravel, loose	31	208
Clay, green, silty	14	222
Sand, coarse, and basaltic gravel, loose	3	225
Gravel, basaltic, bound with clay and silt, tight	23	248
Clay, green, silty, with wood fibers and peat	13	261
Gravel, basaltic, with green silt	4	265
Clay, silty, with basaltic pebbles	5	270
Clay, green-black, silty	11	281
Clay, sticky, and gravel	23	304
Sand and gravel, basaltic, cemented, well oxidized	37	341
Clay, blue	6	347
"Hardpan"	5	352
Clay, sticky	6	358
Gravel, silty, with clay binder	44	402
Screen at 209 ft.		
20/4-9G1. State Department of Institutions well 2. Drilled by Gaudio, log by Robinson & Roberts, February, 1962.		
Sand, gravel and boulders	37	37
Clay	30	67
Sand and gravel	2	69
"Hardpan"	9	78
Gravel and sand, with some water	13	91
Clay	11	102
"Hardpan"	32	134
"Pea gravel"	1	135
"Hardpan"	3	138
Clay, brown, sandy	10	148
Gravel and sand, with some water	12	160
Clay and sand, brown	10	170
Silt, green, and "hardpan", gravelly	30	200
Clay, blue to brown	84	284
"Hardpan"	2	286
Gravel and clay, loose to tight	47	333
"Hardpan"	68	401
Clay and gravel, with some sand and silt	37	438
Gravel and sand, coarse	3	441
Gravel and clay, tight	14	455
Clay, blue to brown, with some gravel and sand	177	632

Table 3 - Driller's logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
20/4-11R2. Mason County Fair Association. Drilled by Bedell, 1964.		
Gravel, clay and sand	38	38
Gravel, cemented	40	78
Gravel with water, water level at 72 ft	22	100
Gravel, cemented, with water	34	134
Clay and gravel streaks	68	202
Gravel, cemented, and water	51	253
Clay, blue, dry	20	273
Gravel, blue, cemented, with seepage	80	353
Clay, hard and dry, with layers of peat wood	24	377
Gravel and clay, hard, with seepage	15	392
Clay, blue, hard and dry	40	432
"Hardpan", tan	22	454
Gravel, cemented, with sand, clay and water	18	472
Clay, red	13	485
Sand and gravel, with water	16	501
Screen 476-501 ft.		
20/4-12D3. Airport Home Tracts Water Association. Drilled by Webber, 1948.		
Soil	1	1
Gravel, coarse	14	15
"Hardpan"	15	30
Gravel, water-bearing	30	60
20/4-15L1. Rayonier, Inc. test well 1. Log by Robinson & Roberts. Drilled September, 1947.		
Sand, gravel and blue clay	56	56
Clay, yellow	14	70
Sand, gravel and clay	37	107
Clay, blue, with sand streaks	7	114
Clay and gravel	7	121
Sand, gravel and clay	21	142
Clay, with some gravel	98	240
Gravel, with streaks of sandy clay	26	266
Sand and blue clay	82	348
Sand and gravel, coarse, with streaks of clay	24	372
Sand and gravel, water-bearing	10	382
Clay and gravel, water-bearing	22	404
Bedrock	at	404
20/4-18B1. Lemke's Store. Drilled by Bedell, 1962.		
Soil	3	3
Clay and sand, blue-gray	12	15
Clay and silt, blue	140	155
Gravel, water-bearing	8	163

Table 3 - Driller's logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
20/4-19H1. Delmar Schur. Drilled by Russell, May, 1964.		
Soil and rocks	6	6
"Hardpan"	4	10
Sand, gravel, "hardpan", and clay	20	30
Gravel and sand, water-bearing	28	58
Casing perforated 48-58 ft.		
20/4-19J2. Darl Goldy. Drilled by Russell.		
Clay	10	10
"Hardpan"	2	12
Gravel and sand	2	14
Bedrock	2	16
20/4-24G1. Simpson Timber Company, formerly Rayonier, Inc. well 6. Drilled July, 1942.		
Sand, clay and silt, with 12-inch boulders in clay 58-62 ft, and some wood in sand and gravel 140-200 ft	223	223
Gravel and clay	35	258
Clay, sand and gravel	484	742
20/4-24N1. Rayonier, Inc. test well 3. Log by Robinson & Roberts. Drilled January, 1947.		
Clay, red, and gravel	50	50
Sand	80	130
Clay with gravel streaks	30	160
Clay and gravel	57	223
Clay and "hardpan", gravelly	49	252
Clay, blue	35	287
Clay, hard, and gravel	149	436
20/4-26N1. Mason County Fair Association. Drilled by Bedell, September, 1953.		
Soil	3	3
Clay, blue	18	21
Clay and silt, blue, with some water	145	166
Clay, blue, hard	10	176
Gravel, water-bearing	33	209
Casing perforated 200-206 ft.		
20/4-27A2. E. M. Franklin. Drilled by Webber, 1952.		
Soil	4	4
"Hardpan"	18	22
Clay, brown	5	27

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
20/4-27A2. - Continued		
Wood (tree)	1	28
Clay, blue	10	38
Silt, gray, sandy	8	46
"Hardpan"	4	50
Sand and gravel	32	82
Gravel, water-bearing	1	83
"Quicksand"	7	90
Casing perforated at 68 ft.		
20/5-24H1. H. L. Kidd. Drilled by Russell, July, 1964.		
Soil and rocks	3	3
Gravel, cemented	3	6
Clay, red	4	10
Gravel, cemented	10	20
Clay and gravel, water-bearing	2	22
Gravel and sand, water-bearing	23	45
Clay and sand	18	63
Gravel and sand	2	65
21/1-5A1. Treasure Island Country Club well 2. Drilled by Bedell, 1958.		
Clay, red, and gravel	16	16
Clay, blue, mixed with gravel	50	66
Gravel, cemented, with some water	15	81
Clay, blue, cemented with gravel	34	115
Clay, blue	100	215
Sand and fine gravel, water-bearing	12	227
Screen 217-227 ft.		
21/1-5B3. C. Deggeller.		
"Hardpan"	15	15
Gravel, water-bearing	4	19
21/1-5G1. C. J. Baulig. Drilled by owner.		
"Hardpan", sand and gravel	37	37
Sand, white, water-bearing	2	39
21/1-5H1. Treasure Island Country Club well 1. Drilled by Bedell, December, 1953.		
"Hardpan"	44	44
Sand and clay, with some water	110	154
Sand, water-bearing	14	168
Screen 158-168 ft.		

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
21/1-8B1. I. F. Rowe. Drilled by Evergreen, 1961.		
"Hardpan"	42	42
Gravel and sand, with "quicksand" at bottom	25	67
21/1-8M1. Robert Lorentz. Drilled by Bedell, 1961.		
Sand and clay	17	17
Clay, blue	60	77
Gravel, blue, cemented	9	86
Clay, blue, with some water	32	118
Gravel, cemented	5	123
Clay, blue, with some gravel and water	10	133
Sand, coarse, water-bearing, with some clay	9	142
Screen 137-142 ft.		
21/1-8Q2. Vineyard Cove Corporation. Drilled by Bedell, 1964.		
Clay and gravel	20	20
Gravel, cemented	11	31
Clay and sand	34	65
Clay and gravel, with some water	35	100
Sand and clay, with some water	25	125
Clay and sand	11	136
Clay, blue	4	140
Sand, clay and gravel, water-bearing	13	153
Sand and gravel, water-bearing	8	161
Screen 155-161 ft.		
21/1-8R1. R. G. Wells. Drilled by Bedell.		
Sand and clay, red	91	91
Clay, blue	146	237
Clay, blue, sand and gravel, water-bearing	11	248
Clay, blue and sand	123	371
Clay, blue	222	593
Sand and clay, water-bearing	7	600
Sand, water-bearing	10	610
Screen 605(?)-610 ft.		
21/1-19N1. Weyerhaeuser Properties, Inc. Drilled by Valley, May, 1964.		
Clay, brown, and gravel	11	11
"Hardpan", gray	7	18
Clay, gray, and sand	22	40
Clay, gray, and gravel	15	55
"Hardpan", gray	25	80
"Hardpan", sandy	25	105

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
21/1-19N1 - Continued		
Clay, blue	16	121
Sand, brown, gravel and silt	11	132
Sand and gravel, water-bearing	14	146
Gravel, fine, with clay	22	168
Sand, gray, fine, and silt	92	260
Casing cut off at 170 ft., well back-filled to 158 ft; screen 143-158 ft.		
21/1-31D2. Steig Gabrielson. Drilled by Harbor, December, 1961.		
Clay, cream-colored, sticky	7	7
"Hardpan", gravelly	6	13
"Hardpan", blue, clayey	13	26
Clay, blue, solid	37	63
Sand and gravel, water-bearing	5	68
Sand and gravel, cleaner	1	69
Sand, fine, to coarse gravel	4	73
Sand, brown	1	74
Sand and small gravel, water-bearing	7	81
Screen 77-81 ft.		
21/2-3D1. Mason County Fire District No. 5. Drilled by Tyee Division, Tacoma Pump, July, 1964.		
"Hardpan"	22	22
Gravel	13	35
Sand, with little clay	33	68
Sand and gravel	9	77
Sand, fine, with some clay and water	14	91
Sand and fine gravel, with some water	7	98
Gravel, fine, loose, and sand, water-bearing	1	99
21/2-3L1. T. R. Sladek. Drilled by Evergreen, June, 1961.		
Soil	2	2
"Hardpan"	35	37
Gravel and coarse sand, water-bearing	3	40
21/2-3L2. Francis McDonald. Drilled by Evergreen, 1961.		
"Hardpan"	35	35
Gravel, water-bearing	6	41
21/2-4B1. Jerry Hill. Drilled by Evergreen, 1959 or 1960.		
"Hardpan"	38	38
Gravel, water-bearing	3	41

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
21/2-4C1. J. F. Northrup. Drilled by Harbor, June, 1961.		
Soil, clayey	6	6
Sand, tan, with gravelly "hardpan"	21	27
Gravel, water-bearing	1	28
21/2-4D1. John Severa. Drilled by Russell, June, 1965.		
Soil	3	3
Gravel and clay, cemented	7	10
Gravel, cemented	28	38
Gravel and sand, water-bearing	4	42
21/2-4D2. Thomas Aarhus. Drilled by Russell, September, 1965.		
Soil	3	3
"Hardpan"	29	32
Gravel and sand, water-bearing	1	33
21/2-5F1. Gladys Vary. Drilled by Russell, May, 1963.		
Soil, gravel and sand	6	6
Gravel and sand, hard	24	30
Sand and gravel, water-bearing	20	50
Gravel and sand, water-bearing	5	55
21/2-5H1. P. R. Lewis. Drilled by Russell, July, 1963.		
Soil and rocks	3	3
Gravel, cemented	48	51
Gravel and blue clay	37	88
Gravel, sand and brown clay	14	102
Sand, brown	3	105
Gravel, cemented	3	108
Gravel and sand, water-bearing	14	122
21/2-5H2. A. P. Golden. Drilled by Russell, July, 1962.		
Soil	1	1
Gravel and sand, water-bearing 24-42 ft	41	42
21/2-7Q1. Anthony Botelho. Drilled by Harbor, July, 1960.		
Soil	2	2
"Hardpan", brown, with seepage at 28 ft	38	40
Sand and gravel, water-bearing	3	43
21/2-27Q2. Donald Welsh. Drilled by Russell, June, 1965.		
Sand and gravel	6	6
"Hardpan"	9	15
Gravel, sand and clay	23	38
Gravel and sand, water-bearing	3	41

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
21/2-7R1. Whitehouse. Drilled by Evergreen, 1961.		
"Hardpan"	28	28
Gravel, water-bearing	10	38
21/2-8A1. C. B. Coselman. Drilled by Bedell, July, 1964.		
"Shot clay"	7	7
"Hardpan" and boulders	25	32
Gravel, cemented	26	58
Sand and gravel, with some clay	5	63
Sand, gravel and boulders	4	67
Sand and gravel, loose	52	119
Sand and clay, with some water	53	172
Sand, gravel and clay, with some water	2	174
Gravel, red, cemented	18	192
Gravel, blue, cemented	22	214
Gravel, loose, water-bearing	2	216
Gravel, cemented, with some water	9	225
Gravel, loose, water-bearing	2	227
Gravel, cemented, with some water	13	240
Clay, blue, and peat	5	245
Casing perforated 116-240 ft.		
21/2-8K1. D. C. Block. Drilled by Russell, June, 1965.		
Soil and rocks	6	6
Gravel, cemented	4	10
Gravel, loose, sand and clay	17	27
Gravel and clay, cemented	10	37
Clay, gravel and sand	13	50
Sand and clay	10	60
21/2-8M1. E. J. Burke. Drilled by Evergreen.		
"Hardpan"	34	34
Gravel, water-bearing	9	43
Casing perforated at bottom.		
21/2-8M2. William Knight. Drilled by Evergreen, March, 1962.		
"Hardpan"	30	30
Gravel, water-bearing	15	45
21/2-13J1. E. T. Pettersen. Drilled by Webber, December, 1948.		
Soil	6	6
Clay, blue	24	30
Gravel, cemented	40	70
Sand, with some water	8	78

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
21/2-13J1 - Continued		
Gravel, cemented	6	84
Gravel, sand, with some water	3	87
Gravel, cemented	5	92
Sand and gravel	3	95
21/2-22Q2. L. N. Rensing. Drilled by Evergreen, October, 1961.		
"Hardpan"	41	41
Gravel, water-bearing	27	68
"Hardpan"	44	112
Gravel, water-bearing	8	120
Casing perforated 112-116 ft.		
21/2-23M2. Bruhahn. Drilled by Harbor, July, 1960		
"Hardpan"	52	52
Clay, silty	7	59
"Hardpan", gravelly	19	78
Sand, water-bearing	2	80
"Hardpan", with wood chips	3	83
Gravel, hard, water-bearing	16	99
Gravel, clean, loose	1	100
Gravel, hard	18	118
Sand and gravel, water-bearing	3	121
21/2-24P1. Irvie Wingert. Drilled by Evergreen, 1961(?).		
"Hardpan"	30	30
Clay, blue	47	77
"Hardpan", water-bearing 77-78 ft	24	101
21/2-25M3. Hartstene Island Community Center. Drilled by Patterson, December, 1959.		
Clay, brown	3	3
Gravel and clay, hard	38	41
Sand and clay, water-bearing	5	46
Sand, silt and gravel	4	50
Gravel, sand and clay, water-bearing	8	58
Sand, gravel and clay	4	62
Gravel, cemented	15	77
Clay, blue	6	83
Gravel, sand and clay, water-bearing	16	99
Casing perforated 52-60, 83-95 ft.		
21/2-29G1. C. R. Gudger. Drilled by Bedell, "about 1955."		
"Shot Clay"	3	3
"Hardpan"	37	40

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
21/2-29G1 - Continued		
Clay and gravel	50	90
Clay, blue	40	130
Sand, clay and gravel, water-bearing	30	160
Sand, water-bearing	4	164
Screen, sandpoint at bottom.		
21/2-29P1. T. T. Westby. Drilled by Webber.		
Gravel	3	3
"Hardpan", with small strata of gravel	49	52
Sand with some gravel strata	38	90
Clay	23	113
21/2-33H1. R. O. Yeager. Drilled (6"x33') by Webber, 1954; and (8"x53') by Bedell, 1963.		
"Shot clay"	10	10
"Hardpan", some water at 33 ft	26	36
Gravel, cemented	12	48
Gravel and sand, water-bearing	5	53
Casing perforated at 33 ft; screen at 53 ft.		
21/2-35D1. J. Meeks. Drilled by Bedell, 1948.		
Soil	2	2
"Hardpan"	9	11
Clay, blue	14	25
Clay, red	8	33
Clay, blue	60	93
Gravel, water-bearing	9	102
21/3-4N1. Alderbrook Inn, Inc. Drilled by Tyee Division, Tacoma Pump, September, 1964.		
"Hardpan", gravelly, and boulders	13	13
Gravel, sand and clay	12	25
"Hardpan", gravelly	8	33
Gravel, sand and clay	64	97
Gravel, sandy, with clay	69	166
Gravel with some sand and water	38	204
Sand, coarse, water-bearing	3	207
Clay, sand and gravel	11	218
Sand, gravel and some water	47	265
Gravel, loose, fine, and clay, with water	4	269
Sand and gravel, water-bearing	23	292
Screen 287-292 ft.		

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
21/3-31A1. Rayonier, Inc. test well 8. Drilled by Gaudio, log by Stevens & Koon, March, 1948.		
Clay, gravel and boulders	26	26
Gravel, cemented	10	36
Sand and gravel, water-bearing	39	75
Gravel, cemented	2	77
Clay, blue to brown	13	90
Gravel, cemented, and clay, with gas 92-100 ft	22	112
Gravel, coarse, water-bearing, alternating with cemented gravel	13	125
Clay and sand	9	134
Gravel, water-bearing	53	187
Gravel, cemented, and "hardpan"	25	212
Gravel, water-bearing	77	289
Sand, gravel and blue clay	16	305
Gravel, cemented, sand and clay	8	313
Sand, black	5	318
Gravel, water-bearing	6	324
Clay, yellow, and gravel	26	350
"Hardpan", with some gray clay	42	392
Gravel, water-bearing	5	397
Sand, clay and cemented gravel	32	429
Clay, yellow	4	433
Gravel, water-bearing	5	438
Clay, blue, and sand	14	452
21/3-31C1. Rayonier, Inc. test well 9. Drilled by Richardson, log by Stevens & Koon, August, 1948.		
"Hardpan", with gravel and clay streaks	65	65
Clay, blue	20	85
Clay and gravel	7	92
"Hardpan", and hard gravel	161	253
Clay, sandy, and gravel	5	258
21/3-31F1. Rayonier, Inc. test well 11. Drilled by Gaudio, log by Robinson & Roberts, July, 1948.		
Soil and gravel	16	16
Sand and gravel, with layers of brown and blue clay	28	44
Gravel, very coarse, with "granitic material", water-bearing	5	49
Clay, silt, and fine sand	11	60
Gravel, brown, cemented	6	66
Sand and gravel, packed, with some water	8	74
Clay, sandy	11	85
"Hardpan" and cemented gravel	51	136
Sand and gravel, up to 6" pebbles, water-bearing	17	153
Clay, sandy	5	158
Gravel, cemented, with streaks of clay	52	210
Gravel, brown, water-bearing	5	215
Clay, gray	10	225
Gravel, red, water-bearing	13	238
Sand and gravel, packed	6	244

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
21/3-31F1 - Continued		
Gravel, with coarse sand, water-bearing	24	268
Clay, blue	4	272
Gravel, cemented	53	325
Sand and gravel, packed, with some sand	25	350
Gravel, cemented, with streaks of sand and clay	71	421
Gravel, water-bearing	3	424
Sand, black	4	428
Gravel, cemented, with streaks of sand and clay	16	444
Casing perforated at gravel zones 200-300 ft.		
21/3-32F1. Rayonier, Inc. test well 10. Drilled by Gaudio, log by Robinson, June, 1948.		
Soil and gravel	4	4
Clay and gravel, hard packed	26	30
Sand and gravel, with clay streaks, some water	50	80
Clay, blue	42	128
Gravel, cemented	22	150
Gravel, medium to large, cemented 158-191 ft.	50	200
Clay, with sand streaks	24	224
Gravel, cemented	6	230
Clay, gray	7	237
Sand and gravel, black to brown, loose	23	260
Gravel, cemented	4	264
21/3-32N1. Rayonier, Inc. test well 7. Drilled by Richardson, log by Stevens & Koon, March, 1948.		
Clay and gravel	20	20
Sand, clay and gravel	36	56
"Hardpan" and hard gravel, with some water	14	70
Clay, yellow, green and blue, with gravel	20	90
Clay, blue	17	107
Gravel, clay, and some sand	19	126
Clay, blue, sand and gravel	9	135
"Hardpan", brown, gravelly	19	154
Gravel, brown and coarse sand, with blue clay	18	172
"Hardpan"	43	215
Gravel, water-bearing	6	221
Sand, gravel and clay	29	250
Gravel, water-bearing	18	268
Gravel, hard, and yellow clay	21	289
Clay, gravelly, and boulders	26	315
Sand, with some clay	22	337
Gravel and clay, with boulders	23	360
Gravel, hard	14	374
Clay and sand	8	382
Clay and gravel, hard	8	390
Clay, sandy, and gravel	22	412
Sand and gravel, water-bearing	8	420

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
21/3-32N1 - Continued		
Clay, yellow to blue, and gravel	50	470
Gravel and sand, hard	8	478
Clay, blue, and gravel	7	485
Clay, yellow and blue, with sand	43	528
Sand, brown, fine	22	550
Gravel, cemented	10	560
Clay, blue, and sand	12	572
Gravel, cemented	3	575
Clay, blue, and gravel	5	580
Gravel, cemented, with "hardpan"	35	615
Sand, with some water	4	619
"Hardpan"	39	658
21/3-34A1. D. H. Knutson. Drilled by Russell, September, 1964.		
Open hole	29	29
"Hardpan"	18	47
Clay and sand	8	55
Sand, gravel	2	57
Sand, water-bearing	11	68
Screen 63-68 ft.		
21/3-36E2. R. E. Nation. Drilled by Bedell, 1951.		
Soil and clay	25	25
"Hardpan"	25	50
Gravel, cemented	32	82
Gravel, water-bearing	1	83
21/3-36G2. R. L. Fitchitt. Drilled by Russell, June, 1965.		
Gravel and soil	10	10
Gravel and clay	20	30
Clay, blue	11	41
Gravel and sand, water-bearing	7	48
21/4-11B1. R. C. Snyder. Drilled by Russell, 1965.		
Soil	3	3
Clay and sand	7	10
Clay	15	25
Gravel and sand, water-bearing	5	30
21/4-11C1. Tom Pulsifer. Drilled by Evergreen, May, 1960.		
Sand and gravel	3	3
Sand and gravel, water-bearing	25	28

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
21/4-18K1. State Game Department. Drilled by Bedell, June, 1963.		
Clay and gravel, dry	18	18
Clay, sand and gravel, with seepage	18	36
Clay and gravel, red	13	49
Gravel, artesian, water-bearing	5	54
"Hardpan", with rocks, large	24	78
Screen 49-54 ft.		
21/4-24G1. A. J. Turner. Drilled by Bedell, 1954, deepened 1963.		
Gravel	4	4
"Hardpan"	16	20
Gravel, cemented, with streaks of red clay	90	110
Gravel, water-bearing	5	115
Gravel, cemented	21	136
Gravel, water-bearing	8	144
Casing perforated 136-144 ft.		
22/1-6B1. C. R. Callow. Drilled by Webber, July, 1946.		
Gravel, loose, and soil	37	37
Gravel, clean, with "polluted water"	10	47
"Quicksand"	208	255
Clay, hard	5	260
"Pea gravel" and sand, water-bearing	3	263
22/1-6B2. W. D. Griffith & H. W. Lohman. Drilled by Tyee Division, Tacoma Pump, July, 1965.		
Clay, with some fine sand	100	100
Gravel	66	166
Sand, water-bearing, with some clay	44	210
Clay, blue, sticky, with small lenses fine sand	60	270
"Hardpan"	10	280
Sand and gravel, water-bearing	13	293
Sand, fine, with clay	8	301
"Hardpan"	3	304
Gravel, water-bearing	3	307
Sand, fine, clay and gravel	3	310
"Hardpan"	5	315
Gravel, water-bearing	5	320
"Hardpan"	14	334
Sand and gravel	8	342
Clay, blue, sticky, and gravel	4	346
"Hardpan" and thin, alternating layers of gravel	17	363
Gravel and sand, water-bearing	at	363

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
22/1-6M1. C. V. Shepard. Drilled by Reliable, June 1960.		
Fill	4	4
Clay, yellow, and gravel	16	20
Clay, blue	102	122
Silt, blue	8	130
Silt, water-bearing	28	158
Silt, clay and gravel, water-bearing	7	165
Silt, water-bearing	35	200
Sand, brown, water-bearing	14	214
Screen at 214 ft.		
22/1-6N1. M. S. Davis. Drilled by Reliable, 1964.		
Soil	1	1
"Hardpan"	24	25
Clay and sand, with seepage	20	45
Clay, blue	115	160
Clay, blue, and fine sand, with seepage	10	170
Sand, water-bearing	51	221
Screen 216-221 ft.		
22/1-6R2. Doug Corliss. Drilled by Reliable, August, 1963.		
Soil	2	2
Sand	14	16
Gravel and sand	24	40
"Hardpan", gray	7	47
Gravel, sand and clay	6	53
"Hardpan"	17	70
Sand and clay, water-bearing 70-109 ft	43	113
Clay, blue	9	122
Clay, yellow, and sand	21	143
Clay, blue	56	299
Gravel, sand and clay, water-bearing	1	300
Sand, water-bearing	10	310
Screen 305-310 ft.		
22/1-8D1. North Mason High School. Drilled by Reliable, August, 1957.		
Sand and soil	3	3
Sand, gravel and clay	27	30
Sand and gravel	35	65
Sand and clay	10	75
"Hardpan"	35	110
Sand and gravel	4	114
Sand with some clay	66	180
Sand, fine, water-bearing	44	224
Screen 209-224 ft.		

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
22/1-17H1. Sargent Oyster Company. Drilled by Harbor, May, 1959.		
Fill	3	3
"Hardpan", sand and gravel	51	54
Sand, brown, and gravel, water-bearing	6	60
Clay, blue, laminated with sand	30	90
Sand and gravel, water-bearing	1	91
22/1-20G2. Tacoma Pump and Drilling Company, Tyee Division. Drilled by owner, April, 1964.		
"Hardpan"	46	46
Sand, fine, coarsens at bottom, water-bearing	5	51
Clay	at	51
Screen 47-51 ft.		
22/1-20K1. John Mead. Drilled by Evergreen, Summer, 1963.		
Clay and sand	56	56
Sand, water-bearing (flows at 61 ft)	35	91
Gravel, water-bearing	2	93
Sand	17	110
Casing perforated 91-93 ft.		
22/1-20P1. Fred Stock. Drilled by Harbor, April, 1961.		
Soil	5	5
Sand, gravel and blue clay, water-bearing 20-28 ft.	23	28
Sand, brown, gravel and "hardpan"	22	50
Sand and gravel, with seepage	8	58
Sand, brown, and gravelly "hardpan"	5	63
Sand and gravel, water-bearing	7	70
22/1-20Q2. Paul McKay. Drilled by Harbor, September, 1959.		
Soil	2	2
"Hardpan", brown, gravelly	41	43
Sand, gravel and clay, with seepage	15	58
Sand and gravel, hard, water-bearing	8	66
22/1-29B2. William Payette. Drilled by Tyee Division, Tacoma Pump, July, 1965.		
Gravel	6	6
Sand, muddy	6	12
"Hardpan"	21	33
Sand, with some water	2	35
Clay, brown, and gravel	16	51
"Hardpan", with sand and gravel, water-bearing at 60 ft.	9	60
Sand and gravel, muddy, "heaving"	12	72
Sand and gravel, loose, water - bearing	at	72

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
22/1-32A1. M. O. Barnard. Drilled by Russell, July, 1963.		
Open hole	16	16
Gravel, cemented	20	36
Gravel and sand, water-bearing	10	46
Sand, water-bearing	8	54
Clay and sand	10	64
Sand	7	71
Screen 46-54 ft.		
22/1-32A2. W. L. Guiles. Drilled by Russell, September, 1965.		
Soil	3	3
"Hardpan"	35	38
Sand and clay	30	68
Sand and gravel, water-bearing	10	78
22/1-32A3. Wally Waugh. Drilled by Russell, July, 1965.		
Soil and rocks	2	2
Gravel, cemented	18	20
Sand and clay, water-bearing	38	58
22/1-32Q1. W. G. Clayton. Drilled by Russell, August, 1963.		
Soil and boulders	3	3
Gravel, cemented	33	36
Gravel and sand, water-bearing	2	38
22/2-12G1. H. C. Stirling. Drilled by Reliable, 1961(?).		
Clay, yellow	10	10
Clay, black, and sand	20	30
Gravel and brown clay	5	35
Gravel, brown clay, and sand, water-bearing	5	40
22/2-14B3. J. P. Taylor. Drilled by Russell, May, 1961.		
Soil	2	2
"Hardpan"	12	14
Sand, water-bearing	10	24
Sand and gravel, water-bearing	4	28
22/2-14B4. Lyle Rarey. Drilled by Reliable.		
Soil	1	1
Sand	4	5
"Hardpan"	13	18
Sand and brown clay, water-bearing	16	34
Sand and gravel, water-bearing	3	37

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
22/2-14M2. Arpod Masley. Drilled by Reliable, April, 1963.		
Soil	1	1
Clay, yellow	22	23
"Hardpan", yellow	13	36
Clay, yellow, and gravel	9	45
Sand and gravel, water-bearing	9	54
Gravel and clay	at	54
22/2-14M3. A. S. Anderson. Drilled by Reliable, November, 1961.		
Rocks and gravel	8	8
"Hardpan"	7	15
Sand, clay and gravel, water-bearing	23	38
22/2-14N1. A. S. Miller. Drilled by Webber, August, 1958.		
Unknown	30	30
Clay, with sand and gravel	10	40
Sand, with clay and gravel	2	42
Gravel, with sand and clay	1	43
22/2-14N2. Will Green. Drilled by Reliable, July, 1962.		
Soil	6	6
"Hardpan"	5	11
Sand and gravel, water-bearing	29	40
22/2-15R1. Debritz. Drilled June, 1962.		
Clay, yellow, and gravel	8	8
Clay, blue	6	14
Clay, yellow, and gravel	12	26
Gravel and clay, yellow	4	30
Clay, blue	9	39
Clay, yellow, and gravel, water-bearing	5	44
22/2-19R1. State Parks Commission (Twanoh State Park). Drilled by Webber.		
Soil and gravel	10	10
Gravel, coarse, water-bearing	37	47
Sand, coarse, and "pea gravel", water-bearing	4	51
Sand, water-bearing	9	60
Sand and gravel, water-bearing	10	70
Sand, fine	5	75
Casing perforated 48-51, 63-67 ft.		
22/2-20J1. G. T. Belland. Drilled by Stoican, by 1958.		
"Hardpan", brown	37	37
Sand and clay, with some water-bearing gravel	3	40

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
22/2-20J1 - Continued		
Sand, muddy	30	70
"Hardpan", brown	37	107
Gravel, clean, coarse, water-bearing	at	107
22/2-20M1. Thomas Snyder, Sr. (restaurant well). Drilled by Bedell.		
Clay, red	70	70
Sand, water-bearing	10	80
22/2-20Q1. Twanoh Tides, Inc. Drilled by Reliable, February, 1963.		
Soil	1	1
Gravel and rocks	19	20
Gravel, clayey, water-bearing 100-124 ft.	104	124
Clay, yellow	4	128
22/2-21E. Ray Orr. Drilled by Russell, August, 1965.		
Clay and gravel	3	3
Clay and rocks, hard	30	33
Sand and gravel, water-bearing 55-67 ft	34	67
Screen 62-67 ft.		
22/2-21H2. Cherry. Drilled by Webber.		
Clay and "hardpan"	72	72
Sand and gravel, water-bearing	4	76
22/2-22C2. J. A. Watson. Drilled October, 1963.		
Soil	1	1
Gravel and rocks	23	24
Gravel, sand and clay, with seepage	1	25
"Hardpan", brown	11	36
Gravel, water-bearing	3	39
22/2-32Q2. Fred Lammers. Drilled by Evergreen.		
"Hardpan"	48	48
Gravel, water-bearing	9	57
22/2-33G1. L. G. Mendenhall. Drilled by Russell, September 1962.		
Gravel and sand	30	30
Gravel and sand, hard, water-bearing zones 35-40, 45-60, and 70-71 ft	41	71

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
22/2-33R1. J. Magee. Drilled by Tyee Division, Tacoma Pump, September, 1965.		
Soil	5	5
"Hardpan", with rock and gravel	35	40
"Hardpan", soft	8	48
Gravel, water-bearing	2	50
22/2-34C1. H. P. Buhl. Drilled by Russell, May, 1963.		
Open hole	8	8
Gravel and sand, hard	10	18
Gravel and sand, water-bearing	2	20
Gravel, cemented	51	71
Gravel and sand	3	74
Gravel, cemented, water-bearing	11	85
Gravel and sand, water-bearing	4	89
Gravel, cemented	11	100
Gravel and sand, water-bearing	6	106
Casing perforated 84-89, 100-106 ft.		
22/2-34E1. Frank Sovereign. Drilled by Tyee Division, Tacoma Pump, October, 1964.		
Gravel, sand and clay	11	11
"Hardpan"	9	20
Clay, brown, sandy	7	27
"Hardpan"	24	51
Gravel, hard, with some water	1	52
Gravel, water-bearing	1	53
22/2-34E2. P. N. Krueger. Drilled by Russell, August, 1962.		
Soil and sand	3	3
Gravel, cemented	73	76
Gravel and sand, water-bearing	12	88
22/2-34M1. Carl Haggstrom. Drilled by Tyee Division, Tacoma Pump, March, 1965.		
Rocks and gravel	8	8
Sand, coarse, muddy	7	15
Sand, gravel and clay	9	24
Sand, muddy	5	29
Clay, sand and gravel, brown	12	41
Gravel, with some water	3	44
Sand and gravel, water-bearing	at	44

Table 3 - Drillers' logs of representative wells - Continued

Materials	Thickness (feet)	Depth (feet)
22/3-32E1. Mason County Public Utility District. Drilled by Bedell, February, 1956.		
"Shot clay"	5	5
Gravel, cemented	15	20
"Hardpan", blue	3	23
Clay, blue, and peat	3	26
Gravel, clayey, hard	5	31
"Hardpan"	13	44
Clay, red, hard	4	48
Gravel, cemented, with some water	6	54
Clay and gravel	22	76
Clay, gravel and sand, water-bearing	19	95
Clay, hard	13	108
Gravel, cemented, with streaks of hard clay, water-bearing	42	150
"Hardpan"	16	166
Gravel	at	166
Casing plugged back to 156 ft, and perforated 84-96, 108-150 ft.		
22/3-32M1. M P. Fassio. Dug 1955.		
Soil	2	2
"Hardpan", with some water	8	10

TABLE 4 - CHEMICAL ANALYSES OF GROUND-WATER SAMPLES

Table 4.--Chemical analyses of ground-water samples.

Well number	Owner or tenant	Altitude (feet)	Well depth (feet)	Depth of water-bearing interval (feet)	Probable aquifer(s) 1/	Date of collection	Analyst 2/	Temp °C
19/3-21H1	Olympia Olyster Co.	10	264	248-264	Qpv	6-13-52	L	-
20/3-5A1	Rayonier, Inc.	213	383	207-221	Qs,Qss	3-3-48	R	-
				275-300		3-2-48	R	-
20/3-5F1	Rayonier, Inc.	209	500	150-165	Qs	1-17-48	R	-
				248-300	Qpv	12-12-47	R	-
				404-452	Qpv	12-12-47	R	-
20/3-18C1	City of Shelton (spring)	200	(spring)	-	Qvr	2-18-64	S	-
20/3-19C1	Simpson Timber Co.	37	735	Below 197 (See log)	Qpv	1-24-47	R	9
20/3-19H1	Simpson Timber Co.	19	750	Below 150 (See log)	Qs,Qpv	1-27-47	R	12
						5- -37	R	-
						6-30-47	R	-
20/3-20E1	Simpson Timber Co.	8	926	873-926	Qpv	5-24-60	G	14
						12-3-56	B	-
20/3-20M1	Rayonier, Inc.	40	600	Below 186 (See log)	Qs,Qpv	1-27-47	R	11
						6-30-47	R	11
20/3-20M2	Rayonier, Inc.	56	770	Below 199	Qs,Qpv	1-27-47	R	11
						6-30-47		
20/3-30K1	Rayonier, Inc.	110	790	74-84	Qs	8-28-47	R	-
20/4-2F1	Port of Shelton (Airport)	295	136	44-136	Qva	5-24-60	G	9
20/4-9E1	State Department of Institutions	267	184	157-178	Qs	5-2-63	B	-
20/4-15L1	Rayonier, Inc.	200	404	372-404	Qpv	8-28-47	R	-
21/3-31A1	Rayonier, Inc.	225	452	134-187	Qs	4-8-48	R	-
				212-300	Qs	4-8-48	R	-
21/3-32N1	Rayonier, Inc.	222	658	30-57	Qva	2-8-48	R	-

1/ Aquifer Symbols:
Qvr-Vashon recessional outwash
Qva-Vashon advance outwash
Qs -Skokomish gravel
Qss-Salmon Springs Drift
Qpv-Pre-Vashon deposits, undifferentiated

2/ Analyst:
B-Bennetts Chemical Laboratory, Inc., Tacoma
G-U. S. Geological Survey
L-Laucks Testing Laboratories, Inc., Seattle
R-Rayonier, Inc. Laboratories
S-State Health Department

Milligrams per liter												Specific conductance (micromhos at 25°C)
Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Phosphate (PO_4)	Dissolved solids	Hardness ($CaCO_3$)	
51	-	129	3.6	79		-	Tr	324	-	669	337	-
21	.10	13	2.6	-	-	-	1.2	1.3	-	86	43	-
22	.44	14	2	-	-	-	1.6	1.0	-	90	43	-
19	.48	14	1.5	-	-	-	1.3	0.7	-	76	41	-
23	.12	18	1.2	-	-	-	0.8	0.2	-	114	51	-
22	.12	19	.6	-	-	-	-	0.3	-	114	52	-
15	.04	5.5	.18	1.4	.13	22	2.5	2.5	.14	42	32	57
19	.10	59	4.9	-	-	-	9.3	8.6	-	262	166	-
11	.03	9.6	.24	-	-	-	3.3	8.5	-	97	26	-
-	-	98	17	-	-	-	-	293	-	695	348	-
11	.03	10	-	-	-	-	3.3	15	-	97	21	-
16	0	3.5	0	30	0.1	70[3/]	5.4	10	.81	101	8	147
16	-	-	-	23	-	65	2.0	-	-	-	9.3	-
18	.03	20	0	-	-	-	2.9	21	-	135	51	-
18	.03	21	0	-	-	-	2.9	41	-	-	54	-
19	.05	18	.6	-	-	-	1.6	17	-	130	47	-
-	-	17	.12	-	-	-	-	32	-	126	43	-
3.6	.44	10	.97	-	-	-	9.4	3.8	-	71	29	-
17	.03	6.0	1.6	2.1	0	30	0.4	1.8	.04	44	22	54
26	.08	14	4.2	5.0	-	-	1.3	0.5	.50	87	51	-
12	.08	8.5	.97	-	-	-	3.9	17	-	102	25	-
28	.24	17	3.3	-	-	-	2.2	1.1	-	118	56	-
15	.20	15	3	-	-	-	3.4	1.0	-	86	50	-
16	.18	7	1.8	-	-	-	1.4	1.9	-	58	26	-

3/ Contains 12 mg/l of CO_3 reported as HCO_3.

Table 5.--Partial chemical analyses of ground-water samples. Analyses by Washington State Department of Water Resources unless noted otherwise as follows:
(G) U. S. Geological Survey; (R) Rayonier, Inc.; (B) Bennetts Lab., Tacoma.

Well number	Owner or tenant	Altitude (feet)	Well depth (feet)	Depth of water-bearing interval (feet)	Date of collection	Milligrams per liter				Electrical conductivity (micromhos at 25°C)	Analyst other than State
						Iron (Fe)	Bicarbonate (HCO_3)	Chloride (Cl)	Hardness ($CaCO_3$)		
19/3-2P1	R. H. Mattson	75	97	at 97	12-9-63	.2	120	2	85	160	-
8M1	Ralph Brewer	190	53	31-53	12-9-63	.0	79	3	72	140	-
10L1	Pearl Brownfield	120	"deep"	-	12-0-63	1.5	160	2	117	210	-
11G1	O. R. Taylor	40	105	at 105	12-9-63	.4	80	3	53	110	-
12D1	J. A. Sells	50	149	75-149	7-12-65	-	-	4	90	160	(G)
18R1	Lloyd Clark	45	37	at 37	12-9-63	.0	50	3	42	86	-
20D1	C. F. Blackwelder	65	200	at 200	12-9-63	.0	110	26	61	200	-
20Q2	Clifton Barnes	240	70	at 70	12-9-63	.0	64	3	49	97	-
21L1	J. J. Brenner Oyster Company	85	110	32-36	12-9-63	.0	50	2	41	78	-
30B1	Max Waldburger	70	117	97-110	12-12-63	.0	100	3	45	140	-
19/4-2F1	H. A. Loertscher	165	110	62-66	12-12-63	.0	100	6	74	140	-
3N1	B. L. Huisingh	170	99	at 99	12-12-63	.0	30	4	27	56	-
24P1	West Whitener	80	147	143-147	12-12-63	.0	130	9	60	190	-
26A1	Stephen Swantak	75	13	5-13	12-12-63	.1	45	5	52	110	-
19/5-12B1	Elma Country Club	486	73	at 73	12-12-63	.2	73	2	47	98	-

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(G) U. S. Geological Survey; (R) Rayonier, Inc.; (B) Bennetts Lab., Tacoma.

Well number	Owner or tenant	Altitude (feet)	Well depth (feet)	Depth of water-bearing interval (feet)	Date of collection	Milligrams per liter				Electrical conductivity (micromhos at 25°C)	Analyst other than State
						Iron (Fe)	Bicarbonate (HCO_3)	Chloride (Cl)	Hardness ($CaCO_3$)		
19/5-13L1	George Leboki	465	112	-	12-12-63	.0	97	3	51	130	-
20/1-20E1	L. H. Jerrells	20	57	28-57	7-26-65	-	-	4	43	96	(G)
20/2-3P1	G. B. Howard	20	61	58-61	7-26-65	-	-	-	17	96	(G)
5A2	Gary Probert	200	80	at 80	1-23-64	.8	67	1	36	90	-
5C2	Jay Noll	200	49	49	1-23-64	.0	60	2	42	88	-
6A1	C. L. Dougherty	180	48	48	1-23-64	.2	40	2	25	56	-
9B1	DGTGOG Water System, Inc.	40	144	140-144	1-23-64	.7	83	2	52	110	-
14B1	James McAuliffe	175	118	102-118	7-26-65	-	-	4	60	130	(G)
16M2	Martin Auseth	125	127	109-127	1-23-64	.8	78	1	50	110	-
21B1	Irvin McArthur	25	60	60	1-23-64	.0	110	670	430	2100	-
21P1	Arkada Park Subdivision	50	183	124-183	12-9-63	.2	95	5	68	140	-
28B1	B. N. Collier	15	172	at 172	12-9-63	.7	110	400	150	1000	-
28C3	L. J. Munson	27	65	at 65	7-12-65	-	-	7	170	320	(G)
32G1	William Bowen	110	120	at 100	7-12-65	-	-	3	100	230	(G)

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						Iron (Fe)	Bicarbonate (HCO_3)	Chloride (Cl)	Hardness ($CaCO_3$)		
20/3-1M1	E. G. Gillette	90	27	11-27	12-17-63	.0	26	2	18	42	-
3K1	Bayshore, Inc.	25	254	87-124, 178-245	1-23-64	trace	72	1	48	100	-
3N2	Mason County Shops	190	235	-	1-23-64	.0	70	1	51	97	-
5N1	Robert Hodgson	245	62	at 72	1-23-64	.0	69	4	62	120	-
6E1	Bud Franklin	250	49	at 49	1-23-64	.0	54	1	39	74	-
7P1	City of Shelton well 1	210	745	515-540, 670-725	7-12-65	-	-	3	53	130	(G)
11R1	Eugene Anderson	125	43	-	12-17-63	.0	71	2	49	91	-
15E1	S. S. Waterman	18	66	-	12-17-63	.2	170	2	120	210	-
15Q1	Clyde Robb	120	148	140-148	12-17-63	.2	100	2	69	130	-
16C3	Wilfred White	15	50	-	7-12-65	-	-	2	56	99	(G)
17L2	Omer Noble	168	152	150-152	1-23-64	.0	86	1	58	110	-
18G1	Jay Abel	190	149	143-149	1-23-64	.1	110	2	81	150	-
18J1	Fred Peste	220	92	90-92	1-23-64	.0	61	2	51	91	-
23F1	C. H. Grunert	15	48	-	12-17-63	.2	120	3	81	140	-

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						Iron (Fe)	Bicarbonate (HCO_3)	Chloride (Cl)	Hardness ($CaCO_3$)		
20/3-23Q1	Joe Gruver	47	93	88-93	7-12-65	-	-	3	93	190	(G)
29M1	Mill Creek Motel	135	70	-	12-9-63	.0	77	4	68	130	-
31Q1	Leroy Boad	150	48	2-6	12-9-63	.0	120	3	98	170	-
32D1	Lester Spilseth	170	55	-	12-9-63	.5	110	3	81	140	-
32P1	Harry Craig	200	42	-	12-9-63	.2	96	1	70	130	-
33N1	Don Nye	160	43	at 43	12-9-63	.0	93	1	74	140	-
34M1	Cook Plant Farm	128	100	80-100	12-9-63	.4	110	1	79	150	-
20/4-8G1	R. E. Grossman	280	60	45-60	12-12-63	.2	52	1	38	74	-
9E3	State Department of Institutions	276	46	32-41	6-15-62	.1	-	-	35	-	(B)
9G1	State Department of Institutions	293	632	-	4-10-62	.1	-	20	68	-	(B)
12D1	E. E. Fluckinger	280	63	-	12-17-63	.0	67	5	67	130	-
16R2	T. J. Baze	235	67	-	12-12-63	1.6	60	2	43	88	-
17R1	M. L. Link	280	45	at 45	12-12-63	.0	68	3	51	98	-
18B1	Lemke's Store	260	163	155-163	12-12-63	.0	63	1	37	91	-
18L1	Warren Williams	275	19	10-19	12-12-63	.0	26	1	17	41	-

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						Iron (Fe)	Bicarbonate (HCO_3)	Chloride (Cl)	Hardness ($CaCO_3$)		
20/4-22G1	J. J. Goodchild	360	189	-	12-12-63	.0	56	3	38	88	-
24G1	Simpson Timber Co. (formerly Rayonier, Inc., well 6)	74	742	140-200	7-11-42	.1	-	-	190	-	(R)
				223-228	7-12-42	.0	-	-	100	-	(R)
				253-258	7-12-42	.0	-	-	88	-	(R)
				280-295	7-13-42	.1	-	-	120	-	(R)
				348-442	7-15-42	.0	-	-	34	-	(R)
				559-570	8-3-42	.2	-	-	33	-	(R)
				635-658	8-5-42	.0	-	-	34	-	(R)
				707-742	8-8-42	.0	-	-	30	-	(R)
26N1	Mason County Fair Association	110	209	176-209	12-12-63	.0	71	16	67	140	-
36H1	William White	240	65	48-65	12-12-63	.0	33	2	28	57	-
21/1-5A1	Treasure Island Country Club	50	227	215-227	1-28-64	.0	78	2	51	100	-
5B1	L. E. Soule	10	352	60& 80	1-28-64	.0	68	1	50	96	-
7A1	Mary Nelson	195	32	30-32	1-28-64	.2	110	4	86	160	-
8G1	Orville Kager	30	150	-	1-28-64	.0	77	3	53	110	-

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						Iron (Fe)	Bicarbonate (HCO_3)	Chloride (Cl)	Hardness ($CaCO_3$)		
21/1-8J1	Lloyd Richey	60	550	550	1-28-64	.1	84	1	52	110	-
8R1	R. G. Wells	60	610	593-610	1-28-64	.6	84	1	48	110	-
31D2	Steig Gabrielson	18	81	63-81	7-26-65	-	-	23	84	220	(G)
21/2-3L1	T. R. Sladek	230	40	37-40	1-28-64	.0	44	1	32	63	-
4B1	Jerry Hill	220	41	38-41	1-28-64	.0	42	1	29	61	-
8A1	C. B. Coselman	320	245	214-240	7-26-65	-	-	3	47	93	(G)
13R1	E. H. Fredericks	28	89	84-89	1-28-64	.0	78	1	54	100	-
22Q2	L. N. Rensing	30	120	112-120	7-26-65	-	-	4	57	120	(G)
24P1	Irvie Wingert	78	101	77-78	7-26-65	-	-	3	96	200	(G)
30Q1	Gordon Costa	242	135	130-135	1-23-64	.0	29	1	20	41	-
32A1	Essie Gibler	179	52	50-52	1-23-64	.0	58	2	43	80	-
32K1	J. H. Gray	183	176	170-176	1-23-64	1.4	82	1	56	110	-
33H1	R. O. Yeager	40	53	48-53	1-23-64	.0	56	2	40	77	-

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						Iron (Fe)	Bicarbonate (HCO_3)	Chloride (Cl)	Hardness ($CaCO_3$)		
21/3-4N1	Alderbrook Inn, Inc.	520	292	218-292	7-27-65	-	-	3	40	76	(G)
34L1	W. A. McCoy	200	76	-	12-17-63	.5	32	3	22	45	-
36C2	J. A. Okonek	50	101	101	12-17-63	.0	93	1	63	120	-
36E1	Norman Castle	25	14	10-14	12-17-63	.0	31	2	24	48	-
36Q1	Don Bowman	160	56	40-56	12-17-63	.0	44	2	34	70	-
21/4-2P1	Mason County School Dist. 404	15	68	-	7-27-65	-	-	3	47	90	(G)
15G1	William Bourgault	28	96	90-96	12-17-63	.0	43	2	30	61	-
18B1	Jim Daily	45	12	8-12	12-17-63	.0	53	3	43	82	-
18K1	State Department of Game	75	78	49-54	12-17-63	.0	43	1	30	58	-
26F1	Mingus Motel	245	23	23	12-17-63	.1	22	3	15	34	-
22/1-6B1	C. R. Callow	15	263	260-263	1-28-64	.0	71	1	49	99	-
8D1	North Mason High School	295	224	180-224	1-28-64	.0	81	2	57	110	-
17B2	W. M. Baker	55	230	220-230	1-28-64	.1	59	1	40	79	-

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						Iron (Fe)	Bicarbonate (HCO_3)	Chloride (Cl)	Hardness ($CaCO_3$)		
22/1-20H1	G. R. Kirk Company	8	288	-	1-28-64	.0	48	1	25	69	-
20K1	John Mead	8	110	61-93	1-28-64	.2	64	1	39	89	-
20N1	D. W. Beeson	20	46	45	1-28-64	.1	66	1	43	93	-
29H1	R. A. Benson	15	273	-	1-28-64	.0	82	1	44	110	-
32P1	G. S. Lewis	70	77	-	1-28-64	.0	56	2	39	79	-
22/2-12G1	H. C. Stirling	12	40	35-40	7-27-65	-	-	9	81	340	(G)
14N2	Will Green	10	40	11-40	7-27-65	-	-	4	70	140	(G)
19R1	State Parks Commission (Twanoh State Park)	15	75	10-70	7-27-65	-	-	3	40	79	(G)
20Q1	Twanoh Tides, Inc.	190	128	100-124	7-27-65	-	-	4	49	83	(G)
32Q2	Fred Lammers	209	57	48-57	7-26-65	-	-	4	62	84	(G)
22/3-32F1	Steve Morris	160	128	128	12-17-63	.0	67	2	53	93	-
32L1	Town of Union	240	146	-	7-27-65	-	-	3	62	120	(G)
32P1	M. M. Miller	205	265	-	12-17-63	.0	61	1	43	79	-