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STATE OF OREGON

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RECORDS OF WELLS AND SPRINGS, WATER LEVELS AND CHEMICAL QUALITY OF GROUND WATER IN THE EAST PORTLAND AREA, OREGON

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PREPARED IN COOPERATION WITH
THE UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
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FOREWARD

An investigation of the occurrence, availability and quality of the ground-water resources of the East Portland area was commenced in 1954 in cooperation with the U. S. Geological Survey. This report presents the data on more than 300 wells and is being released to aid in the development of the ground-water resources of the area.

Numerous wells have been constructed in the area of investigation since the well inventory was completed in 1957. The records of these newer wells, which may also be useful in the development of ground-water supplies, can be examined at the Geological Survey office in Portland or at the office of the State Engineer in Salem.

The first phase of the investigation was the collection of the records presented in this report. As these records will not all be a part of the forthcoming interpretive report describing the occurrence of ground water in the East Portland area, this report will also serve as a supplement to the interpretive report.

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RECORDS OF WELLS AND SPRINGS, WATER LEVELS, AND CHEMICAL QUALITY OF GROUND WATER IN THE EAST PORTLAND AREA, OREGON

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By B. L. Foxworthy, G. M. Hogenson, and E. R. Hampton

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INTRODUCTION

Purpose of This Report and Relation to Other Studies

The eastern part of the city of Portland, Oreg., and the suburban and rural districts east, north, and south of the city constitute an area of rapid population growth in which progressively greater amounts of ground water are being sought for industrial, irrigation, and public supplies. It is also an area of diverse geologic and hydrologic conditions, which cause the success and cost of ground-water development to differ widely from place to place. Throughout the area, but particularly in the rapidly growing suburban districts, information is needed to aid in the orderly development and effective management of the ground-water resources.

To obtain this needed information, a study was begun in 1954 of the occurrence, availability, and uses of ground water in the area, the outlook for future demands and the adequacy of the ground-water resources to meet those demands, and the ground-water problems that are likely to develop. As initial steps in the investigation, records of representative wells and springs were gathered, water levels in selected wells were measured periodically, and samples of water from representative wells and springs were analyzed to determine their chemical character.

The purpose of this report is to assemble the basic hydrologic data gathered during the initial phase of the investigation and to make these data readily available in advance of the final report. The final interpretive report, which will be published by the U.S. Geological Survey, will include only selected portions of the data presented here. A preliminary version of the final report was released in December 1962 (Hogenson, 1962).

Water for the cities of Portland and Gresham, and for some suburban districts, is supplied by the Portland Municipal Water Bureau from the Bull Run River. In parts of the area not supplied from Bull Run, ground water is the principal source of supply; consequently, the greatest need for ground-water information exists in those districts. Most of the effort directed to collection of basic ground-water data was concentrated on those districts of greatest need, although a considerable amount of data on ground water within the city of Portland also was collected and is included herein.

Parts of the East Portland area were studied during two previous water-resources investigations, and ground-water studies have been made in three adjacent areas. The East Portland area is included in a larger area described by Griffin and others (1956) in a report on the water resources of the Portland, Oreg., and Vancouver, Wash., area. That report includes brief descriptions of the principal streams, the major rock units and their water-bearing character, and a few of the wells in the East Portland area. The western part of this area was included also in an investigation of the ground-water resources of the

Willamette Valley (Piper, 1942). The report of that study describes briefly the availability of ground water in the "Portland Delta," and presents records of a few wells in that part of the area.

A comprehensive study of the occurrence, availability, and chemical quality of the ground water in the Tualatin Valley, which adjoins the southwestern part of the East Portland area, was made by Hart and Newcomb (1956). Mundorff (1963, in press) made a similar study in Clark County, Wash., which is on the north side of the Columbia River opposite the East Portland area. A report on the occurrence and problems of utilizing ground water in the west-side business district of Portland (across the Willamette River from the west-central part of the area of this study) was prepared by Brown (1963) concurrently with the present investigation.

Location and Description of the Area

The area of this investigation includes those parts of western Multnomah County and northern Clackamas County, in northwestern Oregon, extending from the Columbia River on the north to the Clackamas River on the south, and from the Willamette River on the west to the Sandy River on the east (fig. 1).

The area is about 30 miles long (northwest-southeast), and about 15 miles wide. It covers about 230 square miles and ranges in altitude from about 10 feet on the flood plain of the Columbia River to 1,083 feet at the top of Mount Scott. The area includes the following major subareas of distinctive topography: The Boring Hills, the Kelso slope, the Portland terraces, Oatfield Heights ridge, and the Columbia River flood plain (fig. 1). Lesser topographic features are the terraces and small flood plains of the Willamette, Clackamas, and Sandy Rivers and the small hills and buttes scattered within the Portland terraces subarea.

Boring Hills

The Boring Hills subarea is a district of low rolling hills that occupies about 52 square miles of the south-central part of the East Portland area. This subarea includes about 25 prominent hills and buttes and associated benches and highlands. The individual hills are mostly steep sided and conical or dome shaped, although some have relatively flat or gently rounded tops. The hills are both volcanic and erosional origin. Several of the hills reach altitudes of about 1,000 feet. The highest is Mount Scott (altitude 1,083 feet), which is about 800 feet higher than adjacent terrace lands to the west and north.

Kelso Slope

The Kelso slope is a dissected northwestward-sloping surface west of the canyon of the Sandy River, northeast of the Clackamas River canyon, and east of the Boring Hills. It extends north nearly to Gresham and occupies an area of about 44 square miles. It descends northwestward from a general altitude of 1,000 feet near Sandy to about 400 feet east of Gresham, and, in this area, constitutes the lowest part of the western slope of the Cascade Range.

Portland Terraces

The Portland terraces comprise the largest physiographic subunit in the East Portland area. Collectively the terraces occupy about a hundred square miles. They form most of the western and northern parts of the area lying south of the Columbia River flood plain.

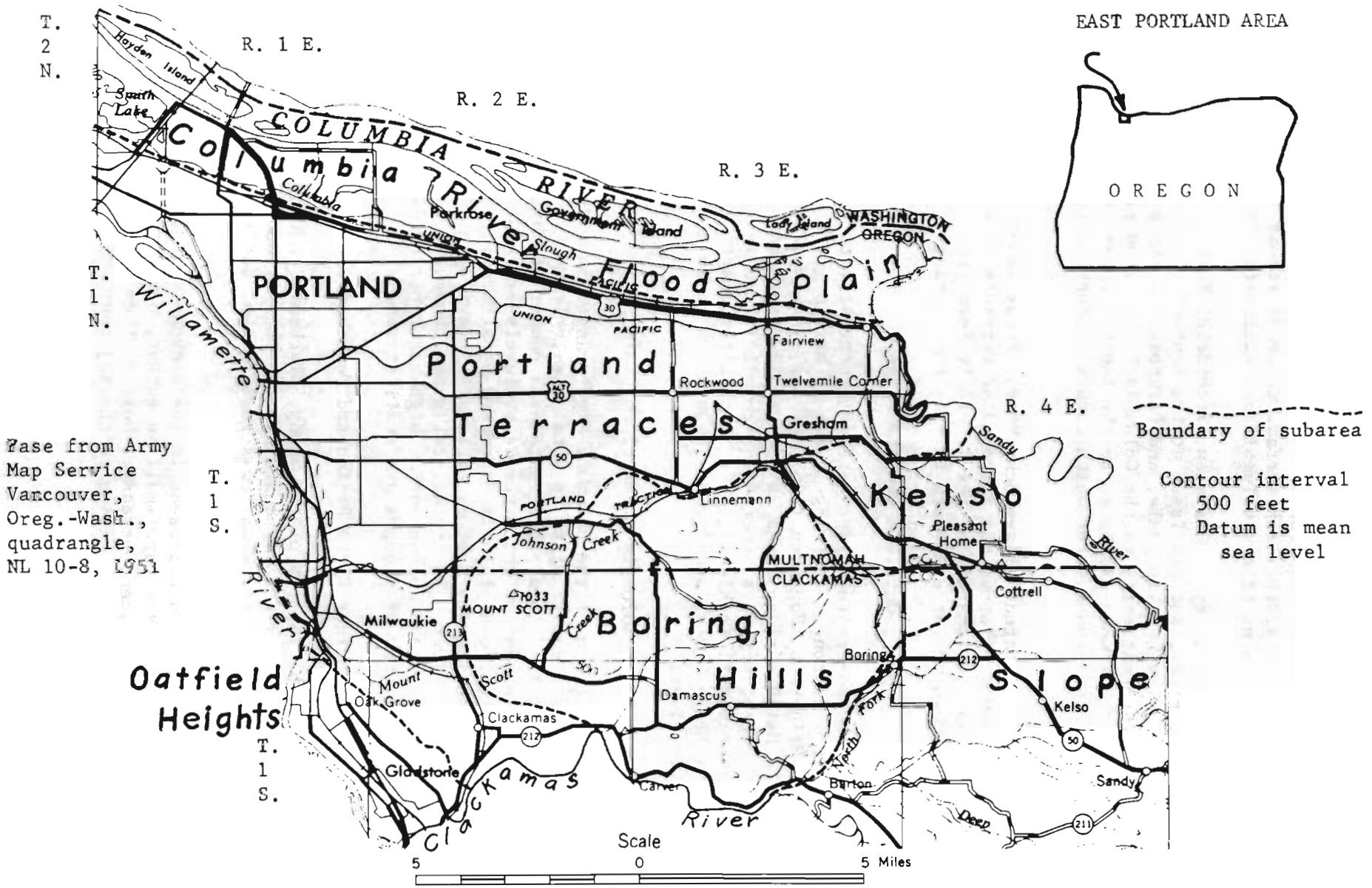

Figure 1.--Map of the East Portland area, Oregon, showing major physiographic subareas.

The highest terraces, at altitudes of about 300 and 350 feet respectively, are near Russellville and in the Troutdale-Gresham district. North and west from these highest terraces, the land surface descends across successively lower terraces to the flood plains of the Columbia and Willamette Rivers.

At places in the vicinity of Fairview, Troutdale, Parkrose, and the Sellwood district of Portland, springs issue at the foot of steep terrace scarps. Some of those near Fairview, Troutdale, and Parkrose are the sources of small streams that flow intermittently to the Columbia River flood plain (pl. 1 and table 4); those near Sellwood discharge to the lower reaches of Johnson Creek. These springs discharge ground water which occurs at depth beneath the higher terraces.

Three prominent isolated hills--Rocky Butte, Mount Tabor, and Kelly Butte--rise about 200 to 400 feet above the surrounding terraces. These hills are composed of Boring Lava and remnants of the Troutdale Formation (table 5) and were left as "islands" when the streams were forming the terraces.

Oatfield Heights Ridge

A prominent, broad-crested ridge extends southeast from the vicinity of Milwaukie to near Gladstone. The ridge seems to have no formal name, but was called Oatfield Heights by Hogenson (1962, p. 23), in accordance with local usage. Oatfield Heights ridge rises as much as 300 feet above adjacent parts of the Portland terraces, occupies about 4 square miles, and is formed largely of the Columbia River Basalt (table 5). Its northeastern part is drained by small tributaries of Kellogg Creek, and its southwestern part by minor streams flowing to the Willamette River.

Columbia River Flood Plain

The flood plain south of the Columbia River ranges in width from about 1 to 2 miles and is about 25 square miles in total area. It ranges in altitude from about 10 to 30 feet. The flood plain contains a number of marshes, shallow lakes, and sloughs, in many of which the water levels are kept low by artificial drainage. Most of the flood plain is protected by artificial dikes and is flooded only partly during years of exceptionally heavy rainfall or of very high water in the Columbia River. In its natural state, however, the flood plain was partly or completely flooded during normal high-water periods and was drained naturally through a system of sloughs and small streams.

Minor Flood Plains and Terraces

Flood plains in the valleys of the Sandy, Clackamas, and Willamette Rivers occupy a total area of less than 5 square miles. These flood plains are commonly only a few feet above the mean low-stream levels, and parts of them are subject to annual flooding.

Several minor terraces are present in the canyons of the Sandy and Clackamas Rivers. The terraces are small in extent, nearly flat in profile, and slope gently toward the adjacent streams. Most of them are bounded by steep bluffs plunging to the river and rising to the adjacent uplands.

Acknowledgments

The basic data included in this report were supplied largely by well owners and operators, well drillers, and by pump companies and their representatives. Officials and operating personnel of municipal and suburban water-supply systems contributed valuable information concerning sources and use of water. The cooperation of all is gratefully acknowledged.

OCCURRENCE AND AVAILABILITY OF GROUND WATER

Summary descriptions of the rock units in the East Portland area, their general location and extent, and their water-bearing characteristics are presented in table 5. The listing of the units, from youngest to oldest, shows the general stratigraphic relations. Additional, more detailed information on the rock units is given in the interpretive report of this investigation (Hogenson, 1962).

As table 5 indicates, not all the rock units are present in any part of the area. The sequence of units at various places is shown by stratigraphic designations in the drillers' logs (table 2).

The principal aquifers in the area are beds of loose sand and gravel in the Troutdale Formation of early Pliocene age, fluviolacustrine deposits of late Pleistocene age, and alluvium of Recent age. At places, each of those water-bearing rock units is tapped by wells that yield moderate to large amounts of water of good chemical quality. Locally, the Columbia River Basalt of Miocene age and the Boring Lava of late Pliocene to late(?) Pleistocene age also yield substantial amounts of water. Other sedimentary rocks that are younger than the Columbia River Basalt are saturated at places but are generally fine grained and relatively impermeable, and do not readily yield water to wells; these include the Sandy River Mudstone of early(?) Pliocene age, piedmont deposits of early(?) Pleistocene age, and terrace deposits, probably of late Pleistocene age. Rocks underlying the basalt--herein called "older rocks"--are poorly permeable and yield only small amounts of water, which locally is of poor chemical quality.

The ground-water bodies tapped by wells in the area are of three principal types: The first is unconfined water[1/] in the alluvium and, locally, in the fluviolacustrine deposits and at lower altitudes in the Troutdale Formation. The second is perched or semiperched water[2/], which is widespread throughout the area. It is found in the Columbia River Basalt at higher altitudes on Oatfield Heights; in the upper part of the Troutdale Formation beneath the Boring Hills, Kelso slope, and Portland terraces subareas; locally, in the Boring Lava and all

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1/ Unconfined ground water occurs under normal water-table conditions--that is, its upper surface is at atmospheric pressure and is free to fluctuate in response to changes in recharge to and discharge from the ground-water body.

2/ Ground water that is held above another underlying body of ground water by a relatively impermeable stratum is said to be perched if the two ground-water bodies are separated by an unsaturated zone, and is termed semiperched if no unsaturated zone separates the two ground-water bodies.

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younger water-bearing units except the alluvium. The third is confined water[3/], which occurs locally at depth in the Troutdale Formation, at most places in the Columbia River Basalt and Sandy River Mudstone, and, so far as is known, in the older rocks. Some bodies of ground water in the fluviolacustrine deposits and the upper parts of the Troutdale Formation are perched and also confined.

EXPLANATION OF DATA

Well- and Spring-Numbering System

Wells discussed in this report are designated by symbols that indicate their location according to the Federal rectangular system of land division. In the symbol 1N/1-35N1, for example, the part preceding the hyphen indicates respectively the township and range (T. 1 N., R. 1 E.) north and east of the Willamette base line and meridian. Because most of the State lies south of the Willamette base line and east of the Willamette meridian, the letters indicating the directions south and east are omitted, but the letters "W" and "N" are included for wells lying west of the meridian and north of the base line. The first number after the hyphen indicates the section (sec. 35), and the letter (N) indicates a 40-acre subdivision of the section as shown in figure 2. The final digit is the serial number of the well within that 40-acre tract. Thus, well 1N/1-35N1 is in SW¼SW¼ sec. 35, T. 1 N., R. 1 E., and is the first well in the tract to be listed.

Springs are numbered in the same manner except that the letter "s" is added following the final digit. Thus, the first spring recorded in SW¼SW¼ sec. 35, T. 1 N., R. 1 E. would have the number 1N/1-35N1s.

In the tables of well and spring records (tables 1 and 4 respectively) the well and spring numbers are not given in full. Only the parts of the numbers following the hyphen are shown (35N1, for example), grouped under subheads that indicate the appropriate township and range. On plate 1 (map showing locations of wells and springs), only the letters indicating location within the section and the serial numbers (as N1, N1s) are shown.

Water-Level Fluctuations

The regional water table in most of the East Portland area stands slightly above the level of the nearest major stream, but there are many local perched water bodies above the regional water table. In the southeastern part of the area--in the Kelso slope and Boring Hills subareas--the water levels recorded in many wells are 200 or more feet above the regional water table. Most of these relatively high water levels represent the water tables of perched ground-water bodies. In these subareas, especially in the Boring Hills, perched ground water occurs at several different levels, and the level at which water will first be encountered during drilling of a well is not closely predictable.

3/ Confined ground water occurs where water moving in a saturated permeable aquifer, such as sand or gravel, passes beneath a less permeable stratum, such as clay, and is under pressure due to the head of water in the unconfined part of the aquifer. In a well that taps such a body of confined ground water the water will rise above the base of the confining stratum.

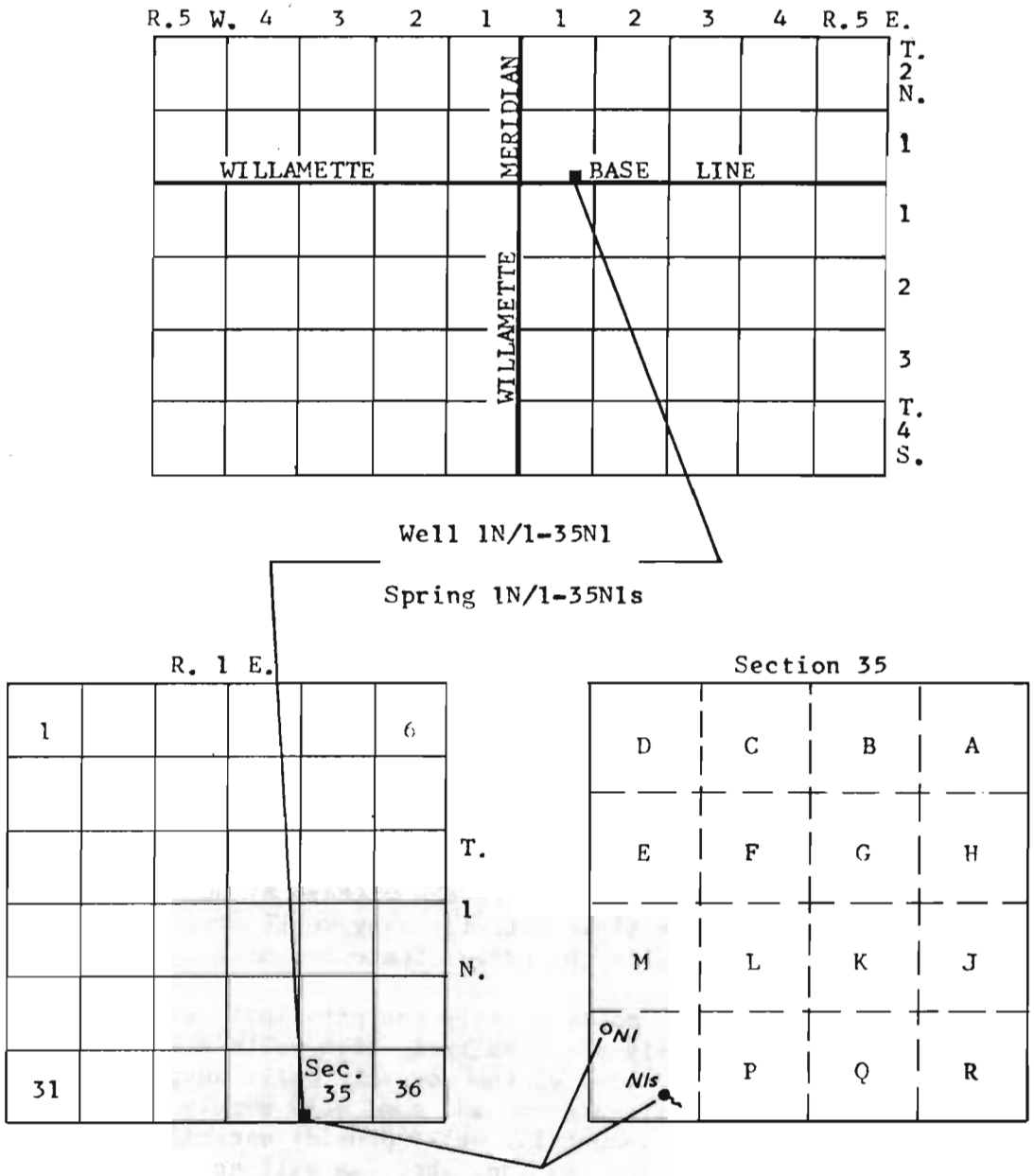

Figure 2.--Sketch illustrating well- and spring-numbering system.

In the western and northwestern parts of the area, water levels in the wells outline generally a common water surface (the regional water table) that slopes gently toward the major streams. In these parts of the area, the aquifers tapped by most of the wells are unconfined, and static (nonpumping) water levels in representative wells can be used to predict, at least within a few tens of feet, the water levels to be expected in new wells of similar depth.

Water levels in 12 wells in the East Portland area were measured periodically during the interval August 1955 to September 1957. Hydrographs of 8 of these are shown in figure 3, along with a graph of the monthly precipitation at Portland Airport. The fluctuations of water level depicted by the hydrographs were chiefly in response to variations in recharge to and discharge from the ground-water bodies. In this area the recharge occurs mainly as infiltration from local rainfall; the discharge occurs mainly as seepage to the perennial streams, through springs and seeps at the land surface, as evapotranspiration, and as withdrawal from wells (Hogenson, 1962, p. 83-84).

As shown by figure 3, the highest annual levels in most of the observation wells occurred during the spring in both 1956 and 1957. The high levels in most of the wells during those years lagged behind the months of greatest precipitation (January and March respectively) by intervals of about 1 to 3 months. Likewise, the lowest annual levels in most wells occurred during autumn or winter, considerably later than the summertime period of least precipitation and greatest withdrawals from wells.

Records of Wells

Table 1 contains records of 320 representative wells, the locations of which are shown on plate 1. Most of the well data were obtained during examination of the wells or were supplied to the writers by owners, operators, and drillers of the wells. The field data for many wells were augmented by drillers' reports submitted to the Oregon State Engineer.

In the "Use" column of table 1, only the principal uses of the well waters are given. Some of the wells shown as irrigation wells also provide domestic and stock water; similarly, most of the domestic wells supply water used for irrigation of lawns or small gardens, and some also supply stock water. Many of the wells classified as industrial wells provide water for drinking fountains, lavatories, fire protection, etc., as well as for industrial processes. The public-supply wells listed include those supplying nonirrigation water for schools or other public buildings, municipal-supply or water-district wells, and private wells supplying group housing.

Most of the water temperatures listed in the "Remarks" column were measured by Geological Survey personnel; others were reported by well drillers or pump companies, and presumably were measured when the wells were completed or were being tested. Additional temperatures, measured when water samples were collected for chemical analyses, are given in table 3.

Drillers' Logs of Wells

Table 2 contains 124 well logs, most of which were obtained from drillers' reports to the State Engineer or from written records held by the drillers. The logs of some of the older wells were reported from memory, and therefore may be subject to error.

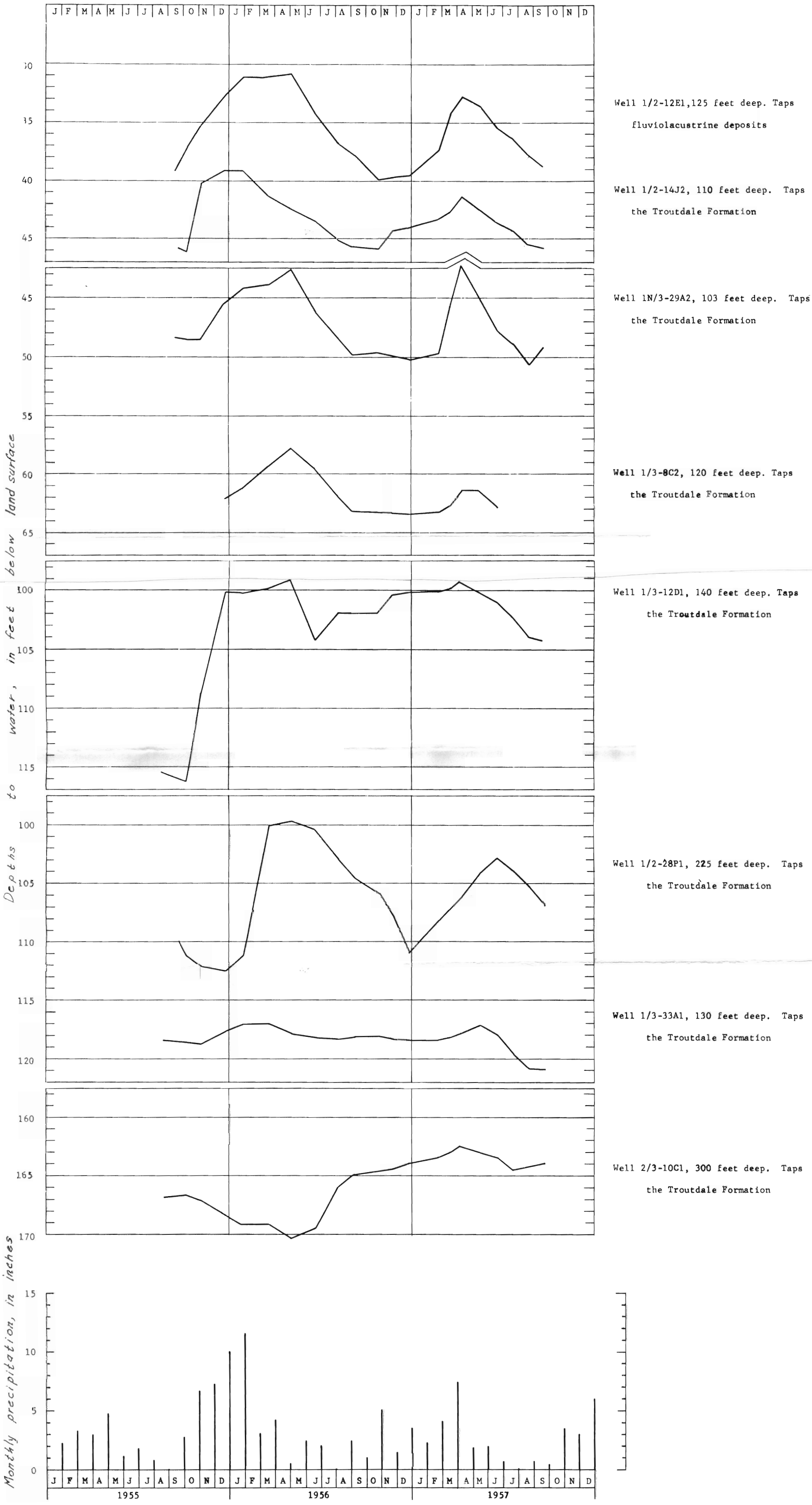

Figure 3.-- Hydrographs of 8 wells in the East Portland area, Oregon, and monthly precipitation at Portland Airport for the period 1955-57.

Descriptions of materials penetrated doubtless vary, depending on the terminology of the person compiling the log. For example, compact clay may be referred to variously as "clay," "shale," or "hardpan." Similarly, compact clay and gravel may be called "cemented gravel," "clay and gravel," "conglomerate," or even "rock." In this report, the logs have been edited for consistency of presentation, but the original designations have not been changed; in some cases, however, the writers' interpretation has been added in parenthesis after the driller's designation.

Tentative stratigraphic designations in the well logs (and also in tables 1 and 4) are mostly by G. M. Hogenson.

Chemical Analyses of Ground Water

Twenty analyses of water from 17 wells in the area are presented in table 3. Twelve of the analyses were made by the U.S. Geological Survey, 6 were by Charlton Laboratory, Portland, Oreg., and 1 each were by Reynolds Metal Co. and the Oregon State Board of Health.

Additional values of water hardness, chloride content, and specific conductance are given in the "Remarks" columns of table 1 (records of wells) and table 4 (records of springs). Those values were determined by the Geological Survey under the same laboratory controls that were applied to the more complete analyses shown in table 3.

Records of Springs

Table 4 contains records of 27 springs. The relatively few listed are fairly representative of the great number of springs in the East Portland area, especially with regard to geologic source and mode of discharge; however, a disproportionately large number of the larger yield springs in the area are included in the table.

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Table 1.--Records of representative wells in the East Portland area, Oregon

Altitude: Land-surface datum at well, in feet above mean sea level, interpolated from topographic maps.

Well number: See p. for description of well-numbering system.

Type of well: Dg, dug; Dr, drilled.

Water-bearing material: B, basalt; C, clay; Cg, cemented gravel; G, gravel; S, sand; Ss, sandstone. Letters within parentheses: Tc, Columbia River Basalt; Ts, Sandy River Mudstone; Tt, Troutdale Formation; QTv, Boring Lava; Qp, piedmont deposits; Qfl, fluviolacustrine deposits; Qt, younger terrace deposits; Qal, younger alluvium.

Ground-water occurrence: C, confined; P, perched; U, unconfined.

Water level: Depths to water given in feet and decimal fractions were measured by the Geological Survey; those given in whole feet are reported by the well owner or driller. F, flowing well whose static water level is not known. Datum is land surface at the well.

Type of pump: B, bucket; C, centrifugal; J, jet; N, none; P, piston; T, turbine; St, submersible turbine.

Use: D, domestic; E, exploration; Ind, industrial; Irr, irrigation; N, none; PS, public supply; S, stock.

Remarks: Ca, chemical analysis in table 3; Cl, chloride; dd, drawdown; gpm, gallons per minute; H, hydrograph included in this report; Hn, hardness as $CaCO_3$; L, driller's log in table 2; mgd, million gallons per day; ppm, parts per million; Sc, specific conductance in micromhos at 25°C; Temp, temperature of water in degrees Fahrenheit. Remarks on the adequacy and dependability of water supply, general quality of water, and materials penetrated are reported by owners, tenants, drillers, or others.

Well number	Owner or occupant	Topography and altitude (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth of casing (feet)	Water-bearing zone (s)			Ground-water occurrence	Water level		Type of pump and yield (gallons per minute)	Use	Remarks
							Depth to top (feet)	Thickness (feet)	Character of material		Feet below datum	Date			
T. 1 N., R. 1 E.															
4B1	E. D. Ming	20	Dr	140	6	140	112	28	S, G (Qal)	U	--	--	--	Irr	Pumped 100 gpm, dd 1 ft after 8 hr.
4K1	U. S. Government	10	Dr	148	12	148	115	22	do	U	13	1942	N	N	Vanport well 2. Pumped 1,400 gpm, dd 8 ft; Ca, L.
6G1	Oregon Crossarm Co.	25	Dr	46	10	--	--	--	(Qal)	U	11	1954	P, 53	Ind	Supplies boiler feed water; Temp 54.
7N1	McCormick & Baxter Co.	30	Dr	130	12	130	60 118	24 5	S (Qal) G (Tt)	U	23	9- -45	T	Ind	Pumped 1,600 gpm, dd 26 ft; L.
8B1	Western States Rendering Co.	80	Dr	96	10	96	48	48	S, G (Qfl)	U	--	--	T	Ind	Pumped 500 gpm; L.

Table 1.--Records of representative wells in the East Portland area, Oregon--Continued

Well number	Owner or occupant	Topography and altitude (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth of casing (feet)	Water-bearing zone (s)			Ground-water occurrence	Water level		Type of pump and yield (gallons per minute)	Use	Remarks
							Depth to top (feet)	Thickness (feet)	Character of material		Feet below datum	Date			
						T. 1 N., R. 1 E.--Continued									
9G1	City of Portland	80	Dr	60	--	--	37	17	G (Qfl)	U	37	1946	N	E	Test hole 2; L.
10R2	Blue Bell Potato Chip Co., Inc.	50	Dr	88	10	88	86	2	do	U	--	--	T, 700	Ind	
11N2	American Pipe & Construction Co.	40	Dr	91	12	92	40	52	do	U	25-30	1957	--	Ind	Pumped 1,100 gpm, "no" dd.
12G1	D. Green	10	Dr	137	6	137	20	117	S, G (Qal)	U	15	1947	--	D	Pumped 35 gpm, dd 5 ft after 1 hr; L.
16P1	City of Portland	200	Dr	175	--	--	75	100	G (Qfl)	U	--	--	N	E	Test hole 10; L.
21L1	Continental Grain Co.	20	Dr	189	16	189	136	47	S, G (Tt)	U	30	10-13-57	T	Ind	Pumped 1,000 gpm, dd 48 ft after 8 hr; L.
25J1	Yaw's Restaurant	150	Dr	247	8-6	247	140	10	do	--	--	--	T, 100	Ind	For air-conditioning; Temp 52.
26E1	Farmers' Dairy Assoc.	180	Dr	250	10	--	--	--	--	--	--	--	T, 250	Ind	Supplies cooling and wash water for dairy.
34J1	Northwestern Ice & Cold Storage	65	Dr	145	8-6	125	134	11	G, S (Qfl)	U	63	1927	T	Ind	Pumped 80 gpm, dd 20 ft; L; Temp 54.
35C1	Lloyd Corp., Ltd.	130	Dr	272	16	272	177 238	27 12	S, G (Tt) do	U	121	12- 3-57	T	Ind	Pumped 1,050 gpm, dd 3 ft after 3 hr; Temp 53; L.
35N1	Widmer Plumbing & Heating Co.	75	Dr	80	6	80	67	13	S, G (Qfl)	U	47	1948	--	Ind	Pumped 30 gpm, dd 7 ft after 1 hr; L.
36H1	Ladd Estate	220	Dr	1,700	8-5	--	--	--	--	--	340(?)	1885	N	N	Well drilled about 1885; long abandoned; L.
						T. 1 N., R. 2 E.									
5Q1	City of Portland	20	Dr	125	6	125	107	18	G (Qal)	U	30	1949	N	N	Pumped 50 gpm, "no" dd after 1 hr; well destroyed 1948; L.
8B1	do	20	Dr	135	12	--	110	--	S, G (Qal)	U	20	--	T, 750	Irr	Former Alderwood Country Club well.
9D1	S. J. Mason	30	Dr	115	6	115	107	8	G	U	30	8- -56	J	D	Driller reports only sand was penetrated from surface to aquifer.

Table 1.--Records of representative wells in the East Portland area, Oregon--Continued

Well number	Owner or occupant	Topography and altitude (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth of casing (feet)	Water-bearing zone (s)			Ground-water occurrence	Water level		Type of pump and yield (gallons per minute)	Use	Remarks
							Depth to top (feet)	Thickness (feet)	Character of material		Feet below datum	Date			
T. 1 N., R. 2 E.--Continued															
16P1	Cosmo Spada	15	Dr	125	8	125	118	7	G (Qf1)	U	5	1940	T	Irr	Pumped 150 gpm, dd 3 ft after 3 hr; L.
17Q1	Warren Northwest, Inc.	70	Dr	98	12	98	52	--	do	U	40	2- -57	--	Ind	Pumped 13 gpm, "no" dd after 4 hr; L.
18F1	Ernie Young	80	Dg	80	36	--	--	--	(Qf1)	U	71.1	11-24-54	N	N	Well used for public supply about 1915.
18M2	E. A. Press	100	Dr	100	6	93	87	13	G (Qf1)	U	87	1942	--	D	Pumped 30 gpm, "no" dd after 1 hr.
22J1	Parkrose School Dist.	100	Dr	218	--	--	--	--	G	U	--	--	T, 350	PS	Supplies water for school.
22Q1	Parkrose Water Dist.	210	Dr	265	12	265	215	16	G (Tt)	U	198	4- -52	T	PS	Standby for Parkrose; pumped 1,000 gpm, dd 9 in. after 1 hr; Ca, L.
24P1	J. W. Wolf	40	Dr	86	6	86	55	31	S, G (Tt)	U	60	9- -49	--	D	Pumped 10 gpm, dd 10 ft after 1 hr; L.
25C1	C. R. Springsted	90	Dr	75	6	74	55	20	S, G	U	52	1949	--	D	Pumped 32 gpm, "no" dd after 1 hr.
25C3	Blair Holcomb	75	Dr	133	8	100+	53 119	7 6	G (Tt) do	P U	92	5- 8-49	T	Irr	Perched water cascades into well from water-bearing zone opposite upper perforations.
25M1	Richland Water Dist.	230	Dr	400	12-10	388	160 371	26 11	S, G (Tt) do	U	128	3- -47	T	PS	Pumped 240 gpm, dd 50 ft after 12 hr; L.
26J1	P. O. Place	260	Dr	142	6	--	--	--	--	U	126.8	4-26-57	N	--	
26R1	Richland Water Dist.	260	Dr	490	12	335	200	103	S, G (Tt)	U	145	9- -56	T	PS	Pumped 220 gpm, dd 94 ft after 4 hr; Ca, L.
28E1	Rose City Sand & Gravel Co.	240	Dr	200	8	200	166 193	27 7	G (Tt) S, G (Tt)	U	--	--	T, 500	Ind	L.
30N1	R. W. Mangels	160	Dr	163	8	163(?)	145	12	do	U	124	8- -45	--	Ind	Pumped 50 gpm, dd 14 ft after 1 hr; L.
31L1	Providence Hospital	175	Dr	164	12	--	136	12	do	U	116	2-22-62	T, 260	Ind, Irr	Pumped 360 gpm, dd 8 ft after 2 hr; Temp 54.

Table 1.--Records of representative wells in the East Portland area, Oregon--Continued

Well number	Owner or occupant	Topography and altitude (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth of casing (feet)	Water-bearing zone (s)			Ground-water occurrence	Water level		Type of pump and yield (gallons per minute)	Use	Remarks
							Depth to top (feet)	Thickness (feet)	Character of material		Feet below datum	Date			
T. 1 N., R. 2 E.--Continued															
32R1	Montevilla Ice & Coal Co.	260	Dr	197	6	--	--	--	--	--	--	--	T, 115	Ind	Temp 49.
35E1	R. R. Hamilton	290	Dr	366	6	365	--	--	G (Qfl, Tt)	U	215	1946	T	--	Pumped 15 gpm, dd 23 ft after 1 hr; L.
35H1	Glendoveer Golf Course	330	Dr	300	8	--	--	--	G	U	--	--	T, 90	Irr	Pumped 90 gpm, dd 30 ft.
36F1	do	325	Dr	358	8	--	200	275	do	U	190	--	T, 75	Irr	Driller test pumped well at 900 gpm.
T. 1 N., R. 3 E.															
21G1	Church of Latter Day Saints	20	Dr	52	12	--	2	50	G (Qal)	U	--	--	T	Irr	Pumped 1,050 gpm, dd 7 ft; "flows" during high stages of Columbia River; Ca.
23B1	Bonneville Power Admin.	25	Dr	183	10	183	175	8	G, S (Tt)	U	10.3	3-15-46	T	Ind	Pumped 142 gpm, dd 142 ft after 20 hr; Ca, L.
23G4	Reynolds Metals Co., well 10	28	Dr	625	12	590	472 520 536	10 12 23	S, G (Tt) do do	U	78	1955	T, 1,000	Ind	Pumped 1,100 gpm, dd 48 ft; L.
23H1	Reynolds Metals Co., well 4	28	Dr	190	12	190	164	13	G (Tt)	U	16	8- 3-42	T, 980	Ind	Pumped 1,300 gpm, dd 24 ft; Ca; Temp 54.
23J1	Reynolds Metals Co., well 15	28	Dr	275	26-12	275	255	18	G, S (Tt)	U	41	4- -53	T	Ind	Pumped 1,350 gpm, dd 51 ft after 10 hr.
23K1	Reynolds Metals Co., well 12	28	Dr	615	12	590	156 230 507	31 4 70	S, G (Tt) S (Tt) S, G (Tt)	U	23	9- -49	T, 1,200	Ind	Upper aquifers cased out. Pumped 1,475 gpm, dd 101 ft; Ca, L.
26E1	Oregon Highway Comm.	55	Dr	93	6	88	80	13	G, S (Tt)	U	25	11- -47	--	--	Bailed 30 gpm, dd 42 ft after 1 hr; L.
26N1	Multnomah County Farm	135	Dr	228	10	--	195	33	Cg (Tt)	U	65	1943	T	PS, Irr	Drilled to 257 ft, backfilled to 228 ft. Pumped 500 gpm, dd 100 ft; Ca.

Table 1.--Records of representative wells in the East Portland area, Oregon--Continued

Well number	Owner or occupant	Topography and altitude (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth of casing (feet)	Water-bearing zone(s)			Ground-water occurrence	Water level		Type of pump and yield (gallons per minute)	Use	Remarks
							Depth to top (feet)	Thickness (feet)	Character of material		Feet below datum	Date			
T. 1 N., R. 3 E.--Continued															
27L1	City of Fairview	120	Dr	150	10	150	100+	--	G	U	35	1- -56	T, 40	PS	
27M1	do	130	Dr	1,060	10-12	830	265 967	80 8	G (Tt) Ss	--	92.7	7-30-58	--	PS	Pumped 400 gpm; L.
28E1	F. D. Shepard	65	Dr	250	8 6	159 250	230	20	G (Tt)	U	55	10- -51	--	--	Pumped 250 gpm, dd 140 ft after 1 hr; L.
28M1	B. E. Davis	140	Dr	65	6	65	16 54	10 9	do S, G (Tt)	U, P	16	12- -44	--	D	Pumped 20 gpm, dd 8 ft after 1 hr; L.
29A2	Gresham Sewage Plant	80	Dr	103	6	--	--	--	G (Tt)	U	50.5	9-12-55	St, 44	D	Hn 108 ppm, Cl 7 ppm, Sc 254, H.
29C1	Cereghino Bros.	60	Dr	150	--	--	--	--	G	U	44.1	do	T, 175	Irr	
30N1	G. Starkel	210	Dg	17	--	17	15	--	(Qfl)	U	15	9- -55	C	D	
30Q2	H. P. Olson	205	Dr	80	8	80	--	--	G	U	53.2	do	J, 50	Irr	
31L1	Staabs Nursery	270	Dr	200	8	--	--	--	do	--	--	--	T	Irr	Pumped 90 gpm.
32B1	G. W. Heaton	200	Dr	155	8	155	--	--	do	--	50.3	9-9-55	T, 180	Irr	
32R1	I. D. Nichols	245	Dr	45	6	45	17	--	(Qfl)	U, P	17.2	do	J, 10	Irr	
33N1	R. Robbins	235	Dr	36	6	40	2	--	do	U, P	2.3	do	J	D	
34D1	Multnomah Kennel Club	180	Dr	405	12	--	--	--	G	U	103	5- -56	T	--	Pumped 350 gpm, dd 73 ft; Ca.
34L1	Mr. Bauman	285	Dr	360	10-8	355	170	--	G, Ss (Tt)	U	--	--	--	D	Pumped 200 gpm, dd 165 ft after 1 hr; L.
34N1	Carl Zimmerman	325	Dr	132	8	126	55 85	-- 45	G (Qfl) G, S (Tt)	--	85	1944	T	D, Ind	Pumped 30 gpm, "no" dd after 1 hr; L.
35B1	E. E. Shroy	310	Dr	230	6 4	77 230	--	--	do	--	--	--	--	D	Pumped 4 gpm for about 1 hr, dd 215 ft; L.
35Q1	Snider Farms	325	Dr	135	10	135	58 109	12 11	do	U	48	4- -50	C	D	Pumped 180 gpm, dd 8 ft after 4 hr; L.

Table 1.--Records of representative wells in the East Portland area, Oregon--Continued

Well number	Owner or occupant	Topography and altitude (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth of casing (feet)	Water-bearing zone (s)			Ground-water occurrence	Water level		Type of pump and yield (gallons per minute)	Use	Remarks
							Depth to top (feet)	Thickness (feet)	Character of material		Feet below datum	Date			
T. 1 N., R. 3. E.--Continued															
36F1	Y. Mishima	215	Dr	46	10	46	--	--	G (Tt?)	C, P	F	1-15-54	--	Irr	Flows about 15 gpm; pumped 60 gpm, dd 45+ ft after 2 hr.
36L1	Hill Military Academy	210	Dr	107	6	--	--	--	Cg?	U	50	3- -45	--	D	Pumped 12 gpm, dd 35 ft after 1 hr.
T. 1 S., R. 1 E.															
1C2	Damascus-Carnation Co.	155	Dr	200	14	200	172	16	G, S (Tt)	U	100	7- -47	T, 650	Ind	L; Temp 52.
1Q1	Sunnybrook Farm	145	Dr	156	10 8	93 156	110	--	do	U	83	9- -55	--	Ind	Pumped 44 gpm for 1 hr, dd slight; L.
2C1	Lewis Bros.	55	Dr	105	8	104	85	20	S, G (Qfl, Tt)	U	38	1956	--	Ind	Pumped 60 gpm, dd 42 ft after 4 hr; L.
2C2	Riverview Dairy	55	Dr	190	6	--	--	--	--	--	--	--	T, 350	Ind	
2E1	Western Dairy Products Co.	50	Dr	504	12	504	170	33	G	U	37	1924	T, 350	Ind	
2E2	Arden Farms Co.	55	Dr	385	14	307	170 281	5 11	G (Tt) S, G (Ts)	--	--	--	T	Ind	Pumped 1,200 gpm, dd 27 ft after 1 hr; L.
3A1	City of Portland	50	Dr	100	--	--	--	--	--	U	13	1946	N	E	Test hole 23; L.
3A3	Northwestern Ice & Cold Storage Co.	35	Dr	265	12 10	241 265	240	25	S (Ts)	U	14.5	1928	T, 500	Ind	Supplies about 1/2 mgd for cooling; L. Temp 56.
11D1	Dairy Coop. Assoc.	40	Dr	490	16	433	119 194 415	3 24 8	S (Tt) do S, G (Ts)	U	49	1- -46	T	Ind	Pumped 1,200 gpm, dd 108 ft after 48 hr; L.
11H1	Libby, McNeill, & Libby	65	Dr	330	12 10	301 330	215 282	25 48	G (Tt) S, G (Tt)	U	20.5	1929	T	Ind	Pumped 800 gpm, dd 50 ft; Ca, L.
14B1	Iron Fireman	65	Dr	190	6-4	190	66	124	Cg	U	35	1936	T, 35	Ind	Pumped 28 gpm, dd 7 ft after 1 hr.
24L1	City of Portland	65	Dg	20	36	20	--	--	G	U	5	1946	N	N	Near Crystal Springs; yielded 25 gpm.

Table 1.--Records of representative wells in the East Portland area, Oregon--Continued

Well number	Owner or occupant	Topography and altitude (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth of casing (feet)	Water-bearing zone (s)			Ground-water occurrence	Water level		Type of pump and yield (gallons per minute)	Use	Remarks
							Depth to top (feet)	Thickness (feet)	Character of material		Feet below datum	Date			
T. 1 S., R. 1 E.--Continued															
25M1	Kellogg Park Housing Project	45	Dr	430	12-8	368	120 402	48 18	B (Tc) do	C	24	6- -45	--	PS	Pumped 180 gpm, dd 125 ft after 1 hr; L.
25R2	City of Milwaukie	180	Dr	290	12-10	283	172	100	S, G (Tt)	U	106	9- -45	T	PS	Pumped 580 gpm, dd 20 ft after 1 hr; L.
36H1	E. H. Reddaway	90	Dr	72	6	67	--	--	S, G (Qfl)	U	--	--	--	D	Pumped 12 gpm, dd 30 ft; L.
T. 1 S., R. 2 E.															
1Q1	Troh's Airport	230	Dr	80	6	--	70	--	--	U	40	1946	J	D, Ind	Supplies water for airport.
2L1	R. W. Oliver	280	Dr	158	6	158	--	--	--	U	98	9-14-55	T, 35	D, Irr	Temp 52.
3E1	C. H. Withers	290	Dr	165	8	165	155	10	G (Tt)	U	110	1951	St, 60	Irr	Pumped 50 gpm, dd 2 ft after 2 hr; Ca; Temp 52.
3Q1	Petre Quin	305	Dr	215	6	203	160	40	G, S (Tt)	U	--	--	--	--	Pumped 14 gpm, dd 15 ft after 1 hr; L.
4A1	Morningside Hospital	275	Dr	243	8	--	--	--	--	U	210	9-16-55	T, 400	D, Irr	Pumped 400 gpm.
10E1	City of Portland	480	Dr	665	12 10	113 665	349 561	1 58	Cg (Tt) S, G (Ts)	U	350	1956	--	PS	Pumped 20 gpm, dd 110 ft after 14 hr; L.
12E1	J. Henderson	230	Dr	125	6	--	--	--	G (Qfl)	U	39.0	9-13-55	J	D	Supplies domestic heating plant; H.
12K1	B. N. Wade	235	Dr	94	8	90	60	27	do	U	60	1939	St	Irr	Pumped 40 gpm, dd 7 ft after 1 hr; L.
13R2	Mr. Landgraver	245	Dr	128	8	--	--	--	--	U	18.0	9-20-55	--	Irr	
14F1	W. Frenz	225	Dr	80	6	--	--	--	G	U	35.5	9-21-55	J	Irr	Supplies water for garden.
14J2	M. Raab	250	Dr	110	6	--	--	--	(Tt)	U	45.8	do	J	Irr	Supplies water for garden; H.
14Q1	G. Rosier	275	Dr	--	6	--	--	--	--	--	--	--	--	--	

Table 1.--Records of representative wells in the East Portland area, Oregon--Continued

Well number	Owner or occupant	Topography and altitude (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth of casing (feet)	Water-bearing zone (s)			Ground-water occurrence	Water level		Type of pump and yield (gallons per minute)	Use	Remarks
							Depth to top (feet)	Thickness (feet)	Character of material		Feet below datum	Date			
T. 1 S., R. 2 E.--Continued															
17J1	Fred Meyer, Inc.	220	Dr	110	10	--	--	--	--	--	--	--	T, 200	Ind	Supplies water for air-conditioning.
22M1	Tom Jones	325	Dr	340	8-6	60	--	--	B (QTv)	--	--	--	P	D,S	Driller reports 60 ft of clay overlying rock.
22N1	Lincoln Memorial Cemetery	375	Dr	525	--	--	436	89	G (Tt)	U	275	1953	T	Irr	Pumped 260 gpm, dd 65 ft; L.
23K1	M. H. Young	350	Dr	205	6	75	190	5	B (QTv)	U	190	1950	St, 10	D	L.
23L1	Campfire Girls	410	Dg	18.5	40	--	--	--	--	U	8.3	9-20-55	P	PS	Supplies water for camp.
24D1	E. J. Kunzler	275	Dr	160	--	--	100	60	B (QTv)	--	--	--	J	D	Driller reports 100 ft of clay and gravel overlying rock.
24P1	A. Karrick	510	Dr	380	6	--	--	--	--	--	300+	1955	P	D	Supplies water for 8 families.
24Q1	G. R. Rhode	505	Dr	297	6-4	122	252	21	Cg (Tt)	--	265	1946	10	--	L.
24R1	J. H. Hunt	445	Dr	210	6	--	--	--	--	--	168.7	8-29-55	P	D	Supplies water for 3 families; Hn 129 ppm, Cl 2 ppm, Sc 276.
27B1	U.S. Veterans' Adm.	730	Dr	967	10	769	576	13	S, G (Tt)	--	487	1950	T	Irr	Pumped 100 gpm, dd 73 ft after 3 hr; L.
28M1	A. L. Zeising	205	Dr	128	6	--	82	46	B (QTv)	--	80	9- -55	J, 20	D	Clay penetrated to 82 ft, and lava rock from 82 ft to bottom.
28P1	M. E. Thomas	375	Dr	225	6	99	--	--	(Tt)	P	109	9-19-55	St	D	H.
29P1	Portland Road & Driveway Co.	205	Dr	235	8	235	80 225	10 10	G (Tt) do	--	85	1-31-57	--	Ind	Pumped 50 gpm, dd 20 ft; L.
31N1	A. Calcagno	150	Dr	178	8	178	103	75	do	U	72	1956	--	Irr	Pumped 170 gpm, dd 155 ft after 2 hr; L.
33B1	C. E. Acres	375	Dg	41.7	--	45	--	--	--	U, P	36.2	7-19-55	J	D	Penetrated 45 ft of sandy soil overlying "solid rock"; reportedly was 60 ft deep when dug.
33J1	Top O'Scott Golf Course	290	Dr	353	10-8	240	--	--	B (QTv)	U	185.4	9-19-55	T, 320	Irr	Penetrated rock from 20 to 300 ft and gravel below 300 ft.

Table 1.--Records of representative wells in the East Portland area, Oregon--Continued

Well number	Owner or occupant	Topography and altitude (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth of casing (feet)	Water-bearing zone (s): Depth to top (feet)	Water-bearing zone (s): Thickness (feet)	Water-bearing zone (s): Character of material	Ground-water occurrence	Water level: Feet below datum	Water level: Date	Type of pump and yield (gallons per minute)	Use	Remarks
							T. 1 S., R. 2 E.--Continued								
34K1	R. F. Van Bishler	430	Dg	90	60	90	--	--	--	U	31.9	6-18-57	P	S	
34M1	Mount Calvary Cemetery Assoc.	440	Dr	760	14-8	642	385 395 447	2 2 1	G (Tt) do do	U	250 319	3-19-58 4- 6-60	T	Irr	Pumped 422 gpm, dd 15 ft after 8 hr; L.
34Q1	C. H. Garbe	325	Dr	240	6	40	230	8	B (QTv)	--	120	1948	T, 50	D	Pumped 60 gpm, dd 60 ft; L.
35C2	W. B. Kanauss	495	Dr	300	6	--	300	--	do	P	260	1921	P	S	In lava rock from 60 ft down.
35J1	G. F. Krause	760	Dr	168	6	169	102	8	do	--	--	--	P	D,S	Supplies 2 families; L.
35N1	H. L. Eisert	400	Dr	211	6	--	--	--	--	--	86.7	9-14-55	P	D	
36K1	H. A. Kannenberg	650	Dr	167	8	--	--	--	B (QTv)	P	112.0	8-29-55	J	D,S	Hn 76 ppm, Cl 3 ppm.
36N1	R. E. Wald	690	Dr	595	6	--	160 220 515 527	-- -- -- --	--	--	--	--	T	D	Supplies 4 families; inadequate in autumn.
36R1	Mrs. W. Monner	420	Dr	210	--	--	100 200	-- 10	B (QTv) G (Tt)	--	170	6- -57	J, 15	D	Supplies 2 families and millpond.
							T. 1 S., R. 3 E.								
1J2	Mountain View Nurseries, Inc.	275	Dr	450	8	325	218 315	30 10	G (Tt) do	--	215	1952	T	Irr	Pumped 180 gpm, dd 10 ft after 2 hr; L.
1P1	Oscar Funk	310	Dr	54	6	--	--	--	--	U, P	26.4	8-15-55	J	D,S	
2E1	Allen Pitts	325	Dr	90	6	90	69	21	G (Qfl)	U	70	1944	30	D	L.
3A1	C. Southworth	360	Dg	16	--	16	--	--	--	U	12.1	8-17-55	P	D	
4Q1	M. B. McGinnis	350	Dr	145	8	145	130	9	G	U	80	1951	--	--	Pumped 43 gpm, dd 25 ft; L.
4R1	Olympia Manufacturing Co.	310	Dr	220	8	220	140 210	10 10	Cg (Tt) do	U	--	--	--	--	Pumped 250 gpm, dd 80 ft. Casing perforated.
5K1	Vernie Jarl	260	Dr	98	12	98	61	32	S, G (Tt)	U	39	1946	--	--	Pumped 95 gpm, dd 50 ft after 1 hr; L.

Table 1.--Records of representative wells in the East Portland area, Oregon--Continued

Well number	Owner or occupant	Topography and altitude (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth of casing (feet)	Water-bearing zone (s)			Ground-water occurrence	Water level		Type of pump and yield (gallons per minute)	Use	Remarks
							Depth to top (feet)	Thickness (feet)	Character of material		Feet below datum	Date			
T. 1 S., R. 3 E.--Continued															
6C1	J. S. Budd	255	Dg	69	36	69	--	--	--	U	63.8	9- 8-55	P	N	
6P1	A. Goucher	255	Dr	75	6	75	69	6	G	U, P	8	1954	--	--	Pumped 55 gpm, dd 65 ft after 1 hr.
7H1	T. Van Dominik	295	Dr	225	8	225	85	140	S, G (Tt)	U	48	1952	--	--	Pumped 400 gpm, dd 85 ft after 4 hr. Casing perforated below 85 ft.
7N1	H. Andregg	305	Dr	260	12	--	--	--	(Tt)	U	139.8	9- 9-55	T, 500	Irr	
8C1	Rockwood Water Dist.	356	Dr	300	10-8	230	82	12	S, G (Tt)	U	55	1927	N	N	Pumped 125 gpm; L.
8C2	do	348	Dr	120	12	120	82 104	10 16	G (Tt) do	U	62	12- -55	N	N	Formerly used for public supply; pumped 100 gpm, dd 12 ft; H.
9P1	P. Schedeen	290	Dr	160	--	--	100	60	Cg (Tt)	U	28	--	--	D	Pumped 80 gpm, dd 22 ft after 4 hr.
10B1	Gresham Berry Growers	335	Dr	400	--	--	--	--	S, G (Tt)	U	--	--	--	Ind	Ca.
10B2	do	330	Dr	400	16-10	400	240 335 367	15 10 28	G, S (Tt) S (Ts) do	U	102	8- -46	--	Ind	Pumped 310 gpm, dd 102 ft after 1 hr; L.
11B1	E. Belger	350	Dr	75	6	--	--	--	G, S (Qfl)	U	--	--	J	D	Water contains iron; Hn 106 ppm, Cl 4 ppm, Sc 236.
12B1	M. Tamura	355	Dr	110	6	--	--	--	--	U, P	56	--	J, 5	D	
12D1	F. A. Arrington	400	Dr	140	6	--	--	--	(Tt)	P	115.5	8-15-55	P	D	Water contains iron; H.
13B1	R. Reed	485	Dg	23	36	23	--	--	(Qp)	U	11	do	N	N	
13E1	W. H. Fahner	420	Dr	177	8	--	--	--	--	U	80	1952	T, 250	Irr, S	Pumped 250 gpm, dd 60 ft after 8 hr.
14M1	Columbia Brick Co.	350	Dr	210	10	210	91	103	G, S (Tt)	U	60	8- 9-55	T	Ind	Pumped 250 gpm, dd 95 ft after 5 hr.
14R1	James Gordon	450	Dr	197	8	195	155 172	10 23	S, G (Tt) G (Tt)	P	88	1953	--	--	Pumped 300 gpm, dd 57 ft after 7 hr; L. Temp 54.

Table 1.--Records of representative wells in the East Portland area, Oregon--Continued

Well number	Owner or occupant	Topography and altitude (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth of casing (feet)	Water-bearing zone (s)			Ground-water occurrence	Water level		Type of pump and yield (gallons per minute)	Use	Remarks
							Depth to top (feet)	Thickness (feet)	Character of material		Feet below datum	Date			
T. 1 S., R. 3 E.--Continued															
15L1	Fred Howitt	550	Dr	230	6	228	203	3	G (Tt)	U	190	1941	--	--	Pumped 15 gpm, dd 10 ft after 1 hr; L.
15N1	Mr. Townsend	640	Dr	414	6-4	--	--	--	Cg (Tt)	--	--	--	J	D	Casing reportedly was bent by earthquake in 1948.
16D1	E. J. Babuska	300	Dr	115	6	--	90	2	G (Tt)	U	90	7-22-57	--	D	Pumped 20 gpm, dd 30 ft; L.
16F1	Stahley	400	Dr	94	6	--	--	--	--	P	40.3	8-25-55	J	D	Driller reports 13 ft of "bedrock" (Boring Lava) below 50 ft. Hn 70 ppm, Cl 4 ppm, Sc 186.
16L1	D. R. Weed	470	Dr	238	6	--	--	--	--	--	160	1954	P	D	Supplies 4 families.
17K1	P. A. Binford	295	Dr	321	10	--	--	--	--	--	62	1955	St, 380	Ind	
18A1	T. DeWitte	285	Dr	50	8	50	30	20	Cg, S (Tt)	U	--	--	--	D	Pumped 86 gpm, dd 46 ft after 3 hr.
18F2	E. J. Reese	290	Dr	80	--	--	--	--	--	--	41.7	8-30-55	J	D	Hn 56 ppm, Cl 2 ppm, Sc 146.
18R1	J. Vohs	510	Dr	480	6	--	--	--	(Tt)	U	350	8- -55	St	D	
19L1	Pleasant Valley Farms	330	Dr	138	6	--	--	--	--	--	43.3	9-20-55	J, 5	D,S	
19M1	K. Hamke	370	Dr	265	8	--	--	--	--	U	142.0	8-26-55	T	D, Irr	Supplies 12 houses.
19P2	W. Smith	360	Dr	83	6	65	78	5	G (Tt)	U	31	1952	J, 50	D	
20E1	F. Baker	375	Dr	300	10	300	150 280	85 20	do	U	--	--	T	Irr	Pumped 410 gpm, dd 60 ft after 4 hr; L.
20M2	Mr. Eberhart	360	Dr	75	6	--	--	--	do	--	50	1952	J	D	
20P1	H. Nordlander	370	Dr	96	6	--	--	--	G	U	--	--	St	--	Driller reports "rock" at 90 ft and well capable of large yield.
21F1	Arthur Van	580	Dr	170	6	--	--	--	G, S (Tt)	--	40	1956	--	D	Pumped 10 gpm, dd 20 ft; L.

Table 1.--Records of representative wells in the East Portland area, Oregon--Continued

Well number	Owner or occupant	Topography and altitude (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth of casing (feet)	Water-bearing zone (s)			Ground-water occurrence	Water level		Type of pump and yield (gallons per minute)	Use	Remarks
							Depth to top (feet)	Thickness (feet)	Character of material		Feet below datum	Date			
T. 1 S., R. 3 E.--Continued															
22J1	G. O. Kita	525	Dr	140	6	130	104 138	8 2	S (Tt) G, S (Tt)	U	67	1939	T	Irr	Pumped 30 gpm, dd 20 ft after 1 hr; L.
22J2	R. Shiiki	600	Dr	510	12-8	509	265 331 499	5 10 9	G (Tt) do B (Tc)	--	199.0	8-18-55	T	Irr	Pumped 600 gpm, dd 75 ft after 1 hr; L; Temp 54.
23D1	H. Smith	460	Dr	120	6	--	116	4	G, S (Tt)	U, P	63.6	do	J	D	Pumped 25 gpm, dd 8 ft after 2 hr.
23H1	I. Tombia	400	Dr	94	8	94	83	11	G (Tt)	--	8	1954	T, 60	D	Pumped 100 gpm, dd 22 ft after 2 hr; L.
23N1	N. Lekander	550	Dr	92	6	--	--	--	--	--	42.6	8-24-55	P	D	
24E1	R. D. Monnie	440	Dr	177	6	86	170	5	B (QTv)	--	50	1956	J	D	Pumped 15 gpm, dd 5 ft; L.
24F1	S. Hausmann	460	Dr	120	6	--	--	--	--	--	81.0	8-15-55	P	D,S	
24P2	L. V. Homsley	425	Dr	48	6	--	20	28	G	U	19.3	8-16-55	J, 10	D	
24R1	H. A. Lake	485	Dr	88	6	87	86	1	S	--	39.2	8-15-55	J, 11	D	Hn 129 ppm, Cl 2 ppm.
25K1	H. D. Rolph	445	Dr	72	6	--	--	--	--	--	13.1	8-16-55	C, 32	D	
25K2	C. D. Hillyard	425	Dr	31	8	--	24	7	G, S (Tt)	U	11.5	8-17-55	C	D, Irr	Hn 70 ppm, Cl 3 ppm, Sc 169; L.
25Q1	D. Miller	470	Dr	46	--	--	--	--	--	U	23.0	8-22-55	C, 7	Ind	Supplies millpond.
27Q1	F. Wilson	475	Dr	104	--	--	102	2	G (Tt)	--	--	--	J, 15	D	L.
27R1	G. Zimmerman	465	Dg	34	36	--	--	--	--	U	30.0	8-23-55	C	D	
28A1	H. F. Mearer	800	Dr	322	--	--	--	--	--	--	264.0	8-19-55	P	D	Temp 56.
28K1	M. Magnuson	700	Dr	170	6	--	--	--	--	--	--	--	T, 60	D, Irr	
29C1	H. Spiece	425	Dr	120	6	--	--	--	--	--	100.6	12-8-54	P, 10	D	
29F1	F. DeLano	550	Dr	265	--	--	200	65	B (QTv)	P	170	--	10	D	Ca, L.

Table 1.--Records of representative wells in the East Portland area, Oregon--Continued

Well number	Owner or occupant	Topography and altitude (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth of casing (feet)	Water-bearing zone (s)			Ground-water occurrence	Water level		Type of pump and yield (gallons per minute)	Use	Remarks
							Depth to top (feet)	Thickness (feet)	Character of material		Feet below datum	Date			
							T. 1 S., R. 3 E.--Continued								
29M1	Mr. Eggenberger	335	Dr	180	8	120	115	43	B (QTv)	P	55	1948	50	D	L.
30D1	L. A. Allen	400	Dr	202	6	60	202	--	B (QTv)	C	18	do	P	D	Hn 129 ppm, Cl 5 ppm, Sc 280.
30J1	J. White	355	Dr	59.5	6	--	--	--	--	--	21.8	8-26-55	J	D	
31A1	W. S. Dryden	340	Dr	98	6	--	--	--	--	--	53.0	do	P	D	
31A2	do	345	Dr	160	8	--	--	--	--	--	--	--	T, 150	Irr	
31Q1	F. L. Barkley	340	Dr	95	--	--	--	--	--	--	30	6- -57	P	D	
32E1	R. M. Williams	425	Dr	169	8	--	--	--	(Tt)	U	149.9	8-26-55	J	D	
32K1	C. Livingston	375	Dr	75	6	--	60	15	B (QTv)	C	F	1951	--	D,S	Water flows up around casing. Static level 20-30 ft above surface.
33A1	O. H. Yeager	550	Dr	130	6	--	--	--	G, C (Tt)	U	118.5	8-19-55	J	D	Pumped 15 gpm, dd 1 ft after 1 hr; H.
33K2	O. Menser	535	Dr	305	8-6	305	180 298	64 2	G (Tt) G (Ts)	--	149	1953	T	D, Irr	Pumped 275 gpm, dd 27 ft after 4 hr; L.
33R1	R. Ledbury	660	Dr	325	8 5	265 325	260	--	--	--	202	8-18-55	T, 170	D, Irr	
34D1	W. F. McDonald	580	Dg	33	48	--	--	--	--	--	15	8-19-55	J	D	
34G1	D. Tilstrom	535	Dr	--	6	--	--	--	--	--	96.8	8-22-55	J	D, Irr	Hn 67 ppm, Cl 3 ppm, Sc 172.
34N2	H. G. Siron	640	Dr	245	6	--	215	30	Cg (Tt)	U	190	1953	P	D	L.
34P1	D. Tilstrom	650	Dr	300	--	--	230	70	G	--	194	--	T	D, Irr	Pumped 156 gpm, dd 16 ft after 22 hr.
35C2	V. A. McClure	500	Dr	101	6	--	--	--	--	--	--	--	T, 15	D	Hn 76 ppm, Cl 3 ppm, Sc 198.
35G1	Mrs. A. Jones	650	Dg	34	--	--	20	--	B (QTv)	U, P	30.6	8-17-50	P	D,S	Goes dry in autumn of some years.
35M2	A. Gran	625	Dr	250	6 5	190 250	190	60	Cg (Tt)	--	180	1956	--	D	L.

Table 1.--Records of representative wells in the East Portland area, Oregon--Continued

Well number	Owner or occupant	Topography and altitude (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth of casing (feet)	Water-bearing zone (s)			Ground-water occurrence	Water level		Type of pump and yield (gallons per minute)	Use	Remarks
							Depth to top (feet)	Thickness (feet)	Character of material		Feet below datum	Date			
						T. 1 S., R. 3 E.--Continued									
36C1	A. Davis	515	Dr	77	6	--	70	10	B (QTv)	P	6.1	8-22-55	N	N	Water contains iron.
36H1	R. E. Paynter	571	Dg	51.3	48	--	--	--	--	U	44.1	do	J	D	
36K1	C. W. Anthony	575	Dr	95	6	--	50	45	G (Tt)	--	50	1953	J, 12	D, Irr	Driller reports 50 ft of clay overlying gravel aquifer.
						T. 1 S., R. 4 E.									
5E1	P. Carlson	320	Dr	145	8	145	115	30	Cg (Tt)	U, P	60	--	--	D	Pumped 30 gpm, dd 80 ft after 20 hr.
6G1	J. Roth	235	Dr	163	6	--	--	--	--	U, P	138.8	8-12-55	P	D,S	
6K1	W. Wilson	288	Dg	24.4	36	25	--	--	--	U, P	16.2	do	P	D	
7C1	W. D. Fritz	360	Dr	82	6	--	--	--	--	--	66.5	8-11-55	P	D,S	
7E1	A. Strebin	360	Dr	544	12	245	171	--	G, S (Tt)	--	170	1953	N	N	Pumped 120 gpm, dd 70 ft after 72 hr; yields much sand; L; Temp 54.
7G1	S. G. Lehr	350	Dr	52	6	--	--	--	--	--	28.7	8-11-55	J	D	
8N1	E. F. LaFriener	560	Dr	177.5	6	--	169	--	G	C	147.6	do	P	D	
8Q1	Arlene Katzberg	605	Dg	41.5	--	--	--	--	--	U	25.5	do	P	D	
9M2	H. G. McCreary	600	Dg	27.5	--	--	--	--	--	U	2.6	do	P	S	
9N1	Irvin Ickler	610	Dr	181	8	--	--	--	--	--	118.3	do	J	D	Hn 58 ppm, Cl 3 ppm, Sc 190; supplies 3 homes.
10D1	Young Men's Christian Assoc.	80	Dr	310	--	310	310	--	B (Tc)	C	F	8-10-55	--	PS	Flows 40 gpm; has shut-in pressure of 12 lbs; Ca; Temp 76.
10N1	A. Thompson	375	Dg	20.8	11	--	--	--	(Qt)	P	14.7	do	C	D	
15F1	A. J. Ryan	635	Dg	42	48	42	--	--	--	P	34.4	do	J	D	
15N1	N. W. Jackson	650	Dr	92	6	--	80	5	(Qp)	P	30	--	J	D,S	L.

Table 1.--Records of representative wells in the East Portland area, Oregon--Continued

Well number	Owner or occupant	Topography and altitude (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth of casing (feet)	Water-bearing zone (s)			Ground-water occurrence	Water level		Type of pump and yield (gallons per minute)	Use	Remarks
							Depth to top (feet)	Thickness (feet)	Character of material		Feet below datum	Date			
T. 1 S., R. 4 E.--Continued															
16H1	A. W. Sherwood	650	Dr	480	8	383	380	30	Ss (Tt)	U	375	6-30-56	T	Irr	Pumped 150 gpm, dd 15 ft after 6 hr; L.
16M1	A. C. Carrell	610	Dg	39.8	48	40	--	--	S	P	4.5	8-10-55	N	--	Temp 58.
17F2	J. E. Nelson	600	Dr	198	6	180	--	--	(Tt)	P	157.1	do	P	Irr	Supplies small garden.
17G1	A. Bruhn	570	Dr	403	8	215	--	--	S, G (Tt)	P	196	1954	T, 300	D, Irr	Supplies water to irrigate 40 acres.
17L1	Martin Taylor	580	Dr	300	8	175	--	--	Cg (Tt)	P	138	4- -51	T, 50	Irr	L.
18H1	C. Satterstrom	525	Dg	32	--	--	--	--	C (Qp)	P	6.5	8- 9-55	B	D	Temp 52.
18M1	H. W. Park	490	Dr	197	10	197	135 189	25 8	G (Tt) do	--	120	1951	T	Irr	Pumped 250 gpm, dd 50 ft after 1 hr; L.
19E2	M. Milne	480	Dg	48.5	36	--	50	15	S	P	35.6	8-16-55	J	D	Temp 54.
19M1	Mrs. Howard Lake	495	Dg	34.2	48	--	--	--	--	P	29.4	8- 9-55	J	D,S	Hn 16 ppm, Cl 7 ppm, Sc 630.
20K1	A. Heiman	555	Dg	33.2	36	--	--	--	--	P	22.2	8- 8-55	N	N	
20M2	L. R. Lauderback	550	Dr	49	8	48.8	--	--	--	P	44.2	8- 9-55	N	N	Newly drilled when visited.
20P1	J. Hillyard	555	Dr	37	6	37	--	--	B (QTv)	--	--	--	25	D	Twenty feet of clay overlies basalt.
21B1	Mr. Sester	600	Dg	54	--	54	48	6	Cg (Tt)	C	2.9	11-24-54	N	N	Forty-eight feet of clay overlies gravel; yields 50 gallons per day.
22F1	E. L. Meyer	660	Dg	19.2	36	--	--	--	(Qp)	P	10.5	8- 8-55	B	S	Temp 47.
23P1	Ida Nordene	500	Dg	19.8	48	20	--	--	(Qt)	P	14.1	8- 5-55	B	D	Temp 50.
25P1	A. I. Geetz	585	Dg	10	108	10	--	--	Cg (Qt)	P	4.9	4- 4-55	C, 150	Irr	Hn 14 ppm, Cl 3 ppm, Sc 52.
26E2	Cotrell School Dist.	725	Dr	135	10-8	--	100	35	G	P	80	1951	20	PS	Pumped 20 gpm, dd 20 ft after 2 hr.
26M1	W. Waugh	730	Dg	52	72	--	--	--	G (Qp)	U, P	31.2	8- 4-55	J	D,S	

Table 1.--Records of representative wells in the East Portland area, Oregon--Continued

Well number	Owner or occupant	Topography and altitude (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth of casing (feet)	Water-bearing zone (s)			Ground-water occurrence	Water level		Type of pump and yield (gallons per minute)	Use	Remarks
							Depth to top (feet)	Thickness (feet)	Character of material		Feet below datum	Date			
T. 1 S., R. 4 E.--Continued															
27G1	A. Klinski	690	Dg	40	42	--	--	--	(Qp)	P	32	8-4-55	P, 9	D,S	
27Q1	W. Booth	700	Dg	43.5	48	--	--	--	do	P	27.7	8-5-55	J	D	
28A1	Y. K. Whang	640	Dr	120	8	--	--	--	--	P	35.5	do	T	D	
28Q1	S. Paulson	625	Dr	300	12-10	280	190	70	Cg (Tt)	--	190	1952	T	Irr	Pumped 160 gpm, dd 55 ft after 4 hr.
29D2	W. H. Gunderson	530	Dg	24.9	--	--	--	--	(Qp)	P	18.7	8-8-55	C	S	
30D1	C. E. Wilson	480	Dr	102	6	94	95	7	Cg, S (Tt)	--	--	--	25	D	Twenty-three feet of clay overlies cemented gravel and sand.
30G1	C. J. Underwood	645	Dr	96	6	--	--	--	--	P	68.4	do	T	D	
30M2	T. Okino	590	Dr	444	8	444	410 430	11 5	G, S (Tt) do	--	138	5-10-53	T	Irr	Pumped 400 gpm, dd 57 ft after 18 hr; L; Temp 54.
31A1	C. A. Rayborn	575	Dr	140	8	140	90	5	S, G (Tt)	--	50	--	--	D, Irr	Pumped 60 gpm, dd 50 ft after 4 hr; L.
31G1	Max Buttgereit	575	Dr	102	6	--	50	40	Cg (Tt)	--	44.8	8-8-55	J, 10	D	Fifty feet of clay overlies cemented gravel.
31G2	do	575	Dg	52	36	--	50	--	do	U, P	42.0	8-9-55	P	N	
32Q1	Dwight Berg	580	Dr	225	8	177	70	105	do	--	45	--	--	D, Irr	Pumped 60 gpm, dd 105 ft after 8 hr; L.
35P2	G. Smith	775	Dg	36	48	--	--	--	G (Qp)	P	23.2	8-4-55	J	D	
36E1	W. C. Hoar	760	Dg	44	48	44	--	--	do	P, U	35.4	do	P	D	
T. 2 S., R. 1 E.															
1L1	D. M. Steeves	190	Dr	397	6	23	264	--	B (Tc)	U	150	11- -56	--	D	Bailed 25 gpm, dd 25 ft; L.
12D1	H. A. Roberts	180	Dr	154	8	89½	93	61	do	U	--	--	P, 50	D	L.
13J1	Peter Pan Ice Cream Co.	75	Dr	88	--	--	48	40	do	--	--	--	--	Ind	L.

Table 1.--Records of representative wells in the East Portland area, Oregon--Continued

Well number	Owner or occupant	Topography and altitude (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth of casing (feet)	Water-bearing zone(s)			Ground-water occurrence	Water level		Type of pump and yield (gallons per minute)	Use	Remarks
							Depth to top (feet)	Thickness (feet)	Character of material		Feet below datum	Date			
T. 2 S., R. 2 E.															
1L1	J. R. Ashley	340	Dr	199.5	6	--	--	--	--	--	150.7	6-18-57	P	D,S	Water reported to contain iron.
1P1	John Lorenz	315	Dr	135	6	--	--	--	--	--	100±	1957	P	D	
2A2	J. R. LeVoux	390	Dr	215	6	--	--	--	--	--	128.9	do	St	D	
2F1	W. W. Wheeler	380	Dg	45.5	60	--	--	--	--	U, P	31.9	do	J	D	Yield is small.
2M1	Mr. McKinnon	360	Dr	285	6	--	--	--	--	--	124.1	8-14-55	J	D,S	
3A1	M. N. Durham	290	Dr	161	6	60	125	36	B (QTv)	--	112.1	6-12-57	J	S	Bailed 12 gpm, dd 22 ft; L.
3K2	B. A. Alby	320	Dr	217	6	--	216	1	G (Tt)	--	200	1922	P	D	Supplies 2 homes; L.
3R1	J. J. Summers	295	Dr	168	8	--	--	--	--	--	37.9	9-16-55	St	D,S, Irr	Well was reportedly drilled in soil, clay, and gravel.
4H1	John Jeleniewski	245	Dr	101	6	74	80	21	B (QTv)	--	35	1-21-58	J	D	Bailed 10 gpm, dd 40 ft after 1½ hr; L.
5M1	Union High School Dist. 5	95	Dr	203	8-6	203	147 187	33 1	Cg (Tt) G, S (Tt)	U	4	11-2-57	T	Irr	Pumped 135 gpm for 30 hr, dd 58 ft; L; Temp 52.
7D1	I. T. Stewart	405	Dr	490	--	--	--	--	B (Tc)	--	--	--	--	D	Clay overlies basalt to a depth of 36 ft.
9B1	A. L. Alexander	110	Dr	80	6	80	50	22	G, S (Tt)	U	8	1929	P, 10	S	L.
10H2	F. R. Brown	315	Dr	80	6	80	70	10	G	U	69	2-19-58	J	Irr	Bailed 40 gpm.
11C1	W. A. Piper	280	Dg	47	36	--	--	--	--	U, P	41.0	9-15-55	B	D	
11C2	E. E. Oehlschlaeger	320	Dg,Dr	50,99	6	--	75	24	B (QTv)	U, P	51	1950	J, 20	D,S	
11K1	F. T. Williams	140	Dr	185	6	165	133	10	S (Ts)	C	7	5- 5-27	P, 50	Irr	Pumped 50 gpm, dd 8 ft; L.
12A1	E. Gerhardus	355	Dr	193	6	53	175	4	(Tt)	U	155	1956	--	D	Bailed 6 gpm, dd 24 ft; L.
12E1	Fred Wenzel	275	Dr	98	8	--	--	--	--	U, P	87.5	6-18-57	J	D	Pump "breaks suction" in late summer.
12F1	W. L. Buel	175	Dr	173	6	171	171	2	G	U	65	1957	J	D	

Table 1.--Records of representative wells in the East Portland area, Oregon--Continued

Well number	Owner or occupant	Topography and altitude (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth of casing (feet)	Water-bearing zone (s)			Ground-water occurrence	Water level		Type of pump and yield (gallons per minute)	Use	Remarks
							Depth to top (feet)	Thickness (feet)	Character of material		Feet below datum	Date			
T. 2 S., R. 2 E.--Continued															
14E1	Joe Heeter	110	Dr	111	6	105	106	5	G, S (Tt)	U	54	10-1-57	--	D	Bailed 30 gpm, dd 28 ft after 1 hr; L; Temp 54.
16B1	F. J. Mooney	95	Dr	51	8	34	15	--	G (Tt)	U	3½	1-22-58	N	N	Bailed 10 gpm, dd 32 ft; L.
19E1	N. F. Bixby	75	Dr	124	6	124	96	28	B (Tc)	U	44	10-29-57	--	D	Pumped 26 gpm, dd 60 ft after 4 hr; L.
19E2	H. L. Ott	75	Dr	73	6	73	62	9	G (Qt)	U	45	8-29-57	St	D	Pumped 85 gpm, dd 19 ft after 4 hr; L; Temp 52.
19G1	Howard Olivier	80	Dr	185	6	65	110	70	B (Tc)	U	160	7- -56	--	D, PS	Supplies water for auto court; pumped 20 gpm, dd 80 ft.
19Q1	Oregon City Sand & Gravel Co.	45	Dr	67	12	--	30	37	G (Qal)	U	30	1951	T, 1,500	Ind	Supplies water for gravel-washing plant. Hn 75 ppm, Cl 5 ppm.
20F1	City of Gladstone	65	Dr	692	12	169	675	10	B (Tc)	C	42.1	1-27-51	T	N	Large yield at 675-ft depth from basalt; water saline and was cemented off. Pumped 200 gpm from upper fresh-water part of basalt; Ca, L.
20K1	do	50	Dr	250	12	--	--	--	do	C	--	--	--	N	Yielded 250 gpm, water saline. Drilled in basalt entire depth; Ca.
T. 2 S., R. 3 E.															
2D1	E. E. Menser	650	Dr	325	6	235	--	--	S, G (Tt)	U	197.8	8-5-63	J, 3	D	
2G1	Vernon DeYoung	650	Dr	400	8	335	192	3	S (Tt)	U	185	8-18-58	T, 60	Irr	L; Temp 53.
2H1	O. W. Beckwith	620	Dr	105	6	90	95	10	Cg (Tt)	P	20	12-26-57	--	D	Bailed 16 gpm, dd 60 ft after 1 hr; L; Temp 52.
3C1	L. W. Hoffmeister	665	Dr	260	6	--	248	12	Ss (Tt)	--	230	1955	P, 10	D	L.
3J1	W. Schubert	580	Dr	180	6	--	--	--	--	--	150	1951	T, 60	D, Irr	

Table 1.--Records of representative wells in the East Portland area, Oregon--Continued

Well number	Owner or occupant	Topography and altitude (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth of casing (feet)	Water-bearing zone (s)			Ground-water occurrence	Water level		Type of pump and yield (gallons per minute)	Use	Remarks
							Depth to top (feet)	Thickness (feet)	Character of material		Feet below datum	Date			
T. 2 S., R. 3 E.--Continued															
3N1	M. R. White	625	Dr	90	6	--	60	--	Cg	P	65	1955	J	D	Driller reports 60 ft of clay overlying cemented gravel.
4H1	Al Heacock	740	Dr	294	8	--	--	--	--	P	240.5	8-22-55	St, 8	D	
5N1	Mr. Josefson	550	Dr	60	6	--	--	--	B (QTv)	P	--	--	J	D	Well reportedly entered rock at 40 ft; Ca.
5R1	Roy Bachelor	545	Dr	238	8	238	195	43	G (Tt)	P	162	1949	150	--	Pumped 115 gpm, dd 28 ft after 2 hr.
6F1	Lewis Isaacs	335	Dr	228	8	--	210	18	do	--	--	--	T	D, Irr	Pumped 105 gpm, dd 116 ft; L.
6N1	M. Lohman	340	Dg	33	--	--	--	--	do	--	9.5	6-19-57	J	D	
6Q1	J. W. Aylett	430	Dr	105	6	105	90	15	B (QTv)	P	88	7- -56	St, 35	D, Irr	Bailed 20 gpm, dd 5 ft after 1 hr; L; Temp 52.
7F1	J. B. Snyder	175	Dr	121	6	67	100	21	Cg (Tt)	P	86	1956	--	--	Pumped 5 gpm, dd 28 ft; L.
7M1	Howard Eckert	345	Dr	174	6	164	155	16	Cg, S (Tt)	P	85	1957	--	D	Pumped 16 gpm, dd 60 ft; L.
8P1	E. G. Rogge	385	Dr	116	6	--	--	--	(Tt)	P	79.4	6-21-57	J	D	Pumped 21 gpm, "no" dd after 24 hr.
9E1	P. E. Jones	480	Dr	97	6	--	--	--	--	P	61.7	6-20-57	St	D	
10C1	M. Fujimoto	640	Dr	300	10	--	225	--	S (Tt)	P	166.7	8-23-55	T, 300	Irr	Pumped 300 gpm, dd 125 ft; H.
10P1	W. E. Sandstrom	660	Dr	246	6	--	--	--	G (Tt)	--	--	--	P	D,S	
10Q1	C. H. McBride	655	Dr	--	6	--	--	--	G	P	35.8	6-21-57	J	D	
11D1	Carl France	535	Dr	380	6	--	70	10±	G, S (Tt)	P	65	6-26-57	J	D	L.
11E1	Gerald Meyer	600	Dr	179	8	179	162	17	do	--	152	1940	T, 60	S, Irr	Pumped 40 gpm, dd 9 ft; L.
11G1	C. T. Cox	570	Dr	230	6	--	--	--	--	--	191.8	6-26-57	St, 13	D	
12M1	G. Dahlgliesh	555	Dg	27	48	--	--	--	--	U, P	18.9	do	J	D	Water level declines in late summer.

Table 1.--Records of representative wells in the East Portland area, Oregon--Continued

Well number	Owner or occupant	Topography and altitude (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth of casing (feet)	Water-bearing zone (s)			Ground-water occurrence	Water level		Type of pump and yield (gallons per minute)	Use	Remarks
							Depth to top (feet)	Thickness (feet)	Character of material		Feet below datum	Date			
T. 2 S., R. 3 E.--Continued															
13L1	G. Eichner	425	Dr	75	6	--	35	40	B?	P, C	0	6-26-57	J	D, Irr	Well flows after being pumped.
14L1	Salvation Army	300	Dr	600	8	571	575	25	B (Tc)	C	F	1951	--	PS	Pumped 30 gpm, dd 200 ft after 1 hr; L.
15D1	Abraham Bialostosky	755	Dr	400	12-6	370	370	30	B (QTv?)	P	205	6-20-57	St, 25	D	L.
16C1	A. Deggendorfer	635	Dr	320	6	--	300+	--	--	P	312	6- -57	P, 5	D	
16R1	P. L. Lenz	235	Dr	282	6	241	160	60	S (Ts)	P, C	40	7-29-57	St	D	Pumped 35 gpm, dd 100 ft after pumping 1 hr; L; Temp 57.
17P2	L. R. Hughes	110	Dr	32	6	--	--	--	(Qal)	U	--	--	J	D	
20C1	Mr. Brodie	115	Dr	53	6	--	--	--	do	U	14.8	6-21-57	J	D	Water contains dissolved iron.
21E1	V. E. Beal	150	Dr	600	6	380	465	--	G	C	+21	do	3	D	
23B1	Barton Baptist Church	270	Dr	135	6	120	129	1	S (Ts)	P	70	3- -56	--	D	Pumped 10 gpm, dd 45 ft; L.
23B2	Victor Foreman	260	Dr	100	8	36	--	--	(Ts)	U	34	1949	J, 14	D	L.
23G1	O. Wright	260	Dr	162	--	--	--	--	do	U	18.6	6-26-57	J	D	Supplies 2 families.
24E1	Erl Odell	270	Dr	37	6	34	30	4	G (Qt)	U, P	7	1951	S, 11	D	L.
T. 2 S., R. 4 E.															
3N1	M. A. Carmony	690	Dr	52	6	52	--	--	G (Qp)	P, U	--	--	20	D	Driller reports 25 ft of clay overlying boulders.
4B1	Ernest Dutton	645	Dr	94	6	--	--	--	Cg (Tt)	P, U	--	--	15	D	Driller reports 30 ft of clay overlying cemented gravel.
4G2	C. E. Hamblet	655	Dr	137	8	--	60 137	5 --	do do	P, U	--	--	--	D	Driller reports 45 ft of clay overlying cemented gravel.
4R1	M. K. Smith	700	Dr	400	8	--	--	--	do	U	93.5	3-13-58	St	Irr	Irrigates 30 acres.

Table 1.--Records of representative wells in the East Portland area, Oregon--Continued

Well number	Owner or occupant	Topography and altitude (feet)	Type of well	Depth of well (feet)	Diameter of well (inches)	Depth of casing (feet)	Water-bearing zone (s)			Ground-water occurrence	Water level		Type of pump and yield (gallons per minute)	Use	Remarks
							Depth to top (feet)	Thickness (feet)	Character of material		Feet below datum	Date			
T. 2. S., R. 4 E.--Continued															
5P1	L. H. Morrie	580	Dr	120	6	--	110	10	G (Tt)	U	--	--	15	D	L.
8A1	E. J. Campbell	620	Dr	119	6	117	90	22	Cg (Tt)	U	30	1940	18	D,S	L.
8C1	G. Schaeffer	610	Dr	450	--	--	--	--	B (Tc)	C	160	1952	T, 500	Irr	Irrigates 40 acres.
9B1	M. K. Smith	670	Dr	260	--	--	260	--	do	--	--	--	--	D	Driller reports 260 ft of cemented sand and gravel overlying Columbia River(?) Basalt.
9C1	F. G. Logus	655	Dr	137	6	--	55 105	15 25	Cg (Tt)	U	--	--	15	D	L.
10M1	H. Huck	690	Dr	165	6	--	160	5	S (Tt)	U	--	--	30	D	
14B1	Emil Beck	875	Dr	140	6	--	90	50	Cg (Tt)	P, U	80	1957	St, 15	D	Driller reports 90 ft of clay overlying cemented gravel.
18R1	Schedeen Bros.	665	Dr	904	8-6	743	750	10±	B (Tc)	U	550	1947	--	D	Pumped 7 gpm, "no" dd; L.
21J1	Hudson-Duncan Co.	790	Dr	1,330	16-6	476	165 885	2 445	G (Tt) B (Tc)	U	585	6-7-52	T, 100	Irr	L.
28F2	Virgil Nelson	650	Dr	110	6	110	40	70	G, S (Tt)	U	55	1949	16	D	L.
30G1	Elza Anderson	340	Dr	46	6	45	25	11	G (Qt)	P, U	16	1950	35	D,S	L.

Table 2.--Drillers' logs of representative wells in the East Portland area, Oregon

Abbreviations: dd, drawdown in feet of the water level during pumping; ft, feet; gpm, gallons per minute; in., inch; swl, static water level, in feet below land surface.

1N/1-4K1. U.S. Government (Vanport well 2). Drilled by R. J. Strasser Drilling Co., 1942

Materials	Thickness (feet)	Depth (feet)
Younger alluvium:		
Clay	5	5
Silt and sand	90	95
Gravel and clay	20	115
Sand and gravel, water-bearing	22	137
Unreported	11	148
Casing: 12-in. to 148 ft.		

1N/1-7N1. McCormick & Baxter Co. Drilled by R. J. Strasser Drilling Co., 1945

Artificial fill:		
"Dredged sand"	12	12
Younger alluvium:		
Silt, clay, and very fine sand	48	60
Sand, coarse, water-bearing	24	84
Gravel and clay	21	105
Troutdale Formation:		
Gravel, cemented	13	118
Gravel, water-bearing	5	123
Gravel, cemented	7	130
Casing: 12-in. to 130 ft; perforated from 65 to 80, 94 to 104, and 116 to 124 ft; gravel packed from 60 to 85 ft.		

1N/1-8B1. Western States Rendering Co. Drilled by Steinman Bros. Drilling Co., 1946

Fluviolacustrine deposits:		
Hardpan	6	6
Clay, sandy	11	17
Sand, brown	31	48
Sand and gravel	12	60
Gravel, coarse	5	65
Sand and coarse gravel	31	96
Casing: 10-in. to 96 ft; perforated from 55 to 96 ft.		

1N/1-9G1. City of Portland. Drilled by R. J. Strasser Drilling Co., 1946

Fluviolacustrine deposits:		
Soil	2	2
Clay, yellow	5	7
Clay, sandy, gray	30	37

Table 2.--Drillers' logs of representative wells--Continued

Materials	Thickness (feet)	Depth (feet)
Gravel, water-bearing	17	54
Gravel, cemented	6	60
Casing to 54 ft.		

1N/1-12G1. D. Green. Drilled by Steinman Bros. Drilling Co., 1947

Younger alluvium:		
Soil	20	20
Sand, silty, water-bearing	103	123
Sand, coarse	8	131
Sand, coarse, and gravel	6	137
Casing: 6-in. to 137 ft.		

1N/1-16P1. City of Portland. Drilled by R. J. Strasser Drilling Co., 1946

Fluviolacustrine deposits:		
Soil, sandy	47	47
Sand, coarse	28	75
Gravel	47	122
Sand, coarse	10	132
Gravel	43	175

1N/1-21L1. Continental Grain Co. Drilled by R. J. Strasser Drilling Co., 1957

Artificial fill:		
Soil	5	5
Concrete footing	10	15
Younger alluvium:		
Boulders, loose	5	20
Silt, blue	58	78
"Rock," brown, soft	2	80
Clay, blue	47	127
Troutdale Formation:		
Gravel, cemented	9	136
Sand and gravel, loose, water-bearing	32	168
Gravel, loose, water-bearing	15	183
Gravel, sandy, cemented	6	189
Casing: 16-in. to 189 ft; perforated from 135 to 147, 150 to 167, and 169 to 183 ft.		

1N/1-34J1. Northwestern Ice & Cold Storage Co. Drilled by R. J. Strasser Drilling Co., 1927

Fluviolacustrine deposits:		
Clay, sandy	7	7
Gravel, loosely cemented	45	52
Gravel, bouldery, cemented	60	112

Table 2.--Drillers' logs of representative wells--Continued

Materials	Thickness (feet)	Depth (feet)
Sand, water-bearing	22	134
Gravel and sand, water-bearing	11	145
Casing: 8-in. to 125 ft; 6-in. screen from 125 to 145 ft.		
1N/1-35C1. Lloyd Corp., Ltd. Drilled by R. J. Strasser Drilling Co., 1957		
Fluviolacustrine deposits:		
Soil	4	4
Silt, sandy	45	49
Sand and gravel, coarse	18	67
Sand, silty	22	89
Sand, silty, some gravel	27	116
Troutdale Formation:		
Gravel and sand, bouldery	17	133
Gravel and sand, loose	11	144
Gravel and sand, some boulders	33	177
Gravel and sand, loose, water-bearing	27	204
Gravel and sand, some boulders	11	215
Gravel, sand, and clay, with boulders	23	238
Sand and gravel, water-bearing	12	250
Gravel, cemented	22	272
Casing: 16-in. to 272 ft; perforated from 189 to 204 and 240 to 250 ft.		
1N/1-35N1. Widmer Plumbing & Heating Co. Drilled by R. J. Strasser Drilling Co., 1948		
Fluviolacustrine deposits:		
Clay	10	10
Sand, brown	7	17
Gravel, cemented	50	67
Sand and gravel, loose	13	80
Casing: 6-in. to 80 ft; perforated from 69 to 80 ft.		
1N/1-36H1. Ladd Estate. Drilled about 1885		
Fluviolacustrine deposits:		
Sand and clay	100	100
Sand, clay, and gravel	20	120
Troutdale(?) Formation:		
Sand with boulders	20	140
Gravel with boulders and "veins" of white sand	40	180
Gravel, sandy	20	200
"Boulders and grit"	20	220
Gravel with "veins" of white sand	60	280
Troutdale Formation:		
Conglomerate, sandy	50	330
Sand, fine, and gravel	30	360
Clay, sand, and gravel in alternating layers	45	405

Table 2.--Drillers' logs of representative wells--Continued

Materials	Thickness (feet)	Depth (feet)
Sandy River Mudstone:		
"Marl," olive-colored, and shale with some basaltic grit and sand. Some fossilized plant remains	315	720
Sand, fine, and gravel	10	730
"Marl" and clay, some layers of fine, soft sandstone ...	120	850
Shale and "marl," some layers of sand; much fossilized plant debris	150	1,000
Sandstone, white and gray, partly micaceous	80	1,080
Conglomerate, fine, some shale and "marl"; some fossil plants	120	1,200
Gravel and coarse grit	50	1,250
"Marl" and clay; some gravel and plant fossils	50	1,300
Columbia River Basalt:		
"Granite" (basalt)	400	1,700

1N/2-5Q1. City of Portland. Drilled by Steinman Bros. Drilling Co., 1949

Younger alluvium:		
Sand and gravel	13	13
Silt, sandy, blue	19	32
Gravel	5	37
Silt, blue	70	107
Gravel	18	125
Casing: 6-in. to 125 ft.		

1N/2-16P1. Cosmo Spada. Drilled by Steinman Bros. Drilling Co., 1940

Fluviolacustrine deposits:		
Silt and "fine packed gravel"	60	60
Sand, consolidated	50	110
Sand, clean	8	118
Gravel, fine, water-bearing	7	125
Casing: 8-in. to 125 ft.		

1N/2-17Q1. Warren Northwest, Inc. Drilled by A. M. Jannsen Drilling Co., 1957

Fluviolacustrine deposits:		
Gravel, with boulders	35	35
Gravel, water-bearing at 52 ft	18	53
Sand and gravel	8	61
Sand	2	63
Sand and gravel	3	66
Gravel and clay	11	86
Sand and gravel, water-bearing	12	98
Casing: 12-in. to 98 ft; perforated from 53 to 60 and 75 to 98 ft.		

Table 2.--Drillers' logs of representative wells--Continued

1N/2-22Q1. Parkrose Water Dist. Drilled by Haakon I. Bottner Drilling Co., 1952

Materials	Thickness (feet)	Depth (feet)
Fluviolacustrine deposits:		
Soil(?)	51	51
Troutdale Formation:		
Gravel, cemented	43	94
Gravel, loose	44	138
Sand	40	178
Sand and gravel	15	193
Gravel	12	205
Sand	10	215
Gravel, water-bearing	16	231
Unreported	7	238
Gravel and clay	23	261
Unreported	4	265
Casing: 12-in. to 265 ft; perforated from 217 to 220, 221 to 241, and 243 to 247 ft.		

1N/2-24P1. J. W. Wolf. Drilled by A. M. Jannsen Drilling Co., 1949

Fluviolacustrine deposits:		
Soil, sandy	10	10
"Rock" (ice-transported erratic?)	8	18
Clay	9	27
Troutdale Formation:		
Gravel, cemented	28	55
Sand and fine gravel	26	81
Gravel	5	86
Casing: 6-in. to 86 ft.		

1N/2-25M1. Richland Water Dist. Drilled by R. J. Strasser Drilling Co., 1947

Fluviolacustrine deposits:		
Soil	3	3
Gravel and clay	9	12
Gravel, loose	7	19
Gravel and clay	9	28
Gravel, loose	15	43
Gravel, cemented, and boulders	15	58
Gravel, loose	16	74
Troutdale Formation:		
Gravel, cemented	17	91
Gravel and clay	10	101
Clay, sandy, with small gravel	20	121
Gravel and clay	6	127
Conglomerate	14	141
Sand, yellow, some gravel	12	153
Clay, yellow	7	160
Sand and gravel, water-bearing	18	178

Table 2.--Drillers' logs of representative wells--Continued

Materials	Thickness (feet)	Depth (feet)
Troutdale Formation:--Continued		
Sand, yellow	1	179
Sand and gravel, water-bearing	7	186
Gravel, cemented	7	193
Silt, yellow	17	210
Conglomerate	6	216
Gravel, cemented	28	244
Gravel, sand, and clay	34	278
Clay, blue	4	282
Sand, gravel, and clay	33	315
Gravel, large, cemented	11	326
Gravel, small, cemented	11	337
Clay, blue, some gravel	6	343
Gravel, cemented	28	371
Sand and gravel, water-bearing	11	382
Gravel, cemented	18	400
Casing: 12-in. to 272 ft; 10-in. from 271 to 388 ft; perforated from 252 to 263, 300 to 315, and 369 to 383 ft.		

1N/2-26R1. Richland Water Dist. Drilled by Haakon I. Bottner Drilling Co., 1956

Fluviolacustrine deposits:		
Clay, yellow	6	6
Gravel and boulders	26	32
Gravel, loose	34	66
Troutdale Formation:		
Gravel, cemented	19	85
Gravel and yellow clay	15	100
Sand, water-bearing (approximately 26 gpm)	30	130
Gravel and yellow clay	15	145
Gravel, cemented	55	200
Gravel and sand, water-bearing	11	211
Gravel, cemented, water-bearing	92	303
Sand, coarse, and gravel	9	312
Gravel, cemented	98	410
Sandy River Mudstone:		
Clay, gray	42	452
Clay, blue	38	490
Casing: 12-in. to 335 ft; perforated from 145 to 200, 240 to 280, 300 to 310, and 312 to 330 ft.		

1N/2-28E1. Rose City Sand & Gravel Co. Drilled by Steinman Bros. Drilling Co., 1936

Fluviolacustrine deposits:		
Clay and gravel	16	16
Sand and gravel	47	63
Sand, soft	8	71

Table 2.--Drillers' logs of representative wells--Continued

Materials	Thickness (feet)	Depth (feet)
Fluviolacustrine deposits:--Continued		
Gravel, cemented	26	97
Gravel and sand, loose	3	100
Gravel and boulders	8	108
Troutdale Formation:		
Gravel, loose, water-bearing	6	114
Clay, yellow	17	131
Clay and gravel	35	166
Gravel, cemented	27	193
Sand and gravel	7	200
Casing: 8-in. to 200 ft; perforated from 165 to 177 and 181 to 195 ft.		
1N/2-30N1. R. W. Mangels. Drilled by R. J. Strasser Drilling Co., 1945		
Fluviolacustrine deposits:		
Silt, sandy	64	64
Clay, blue	9	73
Silt, sandy	6	79
Troutdale Formation:		
Gravel, cemented	66	145
Sand and gravel, water-bearing	12	157
Gravel and silt	6	163
Casing: 8-in. to 163(?) ft; perforated from 151 to 157 ft.		
1N/2-35E1. R. R. Hamilton. Drilled by Steinman Bros. Drilling Co., 1946		
Fluviolacustrine deposits and Troutdale Formation, undifferentiated:		
Soil, sand, and gravel	147	147
Sand, silty, some gravel	17	164
Sand and gravel, loose, water-bearing	12	176
Gravel, sand, and clay	19	195
Clay, blue	13	208
Clay, sandy, yellow	17	225
Gravel	34	259
Clay, blue	4	263
Gravel	5	268
Clay, blue	8	276
Gravel and clay	13	289
Gravel, clay, and boulders	23	312
Gravel, cemented	54	366
Casing: 6-in. to 365 ft.		
1N/3-23B1. Bonneville Power Admin. Drilled by R. J. Strasser Drilling Co.,1946		
Younger alluvium:		
Sand	10	10
Clay	15	25

Table 2.--Drillers' logs of representative wells--Continued

Materials	Thickness (feet)	Depth (feet)
Younger alluvium:--Continued		
Sand	143	168
Clay	6	174
Troutdale Formation:		
Gravel, cemented	1	175
Gravel and sand	8	183
Casing: 10-in. to 183 ft.		

1N/3-23G4. Reynolds Metals Co. Drilled by R. J. Strasser Drilling Co., 1949

Old well, no record	190	190
Troutdale Formation:		
Silt, sandy, blue	16	206
Sand, hard-packed	21	227
Silt, sandy	11	238
Sand, coarse, and gravel	6	244
Clay, blue	8	252
Sand, hard-packed, some gravel	85	337
Silt, sand and gravel layers	35	372
Clay, sandy	5	377
Sand, hard-packed, and gravel	8	385
Clay and silt, sandy	16	401
Sand, hard-packed	15	416
Clay	5	421
Sand, hard-packed	11	432
Clay, sandy, with some gravel	29	461
Gravel, cemented	11	472
Sand and gravel, water-bearing	10	482
Gravel, cemented	31	513
Sand, clay, and small gravel	7	520
Sand and gravel, water-bearing	12	532
Silt, blue	4	536
Sand and gravel, water-bearing	23	559
Silt and clay, some gravel	28	587
Shale, hard	38	625
Casing: 12-in. to 590 ft; perforated from 512 to 518, 544 to 555, and 563 to 578 ft; backfilled with gravel to 584 ft.		

1N/3-23K1. Reynolds Metals Co. Drilled by R. J. Strasser Drilling Co., 1949 and 1954

Artificial fill and younger alluvium:		
Fill and soil	24	24
Younger alluvium:		
Silt and clay	18	42
Sand, brown	12	54
Sand, fine, gray	89	143
Sand, coarse, gray, some clay	13	156

Table 2.--Drillers' logs of representative wells--Continued

Materials	Thickness (feet)	Depth (feet)
Troutdale Formation:		
Sand, coarse, some gravel, water-bearing	31	187
Sand and clay, gray	43	230
Sand, in part water-bearing	4	234
Sand and clay, blue	31	265
Shale, blue	16	281
Clay and sand	24	305
Sand, fine, with scattered gravel	47	352
Sand and clay, gray	9	361
Shale and sand, black	23	384
Clay, brown	12	396
Sandstone	13	409
Sand and clay, with some gravel	11	420
Sand, hard-packed, with some clay	26	446
Clay and gravel	28	474
Clay, sandy	13	487
Sandstone	20	507
Sand and gravel, loose, water-bearing	70	577
Gravel, cemented	20	597
Sand and silt	9	606
Clay, blue, hard	9	615
Casing: 12-in. to 590 ft; perforated from 512 to 518, 522 to 538, 544 to 555, and 563 to 578 ft; backfilled with sand to 598 ft, and with gravel to 584 ft.		

1N/3-26E1. Oregon Highway Commission. Drilled by R. J. Strasser Drilling Co., 1947

Soil	7	7
Troutdale Formation:		
Gravel, cemented	21	28
Sand and gravel, water-bearing	2	30
Gravel, cemented	50	80
Sand and gravel, water-bearing	13	93
Casing: 6-in. to 88 ft; perforated from 76 to 88 ft.		

1N/3-27M1. City of Fairview. Drilled by Barron & Strayer, 1956

Troutdale Formation:		
Clay	5	5
Boulders and gravel	15	20
Gravel	39	59
Gravel, cemented	24	83
Clay, blue	22	105
Silt	20	125
Gravel, sandy, water-bearing	15	140
Gravel, cemented; bottom of 12-in. casing at 182 ft	63	203
Silt	62	265
Gravel, clean	55	320

Table 2.--Drillers' logs of representative wells--Continued

Materials	Thickness (feet)	Depth (feet)
Troutdale Formation:--Continued		
Gravel, muddy	25	345
Gravel, cemented, swl 110 ft	15	360
Sandy River(?) Mudstone:		
Clay, yellow, sandy	20	380
Sand, fine, "heaving"	40	420
"Rock" (gravel?), coarse	25	445
Silt, sandy	50	495
Sand, heaving	40	535
Shale, blue	5	540
Sand, black	20	560
Sand, some gravel	15	575
Sand, fine, white; swl dropped to 120 ft at 585-ft depth	50	625
Gravel, water-bearing	1	626
Sand, fine, white	44	670
Sand, fine, and gravel	20	690
Sandstone, hard, "sharp"	15	705
Shale, blue	10	715
Sand, fine	20	735
Gravel, small, sandy, caving	10	745
Clay, gray, sandy	10	755
Clay, yellow; bottom of 10-in. casing at 800-ft depth	45	800
Columbia River Basalt:		
Rock, gray, hard; open 10-in. hole below 800-ft depth	10	810
Rock, broken	16	826
Clay	1	827
Rock, black, hard	23	850
Rock, hard, some blue clay	25	875
Rock, black	25	900
Clay, blue	15	915
Rock, gray	5	920
Older rocks:		
Clay, blue; swl 90 ft	15	935
"Shell," hard	2	937
Clay	13	950
"Sand rock," (tuffaceous sandstone), hard, gray	15	965
Clay, blue	2	967
Sandstone, gray, hard, water-bearing	8	975
Rock, hard, black	23	998
Clay, red and pink	4	1,002
Rock, broken, hard, drilled muddy	28	1,030
Rock, broken, and blue clay	15	1,045
Sand, gray, and clay	15	1,060
Casing: 12-in. to 82 ft, 10-in. from 82 to 830 ft; perforated from 320 to 340 ft.		

Table 2.--Drillers' logs of representative wells--Continued

1N/3-28E1. F. D. Shepard. Drilled by A. M. Jannsen Drilling Co., 1951

Materials	Thickness (feet)	Depth (feet)
Troutdale Formation:		
Clay	10	10
Sandstone	5	15
Boulders	43	58
Gravel, cemented	56	114
Gravel	6	120
Gravel, cemented	5	125
Sand and gravel	50	175
Sandstone	9	184
Gravel, cemented	46	230
Gravel, water-bearing	20	250
Casing: 8-in. to 159 ft, 6-in. from 159 to 250 ft; perforated from 159 to 250 ft.		

1N/3-28M1. B. E. Davis. Drilled by R. J. Strasser Drilling Co., 1944

Troutdale Formation:		
Gravel and boulders, water-bearing	26	26
Gravel, cemented	28	54
Sand and gravel, water-bearing	9	63
Gravel and clay	2	65
Casing: 6-in. to 65 ft; perforated from 54 to 62 ft.		

1N/3-34L1. Mr. Bauman. Drilled by R. J. Strasser Drilling Co.

Fluviolacustrine deposits:		
Soil	15	15
Gravel and boulders	25	40
Boulders	43	83
Troutdale Formation:		
Gravel, cemented	207	290
Gravel, loose	4	294
Sandstone, gray	66	360
Casing: 10-in. to 170 ft, 8-in. to 355 ft; perforated from 170 to 180, 284 to 294, and 340 to 355 ft.		

1N/3-34N1. Carl Zimmerman. Drilled by Steinman Bros. Drilling Co., 1944

Fluviolacustrine deposits:		
Gravel and boulders	11	11
Gravel	26	37
Gravel and boulders	8	45
Gravel, water-bearing at 55 ft	25	70
Clay, sandy	15	85
Troutdale Formation:		
Gravel, cemented, water-bearing	35	120
Gravel, fine, and coarse sand	10	130

Table 2.--Drillers' logs of representative wells--Continued

Materials	Thickness (feet)	Depth (feet)
Troutdale Formation:--Continued		
Clay, sandy, yellow	2	132
Casing: 8-in. to 126 ft.		
1N/3-35B1. E. E. Shroy. Drilled by A. M. Jannsen Drilling Co., 1949		
Fluviolacustrine deposits:		
Clay	8	8
Gravel	77	85
Troutdale Formation:		
Clay, yellow	38	123
Sand, muddy	27	150
Sand and gravel	8	158
Gravel	52	210
Sand and gravel	15	225
Gravel, loose	5	230
Casing: 6-in. to 77 ft, 4-in. to 230 ft.		
1N/3-35Q1. Snider Farms. Drilled by R. J. Strasser Drilling Co., 1950		
Fluviolacustrine deposits:		
Soil	2	2
Gravel and boulders	15	17
Troutdale Formation:		
Gravel, cemented	41	58
Sand and gravel, loose, water-bearing	12	70
Gravel, cemented	10	80
Clay, sandy	10	90
Gravel, cemented	19	109
Gravel, sandy, loose	11	120
Gravel, coarse, and clay	6	126
Gravel and boulders	9	135
Casing: 10-in. to 135 ft; perforated from 58 to 70, 108 to 112, and 114 to 120 ft.		
1/1-1C2. Damascus-Carnation Co. Drilled by A. M. Jannsen Drilling Co., 1947		
Fluviolacustrine deposits:		
Sand	86	86
Gravel and sand	41	127
Sand	10	137
Troutdale Formation:		
Gravel, cemented	23	160
Sandstone	12	172
Sand and gravel, water-bearing	16	188
Gravel, cemented	12	200
Casing: 4-in. to 200 ft; perforated from 174 to 185 and 190 to 195 ft.		

Table 2.--Drillers' logs of representative wells--Continued

1/1-1Q1. Sunnybrook Farm. Drilled by A. M. Jannsen Drilling Co., 1945

Materials	Thickness (feet)	Depth (feet)
Fluviolacustrine deposits:		
Sand	80	80
Sand and gravel	5	85
Boring(?) Lava:		
Black lava rock(?)	13	98
Sand	2	100
Rock(?)	10	110
Troutdale Formation:		
Sand and gravel	33	143
Sand, brown, some clay	9	152
Sand and gravel	4	156
Casing: 10-in. to 93 ft; 8-in. from 90 to 156 ft.		

1/1-2C1. Lewis Bros. Drilled by A. M. Jannsen Drilling Co., 1956

Fluviolacustrine deposits and Troutdale Formation:		
Soil, sandy	15	15
Gravel, cemented	70	85
Sand and gravel, water-bearing	20	105
Casing: 8-in. to 104 ft.		

1/1-2E2. Arden Farms Co. Drilled by R. J. Strasser Drilling Co., 1944

Younger terrace deposits:		
Clay	6	6
Gravel	8	14
Boulders	6	20
Fluviolacustrine deposits and Troutdale Formation:		
Gravel with clay binder	25	45
Gravel, loose, water-bearing	7	52
Sand, yellow	2	54
Gravel with clay binder	59	113
Silt and sand, blue	4	117
Clay	6	123
Troutdale Formation:		
Gravel, cemented	47	170
Gravel, water-bearing	5	175
Gravel, with sand and clay	54	229
Sandy River Mudstone:		
Shale	52	281
Sand and gravel, water-bearing	11	292
Clay	18	310
Clay and silt, scattered gravel	63	373
Sandstone	12	385
Casing: 14-in. to 307 ft; perforated from 45 to 50, 168 to 175, and 285 to 295 ft.		

Table 2.--Drillers' logs of representative wells--Continued

1/1-3A1. City of Portland. Drilled by R. J. Strasser Drilling Co., 1946

Materials	Thickness (feet)	Depth (feet)
Artificial fill and younger alluvium:		
Fill, some rock	8	8
Clay, yellow	20	28
Silt and fine sand, dark	72	100
Casing: Uncased.		

1/1-3A3. Northwestern Ice & Cold Storage Co. Drilled by R. J. Strasser Drilling Co., 1928

Younger alluvium:		
Clay and gravel fill	19	19
Alluvium of abandoned river channel:		
"Muck," dark	14	33
Clay, "solid"	3	36
"Muck," dark	17	53
"Wood" (buried log?)	2	55
"Muck," dark	57	112
"Muck," sandy	13	125
Troutdale Formation:		
Gravel, some boulders	15	140
Sand	19	159
Gravel, cemented	5	164
Shale and gravel	15	179
Sandy River Mudstone:		
Clay, blue	54	233
Clay, blue, some sand, yellow	7	240
Sand, yellow, and clay	15	255
Sand, clean	10	265
Casing: 12-in. to 241 ft; 10-in. slotted pipe from 235 to 265 ft.		

1/1-11D1. Dairy Coop. Assoc. Drilled by R. J. Strasser Drilling Co., 1946

Artificial fill:		
Fill	12	12
Fluviolacustrine deposits:		
Gravel, loose	15	27
Gravel, bouldery	16	43
Troutdale Formation:		
Gravel, cemented	76	119
Sand, fine, water-bearing	3	122
Gravel, cemented	72	194
Sand, water-bearing	24	218
Gravel	2	220
Gravel, cemented	38	258
Sandy River Mudstone:		
Clay and fine sand	5	263
Clay, blue	50	313
Clay, brown	3	316

Table 2.--Drillers' logs of representative wells--Continued

Materials	Thickness (feet)	Depth (feet)
Sandy River Mudstone:--Continued		
Sand	8	324
"Soapstone," green	7	331
Sand	3	334
Clay, blue and brown	6	340
Sand	39	379
Clay, brown; some gravel below 391 ft	17	396
Clay, sandy	14	410
Sand, gray	5	415
Gravel and sand, water-bearing	8	423
Shale	67	490
Casing: 16-in. to 433 ft; perforated from 105 to 115, 221 to 230, 245 to 255, and 419 to 425 ft.		

1/1-11H1. Libby, McNeill & Libby. Drilled by R. J. Strasser Drilling Co., 1929

Alluvium of an abandoned river channel:		
Soil and clay	18	18
Gravel, loose, water-bearing	7	25
Gravel, cemented	13	38
Silt, sandy	24	62
Troutdale Formation:		
Gravel, cemented	45	107
Clay, yellow	3	110
Gravel, cemented	37	147
Gravel, with sand and clay	43	190
Gravel, cemented	25	215
Gravel, water-bearing	25	240
Gravel, cemented	42	282
Sand and gravel, water-bearing	48	330
Casing: 12-in. to 301 ft, 10-in. from 300 to 330 ft; perforated from 215 to 240, 282 to 297, and 301 to 330 ft.		

1/1-25M1. Kellogg Park Housing Project. Drilled by R. J. Strasser Drilling Co., 1945

Alluvium of abandoned river channel:		
Soil	4	4
Clay and silt, blue	86	90
Columbia River Basalt, weathered:		
Shale, red	11	101
Clay, blue	19	120
Columbia River Basalt:		
Rock, black, water-bearing, about 50 gpm	48	168
Clay, blue	17	185
Rock, gray	25	210
Shale, blue and red (weathered basalt?)	25	235
Rock	10	245
Shale, red (weathered basalt?)	12	257

Table 2.--Drillers' logs of representative wells--Continued

Materials	Thickness (feet)	Depth (feet)
Columbia River Basalt:--Continued		
Rock	30	287
Shale, red (weathered basalt?)	5	292
Rock	56	348
Clay, blue	12	360
Shale, red	5	365
Rock, brown	7	372
Rock, black	30	402
Rock, black, fractured, water-bearing	18	420
Rock, black, hard	10	430
Casing: 12-in. to 122 ft, 10-in. from 157 to 292 ft, 8-in. from 290 to 368 ft.		
1/1-25R2. City of Milwaukie. Drilled by A. M. Jannsen Drilling Co., 1945		
Fluviolacustrine deposits:		
Clay	7	7
Sand	49	56
Troutdale Formation:		
Gravel, cemented, water-bearing at 95 ft	77	133
Sand and gravel, coarse	22	155
Sand and gravel, water-bearing	77	232
Sand and gravel, cemented	26	258
Sand	2	260
Gravel, cemented	9	269
Gravel, water-bearing	3	272
Gravel, cemented	13	285
Clay	5	290
Casing: 12-in. to 233 ft, 10-in. to 283 ft; perforated from 147 to 222 ft.		
1/1-36H1. E. H. Reddaway. Drilled by O. E. Jannsen		
Alluvium of abandoned river channel and fluviolacustrine deposits:		
Soil	13	13
Sand, cemented	9	22
Shale, blue	13	35
Sand, cemented	11	46
Sand, fine	13	59
Sand and gravel	3	62
Sand	3	65
Sand, coarse	2	67
Sand and pea gravel	5	72
Casing: 6-in. to 67 ft.		
1/2-3Q1. Petre Quin. Drilled by Steinman Bros. Drilling Co., 1934		
Fluviolacustrine deposits and Troutdale Formation:		
Gravel and small boulders	18	18

Table 2.--Drillers' logs of representative wells--Continued

Materials	Thickness (feet)	Depth (feet)
Fluviolacustrine deposits and Troutdale Formation:--Continued		
Gravel	62	80
Sand and gravel	80	160
Sand, coarse, and water-bearing fine gravel	40	200
Clay, blue	10	210
Sand, brown	5	215
Casing: 6-in. to 203 ft.		

1/2-10E1. City of Portland. Drilled by Haakon I. Bottner Drilling Co., 1955

Troutdale Formation:		
Gravel	2	2
Wood and brown clay	5	7
Clay, some gravel	13	20
Gravel, cemented	41	61
Sandstone	2	63
Gravel, brown and gray, cemented, water-bearing at 349 ft, with swl at 332 ft; test bailed at 6 gpm	302	365
Gravel with clay binder	21	386
Sandy River Mudstone:		
Clay, blue and black, with hole at 432 ft and swl at 405 ft; well test bailed 12 gpm	46	432
Clay, black, shaley	28	460
Shale, blue, sandy	17	477
Clay, gray, blue, and black	73	550
Sand, blue, loose, fine, water-bearing	8	558
Clay and sandstone	3	561
Quicksand	49	610
Sand and gravel	9	619
Sandstone	8	627
Silt, black, greasy	3	630
Clay, blue	35	665
Casing: 12-in. to 113 ft, 10-in. to 665 ft; perforated at unknown depths and intervals.		

1/2-12K1. B. N. Wade. Drilled by Steinman Bros. Drilling Co., 1934

Fluviolacustrine deposits:		
Gravel, bouldery	7	7
Gravel, loose, coarse, water-bearing at 60-65 ft	65	72
Sand and gravel	15	87
Troutdale Formation:		
Gravel and sand, cemented	7	94
Casing: 8-in. to 90 ft; perforated from 30 to 90 ft.		

Table 2.--Drillers' logs of representative wells--Continued

1/2-22N1. Lincoln Memorial Cemetery. Drilled by A. M. Jannsen Drilling Co., 1953

Materials	Thickness (feet)	Depth (feet)
Boring Lava:		
Clay and boulders	3	3
Rock with clay	42	45
Rock, broken	25	70
Lava rock, brown	8	78
Rock, hard, black	47	125
Rock, black and red, interlayered	180	305
Basalt, gray, red, and black	98	403
Basalt, black	33	436
Troutdale Formation:		
Gravel, cemented	89	525

1/2-23K1. M. H. Young. Drilled by A. M. Jannsen Drilling Co., 1950

Boring Lava:		
Clay	48	48
Rock	3	51
Clay	19	70
Rock	130	200
Clay, brown	5	205
Casing: 6-in. to 75 ft.		

1/2-24Q1. G. R. Rhode. Drilled by Steinman Bros. Drilling Co., 1946

Boring Lava:		
Clay, yellow and red	35	35
Gravel, bouldery, cemented	24	59
Rock, reddish	161	220
Rock, hard	32	252
Troutdale Formation:		
Gravel, cemented	21	273
Clay, yellow	24	297
Casing: 6-in. to 65 ft, 4-in. to 122 ft.		

1/2-27B1. U. S. Veterans' Administration. Drilled by R. J. Strasser Drilling Co., 1950

Boring Lava, weathered:		
Soil	3	3
Clay	26	29
Boring Lava:		
Rock, decomposed	10	39
Rock, gray, hard; red seams at 125-131 and 144-167 ft	157	196
Rock, gray, hard layers alternating with red, brown, and yellow soft layers	250	446
Rock, gray, hard, with red seams	89	535

Table 2.--Drillers' logs of representative wells--Continued

Materials	Thickness (feet)	Depth (feet)
Troutdale Formation:		
Sand, coarse, and gravel, tight	41	576
Sand and silt, water-bearing, test bailed at 70 gpm	13	589
Sand and gravel	50	639
Shale	11	650
Gravel and clay	7	657
Sand and clay	26	683
Shale	33	716
Sand and clay	45	761
Conglomerate	78	839
Conglomerate, sand, and shale	6	845
Conglomerate and loose sand	6	851
Conglomerate	42	893
Conglomerate with quartz sand	52	945
Conglomerate	22	967
Casing: 10-in. to 769 ft; perforated from 540 to 550 and 560 to 573 ft; cemented plug from 756 to 769 ft.		

1/2-29P1. Portland Road & Driveway Co. Drilled by C. E. Hamblet, 1957

Fluviolacustrine deposits:		
Soil and clay	55	55
Troutdale Formation:		
Gravel, cemented	25	80
Gravel, water-bearing	10	90
Gravel	30	120
Clay	5	125
Gravel	50	175
Clay	50	225
Sand and gravel	10	235
Casing: 8-in. to 235 ft; perforated from 80 to 90, 175 to 180, and at 200 ft.		

1/2-31N1. A. Calcagno. Drilled by Steinman Bros. Drilling Co., 1956

Alluvium of an abandoned river channel:		
Silt, sandy, yellow	20	20
Sand, coarse, clean, compacted	15	35
Sand, gravelly	3	38
Sand, silty, micaceous, water-bearing	52	90
Gravel, fine, loose, water-bearing	7	97
Troutdale Formation:		
Gravel, loosely cemented	6	103
Gravel, swl 70 ft, test bailed at 30 gpm with 25 ft of dd	28	131
Gravel, loosely cemented, water-bearing	47	178
Casing: 8-in. to 178 ft.		

Table 2.--Drillers' logs of representative wells--Continued

1/2-34M1. Mount Calvary Cemetery Assoc. Drilled by A. M. Jannsen Drilling Co., 1958

Materials	Thickness (feet)	Depth (feet)
Boring Lava:		
Clay	9	9
Boulders	6	15
Rock, hard, gray	38	53
Clay and boulders	12	65
Rock, hard, gray	10	75
Interbed, soft	5	80
Rock, hard, gray	15	95
Interbed, soft	3	98
Rock, hard, gray	14	112
Rock, soft	3	115
Rock, hard, gray	30	145
Interbed, soft	3	148
Rock, hard, gray	28	176
Rock, soft	5	181
Rock, hard, gray	5	186
Rock, soft	5	191
Rock, hard, gray	127	318
Troutdale Formation:		
Gravel, cemented, water-bearing at 385-387, 395-397, and 447-448 ft	165	483
Sandy River Mudstone:		
Clay with cemented gravel beds 499-504 and 544-545 ft	62	545
Rock, gray (dike or sill of Boring Lava?)	23	568
Gravel, cemented	7	575
Sand	37	612
Gravel, cemented	16	628
Sand and clay	54	682
Sandstone, coarse-grained	43	725
Shale	35	760
Casing: 14-in. to 60 ft, 10-in. from 60 to 616 ft, 8-in. from 592 to 642 ft; perforated from 261 to 266, 290 to 296, 350 to 355, 375 to 380, 387 to 393, 414 to 417, 442 to 446, and 584 to 591 ft.		

1/2-34Q1. C. H. Garbe. Drilled by owner, 1948

Boring Lava:		
Soil	2	2
Rock, hard	228	230
Rock, gray, soft, porous (scoria?), water-bearing	8	238
Troutdale Formation:		
Clay, white	2	240
Casing: 6-in. to 40 ft.		

Table 2.--Drillers' logs of representative wells--Continued

1/2-35J1. G. F. Krause

Materials	Thickness (feet)	Depth (feet)
Boring Lava, weathered(?):		
Soil	2	2
Clay and sandstone	12	14
Clay, yellow	31	45
Boring Lava:		
Lava rock	57	102
Rock, soft, porous, water-bearing	8	110
"Conglomerate"	10	120
Clay	26	146
"Conglomerate"	8	154
Lava rock	14	168
Casing: 6-in. to 169 ft; perforations unknown.		

1/3-1J2. Mountain View Nurseries, Inc. Drilled by A. O. Olsen, 1952

Fluviolacustrine deposits:		
Clay and sand	35	35
Clay, blue and gray	95	130
Troutdale Formation:		
Gravel, cemented	35	165
Clay, sandy, yellow	3	168
Sandstone	50	218
Gravel, black, and clay	30	248
Gravel, cemented	40	288
Clay, blue, and gravel	7	295
Clay and sand	20	315
"Honeycomb black rock" (basaltic gravel?)	10	325
Sandy River Mudstone:		
Clay, blue	125	450
Casing: 8-in. to 325 ft; perforated from 310 to 325 ft.		

1/3-2E1. Allen Pitts. Drilled by Steinman Bros. Drilling Co., 1944

Fluviolacustrine deposits:		
Gravel and sand	20	20
Gravel, water-bearing	49	69
Gravel, bouldery	12	81
Gravel	9	90
Casing: 6-in. to 90 ft.		

1/3-4Q1. M. B. McGinnis. Drilled by Steinman Bros. Drilling Co., 1951

Fluviolacustrine deposits and Troutdale Formation:		
Gravel, cemented, water-bearing at 30 ft	57	57
Gravel, cemented, some small boulders	14	71
Gravel, cemented, water-bearing at 94 ft	39	110
Clay, sandy	4	114

Table 2.--Drillers' logs of representative wells--Continued

Materials	Thickness (feet)	Depth (feet)
Fluviolacustrine deposits and Troutdale Formation:--Continued		
Gravel, cemented, water-bearing at 130 ft	20	134
Sand and gravel, loose	5	139
Clay, sandy	2	141
Gravel, cemented	4	145
Casing: 8-in. to 145 ft; perforated from 94 to 145 ft.		
1/3-5K1. Vernie Jarl. Drilled by R. J. Strasser Drilling Co., 1946		
Fluviolacustrine deposits:		
Dug hole, no record	34	34
Clay	4	38
Gravel and boulders	5	43
Troutdale Formation:		
Gravel, cemented	18	61
Gravel and boulders, water-bearing	18	79
Sand and gravel, water-bearing	14	93
Gravel and boulders, cemented	5	98
Casing: 12-in. to 98 ft; perforated from 66 to 77 and 79 to 93 ft.		
1/3-8C1. Rockwood Water Dist. Drilled by A. L. Zeising, 1927		
Troutdale Formation:		
Clay	6	6
Gravel, cemented	76	82
Sand and gravel, water-bearing	12	94
Gravel, cemented	148	242
Sandy River Mudstone:		
Clay, yellow	17	259
Clay, blue	13	272
Clay, brown	28	300
Casing: 10- and 8-in. to 230 ft; perforated from 84 to 105 ft.		
1/3-10B2. Gresham Berry Growers. Drilled by R. J. Strasser Drilling Co., 1946		
Fluviolacustrine deposits:		
Soil and clay	15	15
Gravel and boulders, cemented	30	45
Clay, yellow	14	59
Troutdale Formation:		
Gravel, cemented	46	105
Gravel and clay	25	130
Gravel and sand, water-bearing	10	140
Gravel and clay	65	205
Clay, blue	5	210
Gravel and clay	22	232
Shale	8	240
Sand and gravel, water-bearing	15	255
Gravel and clay	25	280

Table 2.--Drillers' logs of representative wells--Continued

Materials	Thickness (feet)	Depth (feet)
Sandy River Mudstone:		
Clay, blue	5	285
Shale, dark-brown	10	295
Sand, clayey, brown	15	310
Shale, gray	25	335
Sand, gravelly, water-bearing	10	345
Shale	9	354
Sandstone	13	367
Sand, gravelly, water-bearing	28	395
Shale	5	400
Casing: 16-in. to 225 ft, 10-in. from 0 to 400 ft; perforated from 245 to 255, 337 to 347, and 358 to 390 ft; gravel-packed from 225(?) to 400 ft.		
1/3-14R1. James Gordon. Drilled by Haakon I. Bottner Drilling Co.		
Piedmont deposits:		
Clay, yellow	55	55
Clay, white	8	63
Troutdale Formation:		
Gravel, cemented	21	84
Clay, sandy	5	89
Gravel, cemented	36	125
Sand, fine	5	130
Gravel, cemented	25	155
Sand and gravel, water-bearing	10	165
Gravel and sand	7	172
Gravel, water-bearing	23	195
Gravel, cemented	2	197
Casing: 8-in. to 195 ft; perforated from 174 to 192 ft.		
1/3-15L1. Fred Howitt. Drilled by Steinman Bros. Drilling Co., 1941		
Troutdale Formation:		
Clay, yellow	68	68
Sandstone	12	80
Gravel, bouldery, cemented	123	203
Gravel and sandy clay, water-bearing	3	206
Gravel, cemented, some boulders	24	230
Casing: 6-in. to 228 ft.		
1/3-16D1. E. J. Babuska. Drilled by A. O. Olsen, 1957		
Troutdale Formation:		
Clay	15	15
Sand	5	20
Clay	30	50
Gravel, cemented	40	90
Gravel, water-bearing	2	92
Gravel, cemented	23	115
Casing: 6-in.		

Table 2.--Drillers' logs of representative wells--Continued

1/3-20E1. F. Baker

Materials	Thickness (feet)	Depth (feet)
Piedmont deposits:		
Clay	60	60
Troutdale Formation:		
Gravel, cemented	175	235
Clay, blue	45	280
Gravel, water-bearing	20	300
Casing: 10-in. to 300 ft; perforated from 100 to 235 and 280 to 300 ft.		

1/3-21F1. Arthur Van. Drilled by C. E. Hamblet

Boring Lava, weathered(?):		
Clay, red	70	70
Troutdale Formation:		
Gravel, cemented	95	165
Sand	5	170
Casing: 6-in.		

1/3-22J1. G. O. Kita. Drilled by Steinman Bros. Drilling Co., 1939

Dug well, no record	70	70
Troutdale Formation:		
Gravel, cemented, bouldery	21	91
Sand and gravel	13	104
Sand, coarse, black, water-bearing	8	112
"Crushed rock and sand," water-bearing at 138 ft	28	140
Casing: 6-in. to 130 ft.		

1/3-22J2. R. Shiiki. Drilled by Haakon I. Bottner Drilling Co., 1954

Boring Lava, weathered(?):		
Clay, yellow	64	64
Boring Lava:		
Rock	90	154
Rock and yellow clay	24	178
Rock	16	194
Troutdale Formation:		
Clay, yellow	6	200
Gravel, cemented	15	215
Clay, yellow	4	219
Gravel, cemented	46	265
Gravel, water-bearing (estimated 40 gpm)	5	270
Gravel, cemented	61	331
Gravel, water-bearing (estimated 60 gpm)	10	341
Gravel, cemented	19	360
Sandy River Mudstone:		
Clay, blue	100	460
Clay, green	10	470

Table 2.--Drillers' logs of representative wells--Continued

Materials	Thickness (feet)	Depth (feet)
Columbia River Basalt:		
Rock	29	499
Rock, soft, water-bearing	9	508
Rock, hard	2	510
Casing: 12-in. to 342 ft, 8-in. from 331 to 509 ft; perforated from 265 to 270 and 331 to 509 ft.		
1/3-23H1. P. Vessello. Drilled by A. O. Olson		
Piedmont deposits:		
Clay	6	6
Troutdale Formation:		
Gravel, cemented	77	83
Gravel, loose, water-bearing	11	94
Casing: 8-in. to 94 ft; perforated from 85 to 93 ft.		
1/3-24E1. R. D. Monnie. Drilled by O. E. Jannsen, 1956		
Piedmont deposits:		
Clay, sticky, red, some boulders	35	35
Gravel, partially cemented	51	86
Boring Lava:		
Lava, gray-black, hard and soft, water-bearing from 170-175 ft	91	177
Casing: 6-in. to 86 ft.		
1/3-25K2. C. D. Hillyard. Drilled by E. N. Townsend, 1951		
Boring Lava:		
Clay	18	18
Rock, solid	6	24
Troutdale Formation:		
Gravel and sand	6	30
Sand, fine, black	1	31
Casing: 8-in.		
1/3-27Q1. F. Wilson. Drilled by A. O. Olsen, 1950		
Piedmont deposits:		
Clay	50	50
Troutdale Formation:		
Gravel, cemented	52	102
Gravel, loose, water-bearing	2	104
Casing: No data.		

Table 2.--Drillers' logs of representative wells--Continued

1/3-29F1. F. DeLano. Drilled by A. O. Olsen

Materials	Thickness (feet)	Depth (feet)
Boring Lava:		
Clay	40	40
Basalt	90	130
"Red volcanic ash"	30	160
Basalt	40	200
Basalt, vesicular	65	265

1/3-29M1. Mr. Eggenberger. Drilled by A. O. Olsen, 1948

Piedmont deposits and Boring Lava, weathered:		
Clay	82	82
Boring Lava:		
"Honeycomb rock"	20	102
Clay	13	115
Rock, vesicular streaks	43	158
Clay, blue	22	180

Casing: 8-in. to 120 ft; perforated from 85 to 100 ft.

1/3-33K2. O. Menser. Drilled by O. B. Olsen, 1953

Troutdale Formation:		
Soil, clay, and scattered boulders	40	40
Gravel, cemented	106	146
Clay, yellow	6	152
Gravel, cemented	24	176
Clay, brown	4	180
Gravel, cemented	64	244
Sandy River(?) Mudstone:		
Clay, blue and green	54	298
Gravel, loose, water-bearing	2	300
Sandstone	5	305

Casing: 8-in. to 249 ft, 6-in. from 249 to 305 ft; perforated from 182 to 238 and 295 to 305 ft.

1/3-34N2. H. G. Siron. Drilled by A. O. Olsen, 1953

Piedmont deposits:		
Clay	70	70
Clay, sandy	30	100
Troutdale Formation:		
Gravel, cemented	115	215
Gravel, cemented, water-bearing	30	245

Casing: 6-in.

Table 2.--Drillers' logs of representative wells--Continued

1/3-35M2. A. Gran. Drilled by A. O. Olsen, 1956

Materials	Thickness (feet)	Depth (feet)
Boring Lava:		
Clay	70	70
"Bedrock," gray	120	190
Troutdale Formation:		
Gravel, cemented	60	250
Casing: 6-in. to 190 ft, 5-in. from 185 to 250 ft; perforated from 200 to 250 ft.		

1/4-7E1. A. Strebin. Drilled by Haakon I. Bottner Drilling Co., 1953

Fluviolacustrine deposits:		
Soil	5	5
Clay, blue and brown	55	60
Troutdale Formation:		
Gravel, cemented	62	122
Clay, gravel and boulders	49	171
Gravel, water-bearing	2	173
Clay	4	177
Gravel	2	179
Clay and gravel	8	187
Gravel	3	190
Gravel and shale	30	220
Sandstone	123	343
Gravel, cemented, little water in places between 250-403 ft	60	403
Sandy River Mudstone:		
Clay, gray	10	413
Gravel and clay	10	423
Clay, blue	35	458
Gravel and clay	12	470
Clay, blue	16	486
Gravel and clay	13	499
Clay, blue	25	524
Gravel and clay	1	525
Clay, blue	19	544
Casing: 12-in. to 245 ft; perforated from 173 to 179 ft; backfilled with gravel from 515 to 544 ft.		

1/4-15N1. N. W. Jackson. Drilled about 1915

Piedmont deposits:		
Soil and clay	60	60
Gravel, cemented	20	80
Gravel, loose	5	85
Sandstone	7	92
Casing: 6-in.		

Table 2.--Drillers' logs of representative wells--Continued

1/4-16H1. A. W. Sherwood. Drilled by A. O. Olsen, 1956

	Thickness (feet)	Depth (feet)
Piedmont deposits:		
Clay and silt	75	75
Clay and gravel	10	85
Clay and silt	20	105
Clay and gravel	50	155
Clay, blue	25	180
Clay and gravel	5	185
Clay, blue, sandy	3	188
Boring Lava:		
Rock, hard	11	199
Rock, red, soft	4	203
Sand and clay (weathered lava?)	12	215
Rock, hard	3	218
Troutdale Formation:		
Gravel, cemented	37	255
Clay and sand	50	305
Sandstone	25	330
"Loam," sandy	30	360
Gravel, cemented	20	380
Sandstone, water-bearing	30	410
Sandy River Mudstone:		
Clay, red	5	415
Sandstone and clay layers	65	480

Casing: 8-in. to 383 ft; perforations unknown.

1/4-17L1. Martin Taylor. Drilled by Haakon I. Bottner Drilling Co., 1951

Piedmont deposits:		
Soil	10	10
Clay, yellow	67	77
Troutdale Formation:		
Gravel, cemented, water-bearing at 138 ft	73	150
Gravel, black	25	175
No record (later deepened)	125	300

Casing: 8-in. to 175 ft; perforated from 165 to 169 ft.

1/4-18M1. H. W. Park. Drilled by A. M. Jannsen Drilling Co., 1951

Piedmont deposits:		
Clay	71	71
Troutdale Formation:		
Gravel	64	135
Gravel, water-bearing	25	160
Gravel, cemented	29	189
Gravel, water-bearing	8	197

Casing: 10-in. to 197 ft; perforated from 140 to 160 and 189 to 196 ft.

Table 2.--Drillers' logs of representative wells--Continued

1/4-30M2. T. Okino. Drilled by Haakon I. Bottner Drilling Co., 1953

Materials	Thickness (feet)	Depth (feet)
Boring Lava, weathered(?):		
Clay, yellow	18	18
Clay, gray	13	31
Boring Lava:		
Rock, solid	77	108
Clay and rock	50	158
Rock	32	190
Rock and clay	12	202
Rock, solid	26	228
Troutdale Formation:		
Gravel, cemented	59	287
Clay, yellowish-gray, and "rock" (gravel?)	11	298
Gravel, cemented	57	355
Clay, yellow, and "rock"	20	375
Clay, gray	12	387
Gravel, cemented	13	400
Clay, gray	10	410
Gravel and sand, water-bearing	11	421
Clay, blue	9	430
Gravel and sand, loose, water-bearing	5	435
Clay, blue	9	444
Casing: 8-in. to 442 ft; perforated from 410 to 421 and 431 to 434 ft; casing gravel-packed in 12-in. hole.		

1/4-31A1. C. A. Rayborn. Drilled by A. O. Olsen

Piedmont deposits:		
Clay	60	60
Troutdale Formation:		
Gravel, cemented	30	90
Sand and boulders, water-bearing	5	95
Gravel, cemented	45	140
Casing: 8-in. to 140 ft; perforations unknown.		

1/4-32Q1. Dwight Berg. Drilled by A. O. Olsen

Piedmont deposits:		
Clay	70	70
Troutdale Formation:		
Gravel, cemented	105	175
Sandy River Mudstone:		
Clay, blue	50	225
Casing: 8-in. to 177 ft; perforated from 80 to 175 ft.		

Table 2.--Drillers' logs of representative wells--Continued

2/1-1L1. D. M. Steeves. Drilled by Steinman Bros. Drilling Co., 1956

Materials	Thickness (feet)	Depth (feet)
Columbia River Basalt:		
Clay	4	4
Rock, broken, and clay	10	14
Rock, broken	6	20
Rock, hard, some crevices	14	34
Rock, softer	7	41
Rock, black and gray, hard	223	264
Rock, black; test bailed 7 gpm, swl 150 ft	16	280
Rock, gray, soft	8	288
Rock, gray, hard; test bailed 18 gpm, dd 35 ft, swl 150 ft	62	350
Rock, gray and black, hard	38	388
Rock, black, with red seams	8	396
Rock, gray, hard; test bailed 25 gpm, dd 25 ft, swl 150 ft	1	397
Casing: 6-in. to 23 ft.		

2/1-12D1. H. A. Roberts. Drilled by O. E. Jannsen, 1928

Fluviolacustrine deposits:		
Clay	18	18
Gravel	12	30
Clay, yellow	2	32
Shale	23	55
Sand, coarse and water-bearing at 65 ft	15	70
Mud, green	7	77
Shale, sandy	8	85
Columbia River Basalt:		
Sandrock (decomposed basalt?)	8	93
Rock (basalt)	61	154
Casing: 8-in. to 89½ ft; perforated near 65 ft.		

2/1-13J1. Peter Pan Ice Cream Co.

Younger terrace deposits:		
Clay	10	10
Gravel	38	48
Columbia River Basalt:		
Basalt, black, water-bearing	40	88

2/2-3A1. M. N. Durham. Drilled by O. E. Jannsen, 1957

Boring Lava:		
Clay, with partially decomposed boulders	40	40
Lava, dark-gray, hard	7	47
Lava, brown, decomposed	11	58
Lava, gray	16	74
Cinders, red	1½	75½

Table 2.--Drillers' logs of representative wells--Continued

Materials	Thickness (feet)	Depth (feet)
Boring Lava:--Continued		
Lava, gray, with red streaks	6½	82
Lava, gray, partially decomposed	16	98
Lava, red and brown, partially decomposed, water-bearing at 125 ft	52	150
Lava, gray, soft	11	161
Casing: 6-in. to 60 ft.		
2/2-3K2. B. A. Alby. Drilled by R. J. Strasser Drilling Co., 1922		
Boring Lava:		
Soil and clay (weathered lava)	40	40
Rock, soft	60	100
Rock, hard	20	120
Clay and gravel (sedimentary interbed?)	20	140
Rock, hard	76	216
Troutdale Formation:		
Gravel, water-bearing	1	217
Casing: 6-in.		
2/2-4H1. John Jeleniewski. Drilled by O. E. Jannsen, 1958		
Piedmont and other deposits, undifferentiated:		
Clay, gravel, and boulders	25	25
Shale, blue and gray, occasional boulders	20	45
"Soapstone," gray and brown	35	80
Boring Lava:		
Rock, partially decomposed, pink	21	101
Casing: 6-in. to 74 ft.		
2/2-5M1. Union High School Dist. 5. Drilled by O. E. Jannsen, 1957		
Alluvium of abandoned river channel:		
Clay, sandy, brown	29	29
Troutdale Formation:		
Gravel, cemented, gray	14	43
Sand, fine, brown, water-bearing	3	46
Gravel, cemented, gray	17	63
Sand, fine, gray	2	65
Gravel, cemented, gray	27	92
Shale, blue and gray	14	106
Gravel, cemented, gray	24	130
Shale, gray	17	147
Gravel, cemented, gray, water-bearing	33	180
Shale, blue-gray	7	187
Sand and gravel, loose, water-bearing	1	188
Gravel, cemented, gray	10	198

Table 2.--Drillers logs of representative wells--Continued

Materials	Thickness (feet)	Depth (feet)
Columbia River Basalt:		
Lava, gray	5	203
Casing: 8-in. to 96½ ft, 6-in. from 94½ to 203 ft; perforated from 101 to 108, 124 to 131, 146 to 181, and 186 to 197 ft.		
2/2-9B1. A. L. Alexander. Drilled by O. E. Jannsen, 1927		
Alluvium of abandoned river channel:		
Soil and clay	5	5
Troutdale Formation:		
Gravel, cemented	11	16
Sand	2	18
Gravel, cemented	10	28
Gravel, cemented, and sand	5	33
Gravel, cemented	5	38
Sand	10	48
Gravel, cemented, sandy	7	55
Sand	6	61
Sand, cemented	4	65
Sand, fine	13	78
Gravel, cemented	2	80
Casing: 6-in. to 80 ft; not perforated.		
2/2-11K1. F. T. Williams. Drilled by O. E. Jannsen, 1927		
Alluvium of abandoned river channel:		
No record	20	20
Sand and gravel	8	28
Troutdale Formation:		
Gravel, cemented	13	41
Sand	14	55
Gravel, cemented	11	66
Sandy River Mudstone:		
Clay, green	6	72
Shale, brown	15	87
Shale, blue	8	95
Shale, sandy	33	128
Quicksand	5	133
Sand, water-bearing; swl rose to 7 ft; well tested 24 gpm with 17 ft dd	10	143
Sand and blue shale	16	159
Shale, blue	21	180
Shale, green	5	185
Casing: 6-in. to 165 ft; perforated from 122 to 150 ft.		

Table 2.--Drillers' logs of representative wells--Continued

2/2-12A1. E. Gerhardus. Drilled by O. E. Jannsen, 1956

Materials	Thickness (feet)	Depth (feet)
Soil and Boring Lava:		
Soil and yellow clay	10	10
Clay, red	10	20
"Soapstone," brown (weathered lava)	27	47
Lava, partially decomposed	13	60
Lava, gray, hard	11	71
Troutdale Formation:		
"Troutdale Formation," gray, water-bearing from 175-179 ft	122	193
Casing: 6-in. to 53 ft.		

2/2-14E1. Joe Heater. Drilled by Steinman Bros. Drilling Co., 1957

Alluvium of abandoned river channel:		
Soil and gravel	7	7
Gravel, loose, with boulders	7	14
Troutdale(?) Formation:		
Gravel, cemented	30	44
Clay, brown	14	58
Sand, coarse, compacted	10	68
Clay, gray	38	106
Gravel, fine, water-bearing	2	108
Sand, gray	3	111
Casing: 6-in. to 105 ft.		

2/2-16B1. F. J. Mooney. Drilled by O. E. Jannsen, 1958

Alluvium of abandoned river channel:		
Clay, gravelly, brown	4	4
Troutdale Formation:		
Gravel, lightly cemented	11	15
Gravel, loose, water-bearing	1	16
Gravel, lightly cemented	3	19
Gravel, cemented, with layers of brown clay	12	31
Gravel, cemented, water-bearing at 39 ft	8	39
Shale, gray	6	45
Gravel, cemented	6	51
Casing: 8-in. to 34 ft.		

2/2-19E1. N. F. Bixby. Drilled by J. W. Beck Drilling Co., 1957

No record; old drilled well	96	96
Columbia River Basalt:		
Basalt, weathered	5	101
Basalt, solid	5	106
Clay, brown	5	111
Clay, blue	8	119

Table 2.--Drillers' logs of representative wells--Continued

Materials	Thickness (feet)	Depth (feet)
Columbia River Basalt:--Continued		
Basalt, weathered	2	121
Basalt, solid	3	124
Casing: 6-in. to 124 ft; perforated from 85 to 95 and 105 to 120 ft.		
2/2-19E2. H. L. Ott. Drilled by J. W. Beck Drilling Co., 1957		
Younger terrace deposits:		
Soil	7	7
Clay and silt, brown	7	14
Gravel, cemented	20	34
Sand and cobbles	13	47
Gravel, cemented	15	62
Gravel, sandy, loose	9	71
Columbia River(?) Basalt:		
Clay, dark red (weathered basalt?)	2	73
Casing: 6-in. to 73 ft; perforated from 65 to 72 ft.		
2/2-20F1. City of Gladstone. Drilled by Haakon I. Bottner Drilling Co., 1949		
Younger terrace deposits:		
Clay and boulders	11	11
Clay, blue and yellow	29	40
Clay and sand	15	55
Shale, brown, sandy	20	75
Columbia River Basalt:		
"Shale rock" (weathered basalt?)	12	87
Rock, gray, solid	1	88
Rock, blue, hard	7	95
Rock, hard, fractured	15	110
Rock, solid	7	117
Clay and shale (weathered zone in the basalt?)	13	130
Rock, soft	5	135
Basalt, black	40	175
Basalt, water-bearing at 200 ft	500	675
Basalt, water-bearing, saline water	10	685
Older rocks:		
Shale, blue, water-bearing, saline water	7	692
Casing: 12-in. to 169 ft; well bore was backfilled with cement to 666 ft.		
2/3-2G1. Vernon DeYoung. Drilled by A. O. Olsen, 1958		
Piedmont deposits:		
Clay	5	5
Clay and boulders	11	16
Troutdale Formation:		
Clay and gravel	59	75
Sand and clayey silt	23	98

Table 2.--Drillers' logs of representative wells--Continued

Materials	Thickness (feet)	Depth (feet)
Troutdale Formation:--Continued		
Gravel and clay	30	128
Sand and gravel, cemented	64	192
Sand, water-bearing	3	195
Sandstone	15	210
Gravel, cemented	75	285
Sandy River Mudstone:		
Clay, blue	30	315
Sand, blue	5	320
Clay, blue	40	360
Sand	5	365
Clay, blue	35	400
Casing: 8-in. to 335 ft; perforated from 185 to 200 ft.		
2/3-2H1. O. W. Beckwith. Drilled by E. N. Townsend, 1957		
Boring Lava:		
Clay, red	20	20
Basalt, gray	15	35
Troutdale Formation:		
Silt and clay, gray	60	95
Gravel, cemented	10	105
Casing: 6-in. to 90 ft.		
2/3-3C1. L. W. Hoffmeister. Drilled by A. O. Olson, 1955		
Piedmont deposits:		
Clay	50	50
Troutdale Formation:		
Gravel, cemented	198	248
Sandstone	12	260
Casing: 6-in.		
2/3-6F1. Lewis Isaacs. Drilled by O. B. Olsen, 1952		
Piedmont deposits:		
Clay	20	20
Gravel, cemented	60	80
Boring Lava:		
Rock, solid	35	115
Troutdale Formation:		
Clay, red	5	120
Clay, blue	5	125
Sand	5	130
Gravel, cemented	80	210
Gravel, loose	18	228
Casing: 8-in.		

Table 2.--Drillers' logs of representative wells--Continued

2/3-6Q1. J. W. Aylett. Drilled by A. O. Olsen, 1956

Materials	Thickness (feet)	Depth (feet)
Boring Lava:		
Clay	28	28
Rock, gray, hard	62	90
Rock, "honeycomb," red	15	105
Casing: 6-in. to 105 ft; perforated from 95 to 105 ft.		

2/3-7F1. J. B. Snyder. Drilled by O. E. Jannsen, 1956

Piedmont deposits:		
Clay, yellow, with pebbles and cobbles	8	8
Boulders, partially decomposed	6	14
Clay, yellow, white, and brown	10	24
Troutdale Formation:		
Sandstone	14	38
Gravel, cemented(?)	83	121
Casing: 6-in. to 67 ft.		

2/3-7M1. Howard Eckert. Drilled by O. E. Jannsen, 1957

Piedmont deposits:		
Clay, yellow and brown	12	12
Clay, brown, with partially decomposed rock	6	18
Clay, brown, sandy	10	28
Troutdale Formation:		
Gravel, cemented, hard and soft layers	54	82
Shale, red, hard	13	95
Gravel, cemented, hard and soft layers	30	125
Sand, fine, loosely cemented, brown	23	148
Shale, gray	7	155
Shale, sandy, gray, water-bearing	13	168
Gravel, cemented, water-bearing	3	171
Shale, brown	3	174
Casing: 6-in. to 164 ft.		

2/3-11D1. Carl France. Drilled by C. E. Hamblet, 1956

Piedmont deposits:		
Clay and boulders	40	40
Troutdale Formation:		
Gravel, cemented	44	84
Clay, blue and brown	31	115
Gravel	48	163
Sandy River Mudstone:		
Clay, blue	19	182
Quicksand	23	205
Clay, blue	120	325
Quicksand	20	345

Table 2.--Drillers' logs of representative wells--Continued

Materials	Thickness (feet)	Depth (feet)
Sandy River Mudstone:--Continued		
Clay, blue	25	370
Quicksand	10	380
Casing: 6-in.; perforated from 70 to 80 ft; bottom part of well backfilled with cement.		
2/3-11E1. Gerald Meyer. Drilled by A. L. Zeising, 1940		
Piedmont deposits:		
Clay	35	35
Troutdale Formation:		
Gravel	8	43
Sand, cemented	3	46
Gravel, cemented	4	50
Gravel and boulders	30	80
Sand, cemented	49	129
Clay, yellow and blue	33	162
Sand and gravel	17	179
Casing: 8-in. to 179 ft; perforated from 164 to 174 ft.		
2/3-14L1. Salvation Army. Drilled by A. M. Jannsen Drilling Co., 1948		
Soil	3	3
Gravel and boulders	6	9
Sandy River Mudstone:		
Shale, blue	71	80
Shale, brown	40	120
Quicksand	40	160
Clay, blue	377	537
Clay, brown, layers of shale	38	575
Columbia River Basalt:		
Rock, water-bearing	25	600
Casing: 8-in. to 572 ft.		
2/3-15D1. Abraham Bialostosky. Drilled by Haakon I. Bottner Drilling Co., 1954		
Boring Lava:		
Soil	21	21
Basalt	24	45
Troutdale Formation:		
Sandstone	205	250
Gravel	15	265
Sandy River Mudstone:		
Clay	105	370
Boring Lava (sill?):		
Basalt, water-bearing at 400 ft	30	400
Casing: 12-in. to 40 ft, 6-in. to 370 ft.		

Table 2.--Drillers' logs of representative wells--Continued

2/3-16R1. P. L. Lenz. Drilled by Steinman Bros. Drilling Co., 1957

Materials	Thickness (feet)	Depth (feet)
Younger terrace deposits:		
Gravel and boulders	11	11
Sandy River Mudstone:		
"Soapstone," yellow (clay?)	3	14
Clay, silty, blue and gray	26	40
Clay, sticky, blue	4	44
Clay, sandy, gray	17	61
Clay, sticky, blue	59	120
Clay, sandy, blue	9	129
"Quicksand"	6	135
Clay, sandy, blue	23	158
Sand and shale, green, with wood fragments	2	160
Sand, gray, compacted, water-bearing	60	220
"Quicksand"	8	228
Shale, blue	54	282
Casing: 6-in. to 241 ft; perforations unknown.		

2/3-23B1. Barton Baptist Church. Drilled by O. E. Jannsen, 1956

Younger terrace deposits:		
Gravel and clay	5	5
Gravel, coarse	22	27
Gravel and sand	5	32
Sandy River Mudstone:		
Shale, blue-green	58	90
Sand, fine, water-bearing	3	93
Shale, blue, sticky	6	99
Shale, green, sandy	10	109
Shale, dark-gray, sandy	7	116
Shale, blue-green, sticky	13	129
Sand, fine, water-bearing	1	130
Shale, gray, sandy	5	135
Casing: 6-in. to 120 ft.		

2/3-23B2. Victor Foreman. Drilled by Steinman Bros. Drilling Co., 1949

Younger terrace deposits:		
Gravel, coarse, and boulders	28	28
Sandy River Mudstone:		
Clay	57	85
Clay and shale streaks, some water	5	90
Clay	10	100
Casing: 8-in. to 36 ft.		

Table 2.--Drillers' logs of representative wells--Continued

2/3-24E1. Erl Odell. Drilled by Steinman Bros. Drilling Co., 1951

Materials	Thickness (feet)	Depth (feet)
Younger terrace deposits:		
Soil	3	3
Gravel	27	30
Gravel, water-bearing	4	34
Sandy River Mudstone:		
Clay	3	37
Casing: 6-in. to 34 ft.		

2/4-5P1. L. H. Morrie. Drilled by C. E. Hamblet, 1957

Piedmont deposits:		
Clay	12	12
Troutdale Formation:		
Gravel, cemented, bouldery	93	105
Clay, brown	5	110
Gravel, water-bearing	10	120
Casing: 6-in.		

2/4-8A1. E. J. Campbell. Drilled by Steinman Bros. Drilling Co., 1940

Piedmont deposits:		
Clay	10	10
Troutdale Formation:		
Gravel, cemented	35	45
Clay, sandy	15	60
Gravel, cemented	8	68
Sand, packed	22	90
Gravel, sandy, cemented, water-bearing	22	112
Clay	7	119
Casing: 6-in. to 117 ft.		

2/4-9C1. F. G. Logus. Drilled by C. E. Hamblet, 1957

Piedmont deposits:		
Clay	25	25
Troutdale Formation:		
Gravel, cemented, with boulders	30	55
Gravel, cemented	45	100
Clay	5	105
Gravel, cemented, water-bearing	25	130
Clay	7	137
Casing: 6-in. to unknown depth; perforated from 55 to 65 ft.		

Table 2.--Drillers' logs of representative wells--Continued

2/4-18R1. Schedeen Bros. Drilled by Steinman Bros. Drilling Co., 1947

Materials	Thickness (feet)	Depth (feet)
Troutdale Formation:		
Gravel and boulders	18	18
Sandy River Mudstone:		
Clay, sandy, yellow	80	98
Clay, blue	7	105
Clay, sandy, yellow	50	155
Clay, soft, blue and brown	275	430
Sandy River(?) Mudstone:		
Rock, soft, chocolate-colored	30	460
Rock, red, water-bearing from 555-558 ft	130	590
Clay, brown and yellow	77	667
Clay, red	13	680
Clay, yellow	23	703
Rock, gray	3	706
Clay, gritty, blue	2	708
Columbia River Basalt:		
Rock, gray, cubic-fracture	20	728
Rock, red, soft	12	740
Rock, soft, black	5	745
Rock, gray, hard and soft, water-bearing at 750 ft	69	814
Rock, black, "honeycomb"	50	864
Shale, soft, green	2	866
Rock, blue, "honeycomb"	38	904
Casing: 8-in. to 272 ft; 6-in. to 743 ft.		

2/4-21J1. Hudson-Duncan Co. Drilled by A. M. Jannsen Drilling Co., 1952

Piedmont deposits and Troutdale Formation, undifferentiated:		
Gravel and sand	160	160
"Claystone"	5	165
Gravel, water-bearing (10 gpm±) with swl at 162 ft	2	167
Sandy River Mudstone:		
Claystone	718	885
Columbia River Basalt:		
Basalt, water-bearing	445	1,330
Casing: 16-in. to 160 ft, 6-in. from 0 to 476 ft; no seal in annular space between casings.		

2/4-28F2. Virgil Nelson. Drilled by Steinman Bros. Drilling Co., 1949

Troutdale Formation:		
Clay, sandy	40	40
Gravel and sand, cemented, water-bearing	67	107
Gravel and sand, loose, water-bearing	3	110
Casing: 6-in. to 110 ft; perforations unknown.		

Table 2.--Drillers' logs of representative wells--Continued

2/4-30G1. Elza Anderson. Drilled by Steinman Bros. Drilling Co., 1950

Materials	Thickness (feet)	Depth (feet)
Younger terrace deposits:		
Gravel, coarse, with boulders	25	25
Gravel, loose, water-bearing	11	36
Gravel, more consolidated than above	9	45
Sandy River Mudstone:		
Clay, blue, soft	1	46
Casing: 6-in. to 45 ft; perforations unknown.		

Table 3.--Chemical analyses of water from wells in the East Portland area, Oregon

/For consistency of presentation, analytical results from other laboratories have been rounded to conform with reporting standards of the Geological Survey/

Well number	Water-bearing material[1/]	Date of collection	Temperature (°F)	Constituents in parts per million (ppm): Silica (SiO_2)	Iron (Fe) Total	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Total dissolved solids: Residue on evaporation at 130°C	Hardness as $CaCO_3$: Total	Hardness as $CaCO_3$: Noncarbonate	Percent sodium	Specific conductance (micromhos at 25°C)	pH	Laboratory[2/]
1N/1-4K1	Sand, gravel	5-10-43	--	43	0.05	--	34	12	11		117	--	15	14	0.3	--	--	272	135	39	--	--	--	CL
1N/2-22Q1	Gravel	3- 9-55	--	45	.10	0	19	8.6	8	2	--	--	8.5	7	0	--	--	195	83	--	--	--	7.1	OBH
1N/2-26R1	Sand, gravel	4-22-58	52	64	.09	.00	16	7.8	7.2	1.2	101	0	4.1	2	.1	0.0	--	151	72	0	18	167	7.2	USGS
1N/3-21G1	Gravel	6- 7-54	--	54	.01	.00	39	16	26	5.2	231	0	20	9	.5	1.2	--	281	163	0	25	423	7.4	Do
1N/3-23B1	Gravel, sand	do	63	57	.08	.00	56	4.4	79	7.2	132	0	7.8	156	.3	.4	--	454	158	50	--	726	7.8	Do
1N/3-23H1	Gravel	do	54	59	.03	.14	21	3.5	11	2.2	87	0	4.8	11	.2	1.0	0.03	152	67	0	25	184	--	Do
1N/3-23K1	Sand, gravel	9- 2-52	--	--	--	--	--	--	--	--	--	--	--	6	--	--	--	153	34	--	--	--	8.0	RM
1N/3-26N1	Gravel, cemented	2- 2-58	54	40	.02	.01	15	10	7	2.0	106	0	1.6	2.2	.1	3.3	.02	130	78	0	--	182	7.9	USGS
1N/3-34D1	Gravel	5- 5-58	60	40	1.8	.10	11	11	11	2.2	115	0	3.3	2	.1	.0	--	155	73	0	24	182	7.9	Do
1/1-11H1	Sand,gravel	11-28-29	56	45	.06	--	15	10	8.2	3.0	118	0	4.4	2.2	--	.0	--	141	78	--	--	--	--	Do
1/2-3E1	Gravel	6-11-54	52	58	.06	--	18	7.3	4.4	3.4	54	0	14	7	.1	15	--	159	75	31	11	168	6.5	Do
1/3-10B1	Sand, gravel	do	55	41	.07	.01	18	12	9.2	2.1	122	0	4.4	4	.1	.0	.15	149	94	0	17	201	7.2	Do
1/3-29F1	Basalt	5- 5-58	54	52	.14	--	16	14	9.5	1.3	136	0	1.2	3.2	.1	.0	--	155	98	0	17	196	7.8	Do
1/4-10D1	do	2- 9-56	74	60	.06	--	5.2	.2	100	9.6	114	5	1.2	92	3.2	.5	.38	326	14	0	--	517	8.6	Do
2/2-20F1	do	2-28-50	62	53	--	--	42	--	--	--	116	--	--	144	--	--	--	452	106	--	--	--	7.6	CL
Do	do	7-26-50	--	53	.07	.05	35	6.2	87		122	--	.3	149	.6	--	--	480	114	--	--	--	7.8	Do
Do	do	6-23-53	--	49	.40	.01	37	12	63		114	--	4.0	137	.4	--	--	409	144	--	--	--	7.8	Do
2/2-20K1	do	3-17-52	--	24	.13	.0	34	5.3	82		116	--	.4	136	.4	--	--	418	107	--	--	--	7.7	Do
Do	do	6- 9-53	--	50	.43	.05	54	15	96		116	--	4.6	225	.4	--	--	589	195	--	--	--	7.7	Do
2/3-5N1	do	5- 5-58	54	60	.10	--	9.5	6.4	7.0	0.7	70	0	.6	4.0	.1	3.5	.20	126	50	0	23	124	7.7	USGS

1/ See table 1 for unit designation.

2/ CL, Charlton Laboratories, Portland, Oreg.; OBH, Oregon State Board of Health; RM, Reynolds Metals Co., Troutdale, Oreg.; USGS, U. S. Geological Survey.

Table 4.--Representative springs in the East Portland area, Oregon

Topographic situation and altitude: cm, canyon of minor stream; cw, canyon wall; hs, hillside; s, slope; sc, spring cirque; te, terrace escarpment. Altitudes are in feet above mean sea level.

Geologic source: Tt, Troutdale Formation; QTv, Boring Lava; Qp, piedmont deposits: Qal, younger alluvium.

Use of water: D, domestic; Irr, irrigation; N, none; PS, public supply; S, stock.

Spring number	Owner	Topographic situation and altitude	Geologic source	Mode of discharge	Use of water	Remarks
			T. 1 N., R. 2 E.			
23D1s	--	te, 25	Qal	Issues from gravel beds at the water table	N	Flowed 700 gpm in 1959; reportedly varies with river stage. Hardness of water reportedly 63 ppm. One of several springs that flow into river sloughs.
			T. 1 N., R. 3 E.			
20N1s	T. V. Parkin	sc, 25	Qal	--	D	Water retained in concrete cistern.
26G1s	Mr. Stromboli	s, 60	Tt	Issues from soil overlying Troutdale Formation on gentle slope	D, S	Water retained by covered concrete cistern over spring opening, and piped to 3 homes. Flowed 135 gpm Feb. 12, 1957.
26H2s	Spence Estate	sc, te, 50	Tt	Flows from bouldery rubble at bottom of spring cirque	Irr	Concrete curbing and covered box divert part of flow into 6-in. pipe. Flowed 335 gpm Feb. 12, 1957. Typical of many springs on edge of flood plain.
26H3s	Mr. Wilson	sc, te, 50	Tt	do	D	Water impounded by concrete dam about 3 ft high; overflow spills into a concrete stilling basin about 5 ft square, from which part is pumped; remainder spills into natural surface channels. Flowed 220 gpm Feb. 12, 1957.
26H4s	--	sc, te, 50	Tt	Issues from culvert driven into head of cirque-shaped depression	N	Flowed 5 gpm Feb. 12, 1957.
26H5s	--	sc, te, 50	Tt	Issues from and around culvert pipe under railroad fill	Irr	Railroad fill covers spring orifice. Flowed 60 gpm Feb. 12, 1957.

Table 4.--Representative springs in the East Portland area, Oregon--Continued

Spring number	Owner	Topographic situation and altitude	Geologic source	Mode of discharge	Use of water	Remarks
			T. 1 N., R. 3 E.--Continued			
34A2s	Wood Village (Arata Spring)	te, 250	Tt	Issues from soil near base of terrace scarp	P, S	Water retained in 32x13 ft concrete reservoir.
35D1s	Multnomah County	te, 250	Tt	Flows from gravel bed through 3 outlets along 1,000-ft length of terrace scarp	D, Irr	Flowed 50 gpm in 1937. Water temperature 58°F.
			T. 1 S., R. 2 E.			
25P1s	A. Guidi	hs, 650	QTv	Issues from soil mantle	D	Water retained in concrete cistern; supplies 10 families.
			T. 1 S., R. 3 E.			
12C1s	Lawrence Plum	cm, 275	Tt	Issues from rubbly mantle on canyon wall	D	Spring is enlarged by a dug hole 4x4x12 ft, enclosed in small concrete building. Flows about 3 gpm.
21B1s	C. VanZyl	cm, 690	QTv	Issues from soil and rubble overlying basalt	D	Water retained in small reservoir; supplies 2 families.
21G1s	R. R. Sherwood	cm, 700	QTv	--	D	Water retained in cistern.
21M1s	Mr. Imel	hs, 575	QTv	--	D	Water flows up into concrete cistern and is stored in 2 tanks having a combined capacity of 5,000 gallons. Flows 6 to 10 gpm; supplies 9 families.
28C1s	John Furst	hs, 775	QTv	Issues from platey joint openings	D	Water retained in concrete cistern; half-inch pipe flows full continuously.
28L1s	Fred Borges	hs, 750	QTv	Issues from soil mantle	D, S	
35L1s	R. Taylor	hs, 630	Colluvium and Qp	Seeps from soil on mantle slope	D	Improved by dug hole, 4 ft in diameter and 19 ft deep. Water hardness 54 ppm, chloride 5 ppm, and specific conductance 140.

Table 4.--Representative springs in the East Portland area, Oregon--Continued

Spring number	Owner	Topographic situation and altitude	Geologic source	Mode of discharge	Use of water	Remarks
			T. 1 S., R. 4 E.			
6Q1s	W. Wilson	te, 288	Tt	Seeps from soil	D	Water retained in brick cistern. Flowed 3 gpm Aug. 12, 1955.
22E1s	--	sc, 658	Qp	--	N	This spring is the source of a small stream.
22J1s	--	cw, 675	Qp	Seeps from soil on slope	S	Flowed 2± gpm Aug. 12, 1955.
25D1s	--	cw, 510	Qp	Issues from bouldery clay	N	Flowed 5 gpm Aug. 12, 1955.
36C1s	J. V. Carlson	te, 625	Qp	--	D	Water retained in 5,000-gallon concrete tank.
			T. 2 S., R. 2 E.			
3N1s	Andrew Teener	hs, 325	QTv	--	D	
11H1s	Sam Ackley	te, 210	QTv	Issues from rocky soil overlying Boring Lava	D, Irr	Enclosed by spring house.
			T. 2 S., R. 3 E.			
10P2s	W. G. Wiley	hs, 680	QTv	--	D	Water retained in 6x6x4 ft cistern. Yield is sometimes inadequate for domestic supply.
18H1s	Mrs. Heald	cw, 280	QTv	--	D	Water retained in concrete cistern of about 5,000-gallon capacity; supplies 2 families.
			T. 2 S., R. 4 E.			
1C1s	H. A. Bess	cw, 380	Tt	Seeps from gravelly soil mantle	D	Water is drawn from 34-in. tile sunk in hillside. Flows about 5 gpm, sufficient to keep half-inch pipe full continuously.

Table 5.--Rock units penetrated by wells in the East Portland area, and their water-bearing characteristics[1/]

Rock unit	Type of material	Thickness	Area(s) of occurrence	Water-bearing character
Younger alluvium	Gravel, sand, silt, and clay, rudely stratified. Mostly well sorted beneath the flood plains of larger rivers; less sorted near smaller streams.	A few ft near small streams; 20-30 ft along Clackamas and Sandy Rivers; 75-100 ft along Willamette R., as much as 200 ft along Columbia R.	Flood plains of perennial streams.	Layers of well-sorted gravel and sand yield large amounts of water to wells; less sorted and finer materials yield smaller amounts.
Alluvium of abandoned river channel	Principally silt and clay.	Commonly less than 50 ft but locally more than 100 ft.	The floor of a broad valley near the southern and western edges of the Portland terraces subarea; extends 12 miles northwest from the Clackamas R. near Clackamas to the Willamette R. near Ross Island Bridge.	Largely non-water bearing or yields only small amounts of water to wells.
Younger terrace deposits	Bouldery gravel, sand, silt, and clay, poorly sorted. Includes mudflow deposits in Sandy R. canyon.	Generally 5-50 ft.	Terraces at intermediate levels in the canyons of Clackamas and Sandy Rivers; terraces on and southwest of Oatfield Heights.	Permeability mostly low, but yields small amounts of perched ground water to some wells. On many of the small terraces, small bodies of ground water build up during the wetter seasons and drain away rapidly during the drier seasons.
Fluviolacustrine deposits	Unconsolidated gravel, sand, silt, and clay, rudely stratified. Generally bouldery and coarser grained to the east and progressively finer grained to the west, but contains some gravel layers throughout most of its area.	Generally less than 100 ft, but locally may be as great as 150 ft.	Broad terraces throughout most of the Portland terraces subarea.	Gravel and sand beds are permeable but are mostly above the regional water table. Where the permeable beds are saturated they yield moderate to large amounts of water to wells.
Piedmont deposits	Mostly silt and clay, but includes some sand, gravel, and mudflow deposits.	Generally less than 100 ft.	Most of the Kelso Slope subarea; floors of large valleys in the Boring Hills subarea.	Generally non-water bearing or yields only small amounts of perched ground water to wells and springs.
Boring Lava	Mostly gray massive basaltic lava; lesser amounts of volcanic cinders. The lava is mostly in flow layers but also occurs as sills and dikes.	Ranges from 5 to about 800 ft.	Underlies most of the Boring Hills subarea, where it forms the major hills; caps the southeast end of Oatfield Heights and isolated hills in the Portland terraces subarea. Small isolated bodies of lava occur along canyon of Sandy River and probably elsewhere beneath the area.	Almost entirely above the regional water table and yields only small to moderate amounts of perched ground water to wells and springs. Some of the springs flow only intermittently, and some wells fail during dry periods.
Troutdale Formation	Unconsolidated and partly consolidated gravel, sand, silt, and clay, commonly in the form of well-indurated sandy conglomerate.	Generally more than 100 and locally more than 800 ft.	Throughout, except Oatfield Heights subarea; overlain by Boring Lava or younger deposits except in hills and along stream canyons.	Layers of loose sand and gravel below the regional water table yield moderate to large amounts of water to wells and springs; similar beds above the regional water table yield smaller, less dependable supplies of perched ground water.

1/ After G. M. Hogenson, 1962.

Table 5.--Rock units penetrated by wells in the East Portland area, and their water-bearing characteristics[1/]--Continued

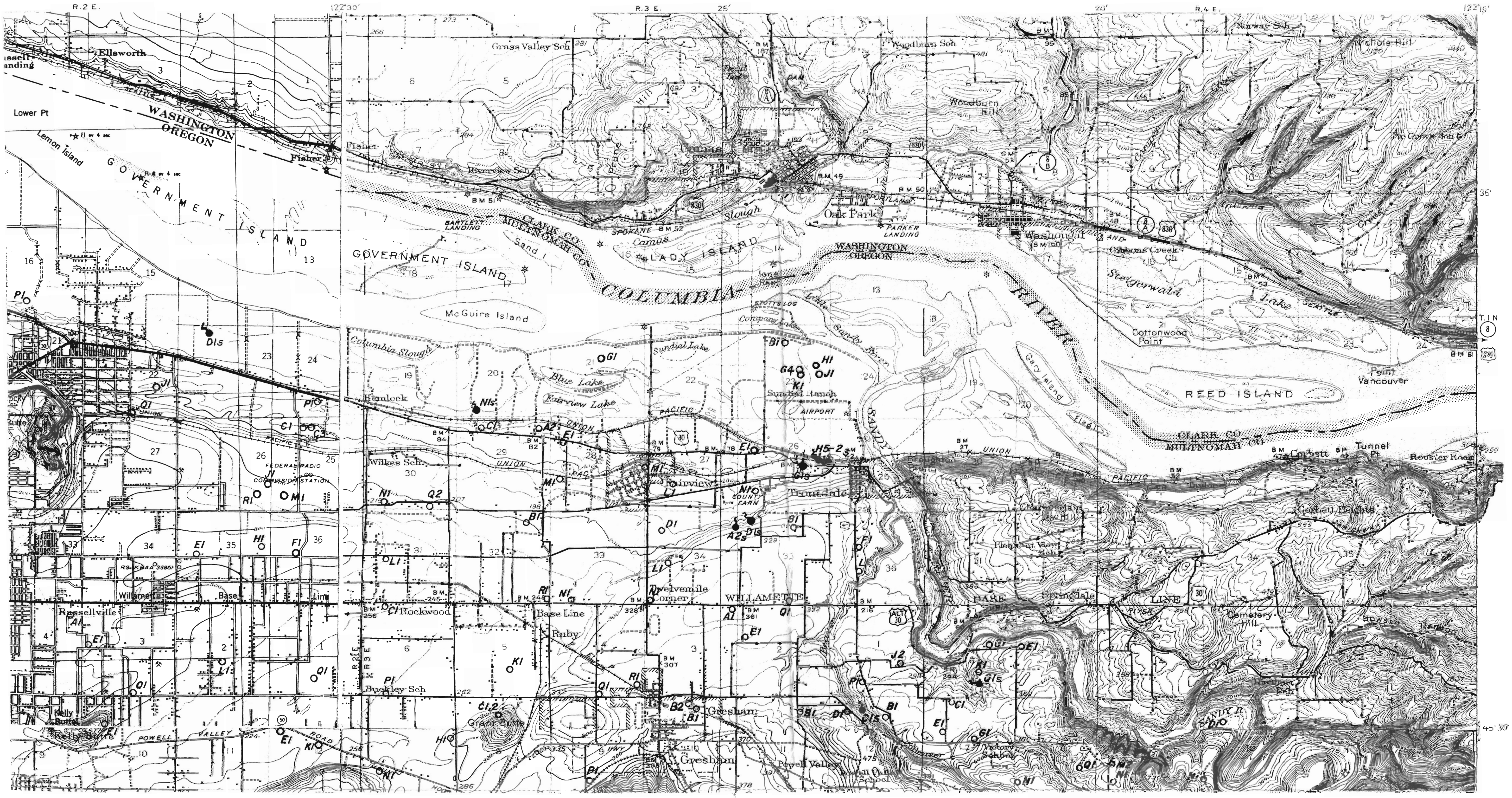
Rock unit	Type of material	Thickness	Area(s) of occurrence	Water-bearing character
Sandy River Mudstone	Principally mudstone, claystone, and partly consolidated silt and clay, but includes minor beds of sand and gravel.	Ranges from a few hundred to more than 1,000 ft.	Throughout (at depth), except Oatfield Heights subarea and Fairview-Troutdale district; exposed only in canyons of Clackamas and Sandy Rivers bordering Kelso Slope subarea.	Generally tight and non-water bearing, but a few wells obtain small amounts of water from thin layers of sand and gravel.
Columbia River Basalt	Dark basalt in accordantly layered flows that range from about 10 to 150 ft thick.	Ranges from 100 ft or less to more than 800 ft.	Throughout (at depth), except may be missing locally in Fairview-Troutdale district; exposed only in and near Oatfield Heights subarea.	Permeable zones at contacts between some flow layers yield moderate to large amounts of water to wells that penetrate the basalt below the regional water table, and lesser amounts of perched ground water to wells and springs above the regional water table.
Older rocks	Fine-grained marine sedimentary rocks; volcanic and pyroclastic rocks of andesitic composition.	Unknown.	Throughout, at depth; not exposed in the area. Encountered by deep wells at Gladstone and Fairview.	Penetrated by few wells; does not yield appreciable amounts of water. Locally contains water of inferior chemical quality.

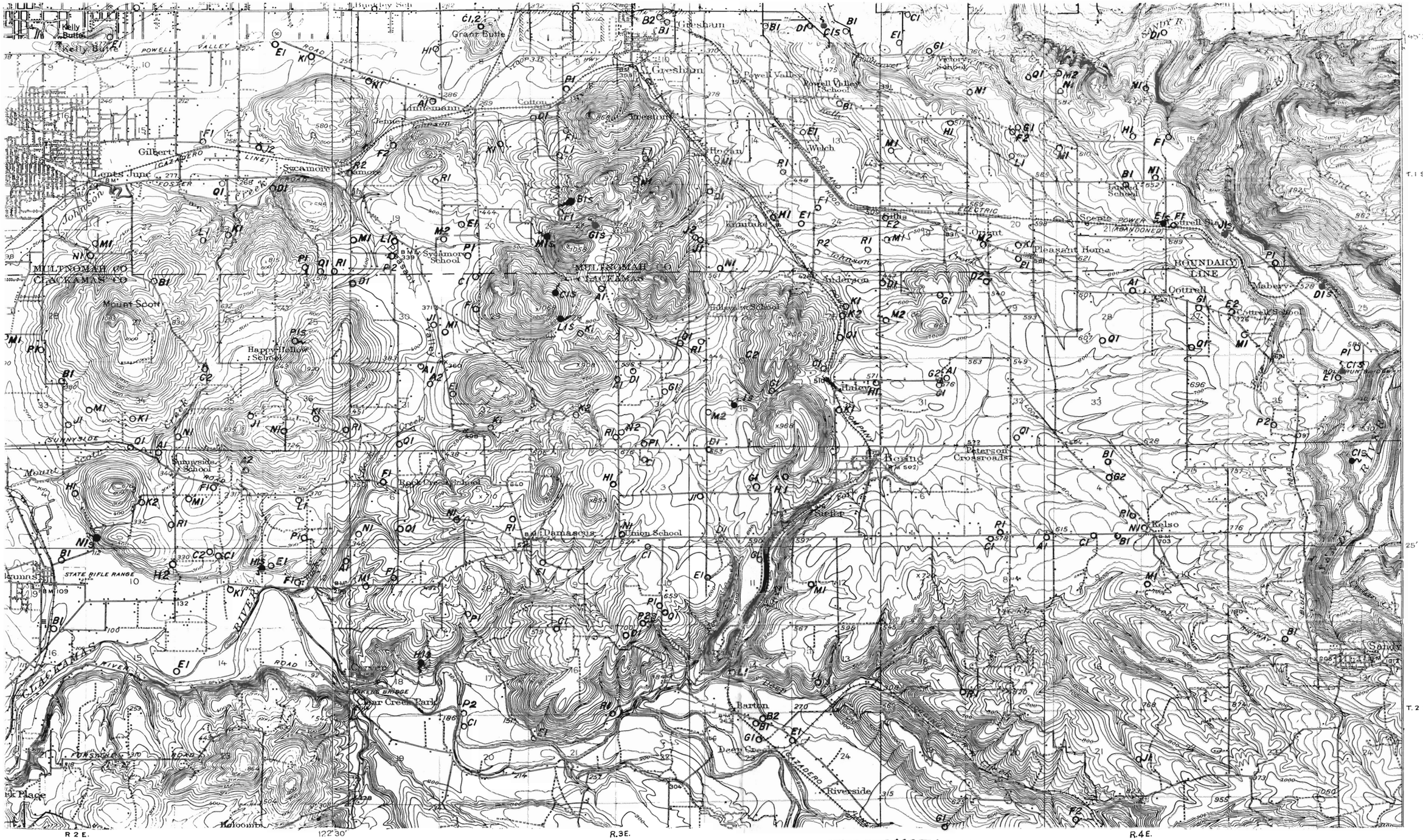
1/ After J. M. Hogenson, 1962.

MAP OF THE EAST PORTLAND AREA, OREGON

PLATE I

Showing the locations of representative wells and springs





½ Miles

Yards

APPROXIMATE MEAN DECLINATION 1905.

EXPLANATION

Well

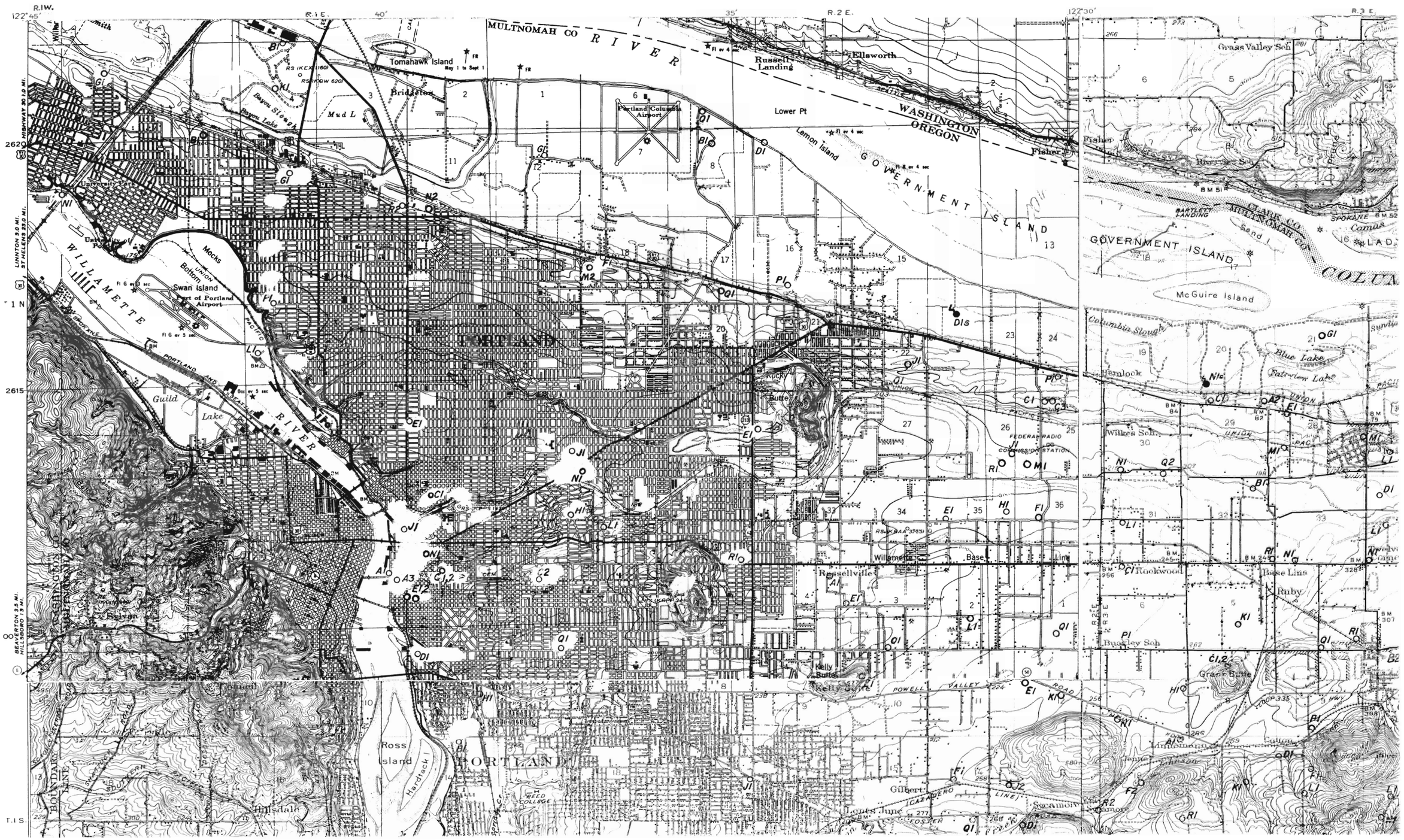
Spring

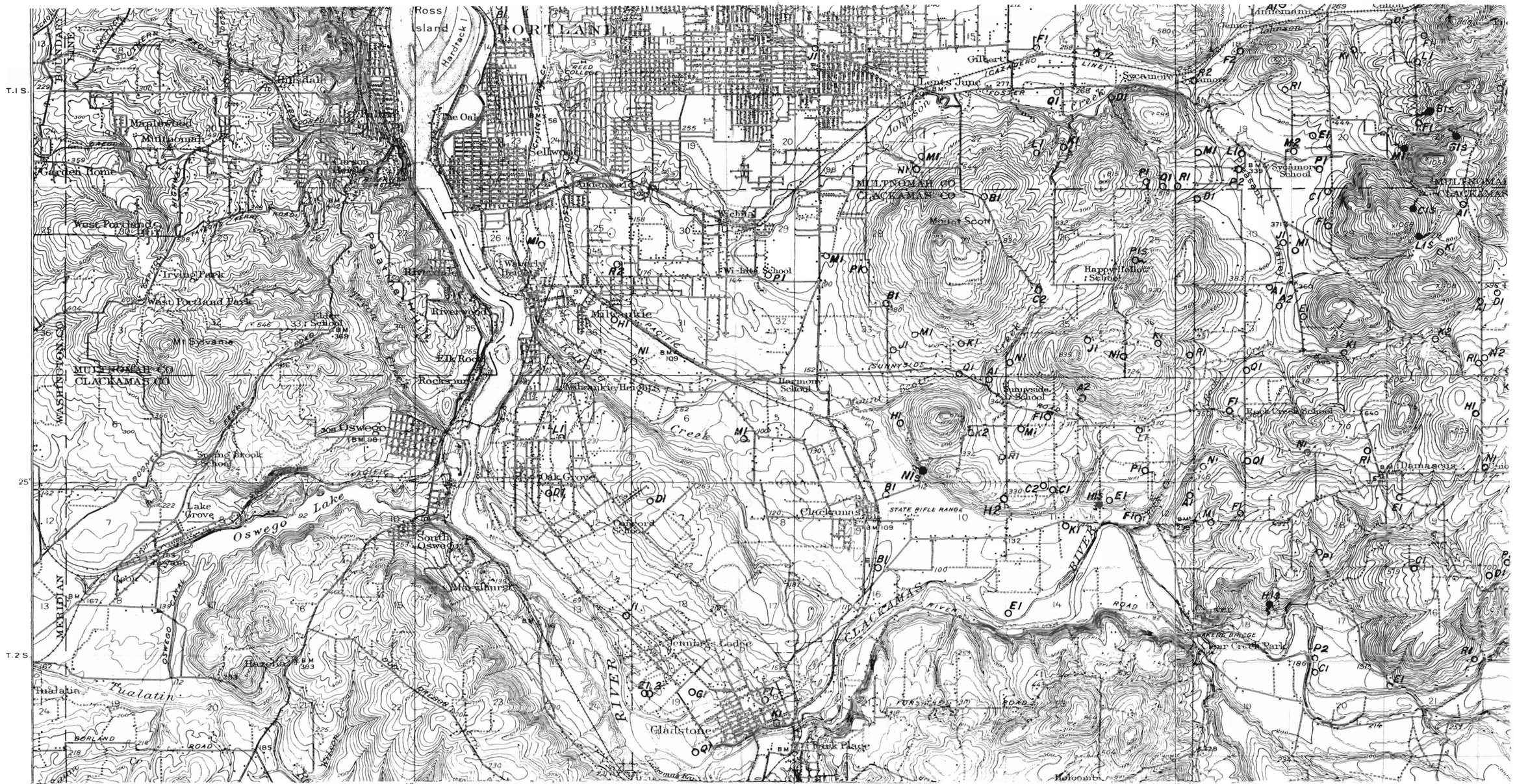
Numbering system described in text

G.M. Hogenson
December 1959

MAP OF THE EAST PO

Showing the locations of repres





Base from Geological Survey
Boring, Camas, Oregon City,
and Portland quadrangles

Scale

1 0 1 2 3 4 Miles

1000 500 0 1000 2000 3000 4000 5000 6000 7000 Yards

1000 0 3000 6000 9000 12000 15000 21000 Feet

1 5 0 1 2 3 4 5 Kilometers

Contour interval 25 feet

Datum is mean sea level

21°

TRUE NORTH

MAGNETIC NORTH

APPROXIMATE MEAN DECLINATION 1905