STATE OF WASHINGTON
Daniel J. Evans, Governor

DEPARTMENT OF ECOLOGY
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WATER-SUPPLY BULLETIN 34

Water in The Okanogan River Basin, Washington

By
KENNETH L. WALTERS

Prepared in Cooperation With
U. S. Geological Survey
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By Kenneth L. Walters

INTRODUCTION

Water plays a major role in the Okanogan River basin. With sufficient water, the fertile soil yields bountiful crops of apples and other fruits, hay and pasture grasses, vegetables, and cereal grains. Dryland farming accounts for most of the grain acreage, but irrigation contributes substantially to the production of other major crops. Irrigation is the most important water use; other water uses include those for domestic and light-industry supplies and for recreational purposes.

The Okanogan River originates in British Columbia and flows southward into north-central Washington. Most of the area drained by the Okanogan River is in British Columbia. The headwaters of the Similkameen River, which is the principal tributary of the Okanogan River, has two tributaries (the Pasayten and Ashnola Rivers) that drain an area of about 300 square miles in northwestern Okanogan County and flow northward into British Columbia before returning to Washington. Because almost no hydrologic data are available on this headwaters area, it was not included in this study and the amount of water that originates there is included in the amount that enters the State from British Columbia. The area in Washington that is the subject of this report covers about 2,300 square miles in central Okanogan County.

Existing records of hydrologic conditions provide considerable information on water resources and use in the basin. Those records, however, have been compiled over the years in differing tabulations by several agencies with various approaches and goals, and therefore constitute raw data scattered among several sources. For example, localized water-resources inventories of differing completeness preceded the construction of some of the later irrigation systems, yet such information does not in itself provide an adequate base to plan for the most beneficial water uses or to meet the growing water problems throughout the entire basin. Also, data are not included on a suspended-sediment study now (1971) being conducted on streams in the basin; the data have not been collected in sufficient detail to warrant inclusion in this report. This present report, then, gathers, summarizes, and interprets the water information now (1971) available for use in developing, protecting, and managing the area's water resources.

During the study that led to this report, existing data were interpreted on the bases of (a) the amount of water available, (b) the quality or usability of the water, and (c) the frequency of seasonal water shortages or surpluses.

This report comprises three parts. Part A presents basinwide information as either a self-contained generalized report or an introduction and summary of Parts B and C; Part B gives technical information on the hydrology of specific parts of the basin, and Part C presents basic hydrologic data collected throughout the basin since the early 1900's. Part A contains certain estimated values without qualification or substantiation; however, Parts B and C include the basic data and the interpretations and assumptions used to make the estimates. The three-part format presents the broad overview information first in readily grasped terms, avoiding technical details that might not interest the lay reader. However, the second and third parts relate the details that lend credence to the conclusions and form the framework for sound water-resources planning and management.

The U.S. Geological Survey prepared the report as part of a program of studies in cooperation with the State of Washington Department of Ecology. The studies provide scientific information the Department of Ecology needs to protect and manage water resources in Washington State.

Part A

GENERAL HYDROLOGIC CONDITIONS

PART A: GENERAL HYDROLOGIC CONDITIONS

PHYSICAL AND CULTURAL FEATURES

The Basin and Its History—In Brief

The part of the Okanogan River basin in Washington included in the study area extends north and south in Okanogan County, from the Canadian border to the Columbia River, and encompasses about 2,300 square miles (fig. A1). The remainder of the basin, about 6,000 square miles in the Canadian province of British Columbia and about 300 square miles drained by the Pasayten and Ashnola Rivers in northwestern Okanogan County, has a dominating influence on the hydrology of the study area in Washington. The Okanogan River itself flows through Osoyoos Lake, which extends across the international boundary, and continues southward to empty into the Columbia River near Brewster. However, an even greater inflow from Canada is from the Okanogan's major tributary, Similkameen River. The Similkameen crosses the border west of the Okanogan and enters the main stream near the south end of Osoyoos Lake.

Aboriginal Indians, mostly of the Colville Nation, hunted and fished in the basin for generations. The name Okanogan is derived from an Indian word, "okinikane," equivalent to the English word "rendezvous." Each autumn, to replenish their game and fish supplies for the winter, the Indians met at a large lake that forms the head of the river in Canada. This annual gathering gave the lake, and hence the river, its name.

Early in the 19th century, non-Indian settlers began arriving, centering around cavalry and fur-trading posts. Trappers and prospectors spent most of their time in the high country, where water was generally available for their pursuits. The first permanent settlers engaged mainly in cattle and sheep grazing. They found enough water to preclude major range squabbles over watering places. After railroads penetrated the area, lumbering became a significant industry.

The mining industry in Washington began about 1860 in what is now Okanogan County. Rich silver strikes in the 1880's near Conconully (then named Salmon City) drew many prospectors and miners, and the town of Ruby grew on the banks of Salmon Creek 7 miles southeast of Conconully. Ruby flourished, served briefly as the first county seat, became the first incorporated town in the county, and then withered and died after the drastic drop in silver prices in 1892 and the severe panic and financial depression of 1893. Hardly any trace of the once-lively town remains. As more and more mining operations shut down, residents moved from the area or turned to ranching.

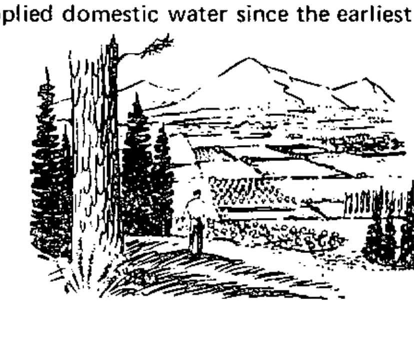
Some early pioneers recognized that the rich soil and relatively mild climate in lowland areas would support fruit growing, if water were added to the land. About 1857, a squatter established the first orchards. Hiram F. "Okanogan" Smith brought tree sprouts from the Pacific Coast and planted 24 acres of apples, 8 acres of peaches and pears, and 3 acres of grapes near the south end of Osoyoos Lake. A ditch above the east shore of the lake carried water from Ninemile Creek (fig. A1) to Smith's orchards, and both fruit growing and irrigation became institutions in the basin.

Pioneer ventures to use the water resources were rare, however, until just before the turn of the century. Except for minor diversions to support mining operations, streams flowed virtually uninterrupted, and natural conditions remained virtually unmodified. Perhaps the most notable exception was a successful project by Dr. J. I. Pogue. A 3½-mile ditch, opened in 1888, brought water from Salmon Creek to irrigate his orchards on Pogue Flat, just north of Omak.

As mining dwindled and livestock raising increased, hay became a valuable commodity. Because irrigated lands produced heavy crops of good-quality hay, the number of diversions and irrigated acreage increased. Overappropriation of the normal flow in Salmon Creek soon caused water shortages near the end of each growing season. To alleviate the situation and help perpetuate their water supply, many of the original appropriators from Salmon Creek formed the Conconully Lake Reservoir Company in 1897. The new corporation developed a rudimentary distribution system and dammed the outlet of Salmon Lake, now called Conconully Lake, to store water for low-flow periods.

The U.S. Reclamation Act of 1902 held the possibility of a Federal project, to provide additional storage and extend the acreage under irrigation. Early attempts to gain acceptance by the Department of the Interior failed, but 3 years of persistent effort won approval of the Okanogan project late in 1905. Construction under the initial authorization began in 1906 and culminated in 1910 with completion of Conconully Dam and Reservoir a short distance downstream from Conconully Lake. In 1921, an improved dam on Conconully Lake resulted in increased storage. The Okanogan Project, with the two dams and reservoirs, and associated diversionary canals and distribution systems—one of the earliest ventures by the Bureau of Reclamation in the Northwest—proved the value of irrigating these semiarid lands and set a pattern for similar projects. Subsequent expansion of the original project has since supplied water to additional acres.

These first extensive irrigation systems increased crop yields and land values. The success of the systems, which diverted stream water, prompted additional diversions and the enlargement of the original systems. Although wells have supplied domestic water since the earliest settlements,



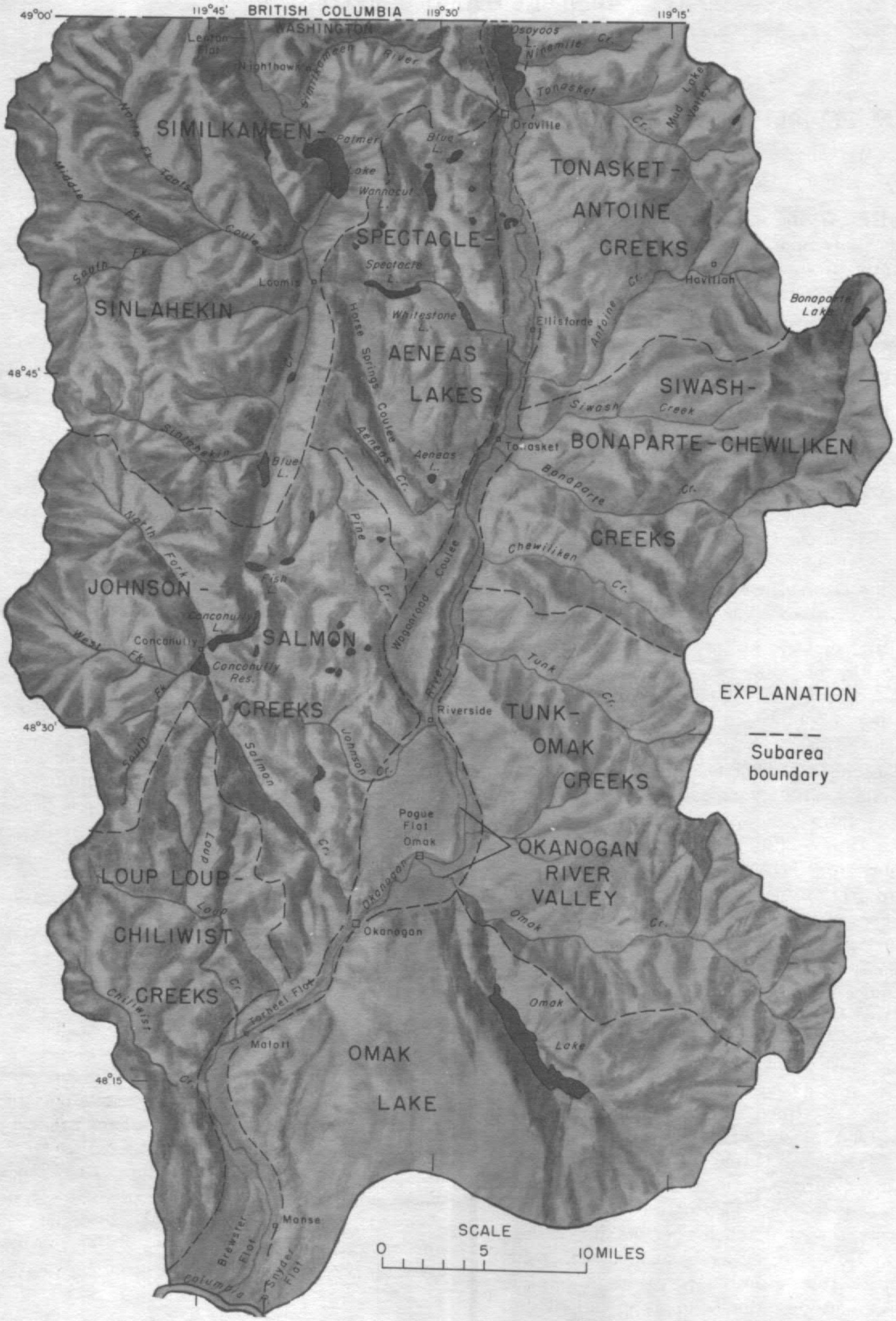


FIGURE A1. Okanogan River basin and hydrologic subareas.

ground-water use for large-scale projects such as irrigation awaited the development of suitable pumps and pump motors. Even then, such use occurred only where surface-water supplies were inadequate or diversion was impractical.

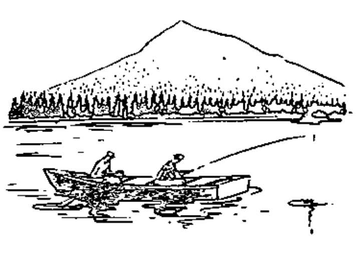
Enloe Dam and an accompanying hydroelectric power-plant were constructed in 1920 on the Similkameen River about 3 miles northwest of Oroville by the Okanogan Valley Power Company. This power-generating facility was used until 1958 when its operation became economically unfeasible. A report by Nelson (1972) discusses the possible sedimentation effects downstream if the dam were removed to permit more unrestricted migration of fish up the Similkameen River.

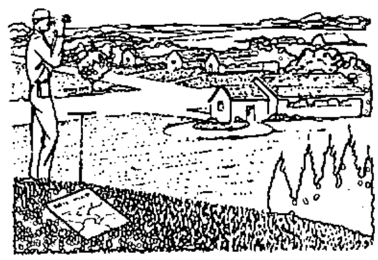
Until railroads were built into the area, stagecoach, buckboard, and horseback were the principal means of transportation. During most of the year, the Okanogan River was too shallow for sternwheeler steamboats, which regularly plied a 60-mile stretch of the Columbia between Wenatchee, the nearest railhead, and Brewster. However, spring runoffs, lasting 6 to 8 weeks raised the river enough so that flat-bottom steamers could navigate upstream to Riverside, about 9 miles above Omak. Another part of the Okanogan River system, Osoyoos Lake, later became an important transportation link. During Prohibition, Treasury agents had some difficulty in preventing powerboats from slipping across the border with illicit spirits from Canada.

More recently, improved roads and highways have helped to stabilize the economy, the means of livelihood, and the resident population. Most of the permanent residents have settled in the main river valley and along some of the tributary streams. The mountainous regions, which are virtually uninhabited, have drawn many hunters, campers, fishermen, hikers, and rockhounds annually. Boating, swimming, fishing, and water skiing have increased on lakes in the basin. Recreational land developments have appeared on some of the higher terrace lands and lower ridges, particularly near Tonasket. Completion of the new North Cross-State Highway, linking the Skagit and Methow River valleys to the west, has also helped open up the Okanogan area for further recreational uses and development.

Much of the mountainous area, both east and west of the Okanogan River, is in the Okanogan National Forest. Most of the area east of the river and south of Riverside, is in the Colville Indian Reservation.

The permanent population is about evenly divided between urban and rural residents. The populations of incorporated cities and towns in 1970 were: Omak, 4,164; Okanogan, 2,015; Oroville, 1,555; Tonasket, 951; Riverside, 228; and Conconully, 122. Conconully is the only incorporated town outside the main river valley.





Topography and Climate

In the study area, the Okanogan River basin is about 65 miles long and averages about 35 miles wide. Figure A1 shows the basin and identifies the nine hydrologic subareas studied. The eastern and western boundaries of the basin are steep, jagged ridgelines at elevations ranging from 1,500 feet to more than 5,000 feet above the basin floor. The basin for the northern 50 to 55 miles has a nearly constant width, whereas in its southern 10 to 15 miles it is roughly funnel shaped, narrowing to less than 4 miles near the mouth of the river. From the rugged mountain ridges, with individual peaks jutting to 7,000 to 8,000 feet above sea level, lateral ridges extend toward the valley floor, tapering to gentler slopes as they reach the lower elevations. Streams fed by runoff from rain and snowmelt flow down the valleys between the lateral ridges.

The flood plain of the Okanogan River valley averages about a mile in width, and descends from an elevation of about 920 feet at the international boundary to about 780 feet at the river's confluence with the Columbia River. Osoyoos Lake occupies the northernmost 4 miles of the valley floor and extends several miles into Canada. Multiple natural terraces—formed mostly of glacially deposited gravel—rise locally as much as 500 feet above the valley floor to the foot of, and between, the lateral ridges.

Climate in the lower parts of the Okanogan River valley (see fig. A1) is semiarid whereas in the mountains it can be classed as subhumid. Characteristics of the climate include fairly large seasonal temperature extremes and daily temperatures and precipitation that vary widely between different parts of the area. The lowest temperatures and greatest precipitation generally occur at the higher altitudes. Annual precipitation averages less than 12.5 inches in the main valley and more than 40 inches on the highest ridges. Temperature data are not available for the higher elevations, but in the valley recorded temperatures range from a high of 112°F (Fahrenheit) to a low of -31°F. Records show that in the lowlands the earliest killing frost in the autumn occurred on August 24 and the latest killing frost in the spring occurred on June 23, both at Conconully. The average length of growing season for the valley is about 140 days.

Geology and Soils

The bedrock underlying the Okanogan River basin comprises chiefly granitic and andesitic rocks, and metamorphosed sedimentary rocks. An exception is in a triangular area between the Okanogan River, Omak Lake, and the Columbia River; this area is underlain by basalt, an extension of the lava flows forming the Columbia Plateau to the south.

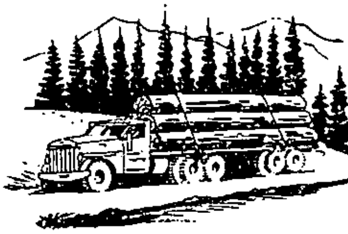
The valley occupied by the Okanogan River has undergone great modification resulting from the advance and retreat of Ice Age glaciers. The scouring action of the ice rounded and smoothed the upland bedrock areas and cut several lake basins above the main valley. Along the main valley, large deposits of rock debris—subsequently reworked by glacial melt water—form broad terraces above the valley floor.

The soils in the basin include shallow to moderately deep, mildly alkaline to strongly acid sandy loam and silt loam, formed from volcanic ash and pumice (ejected from Glacier Peak to the west centuries ago), glacial till and outwash, alluvium, lake sediments, and wind-laid silts.

Vegetation and Industry

The natural vegetation (Berger, 1962)* varies with altitude and distance northward. In the southern part of the basin, the mountains sustain Ponderosa pine at the lower elevations and Douglas fir, western larch, and lodgepole pine at higher elevations. In the mountains farther north, lodgepole pine and Douglas fir predominate, while some spruce and fir grow along the range crests. The lower slopes support scattered pines and deciduous trees (cottonwoods, aspen, birch, and alder), while the river terraces support sage and other plants typical of semiarid regions. The river bottomlands contain cottonwoods and the usual wetland species.

Agriculture is the principal industry of the basin. Orchard fruits and hay crops cover most of the irrigated acreage; much of the unirrigated open land supports the grazing of cattle and sheep and the raising of some grain crops. The mountainous lands, which are largely in the Okanogan National Forest, are used almost exclusively for timber harvest and recreation. Processing and storage of fruit and milling and manufacture of forest products provide employment for many of the urban residents.



THE HYDROLOGIC CYCLE AND WATER RESOURCES

The rain and snow that fall in the Okanogan River basin furnish nearly all the fresh-water supply. Only minor exceptions occur where ground-water divides do not coincide with the surface-water or topographic divides that form the basin boundaries; there, some ground water may move laterally between the basin and an adjoining topographic basin. The overall cyclic movement of water into and out of the basin is diagrammatically illustrated in figure A2.

*A listing of the full titles of publications referred to appears at the end of this report.

Evaporation and transpiration reduce the amount of water from precipitation that becomes available to man as streamflow, storage in lakes and reservoirs, and recharge of the ground-water supply. Water vapor returns to the atmosphere through evaporation from water and soil surfaces and through transpiration by vegetation. These two water-loss phenomena, commonly considered together as evapotranspiration, begin to reclaim the precipitation as soon as it falls. In an arid climate, evapotranspiration may claim all the precipitation from a storm. Plants draw moisture through their roots and transport it to foliage where transpiration returns some of it to the air. Capillary action in the soil moves residual moisture and ground water to the surface where evaporation occurs.

Part of the precipitation remains for several months as winter snowpack at higher altitudes. Rainfall that escapes evapotranspiration may remain only briefly before leaving the basin as stream runoff or it may recharge the ground-water body and remain underground for periods ranging from a few days to centuries. Some water stays temporarily in lakes and reservoirs and then discharges as streamflow.

Precipitation and Inflow

Based on records compiled from 1939 through 1969, the estimated mean annual precipitation over the study area is 17.5 inches, or about 2 million acre-feet of water. Annual precipitation during the period averaged 15.5 inches at Conconully and 12.4 inches at Oroville and Omak. Figure A3 graphically portrays the recorded maximum, minimum, and average monthly precipitation at these stations.

Average precipitation during the 6-month period April-September, for 1939 through 1969, was 6.6 inches at Conconully, 5.5 inches at Oroville, and 4.9 inches at Omak. Freezing temperatures at the higher altitudes during fall and winter months, when much of the precipitation occurs, results in snow buildups. Springtime melting of the snow then releases water to the streams. The mountainous regions thus contribute a major part of the water for the basin during the growing season.

About 2.1 million acre-feet of water enters the study area each year from Canada as streamflow; about 75 percent of this amount is carried by the Similkameen River, the largest contributor to the streamflow in the lower Okanogan basin. Some of the water that enters the study area from Canada actually originates in the headwaters of the Pasayten and Ashnola River drainages in the United States. Some water also enters the basin as ground-water inflow from Canada, but its quantity cannot be determined from available information. Subsurface inflows probably occur mainly in the valleys of the Similkameen and Okanogan Rivers at the international boundary. At the boundary, Osoyoos Lake occupies the Okanogan River valley, however, and a combination of conditions, including regulated lake levels and fine-grained sediments, probably restrict subsurface inflow. Subsurface inflow may be much greater in the Similkameen valley to the west, where the steep-sided glacial depression is underlain to great depths by unconsolidated sediments. The valley floor is more than a mile wide at the boundary, and the sediments include some permeable layers that allow the southward movement of ground water.

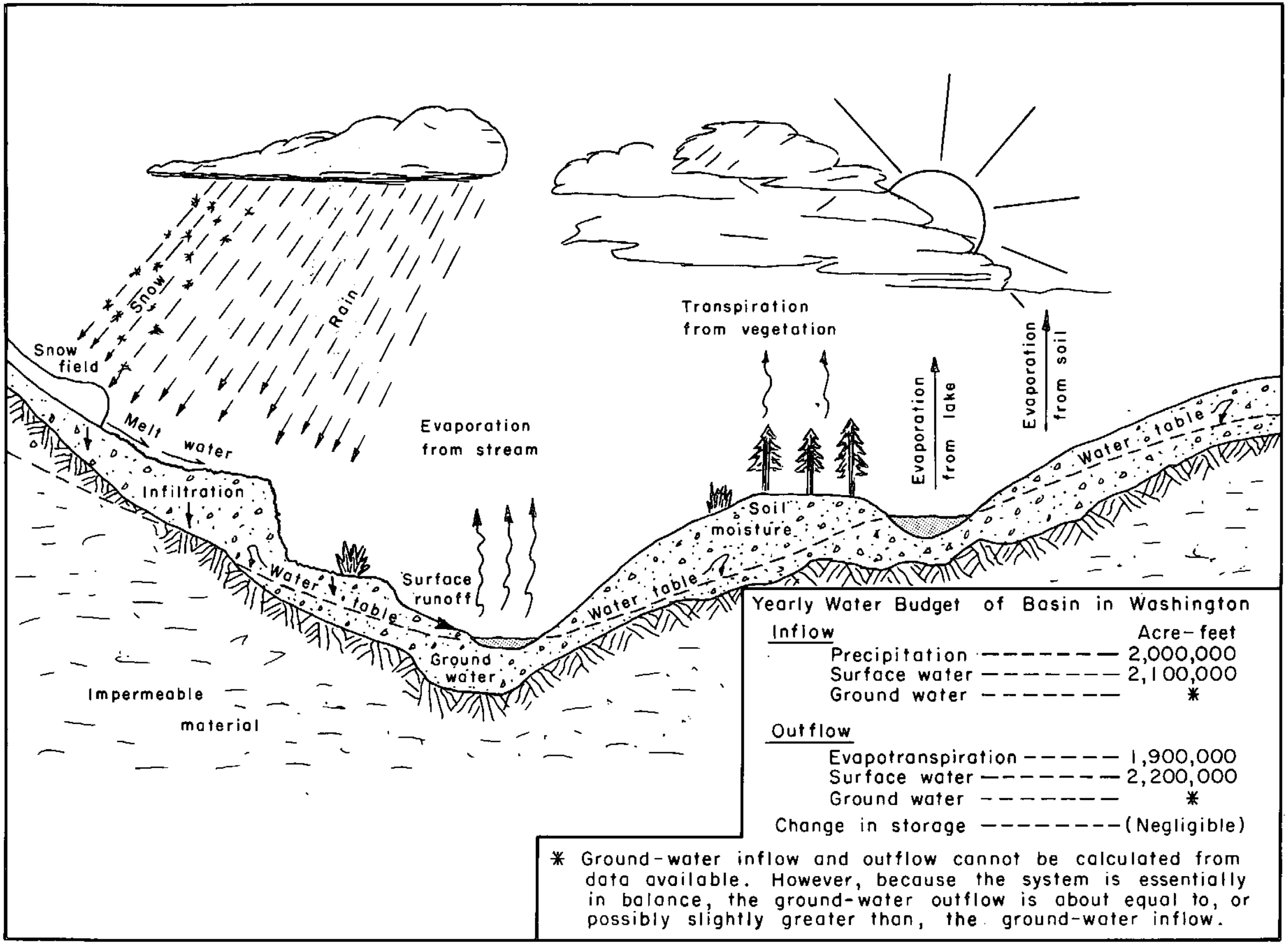


FIGURE A2.— Schematic sketch of the hydrologic cycle in the Okanogan River basin.

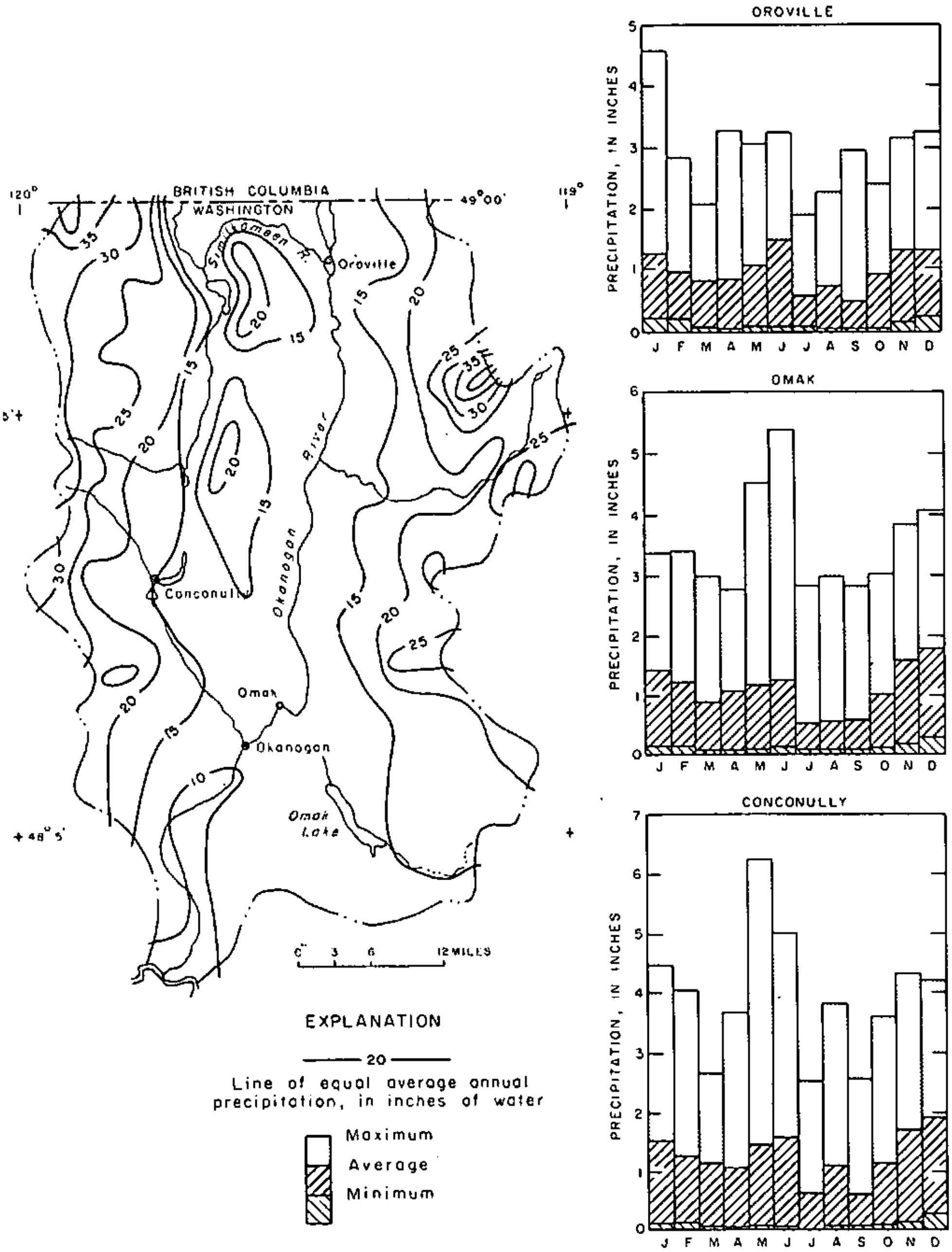
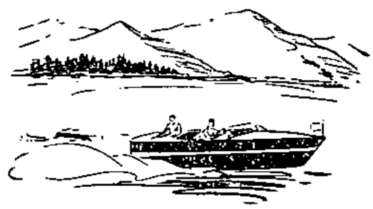


FIGURE A3.— Areal distribution of average annual precipitation in Okanogan River basin, and maximum, minimum, and average monthly precipitation at three stations. Data from U.S. Weather Bureau.



Streams and Lakes

More than a score of continuously flowing streams and many intermittent creeks flow from the mountainous country on the east and west of the main Okanogan Valley, and contribute directly to Osoyoos Lake and the Okanogan River (fig. A1).

The Similkameen River is the principal tributary of the Okanogan River, and above their confluence the discharge of the Similkameen is usually several times that of the Okanogan. The Similkameen River originates in Canada, then crosses the international boundary about 80 miles from its source and continues another 20 miles to empty into the Okanogan River at Oroville (fig. A1). It drains some 3,000 square miles in Canada, and about 400 square miles within the study area, in the United States. In Washington, it receives discharge from Sinlahekin Creek and its principal tributary, Toats Coulee Creek. Sinlahekin Creek contributes to Palmer Lake, which empties into the Similkameen River through Palmer Creek. Nature partially regulates floodflows of the Similkameen River; during peak discharges the flow of Palmer Creek reverses, and Palmer Lake temporarily stores Similkameen water.

A diversion from Toats Coulee Creek stores irrigation water in Spectacle and Whitestone Lakes. Diversion from the Similkameen River supplies water for additional irrigation in the Okanogan River valley.

Numerous streams are tributary to the Okanogan River in addition to the Similkameen River. Aeneas, Johnson, Salmon, Loup Loup, and Chiliwist Creeks flow into the Okanogan from the west (fig. A1). Dams impound Salmon Creek water in Conconully Lake and Conconully Reservoir for irrigation. Tributaries from the east include Ninemile Creek, which discharges into Osoyoos Lake, and Tonasket, Antoine, Siwash, Bonaparte, Tunk, and Omak Creeks, which flow directly into the river. Many smaller streams flow into the Okanogan River, Osoyoos Lake, and the major tributary streams.

In addition to the major diversions from the large streams for irrigation, many individual irrigators divert water from the smaller streams throughout the basin or pump from lakes or the Okanogan River.

Yearly and seasonal discharges of the major streams vary considerably. As shown in figure A4, the greatest average streamflow for a year generally is about three to four times greater than the lowest yearly average, at least for streams with long-term records. Figure A5 shows the seasonal-discharge variations for the Similkameen and Okanogan Rivers. The greatest discharges occur during the 4-month period from April through July, when these streams contribute about 70 to 80 percent of their average annual discharges.

Other than the lakes named in relation to stream systems and storage of irrigation water, most lakes in the basin are small. However, Omak Lake, in the southeastern part of the basin, has a larger surface area than any other except Osoyoos Lake, which is mainly outside the study area. East of the Okanogan River, Bonaparte Lake feeds Bonaparte Creek, and water from Sidley Lake near the Canadian border enters the Tonasket Creek system. West of the Okanogan River, Blue Lake discharges into Sinlahekin Creek.

Throughout the basin, numerous lakes have no stream outlets and contain water that is somewhat mineralized. Omak Lake is the largest such lake in the study area. A large area southwest of Omak Lake contains many more small trapped lakes, and others occur elsewhere either singly or in small groups. A group of such lakes east of Palmer Lake includes Wannacut Lake and another Blue Lake and another group east of Conconully Reservoir includes Mud, Horseshoe, Medicine, and Alkali Lakes. These lakes are not used for water supplies, and generally are subject only to limited recreational use.

Ground Water

Alluvial and glacial sedimentary deposits, ranging from a few feet to several hundred feet thick, contain the main volume of ground water in the basin, with sand and gravel layers constituting the principal water-bearing zones. Most of the sedimentary deposits occur in and adjacent to major valleys, and are underlain by rather impermeable bedrock which consists principally of granitic and various metamorphic rocks; limestone, dolomite, and basalt form the bedrock in small areas. Generally, the bedrock establishes the floor of the ground-water reservoir, although cracks in the bedrock below the water table become filled with water, and limestone, dolomite, and basalt locally yield small quantities of water to springs and wells.

In some places, the sedimentary deposits are thick and consist almost entirely of sand and gravel containing large quantities of ground water. In other places, the deposits hold little water, being thin or consisting mostly of clay or poorly permeable glacial till. Figure A6 presents a generalized picture of ground-water availability and shows the approximate maximum yield that can be expected from properly constructed wells.

Evapotranspiration and Outflow

Water leaves the Okanogan River basin as streamflow and subsurface outflow and by evapotranspiration. Estimates of the outflow are less accurate than estimates of the input, largely because precipitation quantities can be measured or extrapolated quite accurately whereas evapotranspiration quantities must be derived from broad assumptions and empirical observations.

Streamflow accounts for most of the water leaving the basin. The discharge, represented fairly accurately by flows gaged at Malott, averaged about 2.2 million acre-feet per year in water years 1959-69.

The loss of ground water by subsurface migration occurs across only a narrow band of unconsolidated materials at the south end of the basin. The quantity

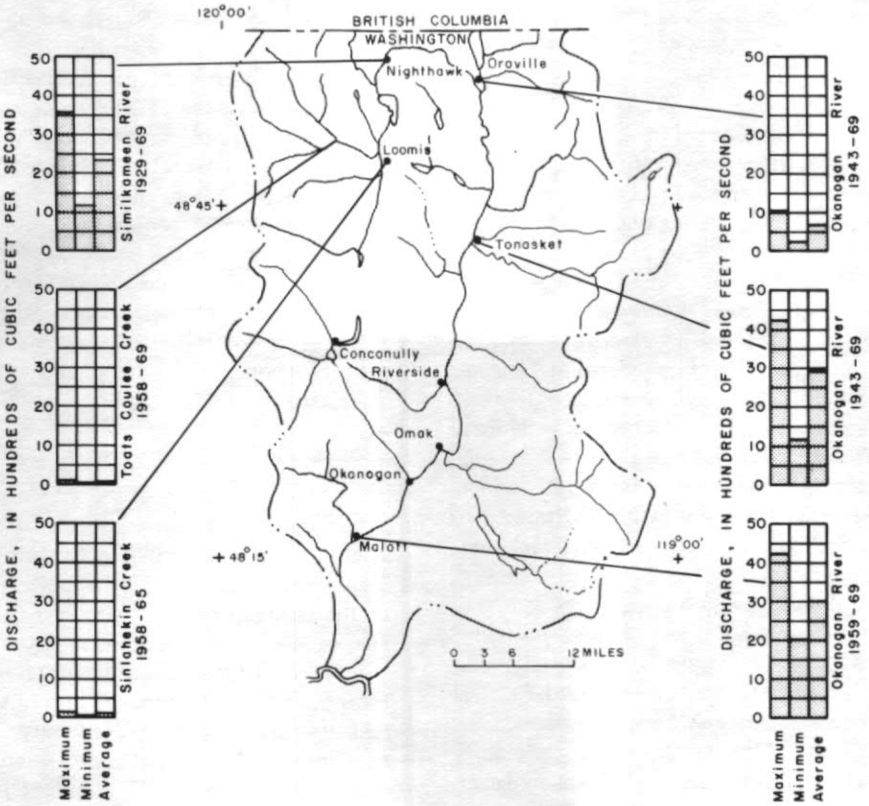


FIGURE A4.— **Maximum, minimum, and average mean annual discharges of principal streams in the Okanogan River basin, for the periods noted.**

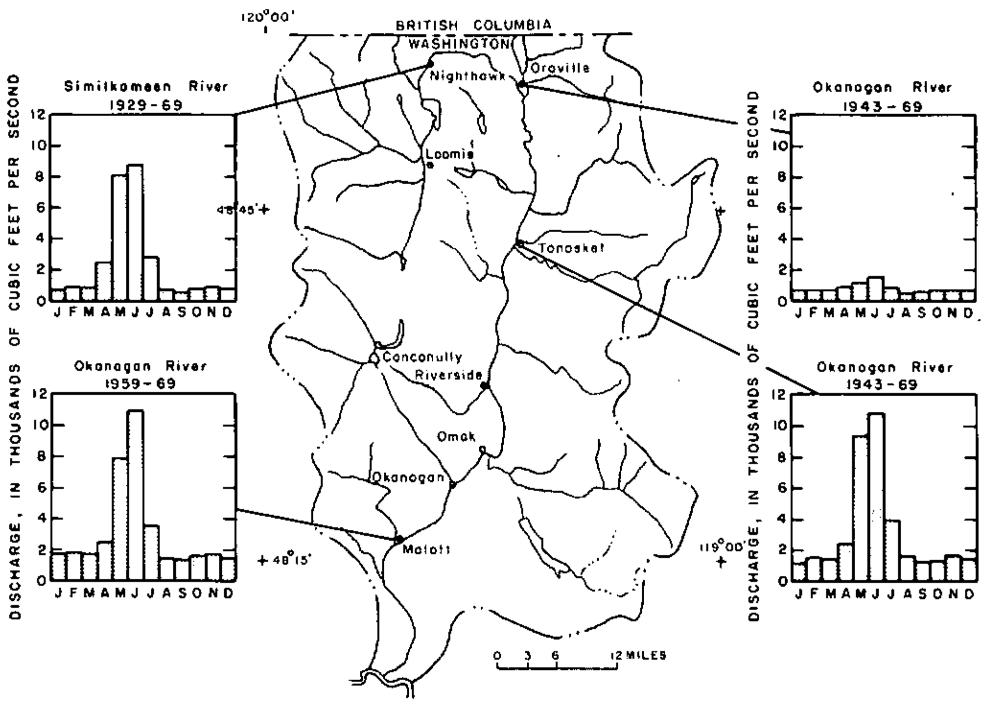


FIGURE A5.— Average mean monthly discharges of the Similkameen and Okanogan Rivers, for periods noted.

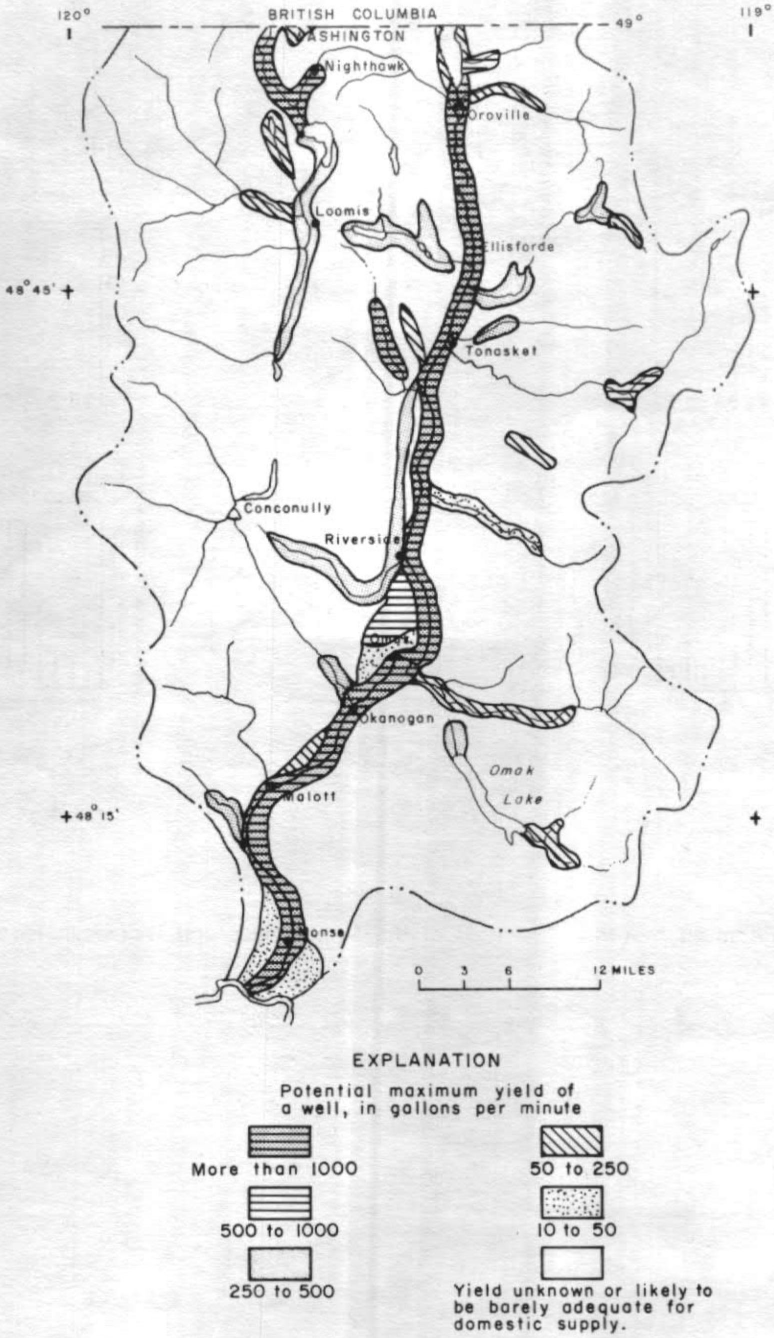


FIGURE A6.– Generalized availability of ground water.

probably approximates the quantity of ground water entering the basin at the international boundary.

A report by Molenaar and others (1952) presents estimates of the rates of evapotranspiration in various parts of the basin for several types of irrigated crops. The following table shows these estimates of the total water evapotranspired through various crops at three localities. The estimates indicate that the evapotranspiration loss exceeds the average annual precipitation for most irrigated crops. Because such losses depend on the availability of water, they can average more than the total precipitation only in irrigated areas. During much of the growing season, soil moisture becomes deficient in unirrigated parts of the basin to the point where evapotranspiration is negligible.

Total evapotranspiration, in inches						
Location	Alfalfa	Grass pasture	Small grain	Corn	Orchard	Potatoes
Okanogan	30.8	29.0	16.8	24.2	25.4	21.3
Omak	27.8	26.2	17.3	24.1	22.9	21.3
Oroville	29.1	27.4	14.3	24.3	24.0	21.5

The rate of evapotranspiration depends not only on the availability of water but also on air and water temperatures, solar radiation, humidity, wind movement, and the nature of the land and its plant cover. The estimates of water entering the basin as precipitation, along with the measurements of stream inflow and outflow, suggest that the average annual evapotranspiration throughout the basin may be slightly more than 16 inches, or 1.9 million acre-feet—about 90 percent of the average annual precipitation.

Water Quality

In the Okanogan River basin, as is universally true, all natural water contains chemical substances in solution. The type and concentration of chemicals depend on the type of rock materials the water has contacted and, for some types of rock, on length of contact and on constituents added by man's activities. Ground water commonly is in contact with soluble rock materials longer than is surface water and, therefore, usually contains higher mineral concentrations.

The chemical character of water in the Okanogan and Similkameen Rivers is known from repeated sampling at various stations from about 1947 to 1970. Other streams have been sampled for chemical analysis infrequently or not at all.

Water in the Okanogan and Similkameen Rivers is of the calcium-magnesium bicarbonate type, and is suitable for most common uses. Nearly all samples tested are within the standards set for drinking-water supplies by the U.S. Public Health Service (1962). A few samples contained enough dissolved iron, or were sufficiently colored to indicate that the water would warrant treatment, before use as a public supply.

The dissolved-mineral content—designated technically as dissolved solids—of water in the Okanogan River above its confluence with the Similkameen is fairly constant, usually ranging from 145 to 180 mg/l (milligrams per liter), with the higher values generally coinciding with lower streamflow rates. (In practical terms, 1 mg/l is equivalent to one part per million.) Below the mouth of the Similkameen River, the dissolved-mineral content in the Okanogan River is more variable, usually ranging from 60 to 200 mg/l, and is somewhat less concentrated on the average than it is above the confluence. This results from the diluting effect of the snowmelt-supplied Similkameen, whose dissolved-mineral content even at low flow rarely exceeds 120 mg/l.

Recorded temperatures of water in the Okanogan River range from 0° to 22°C (Celsius) or 32° to 71°F. No data are available on temperatures of other streams or of lakes in the basin.

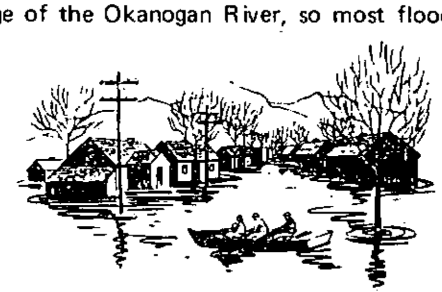
The chemical quality of water in the lakes varies greatly. Some lakes, such as Osoyoos and Palmer, contain water of about the same quality as the streams that feed them. However, the closed-basin lakes in the northern part of the basin between Palmer Lake and the Okanogan River and in the southern part of the basin southeast of Omak contain saline water. Such mineralized or saline lakes develop when the outflow is slight in relation to the inflow and evaporation is great. The concentration and type of mineralization depend on the ratio of evaporation to precipitation, the nature of the rock materials surrounding the lake, and the character of the inflow water.

Ground water generally is more mineralized and more variable in chemical composition than the surface water, but in the Okanogan River basin it still is suitable for most common uses, although excessive concentrations of iron and sulfate occur locally. Nearly all analyzed ground-water samples were classified as hard to very hard. Water from wells near the saline lakes might contain high mineral content or might become mineralized with prolonged pumping.

Measured ground-water temperatures range from 11° to 16°C (52° to 60°F), depending mainly on the depth of the water-yielding zone below the land surface. Shallower zones tend to yield the cooler water.

Floods and Low Flows

Damage from flooding of the Okanogan River normally is limited mostly to narrow strips of agricultural land near the river, particularly in the area north of Ellisforde and in the lower areas near Oroville, Tonasket, Riverside, Omak, Okanogan, and Malott. However, in 1948 serious damage to orchards, highways, and property in virtually all settled areas of the Okanogan valley occurred during one of the largest recorded floods. Regulation of the stage of Okanagan Lake in Canada partially controls the discharge of the Okanogan River, so most flooding along



the river in Washington results from high flows of the Similkameen River.

Flooding in the Similkameen valley damages mostly crops and farmlands. However, extremely high flows of the Similkameen River occasionally cause reverse flows in the Okanogan River near Oroville, resulting in damage to low-lying areas around Osoyoos Lake. As noted earlier in this report, high stages of the Similkameen River force Palmer Creek to reverse, temporarily storing some flood water in Palmer Lake.

In some respects, extremely low flows of streams are more significant than floods, though less spectacular. Lower-than-normal streamflow may result in inadequate irrigation-water supplies during times of greatest demand, increased water temperature, and decreased efficiency in the disposal and dilution of liquid wastes. Fortunately, in the Okanogan River basin the low-flow period for many streams occurs during the winter months when the demand for irrigation water is low.

The following table shows the average annual maximum and minimum daily discharges, in cfs (cubic feet per second), of principal streams in the basin for 1959 through 1969.

Stream and station	Average flow (cfs)	
	Maximum	Minimum
Similkameen River near Nighthawk	16,400	324
Okanogan River at Oroville	1,630	134
Toats Coulee Creek near Loomis	432	3.8
Okanogan River at Malott	16,900	690

WATER USE AND MANAGEMENT

Present Uses

The streams and lakes in the Okanogan River basin provide a base for recreational purposes, and water for irrigation and industrial supplies and for dilution and transport of small amounts of sewage and industrial wastes. Irrigation is by far the most important surface-water use, the total withdrawal of surface water for irrigation in 1970 being estimated at 90,000 to 100,000 acre-feet. Much of this water is lost from the basin through evapotranspiration, although some returns to streams and some recharges the ground-water reservoir. Figure A7 shows the relative importance of surface and ground water as sources of supply for various purposes.

Surface Water — Irrigation by water from streams and lakes is extensive in the Okanogan River valley. North of Tonasket nearly all irrigation relies on water diverted from the Similkameen River—about 180 cfs during the irrigation season—or pumped from the Okanogan River by the Oroville-Tonasket Irrigation District—about 33,500 acre-feet of water annually for application to about 9,500 acres.

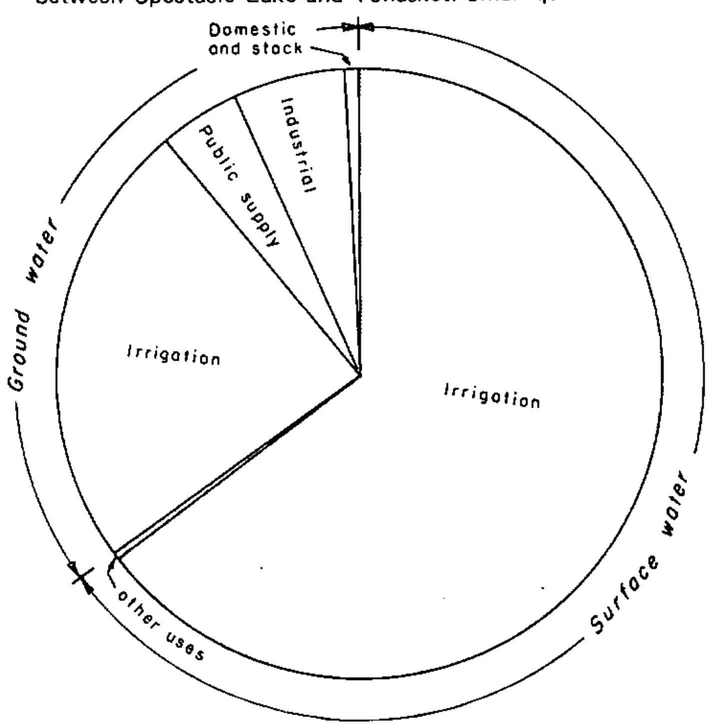
The terraces west of Okanogan and northwest of Omak (Pogue Flat) receive irrigation water supplied by the Okanogan Irrigation District, via Salmon Creek above Conconully Lake and Conconully Reservoir. Duck Lake and the ground-water reservoir surrounding the lake store excess spring-runoff water from Salmon Creek for summer irrigation. Continuous records on the quantities of water involved have not been maintained but, in the years since the project was first authorized in 1919, many thousands of acre-feet of water have been added to the lake and surrounding aquifers. The district supplies about 17,000 acre-feet annually to irrigate about 4,000 acres, mostly in the Okanogan River valley; some of the water is pumped from the Okanogan River.

A pumping plant completed in 1971 on the Okanogan River near Tonasket—by the Aeneas Lake Irrigation District—provides withdrawal of about 12 cfs of water for irrigation of about 900 acres on the terrace near Aeneas Lake. Excess water is stored in Aeneas Lake and the surrounding ground-water reservoir; some water pumped from the lake irrigates acreage to the west.

South of Riverside, about half of the irrigation on the valley floor relies on water pumped from the Okanogan River by individual growers. The remainder of the valley floor here—about 1,300 acres on Tarheel Flat and additional small areas near Malott—receives water diverted from Little Loup Loup Creek, Loup Loup Creek, and Leader Lake.

Land irrigated by surface water in the Sinlahekin Creek valley comprises only a few orchards supplied from the creek south of Loomis, about 100 acres supplied from the creek between Loomis and Palmer Lake, and another 100 acres of orchards supplied directly from Palmer Lake.

About 10,000 acre-feet of water per year is diverted from Toats Coulee Creek for storage in Spectacle and Whitestone Lakes and for subsequent irrigation in the area between Spectacle Lake and Tonasket. Small quantities of



Entire circle represents about 136,000 acre-feet

FIGURE A7.— Uses of surface and ground water in 1970.

water withdrawn from Aeneas and Pine Creeks irrigate a few small fields. Also, some water is diverted from Johnson Creek into Duck Lake during periods of high streamflow and is used for irrigation from there. Ninemile Creek east of Osoyoos Lake supplies water to several hundred acres of alfalfa and grass during the early part of the growing season.

Ground Water — The estimated total ground-water pumpage for the entire study area in 1970 was about 46,000 acre-feet. About 65 percent of this water was for irrigation while the remainder was for industries, public supplies, domestic consumption, and livestock. More than three-fourths of the ground-water pumpage for irrigation is in the Okanogan River valley, although ground water is used to some extent for irrigation in nearly all parts of the basin where it is available in sufficient quantities.

Potential Future Development

Most of the fertile land of the basin that can be readily supplied from surface-water sources without major construction effort is now (1971) being irrigated. Therefore, except for some possible gradual increase in irrigated acreage resulting from more efficient use of existing supplies, irrigation from surface sources will likely remain at about the present level, unless additional storage and distribution facilities are built. For much of the area, the Okanogan River is the only practical source of additional water in amounts adequate for irrigation or other large-scale uses. However, further diversions from the Okanogan could produce undesirable results, such as a degradation of the quality of the river water during summer, possible hazards to fish propagation, and further complication of conflicting claims to water rights by various downstream groups.

Several localities—mostly in tributary valleys—that are now virtually undeveloped because of inadequate supplies of surface water may have untapped ground-water supplies. However, development of large ground-water supplies in some of these valleys may be impractical because of limited recharge of the ground-water reservoir or undesirable effects on downstream surface-water supplies. Other problems that may occur with increased ground-water development include mutual interference between wells and diminished yield after prolonged pumping. These and other possible hydrologic consequences should be studied and analyzed thoroughly before major water-development projects are undertaken.

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Part B

TECHNICAL ANALYSIS OF HYDROLOGIC DATA

PART B: TECHNICAL ANALYSIS OF HYDROLOGIC DATA

This part of the report presents the technical aspects of hydrologic conditions in the Okanogan River basin, in a degree of detail consistent with the available data.

Some of the factors which require evaluation in water-resource planning and development include the maximum and minimum amounts of water available from different sources, the frequency and duration of floods and of minimum streamflow, and the pattern of fluctuations in the volume of the ground-water reservoir as determined from water-level changes. Examples of curves portraying these factors for selected data-collection points are presented in this part of the report. The locations of principal data-collection sites in the Okanogan basin are shown in figure B1, and the periods of record and types of data collected are shown in table B1.

The generalized geology and locations of wells for which data are available, and the hydrologic subareas of the basin as discussed in the report, are shown on plate B1 (in pocket).

OKANOGAN RIVER VALLEY SUBAREA

The Okanogan River valley subarea covers about 150 square miles and extends almost due south from Canada to the Columbia River, a distance of about 65 miles (fig. A1, pl. B1). Included in the subarea are the alluvium-underlain floor of the valley, which ranges in width from about one-half to 1½ miles, and the major terraces of the Okanogan River, such as Brewster Flat near Brewster, Pogue Flat at Omak, and Tarheel Flat north of Malott. At one time in the geologic past the Okanogan River occupied a 10-mile-long channel about 2 to 3 miles west of the present river between Janis and Riverside. This abandoned channel—known as Wagonroad Coulee—and the bedrock ridge between it and the present river, are included in the subarea.

Nearly the entire Okanogan River valley subarea is arable land, with apples being the principal crop, and alfalfa also being grown extensively. Most croplands on the valley floor are irrigated, and irrigation on the higher terraces is practiced to the extent permitted by availability of water.

Surface Water

The Okanogan and Similkameen Rivers are the only sources of an appreciable surface-water supply within the subarea. Numerous small streams are tributary to the Okanogan River within the subarea, but their flow is small or is diverted upstream.

The annual mean discharges of the Okanogan River at Oroville (upstream from the confluence with the Similkameen River), for the period 1943-69, ranged from 277 to 1,020 cfs (cubic feet per second) and averaged 666 cfs (fig. B2), or slightly more than 480,000 acre-feet per year. The average monthly discharge during August through March for the same period was about 570 cfs. The average monthly discharge during April through July was about 880 cfs (fig. B3). The higher discharge rates in the spring and early summer months are due to the melting of snow in the higher parts of the basin. The range of monthly average discharges would be much greater except for natural lake storage and regulation of lake levels in Canada.

The annual mean discharges of the Okanogan River near Tonasket (which includes the discharge of the Similkameen River), for 1930-69, ranged from 1,140 to 4,324 cfs, and averaged 2,921 cfs (fig. B4), or about 2,100,000 acre-feet per year. The average monthly discharge during August through March for the same 40-year period was about 1,280 cfs. The average monthly discharge for April through July during the period was about 6,050 cfs (fig. B5). Most of the increased discharge between Oroville and Tonasket comes from the Similkameen River, which normally has a discharge about three times greater than that of the Okanogan at Oroville. A small part of the increase is due to the return of irrigation water to the river, and some comes from minor tributaries such as Siwash and Bonaparte Creeks.

The annual mean discharges of the Okanogan River at Malott for 1959-69 ranged from 2,018 to 4,290 cfs and averaged 3,005 cfs (fig. B6), or 2,117,000 acre-feet per year. The average monthly discharge during August through March for the same period was 1,410 cfs. The average monthly mean discharge during April through July was about 6,100 cfs. The Malott gaging station is downstream from all significant tributaries of the Okanogan River except Loup Loup and Chiliwist Creeks. The average monthly discharges for the low-flow months and the yearly discharges for the stations near Tonasket and at Malott agree closely. The average monthly discharge for the months of April through July at Malott would be considerably more than near Tonasket, but the shorter record at Malott does not reflect the floodflow of June 1948, which is the greatest on record in the Okanogan River basin (figs. B3, B5; table C1).

Unadjusted data from gaging stations on the Okanogan River at Oroville, Tonasket, and Malott were used in preparation of the three curves in figure B7, which show the approximate frequency of occurrence of peak discharges of various rates. The recurrence interval of floods does not indicate regularity of occurrence, but rather the average interval in years that a flood of given magnitude will be exceeded over a long period of time. For example, figure B7 shows that at Oroville annual peak discharge of the Okanogan River will exceed 1,850 cfs at intervals averaging 2 years or that the probability of the maximum discharge exceeding 1,850 cfs any one year is 50 percent, whereas a peak discharge of about 2,800 cfs will be exceeded at intervals averaging 10 years. The peak discharge of 40,900 cfs of the Okanogan River near Tonasket on May 31, 1948, represents a flood of about a 100-year recurrence interval.

Curves showing the frequency of recurrence of specified low flows of a stated number of consecutive

TABLE B1.--Types and periods of records for data-collection sites in the Okanogan River basin

[For locations of miscellaneous data-collection sites, refer to table C6]

Number on figure B1	Station number	Station name	Drainage area (sq mi)	Type of record	Period of record (1930 1940 1950 1960 1970)
1	12439000	Osoyoos Lake near Oroville	[a]3,150	L	
2	12439150	Okanogan River at Bridge Street, at Oroville	[a]3,150	D	
3	12439200	Dry Creek tributary near Molson	1.68	C	
4	12439300	Tonasket Creek at Oroville	60.1	D	
5	12439400	Okanogan River at Zosel millpond, at Oroville	[a]3,210	D	
6	12439500	Okanogan River at Oroville	[a]3,210	D	
7	12440000	Sinlahekin Creek above Blue Lake, near Loomis	41.7	D	1924-30
8	12440500	Sinlahekin Creek at Blue Lake, near Loomis	42.9	D	1920
9	12441000	Sinlahekin Creek at twin bridges, near Loomis	75.5	D	1921-23
10	12441500	Sinlahekin Creek near Loomis	86.6	D	1903-05
11	12441700	Middle Fork Toats Coulee Creek, near Loomis	17.1	C	
12	12441800	Olie Creek near Loomis	1.42	C	
13	12442000	Toats Coulee Creek near Loomis	130	D	
14	12442200	Whitestone Irrigation Canal near Loomis	--	D	
15	12442300	Sinlahekin Creek above Chopaka Creek, near Loomis	256	D	
16	12442400	Palmer Lake near Nighthawk	293	L	
17	12442500	Similkameen River near Nighthawk	[a]3,550	D	
18	12443000	Oroville-Tonasket Irrigation Canal near Oroville	--	D	1916-28
19	12443500	Similkameen River near Oroville	[a]3,580	D	1911-28
20	12443700	Spectacle Lake tributary, near Loomis	4.59	C	
21	12443800	Spectacle Lake near Loomis	17.2	L	
22	12444000	Whitestone Lake near Tonasket	52.3	L	
23	12444100	Whitestone Creek near Tonasket	55.4	D	
24	12444400	Siwash Creek tributary near Tonasket	.66	C	
25	12444490	Bonaparte Creek near Wauconda	96.6	D	
26	12444500	Bonaparte Creek near Anglin	110	D	1921
27	12444700	Aeneas Lake near Tonasket	32.4	L	
28	12445000	Okanogan River near Tonasket	[a]7,280	D	
29	12445500	Johnson Creek near Riverside	73.3	S	1903-07
30	12445800	Omak Creek tributary near Disautel	4.12	C	

TABLE B1.--Types and periods of records for data-collection sites in the Okanogan River basin--Con.

Number on figure B1	Station number	Station name	Drainage area (sq mi)	Type of record[1/]	Period of record 1930 1940 1950 1960 1970
31	12446000	Okanogan River at Okanogan	[a]7,880	D	1911-29
32	12446500	Salmon Creek near Conconully	121	S	1910-22
33	12447000	Salmon Creek near Okanogan	150	S	1903-10
34	12447100	Okanogan River tributary at Malott	2.66	C	
35	12447200	Okanogan River at Malott	[a]8,100	D	
36	12447300	Okanogan River near Malott	[a]8,220	D	
37	--	Oroville	--	P	
38	--	Conconully	--	P	← 1900
39	--	Omak	--	P	
40	--	33/25-1P1	--	O	
41	--	33/25-12F1	--	O	
42	--	33/25-12F2	--	O	
43	--	33/25-12F3	--	O	
44	--	34/26-26Q1	--	O	
45	--	34/26-26Q2	--	O	
46	--	34/26-28A1	--	O	
47	--	34/26-28B1	--	O	
48	--	34/26-28P1	--	O	
49	--	34/26-35B1	--	O	
50	--	34/26-35R1	--	O	
51	--	36/26-24C1	--	O	
52	--	37/26-10H1	--	O	
53	--	37/26-10J1	--	O	
54	--	37/26-10J2	--	O	
55	--	37/26-14P1	--	O	
56	--	37/26-25P1	--	O	
57	--	37/26-26J1	--	O	
58	--	37/26-36D1	--	O	
59	--	40/27-21K1	--	O	
60	--	40/27-27N1	--	O	
61	--	40/27-28A1	--	O	
62	--	40/27-28G1	--	O	
63	--	40/27-28G2	--	O	
64	--	40/27-28L1	--	O	
65	--	40/27-33B1	--	O	

[1/] C, crest-stage gage; D, continuous discharge record; L, lake-stage gage; O, observation well; P, precipitation station; S, stage gage.

[a] Approximate.

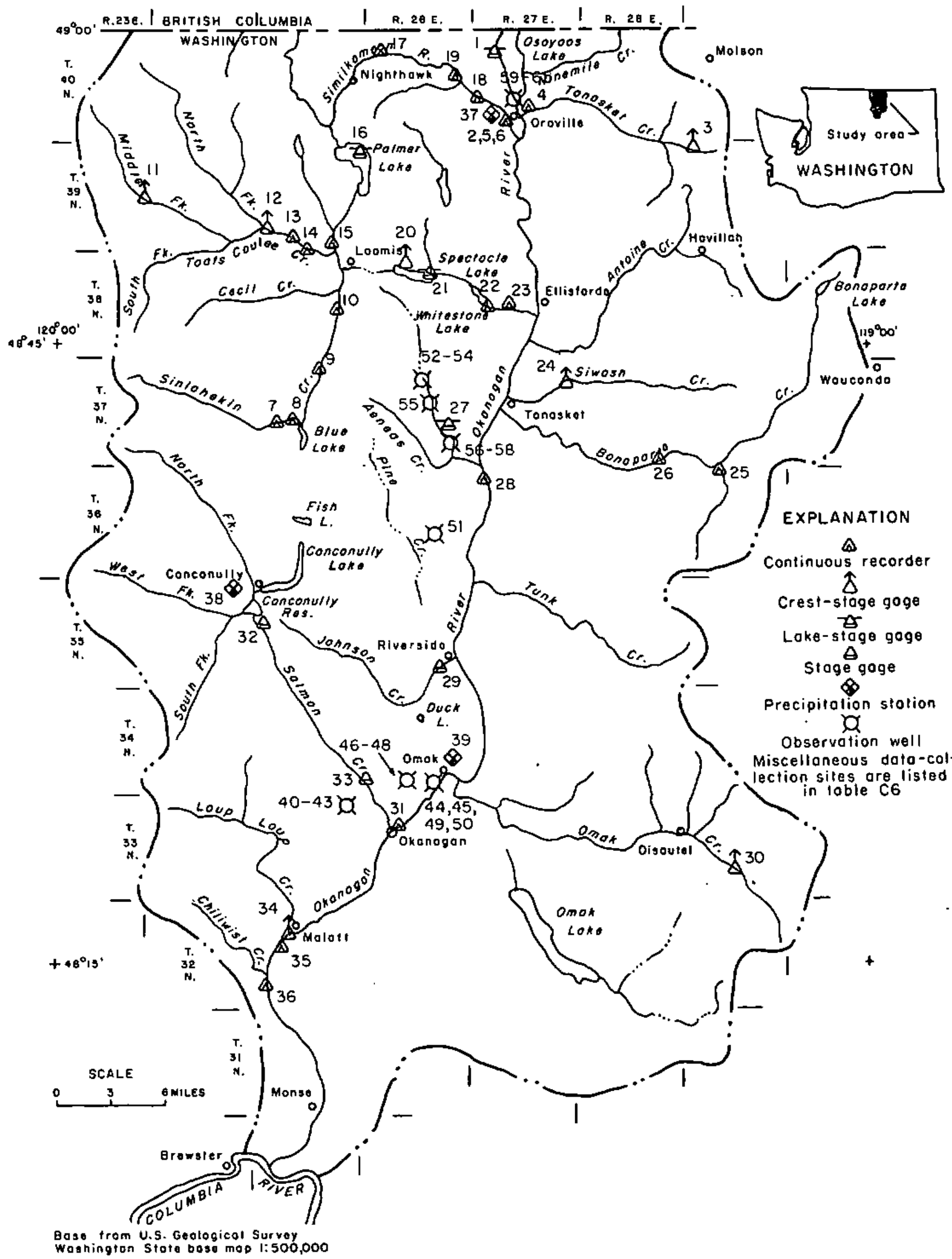

FIGURE B1.– Data-collection sites in the Okanogan River Basin. Numbers of sites are indexes to data sites listed in table B1.

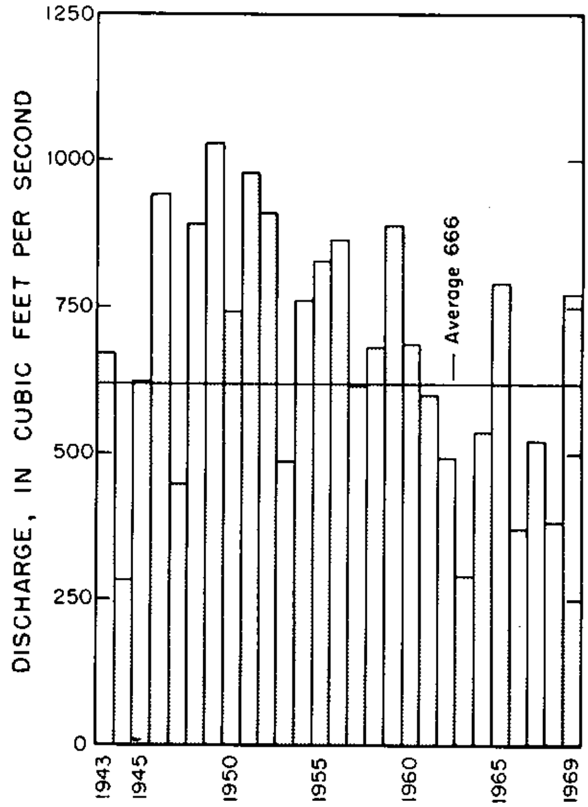

FIGURE B2.— Annual mean discharges of Okanogan River at Oroville, 1943-69.

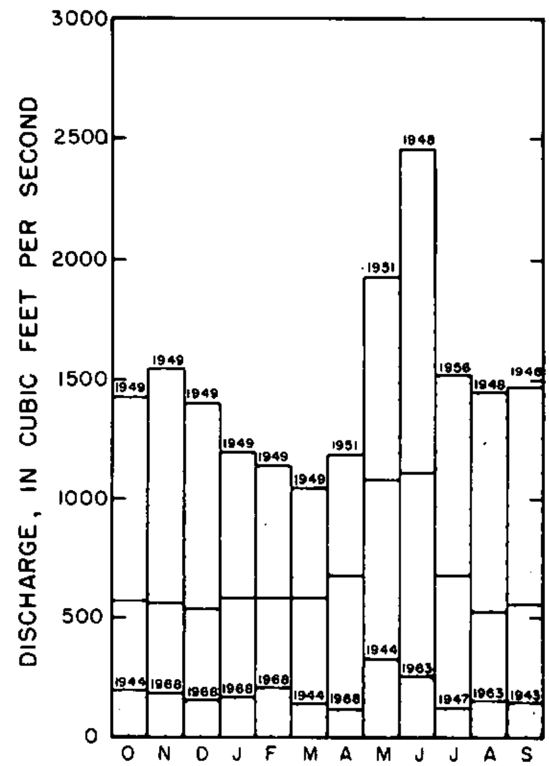

FIGURE B3.— Average monthly discharges, (middle bars) and maximum and minimum monthly discharges and the years when extremes occurred, Okanogan River at Oroville, 1943-69.

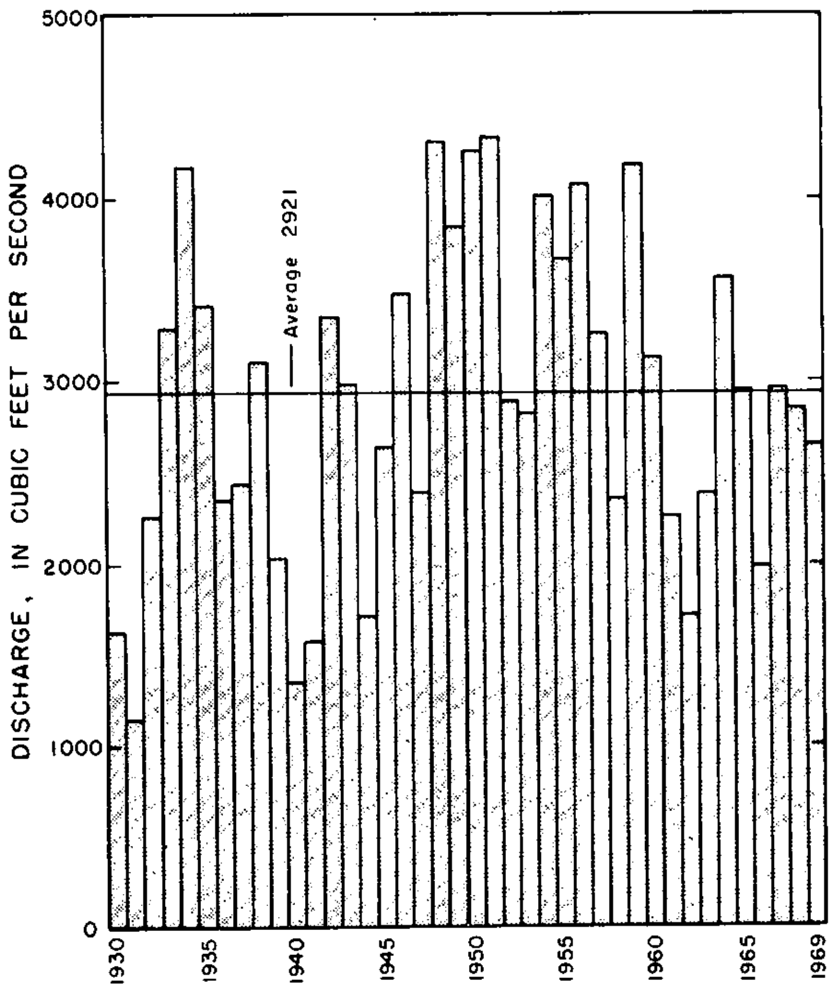

FIGURE B4.– Annual mean discharges of Okanogan River near Tonasket, 1930-69.

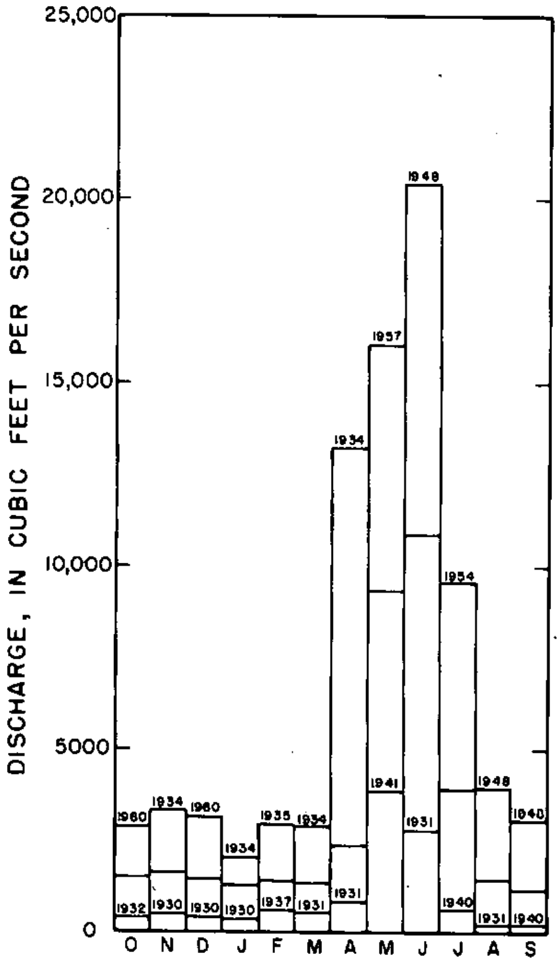

FIGURE B5.— Average monthly discharges (middle bars), and maximum and minimum monthly discharges and the years when extremes occurred, Okanogan River near Tonasket, 1930-69.

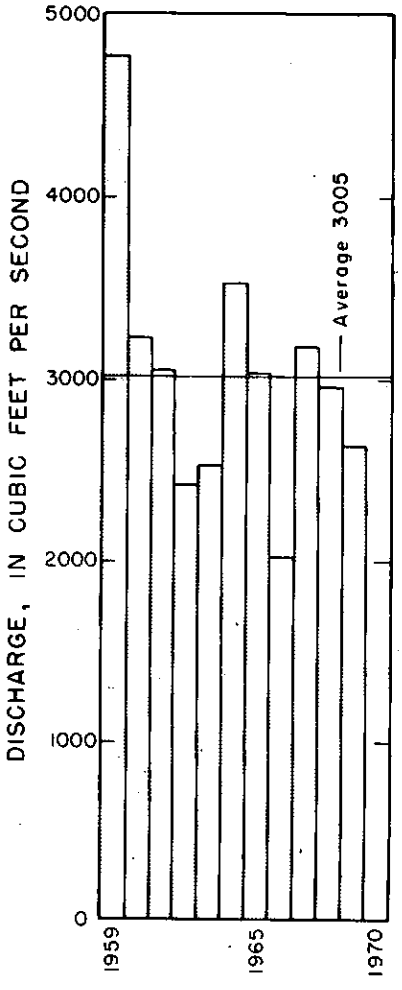

FIGURE B6.— Annual mean discharges of Okanogan River near and at Malott, 1959-1969.

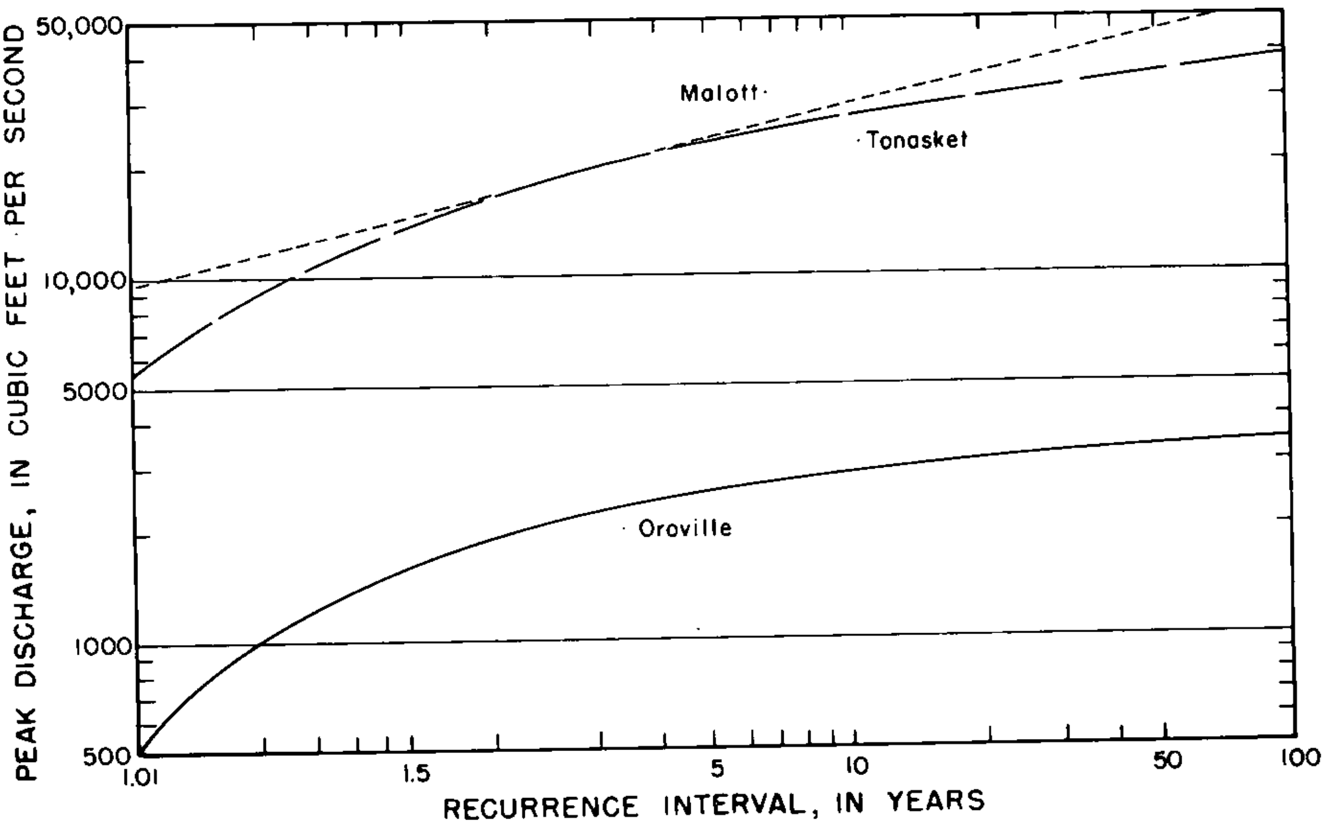

FIGURE B7.— Flood frequencies, Okanogan River near Tonasket, at Oroville, and at Malott.

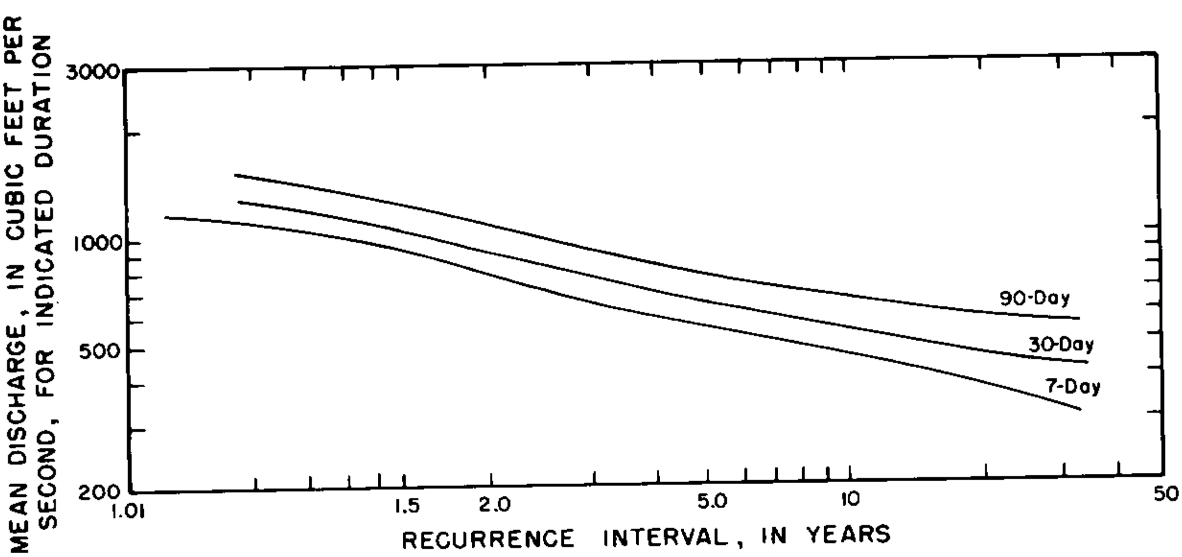

FIGURE B8.— Low-flow frequency, Okanogan River near Tonasket, 1944-69.

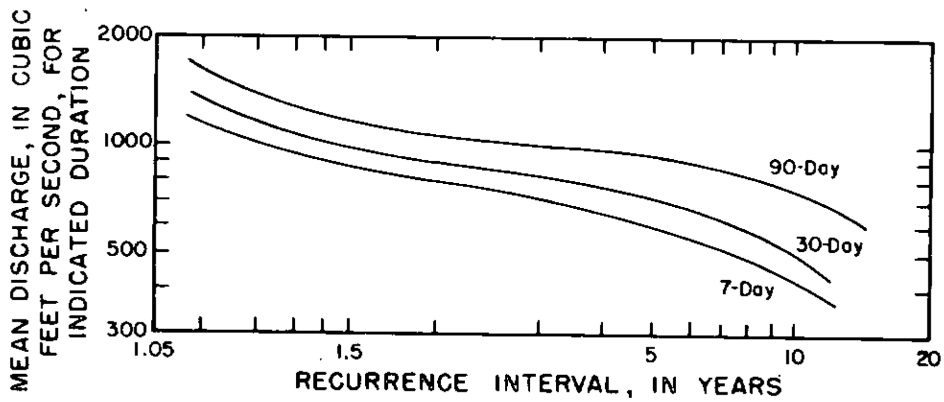

FIGURE B9.— Low-flow frequency, Okanogan River near and at Malott, 1958-69.

days duration in the climatic year (April 1 to March 31) for the Okanogan River are shown in figures B8 and B9. For example, figure B8 indicates that a lowest mean discharge of about 780 cfs or less for a 7-day period occurs on the average of once every 2 years at Tonasket, the same low-flow discharge for a 30-day period occurs on the average of once every 3 years, and for a 90-day period occurs about once every 5 years. No regularity of events is implied. Because low flows of the Okanogan River frequently occur during the fall or winter months (fig. B5), determinations of their frequency during the irrigation season should be based on curves reflecting flow conditions during the summer months only.

Ground Water

The bedrock underlying the Okanogan River valley subarea is principally of granitic types, but andesite, basalt, and a variety of metamorphic rocks are present locally. The bedrock is nearly devoid of water and is effectively impermeable and can be regarded as the floor of the ground-water reservoir.

The bedrock is overlain in varying thicknesses by unconsolidated alluvium, terrace deposits, fine-grained lake deposits, glacial outwash, and glacial till (table C5). Locally, the bedrock is at or near the surface and no ground water is available for development in such places.

Yields of wells on the valley floor are extremely variable because of differences in the depth to bedrock and to a thick zone of so-called blue clay that occurs locally throughout the length of the valley. Well depths commonly range from about 20 to 80 feet (table C4), and yields of wells within this depth range are from about 50 gpm (gallons per minute) to as much as 5,000 gpm. The yields of properly constructed irrigation and public-supply wells on the valley floor average about 300 gpm. Locally, especially near Osoyoos Lake, wells as deep as 300 feet have produced practically no water because the blue clay encountered at a shallow depth extended virtually the entire depth, from the water table to bedrock. However, some wells have substantial yields obtained from gravel beds that underlie the clay. The depth to bedrock at some places on the valley floor is known to be more than 300 feet.

The water table beneath the valley floor is controlled by the level of the river. Depths to water in wells range from about 15 feet near the river to about 30 feet near the valley walls or terrace fronts.

The terraces in the Okanogan River valley subarea—except for some of the more extensive flat areas such as Pogue Flat and Wagonroad Coulee—are underlain by materials that are largely dewatered. Unconsolidated deposits underlying the terraces consist of permeable sand and gravel beds and some relatively impermeable beds of silt, clay and till. The bedrock, which has a very uneven surface, is exposed locally (pl. B1), but in other places depressions in the bedrock are filled with unconsolidated deposits and, where saturated, perched ground-water bodies may occur at altitudes considerably above the regional water table.

Pogue Flat, an area of several square miles immediately north and west of Omak (fig. A1, pl. B1), and about 400 feet above the main valley floor, is the most extensive terrace beneath which large ground-water supplies are available. Wells there yield moderate to large quantities of water, except in the area just west of Okanogan and on a lower terrace along the east edge of Pogue Flat between Omak and Riverside. Many wells in the northern three-fourths of the flat yield 100 gpm or more, and may yield as much as 800 gpm. Practically all these wells tap less than 25 feet of saturated material. Depths to water range from about 90 feet north of Duck Lake to as little as 10 feet in places south of Duck Lake.

On the terrace immediately west of Okanogan many wells are unproductive or only moderately productive. Wells in this area may enter bedrock at shallow depths or may extend as much as 200 feet into gravel without reaching the water table. Ground-water supplies also are meager on the low terrace between Omak and Riverside. Bedrock crops out at Coleman Butte (sec. 24, T.34 N., R.26 E.) and to the north, and apparently forms a divide between this low terrace and the higher terrace to the west. A well of the Coleman Butte Water System is located on the upper terrace and serves much of the lower terrace. Residents of the area west of Okanogan are supplied by the Progressive Flats Water Association which has a 30-foot well located in the NW¼NW¼ sec. 4, T.33 N., R. 26 E. (table C4).

Much of the ground-water reservoir underlying Pogue Flat is sustained by artificial recharge from irrigation-ditch leakage and sprinkling. Although some ground water was present under natural conditions prior to irrigation in the area, the amount is unknown.

Moderate to large ground-water supplies are available in Wagonroad Coulee, but there the lateral extent of aquifers is limited by the bedrock sides of the valley. The yields of wells decrease with long pumping time, particularly where there is no opportunity for recharge from streams or canals. A 172-foot well in Wagonroad Coulee was tested for 4 hours at 1,000 gpm and had only 20 feet of drawdown. However, when the well was pumped all summer it had a sustained yield of only 400 gpm. Another well in the vicinity also tested at a rate of 1,000 gpm, but yielded only 500 gpm on a sustained basis. Depth to water in the vicinity of these wells in the northern part of the coulee is generally about 90 feet. However, because the coulee floor is very uneven, the depth to water ranges from a few feet to more than 200 feet below land surface.

Tarheel Flat, north of Malott, has some moderately productive wells; however, the ground-water reservoir probably is recharged largely by irrigation from surface-water sources. The materials underlying the southern end of the terrace are drained to about the level of the water table beneath the adjacent valley floor.

Ground-water supplies are meager on Brewster Flat, on the terrace west of Tonasket, and on Snider Flat, which is a small terrace immediately east of the mouth of the Okanogan River. Water supplies for residents of Brewster Flat are obtained either from wells on the valley floor, or, as in the case of the Brewster Flat Water District, from wells in a small valley that drains the uplands north and west of the flat. There is little ground-water development on Snider Flat and on the terrace west of Tonasket.

Hydrographs of water levels in wells in the Okanogan River valley subarea show fluctuations in response to variations in pumpage, precipitation, river stage, and application of surface water for irrigation.

Hydrographs for three wells in the subarea are shown in figure B10. Wells 34/26-26Q1 (30 ft deep) and 40/27-27N1 (12 ft deep) show no long-term changes in water levels, doubtless because the wells are shallow and near the Okanogan River. (See table C4 for well-numbering system.) Water levels fluctuate with river stage and are highest in May, June, or July. Annual fluctuations in these wells seldom exceed 5 feet except when directly affected by pumpage.

The water level in well 34/26-28A1 (43 ft deep; fig. B10) is affected both by pumping and by recharge from irrigation. In many years, the water level was lowest in May, June, or July, when pumpage was intensive and recharge water from irrigation had not yet percolated to the ground-water body. Although water-level measurements in this well have shown both slightly rising and declining trends persisting for several years at different times, the net long-term change in water level is negligible.

On the basis of the estimated average thickness of saturated unconsolidated deposits and water-storage capacity of the various types of these deposits, the Okanogan River valley subarea is estimated to have about 3,700,000 acre-feet of ground water in storage. Probably about 75 percent of the ground water in storage in unconsolidated deposits in the study area is in the Okanogan River valley subarea. However, a large but undetermined amount of this water is stored in fine-grained deposits that drain very slowly and is not available to wells under normal development. Also, should a large part of this stored water be withdrawn, pumping lifts would be increased, shallow wells would go dry, and the flow of streams would diminish.

The estimated annual pumpage of ground water in the Okanogan River valley subarea for all purposes is about 38,000 acre-feet (1970), or about 85 percent of the total ground-water pumpage in the entire study area.

Quality of Water

Water in the Okanogan River above its confluence with the Similkameen is considered hard, according to the standard used by the Geological Survey, as tabulated below. Water in the Similkameen River is considered soft to moderately hard, and water from the Okanogan

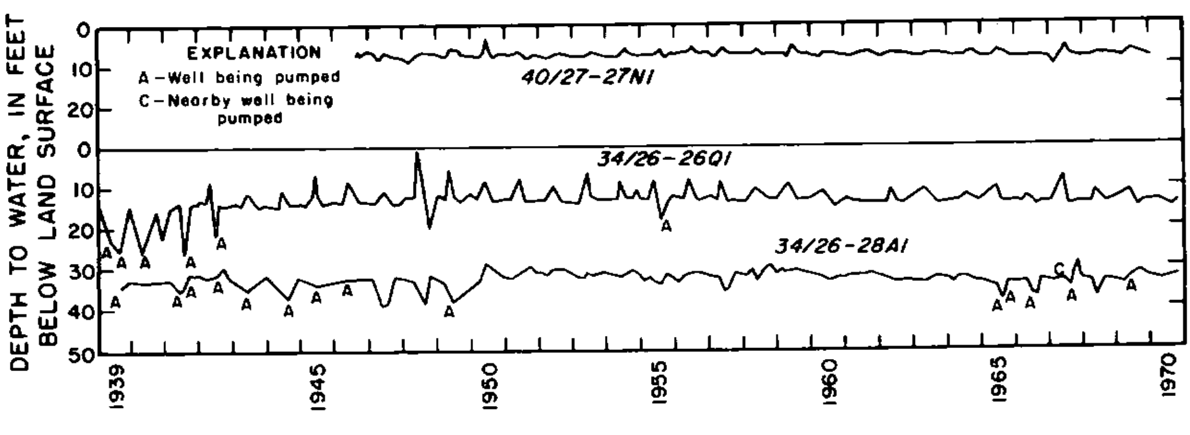

FIGURE B10.— Water-level fluctuations in selected wells in the Okanogan River valley subarea, 1939-70.

below its confluence with the Similkameen varies from soft to hard depending on the relative discharge of the two rivers.

Hardness as $CaCO_3$, in mg/1	Classification	Usability
0-60	Soft	Suitable for many uses without further softening
61-120	Moderately hard	Usable except in some industrial applications
121-180	Hard	Softening required by laundries and some other industries
More than 180	Very hard	Softening desirable for most purposes.

The observed range in temperature of water in the Okanogan River was from 0° to 22°C (Celsius) or 32° to 71°F (Fahrenheit).

Ground water in the Okanogan River valley subarea is more mineralized and more variable in chemical composition than is the surface water, but is suitable for most common uses. Several ground-water samples contained more than the maximum iron content recommended for domestic supply (table C3), and one sample exceeded the recommended maximum concentration of sulfate. Practically all ground water in the Okanogan River valley subarea is very hard. The temperature of ground water ranged from about 11° to 16°C (52° to 60°F), depending mainly on the depth of the water-yielding zone.

SINLAHEKIN-SIMILKAMEEN SUBAREA

The Sinlahekin-Similkameen subarea in Washington comprises about 400 square miles in the northwest corner of the Okanogan River basin (fig. A1, pl. B1). About 60 square miles of the subarea is drained directly by the Similkameen River; nearly all of the remaining part is drained by Sinlahekin Creek and its principal tributary, Toats Coulee Creek. Sinlahekin Creek feeds Palmer Lake which drains into the Similkameen River by way of Palmer Creek.

Much of the subarea is mountainous and is used for forestry and for grazing. Irrigation of croplands is restricted largely to the floor of Sinlahekin Creek valley and the Similkameen valley floor upstream from Nighthawk.

Surface Water

More than 75 percent of the surface water passing through the Okanogan River basin downstream from Oroville originates in the Sinlahekin-Similkameen subarea in Washington and the Similkameen River drainage in Canada and northwestern Okanogan County (outside the study area). The Similkameen drainage area is largely mountainous and heavily timbered. Heavy accumulation of snow at high altitudes in winter provides snowmelt that enhances spring runoff. Water to irrigate about 10,500 acres is diverted from the Similkameen River in Canada. The annual mean discharges of the Similkameen River near Nighthawk (above the Oroville-Tonasket Irrigation District diversion), for 1929-69 ranged from 1,150 to 3,588 cfs, and averaged 2,318 cfs (fig. B11), or 1,680,000 acre-feet per year. The average monthly discharge during August through March for the same period was about 745 cfs. The average monthly discharge during April through July was about 5,490 cfs (fig. B12). The flow at high stages is regulated by natural diversion into Palmer Lake, and water to irrigate about 2,900 acres in the study area is diverted from tributary streams above the gaging station near Nighthawk. The mean annual discharge records of the Similkameen River near Oroville are summarized in figure B13. Records for the sites near Nighthawk and near Oroville may be considered as equivalent except that 30 to about 65 cfs was diverted between the two sites for irrigation.

The annual mean discharges of Sinlahekin Creek (above Chopaka Creek) near Loomis for the period 1958-65 ranged from about 20 cfs to about 95 cfs, and averaged about 54 cfs (fig. B14), or about 39,000 acre-feet per year. The high-flow period for Sinlahekin Creek is considerably shorter than for the Similkameen and Okanogan Rivers, largely because of differences in the altitudes of the drainage basins and differences in the pattern of diversions and impoundments. The average monthly discharge of Sinlahekin Creek during July through April was about 25 cfs, whereas during May and June it was about 200 cfs.

The annual mean discharges of Toats Coulee Creek near Loomis (above the intake of Whitestone Irrigation Canal; table C1) for the period 1958-69 ranged from about 24 cfs to about 65 cfs, and averaged about 45 cfs (fig. B15), or about 33,200 acre-feet per year. The average monthly discharge during July through April was about 15 cfs, whereas during May and June, it was nearly 200 cfs (fig. B16).

The short-period records of the annual discharges of Toats Coulee Creek and Sinlahekin Creek are presented for the purpose of comparison. The yearly discharge of Sinlahekin Creek near Loomis, which is downstream from the confluence of Toats Coulee and Sinlahekin Creeks, was, on the average, only slightly more than that of Toats Coulee Creek near Loomis because water to irrigate about 2,000 acres is diverted between the two gaging sites.

Data from gaging stations on the Similkameen River near Nighthawk and Toats Coulee Creek near Loomis were used in preparation of the curves in figures B17 and B18, which show the approximate frequencies of occurrence of peak discharges of various rates.

Streamflow data for Toats Coulee Creek near Loomis, Similkameen River near Nighthawk, and Similkameen River near Oroville were analyzed for the magnitude and frequency of high flows of 1-, 7-, and 30-day durations. The results of the analyses are shown by the curves in figures B19, B20, and B21. As is the case with curves representing peak discharges, regularity of occurrence of flows of a given magnitude and duration is not indicated, only the average frequency or probability of occurrence. For example, figure B18 indicates that Toats Coulee Creek can be expected to have a peak discharge of 1,000 cfs about 1 year in 5

(20-percent probability). Discharges of about 680 cfs for 1 day, 550 cfs for 7 days, and 400 cfs for 30 days would have the same frequencies or chances of occurrence. (fig. B19)

Curves showing the frequencies of recurrence of specified low flows of a stated number of consecutive days duration in the climatic year for Toats Coulee Creek near Loomis, Similkameen River near Nighthawk, and Similkameen River near Oroville are given in figures B22, B23, and B24, respectively.

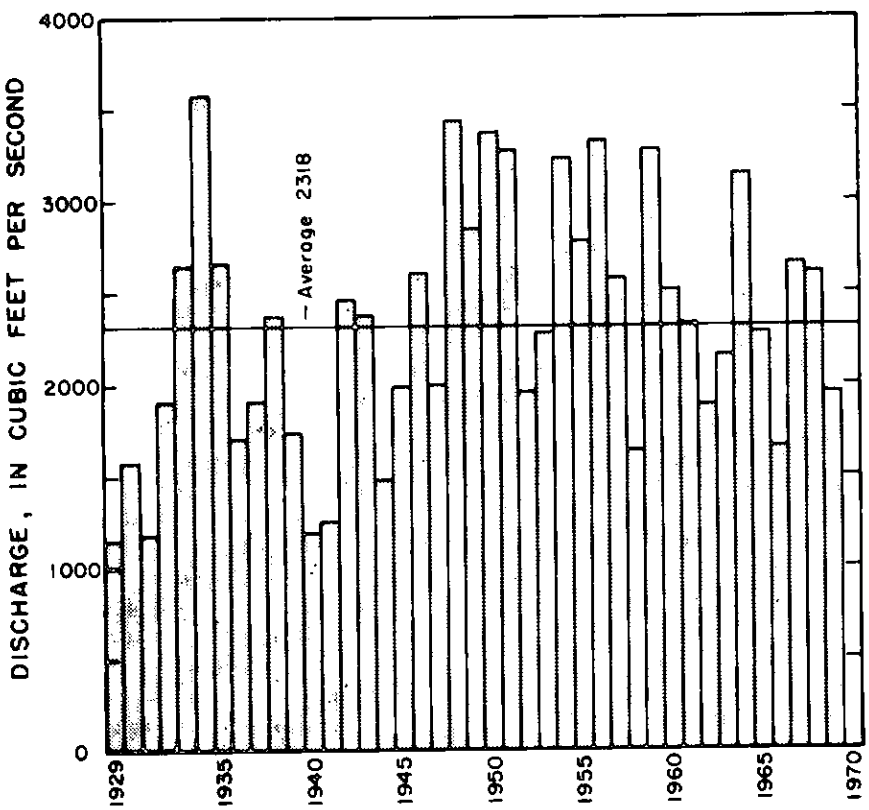

FIGURE B11.— Annual mean discharges of Similkameen River near Nighthawk, 1929-1969.

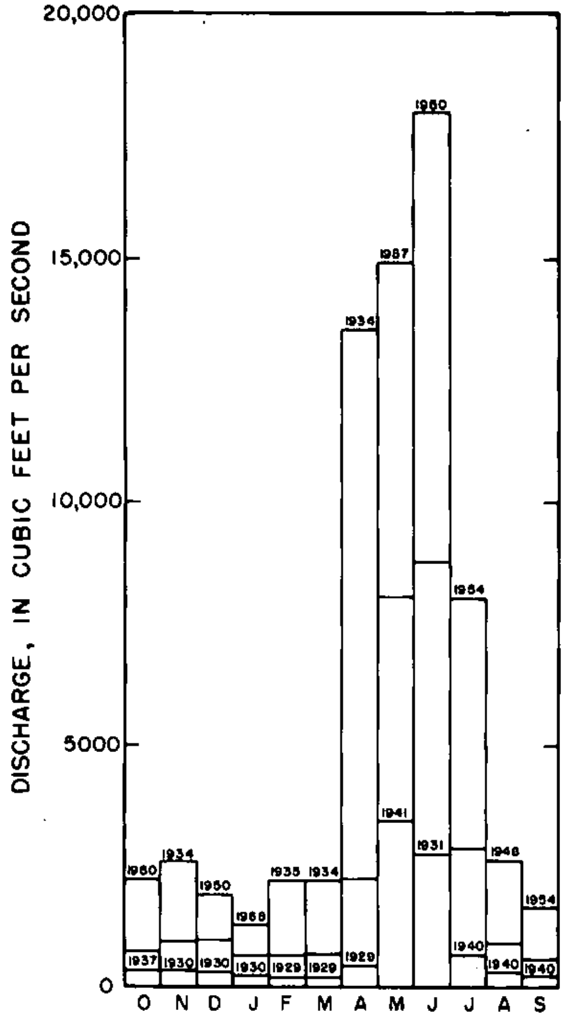

FIGURE B12.— Average monthly discharges (middle bars), and maximum and minimum monthly discharges and the years when extremes ooccurred, Similkameen River near Nighthawk, 1929-69.

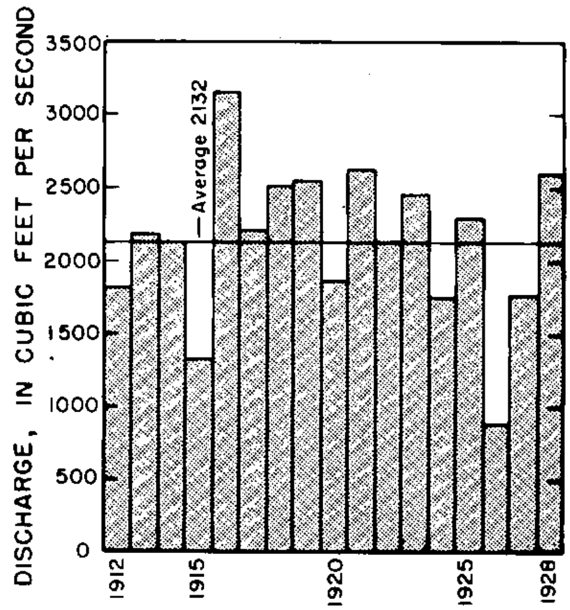

FIGURE B13.— Annual mean discharges of Similkameen River near Oroville, 1912-28.

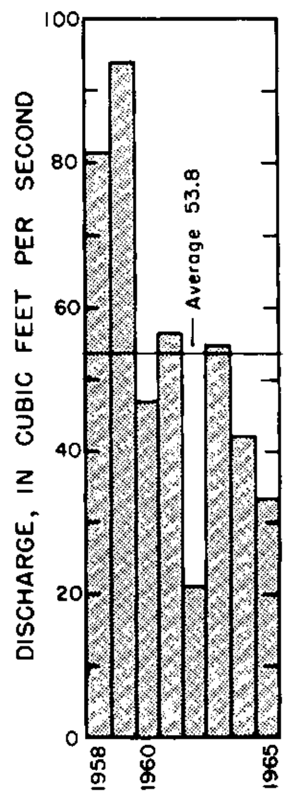

FIGURE B14.— Annual mean discharges of Sinlahekin Creek above Chopaka Creek, near Loomis, 1958-65.

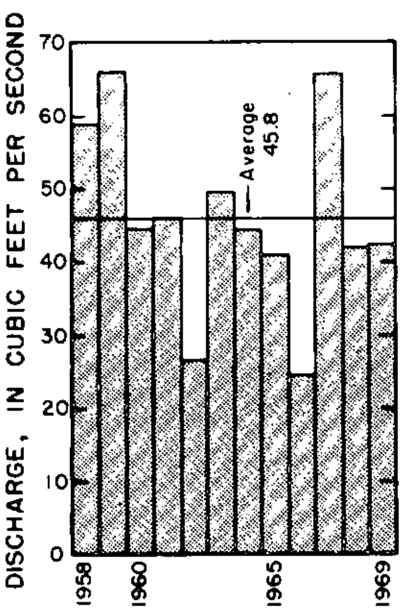

FIGURE B15.– Annual mean discharges of Toats Coulee Creek near Loomis, 1958-69.

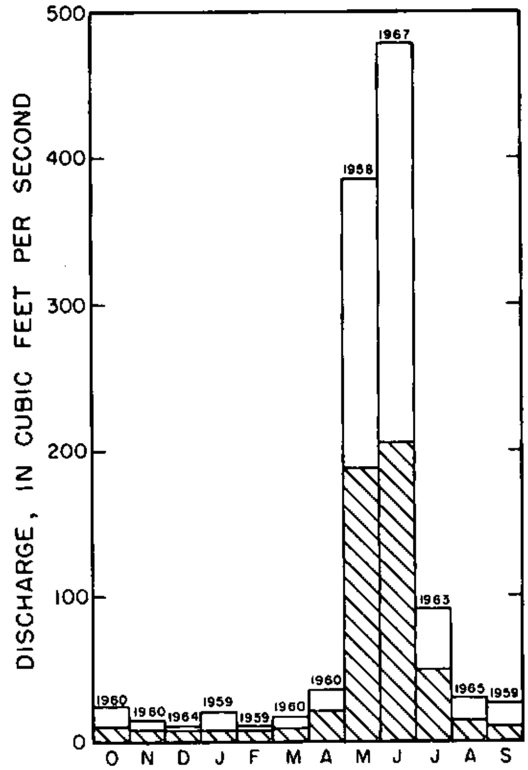

FIGURE B16.– Maximum and average monthly discharges of Toats Coulee Creek near Loomis, 1958-69.

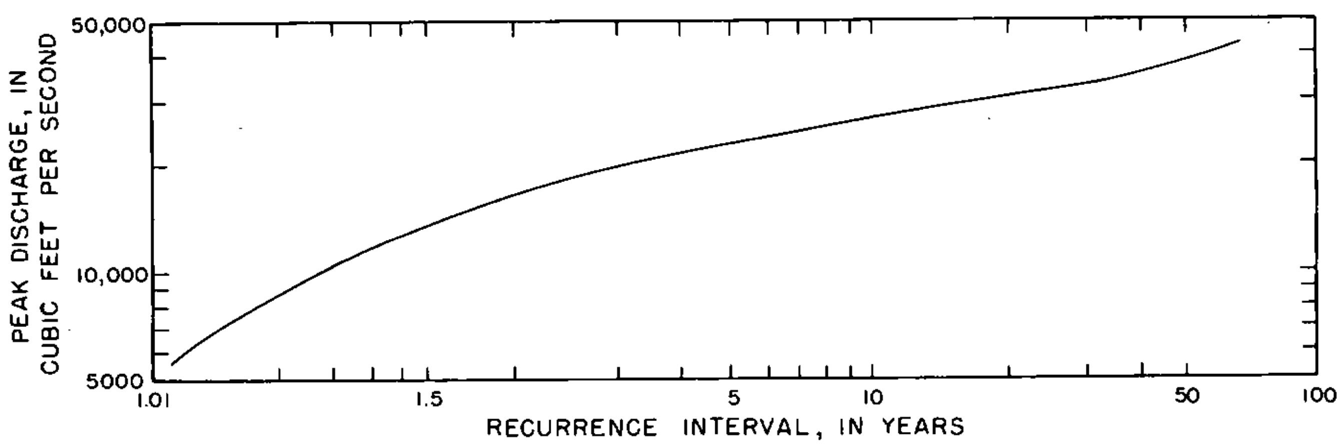

FIGURE B17.– Flood frequency, Similkameen River near Nighthawk, 1929-69.

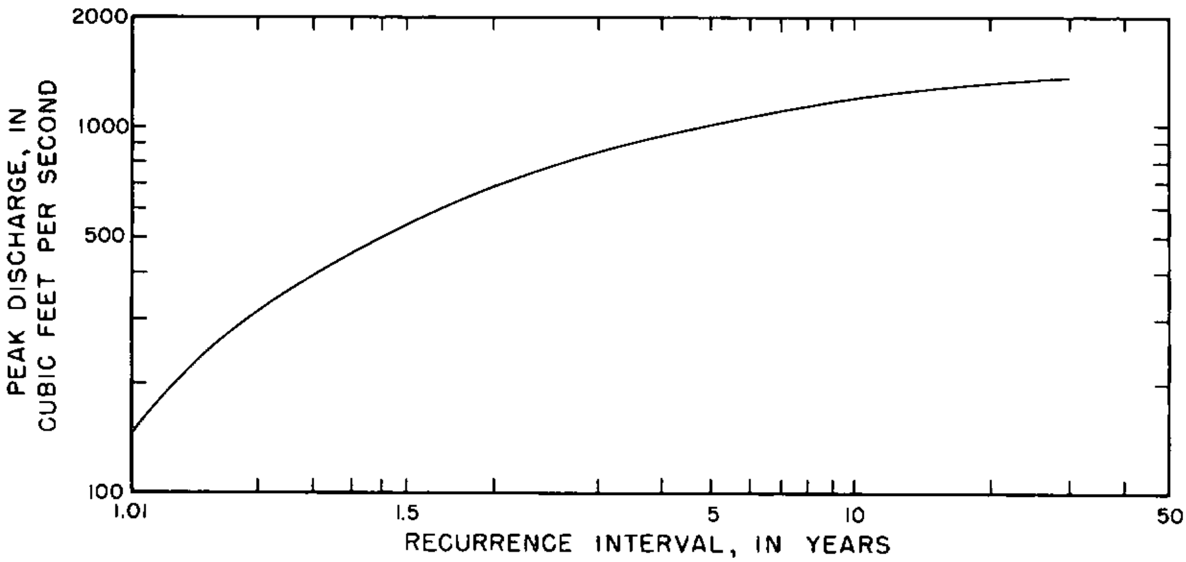

FIGURE B18.— Flood frequency, Toats Coulee Creek near Loomis, 1921 and 1958-63.

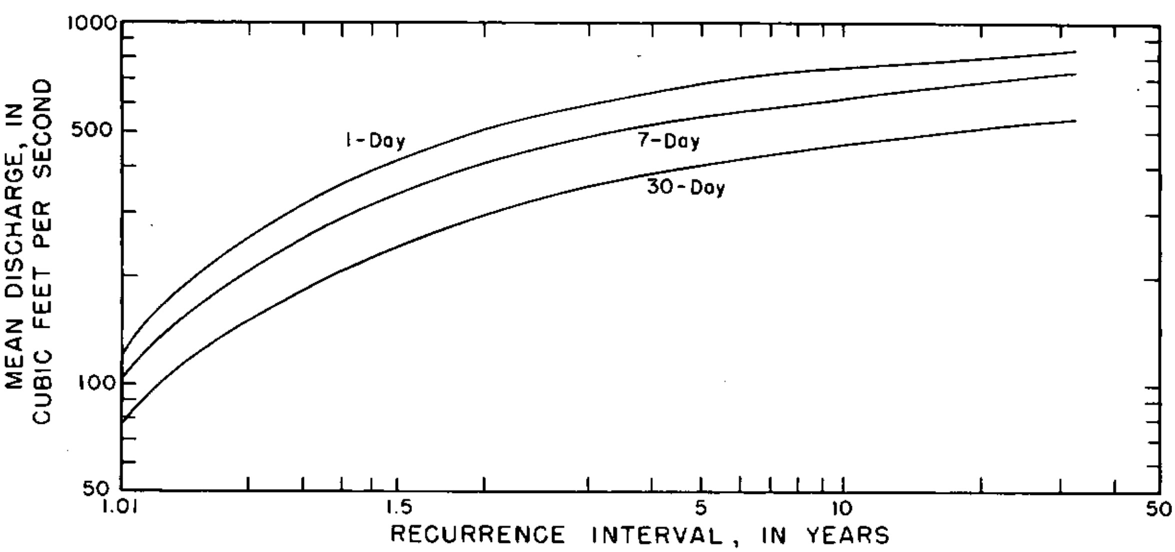

FIGURE B19.— High-flow frequency, Toats Coulee Creek near Loomis, 1921 and 1958-68.

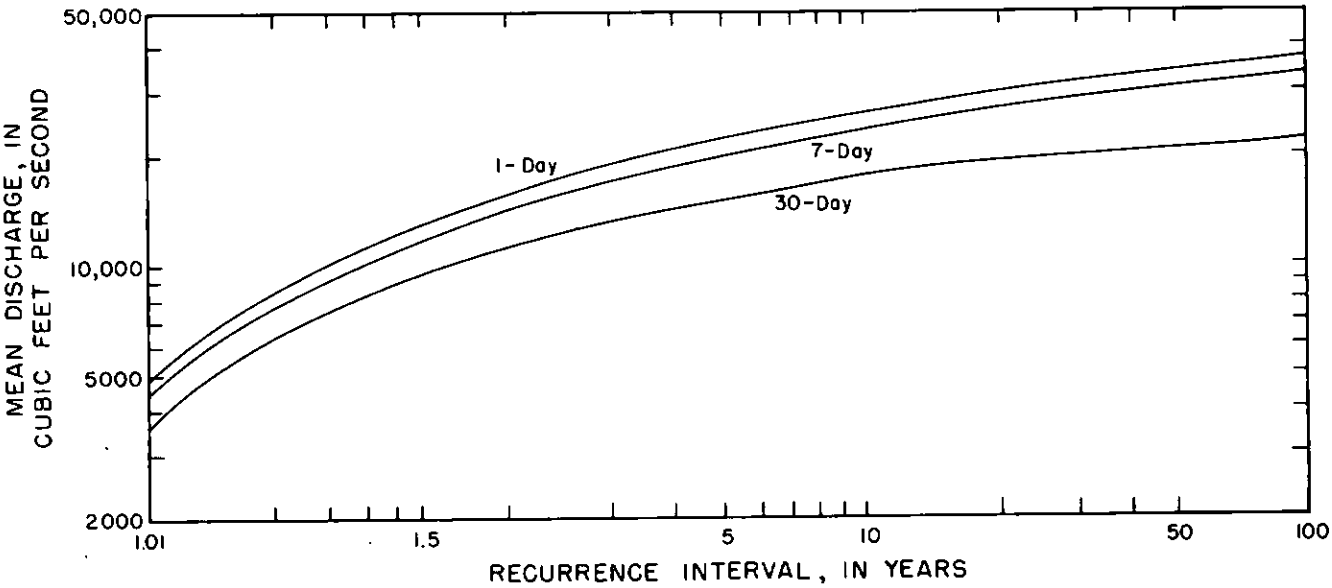

FIGURE B20.– High-flow frequency, Similkameen River near Nighthawk, 1929-68.

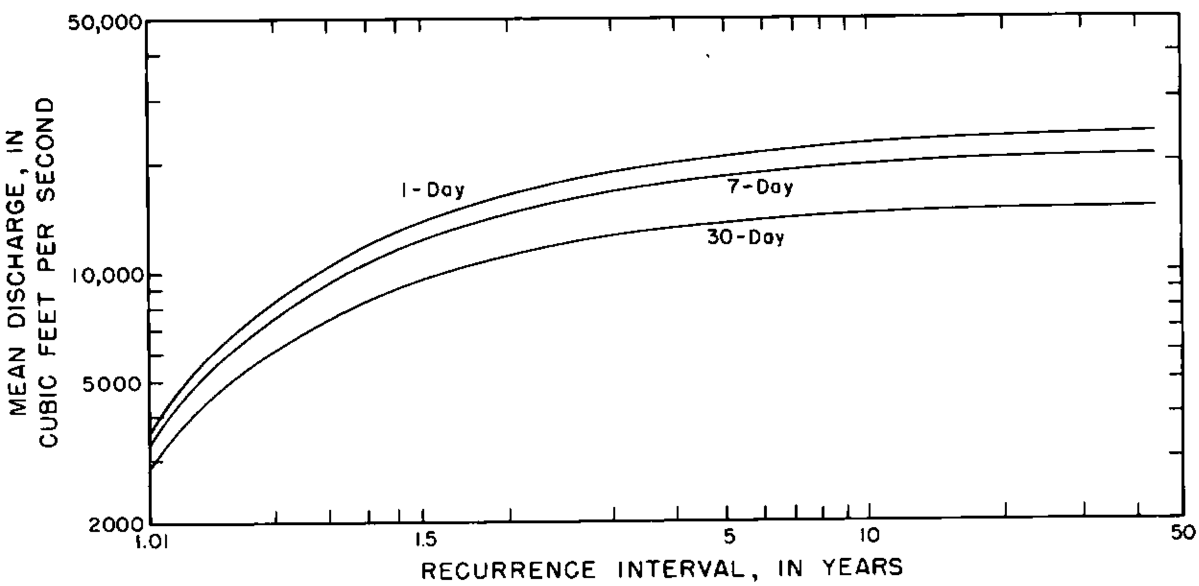

FIGURE B21.– High-flow frequency, Similkameen River near Oroville, 1912-28.

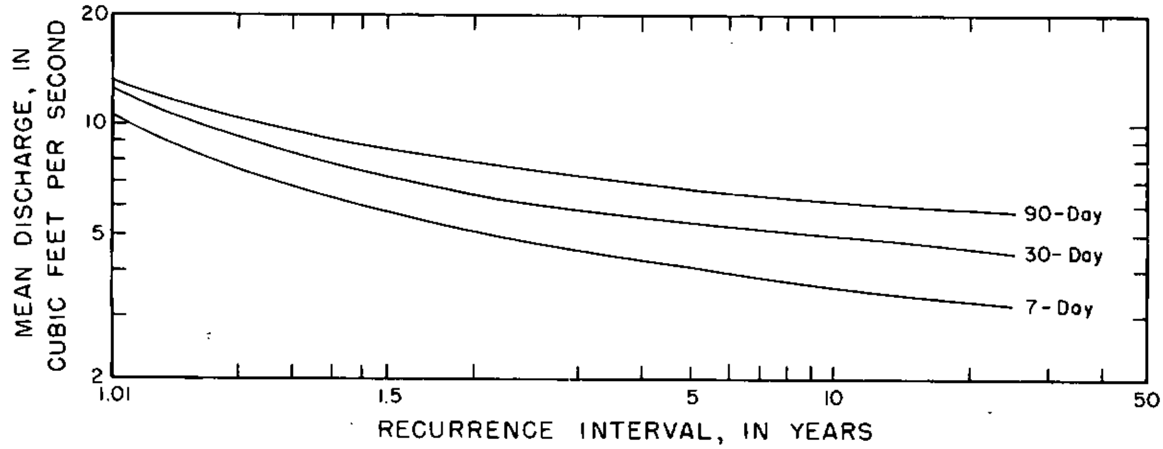

FIGURE B22.— Low-flow frequency, Toats Coulee Creek near Loomis, 1959-68.

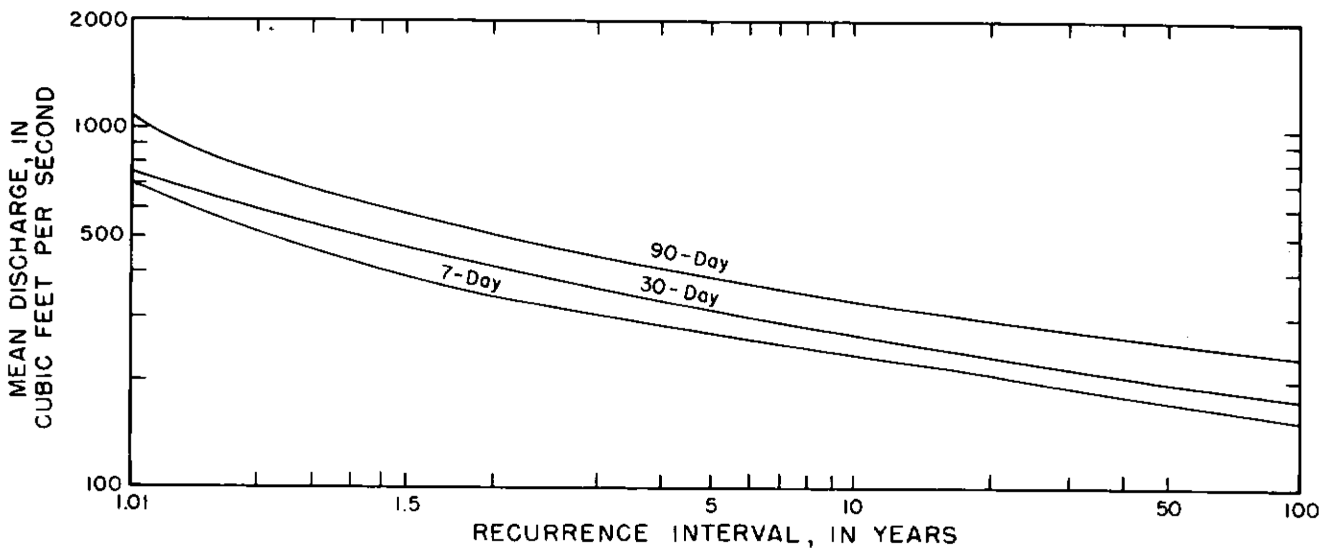

FIGURE B23.— Low-flow frequency, Similkameen River near Nighthawk, 1930-68.

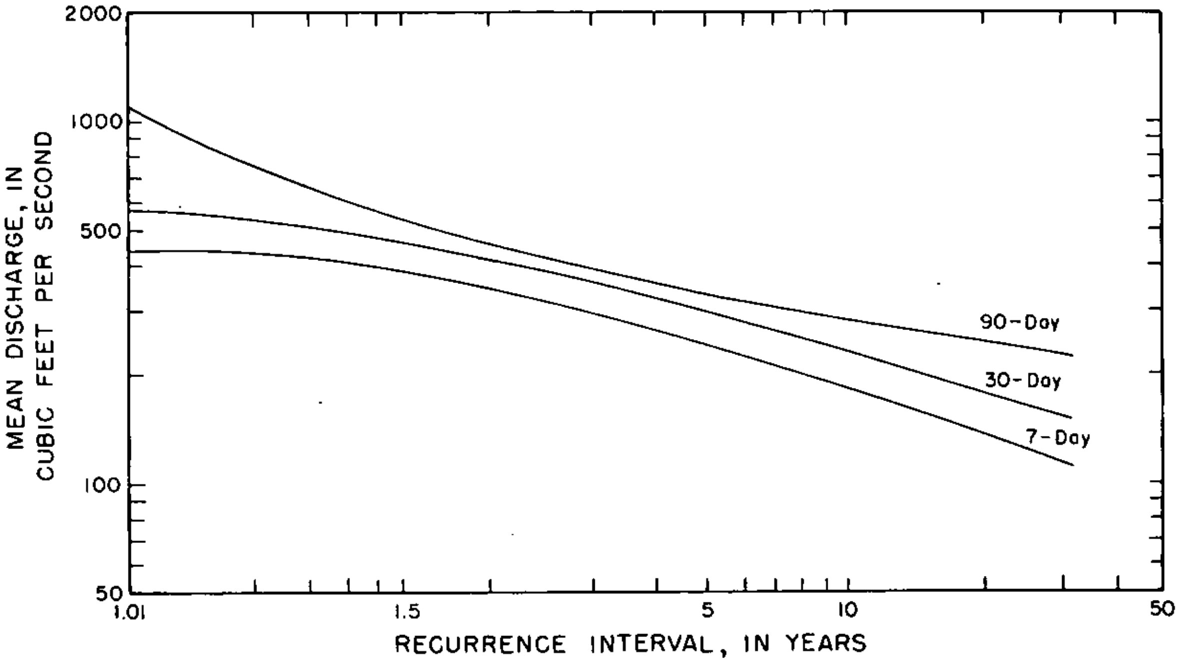

FIGURE B24.– Low-flow frequency, Similkameen River near Oroville, 1913-28.

Ground Water

Most of the ground water available for withdrawal in the Sinlahekin-Similkameen subarea occurs in alluvial deposits underlying the major stream valleys, or in glacial and alluvial deposits that fill abandoned or partially abandoned valleys. Before the latest part of the Pleistocene Epoch, the ancestral Similkameen River flowed southward—parallel to the Okanogan River—for about 35 miles and joined the ancestral Okanogan River near Omak. The south end of the valley was blocked by glacial deposits during glaciation of the area, and the Similkameen River established several temporary courses across the divide between the two valleys before finally becoming established in its present course between Nighthawk and Oroville.

The glacial deposits in the original valley, which is now largely occupied by Sinlahekin Creek, consist of gravel, sand, silt, and clay, and are probably several hundred feet thick. Blue Lake (pl. B1), which is 114 feet deep, is the deepest known penetration below the valley floor. One well (39/25-26G1) is 170 feet deep (table C4), but is on a terrace about 80 feet above the valley floor, and so does not reach the altitude of the lake bottom. Most wells are less than 50 feet deep, and nearly all are north of Loomis.

Yields of more than 100 gpm can be obtained from a properly constructed well nearly everywhere on the main valley floor. Yields of several wells are reported to be 500 gpm or more. A well 1 mile north of Nighthawk reportedly yields 1,000 gpm with 30 feet of drawdown. In contrast, practically no ground water is available in the Similkameen River valley from about 2 miles east of Nighthawk to near Oroville because the valley there contains few glacial deposits.

The thickness and water-bearing character of the deposits beneath the flood plain of the Similkameen River near the border are not known. The valley-fill deposits may reach their greatest thickness in this part of the valley, and probably contain some moderately to highly permeable beds of sand and gravel. The gradient of the Similkameen River near the border probably is about 8 to 10 feet per mile, and a large amount of ground water could be entering Washington there if the valley-fill deposits are reasonably thick and permeable. However, the thickness and character of the deposits, and the amount of ground water they may be conveying across the border, can only be determined from information made available through the drilling of additional wells in this part of the area.

Lenton Flat, near the Canadian border east of the flood plain of the Similkameen River (pl. B1) is a terrace 150 to 200 feet above the river, between bedrock hills. Unconsolidated deposits along the border consist of much clay, and some mixtures of clay and gravel. Locally, water-bearing gravel occurs at a depth of 30 to 50 feet. The unconsolidated deposits underlying Lenton Flat probably are no more than 100 feet thick in most places. Practically no ground-water development has occurred on the flat, but supplies of 100 gpm possibly could be obtained from wells there.

Chopaka Lake occupies part of a small hanging valley nearly 1,800 feet higher than, and about 2 miles west of, Palmer Lake. The valley contains unconsolidated deposits of clay, clay and gravel, and some sand and gravel, except at the south end where Chopaka Creek flows over bedrock to the main valley below. The unconsolidated deposits are about 100 feet thick. One well in the valley yields 45 gpm, and yields of 100 to 200 gpm possibly could be developed from wells tapping the deposits.

Toats Coulee Creek, which drains a mountainous area, flows eastward through a narrow canyon into Sinlahekin Creek 1 mile north of Loomis. Unconsolidated deposits in the lower 2 to 3 miles of the canyon consist of sand, gravel, and boulders, and are more than 60 feet thick even where the canyon is very narrow. Some till occurs in the bottom and on the sides of the valley farther upstream where the sides have more moderate slopes. Locally, the unconsolidated deposits may be as much as 100 feet thick. Ground-water development in the valley is almost nonexistent, although small supplies, adequate for domestic and stock use, probably are available nearly everywhere from the unconsolidated deposits in the valley bottom; larger yields probably would be difficult to obtain.

Recharge to the ground-water reservoir of the Sinlahekin-Similkameen subarea is from precipitation falling directly on the unconsolidated deposits of the lowlands, from infiltration of streamflow from higher parts of the subarea, and from underflow down the main valley from Canada. Recharge to the Sinlahekin Creek drainage basin, which includes the Toats Coulee Creek basin, is estimated to average about 17,000 acre-feet per year, based on low-flow measurements of Sinlahekin Creek 2 miles upstream from Palmer Lake.

Natural discharge of ground water from the Sinlahekin-Similkameen subarea is mostly by seepage to the streams. Some ground water is lost through evapotranspiration where the water table is near the surface, and some moves out by underflow, principally eastward into the valley occupied by Spectacle Lake, and southeastward past Fish Lake.

Development of ground water in the subarea is small. Withdrawals in 1969 were estimated to be about 320 million gallons, or about 1,000 acre-feet of water. The amount of ground water in storage in the unconsolidated deposits of the Sinlahekin-Similkameen subarea is estimated to be about 600,000 acre-feet. This amount, although much smaller than that stored in the Okanogan River valley, is considerably more than that stored in any of the other subareas of the Okanogan River basin.

Quality of Water

Available data are insufficient for evaluation of the chemical quality of ground water, or of surface waters in the Sinlahekin-Similkameen subarea except for water in the Similkameen River. Because of the large amount of water from the Similkameen River that is used in the Okanogan River valley, the chemical quality of water from the Similkameen was discussed previously in the section of this report dealing with the Okanogan River valley subarea.

SPECTACLE-AENEAS LAKES SUBAREA

The Spectacle-Aeneas Lakes subarea covers about 200 square miles between the Okanogan River valley and the Sinlahekin Creek valley (fig. A1, pl. B1). The subarea is mostly mountainous, with peaks ranging in altitude from 3,000 to more than 4,000 feet. Bedrock is exposed in most of the western and northern parts of the subarea. The subarea is crossed by several valleys and coulees which represent temporary courses of the Similkameen River after it was diverted from its original course to the west. These valleys and coulees are bordered and partly filled with unconsolidated glacial deposits.

Surface Water

Aeneas Creek and Whitestone Creek are the only significant perennial streams within the subarea. Streamflow records have been maintained on Whitestone Creek since 1958; however, the flow is regulated by headworks on Whitestone Lake, which is indirectly controlled by diversion from Toats Coulee Creek. Streamflow records have not been maintained on Aeneas Creek but, except for periods of precipitation or snowmelt, the entire flow of the creek probably is derived from local ground-water discharge, as indicated by a flow of 1.44 cfs on September 8, 1967.

A crest-stage gage (indicating only peak discharges) has been maintained since 1961 on a stream flowing into Spectacle Lake in the SE¼NW¼ sec. 10, T.38 N., R. 26 E. During the period of record, either no flow or flow less than 1 cfs was recorded for 6 of the years. The highest recorded flow, 51 cfs, occurred on August 29, 1964 (table C7).

Small amounts of water are withdrawn from Aeneas Creek and Pine Creek for irrigation, but most of the irrigation water in the subarea is transported from other subareas. Tracts near Spectacle and Whitestone Lakes are irrigated by water taken from Toats Coulee Creek and stored in the lakes. Throughout most of the year, about 6 to 10 cfs of water is pumped from the Okanogan River, both for irrigation near Aeneas Lake and for maintenance of the lake level and the adjacent ground-water table.

Ground Water

Significant quantities of ground water within the Spectacle-Aeneas Lakes subarea are limited to the bottoms of the many valleys and coulees that traverse the subarea.

Unconsolidated deposits underlying a small valley northwest of Wannacut Lake (pl. B1) consist of clay underlain by gravel. The thickness of these deposits is unknown, but must be more than 158 feet—the depth of Wannacut Lake at its north end. Salinity of the lake water indicates that evaporation from the lake is greater than the subsurface outflow from the lake down the valley to the south. The thickness and composition of unconsolidated deposits in this valley to the south are unknown, but they may be thin or impermeable.

Yields of several hundred gallons per minute can be obtained from shallow wells tapping the unconsolidated deposits of the Wannacut Lake valley, at least north of the lake. Very little ground-water development has occurred in the valley and, although additional supplies possibly can be developed from deeper wells, saline water may be encountered in the deposits south of Wannacut Lake, or might be induced to move into the deposits north of the lake should the water table there be lowered by pumping of wells.

A connecting valley, which lies between Loomis in the Sinlahekin Creek valley and Ellisforde in the Okanogan River valley, contains Spectacle and Whitestone Lakes. The valley is about one-half mile wide between Loomis and Spectacle Lake and, including terraces, widens to about a mile to the east. Unconsolidated deposits ranging from silt and clay to boulders and till partly fill the valley and mantle the valley sides. The deposits are probably 200 to 300 feet thick in the bottom of the valley. A well (38/27-17R1) situated on a slope just east of Whitestone Lake reached bedrock at a depth of about 275 feet. Bedrock crops out on each side of the valley at Whitestone Lake. The lowest part of the bedrock surface may not necessarily coincide with the lowest part of the present-day land surface.

Ground-water levels in the valley are about the same as, or somewhat higher than, the levels of Spectacle and Whitestone Lakes, and of the creek draining Whitestone Lake. Depth to water beneath the terraces on the south side of the valley between the lakes is about 140 feet, which is also at about the level of the lakes.

The unconsolidated deposits in the valley yield small to moderate quantities of water to wells. Some wells yield only enough water for domestic use; others used for irrigation reportedly yield 100 to 400 gpm. Locally in the valley, the water table is lowered so that by the end of the summer well yields are only about one-half that of early spring. Wells that have been drilled for irrigation on higher ground in the valley have had insufficient yields for that purpose. Water from Toats Coulee Creek, which is carried in canals for storage in the lakes, which is then used for irrigation by the Whitestone Irrigation District, contributes recharge to the ground-water reservoir in this part of the subarea. One well owner reports that his well yield increases from 100 gpm in the spring to about 150 gpm in the fall, apparently because irrigation water recharges the aquifer. Quantities of ground water withdrawn in 1969 from the valley, mostly used for irrigation, are estimated to have been about 280 million gallons, or about 870 acre-feet.

Horse Springs Coulee, which extends south of Spectacle Lake to the terrace west of Tonasket, and which varies in width and contains Aeneas Lake at the southern end, is partly filled by unconsolidated deposits that range from clay to boulders and differ considerably within short distances. The deposits are about 150 feet thick at the south end of the coulee, and are probably more than 100 feet thick throughout most of the coulee. South of Aeneas Lake, near the mouth of the coulee, the deposits are mostly silt and clay, which probably retard the southward movement of ground water. The coulee has terraces along the sides that are underlain mostly by unsaturated deposits. The north end of the coulee is partly blocked by bedrock.

Yields of irrigation wells in the vicinity of Aeneas Lake reportedly have ranged from about 200 gpm to more than 2,000 gpm on a short-time pump-test basis. However, on a long-term seasonal basis, yields of more than 800 gpm are rare. Local overdevelopment and mutual interference of wells have caused declining water levels and decreased yields. Most of the ground-water withdrawals in Horse Springs Coulee are in the vicinity of Aeneas Lake and are estimated to have been about 640 million gallons, or nearly 2,000 acre-feet, in 1969.

An unnamed valley to the east of Horse Springs Coulee, extending southward from Whitestone Lake about 4 miles, contains unconsolidated clay, sand, and gravel in thicknesses of 150 to 200 feet. Although wells may yield several hundred gallons per minute for a short time, aquifers are soon dewatered because of their limited extent and limited recharge area. The springtime depth to water in this valley is about 25 feet.

Recharge to the ground-water reservoirs of the Spectacle-Aeneas Lakes subarea occurs both naturally and artificially. Natural recharge is mostly from precipitation, and possibly some ground water entering the subarea as underflow from the Sinlahekin Creek valley near Loomis. Artificial recharge results from percolation of irrigation water diverted from Toats Coulee Creek and the Okanogan River, and of water pumped into Aeneas Lake. Natural discharge of ground water occurs as subsurface flow east of Whitestone Lake and probably at the south end of Horse Springs Coulee.

Total ground-water pumpage in 1969 from the Spectacle-Aeneas Lakes subarea is estimated to have been about 960 million gallons or about 3,000 acre-feet. The quantity of ground water in storage in the unconsolidated deposits of the subarea is estimated to be about 150,000 acre-feet.

Hydrographs of wells 37/26-26J1, 37/26-25P1, and 37/26-10H1 (fig. B25) indicate that water levels in the area of Aeneas Lake and Horse Springs Coulee have been declining since at least 1964, but at a reduced rate since about 1967. The pronounced rise in water level in well 37/26-25P1 in the last half of 1970 probably resulted from recharge of water from the Okanogan River being stored in Aeneas Lake and used for irrigation in the area east of the lake.

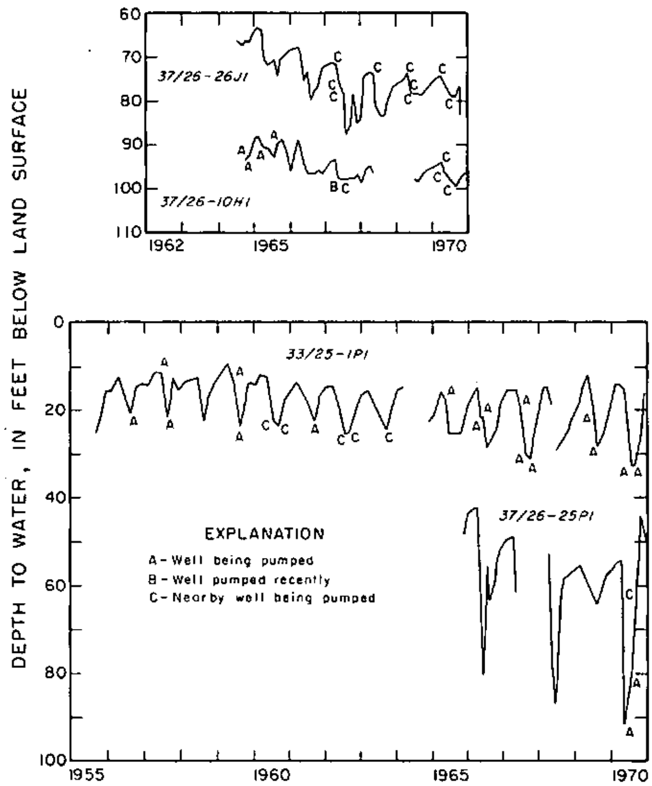

FIGURE B25.— Water-level fluctuations in selected wells in Spectacle-Aeneas Lakes and Johnson-Salmon Creeks subareas, 1955-70.

Quality of Water

No data on the chemical quality of stream water or ground water in the Spectacle-Aeneas Lakes subarea are available. However, because Wannacut, Blue, and Poison Lakes are somewhat saline (primarily sodium and magnesium sulfate), the ground water locally can be expected to be moderately mineralized.

JOHNSON-SALMON CREEKS SUBAREA

The Johnson-Salmon Creeks subarea covers about 240 square miles and extends westward from Pogue Flat near Omak to the west edge of the Okanogan River basin (fig. A1, pl. B1). The western half of the subarea is mountainous and mostly in the Okanogan National Forest.

Surface Water

The principal perennial streams draining the subarea are Johnson Creek and Salmon Creek. The south, west, and north forks of Salmon Creek join near Conconully, and their combined flow is completely controlled by storage in, and release from, Conconully Lake and Conconully Reservoir.

Recent streamflow data for Salmon Creek are not available; however, records for a gaging station operated from 1903 to 1910 on Salmon Creek near Okanogan indicate flow characteristics before regulation of the stream, and records for a station maintained near Conconully from 1910 to 1922 give an indication of the mean yearly discharge. The yearly discharge of Salmon Creek near Okanogan, for the period 1904-09, when the creek was unregulated by impoundments and had only a few small diversions for irrigation, ranged from about 35 cfs to 80 cfs, and averaged 49 cfs or 35,500 acre-feet per year. The average monthly discharge during August through March for the same period was about 15 cfs and during April through July about 114 cfs. At the Salmon Creek station near Conconully during the period 1910-22 the average yearly discharge was only about 31 cfs. The 37-percent smaller flow at the station near Conconully during the later period probably resulted mostly from increased diversion for irrigation and from evaporation losses from impoundments; it was also partly due to the smaller drainage area above that station than above the station Salmon Creek near Okanogan.

Fragmentary streamflow data for Johnson Creek near Riverside for 1903-08 indicate that average yearly discharge was about 5 to 7 cfs. Even in those early years, there were numerous small diversions from the creek for irrigation above the gaging station.

Irrigation with surface water in the subarea is limited to a few orchards in the Salmon Creek valley, although about 17,000 acre-feet of water from Salmon Creek is used annually for irrigation on Pogue Flat in the adjacent Okanogan River valley subarea. Also, some water is diverted from Johnson Creek into Duck Lake in the adjacent subarea during periods of high flow.

Ground Water

The south, west, and north forks of Salmon Creek, joining near Conconully Reservoir, drain forested mountains through valleys that in most places contain only small amounts of unconsolidated deposits. The deposits, which range from clay to boulders, are probably the thickest and most extensive in the valley of the North Fork, where they are at least 90 feet thick even though the valley is narrow. The deposits in the valley bottoms, where present, probably will yield small quantities of ground water. Ground-water development along the three forks of Salmon Creek is limited to a few wells in the area where the forks join. The location of those wells for which data are available are shown on plate B1.

The valley of Salmon Creek between Conconully Reservoir and about the center of T. 34 N., R. 25 E. (pl. B1) is narrow and contains little unconsolidated material. There has been little ground-water development in this reach of the valley, the availability of ground water being virtually limited to the deposits underlying the narrow flood plain.

In the southeastern part of T. 34 N., R. 25 E., Salmon Creek valley gradually widens and becomes underlain by clay, sand, gravel, and boulders. Salmon Creek leaves the main valley through a narrow bedrock gorge near the southeast corner of T. 34 N., R. 25 E.; below this point the valley is known as Spring Coulee.

Spring Coulee and Salmon Creek valley for 2 to 3 miles upstream from Spring Coulee are underlain by as much as 300 feet of unconsolidated deposits. Most of the irrigation wells tapping these deposits (pl. B1 and table C4) are less than 100 feet deep and yield several hundred gallons per minute. Yields of 1,000 gpm can be obtained for a short time, but because the valley is narrow and ground-water storage therefore is limited, water levels are soon lowered enough to decrease the yield. Annual high-water levels in well 33/25-1P1 had a range of about 6 feet during the past 15 years and a net change of only a few feet. The annual low (pumping) water levels, however, have had a range of about 12 feet, and have declined steadily since 1956 because of increasing withdrawals.

The valley that extends from Conconully southeast to Pogue Flat, is occupied by Scotch Creek in the northwesterly part and Johnson Creek in the southeast part. The valley is constricted midway by bedrock hills, just upstream from which it is joined by a valley that extends northward to Fish Lake. Unconsolidated deposits of clay, sand, gravel, and some glacial till partly fill the valley to a depth of several hundred feet near Conconully Reservoir. The unconsolidated deposits thin to the east where bedrock is exposed in secs. 23, 24, and 25, T. 35 N., R. 25 E. (pl. B1). Unconsolidated deposits in Johnson Creek valley and in the valley extending northward toward Fish Lake are about 100 feet thick.

Ground-water development in this part of the subarea is limited largely to the northwesterly end of the Scotch Creek valley and the southeasterly end of the Johnson Creek valley. Yields of wells tapping the unconsolidated deposits of the valley commonly are several hundred gallons per minute, but locally may be less than 100 gpm. Depths to water range from a few feet to about 100 feet below land surface. Locally, in T. 35 N., Rs. 25-26 E., springs issue from limestone and dolomite beds within the bedrock and supply enough water for watering livestock.

The ground-water reservoir in the vicinity of Duck Lake has been recharged artificially for about 50 years. Water diverted from Johnson Creek during periods of high flow and that part of the water diverted from Salmon Creek that is in excess of irrigation needs is discharged into Duck Lake. Because the materials in hydrologic contact with the lake are permeable sand and gravel, the level of the lake does not rise greatly before the hydraulic gradient is sufficient to cause water from the lake to recharge the surrounding aquifers. When water in excess of that available from Salmon and Johnson Creeks is needed for irrigation, the stored water is pumped from Duck Lake or from wells surrounding the lake. According to records of the Okanogan Irrigation District, the amount of water discharged into Duck Lake has ranged from 1,650 to 3,550 acre-feet per year during the past 6 years, and has averaged about 2,250 acre-feet per year. In 1970, about 2,200 acre-feet of water was pumped from Duck Lake, compared to 1,650 acre-feet discharged into the lake.

Natural recharge to the ground-water reservoirs of the Johnson-Salmon Creeks subarea is directly from precipitation and by infiltration from streams. Natural discharge is chiefly by underflow southward out of Spring Coulee and southeastward to Pogue Flat (pl. B1). The amount of ground water withdrawn by pumping (chiefly for irrigation) in the subarea in 1969 was estimated to be about 670 million gallons, or about 2,050 acre-feet. Slightly more than half the withdrawal is from

Salmon Creek valley and Spring Coulee. The amount of ground water in storage in the unconsolidated deposits of the subarea is estimated to be about 45,000 acre-feet.

Quality of Water

Data on the chemical quality of water in the Johnson-Salmon Creeks subarea are limited to an analysis of water from a 50-foot well tapping gravel in sec. 6, T 35 N., R. 25 E. (table C3). Water from this well is of the calcium-magnesium bicarbonate type, and had the lowest dissolved-solids content of any ground water sampled in the entire Okanogan River basin. The water is only moderately hard, but contains enough dissolved iron to make treatment desirable if it is to be used for domestic supply.

LOUP LOUP-CHILIWIST CREEKS SUBAREA

The Loup Loup-Chiliwist Creeks subarea covers about 120 square miles in the southwestern part of the Okanogan River drainage basin (fig. A1, pl. B1). Much of the subarea is mountainous, and the western three-fourths is forested.

Surface Water

The principal streams of the subarea, Loup Loup and Chiliwist Creeks, have not been regularly gaged and little information on their flow characteristics is available. Water is diverted from Loup Loup Creek for the irrigation of land north of Malott. Chiliwist Creek and Sullivan Creek (pl. B1) at least in their lower reaches flow over permeable materials that partly bury an irrigular bedrock surface. Their flows are therefore highly erratic; in some places these creeks flow over the surface and at other places their flow is mostly or entirely beneath the surface. Miscellaneous measurements of Chiliwist Creek in 1968-70 (table C6) indicate that, at least locally, the discharge rarely exceeds 1 cfs. During the growing season the entire discharge of Chiliwist Creek is diverted for local irrigation use.

Ground Water

Ground-water development and the potential for greater development exists only in the Loup Loup and Chiliwist Creek valleys. In the Loup Loup Creek valley, ground-water development is limited to the lower 3 miles of the valley, where wells tapping thin unconsolidated deposits yield only enough water for domestic use. Test drilling in the upper reaches of the Loup Loup Creek valley might reveal thicker unconsolidated deposits capable of yielding moderate amounts of ground water.

In the Chiliwist Creek valley, bedrock is exposed locally and the bedrock surface is very irregular. In general, however, unconsolidated deposits overlying the bedrock are thicker than in the Loup Loup Creek valley. Irrigation wells in the lower part of the valley (pl. B1) penetrate as much as 200 feet of unconsolidated deposits and yield as much as 300 gpm.

Ground-water pumpage in 1969 for irrigation in the Chiliwist Creek valley was estimated to have been about 80 million gallons, or nearly 250 acre-feet. Although additional wells to supply more irrigation water could be drilled, increased pumpage might seriously decrease the flow of Chiliwist Creek, which also is used for irrigation. The amount of ground water in storage in the unconsolidated deposits of the Loup Loup-Chiliwist Creeks subarea is estimated to be about 35,000 acre-feet.

Quality of Water

No data on the chemical quality of surface and ground water in the Loup Loup-Chiliwist Creeks subarea are available. However, the similarity of the geologic and physiographic features of the subarea with those of adjacent subareas suggests that the chemical quality of both surface and ground water would make it similarly suitable for irrigation and drinking purposes.

TONASKET-ANTOINE CREEKS SUBAREA

The Tonasket-Antoine Creeks subarea covers about 175 square miles in the northeastern part of the Okanogan River basin (fig. A1, pl. B1). Most of the subarea is drained by Tonasket and Antoine Creeks, but some is drained by Ninemile and Mosquito Creeks and some is drained directly to the Okanogan River. Much of the subarea is mountainous, and about 40 percent is forested.

Surface Water

A streamflow gage maintained on Tonasket Creek at Oroville from April 1967 through September 1969 showed the maximum discharge during this period to be 75 cfs (Apr. 29, 1969). The annual mean discharges were 1.44 cfs, or 1,050 acre-feet, for 1968 and 3.76 cfs, or 2,720 acre-feet, for 1969. No flow occurs for many days each year during the fall and winter months. Water for irrigation of about 45 acres is diverted from Tonasket Creek upstream from the gaging-station site.

Data on peak discharges of a small tributary of Dry Creek have been collected since 1958 at a crest-stage gage near Molson. During the 12 years of record, the greatest annual peak discharge was 47 cfs; however, the annual peak discharge for 4 of the years was 1 cfs or less. Although the discharge of this stream is too small to be of great importance to the total water resources of the subarea, it does indicate the discharge pattern of similar small streams in the subarea. Figure B26 shows that this tributary to Dry Creek can be expected to have an annual peak discharge of at least 8.5 cfs 1 year in 2, while a peak discharge of at least 53 cfs can be expected only 1 year in 10.

Ground Water

Bedrock is exposed in much of the Tonasket-Antoine Creeks subarea, and the occurrence of ground water in significant quantities is limited chiefly to the bottoms of the major stream valleys and to ancestral

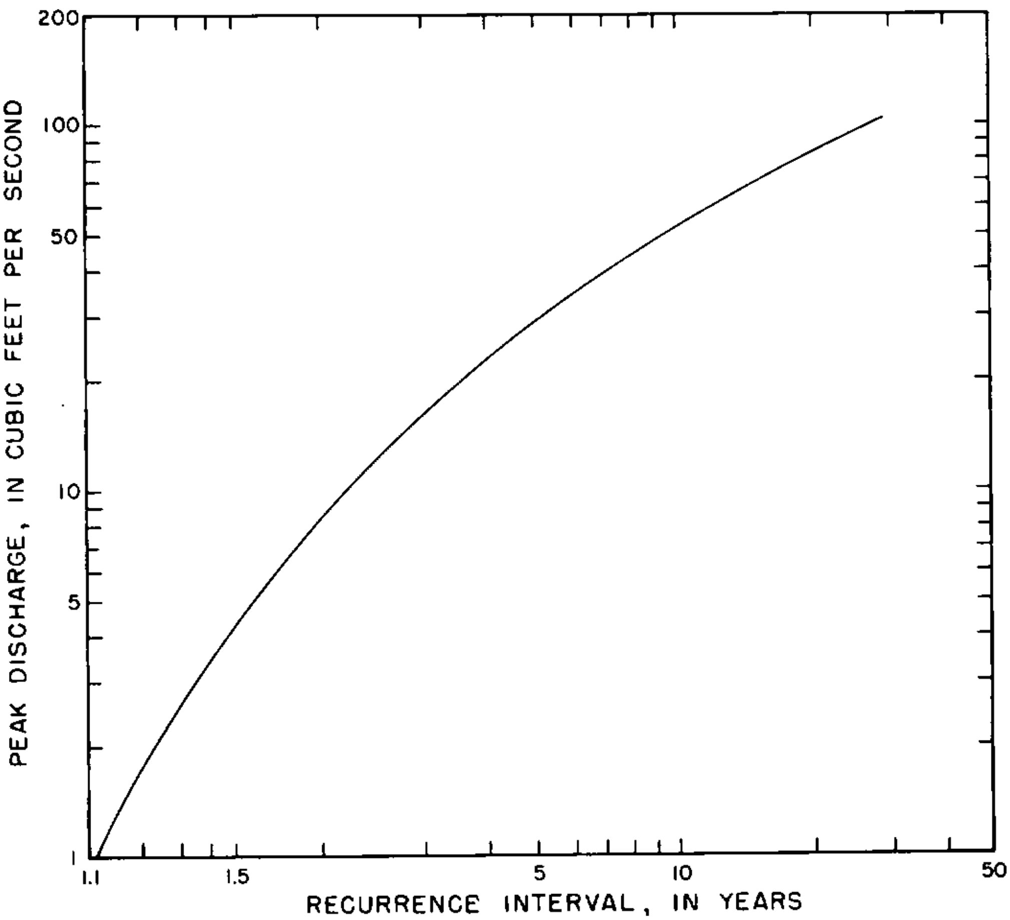

FIGURE B26.— Flood frequency, Dry Creek tributary near Molson, 1958-67.

major stream valleys that are now partly filled with unconsolidated glacial and alluvial deposits.

Joining the Ninemile Creek valley about 2 miles east of Osoyoos Lake is a small cross valley that is underlain by deposits of clay, sand, and gravel about 200 feet thick. Depth to water is about 120 feet below land surface, and gravel zones in the deposits reportedly yield about 800 gpm to wells. Two irrigation wells are located in this valley.

Tonasket Creek valley and tributary Mud Lake valley are, in general, rather narrow and have little ground-water development. Unconsolidated deposits may be as much as 200 feet thick locally, but the nature of the deposits below a depth of about 50 feet is unknown. The upper part of the unconsolidated deposits probably contains more clay than in most other parts of the Okanogan River basin. Most wells in Tonasket Creek valley yield only enough water for domestic and stock use. However, a well in Tonasket Creek valley just upstream from its junction with Mud Lake valley reportedly pumps 100 gpm except when it and the creek go dry in late summer. This situation is probably typical of most of the valley, except for areas where permeable unconsolidated deposits are thick enough to store a greater supply of ground water during the wet season. In the downstream 2 miles of the Tonasket Creek valley bedrock is extensively exposed and therefore little ground water is available in that reach.

Ground-water development in the Antoine Creek valley is largely restricted to an area about 3 miles east of the Okanogan River valley, where a cross valley connects Antoine Creek valley and Siwash Creek valley (pl. B1). Irrigation wells in this area are less than 50 feet deep and reportedly yield 100 to 400 gpm from aquifers of sand and gravel. Most of these shallow wells do not enter bedrock, and possibly wells drilled to a depth of 200 to 300 feet would have appreciably larger yields. Depths to water in the north end of this cross valley are about 30 to 40 feet.

Unconsolidated deposits, possibly as much as 200 feet thick, partly fill Antoine Creek valley in the vicinity of Havillah. The water-yielding capability of the deeper unconsolidated deposits is unknown, but the upper 100 feet of these materials is capable of yields as great as 200 gpm.

Recharge to the ground-water reservoir in the Tonasket-Antoine Creeks subarea is principally from precipitation within the subarea, while natural discharge is mainly to streams and by subsurface flow to the Okanogan River valley and, possibly, southward to the Siwash Creek valley. There is very little evapotranspiration directly from the ground water in this subarea.

Pumpage in the subarea in 1969 is estimated to have been only about 350 acre-feet. Ground water stored in the unconsolidated deposits of the subarea is estimated to be about 70,000 acre-feet.

Quality of Water

No data are available on the chemical quality of surface or ground water in the Tonasket-Antoine Creeks subarea. The quality of surface water is probably similar to that in Bonaparte Creek, which is discussed subsequently.

SIWASH-BONAPARTE-CHEWILIKEN CREEKS SUBAREA

The Siwash-Bonaparte-Chewiliken Creeks subarea covers about 225 square miles east of the Okanogan River valley near Tonasket (fig. A1, pl. B1). Much of the subarea is mountainous and bedrock is exposed at or near the surface except in the major valleys. Most of the subarea is forested; about 40 percent is in the Okanogan National Forest.

Surface Water

Available data on streamflow in the subarea are limited to records from a continuous-recorder station on Bonaparte Creek for the period December 1967-September 1969, and a crest-stage gage on a small tributary to Siwash Creek for the period 1959-69. During the period of record, the monthly discharges of Bonaparte Creek near Wauconda ranged from 1.6 cfs in August 1968 to 42.5 cfs in May 1969. Streamflow at the gage is regulated somewhat by a small dam at Bonaparte Lake, and is affected by several diversions from the creek for irrigation above the gaging site.

Crest-stage data on the tributary to Siwash Creek indicate that, although peak annual discharges for the period 1959-69 have been as much as 52 cfs (1959), there has been no recorded flow in that stream in several of those years. The frequency of annual peak discharges of various magnitudes is indicated in figure B27. The tributary has a drainage area of only 0.66 square mile above the gaging site, which is in the NE¼ sec. 12, T. 37 N., R. 27 E. (fig. B1 and pl. B1).

The only surface water developed for irrigation in the subarea is a small amount in the Bonaparte Creek valley.

Ground Water

The occurrence of ground water and ground-water development to date (1971) in the subarea is limited largely to (1) the Siwash Creek valley, near the south end of Antoine Valley (pl. B1); (2) the Bonaparte Creek valley downstream from about Anglin; and (3) the Chewiliken Creek valley in the vicinity of Talkire Lake. In other parts of the subarea, bedrock is at or near the surface, or the unconsolidated deposits consist mostly of poorly permeable till or clay.

Irrigation wells in the Siwash Creek valley, near the northeast corner of T. 37 N., R. 27 E. (pl. B1), reportedly yield 100 to 400 gpm from depths of about 50 feet (table C4). Unconsolidated deposits here, and upstream in the valley, may be as much as 200 to 300 feet thick, but nothing is known of the water-yielding characteristics of the deeper materials. The depth to water in this part of Siwash Creek valley is about 10 feet.

Aeneas Valley, a northwesterly trending valley that forms a pass between the Bonaparte Creek valley and the West Fork Sanpoil River valley, this latter outside the

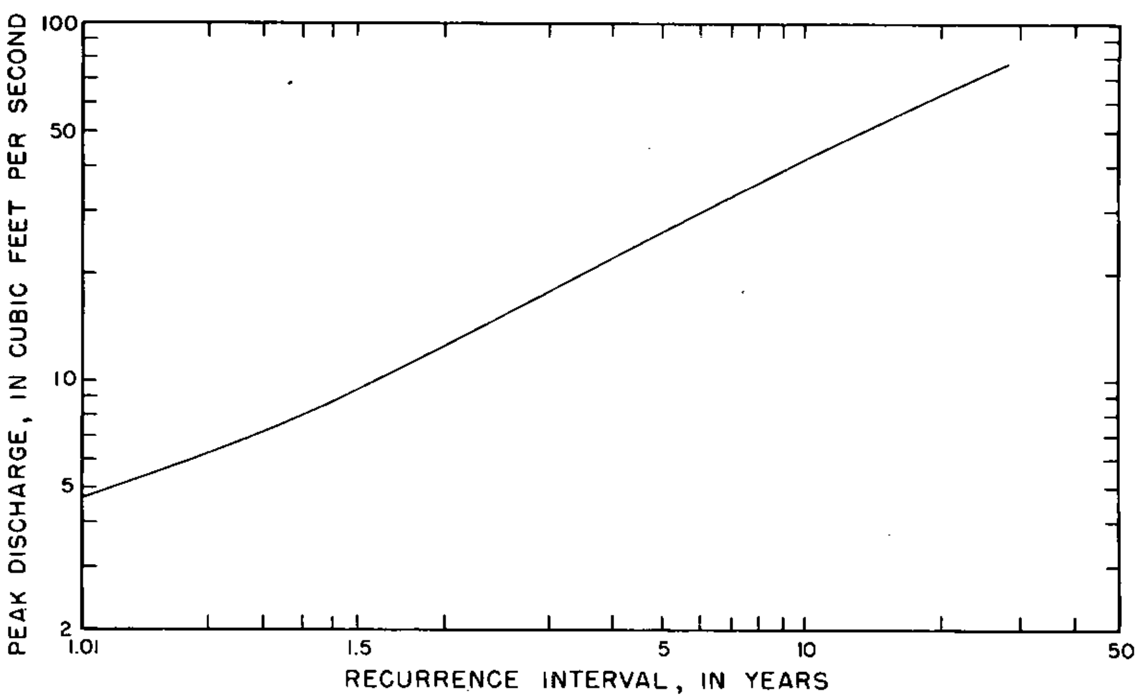

FIGURE B27.— Flood frequency, Siwash Creek tributary near Tonasket, 1959-69.

Okanogan River basin, is underlain by as much as 400 feet of unconsolidated deposits. The uppermost deposits consist mostly of sand, gravel, and boulders, but the character of the deposits at greater depth is unknown. Properly constructed wells as much as 100 feet deep in the northwestern part of Aeneas Valley should be capable of yields as great as 400 gpm.

Probably very little ground water is available in Bonaparte Creek valley upstream from its junction with Aeneas Valley, but large yields are obtained from wells in the valley near the mouth of Bannon Creek. This part of the Bonaparte Creek valley contains as much as 200 feet of unconsolidated deposits. Most of the upper 100 to 150 feet is fine grained, but gravel beds at depths of 150 to 200 feet yield from 600 to 1,700 gpm to irrigation wells. Static water levels in this part of the subarea are 20 to 40 feet below land surface, but by autumn pumping has lowered the water level to 50 to 100 feet below land surface.

Unconsolidated deposits in Chewiliken Creek valley near Talkire Lake are probably 100 to 200 feet thick and irrigation wells yield about 100 gpm. In other parts of the valley, yields of wells are generally adequate only for domestic or stock use.

Recharge to the ground-water reservoirs in the Siwash-Bonaparte-Chewiliken Creeks subarea is from direct infiltration of precipitation and seasonal infiltration from streams, and possibly from some ground-water inflow at the south end of Antoine Valley and the north end of Aeneas Valley.

Discharge of ground water occurs naturally by evapotranspiration, discharge to streams, and by underflow to the Okanogan River valley, and artificially by pumping from wells. Ground-water pumpage in the subarea in 1969 was mostly for irrigation and is estimated to have been about 420 million gallons or about 1,250 acre-feet. The quantity of ground water in storage in the unconsolidated deposits of the subarea is estimated to be about 200,000 acre-feet.

Quality of Water

Data on the chemical quality of water in the Siwash-Bonaparte-Chewiliken Creeks subarea are limited to two surface-water samples, collected from Bonaparte Creek at Tonasket (table C2). These sampled waters were hard and very hard and contained considerably more dissolved solids than most surface water in the Okanogan River drainage basin. Each sample contained 0.7 mg/l (milligram per liter) of fluoride, more than that of any other surface or ground water sampled in the Okanogan River drainage basin, but the chemical quality of the water was within limits recommended in the drinking-water standards of the U.S. Public Health Service (1962). None of the geologic or physiographic features of the subarea indicate that the chemical quality of ground water would differ appreciably from that of adjoining areas, and, therefore, it should be suitable for irrigation and drinking purposes.

TUNK-OMAK CREEKS SUBAREA

The Tunk-Omak Creeks subarea comprises about 260 square miles of mostly steep, mountainous area. About three-fourths of the subarea is within the Colville Indian Reservation, and more than half is forested.

Surface Water

The northern one-third of the Tunk-Omak Creeks subarea is drained by Tunk Creek and its tributaries, most of which are intermittent. Tunk Creek has a drainage area of only about 70 square miles, most of which is below an altitude of 4,000 feet and not forested. Because of these features, and because most of the rock materials in the drainage basin, even the unconsolidated deposits, are relatively impermeable, the creek has appreciable discharge only during periods of snowmelt or heavy precipitation and little or no discharge at other times.

Omak Creek drains the southern two-thirds of the subarea, except for a small area which drains directly into the Okanogan River by way of short intermittent streams. Data on the discharge characteristics of Omak Creek are not available, but because the unconsolidated deposits mantling the lower slopes of the drainage basin are only poorly permeable, the discharge (except during periods of precipitation or snowmelt) is smaller than for neighboring streams of comparable drainage area.

A crest-stage gage has been maintained on a tributary to Omak Creek near Disautel since 1956. The peak annual discharge at this site has ranged from about 1 cfs in 1965 to 13 cfs in 1962. The average frequency of recurrence of specified annual peak discharges of this stream is shown in figure B28.

Ground Water

As in other subareas of the Okanogan River drainage basin, the availability of ground water in the Tunk-Omak Creeks subarea is limited mostly to the larger stream valleys where unconsolidated deposits underlie the surface. The unconsolidated deposits in the Tunk Creek valley probably do not exceed 100 feet in thickness, and are composed mostly of till, at least in the upper part. Few wells have been drilled in the valley, and most have yields barely adequate for domestic or stock use. Permeable materials capable of greater yields may occur locally at depth, but test drilling would be necessary to locate them.

Unconsolidated deposits in the Omak Creek valley are mostly clay intermixed with sand and gravel. The greatest known thickness of these deposits is 124 feet, penetrated by a well in sec. 12, T. 33 N., R. 27 E. This well did not yield enough water for domestic use, and is not listed in table C4. In a small area just east of Disautel, wells in the unconsolidated deposits reportedly yield about 60 gpm. The depth to water in the valley bottom near Disautel (pl. B1) is about 10 feet. Several wells in the Omak Creek valley penetrate granitic rocks beneath the unconsolidated deposits. Most of these wells yield no more than 2 gpm.

All development of ground water in the Tunk-Omak Creeks subarea is for domestic or stock use and the quantity withdrawn is very small. The quantity of ground water in storage in the unconsolidated deposits of the subarea is estimated to be about 60,000 acre-feet.

Quality of Water

No data on the chemical quality of surface or ground water in the Tunk-Omak Creeks subarea are available, but the surface water probably is similar in quality to that of Bonaparte Creek.

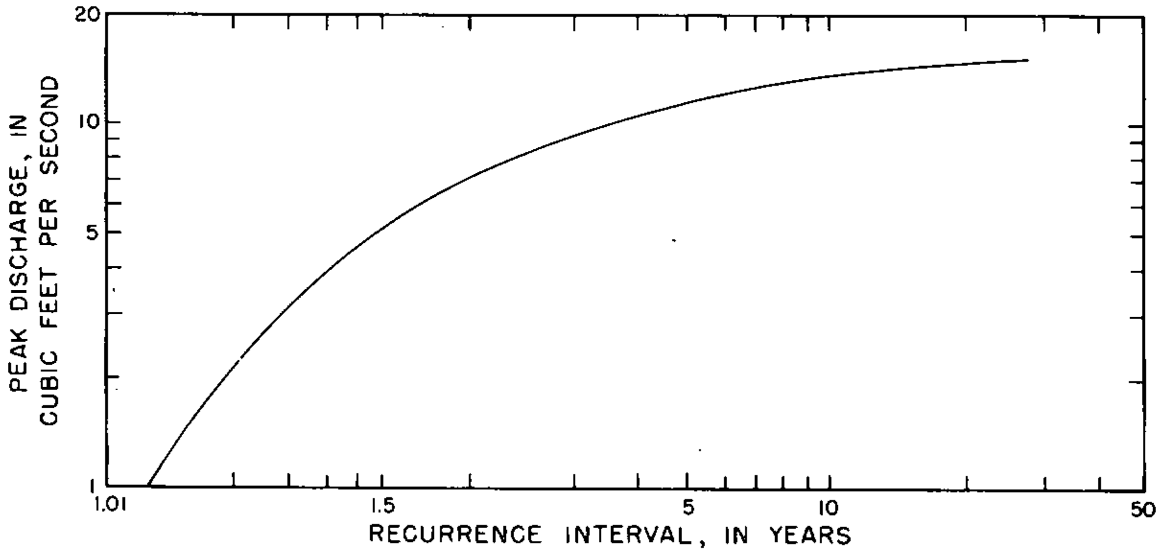

FIGURE B28.— Flood frequency, Omak Creek tributary near Disautel, 1956-67.

Ground water in this subarea may be somewhat more mineralized than in most parts of the Okanogan River drainage basin, because it moves more slowly through the poorly permeable unconsolidated deposits common to the subarea.

OMAK LAKE SUBAREA

The Omak Lake subarea covers about 240 square miles entirely within the western part of the Colville Indian Reservation. The area is mountainous and forested in the eastern one-third, and has many lakes but no streams of significant size.

Surface Water

About 60 square miles in the western part of the Omak Lake subarea is drained directly to the Okanogan River by means of short intermittent streams. Most of the remainder of the subarea is either drained into Omak Lake, which has no surface outlet, or is undrained.

The subarea is underlain principally by granitic bedrock, but locally, in the area southwest of Omak Lake, the granitic rock is overlain by basalt, an extension of the lava flows underlying the Columbia Plateau to the south. The bedrock surface is scoured and eroded by streams and by glacial action, and water from precipitation collects in the resulting depressions or in potholes in the thin glacial deposits that locally mantle the bedrock. Because much of the area has no surface or subsurface outlets, the water becomes saline through evaporation.

Omak Lake, the largest saline lake in Washington, is about 8 miles long and averages one-half mile in width. It is more than 300 feet deep at several places. The level of the lake is reported to have been about 25 feet higher during the last century.

Ground Water

The thickness of the basalt overlying the granitic rock in the area south and west of Omak Lake is not known, but probably only in a few places is it thick enough to yield more than a few gallons of water per minute to wells.

Unconsolidated deposits underlying the valley that extends northward from Omak Lake are more than 75 feet thick and consist of sand, gravel, boulders and some clay. The depth to water in these deposits is about 10 feet, and an irrigation well (33/27-21C2) that taps them is reported to yield 350 gpm with a drawdown of about 25 feet.

Unconsolidated deposits underlying the Kartar Creek valley, southeast of Omak Lake, are more than 50 feet thick and consist of sand, gravel, boulders, and some till. The depth to water in these deposits is about 30 feet and, where coarse gravel occurs near the base, wells yield enough water for irrigation.

Recharge to the ground-water reservoir of the Omak Lake subarea is from local precipitation. Ground-water discharge is by evapotranspiration and possibly by some subsurface outflow to Omak Creek through deposits underlying the valley north of Omak Lake. The amount of ground water in storage is small, and very little ground water is removed by pumping of wells.

Quality of Water

The water in the saline lakes of the subarea is either of the sodium carbonate or sodium sulfate type. The salinity of various lakes depends largely on the drainage area surrounding the individual lakes and also varies with precipitation and rates of evaporation. Omak Lake contains water of the sodium carbonate type. The dissolved-solids content is about 5,500 mg/l, and the chloride content is about 100 to 200 mg/l.

Ground water from wells tapping unconsolidated deposits surrounding some of the saline lakes may be mineralized, or might become mineralized as pumping causes lowering of the water table and migration of lake water toward the wells. However, with the slight development that has taken place to date, mineralized ground water has not been a serious problem in the subarea.

WATER-MANAGEMENT CONSIDERATIONS AND CONSTRAINTS

The total quantity of water available in the Okanogan River basin is considerably more than that required to meet foreseeable needs. However, serious problems arise from the uneven distribution of water, both in relation to time and location. Because irrigation is the principal use of water in the basin, improved management of irrigation supplies would be most effective in overcoming existing problems. The more obvious actions that could be taken to derive maximum benefits from the total water resources of the basin are:

1. Where possible, irrigate from streams during periods of high flow thereby saving ground water and impounded surface water for use during periods of low streamflow.
2. Store as much as possible if the excess streamflow of the basin in the natural fresh-water lakes, surface reservoirs, and the ground-water reservoir for use during periods of low flow. The water-management practices being used in the operation of the Duck Lake and Aeneas Lake systems are examples.
3. Increase the capacity of existing reservoirs, and design distribution systems to minimize wasteful evaporation and leakage from canals.
4. Protect both the ground and surface water of the area from chemical, biological, and thermal pollution.

Any large-scale water-resources development should be preceded by hydrologic studies of sufficient scope to determine the long-term effect of the development on all phases of the hydrologic system. For example, the effects on the waste-dilution capabilities and water temperature of the Okanogan River (the only source of additional water in much of the basin) should be carefully considered before more water is diverted from the river for irrigation. Also, existing data indicate that in some areas, diversion of water from streams has reduced recharge to the ground-water reservoir enough to seriously diminish the long-term yields of wells. Conversely, in other areas leakage from irrigation canals has recharged the ground-water reservoir enough to materially increase the yields of wells. Unfortunately, the water-management functions of distributing the available water to achieve the greatest possible benefit are complicated not only by the inadequacy of presently available hydrologic information, but also by conflicting economic or political interests, water rights, differences in definition of optimum use, and economic limitations.

Part C

BASIC DATA

TABLE C1.--Monthly and yearly mean discharges, in cubic feet per second, of streams and canals, and first-of-the month mean gage heights of lakes and certain streams in Okanogan River basin, for years indicated

Water year	October	November	December	January	February	March	April	May	June	July	August	September	Year
						Mean gage height, Osoyoos Lake near Oroville (station 12439000), 1928-69							
1928	--	--	--	--	--	--	--	--	--	--	15.80	--	
29	14.20	13.81	13.63	--	--	--	--	--	13.48	12.88	11.71	11.50	
30	11.34	11.28	11.31	11.39	11.32	11.48	11.68	12.80	12.89	12.75	11.91	11.59	
31	11.52	11.70	12.12	12.07	--	11.49	11.67	11.80	12.18	12.10	11.84	11.69	
32	11.69	11.86	--	11.82	11.85	13.33	14.16	14.93	14.74	14.08	13.20	12.97	
33	13.11	13.01	13.28	13.87	13.60	12.67	13.93	15.10	15.83	14.91	13.96	13.57	
34	13.54	13.76	14.02	14.15	14.16	14.20	14.42	16.58	14.51	13.91	13.71	12.96	
35	13.09	13.30	13.65	--	14.18	13.90	13.89	14.19	15.09	14.40	14.13	14.08	
36	14.16	14.16	14.27	13.74	13.22	12.87	13.00	14.56	14.59	14.62	14.12	13.80	
37	13.86	13.79	13.82	13.61	--	12.92	13.95	14.31	14.91	15.09	13.30	13.31	
38	13.87	13.77	13.93	14.36	14.19	14.12	14.06	15.32	16.04	13.96	12.94	12.52	
39	13.40	13.19	13.30	13.49	13.23	13.10	14.19	15.05	14.19	14.06	13.95	13.98	
40	13.98	13.82	13.69	13.50	13.28	12.89	14.25	14.75	14.35	13.50	13.46	13.54	
41	13.98	--	--	14.32	14.28	14.40	15.60	15.40	14.44	14.96	13.96	14.70	
42	15.36	15.35	15.51	15.55	15.73	15.07	14.22	15.65	16.49	16.42	16.09	15.36	
43	15.19	15.20	15.23	--	--	14.33	14.80	15.16	--	14.29	13.55	13.32	
44	13.49	13.75	--	13.60	13.61	13.41	13.83	14.26	15.19	15.15	13.81	13.22	
45	11.07	11.45	11.84	12.42	12.02	12.13	12.58	12.82	14.01	12.78	11.97	11.62	
46	11.53	12.13	12.52	12.64	12.03	12.22	12.52	13.25	13.91	13.16	12.43	12.31	
47	12.50	12.66	12.40	12.27	11.73	11.28	10.90	11.89	11.31	11.15	11.21	11.50	
48	11.48	10.98	10.94	11.07	11.12	11.19	11.10	11.59	16.60	12.34	11.98	12.44	
49	12.25	11.81	11.85	11.47	11.04	11.07	10.77	11.51	11.75	10.99	11.24	11.41	
50	11.32	11.40	11.17	10.81	--	10.86	11.19	11.25	12.02	12.04	11.47	11.11	
51	11.24	11.33	11.33	11.64	--	11.37	11.49	12.41	12.73	12.11	12.29	12.08	
52	11.66	11.67	11.83	12.16	--	--	--	12.84	12.39	12.18	11.71	11.70	
53	11.84	11.27	11.00	10.72	10.93	10.57	10.87	11.17	11.63	11.43	11.50	12.10	
54	11.62	11.46	11.38	11.25	--	11.49	11.18	10.68	11.83	11.86	11.78	12.41	
55	11.88	11.47	11.84	11.48	--	11.17	11.44	11.45	12.29	12.20	11.95	11.75	
56	11.98	11.55	11.15	11.16	11.58	12.12	11.31	12.22	13.83	12.42	11.90	11.35	
57	11.44	11.26	10.93	11.15	--	--	11.61	11.64	12.78	12.14	12.00	12.75	
58	12.45	11.64	11.66	11.40	11.35	11.88	12.12	13.13	11.93	11.35	11.46	11.56	
59	11.66	11.25	11.17	11.35	11.22	11.83	12.03	12.60	14.41	13.91	11.79	11.62	
60	11.77	11.80	12.65	12.41	11.74	10.91	12.19	12.24	12.43	11.62	11.72	11.89	
61	11.97	11.88	11.83	11.73	11.49	11.06	11.48	11.59	13.63	11.75	11.70	11.78	
62	11.96	11.44	11.32	11.03	10.81	10.79	11.80	12.44	11.95	11.24	11.09	11.13	
63	11.60	11.04	11.14	11.04	10.50	10.58	10.77	11.07	11.34	11.03	10.83	10.98	
64	11.22	11.03	10.86	10.80	10.87	11.29	11.12	11.11	12.02	11.75	11.54	11.48	
65	11.40	11.11	11.02	10.46	10.79	11.09	11.54	12.12	12.81	11.62	--	11.15	
66	11.30	11.11	10.82	11.11	10.57	10.15	10.92	10.77	10.83	10.90	10.97	10.93	
67	11.08	10.74	10.90	10.62	9.87	10.32	11.16	11.43	12.18	11.26	11.12	11.18	
68	11.05	10.85	10.57	10.57	10.93	10.82	10.52	11.15	11.50	12.02	11.47	11.50	
69	11.46	11.60	11.03	12.29	11.57	11.28	11.65	11.73	12.60	11.22	11.23	11.18	

Note: Add 900 feet to obtain mean sea-level elevations.

Mean gage height, Okanogan River at Bridge Street, at Oroville (station 12439150) 1939-69

1939	--	--	--	--	--	--	--	14.89	14.03	--	--	--
40	--	--	--	--	--	--	--	--	--	--	--	--
41	--	--	--	--	--	--	--	--	--	--	--	--
42	--	--	--	--	--	--	--	--	15.87	15.81	--	14.92
43	14.79	--	--	--	--	14.09	--	--	--	14.00	--	13.27
44	13.42	--	13.55	--	13.53	--	13.83	--	--	14.75	13.69	--
45	--	--	14.09	14.54	14.16	14.25	14.67	14.90	15.91	14.75	14.09	13.76
46	11.41	11.83	12.18	12.16	11.73	11.91	12.12	12.71	13.18	12.58	11.97	11.87
47	12.08	12.24	11.93	11.77	11.44	11.08	10.80	9.22	11.27	11.06	11.19	11.43
48	11.37	10.84	10.85	10.71	10.68	7.34	11.08	11.37	16.27	11.73	11.50	11.89
49	11.63	11.34	11.29	11.01	10.58	10.64	10.44	11.12	11.21	10.88	11.09	11.22
50	11.20	11.27	11.02	10.72	10.42	10.52	10.79	10.94	11.29	11.37	11.16	10.81
51	11.08	11.17	11.19	11.45	10.99	11.13	11.24	11.88	12.08	11.55	11.71	11.69
52	11.32	11.38	11.60	--	11.92	11.35	10.75	12.37	11.80	11.72	11.29	11.30
53	11.66	11.02	10.88	10.59	10.83	10.50	10.82	11.08	11.25	11.12	11.22	11.78
54	11.38	11.30	11.27	11.12	10.84	11.23	11.06	10.59	11.36	--	--	11.90
55	11.59	11.27	11.53	11.26	11.05	10.84	11.25	11.31	12.02	11.68	11.45	11.29
56	11.52	11.35	10.90	10.97	11.33	11.88	11.02	11.68	13.44	11.72	11.09	11.00
57	11.14	10.99	10.67	10.83	--	10.96	11.52	11.50	12.37	11.76	11.62	12.40
58	12.20	11.44	11.46	11.17	11.16	11.77	11.99	12.70	11.64	10.97	11.08	11.21
59	11.32	11.05	11.01	11.30	11.04	11.61	11.82	12.36	13.86	13.27	11.31	11.12
60	11.30	11.47	12.18	12.00	11.42	10.70	12.08	12.15	12.26	11.43	11.41	11.58
61	11.70	11.67	11.65	11.57	11.34	10.94	11.38	11.50	13.39	11.48	11.33	11.36
62	11.65	11.28	11.20	10.92	10.68	10.66	11.63	12.18	11.72	11.07	10.90	10.95
63	11.39	10.94	11.03	10.92	10.35	10.54	10.77	11.02	11.24	10.95	10.75	10.87
64	11.13	10.94	10.77	10.73	10.80	11.10	10.96	10.94	11.68	11.42	11.26	11.21
65	11.10	10.88	10.90	10.25	10.68	10.67	11.27	11.66	12.13	11.17	10.48	10.92
66	11.03	10.87	10.67	11.00	10.38	10.07	10.81	10.71	10.72	10.86	10.89	10.88
67	10.95	10.68	10.86	10.66	9.70	10.12	10.90	11.18	11.68	10.95	11.05	11.08
68	10.95	10.80	10.53	10.53	10.90	10.77	10.48	11.12	11.25	11.55	11.33	11.37
69	11.33	11.36	11.00	--	11.29	11.05	11.30	11.41	11.99	11.14	11.11	11.00

Note: Add 900 feet to obtain mean sea-level elevations.

TABLE C1.--Monthly and yearly mean discharges, in cubic feet per second, of streams and canals, and first-of-the month mean gage heights of lakes and certain streams in Okanogan River basin, for years indicated--Continued

Water year	October	November	December	January	February	March	April	May	June	July	August	September	Year
							Discharge, Tonasket Creek at Oroville (station 12439300), 1967-69						
1967	--	--	--	--	--	--	6.59	7.83	2.80	0.31	0.59	0.26	--
68	0	0	0.010	0.348	1.08	1.55	3.81	4.81	2.80	.561	.832	1.54	1.44
69	0	0	.015	0	.71	1.36	22.7	16.4	1.25	.64	.55	1.47	3.76
							Mean gage height, Okanogan River at Zosel millpond, at Oroville (station 12439400), 1939-69						
1939	--	--	--	--	--	--	--	14.19	13.03	--	--	--	
40	--	--	--	--	--	--	--	--	--	--	--	--	
41	--	--	--	--	--	--	--	--	--	--	--	--	
42	--	--	--	--	--	--	--	--	14.22	13.89	--	13.67	
43	13.78	--	--	--	--	12.79	13.53	--	13.29	13.12	--	13.12	
44	13.31	--	13.43	--	13.43	--	13.37	13.46	13.47	13.19	12.72	12.92	
45	13.34	13.58	13.80	--	13.23	13.16	13.63	13.87	15.05	13.03	13.49	13.52	
46	11.13	11.30	11.61	10.31	11.26	11.39	11.22	11.42	11.30	--	10.62	11.04	
47	11.30	11.48	11.25	--	10.92	10.68	10.41	6.83	11.22	10.84	11.22	11.36	
48	11.27	10.11	10.59	9.93	9.45	6.70	11.03	11.23	16.17	11.09	10.93	11.18	
49	10.83	10.90	10.70	10.49	10.03	10.13	10.12	10.76	10.68	10.81	10.91	10.92	
50	10.92	10.97	10.80	10.61	--	9.55	10.47	10.82	10.71	10.68	10.85	10.43	
51	10.97	10.99	10.97	11.24	10.42	10.71	10.79	10.88	10.76	10.78	10.97	11.22	
52	10.71	10.78	10.68	11.17	11.62	9.59	10.24	10.86	10.30	11.01	10.75	10.79	
53	10.65	10.48	10.83	10.23	10.63	10.23	10.83	10.73	10.41	10.59	10.78	11.01	
54	11.06	10.92	10.50	9.14	9.76	9.62	10.81	10.41	10.23	10.80	10.74	10.84	
55	10.82	10.81	10.69	10.73	10.20	9.98	10.82	10.64	10.91	10.87	10.71	10.86	
56	10.98	10.95	10.35	10.78	10.70	10.85	10.19	10.84	13.16	10.79	10.21	10.88	
57	10.96	10.90	10.62	10.36	--	10.23	10.90	10.86	11.01	10.84	11.05	10.86	
58	11.02	10.82	11.11	10.45	10.40	10.32	10.58	10.62	10.94	10.41	10.81	10.98	
59	10.92	10.85	10.84	10.95	9.98	10.66	10.75	10.93	12.10	11.26	10.85	10.78	
60	10.73	10.98	10.56	10.55	--	8.72	10.57	10.58	10.55	10.61	10.80	10.68	
61	10.48	10.48	10.57	10.41	9.38	9.42	10.70	10.73	12.26	10.50	10.71	10.72	
62	11.01	10.73	10.86	10.49	8.71	9.38	10.74	10.80	10.31	10.54	10.66	10.68	
63	10.70	10.60	10.77	10.54	--	10.23	10.67	--	10.71	10.85	10.69	10.66	
64	10.88	10.79	10.60	10.57	10.62	9.79	10.75	10.79	11.12	10.95	10.91	10.95	
65	10.82	10.66	10.87	9.87	10.63	9.55	10.93	10.97	10.95	10.69	10.18	10.78	
66	10.83	10.77	10.62	10.98	10.19	10.02	10.75	10.68	10.64	10.85	10.85	10.83	
67	10.80	10.66	10.85	10.68	9.46	8.76	10.25	10.75	10.84	10.45	10.95	10.96	
68	10.87	10.75	10.50	10.52	10.88	10.76	10.47	11.12	10.84	10.60	11.03	11.00	
69	11.06	10.98	10.96	11.77	10.68	10.66	10.70	10.75	10.67	11.00	10.93	10.79	

Note: Add 900 feet to obtain mean sea-level elevations.

Discharge, Okanogan River at Oroville (station 12439500), 1943-69

1943	962	1,047	891	584	597	505	917	1,020	802	380	156	140	667
44	201	224	193	184	229	130	185	323	911	501	167	81.7	277
45	188	258	436	530	500	543	660	1,475	1,501	669	449	289	625
46	473	649	921	822	641	783	924	1,711	1,628	1,074	825	836	934
47	903	836	763	612	413	243	175	457	336	126	193	311	448
48	373	366	465	624	419	274	475	693	2,454	1,509	1,456	1,482	882
49	1,430	1,551	1,404	1,190	1,139	1,040	930	1,339	763	452	465	539	1,020
50	548	543	468	403	610	884	877	1,200	1,565	748	572	424	739
51	559	607	674	769	869	879	1,180	1,930	1,387	1,193	868	806	977
52	856	872	745	737	917	749	1,035	1,818	1,024	845	632	701	911
53	713	341	280	231	282	213	256	870	788	613	546	643	483
54	572	615	662	628	869	749	526	725	905	1,071	880	920	759
55	746	811	874	830	779	664	650	802	1,212	918	784	827	824
56	526	394	339	511	565	800	1,045	1,643	1,778	1,522	704	455	858
57	495	475	556	561	491	475	503	1,195	829	626	464	657	612
58	769	572	616	586	557	578	1,082	1,289	683	467	427	521	679
59	489	458	471	609	632	849	909	1,767	2,122	1,178	542	576	884
60	555	1,047	1,281	1,114	844	333	527	684	477	351	449	561	685
61	595	567	558	532	417	381	446	919	1,268	515	477	532	601
62	550	394	390	349	369	453	824	826	599	335	341	388	485
63	418	353	377	365	301	202	247	349	262	225	150	244	291
64	303	293	247	235	423	473	558	655	1,166	719	642	749	538
65	641	456	436	380	645	878	1,078	1,675	1,712	634	385	532	787
66	553	426	307	434	372	287	440	389	291	280	237	334	362
67	259	222	298	373	301	665	786	1,130	1,408	312	243	213	518
68	250	180	150	162	210	185	115	493	1,391	479	436	431	373
69	583	645	361	793	781	933	1,038	1,763	824	480	423	513	761

Discharge, Sinlahekin Creek above Blue Lake, near Loomis (station 12440000), 1924-30

1924	--	--	--	--	--	--	--	18.0	7.10	2.65	2.57	2.43	--
25	--	--	--	--	--	--	29.0	49.7	26.0	6.22	2.79	2.70	--
26	2.73	--	--	--	--	--	9.59	8.11	4.37	1.74	--	--	--
27	--	--	--	--	--	--	--	56.2	61.6	15.6	7.83	8.88	--
28	10.1	--	--	--	--	--	15.2	59.7	25.7	29.3	7.93	3.97	--
29	4.13	3.30	--	--	--	--	--	11.9	18.0	5.66	1.81	1.64	--
30	1.85	--	--	--	--	--	--	5.84	10.2	5.28	1.45	1.11	--

Discharge, Sinlahekin Creek at Blue Lake, near Loomis (station 12440500), 1920

1920	3.90	--	--	--	--	--	--	--	8.17	4.07	1.36	2.12	--

Discharge, Sinlahekin Creek at twin bridges, near Loomis (station 12441000), 1921-23

1921	--	--	--	--	--	--	--	151	75.9	10.4	2.99	3.58	--
22	4.58	--	--	--	--	--	12.1	129	90.6	7.27	4.76	5.03	--
23	--	--	--	--	--	--	--	--	47.7	17.7	4.12	3.85	--

Discharge, Sinlahekin Creek near Loomis (station 12441500), 1903-05

1903	--	--	--	--	--	--	--	--	--	21.2	11.3	11.0	--
04	17.9	22.2	15.3	16.1	39.6	13.5	134	214	107	29.7	14.5	13.2	53.0
05	19.4	22.6	19.7	21.8	31.3	20.2	--	--	--	--	--	--	--

TABLE C1.--Monthly and yearly mean discharges, in cubic feet per second, of streams and canals, and first-of-the month mean gage heights of lakes and certain streams in Okanogan River basin, for years indicated--Continued

Water year	October	November	December	January	February	March	April	May	June	July	August	September	Year
					Discharge, Toats Coulee Creek near Loomis (station,12442000), 1920-26, 1957-69								
1920	--	--	--	--	--	--	--	73.8	83.6	34.6	6.77	8.84	--
21	21.9	12.1	8.92	7.13	7.08	8.31	13.4	264	258	46.9	8.75	7.41	55.5
22	8.74	--	--	--	--	--	13.3	199	229	23.7	10.9	8.47	--
23	13.3	--	--	--	--	--	--	--	246	90.3	24.1	10.4	--
24	13.2	9.43	--	--	--	--	--	109	44.2	10.3	6.35	4.10	--
25	--	--	--	--	--	--	25.7	147	78.0	13.8	5.37	3.88	--
26	--	--	--	--	--	--	31.7	39.0	16.7	8.98	--	--	--
1957	--	--	--	--	--	--	--	482	140	37.4	20.0	7.11	--
58	10.4	9.44	9.44	9.21	11.8	11.6	18.6	377	168	45.3	13.8	9.52	58.3
59	11.5	11.6	12.1	20.1	11.8	11.6	29.0	242	322	75.2	17.9	26.7	66.1
60	25.5	14.6	11.0	7.40	9.58	17.1	35.8	154	199	34.4	15.0	9.00	44.3
61	8.43	8.49	7.68	7.45	7.68	8.51	19.2	210	232	28.0	8.65	5.50	46.1
62	6.93	6.27	6.03	5.40	6.49	6.20	27.3	87.1	114	28.6	16.6	5.79	26.4
63	13.8	13.3	10.1	6.91	9.43	9.69	18.3	204	183	81.5	26.0	15.3	49.6
64	10.5	11.1	12.5	11.8	10.6	10.1	14.1	105	243	67.5	22.6	11.6	44.1
65	10.1	8.17	6.43	7.53	8.78	8.79	23.9	142	192	41.7	26.8	15.1	41.0
66	10.1	8.33	7.49	7.02	7.57	8.83	26.0	102	64.6	28.8	9.64	8.86	24.2
67	8.89	7.59	9.21	6.86	6.51	7.43	9.09	178	478	64.5	10.7	4.66	65.9
68	9.39	8.23	7.76	10.7	10.3	10.6	13.0	187	163	54.7	14.9	9.68	41.7
69	8.51	8.55	8.44	7.31	7.46	8.80	25.2	264	118	31.5	7.84	8.30	42.3
					Discharge, Whitestone Irrigation Canal near Loomis (station 12442200), 1957-69								
1957	--	--	--	--	--	--	--	33.1	34.7	30.0	16.7	8.51	--
58	5.81	0	0	0	0	0	6.20	43.1	36.8	24.9	11.2	8.40	11.4
59	8.21	3.84	0	0	0	0	4.02	39.9	37.9	39.0	16.6	13.8	13.7
60	3.96	.27	0	0	0	0	12.2	30.1	39.1	26.8	14.8	9.78	11.4
61	8.89	2.15	0	0	0	0	11.3	28.9	35.6	28.4	10.2	6.17	11.0
62	7.62	3.52	0	0	0	.10	22.9	35.0	44.0	28.4	16.5	5.74	13.7
63	.72	0	0	0	0	6.20	15.1	40.5	46.9	39.2	23.6	15.6	15.7
64	6.27	0	0	0	0	0	5.13	46.4	43.6	40.3	21.6	11.8	14.7
65	4.34	0	0	0	0	0	13.1	48.2	43.9	34.1	24.1	14.3	15.3
66	3.14	0	0	0	0	0	17.8	53.8	46.3	28.5	10.7	9.12	14.2
67	8.09	4.03	0	0	0	0	7.00	42.5	48.5	40.0	11.6	5.83	14.1
68	10.2	7.96	0	0	0	4.48	13.4	48.7	47.9	30.5	11.6	7.08	15.2
69	3.15	0	0	0	0	0	19.0	46.1	47.2	28.4	8.07	7.26	13.5

Discharge, Sinlahekin Creek above Chopaka Creek, near Loomis (station 12442300), 1957-65

1957	--	--	--	--	--	--	--	774	183	20.6	14.7	11.2	--
58	21.5	24.6	27.5	27.3	32.0	30.3	35.6	495	191	49.1	17.4	17.7	81.3
59	23.5	27.3	29.9	43.5	28.8	36.8	51.4	352	406	62.2	19.7	38.9	93.4
60	47.1	38.7	32.6	24.8	29.1	35.0	30.5	114	162	22.0	14.1	13.6	47.0
61	17.1	21.5	20.7	21.6	27.3	27.3	20.9	222	267	18.2	10.6	11.7	57.2
62	15.9	19.1	20.4	16.5	23.5	20.1	16.1	45.7	53.0	9.08	8.58	6.02	21.1
63	26.3	28.9	26.4	20.5	19.9	15.1	16.4	238	183	61.4	12.4	10.4	55.1
64	16.6	29.3	24.5	23.5	22.0	23.3	17.3	52.7	232	41.5	12.3	12.7	42.1
65	18.4	23.0	18.4	21.2	22.9	24.3	24.7	90.9	122	13.5	12.1	12.3	33.6

Mean gage height, Palmer Lake near Nighthawk (station 12442400), 1956-68

1956	--	--	--	--	--	--	--	51.82	57.99	51.44	46.07	44.86
57	44.74	45.46	45.48	45.33	44.95	45.23	45.12	45.74	55.26	47.00	44.78	44.40
58	44.33	44.98	45.74	46.06	45.16	45.08	45.02	44.98	54.82	46.64	44.90	44.33
59	44.37	44.66	45.05	45.02	--	--	45.09	47.80	55.52	54.03	--	44.70
60	45.16	46.52	46.88	45.17	--	--	--	--	50.60	49.52	45.14	44.44
61	44.38	44.45	44.72	44.66	--	--	--	--	57.26	48.64	--	44.36
62	44.26	44.79	44.78	--	--	--	44.74	47.09	53.32	--	--	44.44
63	44.30	45.12	--	--	--	--	--	45.34	54.78	48.67	46.30	45.00
64	44.68	45.13	45.50	--	--	--	--	44.99	54.14	52.14	46.77	44.82
65	44.57	44.72	44.76	44.80	--	--	44.75	47.03	55.01	49.10	45.25	44.58
66	44.32	44.44	44.59	44.68	--	--	--	46.22	50.46	--	45.36	44.35
67	44.30	44.45	--	44.86	44.77	44.72	44.77	44.70	54.78	53.76	45.56	44.52
68	44.57	45.60	44.88	--	--	45.28	--	44.67	53.26	--	--	--

Note: Add 1,100 feet to obtain mean sea-level elevations.

TABLE C1.--Monthly and yearly mean discharges, in cubic feet per second, of streams and canals, and first-of-the month mean gage heights of lakes and certain streams in Okanogan River basin, for years indicated--Continued

Water year	October	November	December	January	February	March	April	May	June	July	August	September	Year
						Discharge, Similkameen River near Nighthawk (station 12442500., 1929-65							
1929	656	517	371	247	217	345	427	3,960	5,220	1,190	376	269	1,150
30	330	306	285	215	442	466	3,470	5,230	5,620	1,740	533	391	1,590
31	416	484	353	352	473	496	911	6,060	2,760	945	328	411	1,170
32	395	532	387	344	774	1,370	2,290	7,960	6,090	1,650	568	374	1,900
33	523	1,470	1,070	702	496	531	1,480	6,270	12,200	5,030	1,260	631	2,640
34	1,595	2,599	1,661	1,302	1,141	2,206	13,510	11,070	5,377	1,516	645	441	3,588
35	489	1,287	838	779	2,235	1,103	1,315	8,704	9,598	3,675	1,243	617	2,654
36	498	490	462	405	265	409	2,724	8,003	5,287	1,158	385	323	1,703
37	311	310	313	218	282	408	594	5,982	11,220	2,680	791	539	1,971
38	665	963	702	643	535	670	2,536	11,400	8,385	2,108	599	457	2,481
39	462	458	502	624	424	614	2,513	6,861	5,115	2,084	535	335	1,717
40	367	575	911	393	440	525	2,060	5,065	2,795	665	295	219	1,194
41	489	440	418	375	345	575	2,482	3,424	3,378	1,317	587	1,076	1,243
42	2,180	1,516	1,441	765	661	544	2,396	7,937	8,125	2,489	892	468	2,459
43	406	474	605	432	590	544	2,964	5,904	9,793	5,128	1,161	540	2,381
44	473	470	393	327	319	373	922	4,786	6,659	1,815	690	479	1 475
45	577	578	501	545	635	473	633	7 261	9,423	1,139	604	484	1,990
46	678	1,152	666	554	491	539	1,954	12,250	8,447	2,987	834	529	2,603
47	529	521	479	442	518	756	2,969	9,277	5,598	1,612	684	480	1,997
48	762	837	682	514	466	446	1,131	11,130	17,130	3,668	2,625	1,608	3,413
49	1,344	926	736	639	580	635	2,809	14,680	7,528	2,283	944	713	2,834
50	762	1,737	1,898	749	735	735	1,013	7,626	17,980	5,323	1,418	618	3 383
51	811	1,129	1,637	1,115	1,393	988	3,515	13,980	9,288	3,561	951	851	3,279
52	862	814	542	456	537	540	2,121	8,616	5,355	2,265	752	446	1,947
53	330	338	320	448	609	493	1,191	8,531	9,530	3,932	1,042	609	2,288
54	822	914	740	524	670	622	1,014	9,548	11,650	8,004	2,195	1,614	3,207
55	1,185	1,692	1,370	778	599	533	744	4,060	14,090	6,278	1,490	618	2,788
56	1,181	2,212	1,019	802	540	598	2,903	13,800	11,140	3,784	1,058	665	3,313
57	1,091	1,071	1,016	589	607	655	1,228	14,900	6,654	1,655	826	491	2,584
58	453	579	502	513	474	526	1,059	8,986	4,795	1,337	422	364	1,677
59	796	978	1,438	1,256	736	727	1,957	9,801	14,330	4,837	1,087	1,293	3,276
60	2,265	2,166	1,656	735	751	878	3,157	6,500	8,436	2,328	684	509	2,503
61	466	526	392	514	636	632	1,474	8,127	12,280	1,957	613	384	2,332
62	614	484	427	734	1,297	636	2,161	4,960	7,693	2,378	884	475	1,891
63	541	1,025	1,149	646	1,322	1,023	1,303	5,888	6,907	3,511	1,463	1,027	2,153
64	990	1,244	1,480	1,293	842	685	1,312	5,273	15,770	6,084	1,436	1,169	3,125
65	1,343	859	622	667	679	720	1,563	6,981	9,937	2,376	922	673	2,281
66	645	906	575	482	447	472	1,838	5,813	5,141	2,266	661	381	1,641
67	645	687	924	666	601	543	612	6,565	16,070	3,431	777	380	2,656
68	565	1,479	822	1,307	1,527	1,702	1,206	7,647	10,350	3,266	836	647	2,610
69	672	746	577	495	448	449	1,394	9,737	6,220	1,605	467	332	1,938

Discharge, Oroville-Tonasket Irrigation Canal near Oroville (station 12443000), 1916-29

1916	0	0	0	0	0	0	e20	e60	e70	e75	e75	e55
17	0	0	0	0	0	0	e20	e65	e80	e85	e85	e60
18	0	0	0	0	0	0	e25	e75	e85	e95	e90	e65
19	0	0	0	0	0	0	e25	e80	e95	e105	e100	e70
20	0	0	0	0	0	0	e30	e90	e105	e115	e110	e80
21	0	0	0	0	0	0	e30	e100	e115	e125	e120	e85
22	0	0	0	0	0	0	5.27	94.0	143	162	137	39.7
23	0	0	0	0	0	0	1.20	95.4	99.9	129	148	116
24	0	0	0	0	0	0	41.1	141	164	141	147	133
25	0	0	0	0	0	0	51.5	137	142	164	147	143
26	0	0	0	0	0	0	60.2	127	137	160	149	96.7
27	1.74	0	0	0	0	2.26	38.0	110	128	159	165	72.6
28	0	0	0	0	0	0	52.5	128	145	136	142	132
29	0	0	0	0	0	0	53.4	141	149	155	151	125

e Estimated.

Discharge, Similkameen River near Oroville (station 12443500), 1911-28

1911	--	--	--	--	--	--	--	--	10,500	3,190	1,040	955	--
12	662	554	518	523	509	425	1,040	7,450	6,130	2,350	964	707	1,820
13	578	598	507	438	439	443	1,090	6,670	10,600	3,140	976	766	2,190
14	883	802	568	671	520	595	2,370	8,540	7,140	2,310	671	512	2,140
15	615	840	553	343	410	452	2,400	4,280	2,980	1,470	914	478	1,320
16	632	825	461	404	629	1,110	2,140	8,740	13,600	6,800	1,710	829	3,160
17	592	583	475	429	395	430	519	5,830	11,400	4,380	927	449	2,200
18	441	690	799	1,790	746	661	2,240	8,840	10,000	2,540	986	446	2,540
19	636	658	563	500	444	444	2,080	9,820	9,780	3,980	973	514	2,540
20	453	817	649	602	838	578	589	4,360	7,540	4,480	839	608	1,860
21	1,610	902	595	537	796	907	1,360	9,110	11,800	2,700	703	558	2,630
22	911	1,230	1,160	752	663	520	732	6,180	10,700	1,670	589	500	2,130
23	644	596	418	515	412	416	2,030	8,470	10,600	3,800	892	479	2,450
24	521	462	430	369	871	678	1,060	9,940	4,540	1,280	400	279	1,740
25	567	613	1,090	768	760	730	3,130	11,100	6,280	1,630	452	264	2,290
26	348	382	526	402	369	518	2,810	3,030	1,290	395	127	155	864
27	509	471	368	318	349	371	677	4,490	9,500	2,170	624	1,410	1,770
28	2,210	1,690	1,440	1,440	1,110	1,050	2,080	12,100	5,050	2,090	503	256	2,600

Mean gage height, Spectacle Lake near Loomis (station 12443800), 1956-69

1956	--	--	--	--	--	--	10.10	10.09	--	11.36	10.44	7.59
57	7.54	--	8.30	8.67	8.80	--	9.41	10.19	10.72	10.05	7.68	4.10
58	--	5.20	5.66	6.23	6.72	7.18	--	8.88	11.20	11.02	6.07	3.32
59	3.58	4.91	5.82	6.25	7.48	--	8.14	8.66	10.22	11.22	10.49	6.64
60	7.20	7.88	8.18	8.54	8.80	9.40	9.30	11.00	11.35	11.50	9.20	5.40
61	4.10	5.19	5.94	6.28	6.59	6.96	7.22	9.38	10.60	10.92	8.58	4.18
62	2.96	4.26	4.52	4.87	5.12	5.32	5.48	8.38	10.06	11.55	8.84	5.01
63	3.57	3.77	4.13	4.35	4.49	4.68	5.95	8.61	11.56	11.72	11.22	8.31
64	6.93	7.50	7.90	8.15	8.38	8.48	8.58	9.32	10.90	11.62	10.48	7.32
65	7.00	7.58	7.79	8.16	8.30	8.38	8.40	10.72	11.50	11.44	9.50	6.50
66	6.08	6.51	6.75	7.18	7.29	7.37	7.60	9.16	11.30	11.48	9.04	4.26
67	4.18	5.30	6.28	6.66	6.89	6.98	7.61	8.70	10.48	11.62	10.50	5.62
68	3.50	5.24	6.51	6.70	7.04	7.19	8.05	9.53	11.47	11.64	8.46	5.00
69	4.26	--	2.29	2.76	3.32	--	4.44	7.44	11.04	11.65	8.72	3.54

Note: Add 1,353.46 feet to obtain mean sea-level elevation. Elevation of lake is controlled by flow into lake from Whitestone Irrigation Canal, and by outlet gates at headworks of Spectacle Lake Diversion Canal. Staff gage read irregularly, gage heights are for first reading of each month.

TABLE C1.--Monthly and yearly mean discharges, in cubic feet per second, of streams and canals, and first-of-the month mean gage heights of lakes and certain streams in Okanogan River basin, for years indicated--Continued

Water year	October	November	December	January	February	March	April	May	June	July	August	September	Year
					Mean gage height, Whitestone Lake near Tonasket (station 12444000), 1959-69								
1959	--	2.11	--	--	--	--	--	4.80	4.34	3.83	2.47	1.74	
60	2.45	--	4.93	--	2.70	2.44	3.58	4.23	4.76	3.48	1.82	1.78	
61	2.03	1.99	2.82	--	4.14	4.89	4.54	4.60	4.04	2.78	1.55	--	
62	--	1.90	2.40	2.90	--	3.92	4.53	4.27	2.80	1.98	1.77	1.54	
63	1.75	2.81	3.71	3.38	--	3.94	4.52	5.08	3.99	2.78	2.37	1.52	
64	2.11	3.17	4.23	3.97	3.90	3.32	4.61	4.84	2.94	--	2.18	2.24	
65	2.57	3.25	4.17	--	5.55	5.51	5.19	5.40	4.39	3.54	2.06	--	
66	1.77	2.11	3.19	--	--	4.76	5.08	4.85	3.30	3.02	2.02	1.83	
67	1.86	2.82	3.21	--	--	--	5.43	5.32	4.42	--	--	1.91	
68	1.68	2.81	3.69	4.68	--	5.63	5.62	5.64	5.10	4.70	3.62	3.15	
69	3.08	5.03	5.37	--	--	--	5.80	5.84	--	3.80	3.00	2.03	
Note: Add 1,250 feet to obtain mean sea-level elevations.													
					Discharge, Whitestone Creek near Tonasket (station 12444100), 1959-69								
1959	2.30	1.14	1.24	7.28	7.45	4.73	.93	4.22	2.99	4.14	5.09	4.28	3.80
60	.72	.61	6.63	5.86	5.62	1.30	.82	1.68	3.24	3.64	4.15	5.95	3.35
61	4.80	2.25	2.27	1.45	1.48	3.85	1.53	2.87	3.30	4.45	4.27	3.19	2.99
62	2.11	2.24	2.25	2.40	1.10	.72	2.21	2.93	2.87	4.06	4.52	3.97	2.63
63	1.45	.95	3.48	2.24	1.10	.92	.77	2.23	3.89	3.50	2.91	4.73	2.36
64	1.72	1.07	4.20	3.79	2.61	1.32	.93	1.87	2.64	2.49	3.72	3.41	2.48
65	2.02	1.23	1.66	.66	2.19	3.73	1.74	3.34	4.15	4.58	3.50	4.58	2.78
66	2.87	.34	.90	1.99	1.24	2.24	1.15	3.81	4.30	4.95	3.66	3.60	2.60
67	1.28	3.03	1.98	.71	2.02	6.29	.91	3.11	4.92	4.48	3.73	3.31	2.99
68	1.20	.81	.71	2.24	2.43	2.95	1.58	3.13	3.36	5.18	4.35	2.42	2.54
69	2.18	5.43	4.04	2.50	2.14	2.47	3.04	3.02	4.02	3.85	3.44	2.49	3.22
					Discharge, Bonaparte Creek near Wauconda (station 12444490), 1968-69								
1968	--	--	2.10	3.12	5.53	5.38	2.98	2.40	5.03	1.78	1.61	2.23	--
69	2.52	2.12	2.11	2.02	2.95	6.85	14.5	42.5	13.1	5.57	1.65	1.89	8.19
					Discharge, Bonaparte Creek near Anglin (station 12444500), 1921								
1921	0.09	2.00	3.95	3.40	11.7	14.3	17.1	--	--	--	--	--	
					Mean gage height, Aeneas Lake near Tonasket (station 12444700), 1964-69								
1964	--	--	--	--	5.14	5.17	5.25	4.78	4.14	3.50	2.44	1.74	
65	1.18	1.12	1.36	1.46	1.77	1.93	2.09	2.01	1.17	.29	-.76	-1.56	
66	-2.24	-2.32	-2.10	-1.64	-1.62	-1.41	-1.16	-1.26	-2.02	-3.28	-3.76	-5.20	
67	-5.29	-5.40	-5.09	-4.80	-4.61	-4.50	-4.33	-4.24	-4.90	-5.90	-7.12	-7.94	
68	-8.64	-8.83	-8.64	-8.25	--	-6.22	-6.17	-6.16	-6.27	-7.46	-8.37	-8.70	
69	-9.20	-9.26	-9.12	-8.74	-8.37	-8.12	-8.08	-7.66	-7.98	-9.11	-10.09	-10.58	

Note: Add 1,390 feet to obtain mean sea-level elevations. Staff gage read irregularly, gage heights are for first reading of each month.

Discharge, Okanogan River near Tonasket (station 12445000), 1929-69

1929	--	--	--	--	--	--	--	3,890	5,530	1,330	406	270	--
30	416	413	399	360	581	529	3,240	5,090	5,660	1,840	515	365	1,620
31	442	588	443	439	600	525	770	5,630	2,730	908	231	335	1,140
32	403	663	491	398	883	2,060	2,920	8,620	6,840	2,270	915	696	2,260
33	887	1,870	1,850	1,500	1,040	916	1,980	7,200	13,300	5,940	1,810	1,090	3,280
34	2,113	3,233	2,437	2,011	1,861	2,855	13,220	12,270	6,214	2,114	1,055	626	4,168
35	950	2,203	1,755	1,388	2,889	1,896	2,011	9,283	10,710	4,727	1,881	1,251	3,409
36	1,312	1,359	1,199	944	613	701	2,942	8,845	6,484	1,930	885	706	2,330
37	842	895	828	504	532	704	1,258	6,485	11,950	3,382	958	731	2,424
38	1,059	1,496	1,415	1,394	1,345	1,658	3,841	11,860	9,384	2,388	711	574	3,100
39	736	784	821	927	611	849	2,946	7,356	5,535	2,321	696	516	2,015
40	658	929	1,253	715	675	704	2,236	5,219	2,964	605	319	231	1,377
41	710	712	739	700	687	957	3,054	3,790	3,720	1,553	662	1,492	1,565
42	2,756	2,181	2,307	1,800	1,515	1,008	2,897	8,632	9,640	3,932	2,064	1,406	3,352
43	1,352	1,576	1,598	1,115	1,317	1,101	3,766	6,467	10,170	5,423	1,270	575	2,980
44	655	731	594	492	656	539	944	4,747	7,925	2,005	601	515	1,697
45	764	893	1,026	1,193	1,262	1,121	1,339	8,148	11,250	2,796	1,030	707	2,629
46	1,117	1,807	1,551	1,414	1,176	1,408	2,964	13,320	9,787	3,942	1,615	1,335	3,466
47	1,455	1,445	1,326	1,144	951	1,023	2,941	9,161	5,761	1,742	824	757	2,386
48	1,194	1,223	1,188	1,259	1,051	748	1,620	10,980	20,450	5,025	3,928	3,039	4,302
49	2,788	2,556	2,171	1,865	1,805	1,768	3,689	15,530	8,336	2,659	1,349	1,197	3,824
50	1,336	2,200	2,526	1,166	1,568	2,382	2,575	8,760	19,360	6,152	1,966	964	4,246
51	1,384	1,812	2,342	1,984	2,380	2,027	4,583	15,710	11,600	4,596	1,708	1,659	4,324
52	1,746	1,765	1,359	1,246	1,527	1,329	3,093	10,560	6,459	3,074	1,293	1,085	2,882
53	1,072	778	674	757	950	770	1,384	9,323	10,510	4,607	1,557	1,211	2,807
54	1,441	1,635	1,459	1,141	1,570	1,307	1,343	9,937	12,940	9,510	3,031	2,513	3,998
55	2,093	2,618	2,419	1,745	1,469	1,265	1,508	4,627	15,160	7,179	2,317	1,402	3,655
56	1,782	2,653	1,365	1,450	1,120	1,541	3,553	14,460	13,020	4,953	1,693	1,097	4,062
57	1,657	1,629	1,691	1,164	1,262	1,322	1,694	16,010	7,601	2,325	1,265	1,138	3,249
58	1,325	1,206	1,205	1,169	1,188	1,194	2,060	9,863	5,522	1,689	728	814	2,339
59	1,318	1,432	1,988	1,825	1,459	1,814	3,058	10,970	16,660	6,081	1,590	1,810	4,172
60	2,849	3,194	3,105	1,895	1,681	1,344	3,655	6,968	8,717	2,630	1,019	993	3,168
61	1,091	1,155	991	1,109	1,138	1,104	1,836	8,294	13,270	2,404	1,002	847	2,852
62	1,208	964	895	1,065	1,733	1,120	2,863	5,455	7,925	2,645	1,106	773	2,308
63	1,035	1,412	1,572	1,100	1,654	1,261	1,476	5,779	6,909	3,638	1,470	1,172	2,375
64	1,283	1,528	1,723	1,538	1,295	1,235	1,852	5,321	16,510	6,564	2,009	1,873	3,552
65	2,051	1,423	1,025	1,088	1,308	1,575	2,467	7,887	11,220	2,841	1,160	1,155	2,934
66	1,221	1,413	949	1,014	921	783	2,291	5,750	5,271	2,499	794	666	1,968
67	870	959	1,229	1,096	915	1,235	1,459	6,977	16,750	3,703	877	473	3,043
68	819	1,690	1,037	1,552	2,173	2,046	1,354	7,453	11,150	3,690	1,226	1,044	2,931
69	1,233	1,412	917	1,324	1,284	1,515	2,550	10,850	6,927	1,985	765	809	2,639

Discharge, Johnson Creek near Riverside (station 12445500), 1903-08

1903	--	--	--	--	--	--	--	--	3.61	4.19	3.60	5.19	--
04	5.13	6.06	7.96	6.10	5.47	8.58	15.9	10.4	8.48	8.33	--	--	--
05	--	--	--	--	--	--	--	8.64	8.36	6.43	5.99	7.19	--
06	7.81	8.56	8.65	8.54	10.4	9.02	8.16	3.88	5.18	2.12	1.88	3.84	6.48
07	4.44	6.22	6.78	4.06	5.28	8.04	6.94	3.77	2.84	2.49	2.21	3.43	4.70
08	3.90	4.88	7.37	--	--	--	--	--	--	--	--	--	--

TABLE C1.--Monthly and yearly mean discharges, in cubic feet per second, of streams and canals, and first-of-the month mean gage heights of lakes and certain streams in Okanogan River basin, for years indicated--Continued

Water year	October	November	December	January	February	March	April	May	June	July	August	September	Year
						Discharge, Okanogan River at Okanogan (station 12446000), 1911-29							
1911	--	--	--	--	--	--	--	--	11,100	4,460	1,750	1,380	--
12	1,070	997	1,050	1,020	1,000	869	1,530	8,120	7,630	4,100	2,160	1,590	2,600
13	1,260	1,280	1,130	1,000	900	948	1,680	7,160	12,200	5,150	2,300	1,610	3,060
14	1,630	1,590	1,370	1,520	1,230	1,250	3,330	9,480	8,650	3,990	1,610	1,160	3,070
15	1,290	1,500	1,110	972	1,070	1,080	3,180	5,420	4,580	2,670	1,900	1,180	2,170
16	1,190	1,430	1,050	771	1,120	1,860	2,850	9,640	15,500	8,730	2,980	1,710	4,070
17	1,200	988	841	794	808	863	886	5,980	13,100	5,790	1,850	1,140	2,860
18	1,020	1,170	1,000	2,320	1,180	979	2,330	9,170	11,400	3,640	1,800	928	3,080
19	1,020	1,080	890	936	857	904	2,380	10,100	11,700	5,340	1,760	1,070	3,180
20	853	1,160	903	868	1,100	788	844	4,740	8,290	5,750	1,680	946	2,330
21	1,870	1,180	897	818	919	1,170	1,760	9,830	14,600	5,110	1,600	823	3,380
22	1,230	1,640	1,990	1,610	1,290	1,380	1,550	7,000	11,900	2,610	981	816	2,830
23	987	1,110	979	1,280	986	1,030	2,340	9,050	11,700	5,240	1,870	1,220	3,160
24	1,180	1,160	1,040	858	1,660	1,330	1,440	10,200	5,340	1,600	629	452	2,240
25	755	806	1,230	1,290	1,470	800	3,600	11,400	6,930	2,170	743	476	2,640
26	[e]578	[e]588	[e]764	[e]715	[e]920	[e]1,340	[e]3,520	[e]3,390	[e]1,690	[e]750	[e]424	[e]358	[e]1,250
27	[e]642	[e]602	[e]478	[e]450	[e]755	[e]1,090	[e]1,320	[e]5,140	[e]10,400	[e]2,670	[e]1,070	[e]2,050	[e]2,220
28	[e]3,390	[e]2,910	[e]2,770	[e]3,210	[e]2,760	[e]2,500	[e]3,510	[e]14,000	[e]8,170	[e]5,000	[e]2,590	[e]1,640	[e]4,380
29	[e]1,860	[e]1,610	[e]754	[e]362	[e]319	[e]446	[e]500	--	--	--	--	--	--

[e]Estimated.

Water year	October	November	December	January	February	March	April	May	June	July	August	September	Year
						Discharge, Salmon Creek near Conconully (station 12446500), 1910-22							
1910	--	--	--	--	--	--	--	--	--	61.5	60.8	12.9	--
11	2.67	1.50	1.50	2.54	2.02	1.80	12.2	43.4	68.1	81.8	28.0	1.18	20.6
12	4.61	2.71	1.50	1.26	.80	1.21	2.29	24.9	96.8	86.7	68.7	2.15	24.6
13	5.27	1.70	1.78	1.71	1.89	2.96	5.86	46.4	67.0	92.3	99.9	5.33	28.0
14	3.47	2.04	1.90	2.07	2.10	2.27	3.01	114	156	104	108	5.66	42.4
15	1.93	2.08	2.10	2.71	2.80	2.81	11.5	152	128	97.7	118	14.8	45.0
16	4.47	6.88	3.60	3.60	3.66	3.81	6.67	191	241	158	119	54.5	66.6
17	8.38	12.5	2.80	2.80	2.80	2.80	2.95	29.5	165	139	126	30.7	44.0
18	5.69	2.39	1.49	1.60	1.70	1.85	3.02	42.8	54.4	31.0	20.0	15.9	15.2
19	10.8	.80	.80	1.00	.81	1.15	1.35	46.6	55.2	67.7	53.4	17.4	21.6
20	.84	.75	.82	.83	.82	1.18	1.32	13.0	29.4	34.2	28.2	13.2	10.4
21	7.66	.91	.94	1.18	1.38	1.39	1.70	46.4	83.5	87.7	85.9	43.8	30.4
22	2.76	1.84	1.47	1.50	1.50	1.65	6.97	50.3	74.0	78.4	68.2	22.0	26.1

Water year	October	November	December	January	February	March	April	May	June	July	August	September	Year
						Discharge, Salmon Creek near Okanogan (station 12447000), 1903-10							
1903	--	--	--	--	--	--	--	124	170	38	24	23	--
04	24	22	21	14.7	13.5	15.7	224	332	195	51.1	20.0	15.1	78.9
05	20.1	19.3	16.2	15.0	14.1	36.3	87.5	146	215	85.4	30.3	16.2	58.6
06	18.3	13.7	12.8	12.6	12.2	16.4	70.3	109	158	43.5	12.0	7.63	40.5
07	10.1	19.9	11.5	9.29	9.54	10.8	35.3	214	166	42.6	26.1	17.2	47.9
08	11.6	12.9	11.1	10.1	9.16	15.7	35.7	125	131	20.0	22.5	8.17	34.4
09	9.11	14.2	7.62	5.20	9.99	23.7	27.9	83.0	116	31.3	46.1	24.2	33.3
10	6.27	21.7	11.6	8.4	9.4	25.4	8.6	61.2	66.8	--	--	--	--

Water year	October	November	December	January	February	March	April	May	June	July	August	September	Year
						Discharge, Okanogan River at Malott (station 12447200), 1966-69							
1966	---	--	--	1,163	1,052	878	2,330	5,744	5,362	2,557	812	694	--
67	913	1,043	1,322	1,199	1,028	1,321	1,574	7,073	17,610	3,924	913	459	3,194
68	839	1,738	1,002	1,580	2,242	2,127	1,431	7,336	11,190	3,816	1,229	1,076	2,961
69	1,241	1,464	1,008	1,358	1,345	1,652	2,722	11,040	7,144	2,025	806	832	2,728

Discharge, Okanogan River near Malott (station 12447300), 1958-67

1958	--	--	--	--	--	--	2,340	10,330	5,830	1,826	789	860	--
59	1,398	1,520	2,118	1,885	1,499	1,904	3,005	11,120	16,860	6,463	1,728	1,915	4,290
60	2,955	3,305	3,221	1,942	1,770	1,388	3,598	6,877	8,841	2,724	1,074	1,067	3,228
61	1,208	1,289	1,103	1,186	1,298	1,241	1,990	8,466	14,250	2,512	1,070	900	3,040
62	1,303	1,057	973	1,280	2,031	1,243	2,864	5,429	8,280	2,752	1,152	830	2,427
63	1,141	1,484	1,699	1,237	1,963	1,400	1,631	5,828	7,200	3,711	1,561	1,267	2,511
64	1,355	1,625	1,844	1,631	1,369	1,303	1,864	5,160	16,950	6,733	1,980	1,854	3,630
65	2,070	1,501	1,101	1,148	1,404	1,712	2,480	7,945	11,630	2,962	1,219	1,216	3,033
66	1,274	1,488	1,023	1,160	1,054	887	2,289	5,648	5,315	2,507	821	710	2,018
67	939	1,070	1,325	1,233	1,059	1,309	1,582	6,952	17,610	--	--	--	--

TABLE C2.--Chemical quality of surface water in the Okanogan River basin

Date of collection	Mean discharge (cfs)	Milligrams per liter														Hardness as $CaCO_3$		Specific conductance (micromhos per cm at 25°C)	pH (units)	Color (Platinum-cobalt units)	Dissolved oxygen (mg/l)	Coliform		Temperature (°C)
		Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Phosphate (PO_4)	Dissolved solids (residue at 180°C)	Calcium, magnesium	Noncarbonate					MPN (most probable number groups per 100 ml)	Colonies per 100 ml	
Similkameen River near Nighthawk. Station 12442500.																								
3-26-47	1,190	--	--	22	4.2	2.8		82	--	12	1.0	--	0.1	--	84	75	8	154	--	--	--	--	--	--
6-27	3,450	9.9	--	16	3.1	3.9		62	--	8.9	.4	--	.2	--	73	52	2	113	--	--	--	--	--	--
12-13	713	14	--	26	4.1	7.4		96	--	17	1.2	0.1	.3	--	117	82	4	182	--	--	--	--	--	--
6- 1-48	29,700	14	0.31	18	2.3	5.1		62	--	12	.5	.3	.6	--	84	54	4	115	7.7	--	--	--	--	--
3-10-49	630	12	--	34	4.8	10		120	--	23	2.5	.3	.3	--	146	105	6	225	--	--	--	--	--	--
5-12	19,300	13	--	16	2.4	10		68	--	11	2.0	.4	1.8	--	90	50	0	136	--	--	--	--	--	--
11-20-61	446	12	.05	28	5.5	4.4	1.0	100	--	20	.5	.1	.1	0.02	124	92	10	200	7.9	5	13.6	23	--	--
2-19-62	1,170	10	.11	24	3.9	3.8	.8	82	--	15	.2	.1	.1	.03	107	76	9	167	7.6	5	12.4	23	--	--
5-18	3,570	12	.17	16	2.6	2.6	.8	60	--	8.4	.2	.2	.1	.01	79	50	2	113	7.5	10	13.0	930	--	--
8-23	677	12	.01	28	3.4	4.2	1.1	96	--	16	.2	.1	.0	.02	119	84	6	186	8.0	5	9.0	36	--	--
12-18	1,420	9.8	.08	20	2.7	3.0	.8	69	--	11	.2	.1	.3	.02	86	62	5	132	7.8	5	13.7	230	--	--
3-28-63	994	11	.06	24	4.3	3.6	.8	88	--	14	.2	.1	.1	.02	107	78	6	166	7.7	5	10.6	430	--	--
6-27	4,010	9.0	--	14	2.8	2.2	.8	52	--	7.4	.2	.2	.3	.01	66	46	4	97	7.7	10	10.1	36	--	--
9-23	895	13	.04	23	4.0	3.6	1.0	84	--	13	.0	.1	.2	.01	105	74	5	158	7.7	5	--	--	--	--
11-19	1,100	12	.06	21	3.6	3.6	.8	76	--	12	.8	.1	.0	.01	93	68	5	144	7.6	5	--	--	--	--
4- 3-64	946	12	.09	25	5.6	4.3	.9	94	--	15	.5	.1	.1	.01	113	86	8	182	7.7	5	11.9	76	--	--
7-27	2,630	9.5	.12	18	3.3	3.2	.7	69	--	10	.0	.2	.2	.02	82	58	2	129	7.8	5	9.0	23	--	--
1- 9-65	708	12	.06	29	5.0	4.8	1.0	103	0	18	.5	.0	.4	.02	122	94	9	198	7.7	5	14.5	36	--	--
5-15	7,080	11	--	12	2.4	2.3	.7	48	0	5.0	1.0	.1	.2	.03	63	40	0	88	7.3	15	10.9	0	--	--
9-11	582	12	.04	26	4.6	4.2	1.2	95	0	16	.2	.1	.1	.03	110	84	6	183	7.9	5	9.8	36	--	--
3-23-66	440	9.6	--	30	5.9	5.1	1.2	108	0	21	1.0	.2	.1	--	129	99	10	215	7.8	0	12.2	0	--	--
5-10	9,600	8.6	--	9.7	1.8	1.7	.5	38	0	4.0	.0	.1	.3	--	52	32	0	71	7.1	20	8.4	150	--	--
9-15	445	11	--	31	5.8	4.6	1.2	108	0	19	1.5	.1	.2	--	134	102	13	211	7.4	5	11.1	0	--	--
11-17	640	9.1	--	26	4.4	4.0	.8	90	0	15	.0	.2	.2	--	113	83	9	178	7.3	0	12.3	36	--	--
2-22-67	564	11	--	27	5.2	4.1	1.0	98	0	17	.0	.2	.5	--	116	89	8	192	8.1	5	12.8	0	--	--
5-24	13,300	9.4	--	10	2.0	1.8	.6	41	0	4.4	.0	.1	.5	--	50	33	0	79	7.2	10	12.0	72	--	--
8-16	732	12	--	26	4.5	3.9	1.6	96	0	15	.0	.1	.1	--	112	84	5	181	7.9	5	7.9	0	--	--
11-15	1,160	11	--	21	3.6	3.2	.9	77	0	12	.4	.1	.0	--	91	68	5	150	8.0	5	11.4	2,400	--	6
2- 7-68	1,710	9.3	--	20	3.3	3.0	.7	70	0	10	.4	.1	.2	--	82	64	6	129	7.6	5	14.1	150	--	1
5- 7	3,010	11	--	17	3.2	2.9	.6	69	0	7.6	.3	.1	.1	--	80	56	0	122	7.6	10	11.6	--	29	8
8- 7	961	11	--	23	3.9	3.5	.4	84	0	13	.3	.1	.2	--	104	74	5	159	7.9	5	9.0	--	840	17
11-20	693	11	--	26	5.3	4.2	1.0	99	0	15	.3	.2	.1	--	116	87	4	189	7.7	0	11.8	--	100	4
5-14-69	13,700	9.1	--	9.8	1.7	1.6	.6	37	0	4.4	.3	.1	.3	--	56	32	1	69	7.4	20	10.3	--	210	10
8-13	484	12	--	27	4.5	4.4	1.2	100	0	15	.5	.1	.3	--	120	86	4	193	7.8	0	8.9	--	170	17
11-12	640	10	--	24	4.0	3.5	.9	87	0	13	.3	.1	.1	--	103	77	5	170	7.7	0	11.4	--	400	5.4
2-11-70	403	11	--	30	5.2	4.4	1.2	108	0	19	.6	.1	.1	--	127	97	8	213	7.8	5	11.9	--	335	3.5

Similkameen River at Oroville. Ton miles downstream from station 12442500.

1949*	3,595	13	.18	19	3.8	4.1	3.0	72	--	11	1.6	.2	1.0	--	92	63	4	134	--	--	--	--	--	--
1950*	3,585	12	.14	17	3.7	3.2	2.5	66	--	9.4	2.0	.3	.7	--	83	58	4	127	--	--	--	--	--	--

Okanogan River at Oroville. Station 12439500.

3-27-47	209	--	--	36	11	10		150	--	30	2.2	--	.1	--	163	135	12	287	--	--	--	--	--	--
6-27	345	8.6	--	34	9.5	10		142	--	27	1.2	--	.1	--	160	124	8	270	--	--	--	--	--	--
12-13	421	10	--	35	9.8	12		148	--	29	1.5	--	.3	--	170	128	6	289	--	--	--	--	--	--
6- 1-48	3,250	11	.02	36	8.9	10		140	--	29	1.8	.1	.4	--	166	126	12	274	7.8	--	--	--	--	--
12-13	1,470	7.1	.03	33	8.7	8.9	2.7	136	--	25	1.5	.4	.2	--	155	118	7	264	8.1	--	--	--	--	6
4-15-49	881	12	--	33	8.7	15		146	--	27	2.0	.2	.0	--	170	118	0	275	--	--	--	--	--	--
5-19	2,240	9.8	--	31	9.0	8.4		138	--	12	4.0	.2	1.0	--	143	114	1	262	--	--	--	--	--	--
6- 8	814	10	.06	32	8.5	9.0	3.2	130	--	24	1.5	.2	.1	--	153	115	8	257	7.7	--	--	--	--	19
7-30	426	9.3	.02	32	9.1	9.0	1.0	135	--	27	1.2	.2	.4	--	156	117	7	262	7.7	--	--	--	--	--
9-18	519	11	.02	33	9.4	10-	3.2	140	--	27	1.6	.2	.3	--	165	121	6	270	8.0	--	--	--	--	--
10-28	526	9.3	.03	34	11	9.8	5.0	145	--	28	1.5	.2	4.0	--	174	130	11	281	7.9	--	--	--	--	--
12- 2	500	10	.03	35	10	9.6	5.1	148	--	28	1.6	.2	2.7	--	175	128	7	281	7.8	--	--	--	--	--
1-21-50	395	8.7	.02	36	10	10	2.9	152	--	29	1.5	.4	.3	--	174	131	6	290	7.7	--	--	--	--	--
5- 9	1,010	8.1	.05	34	10	9.8	1.9	142	--	28	1.6	.2	.2	--	164	126	10	275	8.0	--	--	--	--	--
6- 6	1,050	8.1	.03	34	8.0	8.5	5.3	138	--	27	2.2	.2	2.5	--	164	118	5	278	7.4	--	--	--	--	--
9- 2	532	12	.03	31	8.9	8.9	2.4	133	--	25	2.0	.4	.2	--	156	114	5	253	8.0	--	--	--	--	--
1960*	685	7.9	--	34	8.6	9.8	2.4	137	--	28	1.1	.2	.2	.01	164	120	9	275	--	--	--	--	--	--
11-20-61	385	7.8	.02	36	8.3	10	2.3	142	0	29	1.0	.3	.3	.02	172	124	8	281	7.7	5	11.8	23	--	--
2-19-62	395	5.2	.02	36	9.4	10	2.5	144	0	28	1.8	.3	.1	.02	178	129	11	288	7.9	5	13.1	23	--	--
5-18	798	5.1	.04	35	9.4	10	2.6	143	0	29	1.2	.3	.1	.00	171	126	9	285	8.0	5	9.4	36	--	--
8-23	365	5.4	.00	32	8.8	10	2.6	130	2	29	1.5	.3	.3	.03	164	116	6	270	8.3	5	10.1	91	--	--
12-18	405	6.9	.05	36	9.8	11	2.4	146	0	31	1.2	.3	.3	.04	172	130	11	290	8.0	5	11.7	23	--	--
3-28-63	179	5.8	.03	36	10	10	2.3	146	0	30	1.5	.3	.1	.02	174	131	12	287	7.9	5	11.1	36	--	--
6-27	154	4.7	.15	36	11	10	2.6	148	0	31	1.5	.3	.3	.01	172	136	14	286	8.1	5	8.8	23	--	--
9-23	268	7.8	.03	34	10	11	2.6	144	0	31	1.2	.3	.5	.02	176	128	10	290	7.8	0	9.6	230	--	--

*Weighted average of many samples collected during the water year indicated.

TABLE C2.--Chemical quality of surface water in the Okanogan River basin--Continued

Date of collection	Mean discharge (cfs)	Milligrams per liter: Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Phosphate (PO_4)	Dissolved solids (residue at 180°C)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Specific conductance (micromhos per cm at 25°C)	pH (units)	Color (platinum-cobalt units)	Dissolved oxygen (mg/l)	Coliform: MPN (most probable number of groups per 100 ml)	Coliform: Colonies per 100 ml	Temperature (°C)
Okanogan River at Oroville. Station 12439500--Continued																								
11-19-63	302	4.6	0.03	35	10	11	2.6	148	0	30	1.0	0.3	0.2	0.01	168	128	7	288	7.9	5	--	--	--	--
4- 3-64	560	4.4	.02	36	10	10	2.5	151	0	30	1.5	.3	.2	.02	174	133	10	297	7.8	0	12.4	23	--	--
7-28	680	3.7	.04	32	9.7	9.8	2.3	134	0	27	1.5	.4	.3	.01	155	120	10	273	8.1	0	8.4	23	--	--
1- 9-65	322	3.1	.03	36	9.3	9.9	2.5	144	0	29	2.0	.3	.4	.01	166	128	10	287	7.8	5	13.0	23	--	--
5-15	1,710	2.9	--	35	8.9	10	2.4	142	0	28	1.0	.4	.2	.02	158	124	8	283	8.0	0	11.3	430	--	--
9-11	405	5.2	.09	33	9.3	10	2.3	136	0	27	1.2	.3	.5	.02	162	121	10	272	7.8	5	9.3	91	--	--
3-23-66	390	5.0	--	36	9.3	10	2.4	144	0	29	1.0	.3	.2	--	164	128	10	284	7.4	10	12.7	0	--	--
5-10	460	3.5	--	35	9.2	10	2.0	144	0	31	.8	.3	.5	--	167	126	8	316	7.8	10	9.0	36	--	--
9-15	395	7.2	--	36	10	9.9	2.6	144	0	30	2.0	.2	.7	--	177	131	13	290	7.5	5	10.4	0	--	--
11-17	220	5.4	--	36	10	12	2.5	150	0	32	2.6	.4	.2	--	182	131	8	301	7.5	0	10.8	0	--	--
2-23-67	324	4.6	--	38	10	10	2.3	142	6	32	.5	.3	.3	--	176	136	10	304	8.3	5	13.7	36	--	--
5-24	1,480	4.8	--	35	9.7	11	2.4	148	0	30	1.0	.4	.6	--	168	128	6	296	8.1	0	10.3	0	--	--
8-16	238	5.3	--	32	8.5	9.4	2.4	123	4	27	1.0	.2	.1	--	151	115	8	260	8.4	5	12.1	0	--	--
11-15	149	5.1	--	34	9.6	10	2.5	138	5	27	1.2	.3	.0	--	166	125	3	281	8.4	5	11.0	1,200	--	9
2- 7-68	221	4.8	--	36	9.7	11	2.6	150	0	30	1.6	.2	.2	--	172	130	7	290	8.2	5	13.6	2,400	--	4
5- 7	360	3.1	--	34	9.4	11	2.4	144	0	30	.9	.3	.1	--	168	124	6	276	8.0	5	10.8	--	26	13
8- 7	414	4.4	--	28	9.2	10	2.4	124	0	29	1.1	.3	.4	--	152	108	7	245	8.1	5	8.1	--	590	22
11-20	649	2.0	--	32	10	11	2.5	139	0	28	1.1	.3	.8	--	163	123	9	279	7.9	0	10.4	--	60	6
2-12-69	758	6.9	--	35	10	11	2.6	145	0	33	1.0	.3	1.0	--	176	129	10	292	8.0	5	12.8	--	--	0
5-14	1,960	3.6	--	33	9.2	10	2.4	135	0	29	1.6	.2	.3	--	160	121	10	271	8.1	0	10.4	--	43	18
8-13	414	9.4	--	34	10	9.9	2.3	142	0	31	1.8	.2	.4	--	177	126	10	296	7.7	5	8.6	--	1,600	22
11-11	524	6.5	--	34	9.8	10	2.6	141	0	30	1.6	.3	.8	--	169	126	10	282	8.0	0	10.8	--	350	9.4
2-11-70	209	4.3	--	35	9.3	10	2.6	144	0	31	1.2	.2	.4	--	170	126	8	294	7.8	5	13.1	--	66	1.7
Bonaparte Creek at Tonasket. Station 12444550																								
2-22-68	--	18	--	38	8.5	20	5.9	177	0	26	4.0	.7	1.2	--	231	130	0	338	7.4	25	--	--	--	3
6-29	--	23	--	55	13	31	.4	253	11	31	3.2	.7	.2	--	304	191	0	462	8.6	20	--	--	--	--

Okanogan River near Tonasket. Station 12445000.

12-13-48	2,280	8.6	.04	33	8.7	9.1	1.6	132	--	27	2.1	.2	.2	--	156	118	10	265	8.0	--	--	--	--	5
3- 9-49	1,850	11	--	34	8.4	14		140	--	30	2	.3	1.0	--	170	119	5	278	--	--	--	--	--	--
4-18	3,520	18	--	28	6.1	9.4		114	--	19	1	.2	.4	--	138	95	2	209	--	--	--	--	--	--
5-12	17,200	12	.24	17	2.8	24	1.9	64	--	8.9	1.5	.5	.6	--	79	54	3	117	6.9	--	--	--	--	13
5-15	24,800	12	--	14	2.8	4.9		58	--	6.0	1.2	.4	.8	--	71	46	0	106	--	--	--	--	--	--
6- 9	11,800	9.0	.13	14	2.8	2.9	1.8	54	--	9.4	.7	.1	.6	--	68	46	2	109	7.2	--	--	--	--	14
7-30	1,900	12	.02	29	7.2	6.9	1.0	115	--	23	1.3	.1	1.5	--	139	102	8	220	7.5	--	--	--	--	--
9-19	1,310	12	.05	36	9.8	8.9	2.2	140	--	30	1.5	.2	.1	--	170	130	15	277	7.8	--	--	--	--	--
10-29	1,310	11	.04	36	9.3	5.7	2.2	132	--	31	1.3	.1	.9	--	162	128	20	270	7.8	--	--	--	--	--
12- 2	4,030	11	.14	20	4.2	3.5	5.0	74	--	15	.7	.3	2.7	--	99	67	6	143	7.5	--	--	--	--	--
1-23-50	1,300	12	.03	35	8.6	8.1	1.1	135	--	28	1.5	.3	.2	--	161	123	12	269	7.7	--	--	--	--	--
5- 9	3,450	11	.22	30	7.7	6.8	1.4	120	--	19	2.4	.4	.0	--	138	106	8	227	7.7	--	--	--	--	--
6- 7	18,500	11	.15	15	2.1	2.6	3.8	59	--	8.4	1.0	.3	1.9	--	75	46	0	115	7.6	--	--	--	--	--
9- 4	1,200	12	.02	35	9.4	8.8	1.4	137	--	30	1.6	.2	.0	--	166	126	14	265	7.7	--	--	--	--	--

Okanogan River at Malott. Station 12447200 (formerly Okanogan River near Malott, station 12447300).

9-29-59	3,070	11	--	24	4.8	4.8	1.4	89	--	17	.5	.3	.3	.03	114	80	6	182	7.3	--	--	--	--	--
8-28	1,370	12	--	36	8.7	8.8	2.5	138	--	31	1.0	.2	.3	.01	174	126	12	277	7.9	--	--	--	--	--
10- 1	2,610	11	--	24	6.2	5.7	1.5	93	--	19	.5	.2	.0	.00	115	86	10	189	7.4	--	--	--	--	--
11- 6	3,440	11	--	24	5.1	4.9	1.3	91	--	16	.5	.0	.2	.04	114	81	6	182	8.2	--	--	--	--	--
12- 3	4,080	11	--	24	5.7	5.3	1.4	93	--	18	.2	.4	.3	.05	113	83	7	189	7.8	--	--	--	--	--
12-29	2,600	11	--	30	7.8	7.6	1.6	118	--	25	.8	.2	.1	.03	146	107	10	244	7.9	--	--	--	--	--
1-25-60	1,800	8.9	--	37	7.9	8.9	2.0	136	--	30	1.2	.2	.0	.06	169	125	14	282	8.0	--	--	--	--	--
2-23	1,580	9.4	--	37	8.4	9.5	2.0	139	--	32	1.5	.1	.1	.04	168	127	13	284	8.1	--	--	--	--	--
3-28	1,830	13	--	32	7.1	8.4	2.6	121	--	28	.5	.3	.4	.15	154	109	10	254	7.8	--	--	--	--	--
4-25	3,260	12	--	26	4.5	5.3	1.1	96	--	15	.2	.1	.2	.02	117	84	5	188	7.9	--	--	--	--	--
5-30	5,980	12	--	18	4.3	3.8	1.0	72	--	11	.0	.1	.1	.04	98	63	4	141	7.8	--	--	--	--	--
6-27	6,110	8.7	--	14	2.9	2.7	.7	54	--	8.2	.0	.1	.1	.04	65	47	2	104	7.5	--	--	--	--	--
7-20	1,920	10	--	24	7.2	6.0	1.3	98	--	19	.5	.2	.0	.05	128	90	9	199	8.1	--	--	--	--	--
8-17	946	10	--	36	11	10	2.2	146	--	32	1.2	.2	.1	.06	188	134	15	283	8.2	--	--	--	--	--
9-20	978	12	--	38	11	11	2.3	153	--	35	1.5	.3	.2	.16	197	141	16	312	8.1	--	--	--	--	--
10-18	1,200	11	--	37	10	9.7	2.1	144	2	33	1.5	.3	.0	.04	182	135	13	298	8.3	--	--	--	--	--
11-16	1,240	11	--	36	9.4	9.2	1.8	139	0	31	.8	.3	.1	.03	180	129	15	278	8.0	--	--	--	--	--
12-19	1,070	11	--	38	10	9.8	1.9	149	0	34	1.5	.3	.2	.06	181	137	15	300	8.2	--	--	--	--	--
1-17-61	1,280	9.8	--	35	8.6	9.2	2.1	137	0	28	1.5	.2	.2	.08	172	123	10	273	7.9	--	--	--	--	--
2-16	1,280	12	--	34	8.8	8.9	2.0	132	0	29	1.2	.3	.2	.07	166	121	13	265	8.0	--	--	--	--	--
3-13	1,150	10	--	35	9.0	8.9	1.9	134	1	30	1.5	.3	.1	.04	165	124	13	271	8.3	--	--	--	--	--
4-21	1,880	11	--	31	6.5	6.5	1.6	116	0	21	1.0	.1	.2	.11	144	104	9	225	7.9	--	--	--	--	--
5- 9	4,130	12	--	21	4.8	4.7	1.0	83	0	13	.2	.1	.3	.05	100	72	4	160	7.8	--	--	--	--	--
6-13	15,500	8.9	--	14	3.2	3.3	.9	55	0	9.0	.0	.1	.3	.04	75	48	3	112	7.5	--	--	--	--	--
7-11	2,860	11	--	23	4.8	5.0	1.3	86	0	16	.5	.2	.1	.15	114	77	6	174	7.9	--	--	--	--	--

TABLE C2.--Chemical quality of surface water in the Okanogan River basin--Continued

Okanogan River at Malott. Station 12447200 (formerly Okanogan River near Malott, station 12447300)--Continued

Date of collection	Mean discharge (cfs)	Milligrams per liter																	Specific conductance (micromhos per cm at 25°C)	pH (units)	Color (platinum-cobalt units)	Dissolved oxygen (mg/l)	Coliform		Temperature (°C)
		Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Phosphate (PO_4)	Dissolved solids (residue at 180°C)	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate					MPN (most probable number groups per 100 ml)	Colonies per 100 ml	
8-21-61	1,160	11	--	35	11	9.5	2.4	137	2	33	1.2	0.3	0.4	0.05	182	131	15	282	8.4	--	--	--	--	--
9-20	845	11	--	39	12	12	2.6	154	3	38	1.5	.2	.1	.04	205	147	16	314	8.4	--	--	--	--	--
11-20	1,050	11	0.06	34	9.6	9.0	1.9	134	0	31	1.5	.2	.2	.02	165	124	14	278	7.7	--	--	--	--	--
12-20	980	11	.01	36	12	10	2.1	148	0	34	1.5	.3	.2	.04	186	138	17	305	7.8	--	--	--	--	--
1-24-62	1,400	11	.02	38	10	9.8	2.4	149	0	35	2.0	.3	.3	.04	192	137	15	304	7.9	--	--	--	--	--
2-19	1,770	9.1	--	29	6.9	6.7	1.7	110	0	23	1.0	.2	.3	.05	137	101	11	226	8.0	--	--	--	--	--
3-21	1,200	10	.11	36	8.6	9.0	2.0	137	0	29	1.2	.3	.1	.06	172	125	12	276	7.9	--	--	--	--	--
4-23	4,140	10	--	19	3.6	4.0	1.2	73	0	11	.5	.2	.3	.04	89	62	2	142	7.3	--	--	--	--	--
5-22	4,650	10	.49	19	4.0	4.1	1.2	74	0	12	.2	.2	.1	.03	87	64	4	147	7.6	--	--	--	--	--
6-27	6,990	8.4	--	14	2.2	2.9	.7	50	0	8.4	.2	.1	.3	.03	69	44	3	100	7.5	--	--	--	--	--
7-17	2,420	10	--	24	4.9	5.3	1.3	89	0	18	.2	.2	.2	.05	111	80	7	182	7.9	--	--	--	--	--
8-23	927	10	.04	36	9.7	9.7	2.1	136	2	33	1.0	.2	.2	.05	171	129	14	285	8.3	--	--	--	--	--
9-24	857	9.6	.00	38	10	10	2.3	150	0	35	1.5	.1	.1	.04	186	137	14	307	8.1	--	--	--	--	--
10-24	1,220	9.9	.04	34	11	9.3	2.0	142	--	32	2.0	.3	.2	.05	177	130	13	286	8.2	--	--	--	--	--
11-27	2,010	9.8	--	22	5.7	5.0	1.1	83	--	18	.8	.2	.8	.04	106	108	10	170	7.7	--	--	--	--	--
12-18	1,910	11	.07	28	6.1	6.5	1.2	103	--	23	.8	.2	.2	.04	134	95	10	205	7.8	--	--	--	--	--
1-29-63	840	11	.09	37	9.6	9.4	1.9	144	--	34	1.5	.2	.3	.05	177	132	14	289	8.0	--	--	--	--	--
2-28	1,640	10	.05	28	6.5	6.6	1.4	108	--	22	.8	.2	.1	.04	133	97	8	218	7.7	--	--	--	--	--
3-28	1,390	11	--	30	6.8	6.6	1.4	112	--	23	1.0	.2	.2	.05	140	103	11	224	7.7	--	--	--	--	--
4-26	1,920	11	.13	26	6.6	6.0	1.6	103	--	17	.8	.2	.1	.09	122	92	8	197	7.7	--	--	--	--	--
5-20	4,920	9.6	--	17	3.7	3.2	1.0	67	--	9.2	.0	.1	.5	.03	79	58	2	127	7.5	--	--	--	--	--
6-27	4,350	9.3	--	14	3.2	2.5	.9	55	--	8.8	.0	.1	.3	.03	71	48	3	105	7.3	--	--	--	--	--
7-26	2,580	11	.13	21	4.8	4.1	1.7	78	--	15	.2	.2	.3	.04	104	72	8	159	7.6	--	--	--	--	--
8-28	1,540	11	.07	26	5.6	5.6	1.2	97	--	19	.2	.2	.2	.04	119	88	8	193	8.0	--	--	--	--	--
9-23	1,220	12	--	28	7.7	6.8	1.6	112	--	23	.8	.2	.1	.04	137	102	10	224	8.1	--	--	--	--	--
11-19	1,600	9.8	.05	28	6.4	6.5	1.4	110	--	21	1.0	.2	.1	.03	133	96	6	212	7.7	5	--	--	--	--
1-29-64	1,400	9.6	.05	28	8.2	6.7	1.4	113	--	24	1.0	.1	.2	.03	145	104	11	232	7.6	0	14.4	430	--	--
4- 3	1,500	11	.10	34	9.5	9.0	2.1	136	--	28	1.5	.2	.3	.07	166	124	12	275	7.7	5	10.8	430	--	--
5-19	5,610	11	--	20	4.1	4.1	1.1	78	--	11	.0	.1	.3	.04	97	67	3	148	7.3	15	9.1	930	--	--
7-28	3,120	7.8	--	22	5.0	5.0	1.4	89	--	17	.0	.1	.1	.04	107	76	2	176	7.8	5	8.0	430	--	--
10-14	2,230	7.3	.07	23	6.0	5.4	1.1	91	0	18	.8	.1	.2	.04	113	82	8	184	7.8	5	--	--	--	--
11-21	1,320	9.2	.03	32	8.6	7.9	1.9	126	0	27	.8	.3	.0	.02	150	115	12	254	8.2	0	13.0	430	--	--
1- 9-65	1,150	8.4	.06	34	9.7	9.1	2.4	138	0	31	1.0	.3	.4	.04	167	125	12	276	8.1	0	12.7	230	--	--
3- 6	1,710	7.2	.17	34	9.3	9.5	2.3	136	0	29	1.5	.3	.3	.05	169	123	12	276	8.0	0	12.8	0	--	--
5-15	7,940	9.1	--	17	4.4	4.1	1.0	70	0	10	.5	.2	.3	.07	84	60	3	135	7.2	15	9.9	230	--	--
7-10	3,630	8.1	.17	19	4.3	4.0	1.0	74	0	13	.0	.2	.3	.03	86	66	5	147	7.4	5	8.5	150	--	--
9-11	1,030	9.1	.06	34	10	9.1	2.0	138	0	31	1.2	.2	.3	.04	167	126	14	277	7.8	5	9.5	230	--	--
11-13	1,510	7.8	--	28	7.7	6.9	1.6	111	0	23	.8	.2	.1	--	132	102	10	224	7.9	5	12.6	210	--	--
1- 8-66	1,150	8.7	--	36	11	9.2	2.0	143	0	34	1.2	.2	.3	--	173	134	18	298	7.8	5	13.7	91	--	--
3-23	944	8.1	--	37	9.6	10	1.9	143	0	33	1.0	.2	.2	--	171	132	15	298	7.5	10	12.0	0	--	--
5-10	8,400	8.4	--	11	2.6	2.3	.7	45	0	5.8	.2	.2	.4	--	59	38	1	86	7.1	20	9.2	150	--	--
7-13	2,920	7.8	--	19	3.9	4.1	.8	72	0	13	.5	.2	.3	--	85	64	4	142	7.2	10	8.7	430	--	--
9-15	762	10	--	41	12	12	2.7	165	0	41	1.0	.4	.3	--	205	152	17	344	8.0	5	10.9	91	--	--
11-17	990	8.7	--	33	9.2	8.4	1.8	130	0	30	1.0	.2	.2	--	156	120	14	263	7.5	0	11.8	230	--	--
2-23-67	990	9.0	--	34	9.8	8.5	1.9	136	0	30	2.0	.2	.2	--	163	126	14	275	7.9	5	12.8	0	--	--

5-24	14,600	9.3	--	12	2.8	2.8	1.0	50	0	7.4	.0	.2	.5	--	61	42	0	100	7.1	10	12.0	750	--	--
8-16	874	10	--	32	9.0	8.3	2.1	132	0	29	1.2	.2	.1	--	163	117	9	264	8.2	5	13.3	36	--	--
11-15	1,450	9.5	--	26	6.0	5.5	1.1	99	0	19	1.0	.2	.3	--	128	90	9	196	7.8	5	11.5	930	--	7
2- 7-68	2,830	10	--	22	4.8	4.6	1.1	84	0	15	.6	.1	.5	--	100	75	6	166	7.7	5	13.2	2,400	--	0
5- 8	3,080	10	--	19	4.0	3.9	.9	76	0	11	.4	.2	.2	--	92	64	2	140	7.8	10	11.2	--	850	11.
8- 7	1,330	9.2	--	29	7.8	7.5	1.8	115	0	26	.6	.2	.3	--	144	105	11	234	7.8	5	8.2	--	6,700	2
11-20	1,350	5.8	--	33	9.5	9.4	2.1	135	0	34	1.0	.2	.5	--	163	122	11	270	7.8	5	11.6	--	860	5
5-14-69	14,400	8.4	--	14	3.0	3.0	..9	53	0	8.6	.7	.1	.4	--	74	48	4	105	7.2	20	10.4	--	610	13
8-13	814	6.2	--	31	8.7	9.6	2.4	130	0	26	1.8	.3	.5	--	156	114	7	265	7.9	5	8.3	--	700	21
11-12	1,320	8.8	--	31	8.5	8.3	2.1	122	0	27	1.6	.2	.4	--	136	113	13	254	7.9	0	12.3	--	600	6.4
2-11-70	810	8.6	--	37	10	9.7	2.5	144	0	35	1.5	.2	.6	--	170	134	16	300	7.7	5	13.1	--	350	.4

TABLE C3.--Chemical quality of ground water in the Okanogan River basin

Well number	Depth (feet)	Date sample collected	Milligrams per liter																		Specific conductance (micromhos per cm at 25°C)	pH (units)	Color (platinum-cobalt units)	Temperature (°C)
			Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Lithium (Li)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Phosphate (PO_4)	Dissolved solids (residue at 180°C)	Hardness as $CaCO_3$					
																		Calcium, magnesium	Noncarbonate				
33/26-16C1	113	3-27-58	19	0.44	54	23	34	4.4	--	227	0	109	3.0	0.5	0.7	0.00	360	229	--	567	7.8	0	14
34/26-26Q1	26	10-21-59	28	.19	55	29	13	5.2	--	244	0	75	1.8	.5	1.6	--	329	256	--	519	8.0	0	16
		5-17-60	23	.41	40	23	10	4.0	--	194	0	55	2.0	.4	.5	.19	254	196	--	412	7.8	0	12
		10-20	--	--	--	--	--	--	--	249	0	--	--	--	--	--	--	257	--	532	7.9	--	13
35/25-6	50	1-10-61	15	.35	34	7.1	4.9	2.7	--	126	0	24	.8	.1	.3	--	151	114	--	253	7.3	5	--
37/27-16F	155	10-20-59	23	.04	70	19	23	4.0	--	279	0	52	8.8	.4	4.9	--	342	250	--	555	7.8	0	11
		11-17-60	--	--	--	--	--	--	--	280	0	--	--	--	--	--	--	258	--	571	7.6	--	12
16H	130	10-20-59	32	1.6	100	21	26	4.0	--	403	0	58	3.5	.4	.3	--	444	338	--	709	7.2	5	12
		5-17-60	--	--	--	--	--	--	--	380	0	--	--	--	--	--	--	325	--	672	7.3	--	12
38/26-20F1s	Spring	10-25-54	18	.00	82	9.0	9.1	2.8	--	234	0	63	1.5	.1	1.2	--	302	242	--	481	7.7	0	12
38/27-10N	372	11-12-70	17	.05	10	3.2	314	1.5	<0.02	237	0	490	1.9	.6	4.3	--	--	38	--	1,461	7.5	0	15
40/27-28L1	33	10-20-59	22	.02	65	16	27	4.6	--	254	0	67	3.5	.3	4.8	--	335	228	--	543	7.7	0	13
		5-17-60	--	--	--	--	--	--	--	246	0	--	--	--	--	--	--	221	--	515	7.7	--	--

TABLE C4.--Records of wells

EXPLANATION OF DATA

Altitude: Interpolated from topographic maps. Degree of accuracy varies with contour interval available.

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

Water level: Water levels expressed in nearest tenth or hundredth of a foot were measured by the Geological Survey; levels to nearest whole foot were reported by owner, tenant, or driller.

Type of pump: C, centrifugal; J, jet; N, none; S, submersible; T, turbine.

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

Reported drawdown: The reported drawdown (where indicated) is in response to pumpage at the reported rate of yield. The length of the pumping period may vary from less than 1 hour to several days.

Remarks: H, observation well, with hydrograph shown in figures B10 or B25; L, driller's log given in table C5; O, observation well, with water-level measurements given in table C8.

Well number: The well number indicates the location according to the official rectangular public-land survey. For example, in the number 32/25-2F2, the part preceding the hyphen indicates successively the township and range (T. 32 N., R. 25 E.) north and east of the Willamette base line and meridian. The first number following the hyphen indicates the section (sec.2), and the letter (F) indicates the 40-acre subdivision of the section as shown in the accompanying sketch. The last number is the serial number of the well in the particular 40-acre tract. Thus, well 32/25-2F2 is the second well for which data are available in the SE¼NW¼ sec. 2, T. 32 N., R. 25 E.

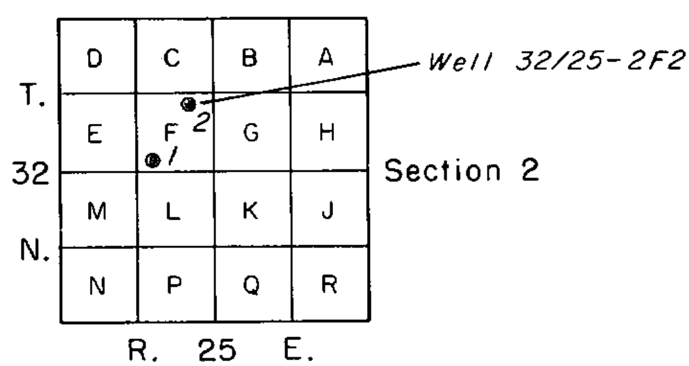

TABLE C4.--Records of wells

Well no.	Owner or tenant	Well: Alt. (ft)	Well: Type	Well: Diameter (inches)	Well: Depth (ft)	Well: Casing depth (ft)	Water-bearing zone(s): Material	Water-bearing zone(s): Depth interval (ft)	Water level: Below land surface (ft)	Water level: Date	Pump: Type	Pump: H.P.	Use of water	Reported yield (gpm)	Draw-down (ft)	Remarks
	T. 30 N., R. 25 E.															
1F1	Dave Smith	1,230	Dr	6	265	102	--	--	50	6- 8-65	--	--	D	2	210	L.
3K1	John Cleveland	790	Dr	6	308	83	--	--	--	--	--	--	D	2	--	L.
8B1	Paul Tift	1,220	Dr	6	164	164	Quicksand	100-164	100	11-15-67	S	1	D	5	30	L.
10F1	Guy Waggoner	770	Dr	6	83	72	Gravel,sand	60-83	--	--	--	--	D	15	--	L.
15F1	State Parks	900	Dr	8	158	158	Gravel	140-152	118	8- -59	--	--	D	72	--	L.
15R1	Chas. Washburn	760	Dr	16	139	139	Gravel,sand	112-139	40	10- -57	T	125	--	350	--	
16C1	Ed. Gorr	800	Dr	6	24	23	Gravel	20-24	--	--	--	--	D	20	--	L.
	T. 31 N., R. 25 E.															
9D1	Jack French	805	Dg	36	45	45	Sand,gravel	40-45	30	7- 2-54	C	10	Irr	250	7	L.
9M1	Great Northern Ry.Co.	830	Dg	84	43	43	--	--	29	1944	--	--	--	100	11	
9Q1	L. H. Schons	810	Dr	6	165	165	Sand,gravel	--	149	7- 1-66	J	1	D	--	--	L.
10N1	Leonard Schons	800	Dg	48	38	38	--	--	30	5- -45	C	10	D,Irr	240	5	
15C1	R. E. Morris	800	Dr	8	223	223	Sand,gravel	187-223	25	8-29-66	T	5	Irr	220	66	L.
26E1	Douglas County PUD	810	Dr	8	60	60	Sand,gravel	--	4	5-13-65	--	--	Irr	75	1	L.
26N1	Lloyd King	795	Dg	48	14	14	Gravel	5-14	8	1- 6-48	C	15	Irr	300	2	
27R1	do.	795	Dr	6	50	43	Gravel	27-43	34	11-10-65	J	½	D	--	--	L.
34A1	Thomas Wick	790	Dg	48	25	25	Gravel,sand	12-25	12	5- -53	C	--	Irr	200	1	
34B1	John Smith	860	Dr	6	95	82	Sand	80-87	80	2-16-66	--	--	D	--	--	L.
34G1	Monse Community	820	Dr	6	150	150	--	--	80	--	J	1/3	D	5	--	
34G2	Communications Satellite Corp.	812	Dr	6	210	200	Sand	200-210	52	3-22-66	T	15	D	40	1	L.
34H1	Thomas Wick	790	Dg	42	17	17	Gravel,sand	12-17	12	4- -48	C	--	Irr	250	1	
34L1	Dept. Nat. Resources	830	Dr	6	155	155	Sand,gravel	152-155	75	1963	J	1	D	--	--	L.
	T. 31 N., R. 26 E.															
1G1	Joseph Kincaid	2,475	Dr	12	35	35	Gravel	27-35	32	4- 1-63	--	--	Irr	450	15	L.
	T. 31 N., R. 28 E.															
1J1	Ed. Condon	1,600	Dr	6	100	29	--	--	22	7-14-65	--	--	D	2	70	L.
2C1	Leonard Condon	1,300	Dr	6	400	55	Granite	--	--	--	--	--	D	½	--	L.
2J1	James Walker	1,400	Dr	6	177	11	Granite	170-177	28	--	--	--	D	20	--	L.
2J2	Smith Condon	1,400	Dr	6	138	37	--	--	25	7-12-65	--	--	D	2	105	L.
3Q1	Paul McGowan	1,240	Dr	12	47	47	Gravel	44-47	44.02	10- 7-69	T	50	Irr	1,500	--	L.
10C1	do.	1,260	Dr	6	50	42	Gravel	42-50	50	7-18-65	S	1	D	42	--	L.

	T. 32 N., R. 24 E.															
10K1	Herbert Poole	2,070	Dr	12	24	24	Sand,gravel	10-24	15	9- -68	C	20	Irr	240	--	L.
10P1	do.	2,060	Dr	48-10	48	46	Sand	28-48	12	8-20-60	C	7½	N	400	28	L.
11P1	George Collins	1,930	Dr	6	200	--	Sand,gravel	59-98	59	6- -69	--	--	D	400	--	L.
13D1	Herbert Armstrong	1,580	Dr	12	40	30	--	--	--	--	N	—	N	--	--	Not enough water for domestic supply. L.
13H1	Paul Stout	1,420	Dr	12-10	185	185	Sand,gravel	85-89, 180-185	35	--	T	30	Irr	120	—	L.
	T. 32 N., R. 24 E.--Con.															
13H2	Paul Stout	1,420	Dr	12	222	--	Sand,gravel	211-222	--	--	N	--	N	--	--	Pumps sand due to broken casing. L.
13H3	do.	1,440	Dr	10	60	50	--	--	--	--	N	--	N	--	--	Not enough water for domestic supply.
	T. 32 N., R. 25 E.															
2B1	A. J. Carlson	820	Dg	48	15	15	Sand,gravel	4-13	4	4- -49	C	--	Irr	150	3	
2B2	G. C. Cook	830	Dr	12	45	40	Gravel	40-45	13	6- 2-65	T	30	Irr	450	9	
2P1	Don Chalmers	835	Dg	72	35	--	Gravel	28-35	28	8- 1-47	C	3	D,Irr	120	3	L.
2P2	Fred Peare	835	Dg	36	52	--	--	--	38	1946	C	2	Irr	125	3	
3N1	Roy Alumbaugh	830	Dg	36-42	67	67	Gravel	--	51	8- 1-60	T	20	Irr	400	4	L.
3P1	Stanley Steele	820	Dg	96-36	32	32	Gravel	—	14	7-30-47	C	10	D,Irr	500	8	
4P1	Dennis Hinger	1,030	Dr	12	237	237	Gravel	218-233	200	7- -65	T	60	Irr	800	--	L.
4R1	do.	900	Dr	10	200	200	Gravel	170-200	110	1962	T	30	Irr	300	50	L.
4R2	do.	850	Dr	8	85	85	Sand	60-85	60	1961	N	--	N	--	--	Not enough water for domestic supply. L.
8R1	Charles Rumbolz	800	Dg	48	50	50	Sand, gravel	38-50	38	5- -45	T	15	D,Irr	1,000	22	L.
9A1	H. C Hitchner	835	Dg	36	34	--	Gravel	19-34	24	1959	--	3	Irr	120	1	
9D1	George Phillips, Jr.	--	Dr	6	120	120	Sand	69-120	61	8- -55	T	15	Irr	150	--	L.
9N1	P. B. Johnson	810	Dg	36	22	22	Gravel	18-22	15	8- -49	C	7½	D,Irr	200	7	
9R1	Ed. Timentwa	800	Dr	6	163	158	Sand,gravel	140-163	--	--	--	--	D	50	--	L.
10B1	Stanley Steele	810	Dg	30	36	30	Sand,gravel	--	12	7-30-47	C	7½	D,Irr	250	10	
10E1	William Olson	815	Dg	52	25	25	--	--	18.5	9-25-62	T	3	Irr	240	--	
16D1	Louise Charley	800	Dr	6	173	169	Sand,gravel	151-173	--	--	--	--	D	45	--	L.
17P1	Kenneth Jimeson	835	Dg	48-36	22	22	Gravel	5-22	6	5-10-48	T	10	Irr	600	6	
30J1	Arthur Waddell	800	Dr	12	55	55	Gravel	39-55	18	4- 1-68	T	30	Irr	1,200	35	Well penetrated clay to 39 ft.
30R1	do.	800	Dg	48	19	19	Gravel	12-19	13	5- -50	C	15	Irr	350	4	L.
30R2	do.	800	Dg	48	18	18	Gravel	10-18	12	5- -59	C	10	Irr	175	1	
32E1	Donald Garrison	830	Dg	48	45	45	Sand,gravel	35-45	33	1953	--	--	Irr	400	7	L.

TABLE C4.--Records of wells--Continued

Well no.	Owner or tenant	Alt. (ft)	Well: Type	Well: Diameter (inches)	Well: Depth (ft)	Well: Casing depth (ft)	Water-bearing zone(s): Material	Water-bearing zone(s): Depth interval (ft)	Water level: Below land surface (ft)	Water level: Date	Pump: Type	Pump: H.P.	Use of water	Reported yield (gpm)	Draw-down (ft)	Remarks
	T. 33 N., R. 25 E.															
1K1	L. L. Cook	1,340	Dg	72-48	31	31	Sand,gravel	12-30	12	7- -47	--	10	D,Irr	550	10	L.
1L1	do.	1,350	Dg	72-36	53	53	Sand,gravel	--	40	7- -47	--	5	D,Irr	50	8	
1P1	Hartness	1,320	Dg-Dr	48	42	42	Gravel	16-37	--	--	C	7½	Irr	280	--	B, L, O.
12C1	J. E. Wilkinson	1,330	Dg-Dr	96-8	217	--	--	--	6	1946	T	10	Irr	600	2	
12C2	Prudential Ins. Co.	1,330	Dr	16	70	70	Gravel	--	16	8- 7-63	T	15	Irr	1,500	4	L.
12F1	C. P. Shell	1,330	Dg	72	21	21	Gravel	12-21	13	8- -54	N	--	N	1,100	4	O.
12F2	do.	1,330	Dr	14	37	37	Sand,gravel	--	16.12	10-26-55	--	--	Irr	--	--	L, O.
12F3	Fletcher Bros.	1,320	Dr	18	66	--	Gravel	--	38.45	8-31-67	T	25	Irr	--	--	O.
13C1	J. E. Wilkinson	1,300	Dg	60	75	--	Gravel	--	30	1947	C	6	D,Irr	370	3	
13F1	Oscar Fulford	1,310	Dr	48-10	55	--	Gravel	40-50	20	6- -56	T	5	Irr	200	20	
13K1	J. E. Wilkinson	1,280	Dg	60	65	--	--	--	--	--	C	3	D,Irr	250	--	
21G1	K. L. Corrier	1,920	Dr	6	140	29	Granite	83-85	10	6-25-64	S	1	D	5½	90	L.
21G2	do.	1,920	Dg	30	17	17	--	--	7.52	10- 8-69	C	¼	D	--	--	
27C1	Johnny Appleseed Orchards	1,610	Dg	42	22	22	Gravel	20-22	14	8- 2-66	C	1	D,Ind	--	--	
36J1	Lloyd Woda	830	Dg	48	49	49	Gravel	41-49	40	9- 8-67	--	--	D,Irr	60	1	L.
	T. 33 N., R. 26 E.															
2D1	Simon Sampson	845	Dr	6	183	165	--	--	--	--	--	--	--	--	--	Abandoned because of low yield. L.
3H1	N. M. Delfeld	--	Dg	48	26	26	Sand	20-26	20	1953	C	7½	Irr	150	3	
3R1	Ewer Lumber Co.	--	Dr	8	41	41	Sand,gravel	31-41	Flow	1967	T	5	D,Irr	100	1	L.
4D1	Progressive Flats Assoc.	1,270	Dg	48	30	30	Gravel	--	8.5	1960	T	5	PS	50	9½	
4R1	Columbia Concrete Pipe	840	Dg, Dr	36-10	45	45	Gravel	25-45	--	--	T	10	Ind	200	--	
5P1	Walter Wood	1,280	Dg	36	45	45	"Quicksand"	--	4	1938	T	7½	D,Irr	100	31	
5P2	do.	1,280	Dg	48	25	25	--	--	2	1938	T	7½	Irr	110	18	
8F1	do.	1,400	Dr	8	161	25	Granite	--	25	6- 9-47	--	--	D	--	--	Encountered bedrock at 23 ft.
9B1	City of Okanogan	880	Dr	12	117	117	Gravel	96-117	75	9- 4-63	T	75	PS	1,150	20	L.
10C1	Henry Ostenberg	840	Dr	6	42	--	--	--	--	--	--	--	--	--	--	Abandoned because of low yield. L.
11D1	Parm Dickson	965	Dr	12	233	233	Gravel	148-170, 206-220	148.42	10-21-69	T	100	Irr	550	70	L.
16E1	Coop. Growers	830	Dg	48-24	40	40	Gravel	--	22	1946	C	3	Ind	250	6	
16F1	City of Okanogan	880	Dr	12	118	118	Gravel	74-94	35	8- -53	T	25	PS	200	--	L.
17D1	Don DeVon	1,085	Dg	36	21	21	Gravel,sand	18-21	7	1956	--	--	D	5	--	L.
17M1	A. J. Carlson	830	Dg	48	20	20	Gravel	10-17	10	1953	C	7½	D,Irr	300	4	

T. 33 N., R. 27 E.

1N1	Fred St. Peter	2,000	Dr	6	176	--	--	--	--	--	--	--	--	--	--	Abandoned because of low yield. L.
4E1	Leonard Miller	1,280	Dr	6	90	80	Gravel	66-82	--	--	--	--	D	6	--	L.
5B1	John Nicholson	1,235	Dr	6	120	--	Sand, silt, gravel	--	--	--	--	--	D	--	--	Log incomplete. L.
6D1	Richard Moomaw	970	Dr	6	135	129	--	--	--	--	--	--	D	6	--	L.
11H1	Arthur Greene	1,335	Dr	6	180	114	Granite	--	--	--	--	--	D	2	--	L.
12L1	Richard Simpson	2,040	Dr	6	200	60	Fractured granite	71-123	--	--	--	--	D	1½	--	L.
16P1	Joe Peters	1,180	Dr	6	62	62	Gravel	60-62	22	3-18-65	--	--	D	30	40	L.
18D1	Eneas Sam	1,322	Dr	6	160	84	Sandstone?	84-158	30	6-15-65	--	--	D	6	110	L.
21C1	Wilson Walton	1,140	Dr	6	66	66	Gravel	61-66	--	--	J	1	D	30	--	Backfilled to 66 ft. L.
21C2	do.	1,180	Dr	12	44	44	Gravel	27-44	4	1969	T	25	Irr	350	25	L.
33A1	Edgar Desautel	960	Dr	6	25	25	Gravel	--	5.35	10-10-69	J	½	D	30	--	Water quality poor.

T. 33 N., R. 28 E.

10N1	Pauline Staggs	2,460	Dr	6	300	--	--	--	--	--	--	--	--	--	--	Abandoned, no yield.
15K1	Jerome Miller	2,330	Dr	6	240	94	Granite	--	23	2- 3-65	--	--	D	1	--	L.
21H1	E. F. Anderson	2,260	Dr	6	288	41	Granite	--	--	--	--	--	D	2	--	L.

T. 33 N., R. 29 E.

9D1	Oscar Anderson	3,060	Dr	12	40	--	--	--	16.55	10-14-69	J	1	D	--	--	
17M1	Mose Sam	2,520	Dr	6	25	25	Sand, gravel	24-27	8	12- -64	--	--	D	5	16	
17P1	Alice Irey	2,570	Dr	6	268	--	--	--	--	--	--	--	--	--	--	Dry hole. L.
18G1	Margie SiJohn	2,520	Dr	6	188	24	Granite	--	--	--	--	--	D	30	--	L.
18P1	Ida Erb	2,615	Dr	6	200	73	Granite	126	--	--	--	--	D	1	--	L.
20B1	Pauline Zacherle	2,550	Dr	6	80	--	Gravel, sand	25-80	10	3- 5-65	--	--	D	60	60	L.
20B2	Lawrence Louie	2,550	Dr	6	74	--	Gravel	--	10	6-18-65	--	--	D	60	40	
27P1	Ambrose Adolph	2,685	Dr	6	268	10	Granite	262	--	--	--	--	D	12	--	Well penetrated only granite below 3 ft.
34A1	Frank Adolph	2,725	Dr	6	168	--	--	--	--	--	--	--	--	--	--	Abandoned, no yield. L.

T. 34 N., R. 25 E.

24M1	Herman Nichols	1,475	Dg	72	16	--	Gravel	--	4	1955	C	5	Irr	140	5	
24P1	do.	1,450	Dg	72	16	--	Gravel	--	--	--	C	3	Irr	40	--	
25B1	Glen Woodward	1,445	Dr	12	108	108	Gravel	95-108	27.18	10-15-69	T	25	Irr	400	53	L.
36A1	Ernest Carpenter	1,400	Dg	36	29	29	--	--	23	5- -48	C	5	Irr	300	2½	
36G1	Clara Carpenter	1,400	Dg	72-48	29	29	--	--	23	3- -48	C	5	D, Irr	400	1	
36K1	L. L. Cook	1,400	Dg	72-48	51	51	Sand, gravel	30-50	30	7- -47	--	20	D, Irr	800	6	L.

TABLE C4.--Records of wells--Continued

Well no.	Owner or tenant	Alt. (ft)	Well: Type	Well: Diameter (inches)	Well: Depth (ft)	Well: Casing depth (ft)	Water-bearing zone(s): Material	Water-bearing zone(s): Depth interval (ft)	Water level: Below land surface (ft)	Water level: Date	Pump: Type	Pump: H.P.	Use of water	Reported yield (gpm)	Draw-down (ft)	Remarks
T. 34 N., R. 26 E.																
2L1	R. H. Holt	1,320	Dr	10	118	118	Gravel	108-118	93	1962	T	30	Irr	350	--	L.
5K1	Shirley Baker	1,360	Dr	12	34	34	Sand	--	23	6-18-65	C	5	D,Irr	350	1	
5R1	Bernie Baker	1,320	Dr	10	51	51	Sand,gravel	--	11	1955	C	10	Irr	200	15	
8A1	Thomas McCain	1,310	Dr	12	48	48	Gravel	25-31	14	5- -66	--	--	Irr	300	12	L.
9M1	Robert Storm	1,365	Dg	72	40	--	Sand,gravel	--	17	6- -47	C	7½	D,Irr	250	3	
10K1	K. D. MacKenzie	1,270	Dg	96-60	60	60	--	--	20	6- -47	C	20	Irr	450	2	
11D1	Greenacres, Inc.	1,330	Dg	48	113	113	Gravel	--	91.10	10-23-69	T	50	Irr	800	--	
11H1	City of Omak	1,305	Dr	8	95	95	Sand,gravel	88-95	78	11-10-64	--	--	Ind	10	--	Supplies airport.L.
12E1	Vern Alumbaugh	1,300	Dg	42	84	84	Sand	47-84	75	1954	--	--	Irr	120	2	
12M1	Gene Smith	1,290	Dr	10	103	103	Sand,gravel	65-103	--	--	T	25	D,Irr	--	--	L.
12P1	Leo Klessig	1,270	Dg	60	90	90	Gravel	--	55	1940	C	3	D,Irr	150	10	
13Q1	N. Nachtrab	1,190	Dg	42	60	60	Gravel	--	25	4- -48	--	7½	D,Irr	150	--	Encountered hardpan at 60 ft.
14G1	George Brown	1,280	Dg	60-42	80	80	Gravel	--	50	--	C	20	Irr	500	6	
14M1	Scott Smith	1,250	Dg	48	55	55	Gravel	28-55	28	5- -47	C	5	Irr	125	1	
14N1	L. P. Johnson	1,235	Dg	72	22	22	Gravel	10-22	10	--	C	5	Irr	300	½	
14Q1	U. E. Thomas	--	Dr	8	60	60	Gravel	50-60	35	12-10-62	T	20	Irr	450	10	L.
15B1	Peterson	1,275	Dg	84	60	60	Gravel	43-60	35	6- -47	C	15	Irr	38	3	L.
15R1	Earl Lane	1,235	Dg	36	20	20	Gravel	6-20	10	--	C	3	Irr	100	1	
21R1	Victor Morgan	1,280	Dg	30	50	50	Gravel	--	33	1945	C	2	D,Irr	110	--	
22C1	Duck Lake Assoc.Inc.	1,230	Dr	8	94	94	Sand,gravel	70-94	60	7- -60	--	--	Irr	--	--	L.
22H1	Velman Pracht	1,230	Dg	48	20	--	Gravel	5-15	5	--	--	5	Irr	100	1	L.
23D1	Irvin Woods	1,235	Dg	96	38	38	Gravel	30-38	8	--	C	10	D,Irr	300	--	
24Q2	City of Omak	830	Dg	120-108	25	25	Gravel	13-25	11.65	1-24-39	T	40	PS	800	--	
26Q1	do.	820	Dg	144	30	30	Gravel	15-30	14.59	12- 3-70	N	--	N	800	10	H, O.
26Q2	do.	820	Dg	120	44	44	Gravel	--	16.86	2-26-53	T	40	PS	800	--	O.
27B1	R. J. Peterson	1,265	Dg	52	32	32	Sand	25-32	8	1947	C	2	D,Irr	40	5	L.
28A1	Charles Byrd	1,300	Dg	36	43	43	Gravel	--	32.50	12- 3-70	C	--	Irr	--	--	H, O.
28B1	Victor Morgan	1,283	Dg	30-48	50	50	Gravel	--	33	7- -46	C	2½	Irr	110	2	O.
28P1	Samuel Peterson	1,270	Dg	48	21	21	Gravel	--	14.52	9-19-39	C	3	Irr	--	--	O.
33G1	Michelsen	1,240	Dg	30	22	22	Sand,gravel	15-22	18	6- -43	C	3	Irr	100	1	L.
33L1	S. A. Douglas	1,240	Dg	48	26	26	Sand,gravel	5-22	14	8- -49	C	1½	Irr	55	4	
33R1	W. H. Jungblom	1,210	Dr	8	46	44	Gravel,sand	28-43	5	1- 4-66	--	--	Irr	70	16	L.

34B1	Anton Kermel	1,060	Dg	60	32	32	Sand,gravel	29-32	14	6- -47	C	5	Irr	200	6	
34P1	John Kermel	1,210	Dg	48	40	40	Sand,gravel	--	30	6- -47	C	7½	Irr	200	5	
34J1	City of Omak	820	Dr	12	93	93	Gravel	--	6.67	6-19-63	T	75	PS	650	--	Well backfilled from 103 ft. L.
35B1	City of Omak	860	Dg	36	30	30	Gravel	20-33	5.19	6-18-51	--	--	--	500	8	Well destroyed. O.
35R1	do.	850	Dg	168	37	37	Gravel	--	28	1944	C	175	PS	2,800	--	O.
35R2	Biles-Coleman	850	Dg	96	35	35	Gravel	--	30	1966	C	275	Ind	5,000	--	
36D1	City of Omak	840	Dg	48	28	28	Gravel	--	13.60	6- 4-68	T	30	PS	550	24	Well backfilled from 49 ft. L.
36E1	Omak Public Schools	850	Dr	8	57	57	Gravel	42-57	42	12-17-64	--	--	Irr	66	1	L.
36H1	Dorothy Jack	850	Dr	6	34	31	Gravel	21-34	16	4- 6-65	--	--	D	10	--	L.
	<u>T. 34 N., R. 27 E.</u>															
5N1	Frank Zabreznik	863	Dr	8	46	46	Gravel	39-46	20	5-10-63	T	7½	Irr	80	2	L.
6F1	Hakon Braathen	920	Dr	12	27	27	Gravel	20-27	14	8- -61	C	10	Irr	300	--	L.
20B1	S. A. Orr	890	Dr	8	81	81	Sand,gravel	53-81	--	--	--	--	--	--	--	L.
20P1	Benner Taylor	860	Dg	--	56	--	Gravel	52-56	25	--	C	10	Irr	206	20	L.
20Q1	E. T. Lane	900	Dr	8	92	92	Gravel	55-92	55	7- -54	--	--	--	130	16	
29P1	J. J. Hodgen	900	Dr	12	85	--	"Bedrock"	65-68, 80-83	25	7- 4-61	--	--	--	100	--	L.
31F1	Agatha Brooks	850	Dr	6	72	63	Gravel,sand	61-72	30	4- 5-65	--	--	D	50	18	L.
	<u>T. 35 N., R. 25 E.</u>															
6N1	U.S. Forest Service	2,315	Dr	8	50	50	Gravel	30-50	17	7-10-61	T	--	--	150	8	L.
8N1	Roland Berney	2,360	Dr	10	172	172	Gravel	115-139	115	2- 4-63	--	--	D	600	--	L.
18A1	do.	2,300	Dr	10	--	--	--	--	28.34	10-15-69	T	40	Irr	250	--	
23K1	W. W. Main	1,460	Dr	8	81	69	Gravel	71-81	51.20	10-15-69	T	25	D,Irr	100	12	L.
23K2	Robert French	1,430	Dg-Dr	42-10	67	67	Gravel	60-67	35	1953	T	--	Irr	300	2	L.
23Q1	do.	1,420	Dr	10	70	--	Sand,clay	45-64	48	1957	--	--	Irr	--	--	Dry hole. L.
25H1	Richard Haeberle	1,280	Dr	8	46	45	Gravel	39-45	11.66	10-15-69	C	15	Irr	250	--	L.
25L1	Lawrence Cunningham	1,340	Dr	8	83	83	Gravel	81-83	48	1957	--	--	Irr	--	--	L.
	<u>T. 35 N., R. 26 E.</u>															
3P1	Raleigh Stansbury	1,020	Dg	36	82	82	Sand,gravel	52-82	52	1952	T	15	Irr	400	2	L.
13A1	Willard Fritz	880	Dr	10	95	90	Sand	48-95	--	--	--	--	Irr	150	1	L.
13F1	Arthur Femling	890	Dg	36	42	42	Sand,gravel	--	34	5- -49	C	10	D,Irr	200	4	
13G1	Vernon Lewis	890	Dr	8	63	63	Sand	40-61	41	10-15-62	S	1	D	--	--	L.
14L1	Francis Tritle	1,080	Dg	36	41	41	--	--	25	1954	C	2	D,Irr	70	6	
23J1	L. A. Utt	920	Dg	36	50	50	Sand,gravel	44-50	40	10- -54	C	5	Irr	100	8	L.
25J1	Bain Crofoot	850	Dr	10	54	54	Gravel	50-54	23	1967	T	15	Irr	300	--	L.
	<u>T. 35 N., R. 27 E.</u>															
7D1	Roland Sackman	880	Dg	42	30	30	Gravel	16-30	16	6- -51	C	20	Irr	320	1	L.

TABLE C4.--Records of wells--Continued

Well no.	Owner or tenant	Alt. (ft)	Type	Well: Diameter (inches)	Well: Depth (ft)	Water-bearing zone(s): Casing depth (ft)	Water-bearing zone(s): Material	Water-bearing zone(s): Depth interval (ft)	Water level: Below land surface (ft)	Water level: Date	Pump: Type	Pump: H.P.	Use of water	Reported yield (gpm)	Draw-down (ft)	Remarks
	T. 35 N., R. 28 E.															
28D1	Marvin Dodge	3,040	Dg	48	28	28	--	--	13.21	10-16-69	--	--	S	--	--	
	T. 36 N., R. 24 E.															
25D1	U.S. Forest Service	2,880	Dr	6	93	93	Gravel	--	40	1969	--	--	D	--	--	Supplies campground.
25K1	do.	2,680	Dr	6	70	70	Gravel	--	Flow	8-18-69	--	--	D	3	--	Supplies campground.
	T. 36 N., R. 25 E.															
1N1	Quentin Sasse	2,920	Dg	42	20	20	Gravel	14-20	10	1959	C	9	Irr	150	--	
28B1	U.S. Forest Service	2,330	Dr	6	70	70	Gravel	--	40	1969	--	--	D	--	--	Supplies campground.
	T. 36 N., R. 26 E.															
13A1	E. L. Buchert	990	Dr	10	148	148	Sand, gravel	130-172	87	5- 1-66	T	75	Irr	500	--	L.
13K2	do.	1,040	Dr	12	172	172	Sand, gravel	151-172	117	9-21-67	T	60	Irr	400	--	L.
24C1	Victor Lesamiz	1,350	Dg	6	49	49	Gravel	--	18.0	8-26-53	--	--	N	--	--	O.
25M1	Fritz Williams	1,100	Dr	8	192	192	Sand, gravel	110-192	129	1-10-67	--	--	D, Irr	60	2	L.
28H1	C. R. Ayers	1,400	Dg	48	24	24	Gravel	--	--	--	C	7½	Irr	125	6	
34P1	G. E. Scholz	1,030	Dr	12	116	116	Gravel	101-116	77	9- 1-70	T	75	Irr	--	--	L.
	T. 36 N., R. 27 E.															
4C1	Guy Fisher	920	Dg	48	24	24	Gravel	--	14	--	C	5	Irr	--	--	
4J1	Okanogan Valley Wood Products, Inc.	900	Dr	10	117	117	Gravel, sand	106-116	19.70	10-16-69	S	1½	Ind	--	--	L.
5M1	L. C. Peterson	880	Dg	42-24	18	18	Gravel	10-18	6	1955	C	20	Irr	480	--	
	T. 36 N., R. 28 E.															
3B1	Raymond Attwood	2,060	Dr	--	125	--	--	--	--	--	--	--	--	--	--	Well encountered bedrock. Insufficient yield for irrigation.
21E1	Barry Voyles	3,040	Dg	36	40	40	--	--	30	1969	--	--	D, S	--	--	
21G1	do.	3,000	Dg	36	14	14	--	--	--	--	C	3	--	--	--	
22Q1	do.	3,110	Dg	60	12	12	--	--	3.42	10-16-69	--	--	Irr	--	--	
	T. 36 N., R. 29 E.															
3D1	Paul Pyatt	2,470	Dr	6	20	20	--	--	--	--	C	--	D	--	--	Yield barely adequate.
	T. 37 N., R. 26 E.															
10H1	Loy McDaniel	1,450	Dr	10	101	101	Gravel	78-95	96.13	12- 2-70	T	40	Irr	800	2	H, L, O.
10J1	do.	1,450	Dr	10	100	100	Gravel	69-	96.64	10- 6-69	N	--	N	350	14	O.
10J2	do.	1,480	Dr	12	139	139	--	--	94.30	4- 9-68	T	60	Irr	--	--	O.
14P1	F. A. Mustard	1,430	Dg	30-48	82	80	--	--	75.33	11-19-63	T	40	Irr	800	4	O.

23F1	F. L. Beeman	1,410	Dr	12	100	100	Gravel	49-90	57.95	11-20-63	T	100	Irr	--	--	Deepened from 72 ft in 1967. L.
23K1	do.	1,400	Dr	10	90	90	Gravel	--	60	3-20-67	T	60	Irr	--	--	Deepened from 67 ft in 1967. L.
25P1	John Yeckel	--	Dr	10	105	105	Sand, gravel	85-105	49.27	12- 2-70	T	--	Irr	600	50	H, L, O.
26A1	Plateau Orchards, Inc.	1,400	Dr	10	93	91	Gravel	87-91	--	--	--	--	Irr	200	--	L.
26J1	Roy Woodard	1,432	Dr	8	90	90	Gravel	--	76.88	10-14-70	N	--	N	--	--	H, O.
36B1	Plateau Orchards, Inc.	1,380	Dr	8	145	145	Gravel	143-145	52.10	8-22-69	--	--	--	50	--	L.
36C1	do.	1,360	Dr	--	147	--	Gravel	8-9	--	--	--	--	--	--	--	Dry hole. L.
36D1	do.	1,380	Dr	12	56	56	Gravel, sand	21-56	39.71	11-17-69	N	--	N	2,400	10	L, O.
36D2	do.	1,380	Dr	12	83	83	Gravel	56-83	--	--	T	60	Irr	--	--	L.
36F1	Dept. Nat. Resources	1,390	Dr	8	64	64	Gravel	50-64	44	--	--	--	S	--	--	L.
	<u>T. 37 N., R. 27 E.</u>															
1A1	J. T. Fancher	1,500	Dg	48	36	36	Gravel	24-36	24	1959	--	--	--	150	--	L.
1J1	James Pruit	1,470	Dg	48	16	16	Gravel	10-16	4	1957	C	7½	Irr	350	8	
1K1	Chas. Morrison	1,450	Dg	36	15	15	--	--	5	--	--	20	Irr	160	7	
1P1	do.	1,445	Dg	48	10	10	Gravel	--	1	1952	--	15	Irr	20	--	
3L1	J. M. Winslow	955	Dr	10	98	91	Sand	85-98	--	--	--	--	D, Irr	600	--	L.
9R1	R. E. Colbert	955	Dr	8	65	65	Gravel	60-65	--	--	--	--	--	--	--	L.
12B1	R. M. Nixon	1,410	Dg	48	12	12	Gravel	10-12	3	6-10-68	C	5	Irr	100	6	L.
12G1	James Pruit	1,445	Dg	48	22	22	Gravel	20-22	4	1956	C	5	D, Irr	200	16	
16C1	City of Tonasket	885	Dr	12	170	170	--	--	--	--	T	30	PS	250	--	
16C2	do.	885	Dr	12	155	155	Gravel	68-93	16	3-10-47	T	15	PS	500	--	L.
16L1	do.	910	Dr	12	65	65	Sand, gravel	50-65	28	9-21-60	T	75	PS	800	1	L.
16L2	do.	910	Dr	12	72	72	Sand, gravel	55-72	29	5- 1-66	T	75	PS	600	--	L.
20K1	A. E. Pauley	900	Dr	12	52	52	Gravel	45-52	12	--	T	25	Irr	800	40	L.
21H1	E. G. Longanecker	940	Dg	36	80	80	Gravel, sand	--	60	3- 1-62	T	20	Irr	125	15	
29M1	Kenneth Clarkson	--	Dr	8	37	37	Sand, gravel	26-37	16	1-20-65	--	--	Irr	--	--	L.
29N1	R. D. Wilson	930	Dg	36	42	42	Gravel	--	32	1962	T	7½	Irr	200	--	
31A1	Guy Fisher	890	Dg	48	25	25	Gravel	12-25	10	--	C	3	Irr	--	--	
	<u>T. 37 N., R. 28 E.</u>															
32L1	E. L Buchert	2,000	Dr	8	128	128	Gravel	110-128	37	12- 1-65	T	--	Irr	600	20	L.
32P1	Raymond Attwood	2,010	Dr	10	202	202	Sand	176-202	22	6-10-66	T	100	Irr	1,700	--	L.
32P2	do.	2,050	Dr	8	104	104	Gravel	103-104	--	--	--	--	D, S	--	--	Well encountered bedrock at 104 ft.
32Q1	do.	2,020	Dr	8	165	165	Sand, gravel	143-165	27	1-20-64	T	50	Irr	600	--	L.
32R1	do.	2,030	Dr	8	42	42	--	--	--	--	--	--	D, S	12	--	
	<u>T. 37 N., R. 30 E.</u>															
10A1	Vern Charbonneau	3,580	Dg	36	10	10	--	--	Flow	8-26-69	C	½	D	--	--	

TABLE C4.--Records of wells--Continued

Well no.	Owner or tenant	Well: Alt. (ft)	Type	Diameter (inches)	Depth (ft)	Casing depth (ft)	Water-bearing zone(s): Material	Depth interval (ft)	Water level: Below land surface (ft)	Date	Pump: Type	H.P.	Use of water	Reported yield (gpm)	Draw-down (ft)	Remarks
	T. 38 N., R. 25 E.															
1L1	Loomis Water Users	1,280	Dg	36	36	36	Gravel	18-36	18	5- 8-63	T	25	PS	--	--	
23A1	Dept. Nat. Resources	1,470	Dg	36	28	28	--	--	4.53	8-23-69	--	--	--	--	--	
23A2	do.	1,470	Dr	8	110	110	Gravel	106-110	23	10- -67	S	--	D	175	20	L.
	T. 38 N., R. 26 E.															
1N1	J. C. Weddle	1,350	Dg	48	29	29	Sand, gravel	--	16	7- -62	C	10	Irr	120	2	
11B1	C. B. Inlow	1,376	Dg	48-36	27	27	Gravel	16-27	15.10	4-14-66	C	15	D, Irr	30	--	
11F1	U.S.Bur. Reclamation	1,454	Dr	--	156	--	Sand	--	93.05	1-25-68	--	--	--	--	--	Test hole. L.
11H1	C. B. Inlow	1,420	Dg	48	24	24	Gravel	--	18	5- 6-63	C	10	Irr	100	--	
13C1	Reese & Krovsoff	1,480	Dr	12	157	157	--	--	137	7- -69	S	¾	D	--	--	
	T. 38 N., R. 27 E.															
10N1	W. G. Hallauer	1,210	Dr	6	372	372	Gravel	355-372	340	1956	S	1½	D	200	--	L.
11L1	Northco Fruit Co.	930	Dr	8	280	280	Gravel	--	--	--	T	50	Irr	250	--	
14L1	Great Northern Ry.Co.	910	Dr	10	26	26	Gravel	24-26	4	--	S	2	P, Ind	120	10	Penetrated clay to 24 ft.
15H1	Billy Godwin	940	Dr	6	126	--	--	--	--	--	--	--	--	--	--	Penetrated only clay and fine sand. Destroyed.
16M1	R. P. Taplett	1,240	Dr	12	155	155	Sand, gravel	124-155	27.41	8-20-69	--	--	--	25	--	L.
16M2	do.	1,280	Dg	48	23	23	Gravel	16-23	19	1969	C	10	D, Irr	250	--	L.
16P1	do.	1,220	Dg	48	27	27	Gravel	--	10	1969	C	15	Irr	200-400	--	
16P2	do.	1,220	Dg	48	21	21	Gravel	10-21	10	1959	C	1	D	--	--	L.
16Q1	Duane Luhn	1,200	Dg	48	24	24	Gravel	12-24	--	--	--	25	Irr	200	--	L.
17R1	R. P. Taplett	1,330	Dr	12	275	275	Sand, gravel	103-242	103	1957	--	--	--	80	68	L.
27B1	Cecil Roggoll	940	Dg	48	24	24	Gravel	12-24	12	--	C	10	Irr	--	--	
32N1	Victor Lesamiz, Jr.	1,350	Dr	12	130	117	Gravel, sand	22-24, 87-117	25.83	8-21-69	T	25	Irr	600	80	L.
	T. 38 N., R. 28 E.															
31Q1	J. T. Fancher	1,540	Dr	12	200	--	--	--	34.96	10-22-69	--	--	--	--	--	Yield inadequate for irrigation, did not encounter bedrock.
	T. 38 N., R. 30 E.															
16D1	Neil Trammell	3,570	Dg	36	20	20	--	--	17	1967	C	¾	D	--	--	Supplies resort.
17A1	U.S. Forest Service	3,565	Dr	8	40	40	Gravel	--	20	1969	--	--	D	--	--	Supplies campground.
17B1	do.	3,565	Dg	8	22	22	--	--	16	10-18-64	--	--	--	--	--	8-inch steel casing installed in old dug well in 1964.

	T. 39 N., R. 23 E.															
1P1	U.S. Forest Service	6,370	Dg	48	7	7	Gravel	6-7	6	9- -69	--	--	--	--	--	
	T. 39 N., R. 25 E.															
4B1	Dept.Nat. Resources	2,930	Dr	6	93	90	Gravel	89-91	17.5	10- 3-67	--	--	D	45	63	L.
24E1	John Woodard	1,230	Dg	36	56	56	--	--	34	6- -56	T	10	D,Irr	175	12	
24K1	Ed. Rowlands	1,180	Dg	48	18	18	Gravel	14-18	14	5- 8-46	--	--	Irr	150	3	L.
24K2	do.	1,180	Dg	48	20	20	Gravel	12-20	6	5-25-62	--	--	Irr	250	6	
26G1	C. H. Badgley	1,260	Dr	8	170	170	Gravel	160-170	100	1956	S	10	Irr	300	20	L.
34M1	U.S.Bur. Reclamation	1,731	Dr	--	60	--	Gravel	--	44.2	8-10-66	--	--	--	--	--	Test hole. Penetrated gravel, sand, and boulders entire depth.
34M2	do.	1,725	Dr	--	45	--	Gravel	--	3	11-16-66	--	--	--	--	--	Test hole. Encountered bedrock at 25 ft.
34M3	do.	1,750	Dr	--	60	--	Gravel	--	50.6	11-29-66	--	--	--	--	--	Test hole. Penetrated gravel entire depth.
	T. 39 N., R. 26 E.															
7H1	Palmer Lake Land Co.	--	Dr	12	85	85	Gravel	70-85	30	1947	--	--	--	750	50	L.
11F1	C. E. Holmes	1,940	Dg	48	36	36	Gravel	15-36	15	12-20-64	--	--	Irr	300	10	
36P1	Dept.Nat. Resources	1,840	Dg	36	16	16	Boulders	15-16	8	1965	C	½	D	--	--	L.
	T. 39 N., R. 27 E.															
3D1	E. J. Ringwood	925	Dg	48	26	26	Gravel	13-26	--	--	C	15	Irr	400	--	
3E1	do.	925	Dg	48	26	26	Gravel	--	2	5- -69	C	30	Irr	550	6	
3P1	Margaret Bottomly	970	Dg	36	24	24	Gravel,sand	--	20	1953	T	1½	D,Irr	40	--	
4A1	E. J. Ringwood	925	Dg	48	26	26	Gravel	13-26	--	--	T	5	Irr	--	--	Reported inadequate for irrigation.
5R1	T. A. Thorndike	970	Dg,Dr	48-12	110	110	Sand,gravel	60-110	60	--	T	30	D,Irr	200	2	L.
10P1	John Thorndike	960	Dg	48-36	50	50	Gravel	38-50	38	1961	T	15	Irr	420	2	
16C1	K. E. Leslie	940	Dr	6	97	24	Granite	---	35	1948	--	--	D	32	--	Encountered granite at 24 ft.
21F1	John Thorndike	1,030	Dg	48-36	28	28	Gravel	20-28	20	1956	--	--	Irr	400	2½	
27H1	Frank Taylor Orchards	955	Dg	48-36	40	40	Gravel	--	--	--	C	7½	Ind	80	--	
28J1	Oscar Thornton	950	Dg	36	25	25	Gravel	18-25	9	6- 8-69	C	10	Irr	120	1½	
	T. 39 N., R. 28 E.															
1D1	Clarence Morris	3,140	Dg	18	25	25	--	--	11	1969	--	--	D	--	--	
	T. 40 N., R. 25 E.															
2D1	U.S.Customs Office	1,360	Dr	8	50	50	Gravel	--	24	1969	--	--	D	--	--	
8G1	Stoddard and Wendle	1,180	Dg	48	21	21	Gravel	--	8	1955	--	--	Irr	500	5	

TABLE C4.--Records of wells--Continued

Well no.	Owner or tenant	Alt. (ft)	Type	Well: Diameter (inches)	Well: Depth (ft)	Water-bearing zone(s): Casing depth (ft)	Water-bearing zone(s): Material	Water-bearing zone(s): Depth interval (ft)	Water level: Below land surface (ft)	Water level: Date	Pump: Type	Pump: H.P.	Use of water	Reported yield (gpm)	Draw-down (ft)	Remarks
	T. 40 N., R. 25 E.--Con.															
8J1	Stoddard and Wendle	1,180	Dg	48	22	22	Gravel	--	11	1955	--	--	Irr	500	8	
12Q1	J. A. Lenton	1,160	Dr	12	59	59	Gravel,sand	34-38, 40-45, 56-59	19	5- 1-69	T	30	Irr	1,000	30	L.
21K1	Stoddard and Wendle	1,170	Dg	48	26	26	Gravel	18-26	8	1955	--	--	Irr	500	8	L.
26B1	Hazel Allemandi	1,190	Dg	48	20	20	Gravel	9-20	9	1- 7-67	C	7½	Irr	--	--	
34G1	W. M. Fancher	1,165	Dg	36	32	--	--	--	10	1- 1-61	--	--	Irr	500	--	
	T. 40 N., R. 27 E.															
10R1	D. A. Thorndike	1,040	Dg	48	42	42	Gravel	27-42	21	1954	T	20	Irr	460	4	L.
12P1	Charles Eder	1,480	Dr	12-10	183	183	Gravel	116-132 151-167 174-183	120	5-12-68	--	--	Irr	800	--	L.
15C1	Gordon Sylvester	950	Dg	48-24	46	46	Gravel	32-46	32	--	--	--	Irr	--	--	L.
16F1	Victor Lehrmen	960	Dg	36	38	38	Sand,gravel	--	30	5-23-59	J	1½	D,Irr	50	--	O.
16P1	Maurice Mahugh	975	Dg	36	42	42	Clay	--	32	--	J	½	D	--	--	
21K1	City of Oroville	930	Dg	48	21	21	Sand,gravel	--	14.53	8-21-46	--	--	--	--	--	
27J1	Donald Thorndike	950	Dg	48	42	42	Gravel	38-42	30	7- -57	T	40	Irr	--	--	L.
27N1	Zosel Lumber Co.	920	Dg	36	12	12	Gravel	--	8.29	6- 3-70	J	--	Ind	--	--	H,O.
27N2	Cariboo Growers,Inc.	925	Dg	48	30	30	Sand,gravel	--	--	--	--	7½	Ind	400	--	
27N3	Stadelman Fruit Co.	925	Dg	36	26	26	Gravel	--	12	1969	C	7½	Ind	150	--	High iron content.
27Q1	Lehrman Warehouse Inc.	--	Dg	48	35	35	Gravel	--	15	--	C	10	Ind	300	--	
27R1	D. J. Thorndike	956	Dg	48	38	38	--	--	5	1957	--	--	--	--	--	Reportedly penetrates only clay.
28A1	City of Oroville	920	Dr	8	60	60	Sand,gravel	--	4.75	8-21-46	--	--	--	--	--	Water reported very poor quality. Well destroyed. O.
28F1	D. A. Thorndike	940	Dg	48	40	40	--	--	30	1969	C	7½	Ind	125	--	
28F2	do.	940	Dg	48	40	40	--	--	30	1969	C	10	Ind	125	--	
28G1	Oroville United Growers	940	Dg	48	26	26	Gravel	19-26	17.88	1-24-39	--	--	--	500	10	
28G2	--	940	Dg	20	11	--	Gravel	--	9.79	4-10-50	C	1	Irr	--	--	O.
28L1	City of Oroville	935	Dg	36	31	31	Gravel	--	20.00	11-17-69	T	60	PS	--	--	O.
28L2	do.	935	Dg	48	32	32	Gravel	--	21.80	11-17-69	T	50	PS	--	--	
33B1	Christiansen	930	Dg	60	14	14	Sand,gravel	--	11.23	3-30-51	C	--	Irr	--	--	O.
34A1	J. T. Hardenburgh	940	Dg	36	39	36	Gravel	--	31	1955	--	--	D	--	--	

TABLE C5

Drillers' Logs of Wells

TABLE C5.-- Drillers' logs of wells

30/25-1F1. Dave Smith. Drilled by Major Drilling Co., June 1965.

Material	Thickness (feet)	Depth (feet)
Topsoil, sandy	4	4
Gravel, coarse, and boulders	16	20
Gravel, medium, and sand	34	54
Granite	47	101
Granite, water-bearing	2	103
Granite, fractured	87	190
Sandstone, hard, blue	30	220
Granite	45	265

30/25-3K1. John Cleveland. Drilled by Major Drilling Co., June 1965.

Material	Thickness (feet)	Depth (feet)
Topsoil, sandy	2	2
Boulders, sand, gravel	41	43
Sand, medium, blue	24	67
Gravel, medium, and sand	17	84
Granite, hard	188	272
Granite, gray	36	308

30/25-8B1. Paul Tift. Drilled by owner, 1967.

Material	Thickness (feet)	Depth (feet)
Gravel, coarse, and cobbles	3	3
Sand, fine	57	60
Clay	2	62
Sand, fine	38	100
"Quicksand"	64	164

Screen 159-164 ft.

30/25-10F1. Guy Waggoner. Drilled by Major Drilling Co., June 1965.

Material	Thickness (feet)	Depth (feet)
Topsoil, sandy	3	3
Gravel, coarse, and boulders	17	20
Sand, medium, brown	5	25
Gravel, medium, and sand	31	56
Gravel, medium, and coarse sand	27	83

30/25-15F1. State Parks. Drilled by Charlton Well Drilling Co., August 1959.

Material	Thickness (feet)	Depth (feet)
Sand and clay, dry	60	60
Gravel	8	68
Till	72	140
Gravel, water-bearing	12	152
Clay and silt	6	158

30/25-16C1. Ed. Gorr. Drilled by Major Drilling Co., June 1965.

Material	Thickness (feet)	Depth (feet)
Topsoil, sandy	3	3
Sand, some brown clay	7	10
Sand, and medium gravel, water-bearing	10	20
Gravel, coarse	4	24

31/25-9D1. Jack French. Dug by R. E Jones, July 1954.

Material	Thickness (feet)	Depth (feet)
Silt	3	3
Clay	37	40
Sand, gravel and "rock"	5	45

31/25-9Q1. L. H. Schons. Drilled by Strasser Drilling Co., 1967.

Material	Thickness (feet)	Depth (feet)
Boulders	19	19
Clay, sandy	23	42
Sand, blue	24	66
Sand, coarse	30	96
Sand, fine	53	149
Sand, coarse	6	155
Gravel	10	165

TABLE C5.--Drillers' logs of wells--Continued

Material	Thick-ness (feet)	Depth (feet)
31/25-15C1. R. E. Morris. Drilled by Strasser Drilling Co., August 1966.		
Clay	20	20
Gravel and "rock"	8	28
Sand, fine	35	63
Sand, coarse	15	78
Sand, fine, and clay	6	84
Sand, fine	44	128
Silt, loose	14	142
Silt, packed	14	156
Sand, packed	31	187
Sand, coarse, and gravel	36	223
Casing perforated 189-196 ft.		
31/25-26E1. Douglas County PUD. Drilled by Strasser Drilling Co., May 1965.		
Topsoil, sandy	5	5
Clay, sandy, some gravel	10	15
Sand and clay	13	28
Gravel and clay	14	42
Gravel, cemented	6	48
Sand and gravel	12	60
Casing perforated 53-58 ft.		
31/25-27R1. Lloyd King, Drilled by Strasser Drilling Co., November 1965.		
Clay, sandy	18	18
Silt, blue	9	27
Gravel	16	43
Sand	7	50

Material	Thick-ness (feet)	Depth (feet)
31/25-34B1. John Smith. Drilled by Strasser Drilling Co., February 1966.		
Sand	2	2
Sand and gravel	17	19
Sand	28	47
Gravel and sand, loose	15	62
Sand, gray	18	80
Sand, coarse	7	87
Sand, brown	8	95
Screen 82-87 ft.		
31/25-34G2. Communications Satellite Corp. Drilled by Gill Drilling Co., March 1966.		
Unknown	58	58
Sand, fine, brown	2	60
Clay, sand, and silt, gray	30	90
Sand, brown, some silt and clay	10	100
Sand and clay, brown	40	140
Sand and clay, brown and gray	30	170
Clay, silt, and sand, gray	18	188
Gravel, brown, some silt	7	195
Sand, fine, brown, some silt	5	200
Sand, coarse, some streaks of black silt	10	210
Screen 200-210 ft.		
31/25-34L1. Dept. Nat. Resources. Drilled by Gill Drilling Co., 1963.		
Sand and cemented gravel	20	20
Sand, brown	70	90
Sand, fine, silty, blue, water-bearing	47	137
Sand and pea gravel	3	140
Silt, fine	12	152
Sand, coarse, and gravel	3	155

TABLE C5.--Drillers' logs of wells--Continued

Material	Thickness (feet)	Depth (feet)
31/26-1G1. Joseph Kincaid. Drilled by Charlton Well Drilling Co., April 1963.		
Unknown	11	11
Sand, gravel, clay	14	25
Gravel, fine	2	27
Gravel, coarse, and sand	8	35
Casing perforated 28-35 ft.		
31/28-1J1. Ed. Condon. Drilled by Major Drilling Co., July 1965.		
Sand, fine	18	18
Boulders, gravel, and sand	10	28
Granite, fractured	72	100
31/28-2C1. Leonard Condon. Drilled by Bach Drilling Co., October 1967.		
Topsoil	6	6
Boulders and gravel	46	52
Granite, gray, hard	348	400
Casing perforated at 55 ft.		
31/28-2J1. James Walker. Drilled by Bach Drilling Co., October 1967.		
Boulders and gravel	9	9
Granite	7	16
Granite, medium, black and white	92	108
Granite, gray, hard; water at 170 ft	69	177
31/28-2J2. Smith Condon. Drilled by Major Drilling Co., July 1965.		
Sand, fine	29	29
Boulders, and coarse gravel	8	37
Granite, decomposed	63	100
Granite, gray	38	138
31/28-3Q1. Paul McGowan. Drilled by Thomas Well Drilling Co., July 1969.		
Topsoil	8	8
"Hardpan" (gravel, clay, and boulders, very hard)	36	44
Gravel, water-bearing	3	47
Granite "bedrock"	at	47

Materials	Thick-ness (feet)	Depth (feet)
31/28-10C1. Paul McGowan. Drilled by Major Drilling Co., July 1965.		
Sand, fine	18	18
Boulders, and coarse gravel	20	38
Gravel, medium coarse	4	42
Gravel, medium coarse, water-bearing	8	50

Materials	Thick-ness (feet)	Depth (feet)
32/24-10K1. Herbert Poole. Drilled by Dennis Hinger, September 1968.		
Boulders, gravel, and sand	10	10
Sand and gravel	14	24
Casing perforated 15-24 ft.		

Materials	Thick-ness (feet)	Depth (feet)
32/24-10P1. Herbert Poole. Drilled by R. E. Jones, August 1960.		
Topsoil	6	6
"Hardpan"	22	28
Sand	20	48
Screen 36-46 ft.		

Materials	Thick-ness (feet)	Depth (feet)
32/24-11P1. George Collins. Drilled by Dennis Hinger, June 1969.		
Silt and sand	8	8
Clay	12	20
Sand, fine	20	40
Gravel, small, sand,and clay	19	59
Sand and gravel, water-bearing	39	98
Sand and gravel	6	104
Sand, fine	16	120
Clay	45	165
Sand and clay	15	180

(continued)

Materials	Thick-ness (feet)	Depth (feet)
32/24-11P1.--Continued		
Gravel, some clay, little water	3	183
Sand	2	185
Clay	15	200
"Bedrock"	at	200
Casing perforated 70-90 ft.		

Materials	Thick-ness (feet)	Depth (feet)
32/24-13D1. Herbert Armstrong. Drilled by Dennis Hinger, August 1968.		
Topsoil	4	4
Sand and fine gravel	26	30
"Bedrock," little water at 30 ft	10	40
Perforated at 30 ft.		

Materials	Thick-ness (feet)	Depth (feet)
32/24-13H1. Paul Stout. Drilled by Charlton Well Drilling Co., 1968.		
Topsoil	5	5
Sand, some water	30	35
Clay	10	45
Sand	40	85
Gravel, fine, and sand; water-bearing	4	89
Clay	36	125
Sand	55	180
Sand and gravel, water-bearing	5	185
Casing perforated at 35 ft, 80-90, 165-185 ft.		

TABLE C5.--Drillers' logs of wells--Continued

32/24-13H2. Paul Stout. Drilled by Bloyed Well Drilling Co., 1965.

Material	Thickness (feet)	Depth (feet)
Topsoil	5	5
Gravel	3	8
Sand	12	20
Gravel, coarse	1	21
Sand	1	22
Gravel, fine	2	24
Sand, coarse	13	37
Sand, coarse, and gravel	9	46
Sand	12	58
Sand, fine	3	61
"Granite," decomposed	23	84
"Granite," broken, decomposed, water-bearing	30	114
"Rock" and sand, water-bearing	31	145
Clay and sand	23	168
Sand and gravel, water-bearing	11	179
Sand and some fine gravel	6	185
Sand, gravel, and rocks, water-bearing	9	194
Clay and sand	7	201
Sand and some rock, water-bearing	8	209
Clay and sand	2	211
Sand and some rocks, water-bearing	3	214
Sand, some rocks, and gravel	8	222

32/25-2F1. Don Chalmers. Dug, 1936.

Material	Thickness (feet)	Depth (feet)
Silt	4	4
Sand	3	7
Gravel	21	28
Gravel, pea, water-bearing	7	35

32/25-3N1. Roy Alumbaugh. Dug by owner, 1960.

Material	Thickness (feet)	Depth (feet)
Sand	25	25
Sand, coarse	10	35
Gravel, water-bearing	32	67

32/25-4P1. Dennis Hinger. Drilled by owner, July 1965.

Material	Thickness (feet)	Depth (feet)
Gravel and "rock"	40	40
Sand with small layers of clay	155	195
Gravel	7	202
Sand, fine, brown	16	218
Gravel (water-bearing)	15	233
Sand, gravelly, gray	4	237

Casing perforated 222-236 ft.

32/25-4R1. Dennis Hinger. Drilled by owner, 1962.

Material	Thickness (feet)	Depth (feet)
"Rock" and gravel	35	35
Sand, fine, gray	45	80
Clay	30	110
Sand, fine	60	170
Gravel (water-bearing)	30	200

Casing perforated 190-200 ft.

32/25-4R2. Dennis Hinger. Drilled by owner, 1961.

Material	Thickness (feet)	Depth (feet)
Silt	6	6
Gravel	4	10
Sand (water-bearing)	75	85
Clay, blue	at	85

32/25-8R1. Charles Rumbolz. Dug. 1945.

Material	Thickness (feet)	Depth (feet)
Topsoil, sandy	8	8
Sand, fine to coarse	30	38
Gravel, sand, and cobbles	12	50

32/25-9D1. George Phillips, Jr. Drilled, August 1955.

Material	Thickness (feet)	Depth (feet)
Topsoil	2	2
Sand, fine	48	50
Clay	1	51
Sand, fine (water-bearing)	69	120

TABLE C5.--Drillers' logs of wells--Continued

Material	Thickness (feet)	Depth (feet)
32/25-9R1. Ed. Timentwa. Drilled by Major Drilling Co., May 1965.		
Topsoil, sandy	4	4
Gravel, coarse, and sand	21	25
Sand, brown	15	40
Gravel, medium, and sand	5	45
Sand, coarse, brown	16	61
Sand, fine, "quicksand"	79	140
Sand, coarse, water-bearing	14	154
Gravel, medium to coarse, water-bearing	9	163
32/25-16D1. Louise Charley. Drilled by Major Drilling Co., May 1965.		
Sand, coarse	8	8
Boulders, gravel, sand	22	30
Gravel, coarse, and sand	14	44
Sand, and brown clay	76	120
Sand, fine, blue, heaving	31	151
Sand, coarse	13	164
Gravel, medium	9	173
32/25-30R1. Arthur Waddell. Dug, 1949.		
Topsoil	2	2
Clay	10	12
Gravel	7	19
32/25-32E1. Donald Garrison. Dug by owner, 1950.		
Silt, sandy	4	4
Gravel and soil	15	19
Sand (alternating coarse and fine)	16	35
Sand, coarse, and gravel (water-bearing)	10	45
33/25-1K1. L. L. Cook. Dug, 1921.		
Topsoil	3	3
Sand and gravel	27	30
Clay and "hardpan"	1	31
Casing perforated 12-31 ft.		
33/25-1P1. Hartness. Deepened by Charlton Well Drilling Co.		
Topsoil	4	4
Clay	12	16
Gravel (water-bearing)	21	37
"Quicksand" (no more water)	5	42
33/25-12C2. Prudential Ins. Co. Drilled by Charlton Well Drilling Co., August 1963.		
Silt and clay	10	10
Gravel and cobbles	42	52
Clay and "hardpan"	16	68
Clay and gravel	2	70
Casing perforated 20-50 ft.		
33/25-12F2. C. P. Shell. Drilled by Martin, October 1955.		
Topsoil, sandy	4	4
Sand, gravel, boulders	33	37
Boulder (granite)	at	37

TABLE C5.--Drillers' logs of wells--Continued

Material	Thickness (feet)	Depth (feet)
33/25-21G1. K. L. Corrier. Drilled by G. A. Reed, 1964.		
Topsoil, heavy, and silt, some water at 25 ft	29	29
Granite, hard	22	51
Clay and coarse sand	19	70
Granite, decomposed (water-bearing 83-85 ft)	15	85
Granite, hard	20	105
Granite, decomposed	35	140
33/25-36J1. Lloyd Woda. Dug by Marvin Hanneman, September 1967.		
Topsoil	2	2
Gravel, and cobbles	28	30
Sand, fine	11	41
Gravel, water-bearing	8	49
33/26-2D1. Simon Sampson. Drilled by Major Drilling Co., April 1965.		
Boulders	10	10
Gravel, and boulders	4	14
Sand, medium, brown	12	26
Sand, fine, and blue clay "quicksand"	157	183
33/26-3R1. Ewer Lumber Co. Drilled by Harry Hubbard, 1967.		
Silt	12	12
Sand and clay	19	31
Sand and gravel, water-bearing	10	41
Casing perforated 10-35 ft.		
33/26-9B1. City of Okanogan. Drilled by Charlton Well Drilling Co., August 1963.		
Sand, gravel, and boulders	12	12
"Hardpan"	3	15
Sand, and 2-inch gravel	3	18
Sand, coarse, and pea gravel	14	32
Sand, and 2- to 3-inch gravel	23	55
Sand, fine and coarse	3	58
Sand, coarse, and gravel	12	70
Sand and gravel, with yellow clay	5	75
Gravel, water-bearing	11	86
Gravel, and coarse sand and clay	10	96
Gravel, clean, water-bearing	21	117
Casing perforated 80-117 ft.		
33/26-10C1. Henry Ostenberg. Drilled by Major Drilling Co., April 1965.		
Sand, gravel, and boulders	18	18
Sand, medium, brown	6	24
Sand, fine, blue, "quicksand"	18	42
33/26-11D1. Parm Dickson. Drilled by Harry Hubbard and Sons, April 1967.		
Sand, with some clay	163	163
Clay, blue, soft	3	166
Sand, water-bearing	4	170
Clay and sand	17	187
Sand, with some gravel	6	193
Gravel	9	202
"Hardpan"	4	206
Gravel, water-bearing	14	220
Sand	5	225
Silt	8	233
Casing perforated 211-220 ft.		

TABLE C5.--Drillers' logs of wells--Continued

Material	Thickness (feet)	Depth (feet)
33/26-16F1. City of Okanogan. Drilled by G. W. Sample, November 1947.		
Unknown	3	3
Muck	1	4
Muck and boulders	27	31
Sand and some small gravel, water level 45 ft	14	45
Sand, water-bearing	3	48
Sand, some gravel, water-bearing	17	65
Clay, sand, and cemented gravel, water level 35 ft	6	71
Sand and gravel	2	73
Sand, fine and coarse, some small and medium gravel	1	74
Gravel, coarse, large and medium, and 10% sand	4	78
Gravel, coarse, large and medium, and 15% sand	11	89
Gravel, small and medium, and 40% sand	1	90
Gravel, small and medium, and 50% sand	5	95
Sand, cemented, gravel and clay	5	100
Gravel, cemented, and clay, and 80% sand	18	118
Casing perforated, 8 rows, 74-84 ft; 4 rows, 84-94 ft.		

Material	Thickness (feet)	Depth (feet)
33/26-17D1. Don DeVon. Dug by owner.		
Silt	2	2
Rocks, gravel, and sand	8	10
Clay	8	18
Gravel, and sand (water-bearing)	3	21

Material	Thickness (feet)	Depth (feet)
33/27-1N1. Fred St. Peter. Drilled by Major Drilling Co., March 1965.		
Topsoil	2	2
Gravel, coarse, and sand	19	21
Clay, blue, and sand	103	124
Granite, decomposed	37	161
Granite, gray	15	176

Material	Thickness (feet)	Depth (feet)
33/27-4E1. Leonard Miller. Drilled by Major Drilling Co., April 1965.		
Sand	24	24
Boulders and coarse gravel	19	43
Gravel, medium	23	66
Gravel, medium, water-bearing	16	82
Clay, blue	6	88
Granite "bedrock"	2	90

Material	Thickness (feet)	Depth (feet)
33/27-5B1. John Nicholson. Drilled by Harry Hubbard and Sons, October 1969.		
Topsoil	4	4
Gravel	4	8
Clay and gravel	22	30
Gravel	7	37
Clay mixed with sand and gravel	25	62
Sand and gravel, water-bearing (had a little clay)	7	69
Clay and gravel (6-inch granite boulder at 72 ft)	8	77
Gravel	2	79
Clay and gravel	12	91
Sand, dry	1	92
Clay, with some gravel	12	104
Silt, water-bearing	2	106
Clay and boulders	3	109
Incomplete log	11	120

Material	Thickness (feet)	Depth (feet)
33/27-6D1. Richard Moomaw. Drilled by Major Drilling Co., April 1965.		
Gravel and boulders	11	11
Clay, blue	15	26
Clay, blue, some medium gravel	22	48
Unknown	67	115
Gravel, fine, and sand	20	135

TABLE C5.--Drillers' logs of wells--Continued

Materials	Thick-ness (feet)	Depth (feet)
33/27-11H1. Arthur Greene. Drilled by Major Drilling Co., March 1965.		
Clay and sand	20	20
Clay, and coarse gravel	43	63
Clay, blue, and sand	52	115
Granite, decomposed	45	160
Unknown	20	180
33/27-12L1. Richard Simpson. Drilled by Major Drilling Co., July 1965.		
Topsoil, sandy	3	3
Gravel, coarse, sand, and boulders with some clay	35	38
Clay, blue, boulders, and coarse gravel	22	60
Granite	11	71
Granite, fractured (water-bearing)	52	123
Granite	77	200
33/27-16P1. Joe Peters. Drilled by Major Drilling Co., March 1965.		
Sand and clay	21	21
Boulders, sand, and some gravel	21	42
Unknown	18	60
Gravel, water-bearing	2	62
33/27-18D1. Eneas Sam. Drilled by Major Drilling Co., June 1965.		
Topsoil, sandy	4	4
Sand, and brown clay	23	27
Clay, blue, and gravel ("hardpan")	36	63
Clay, blue	21	84
Sandstone and clay (water-bearing)	74	158
Clay, sticky	2	160

Material	Thick-ness (feet)	Depth (feet)
33/27-21C1. Wilson Walton. Drilled by Thomas Well Drilling Co., 1960.		
Sand	61	61
Gravel, pea	5	66
Sand	10	76
33/27-21C2. Wilson Walton. Drilled by James Corn., May 1969.		
Clay	4	4
Sand, white, with alternating layers of clay	23	27
Gravel, water-bearing	17	44
Sand	at	44
Casing perforated 29-44 ft.		
33/28-15K1. Jerome Miller. Drilled by Major Drilling Co., February 1965.		
Topsoil	6	6
Clay, blue	54	60
Gravel, medium, coarse sand, and brown clay	32	92
Granite, fractured	4	96
Granite	24	120
Sandstone, gray	8	128
Granite	26	154
Sandstone, brown	4	158
Granite	82	240
33/28-21H1. E. F. Anderson. Drilled by Major Drilling Co., March 1965.		
Topsoil	2	2
Gravel, medium, and clay	22	24
Granite, decomposed	51	75
Granite, fractured	43	118
"Claystone," yellow	32	150
Granite	138	288

TABLE C5.--Drillers' logs of wells--Continued

Material	Thick-ness (feet)	Depth (feet)
33/29-17P1. Alice Irey. Drilled by Major Drilling Co., June 1965.		
Topsoil	2	2
Clay and sand	5	7
Clay, brown	7	14
Granite, decomposed	58	72
Clay, white	4	76
Granite, hard, fractured	80	156
Granite	112	268
33/29-18G1. Margie SiJohn. Drilled by Major Drilling Co., February 1965.		
Topsoil	2	2
Clay, brown, and some medium gravel	20	22
Granite, fractured	34	56
Granite	132	188
Casing perforated 24-188 ft.		
33/29-18P1. Ida Erb. Drilled by Major Drilling Co., January 1965.		
Topsoil	4	4
Clay, brown, and fine sand	11	15
Gravel, medium, and clay	15	30
Gravel, coarse, and sand	15	45
Gravel, medium, and sand	10	55
Clay, blue, and sand	15	70
Clay, brown	2	72
Granite, hard, brown	28	100
Granite, very hard, blue-gray	100	200

Material	Thick-ness (feet)	Depth (feet)
33/29-20B1. Pauline Zacherle. Drilled by Major Drilling Co., March 1965.		
Topsoil	4	4
Clay and sand	21	25
Sand and gravel, water-bearing	45	70
Gravel, coarse, water-bearing	10	80
Casing perforated 74-75 ft.		
33/29-34A1. Frank Adolph. Drilled by Major Drilling Co., July 1965.		
Clay, brown, and fine gravel	28	28
Clay, brown, and fine gravel	32	60
Gravel, medium	5	65
Clay, brown	15	80
Granite, and pink clay	88	168
34/25-25B1. Glen Woodward. Drilled by R. E. Jones, April 1955.		
Topsoil	5	5
Clay	20	25
Gravel, with fine sand and clay	60	85
Gravel, clean	6	91
"Hardpan"	4	95
Gravel, coarse, water-bearing	13	108
34/25-36K1. L. L. Cook. Dug, 1922.		
Topsoil	3	3
Sand and gravel (water-bearing)	47	50
Clay and "hardpan"	1	51

TABLE C5.--Drillers' logs of wells--Continued

Material	Thick-ness (feet)	Depth (feet)
34/26-2L1. R. H. Holt. Drilled by Charlton Well Drilling Co., 1962.		
Gravel, coarse, and boulders	105	105
"Hardpan"	3	108
Gravel, fine (water-bearing)	10	118
Casing perforated 111-118 ft.		
34/26-8A1. Thomas McCain. Drilled by Harry Hubbard, May 1966.		
Topsoil	5	5
"Hardpan"	14	19
Sand and gravel, water-bearing	3	22
"Hardpan"	3	25
Gravel, water-bearing	6	31
Clay and silt	17	48
34/26-11H1. City of Omak. Drilled by Thomas Well Drilling Co., June 1964.		
Topsoil and sand	3	3
Gravel and cobbles	62	65
Sand, dry	13	78
Sand, water-bearing	10	88
Sand and gravel, water-bearing	7	95
Bedrock	2+	95
Casing perforated 92-94 ft.		
34/26-12M1. Gene Smith. Drilled by Thomas.		
Topsoil	2	2
Boulders	13	15
Sand and gravel	15	30
Boulders, sand and gravel	30	60
Sand and gravel	5	65
Sand and gravel, water-bearing	38	103
Screen 97-103 ft.		

Material	Thick-ness (feet)	Depth (feet)
34/26-14Q1. U. E. Thomas. Drilled by Thomas Well Drilling Co., December 1962.		
Topsoil	4	4
Gravel and boulders	16	20
"Hardpan"	30	50
Gravel, water-bearing	10	60
Casing perforated 54-59 ft.		
34/26-15B1. Peterson. Dug, 1922.		
Topsoil	3	3
Gravel and sand	30	33
"Hardpan"	5	38
Sand	5	43
Gravel, coarse (water-bearing)	17	60
34/26-22C1. Duck Lake Water Assoc.Inc. Drilled by Thomas.		
Topsoil and boulders	14	14
"Hardpan" with clay	24	38
Sand	32	70
Sand with gravel (water-bearing)	24	94
Screen 84-94 ft.		
34/26-22H1. Velman Pracht. Dug, 1917.		
Topsoil	5	5
Gravel	10	15
Clay, silty	5	20
34/26-27E1. R. J. Petersen. Dug, 1924.		
Topsoil	2	2
"Rock" and gravel	22	24
Gravel, cemented	1	25
Sand, coarse (water-bearing)	7	32

TABLE C5.--Drillers' logs of wells--Continued

Material	Thick-ness (feet)	Depth (feet)
34/26-33G1. Michelsen. Dug, April 1943.		
Topsoil	2	2
"Rock" and gravel	5	7
Sand and gravel (water-bearing)	15	22
34/26-33R1. W. H. Jungblom. Drilled by Thomas Well Drilling Co., 1966.		
Gravel	2	2
Clay	12	14
Gravel	4	18
Clay, hard	10	28
Gravel, and sand, water-bearing	15	43
Bedrock	3	46
Casing perforated 14-18, 28-43 ft.		
34/26-34J1. City of Omak. Drilled by Thomas Well Drilling Co., June 1963.		
Topsoil	2	2
Clay, white, some sand	14	16
Clay, blue, and silt	3	19
Gravel, compact, some binder	7	26
Gravel, loose	2	28
Sand, fine, with binder, some gravel	20	48
"Hardpan"	3	51
Gravel, 1-inch	9	60
Gravel, some binder	3	63
Gravel, loose	3	66
Gravel, some binder	2	68
Gravel, loose, 1½-inch	2	70
Gravel, some pea gravel	8	78
Gravel, some pea gravel, 25% sand	18	96
Sand, fine, some gravel and clay	7	103
"Bedrock"	at	103
Casing perforated 62-93 ft.		

Material	Thick-ness (feet)	Depth (feet)
34/26-36D1. City of Omak. Dug by Marvin Henneman, 1968.		
Sand	7	7
Cobbles and gravel	8	15
Cobbles and gravel, water-bearing	14	29
Sand, fine	20	49
34/26-36E1. Omak Public Schools. Drilled by Thomas Well Drilling Co., December 1964.		
Topsoil	2	2
Boulders and gravel	24	26
"Hardpan"	6	32
Gravel	10	42
Gravel, water-bearing	15	57
Casing perforated 48-55 ft.		
34/26-36H1. Dorothy Jack. Drilled by Major Drilling Co., April 1965.		
Boulders and sand	21	21
Gravel	13	34
34/27-5N1. Frank Zabreznik. Drilled by Thomas Well Drilling Co., June 1963.		
Topsoil and gravel	5	5
Sand	5	10
Clay and "hardpan"	29	39
Gravel, water-bearing	7	46
Casing perforated 40-46 ft.		

TABLE C5.--Drillers' logs of wells--Continued

Material	Thick-ness (feet)	Depth (feet)
34/27-6F1. Hakon Braathen. Drilled by Thomas Well Drilling Co., August 1961.		
Topsoil and sand	10	10
Boulders and clay	10	20
Boulders and gravel, water-bearing	7	27
34/27-20B1. S. A. Orr. Drilled by Thomas, May 1957.		
Topsoil	1	1
Boulders	16	17
Sand	36	53
Sand, blue, water-bearing	15	68
Sand and gravel, water-bearing	13	81
Screen 75-81 ft.		
34/27-20P1. Benner Taylor. Dug, 1940.		
Topsoil and silt	12	12
Sand and gravel	40	52
Gravel	4	56
34/27-29P1. J. J. Hodgen. Drilled by R. E. Jones, July 1961.		
Topsoil	20	20
Clay, blue, soft, water-bearing	5	25
"Hardpan"	30	55
Clay, blue, soft, water-bearing	5	60
"Bedrock"	5	65
Crevices with water	3	68
"Bedrock"	12	80
Crevices with water	3	83
"Bedrock"	2	85

Material	Thick-ness (feet)	Depth (feet)
34/27-31F1. Agatha Brooks. Drilled by Major Drilling Co., April 1965.		
Sand	20	20
Gravel, medium	4	24
Clay, blue	37	61
Gravel, coarse, and sand	11	72
35/25-6M1. U.S. Forest Service. Drilled by Charlton Well Drilling Co., December 1964.		
Topsoil	5	5
"Hardpan"	25	30
Gravel, medium	20	50
Casing perforated 45-49 ft.		
35/25-8N1. Roland Berney. Drilled by Thomas Well Drilling Co., February 1963.		
Topsoil and gravel	5	5
Sand and boulders	15	20
Gravel	30	50
"Hardpan"	30	80
Gravel	35	115
Gravel, water-bearing	4	119
Sand, fine	18	137
Gravel, water-bearing	2	139
Gravel, compact, some water	33	172
Casing perforated 120-160 ft.		
35/25-23K1. W. W. Main. Drilled by M. K. Hansen, March 1946.		
Topsoil	57	57
"Hardpan"	3	60
Gravel, clean	10	70
"Hardpan"	1	71
Gravel (water-bearing)	10	81
Limestone ("bedrock")	at	81
Casing perforated 60-81 ft.		

TABLE C5.--Drillers' logs of wells--Continued

Material	Thickness (feet)	Depth (feet)
35/25-23K2. Robert French. Drilled by Jones.		
Topsoil and "hardpan"	25	25
Gravel, boulders, and clay	35	60
Gravel, coarse to medium, water-bearing	7	67
35/25-23Q1. Robert French. Drilled by Charlton Well Drilling Co.		
Topsoil	3	3
Gravel and clay	9	12
Clay	33	45
Sand, clay, water-bearing	5	50
Wood, decayed, some water	14	64
Clay	3	67
"Bedrock"	3	70
35/25-25H1. Richard Haeberle. Drilled by Thomas Well Drilling Co., September 1962.		
Topsoil and boulders	6	6
Boulders and sand	4	10
"Hardpan"	25	35
Gravel, compact, some water	4	39
Gravel, loose, water-bearing	6	45
"Bedrock"	1	46
Casing perforated 39-44 ft.		
35/25-25L1. Lawrence Cunningham. Drilled by Thomas, 1957.		
Clay and sand	20	20
Clay, sand, and gravel	58	78
"Hardpan"	3	81
Gravel (water-bearing)	2	83

Material	Thickness (feet)	Depth (feet)
35/26-3F1. Raleigh Stansbury. Dug by owner, November 1952.		
Topsoil	5	5
Clay	1	6
Sand	20	26
Clay	1	27
Sand and gravel (water-bearing)	55	82
35/26-13A1. Willard Fritz. Drilled by Thomas Well Drilling Co., April 1963.		
Topsoil and boulders	10	10
Gravel and sand	38	48
Sand, coarse, water-bearing	47	95
Sand, fine	at	95
Screen 90-95 ft.		
35/26-13G1. Vernon Lewis. Drilled by Thomas Well Drilling Co., October 1962.		
Topsoil, boulders, gravel	6	6
Gravel, and boulders	10	16
Gravel, and sand	24	40
Sand, coarse, water-bearing	21	61
Sand, fine, blue	2	63
35/26-23J1. L. A. Utt. Dug by Thomas Ward, October 1954.		
Sand and loose rocks	8	8
Clay, sandy, hard	4	12
Sand	32	44
Sand and gravel (water-bearing)	6	50

TABLE C5.--Drillers' logs of wells--Continued

Material	Thick-ness (feet)	Depth (feet)
35/26-25J1. Bain Crofoot. Drilled by Harry Hubbard, 1964.		
Topsoil	10	10
Clay and cobbles	6	16
Gravel	10	26
"Hardpan"	2	28
Gravel, water-bearing	1	29
Clay, blue	5	34
Clay, blue, and gravel	5	39
Sand, some gravel	5	44
Gravel, and brown sand	1	45
Gravel and sand	5	50
Gravel, coarse	4	54
Casing perforated 50-54 ft.		
35/27-7D1. Roland Sackman. Dug by Leese, 1950.		
Topsoil, sandy	4	4
Clay, silty	12	16
Gravel, coarse	14	30
36/26-13A1. E. L. Buchert. Drilled by Thomas Well Drilling Co., 1966.		
Topsoil	3	3
Sand	5	8
Sand and gravel	140	148
36/26-13K2. E. L. Buchert. Drilled by Thomas Well Drilling Co., 1967.		
Sand and gravel	95	95
Gravel, compact	35	130
Sand (water-bearing)	21	151
Sand and gravel (water-bearing)	21	172
Screen 164-172 ft.		
36/26-25M1. Fritz Williams. Drilled by Thomas Well Drilling Co., August 1967.		
Topsoil	2	2
Gravel and sand	26	28
Gravel and cobbles	42	70
"Hardpan"	40	110
Sand	49	159
Gravel	3	162
Sand, fine	17	179
Sand, coarse	13	192
Screen 181-192 ft.		
36/26-34P1. G. E. Scholz. Drilled by Hubbard Well Drilling Co.		
Topsoil	10	10
Sand and clay layers	20	30
Gravel and "rock"	11	41
Gravel, clay bound	9	50
Gravel	10	60
Mud, and dirty gravel	10	70
Gravel	20	90
Sand, some gravel	5	95
Gravel	6	101
Boulders and gravel	2	103
Gravel (water-bearing)	13	116
Casing perforated 101-115 ft.		

TABLE C5.--Drillers' logs of wells--Continued

Materials	Thickness (feet)	Depth (feet)
36/27-4J1. Okanogan Valley Wood Products, Inc. Drilled by Charlton Well Drilling Co.		
Topsoil, soft sandy clay	30	30
Clay, hard	2	32
Clay, soft	35	67
Clay, hard	39	106
Sand, water-bearing	4	110
Gravel, and sand (water-bearing)	6	116
Sand, fine	1	117
37/26-10H1. Loy McDaniel. Drilled by Thomas Well Drilling Co., 1962.		
Topsoil, gravel, rocks	2	2
Gravel, and rocks (no water)	76	78
Gravel, and rocks (water-bearing)	17	95
Unknown	6	101
Casing perforated 85-93 ft.		
37/26-23F1. F. L. Beeman. Drilled by Thomas Well Drilling Co., December 1961; deepened March 1967.		
Topsoil and sand	6	6
Clay	12	18
Boulders, gravel	22	40
Gravel, compact	14	54
Gravel, some binder, water-bearing	11	65
Gravel, large, water-bearing	7	72
Gravel, water-bearing	28	100
Casing perforated 90-100 ft.		
37/26-23K1. F. L. Beeman. Drilled by Ralph T. Furness, September 1955; deepened by Thomas Well Drilling Co., 1967.		
Topsoil and clay	10	10
Cobblestones and gravel	20	30
Clay	19	49
Gravel, medium to coarse, water-bearing	18	67
(continued)		
37/26-23K1.--Continued		
Gravel, water-bearing	23	90
Casing perforated 60-90 ft.		
37/26-25P1. John Yeckel. Drilled by Thomas Well Drilling Co., 1963.		
Topsoil	2	2
Gravel, and sand	33	35
Silt, blue (no water)	50	85
Sand, water-bearing	10	95
Gravel, water-bearing	10	105
Casing perforated 97-104 ft.		
37/26-26A1. Plateau Orchards, Inc. Drilled by Thomas Well Drilling Co., April 1961.		
Topsoil and sand	20	20
Boulders and sand	20	40
Gravel, loose	22	62
Sand and some gravel	10	72
"Hardpan," compact, blue, and clay	15	87
Gravel, loose (water-bearing)	4	91
Clay	2	93
Casing perforated 87-90 ft.		
37/26-36B1. Plateau Orchards, Inc. Drilled by Thomas Well Drilling Co., March 1963.		
Topsoil	3	3
Clay and gravel	10	13
Gravel	8	21
Clay, blue, and silt	121	142
"Hardpan"	1	143
Gravel, water-bearing	2	145
"Bedrock"	at	145

TABLE C5.--Drillers' logs of wells--Continued

Material	Thick-ness (feet)	Depth (feet)
37/26-36C1. Plateau Orchards, Inc. Drilled by Thomas Well Drilling Co., 1963.		
Clay, yellow	6	6
Boulders	2	8
Gravel, some water	1	9
Silt and clay, blue	138	147
"Bedrock"	at	147
37/26-36D1. Plateau Orchards, Inc. Drilled by Thomas Well Drilling Co., 1963.		
Topsoil	3	3
Clay, yellow	10	13
Gravel (no water)	8	21
Gravel and sand, water-bearing	35	56
37/26-36D2. Plateau Orchards, Inc. Drilled by Thomas Well Drilling Co., August 1966.		
Topsoil	2	2
Clay, yellow	10	12
"Hardpan"	6	18
Clay, blue, and rocks	18	36
Silt	20	56
Gravel, water-bearing	27	83
"Hardpan"	at	83
Casing perforated 65-81 ft.		
37/26-36F1. Dept. Nat. Resources. Drilled by Thomas Well Drilling Co., 1966.		
Topsoil	2	2
Gravel and boulders	8	10
Gravel and clay	30	40
Sand	10	50
Gravel	14	64
Casing perforated 60-64 ft.		
37/27-1A1. J. T. Fancher. Dug by Marvin Henneman, August 1959.		
Topsoil	4	4
Gravel and boulders	20	24
Gravel, water-bearing	12	36
37/27-3L1. J. M. Winslow. Drilled by Thomas Well Drilling Co., October 1966.		
Topsoil	4	4
Gravel and boulders	19	23
Sand	7	30
Silt	15	45
Sand	5	50
Silt and cobbles	35	85
Sand	13	98
Screen 88-98 ft.		
37/27-9R1. R. E. Colbert. Drilled by Thomas Well Drilling Co., February 1961.		
Topsoil and boulders	5	5
Sand	37	42
Sand and gravel, water-bearing	18	60
Gravel, water-bearing	5	65
37/27-12E1. R. M. Nixon. Dug, 1968.		
Silt and clay	4	4
Gravel	6	10
Clay	1	11
Gravel	1	12

TABLE C5.--Drillers' logs of wells--Continued

Material	Thick-ness (feet)	Depth (feet)
37/27-16C2. City of Tonasket. Drilled by Puget Drilling Co., March 1947.		
Muck, gravel, and clay	23	23
Sand, coarse, medium and large gravel	5	28
Sand and gravel, water-bearing	3	31
Peat, medium gravel, and coarse sand	7	38
Sand, and fine gravel	2	40
Sand, and medium and coarse gravel	8	48
Sand, white, and clay	20	68
Sand, gray, and some fine gravel, water-bearing	25	93
Clay and gravel, some sand	3	96
Clay, gray, little sand	34	130
Clay, trace of medium and coarse gravel	10	140
Clay, tightly cemented, fine sand, and medium and coarse gravel	5	145
Gravel, fine, and coarse sand	10	155
37/27-16L1. City of Tonasket. Drilled by Thomas, September 1960.		
Topsoil and boulders	19	19
"Hardpan" with clay	14	33
Gravel, water-bearing	13	46
Sand, fine, some water	4	50
Sand, coarse, and gravel, water-bearing	9	59
Sand, coarse, water-bearing	6	65
Casing perforated 33-46 ft; screen 53-65 ft.		
37/27-16L2. City of Tonasket. Drilled by Thomas Well Drilling Co., April 1966.		
Topsoil	3	3
Gravel, compact	13	16
Gravel, loose	9	25
Clay, yellow	19	44
Silt	11	55
Sand, coarse (water-bearing)	9	64
Sand, coarse, and gravel (water-bearing)	8	72

Material	Thick-ness (feet)	Depth (feet)
37/27-20K1. A. E. Pauley. Drilled by Thomas Well Drilling Co., February 1967.		
Topsoil	4	4
Clay and sand	13	17
Gravel, water-bearing	4	21
Clay	24	45
Gravel	7	52
Casing perforated 45-51 ft.		
37/27-29M1. Kenneth Clarkson. Drilled by Thomas Well Drilling Co., February 1965.		
Topsoil	3	3
Sand and gravel	9	12
"Hardpan"	14	26
Sand and gravel, water-bearing	11	37
Casing perforated 28-36 ft.		
37/28-32L1. E. L. Buchert. Drilled by Thomas Well Drilling Co., December 1965.		
Topsoil	2	2
Clay and silt	38	40
Sand, some gravel	4	44
Clay	12	56
"Hardpan"	7	63
Gravel, compact	13	76
"Hardpan"	34	110
Gravel, water-bearing	18	128
Casing perforated 115-126 ft.		

TABLE C5.--Drillers' logs of wells--Continued

Material	Thick-ness (feet)	Depth (feet)
37/28-32P1. Raymond Attwood. Drilled by Thomas Well Drilling Co., June 1966.		
Topsoil	5	5
Clay and silt	51	56
"Hardpan"	6	62
Clay, blue	6	68
"Hardpan", blue	44	112
Clay, hard, yellow	52	164
Gravel and sand, compact	12	176
Sand, fine	9	185
Sand, coarse	17	202
Screen 192-202 ft.		

Material	Thick-ness (feet)	Depth (feet)
37/28-32Q1. Raymond Attwood. Drilled by Thomas Well Drilling Co., January 1964.		
Topsoil	2	2
Sand and gravel	18	20
"Hardpan"	15	35
Clay	75	110
Silt	33	143
Sand and gravel, water-bearing	22	165
Casing perforated 146-163 ft.		

Material	Thick-ness (feet)	Depth (feet)
38/25-23A2. Dept. Nat. Resources. Drilled by Harry Hubbard and Sons, October 1967.		
Topsoil	16	16
"Hardpan"	4	20
Sand	12	32
"Hardpan"	10	42
Clay, mud and sand	3	45
Sand	2	47
Sand, gravel, and clay binder	5	52
Sand, brown, and clay	41	93
Sand	5	98
Sand, brown, very little water	5	103
Sand and small gravel	3	106
Gravel, water-bearing	4	110

Material	Thick-ness (feet)	Depth (feet)
38/26-11F1. U.S. Bur. Reclamation. Drilled, June 1966.		
Gravel and sand	36	36
Sand and gravel	53	89
Sand, fine to coarse, with a few pebbles	26	115
Sand and silt, with a little small gravel	10	125
Sand, fine to medium	16	141
Silt and sand, limy, with a few pebbles	15	156

Material	Thick-ness (feet)	Depth (feet)
38/27-10N1. W. G. Hallauer. Drilled by Don Peterson.		
Sand, medium	123	123
Silt, fine	50	173
Silt, hard	117	290
Sand, medium, and some water	42	332
Sand, fine	8	340
Gravel, fine	15	355
Gravel, coarse (water-bearing)	17	372
Casing perforated 345-365 ft.		

TABLE C5.--Drillers' logs of wells--Continued

Material	Thick-ness (feet)	Depth (feet)
38/27-16M1. R. F. Taplett. Drilled by Don Peterson.		
Topsoil	3	3
Boulders	22	25
Sand	15	40
Gravel	9	49
Sand, coarse	5	54
"Hardpan"	16	70
Gravel	2	72
"Hardpan"	52	124
Sand and gravel (water-bearing)	11	135
Sand, light, and gravel (water-bearing)	20	155
Casing perforated 44-50, 134-150 ft..		
38/27-16M2. R. F. Taplett. Dug by Frank Hunter, 1955.		
Glacial till	16	16
Gravel, water-bearing	7	23
Gravel, cemented	at	23
38/27-16P2. R. F. Taplett. Dug by Frank Hunter, 1959.		
Topsoil	6	6
Sand and clay	4	10
Sand and gravel	11	21
38/27-16Q1. Duane Luhn. Dug by Marvin Henneman, 1965.		
Topsoil	6	6
Gravel	6	12
Gravel, water-bearing	12	24

Material	Thick-ness (feet)	Depth (feet)
38/27-17R1. R. F. Taplett. Drilled by Don Peterson.		
Topsoil	3	3
Gravel and clay, with boulders	25	28
Sand	65	93
Sand and gravel	107	200
Sand	14	214
Sand, coarse, blue	6	220
Gravel	3	223
Sand, blue, and gravel	5	228
Sand, coarse	14	242
"Hardpan" into rock	33	275
Casing perforated 225-250 ft.		
38/27-32N1. Victor Lesamiz, Jr. Drilled, June 1955.		
Topsoil, sand, and gravel	22	22
Gravel, water-bearing	2	24
"Hardpan"	63	87
Gravel, sand, and "rock," water-bearing	30	117
"Hardpan" or "rock"?	13	130
Casing perforated 22-24, 87-117 ft.		
39/25-4B1. Dept. Nat. Resources. Drilled by Jack's Well Drilling Co., September 1967.		
Topsoil	2	2
Till	6	8
"Hardpan"	3	11
Sand and gravel in clay	14	25
Clay and gravel	6	31
Clay	23	54
Clay and gravel (little water)	4	58
Clay	6	64
Gravel and clay	8	72
Gravel and clay, water-bearing	10	82
Clay, loose	7	89
Gravel and sand (water-bearing)	2	91
"Rock" (probably bedrock)	2	93
Casing perforated 70-82 ft.		

TABLE C5.--Drillers' logs of wells--Continued

Material	Thick-ness (feet)	Depth (feet)
39/25-24K1. Ed. Rowlands. Dug by Marvin Henneman, 1946.		
Topsoil	4	4
Sand	10	14
Gravel, water-bearing	4	18
39/25-26G1. C. H. Badgley. Drilled by Jones Well Drilling Co., June 1956.		
Sand and clay	80	80
Sand and gravel	20	100
Sand	60	160
Gravel (water-bearing)	10	170
39/26-7H1. Palmer Lake Land Co. Drilled by Ralph T. Furness, July 1947.		
Topsoil	12	12
Clay and gravel	13	25
Sand, fine, and gravel	35	60
Sand	10	70
Gravel, medium to coarse (water-bearing)	15	85
Screen 72-85 ft.		
39/26-36P1. Dept. Nat. Resources. Dug by Jack Finsen, September 1965.		
Silt, black	1	1
Silt, white, ashlike	7	8
Gravel, fine	7	15
Boulders	1	16

Material	Thick-ness (feet)	Depth (feet)
39/27-5R1. T. A. Thorndike. Drilled by Charlton Well Drilling Co., June 1965.		
Topsoil and silt	14	14
Sand	26	40
Sand, and pea gravel	20	60
Sand, and coarse gravel	50	110
Casing perforated 60-110 ft.		
40/25-12Q1. J. A. Lenton. Drilled by Thomas Well Drilling Co., May 1969.		
Topsoil	3	3
Sand and gravel	17	20
"Hardpan"	14	34
Gravel and sand, water-bearing	4	38
Clay	2	40
Gravel and sand, water-bearing	5	45
Clay	11	56
Gravel and sand, water-bearing	3	59
Clay	at	59
Casing perforated 34-38, 40-45, 56-59 ft.		
40/25-21K1. Stoddard and Wendle. Dug by Marvin Henneman.		
Topsoil	2	2
Sand, fine	15	17
Clay	1	18
Gravel (water-bearing)	8	26
Casing perforated 18-26 ft.		
40/27-10R1. D. A. Thorndike. Dug by Peterson, 1954.		
Sand, fine	20	20
Quicksand	7	27
Gravel, water-bearing	15	42

TABLE C5.--Drillers' logs of wells--Continued

Material	Thick-ness (feet)	Depth (feet)
40/27-12P1. Charles Eder. Drilled by Thomas Well Drilling Co.; deepened 1968.		
Topsoil	18	18
Gravel	12	30
Clay	10	40
Clay and gravel	13	53
Clay and boulders	47	100
Gravel, some water	10	110
Clay	6	116
Gravel, water-bearing	16	132
Clay and silt	19	151
Sand and gravel, compacted (water-bearing)	7	158
Gravel	9	167
Silt	7	174
Gravel (water-bearing)	9	183
Casing perforated 122-132, 153-167, 175-180 ft.		
40/27-15C1. Gordon Sylvester. Dug by Melvin Henneman, October 1968.		
Topsoil	4	4
Sand, and cobbles	28	32
Gravel, coarse, water-bearing	14	46
40/27-27J1. Donald Thorndike. Dug by owner, 1957.		
Silt	10	10
Sand	25	35
Gravel (water-bearing)	7	42
Clay	at	42

TABLE C6.--Discharge measurements made at miscellaneous sites in the Okanogan River basin

Stream	Tributary to	Location	Drainage area (sq mi)	Date	Discharge (cfs)
Tonasket Creek	Okanogan River	NW¼NW¼ sec.26, T.40 N., R.27 E., 1¼ miles above mouth, 1 mile northeast of Oroville.	60.0	4-12-50	484
Do.	do.	NW¼ sec.27, T.40 N., R.27 E., 200 ft above mouth at Oroville.	60.2	5-21-46	2.25
Okanogan River	Columbia River	SE¼SW¼ sec.27, T.40 N., R.27 E., at gaging station "at Oroville."	[a]3,210	9-10-14	550
				5-25-15	1,470
				6- 1	1,490
				8- 7	872
				10-24	508
				6- 1-16	1,120
				6-11	1,250
				8- 5	1,110
				10-24	411
				2- 7-17	242
				3- 6	248
				5-13-19	630
				9- 4-20	307
				10- 5	219
				9-30-26	43.6
				4-27-39	627
Sinlahekin Creek	Palmer Lake	NE¼ sec.20, T.37 N., R.25 E., at gaging station "above Blue Lake near Loomis."	41.7	11- 3-30	1.35
Do.	do.	NE¼NW¼ sec.21, T.37 N., R.25 E., at gaging station "at Blue Lake near Loomis."	42.9	6- 4-20	3.61
				5-19-29	9.89
Do.	do.	NE¼ sec.21, T.37 N., R.25 E., 1,000 ft above flowage line of Blue Lake Reservoir.	--	6- 8-28	14.0
Barnes and Wilder ditches	Sinlahekin Creek	Sec.22, T.37 N., R.25 E., at head at Blue Lake near Loomis.	--	6- 4-20	3.95
				6- 8	3.55
				6- 9	3.56
Sinlahekin Creek	Palmer Lake	NE¼ sec.3, T.37 N., R.25 E., at gaging station "at twin bridges near Loomis."	75.5	6- 4-20	3.75
				6- 8	6.71
				6- 9	6.05
				10- 6	2.13
				10-12-22	6.2
				10-12	5.8
Do.	do.	NE¼NE¼ sec.23, T.38 N., R.25 E., at gaging station "near Loomis."	86.6	5-26-58	173
				7- 5	34.4
				7-27	22.4
				8-27	15.8
				9-27	15.2
				10-23	15.9
Do.	do.	SW¼NW¼ sec.13, T.38 N., R.25 E., 2 miles south of Loomis.	88.3	2-24-58	13.2
				3-30	14.5
				5- 3	56.8
Do.	do.	SW¼ sec.12, T.38 N., R.25 E., 1.6 miles south of Loomis.	112	5-28-48	2,020
Do.	do.	SW¼ sec.1, T.38 N., R.25 E., at syphon crossing near Loomis.	115	5-17-21	349

TABLE C6.--Discharge measurements made at miscellaneous sites in the Okanogan River basin--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Date	Discharge (cfs)
Middle Fork Toats Coulee Creek	South Fork Toats Coulee Creek	SE¼SW¼ sec.13, T.39 N., R.23 E., at Middle Fork bridge, 12 miles northwest of Loomis.	17.1	5-25-58	138
				7- 5	15.6
				7-27	5.20
				8-26	1.15
				9-26	1.72
				10-22	3.81
				5-11-59	41.2
				6-18	103
				8-17-65	2.86
				5-11-66	35.6
				6-23	15.4
				6- 7-67	181
				6-17	94.3
				9- 9	.81
				2-21-68	.26
				5-15	21.2
				6- 3	82.2
North Fork Toats Coulee Creek	Toats Coulee Creek	SE¼NW¼ sec.24, T.39 N., R.24 E., at North Fork bridge, 6½ miles northwest of Loomis.	48.6	3-28-58	5.79
				5- 2	30.6
				5-25	201
				7- 5	22.3
				7-27	6.97
				8-26	4.34
				9-26	5.14
				10-22	3.81
				5-11-59	41.2
				6-18	103
				9- 9-67	2.91
Do.	do.	NE¼SE¼ sec.30, T.39 N., R.25 E., 300 ft above confluence with South Fork and 5 miles northwest of Loomis.	52.3	3-28-58	4.63
Toats Coulee Creek	Sinlahekin Creek	NE¼SE¼ sec.33, T.39 N., R.25 E., just above Deer Creek at gaging station "near Loomis."	130	4-22-57	17.5
Do.	do.	NW¼SW¼ sec.34, T.39 N., R.25 E., 20 ft below concrete bridge and just below Deer Creek.	132	9-14-51	20.7
Do.	do.	SW¼ sec.34, T.39 N., R.25 E., just below Deer Creek at gaging station "near Loomis."	134	10- 1-26	6.37
				10- 3-47	7.70
Do.	do.	SW¼ sec.34, T.39 N., R.25 E., 50 ft above Whitestone Irrigation District diversion dam, 2½ miles northwest of Loomis.	--	9-14-51	22.0
Do.	do.	SE¼ sec.34, T.39 N., R.25 E., 5,000 ft below gaging station, and 1½ miles northwest of Loomis.	134	5- -48	6,010
Whitestone Irrigation District diversion	Diverts from Toats Coulee Creek	SW¼ sec.34, T.39 N., R.25 E., 100 ft below inlet.	--	7-31-20	3.45
				5- 6-25	55.4
				5- 8	42.8
				5-23	22.8
				7- 8	5.35
				10- 3-47	5.53
				9-14-51	18.1
Whitestone irrigation ditch	Diverts from Spectacle Lake	SW¼SW¼ sec.1, T.38 N., R.26 E., 100 ft below tunnel at Enterprise.	--	10- 3-47	12.9
Do.	do.	SW¼SW¼ sec.1, T.38 N., R.26 E., 500 ft below tunnel at Enterprise.	--	10- 3-47	13.6

TABLE C6.--Discharge measurements made at miscellaneous sites in the Okanogan River basin--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Date	Discharge (cfs)
Whitestone Irrigation District diversion	Diverts from Spectacle Lake	SW¼SW¼ sec.1, T.38 N., R.26 E., 50 ft above road crossing, and 5 miles east of Loomis.	--	10- 3-47	13.5
Do.	do.	SW¼ sec.1, T.38 N., R.26 E., at middle of big loop, 5¼ miles east of Loomis.	--	10- 3-47	13.0
Do.	do.	NE¼NW¼ sec.12, T.38 N., R.26 E., 50 ft below road crossing, and 5½ miles east of Loomis.	--	10- 3-47	13.9
Do.	do.	NE¼NE¼ sec.12, T.38 N., R.26 E., at end of concrete lining, 5¾ miles east of Loomis.	--	10- 3-47	12.8
Sinlahekin Creek	Palmer Lake	On line between secs. 15 and 16, T.37 N., R.25 E., at county road crossing, 8½ miles southwest of Loomis.	--	9- 9-67	2.95
Do.	do.	SE¼NE¼ sec.26, T.39 N., R.25 E., at gaging station "above Chopaka Creek near Loomis."	256	6-29-29	5.42
				4-25-30	8.10
				9- 9-67	13.8
Chopaka Creek	Sinlahekin Creek	NW¼NW¼ sec.10, T.39 N., R.25 E., ½ mile below outlet of Chopaka Lake, 6 miles northwest of Loomis.	2.13	5- 6-21	1.47
Sinlahekin Creek	Palmer Lake	NE¼ sec.24, T.39 N., R.25 E., about 1 mile above Palmer Lake	276	8-11-31	.81
Do.	do.	SW¼ sec.13, T.39 N., R.25 E., 1,000 ft above Palmer Lake	--	9-19-32	1.97
Palmer Creek	Similkameen River	NE¼ sec.35, T.40 N., R.25 E., at bridge ½ mile above mouth near Nighthawk	296	8-24-29	13.7
				4-24-30	*652
				6- 9-31	109
				7-16	65.4
				8-11	16.2
				6-14-32	*588
				6-24	347
				9-19	5.05
				6- 5-33	*536
				3-22-34	*176
				5-11	242
				5-24	0
				10- 8	Trace
				2- 2-35	352
				3-14	52.9
				6- 1	86.3
				6-19	558
				10-18	13.3
				6-11-36	509
				2-16-37	18.5
				5-31	216
				6- 2	*815
				7- 3	561
				11-23	52.2
				1-19-38	35.9
				2- 8	59.0
				5-14	*219
				6-23	141
				1-13-39	41.6
				4-24	*369
				5-23	428
				7- 8	217
				8-16	31.7
				12- 5	*61.3
				4-29-40	*101
				5-16	0
				6- 6	385
				8- 1	19.1

TABLE C6.--Discharge measurements made at miscellaneous sites in the Okanogan River basin--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Date	Discharge (cfs)
Palmer Creek (continued)				8-30-40	6.17
				9-26	3.70
				10-21	*22.8
				1-13-41	30.6
				3-15	28.3
				5- 6	520
				5-22	352
				8-13	60.2
				9-22	67.9
				12- 2	76.5
				3-19-42	57.0
				5- 1	311
				7-20	228
				9-22	32.8
				12-11	44.0
				4-12-43	*32.8
				6- 5	433
				7-12	291
				10- 1	26.8
				10-31-61	.16
Similkameen River	Okanogan River	NE¼NW¼ sec.7, T.40 N., R.26 E., at gaging station "near Nighthawk."	a/3,550	10-25-15	664
				1-27-16	395
				5-30	9,960
				6-10	12,700
				8- 4	2,610
Oroville-Tonasket Irrigation District Canal	Diverts from Similkameen River	NE¼NE¼ sec.7, T.40 N., R.26 E., 400 ft below intake 2 miles northeast of Nighthawk.	--	5-30-16	93.6
				6-10	96.3
				8- 4	61.1
				7-13-17	109
				5-12-19	106
Do.	do.	SW¼SE¼ sec.5, T.40 N., R.26 E., ¼ mile below intake, 1¼ miles northeast of Nighthawk.	--	8-31-25	154
Do.	do.	NE¼ sec.13, T.40 N., R.26 E., opposite gage on Similkameen River near Oroville.	--	8-19-19	114
				9- 5-20	116
				4- 4-27	22.9
Do.	do.	SW¼NW¼ sec.20, T.40 N., R.27 E., at gage "near Oroville."	--	6-24-18	111
				4-25-21	42.5
				4-28-30	131
				6-10	139
				8- 2-35	158
				9-27	154
				10- 4-39	161
				10- 1-40	147
				5-12-41	147
				7- 7	177
				8-25	183
				7-30-43	190
				8- 5-44	179
Similkameen River	Okanogan River	NE¼SW¼ sec.28, T.40 N., R.27 E., at county bridge at Oroville (measuring point for gage "near Oroville").	a/3,580	12-26-29	311
				4-28-30	6,090
				5- 2	5,000
				6-10	6,970
				8- 2-35	1,800
				9-27	381
				8-12-37	682
				10- 4-39	120
				10- 1-40	121
				7-30-43	1,980
				8- 5-44	660
Whitestone Creek	do.	SE¼SW¼ sec.17, T.38 N., R.27 E., 600 ft below Whitestone Lake and 3 miles east of Ellisford.	--	8-11-59	3.97

TABLE C6.--Discharge measurements made at miscellaneous sites in the Okanogan River basin--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Date	Discharge (cfs)
Havillah Creek	Antoine Creek	SE¼ sec.29, T.39 N., R.29 E., 0.2 mile east of county road, and 1½ miles above Havillah.	1.33	7-18-59	1,080
Siwash Creek	Okanogan River	NE¼ sec.16, T.37 N., R.27 E., at Tonasket.	48.1	11-13-11	0
Bonaparte Creek	do.	SE¼ sec.32, T.37 N., R.29 E., at county road crossing, 1,000 ft above Peony Creek, and 4 miles east of Anglin.	65.3	9- 8-67	.04
Do.	do.	SE¼ sec.35, T.37 N., R.28 E., at gage "near Anglin."	110	9- 9-20 5-25-21 9-22-58	.12 22.4 11.4
Do.	do.	SW¼ sec.16, T.37 N., R.27 E., at mouth at Tonasket.	148	5-27-12	.78
Aeneas Creek	do.	NE¼ sec.36, T.37 N., R.26 E., at road crossing 4 miles southwest of Tonasket.	14.2	11-15-54 10-26-55	3.3 26.9
Do.	do.	SE¼ sec.31, T.37 N., R.27 E., at county bridge 3½ miles southwest of Tonasket.	--	9- 8-67	1.44
Tunk Creek	do.	SE¼ sec.3, T.35 N., R.27 E., 5 miles northeast of Riverside.	68.0	5-11-11	12.5
Omak Creek	do.	NE¼SE¼ sec.6, T.33 N., R.27 E., at county bridge and 2.0 miles southeast of Okanogan.	--	9-11-67	4.80
Okanogan River	Columbia River	NW¼ sec.16, T.33 N., R.26 E., at gaging station "at Okanogan."	[a]/7,880	9-30-26	355
Salmon Creek	Okanogan River	SE¼ sec.25, T.36 N., R.24 E., at old ford 1.8 miles north of Conconully.	--	5-28-48	3,020
Do.	do.	Near center sec.18, T.35 N., R.25 E., at gaging station "near Conconully."	121	10- 2-22 10- 2 5-28-48	5.2 5.1 782
Do.	do.	SW¼ sec.5, T.33 N., R.26 E., at county bridge 2½ miles above mouth, 1½ miles northwest of Okanogan.	151	6- 2-48	478
Do.	do.	NE¼ sec.17, T.33 N., R.26 E., at Okanogan.	153	5-30-48	735
Loup Loup Flume	Diverts from Loup Loup Creek.	NW¼ sec.12, T.33 N., R.24 E., 10 miles from Malott.	--	5- 7-11	11.4
Loup Loup Creek	Okanogan River	Sec.32, T.33 N., R.25 E., at weirs 3 miles above mouth near Malott.	60.6	5- 7-11	3.41
Chiliwist Creek	do.	Near center sec.14, T.32 N., R.24 E.	--	9-30-69 10- 9 10-21 11- 7 1-14-70	.55 .59 .59 .59 .59

TABLE C6.--Discharge measurements made at miscellaneous sites in the Okanogan River basin--Continued

Stream	Tributary to	Location	Drainage area (sq mi)	Date	Discharge (cfs)
Chiliwist Creek	Okanogan River	SE¼NE¼ sec.14, T.32 N., R.24 E.	--	5-17-68	0.57
				8-30	.35
				5-21-69	.35
				7-28	.65
				8-18	.55
				9-18	.69
				9-30	.65
				10- 9	.74
				10-21	.74
				11- 7	.74
				1-14-70	.79
Do.	do.	NE¼SW¼ sec.13, T.32 N., R.24 E.	--	5-21-69	.60
				9-30	.74
				10- 9	.74
				10-21	1.05
				11- 7	1.11
				1-14-70	1.16
Do.	do.	SW¼ sec.18, T.32 N., R.25 E.	--	5-21-69	.40
Do.	do.	SE¼SE¼ sec.18, T.32 N., R.25 E., at highway crossing 2 miles southwest of Malott.	--	3- 5-61	2.64
				4- 6	3.66
				11- 3	3.30
				11- 7-69	.75
Okanogan River	Columbia River	SE¼ sec.34, T.31 N., R.25 E., at bridge at Monse.	a/ 8,320	9-24-57	996
				11-14	1,210
				12-13	1,360
				1-24-58	1,360
Do.	do.	NW¼ sec.16, T.30 N., R.25 E., at crossing of U.S. Highway 97, 1 mile above mouth.	a/ 8,340	3-11-55	1,800
				11- 4	2,290
				3-16-56	1,800
				4-25	9,300
				5-23	27,400
				7-24	4,010
				8- 6	2,330
				9-13	1,140
				10-17	1,480
				4-23	2,250
				6-23	4,940
				7-20	2,540
				8-23	1,130
				7-15-63	4,220
				9-17	1,410

Note: Flow on days indicated by asterisk (*) was from Similkameen River to Palmer Lake; on days not so indicated the flow was from Palmer Lake to Similkameen River.

a/ Approximately.

TABLE C7.--Yearly maximum discharges at crest-stage stations in the Okanogan River basin

Year	Dry Creek tributary near Molson (12439200)		Middle Fork Toats Coulee Creek near Loomis (12441700)		Olie Creek near Loomis (12441800)		Spectacle Lake tributary near Loomis (12443700)		Siwash Creek tributary near Tonasket (12444400)		Omak Creek tributary near Disautel (12445800)		Okanogan River tributary at Malott (12447100)	
	Date	Discharge (cfs)	Date	Discharge (cfs)	Date	Discharge (cfs)	Date	Discharge (cfs)	Date	Discharge (cfs)	Date	Discharge (cfs)	Date	Discharge (cfs)
1956											4-22	6.0		
1957									2-27	29	5-20	9.0		
1958	--	29							--	--	5-20	4.7		
1959	4- 1	26							1- 9	52	5-15	6	1- 9	50
1960	3-21	43							--	9	--	--	3 --	13
1961	--	[e]1			--	[1/]D	--	<1	--	9	--	10	2 --	<10
1962	--	<1			--	<1	--	D	--	D	--	13	--	D
1963	3-30	47			--	8	--	44	--	D	3-30	12	--	D
1964	4-21	[e]1			8-18	3	8-29	51	8-18	7.6	4-22	3	--	D
1965	5-12	6	6-11	200	--	D	9-10	[e]10	--	D	--	[e]1	--	D
1966	4- 1	9	5- 6	65	--	D	--	D	--	D	3-29	12	--	D
1967	5-10	9	6-21	434	--	D	1-29	<1	1-29	11	1-29	5	1-29	3
1968	2-21	<1	5-20	345	--	D	--	D	2- 3	18	2-21	5	2-21	1.8
1969	4-23	5	5-23	171	--	D	--	D	4-23	5	4-23	4	4-23	.5

[1/]D, indicates dry or no evidence of flow.

[e/]Estimated.

TABLE C8

Computer printout of water-level measurements in observation wells. All depths are in feet below land surface.

Explanation

A - Well being pumped.
B - Well pumped recently.
C - Nearby well being pumped.
D - Well dry.
J - Water being injected into well.

33N25E01P01 VERNON HARTNESS

ALTITUDE OF LAND SURFACE 1325.00 FEET.

HIGHEST WATER LEVEL 9.54 BELOW LSD, APR. 28, 1959,
LOWEST WATER LEVEL 32.58 BELOW LSD, AUG. 31, 1970.
RECORDS AVAILABLE 1955-70.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
SEP. 20, 1955	24.78	MAR. 30, 1960	11.87	FEB. 23, 1965	19.00	DEC. 8, 1967	22.43
OCT. 26	21.24	MAY 26	12.25	APR. 6	15.78	JAN. 17, 1968	18.65
DEC. 21	15.33	JULY 21	22.42C	MAY 17	17.85A	FEB. 28	14.84
FEB. 24, 1956	15.52	SEP. 27	23.52C	JUNE 19	25.46	APR. 8	14.79
APR. 26	12.19	NOV. 28	17.31	OCT. 27	25.30	MAY 21	18.76
AUG. 21	20.98A	JAN. 23, 1961	15.06	DEC. 9	21.60	JUNE 26	29.76
OCT. 27	14.38	MAR. 27	13.47	JAN. 19, 1966	18.30	OCT. 30	24.99
DEC. 14	13.77	JULY 24	18.48	MAR. 2	16.27	DEC. 12	21.88
FEB. 21, 1957	14.40	SEP. 28	22.63A	APR. 7	14.50	FEB. 19, 1969	18.58
APR. 24	11.26	NOV. 28	16.34	MAY 18	21.78A	MAR. 28	15.00
JUNE 21	11.61A	JAN. 30, 1962	14.83	JUNE 25	21.94A	MAY 8	12.02
AUG. 26	21.62A	MAR. 28	14.79	JULY 20	28.50	JUNE 12	15.31
OCT. 27	12.29	MAY 28	18.61	OCT. 4	24.50	JULY 18	21.84A
DEC. 19	15.43	JULY 24	25.44C	NOV. 3	22.20	AUG. 27	28.19A
FEB. 26, 1958	13.55	SEP. 21	25.01C	DEC. 15	18.80	OCT. 9	25.30
JUNE 28	12.41	NOV. 28	19.85	JAN. 19, 1967	16.46	NOV. 20	22.03
AUG. 26	22.10	JAN. 25, 1963	16.32	FEB. 28	15.05	JAN. 8, 1970	17.43
OCT. 19	16.72	MAR. 29	15.45	APR. 14	15.24	FEB. 27	14.02
DEC. 20	13.51	SEP. 24	24.20C	MAY 17	15.22	APR. 2	14.38
APR. 28, 1959	9.54	NOV. 18	19.25	JUNE 26	19.45A	MAY 14	15.20A
JUNE 27	13.77A	JAN. 21, 1964	15.39	JULY 27	24.48	JULY 23	32.44A
AUG. 29	23.41A	MAR. 26	14.83	AUG. 31	30.20A	AUG. 31	32.58A
NOV. 1	14.31	MAR. 27	14.83	OCT. 2	31.40A	OCT. 29	25.98
DEC. 1	13.61	DEC. 17	22.77	NOV. 9	24.20	DEC. 3	16.58
JAN. 26, 1960	14.14	JAN. 12, 1965	21.79				

33N25E12F01 CP SHELL

ALTITUDE OF LAND SURFACE 1330.00 FEET.

HIGHEST WATER LEVEL 3.23 BELOW LSD, APR. 28, 1959,
LOWEST WATER LEVEL 21.73 BELOW LSD, SEP. 24, 1963.
RECORDS AVAILABLE 1955-63.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
SEP. 20, 1955	16.72	OCT. 27, 1957	12.30A	DEC. 1, 1959	4.32	JAN. 30, 1962	4.60
OCT. 26	12.09	DEC. 19	5.48	JAN. 26, 1960	4.40	MAR. 28	4.71
DEC. 21	8.17	FEB. 26, 1958	4.22	MAR. 30	3.67	MAY 28	7.98
FEB. 24, 1956	7.00	JUNE 28	7.70A	MAY 26	3.56	JULY 24	19.40A
APR. 26	4.35	AUG. 26	14.46	JULY 21	18.37A	SEP. 21	17.26C
JUNE 25	6.72A	OCT. 19	10.38A	SEP. 27	18.40A	NOV. 28	10.00C
AUG. 21	17.97A	DEC. 20	4.36	NOV. 28	8.41	JAN. 25, 1963	6.01
OCT. 27	8.91	MAR. 2, 1959	4.46	JAN. 23, 1961	4.97	MAR. 29	4.96
DEC. 14	5.13	APR. 28	3.23	MAR. 27	4.23	MAY 30	5.71C
FEB. 21, 1957	6.03	JUNE 27	6.25A	JULY 24	11.82A	JULY 23	15.06
APR. 24	4.09	AUG. 29	20.05A	SEP. 28	12.59C	SEP. 24	21.73C
JUNE 21	5.84	NOV. 1	5.02	NOV. 28	6.23	NOV. 18	10.24C
AUG. 26	17.94A						

33N25E12F02 CP SHELL

ALTITUDE OF LAND SURFACE 1330.00 FEET.

HIGHEST WATER LEVEL 3.14 BELOW LSD, APR. 28, 1958,
DRY, WATER LEVEL NOT MEASUREABLE, SEP. 12, 1965, AUG. 31, 1967, OCT. 2, 1967.
RECORDS AVAILABLE 1955-68.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT. 26, 1955	16.12	JUNE 27, 1959	9.70C	JULY 24, 1962	22.99C	APR. 7, 1966	9.10
APR. 26, 1956	7.60	AUG. 29	21.61C	SEP. 27	21.92C	MAY 18	20.06
JUNE 25	8.83C	NOV. 1	9.42	NOV. 28	14.61C	OCT. 4	30.23
AUG. 21	18.10C	DEC. 1	8.71	JAN. 25, 1963	10.59	NOV. 3	18.13
OCT. 27	9.44	JAN. 26, 1960	8.84	MAR. 29	9.52	DEC. 15	13.22
DEC. 14	8.70	MAR. 30	7.96	MAY 30	10.24C	JAN. 19, 1967	10.66
APR. 24, 1957	8.27	MAY 26	7.95	JULY 23	19.71	FEB. 28	9.22
JUNE 21	8.58C	JULY 21	20.62C	SEP. 24	25.62C	APR. 14	9.38
AUG. 26	18.98C	SEP. 27	22.11C	NOV. 18	14.05C	MAY 17	9.39
OCT. 27	16.42C	NOV. 28	12.90	JAN. 21, 1964	9.61	JUNE 26	12.85
DEC. 19	9.97	JAN. 23, 1961	9.46	MAR. 26	9.16	JULY 27	26.17C
FEB. 26, 1958	8.75	MAR. 27	8.65	MAY 19	14.93C	AUG. 31	D
APR. 28	3.14	JULY 24	14.97C	FEB. 24, 1965	9.99	OCT. 2	D
JUNE 28	9.89C	SEP. 28	17.20C	SEP. 12	D	NOV. 9	25.12
AUG. 26	19.63	NOV. 28	10.76	OCT. 27	29.65	DEC. 8	17.42
OCT. 19	12.77C	JAN. 30, 1962	9.21	DEC. 9	16.59	JAN. 17, 1968	12.12
DEC. 20	8.73C	MAR. 28	9.22	JAN. 19, 1966	12.70	FEB. 28	9.09
MAR. 2, 1959	8.97	MAY 28	12.54	MAR. 2	10.46	APR. 8	9.00
APR. 28	7.22						

33N25E12F03 FLETCHER BROS

ALTITUDE OF LAND SURFACE 1320.00 FEET.

HIGHEST WATER LEVEL 4.38 BELOW LSD, APR. 8, 1968,
LOWEST WATER LEVEL 40.00 BELOW LSD, JULY 20, 1966.
RECORDS AVAILABLE 1964-69.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN. 21, 1964	5.80	DEC. 9, 1965	11.93	NOV. 3, 1966	13.45	AUG. 31, 1967	38.45A
MAR. 26	5.33	JAN. 19, 1966	8.00	DEC. 15	8.55	OCT. 2	39.00A
MAY 19	11.91A	MAR. 2	5.81	JAN. 19, 1967	6.03	NOV. 9	20.40
JULY 29	39.05A	APR. 7	4.44	FEB. 28	4.68	DEC. 8	12.75
MAY 18, 1965	8.88	MAY 18	17.90A	APR. 14	4.76	JAN. 17, 1968	7.50
JUNE 19	26.45A	JUNE 25	38.17A	MAY 17	4.73	FEB. 28	4.46
AUG. 2	28.56	JULY 20	40.00	JUNE 26	8.20	APR. 8	4.38
SEP. 12	39.00A	SEP. 1	33.20	JULY 27	23.20A	OCT. 17, 1969	19.90
OCT. 27	24.45	OCT. 4	25.14				

34N26E26Q01 CITY OF OMAK

ALTITUDE OF LAND SURFACE 835.00 FEET.

HIGHEST WATER LEVEL 0.74 BELOW LSD, JUNE 6, 1948,

RECORDS AVAILABLE 1939-70.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN. 24, 1939	15.22	JAN. 10, 1944	14.71	AUG. 1, 1946	12.37	JUNE 11, 1949	9.06
JUNE 9	23.83A	JAN. 17	14.80	AUG. 10	13.61	JUNE 25	11.50
SEP. 19	25.41A	FEB. 1	15.00	SEP. 31	13.86	JULY 2	12.55
DEC. 13	14.37	FEB. 15	14.98	OCT. 7	13.85	JULY 16	12.69
MAY 9, 1940	25.43A	MAR. 2	14.97	OCT. 21	13.85	JULY 30	13.48
OCT. 9	15.48	MAR. 16	15.03	NOV. 9	13.76	AUG. 13	13.69
DEC. 30	22.27A	APR. 1	15.20	NOV. 16	13.90	AUG. 27	13.87
MAR. 24, 1941	14.53	APR. 15	14.90	DEC. 7	13.84	SEP. 10	13.93
JUNE 7	13.79	JUNE 2	10.60	DEC. 21	13.87	SEP. 24	13.71
AUG. 5	26.07A	JUNE 19	10.90	JAN. 4, 1947	13.70	OCT. 8	13.81
OCT. 6	13.82	JULY 7	12.70	JAN. 18	13.32	OCT. 22	13.75
DEC. 4	13.80	JULY 19	13.05	FEB. 1	13.94	NOV. 5	13.70
DEC. 17	13.72	AUG. 7	14.35	FEB. 15	13.70	NOV. 19	13.50
JAN. 3, 1942	14.19	AUG. 22	14.49	MAR. 2	14.16	DEC. 3	12.20
JAN. 15	12.61	SEP. 1	14.56	MAR. 15	14.30	DEC. 17	12.18
FEB. 1	13.04	SEP. 15	14.56	APR. 5	13.76	JAN. 1, 1950	11.75
FEB. 16	13.98	OCT. 7	14.41	APR. 19	12.86	JAN. 15	12.88
MAR. 9	14.32	OCT. 14	14.43	MAY 2	11.38	JAN. 29	13.05
MAR. 16	14.46	NOV. 4	14.22	MAY 17	10.40	FEB. 12	13.13
APR. 3	14.62	NOV. 18	14.31	JUNE 7	10.79	FEB. 26	13.21
APR. 17	13.57	DEC. 2	14.20	JUNE 21	11.85	MAR. 12	13.45
MAY 27	8.21	DEC. 16	13.90	JULY 5	13.03	MAR. 26	13.40
JUNE 3	20.91A	JAN. 6, 1945	14.00	JULY 20	14.10	APR. 9	13.41
JUNE 16	22.33A	JAN. 20	13.90	AUG. 4	14.20	APR. 23	13.20
JULY 10	21.95A	FEB. 3	14.07	AUG. 16	14.68	MAY 7	12.05
JULY 20	13.10	FEB. 17	13.92	SEP. 6	14.50	MAY 21	9.47
AUG. 1	13.63	MAR. 3	14.70	SEP. 20	14.41	JUNE 4	8.62
AUG. 14	14.38	MAR. 17	14.11	OCT. 4	14.32	JUNE 26	15.12A
SEP. 12	14.61	APR. 7	14.01	OCT. 18	14.09	JULY 9	10.39
SEP. 22	14.64	APR. 21	13.90	NOV. 1	13.84	JULY 23	11.89
OCT. 12	14.62	MAY 5	12.40	NOV. 15	13.90	AUG. 6	13.00
OCT. 27	14.57	MAY 19	10.80	DEC. 7	14.00	AUG. 20	14.05
NOV. 3	14.56	JUNE 2	7.41	DEC. 20	13.95	SEP. 3	13.95
NOV. 17	14.52	JUNE 16	7.0	JAN. 3, 1948	13.90	SEP. 17	13.98
DEC. 8	14.49	JULY 7	12.25	JAN. 15	14.07	OCT. 1	13.90
DEC. 17	14.35	JULY 21	13.30	FEB. 7	12.64	OCT. 15	13.51
JAN. 5, 1943	14.45	AUG. 4	13.87	FEB. 21	13.20	OCT. 29	13.53
JAN. 19	14.66	AUG. 18	14.20	MAR. 6	14.49	NOV. 12	13.55
FEB. 11	13.96	SEP. 1	14.39	MAR. 20	14.32	NOV. 26	13.55
FEB. 17	13.99	SEP. 15	14.47	APR. 3	14.38	DEC. 10	13.27
MAR. 3	14.28	OCT. 6	14.31	APR. 17	14.20	JAN. 1, 1951	12.85
MAR. 14	14.28	OCT. 20	14.16	MAY 1	12.95	JAN. 14	13.12
APR. 7	14.41	NOV. 3	13.53	MAY 16	11.51	JAN. 28	13.25
APR. 18	12.83	NOV. 17	13.67	JUNE 6	0.74	FEB. 11	13.05
MAY 8	13.09	DEC. 1	13.74	OCT. 30	19.58	FEB. 25	13.12
MAY 17	13.09	DEC. 15	13.62	NOV. 6	19.60	MAR. 11	13.29
JUNE 4	11.12	JAN. 4, 1946	13.70	NOV. 20	19.58	MAR. 25	13.23
JUNE 22	10.72	JAN. 18	13.85	DEC. 4	13.00	APR. 8	12.75
JULY 3	11.09	FEB. 2	13.95	DEC. 18	13.07	APR. 22	11.21
JULY 16	12.49	FEB. 16	13.92	JAN. 4, 1949	11.65	MAY 6	10.40
AUG. 1	13.20	MAR. 2	13.86	JAN. 15	12.25	MAY 20	6.93
AUG. 18	15.02	MAR. 16	13.85	FEB. 5	12.25	JUNE 3	7.86
SEP. 1	14.96	APR. 6	13.70	FEB. 15	12.53	JUNE 17	8.61
SEP. 15	15.26	APR. 20	13.82	MAR. 5	13.09	JULY 1	11.17
OCT. 8	15.08	MAY 4	11.22	MAR. 19	13.30	JULY 15	12.75
OCT. 21	14.99	MAY 18	8.15	APR. 2	13.41	JULY 29	13.05
NOV. 1	14.74	JUNE 1	8.20	APR. 16	12.75	AUG. 12	13.67
NOV. 15	14.77	JUNE 15	9.30	APR. 30	9.45	AUG. 26	13.71
DEC. 1	14.60	JULY 1	10.95	MAY 16	5.10	SEP. 9	13.50
DEC. 15	14.98	JULY 15	12.18	MAY 29	7.51	SEP. 23	13.61

34N26E26Q01 CITY OF OMAK (CONTINUED)

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT. 9, 1951	13.53	APR. 4, 1954	13.77	OCT. 13, 1956	13.77	JAN. 30, 1962	13.51
OCT. 21	13.40	APR. 18	13.75	OCT. 27	13.42	MAR. 28	14.01
NOV. 4	13.38	MAY 2	13.65	NOV. 10	13.59	MAY 28	10.80
NOV. 18	13.39	MAY 16	10.15	NOV. 24	13.60	JULY 24	14.34
DEC. 2	13.43	MAY 31	8.65	DEC. 8	13.16	SEP. 21	14.84
DEC. 16	13.27	JUNE 13	8.50	DEC. 22	13.12	MAY 30, 1963	11.03
DEC. 30	13.15	JUNE 27	8.75	JAN. 5, 1957	13.62	JULY 23	13.49
JAN. 13, 1952	13.08	JULY 12	9.89	JAN. 19	12.80	SEP. 24	14.27
JAN. 27	13.19	JULY 25	11.88	FEB. 2	12.65	NOV. 18	13.00
FEB. 3	13.32	AUG. 8	13.06	FEB. 16	13.03	JAN. 21, 1964	13.84
FEB. 17	13.50	AUG. 22	12.35	MAR. 2	13.52	MAR. 26	13.94
MAR. 2	13.77	SEP. 5	13.05	MAR. 10	13.74	MAY 19	13.80
MAR. 16	13.67	SEP. 19	13.10	MAR. 23	13.96	JULY 29	12.69
MAR. 31	13.57	OCT. 3	13.19	APR. 6	13.86	OCT. 2	13.60
APR. 13	13.19	OCT. 17	13.25	APR. 19	13.54	NOV. 12	13.66
APR. 27	11.32	NOV. 7	13.31	MAY 3	11.31	DEC. 11	14.00
MAY 18	9.87	NOV. 21	12.57	MAY 17	8.19	JAN. 12, 1965	13.94
JUNE 2	9.71	DEC. 5	10.77	MAY 31	8.29	FEB. 24	13.64
JUNE 15	11.47	DEC. 19	13.07	JUNE 14	10.60	APR. 6	13.72
JUNE 29	11.35	JAN. 2, 1955	13.16	JUNE 28	12.35	MAY 18	11.48
JULY 13	12.37	JAN. 16	13.05	JULY 12	13.98	JUNE 19	10.14
JULY 27	13.37	JAN. 30	13.33	JULY 26	13.35	AUG. 3	13.98
AUG. 10	13.91	FEB. 13	13.75	AUG. 9	13.79	SEP. 12	14.28
AUG. 24	13.87	MAR. 6	13.78	AUG. 23	14.41	OCT. 27	14.05
SEP. 6	13.95	MAR. 19	13.86	SEP. 6	14.20	DEC. 8	14.05
SEP. 21	13.85	APR. 2	13.82	SEP. 20	14.06	JAN. 19, 1966	14.00
OCT. 5	13.90	APR. 16	13.65	OCT. 5	13.77	MAR. 2	14.40
OCT. 19	13.45	APR. 30	13.76	OCT. 18	13.87	APR. 7	13.76
NOV. 2	14.08	MAY 14	13.14	NOV. 1	13.98	MAY 18	12.28
NOV. 17	14.19	MAY 28	18.51A	NOV. 16	14.01	JUNE 25	12.54
NOV. 30	14.23	JUNE 11	8.45	NOV. 30	13.94	JULY 20	14.00
DEC. 14	14.30	JUNE 25	9.35	DEC. 13	13.92	AUG. 31	15.00
DEC. 28	14.30	JULY 9	18.44A	DEC. 27	13.96	OCT. 4	14.30
JAN. 11, 1953	14.31	JULY 23	8.87	JAN. 10, 1958	13.97	NOV. 3	14.06
JAN. 25	14.15	AUG. 6	18.51A	JAN. 24	13.99	FEB. 28, 1967	14.28
FEB. 8	13.99	AUG. 20	18.51A	FEB. 7	14.00	APR. 12	13.90
FEB. 15	13.85	SEP. 3	21.36	FEB. 21	13.93	MAY 17	12.92
MAR. 8	14.19	SEP. 17	13.16	MAR. 7	13.80	JUNE 26	8.00
MAR. 22	14.17	OCT. 1	13.65	MAR. 21	13.88	JULY 27	14.24
APR. 5	14.08	OCT. 15	13.85	APR. 5	13.56	AUG. 31	15.30
APR. 19	14.08	OCT. 29	12.81	APR. 12	13.57	OCT. 2	14.80
MAY 3	12.38	NOV. 12	11.73	APR. 26	13.10	NOV. 9	13.80
MAY 17	6.85	NOV. 26	11.97	MAY 10	11.30	DEC. 8	14.28
MAY 31	9.77	DEC. 10	12.80	MAY 24	10.18	JAN. 17, 1968	13.99
JUNE 14	8.31	DEC. 24	12.98	AUG. 26	23.54A	FEB. 28	13.69
JUNE 23	8.16	JAN. 7, 1956	12.71	OCT. 19	13.09	APR. 8	14.59
JULY 12	10.90	JAN. 21	12.96	DEC. 20	13.45	MAY 20	11.57
JULY 28	12.90	FEB. 4	13.57	APR. 1, 1959	13.55	JUNE 26	11.33
AUG. 9	13.45	FEB. 18	13.33	APR. 28	12.48	AUG. 8	14.86
AUG. 23	13.75	MAR. 3	13.27	JUNE 27	9.06	SEP. 20	14.31
AUG. 30	13.78	MAR. 17	13.62	AUG. 29	13.81	OCT. 30	13.91
SEP. 13	13.88	MAR. 31	13.42	NOV. 1	12.65	DEC. 12	14.17
SEP. 27	13.95	APR. 14	13.43	DEC. 1	12.37	FEB. 19, 1969	13.10
OCT. 11	13.60	APR. 28	10.63	JAN. 26, 1960	13.35	APR. 2	13.37
OCT. 25	13.63	MAY 12	9.56	APR. 1	13.40	MAY 8	11.60
NOV. 8	13.53	MAY 26	6.00	MAY 26	11.38	JULY 18	14.03
NOV. 22	13.60	JUNE 9	8.00	JULY 21	25.30A	AUG. 29	15.21
DEC. 6	13.63	JUNE 23	9.71	SEP. 27	15.21	OCT. 9	13.96
DEC. 20	13.69	JULY 7	10.66	NOV. 28	14.04	NOV. 20	14.10
JAN. 3, 1954	13.71	JULY 21	12.62	JAN. 23, 1961	13.00	FEB. 27, 1970	14.37
JAN. 17	13.75	AUG. 4	13.52	MAR. 27	13.98	MAY 14	14.20
FEB. 7	13.43	AUG. 18	13.00	JULY 24	13.96	JULY 23	14.87
FEB. 21	13.53	SEP. 1	13.70	SEP. 28	14.52	SEP. 1	15.64
MAR. 7	13.65	SEP. 15	13.92	NOV. 28	14.25	DEC. 3	14.59
MAR. 21	13.75	SEP. 29	13.78				

34N26E26Q02 CITY OF OMAK

ALTITUDE OF LAND SURFACE 820.00 FEET.

HIGHEST WATER LEVEL 6.50 BELOW LSD, JUNE 17, 1945,
LOWEST WATER LEVEL 28.64 BELOW LSD, OCT. 6, 1941.
RECORDS AVAILABLE 1939-57.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN. 24, 1939	17.65	FEB. 9, 1942	16.61	AUG. 11, 1946	16.67	APR. 10, 1950	16.19
JUNE 9	23.26A	APR. 8	16.53	FEB. 27, 1947	16.63	JUNE 18, 1951	17.48A
SEP. 19	22.55A	JUNE 3	18.42A	MAY 26	13.07	AUG. 20	21.50
DEC. 11	16.99	AUG. 14	22.93A	JULY 23	16.90	OCT. 23	16.14
MAY 9, 1940	16.20	OCT. 12	22.09A	OCT. 30	16.59	DEC. 17	16.32
OCT. 9	18.07	DEC. 17	17.59	JAN. 15, 1948	16.81	APR. 10, 1952	16.26
DEC. 30	17.63	JUNE 8, 1943	19.15A	APR. 10	17.02	JUNE 9	19.33A
MAR. 24, 1941	17.20	DEC. 31	11.45	AUG. 14	21.14A	AUG. 18	21.56A
JUNE 7	15.87	AUG. 25, 1944	11.20	OCT. 28	15.93	OCT. 23	16.81
AUG. 5	23.37A	DEC. 2	10.90	MAR. 11, 1949	16.06	FEB. 26, 1953	16.86
OCT. 6	28.64A	JUNE 17, 1945	6.50	JUNE 27	14.22	JUNE 21, 1957	19.42A
DEC. 4	16.41	APR. 11, 1946	16.42				

34N26E28A01 CHARLES BYRD

ALTITUDE OF LAND SURFACE 1275.00 FEET.

HIGHEST WATER LEVEL 28.86 BELOW LSD, JUNE 26, 1950,
LOWEST WATER LEVEL 39.86 BELOW LSD, MAY 26, 1947.
RECORDS AVAILABLE 1939-44, 1946-70.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JUNE 17, 1944	34.25A	DEC. 20, 1954	31.48	SEP. 28, 1961	31.61	DEC. 15, 1966	33.56
APR. 11, 1946	32.99A	FEB. 25, 1955	33.11	NOV. 28	31.86	JAN. 19, 1967	33.71
FEB. 27, 1947	32.61	APR. 29	32.46	JAN. 30, 1962	32.61	FEB. 28	33.81
MAY 26	39.86A	JUNE 24	34.00	MAR. 28	32.82	APR. 12	33.86
JULY 23	38.82	AUG. 21	34.32	MAY 28	33.36	MAY 17	33.74
OCT. 30	31.90	OCT. 26	31.77	JULY 24	33.76	JUNE 26	33.69
JAN. 15, 1948	32.91	DEC. 21	32.13	NOV. 28	33.24	JULY 27	35.96A
APR. 10	33.33	FEB. 24, 1956	33.60	JAN. 25, 1963	33.54	AUG. 31	35.34A
AUG. 14	39.00A	APR. 26	32.46	MAR. 29	33.78	OCT. 2	31.91C
OCT. 28	31.67	JUNE 25	31.92	MAY 30	33.89	NOV. 9	29.44
MAR. 11, 1949	33.27	AUG. 21	31.35	JULY 23	32.98	DEC. 8	32.81
JUNE 27	38.94A	OCT. 26	31.21	SEP. 24	32.62	JAN. 17, 1968	33.22
NOV. 19	32.16	DEC. 14	31.91	NOV. 18	32.51	FEB. 28	33.36
APR. 10, 1950	33.10	FEB. 21, 1957	32.68	JAN. 21, 1964	32.00	APR. 8	33.52
JUNE 26	28.86	APR. 24	32.66	MAR. 26	33.74	MAY 20	34.0
OCT. 3	31.03	JUNE 21	36.01A	MAY 19	32.33	JUNE 26	37.24
DEC. 12	32.14	AUG. 26	35.63A	OCT. 2	33.01	AUG. 8	34.09
MAR. 30, 1951	32.80	OCT. 27	31.29	NOV. 12	33.23	SEP. 20	33.11
JUNE 18	31.68	DEC. 19	31.71	DEC. 11	33.41	OCT. 30	33.16
AUG. 20	30.58	FEB. 26, 1958	32.35	JAN. 12, 1965	33.66	DEC. 12	33.46
OCT. 23	29.82	APR. 28	30.88	FEB. 23	33.97	MAR. 28, 1969	34.23
DEC. 16	31.56	JUNE 28	33.86	APR. 6	34.07	MAY 8	32.81
DEC. 17	31.56	AUG. 26	30.97	MAY 18	34.36	JUNE 12	32.64A
FEB. 24, 1952	31.39	OCT. 19	29.68	JUNE 19	34.22	JULY 18	32.47
APR. 10	31.92	DEC. 20	31.41	AUG. 3	38.56A	AUG. 29	32.02
JUNE 9	30.43	MAR. 2, 1959	30.31	SEP. 12	36.78A	SEP. 24	31.90
OCT. 23	30.55	APR. 28	31.11	OCT. 27	33.47	OCT. 9	31.69
DEC. 16	31.47	AUG. 29	30.72	DEC. 8	33.77	NOV. 20	32.18
FEB. 26, 1953	32.20	NOV. 1	30.85	JAN. 19, 1966	34.01	JAN. 8, 1970	32.82
MAY 1	32.72	DEC. 1	31.33	MAR. 2	34.26	FEB. 27	33.10B
JUNE 2	31.28	JAN. 26, 1960	32.00	APR. 7	33.85	APR. 2	33.24
AUG. 26	31.90	MAR. 30	32.36	MAY 18	33.81	MAY 14	33.63
OCT. 26	31.26	MAY 26	32.70	JUNE 25	34.13	JULY 23	33.15
DEC. 19	31.11	JULY 21	33.34	JULY 20	37.01A	SEP. 1	32.99
FEB. 24, 1954	31.77	NOV. 28	32.46	AUG. 31	37.11	OCT. 16	32.38
APR. 19	32.15	JAN. 23, 1961	32.62	OCT. 4	32.91	OCT. 29	32.81
JUNE 23	32.40	MAR. 27	32.06	NOV. 3	33.15	DEC. 3	32.50
OCT. 25	30.77	JULY 24	32.07				

34N26E28B01 V MORGAN

ALTITUDE OF LAND SURFACE 1283.00 FEET.

HIGHEST WATER LEVEL 26.05 BELOW LSD, APR. 28, 1958,
DRY, WATER LEVEL NOT MEASUREABLE, MAY 18, 1965, JUNE 19, 1965, AUG. 3, 1965, DEC. 8, 1965,
JAN. 19, 1966, MAR. 2, 1966, JULY 20, 1966, AUG. 31, 1966, FEB. 28, 1967.
RECORDS AVAILABLE 1940-68.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT. 9, 1940	31.86	JUNE 18, 1951	31.00	OCT. 27, 1957	28.12	MAR. 26, 1964	33.11
DEC. 31	31.13	AUG. 20	29.37	DEC. 19	30.15	MAY 19	32.79
MAR. 24, 1941	32.67	OCT. 23	27.96	FEB. 26, 1958	31.63	JULY 29	32.04
JUNE 7	31.40	DEC. 17	30.20	APR. 28	26.05	OCT. 2	30.89
AUG. 5	28.70	FEB. 24, 1952	31.78	JUNE 28	26.38	NOV. 11	31.95
OCT. 6	29.55	APR. 10	29.36	AUG. 26	27.51	DEC. 11	32.49
DEC. 4	30.52	JUNE 9	29.83	OCT. 19	28.74	JAN. 12, 1965	33.08
FEB. 8, 1942	29.91	AUG. 18	29.08	DEC. 20	29.89	FEB. 24	33.25
APR. 8	31.36	OCT. 23	27.87	MAR. 2, 1959	30.79	APR. 6	33.46
JUNE 3	31.18	DEC. 16	30.35	APR. 28	27.87	MAY 18	D
AUG. 14	28.23	FEB. 26, 1953	31.61	JUNE 27	27.75	JUNE 19	D
OCT. 12	27.47	MAY 1	32.27	AUG. 29	27.47	AUG. 3	D
DEC. 17	29.83	JUNE 21	32.18	NOV. 1	29.30	SEP. 12	31.91
JUNE 6, 1943	31.76	AUG. 26	30.05	DEC. 1	30.14	OCT. 27	33.27
JUNE 7	31.76	OCT. 26	30.09	JAN. 26, 1960	31.33	DEC. 8	D
JUNE 8	31.76	DEC. 19	31.95	MAR. 30	32.00	JAN. 19, 1966	D
DEC. 31	31.19	FEB. 24, 1954	32.61	MAY 26	32.43	MAR. 2	D
AUG. 25, 1944	30.70	APR. 9	33.27	JULY 21	31.64	APR. 7	30.90
DEC. 2	31.30	JUNE 23	32.99	SEP. 27	29.60	MAY 18	31.10
JUNE 17, 1945	32.90	AUG. 30	30.84	NOV. 28	30.20	JUNE 25	31.65
APR. 11, 1946	33.94	OCT. 25	29.21	JAN. 23, 1961	31.37	JULY 20	D
AUG. 21	29.86	DEC. 20	31.64	MAR. 27	29.15	AUG. 31	D
FEB. 27, 1947	31.79	FEB. 25, 1955	32.85	JULY 24	28.95	OCT. 4	30.61
MAY 26	32.97	APR. 29	33.63	SEP. 28	28.00	NOV. 3	31.35
JULY 23	33.67A	JUNE 24	32.90	NOV. 28	30.34	DEC. 15	31.44
OCT. 30	31.01	AUG. 21	31.97	JAN. 30, 1962	31.96	JAN. 19, 1967	32.35
JAN. 15, 1948	32.56	OCT. 26	31.15	MAR. 28	31.62	FEB. 28	D
APR. 10	33.32	DEC. 4	32.15	MAY 28	32.76	APR. 12	29.85
AUG. 14	31.87	FEB. 24, 1956	33.11	JULY 24	32.85	MAY 17	32.50C
OCT. 28	30.22	APR. 26	29.93	SEP. 21	32.05	JUNE 26	28.83C
MAR. 11, 1949	32.88	JUNE 25	27.97	NOV. 28	32.18	JULY 27	29.19C
JUNE 27	31.58	AUG. 21	28.52	JAN. 25, 1963	33.06	AUG. 31	29.10C
NOV. 19	31.06	OCT. 26	29.41	MAR. 29	33.49	OCT. 2	29.38C
APR. 10, 1950	32.18	DEC. 14	30.53	MAY 30	31.44	NOV. 9	30.32
JUNE 26	31.59	FEB. 21, 1957	32.08	JULY 23	30.95	DEC. 8	32.12
OCT. 3	29.84	APR. 24	29.82	SEP. 24	31.06	JAN. 17, 1968	33.70
DEC. 12	30.82	JUNE 21	28.40	NOV. 18	32.85	FEB. 28	37.81
MAR. 30, 1951	32.11	AUG. 26	28.65	JAN. 21, 1964	32.69	APR. 8	42.90

34N26E28P01 SAM PETERSON

ALTITUDE OF LAND SURFACE 1270.00 FEET.

HIGHEST WATER LEVEL 9.51 BELOW LSD, AUG. 20, 1951,
LOWEST WATER LEVEL 23.77 BELOW LSD, MAY 26, 1947.
RECORDS AVAILABLE 1939-53.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
SEP. 19, 1939	14.52	OCT. 12, 1942	11.64	JAN. 15, 1948	13.62	OCT. 23, 1951	12.61
DEC. 13	16.89	DEC. 17	14.98	APR. 10	14.05	DEC. 17	13.85
MAY 9, 1940	16.40	JUNE 8, 1943	14.21	AUG. 14	10.97	FEB. 24, 1952	14.58
OCT. 9	13.74	DEC. 31	14.91	OCT. 28	11.59	APR. 10	13.14
DEC. 30	17.15	AUG. 25, 1944	16.66	MAR. 11, 1949	14.08	JUNE 9	11.49
MAR. 24, 1941	16.65	DEC. 2	14.77	JUNE 27	15.32A	AUG. 18	10.60
JUNE 7	14.54	JUNE 17, 1945	12.37	NOV. 19	12.46	OCT. 23	12.30
AUG. 5	14.20A	APR. 11, 1946	14.71	APR. 10, 1950	13.90	DEC. 16	13.76
OCT. 6	13.86	AUG. 21	14.07	JUNE 26	11.98	FEB. 26, 1953	14.07
DEC. 4	15.48	FEB. 27, 1947	14.90	OCT. 2	11.41	MAY 1	13.51
FEB. 8, 1942	16.07	MAY 26	14.90	DEC. 12	13.80	JUNE 21	12.93
APR. 8	15.70	MAY 26	23.77	MAR. 30, 1951	13.91	AUG. 26	11.88
JUNE 3	13.24	JULY 23	18.38	JUNE 18	11.57	OCT. 26	13.06
AUG. 14	11.20	OCT. 30	14.30	AUG. 20	9.51	DEC. 19	13.93

34N26E35B01 CITY OF OMAK

ALTITUDE OF LAND SURFACE 850.00 FEET.

HIGHEST WATER LEVEL 5.19 BELOW LSD, JUNE 18, 1951,
LOWEST WATER LEVEL 22.70 BELOW LSD, AUG. 14, 1942.
RECORDS AVAILABLE 1939-51.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN. 24, 1939	11.05	AUG. 5, 1941	12.56	JUNE 8, 1943	19.25A	OCT. 30, 1947	9.52
JUNE 9	8.08	OCT. 6	10.23	DEC. 31	10.04	JAN. 15, 1948	9.79
SEP. 19	11.58	DEC. 4	10.00	AUG. 25, 1944	9.34	APR. 10	9.96
DEC. 13	10.65	FEB. 9, 1942	9.50	DEC. 2	9.84	AUG. 14	7.93
MAY 9, 1940	9.48	APR. 8	10.65	APR. 11, 1946	9.61	OCT. 28	8.56
OCT. 9	11.46	JUNE 3	6.86	AUG. 21	9.35	MAR. 11, 1949	8.64
DEC. 30	10.79	AUG. 14	22.70A	FEB. 27, 1947	9.62	JUNE 27	7.06
MAR. 24, 1941	10.83	OCT. 12	20.12A	MAY 26	7.16	APR. 10, 1950	9.21
JUNE 7	10.13	DEC. 17	9.97	JULY 23	8.90	JUNE 18, 1951	5.19

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ALTITUDE OF LAND SURFACE 850.00 FEET.

HIGHEST WATER LEVEL 17.95 BELOW LSD, JUNE 16, 1948,
LOWEST WATER LEVEL 32.58 BELOW LSD, NOV. 28, 1960.
RECORDS AVAILABLE 1944-68.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
AUG. 26, 1944	27.87A	OCT. 20, 1945	27.03A	DEC. 28, 1946	26.58A	JAN. 31, 1948	26.57A
SEP. 2	27.50A	OCT. 27	26.30A	JAN. 4, 1947	26.61A	FEB. 7	26.37A
SEP. 9	27.69A	NOV. 3	26.43A	JAN. 11	26.67A	FEB. 14	26.21A
SEP. 16	27.80A	NOV. 10	26.01A	JAN. 18	26.45A	FEB. 22	25.48A
SEP. 26	27.56A	NOV. 17	25.87A	JAN. 25	26.74A	FEB. 28	25.43A
SEP. 30	27.43A	NOV. 24	25.70A	FEB. 1	26.80A	MAR. 6	25.49A
OCT. 7	27.15A	DEC. 1	25.69A	FEB. 8	26.87A	MAR. 13	25.42A
OCT. 14	26.91A	DEC. 8	25.95A	FEB. 15	26.72A	MAR. 20	25.44A
OCT. 21	26.64A	DEC. 15	25.80A	FEB. 22	26.83A	APR. 3	27.20A
OCT. 28	26.81A	DEC. 22	25.66A	FEB. 27	26.81A	APR. 10	27.33A
NOV. 4	26.64A	DEC. 29	25.70A	MAR. 2	26.46A	APR. 17	27.75A
NOV. 11	25.82A	JAN. 5, 1946	25.55A	MAR. 8	26.95A	APR. 24	27.60A
NOV. 18	25.66A	JAN. 12	25.68A	MAR. 15	26.80A	MAY 1	27.00A
NOV. 25	25.66A	JAN. 19	25.67A	MAR. 22	26.80A	MAY 8	26.68A
DEC. 2	25.80A	JAN. 26	25.46A	MAR. 29	27.15A	MAY 16	26.12A
DEC. 9	25.66A	FEB. 2	25.25A	APR. 5	27.04A	MAY 22	25.60A
DEC. 16	25.60A	FEB. 9	24.95A	APR. 12	26.98A	JUNE 6	18.14A
DEC. 23	25.88A	FEB. 16	25.01A	APR. 20	26.60A	JUNE 16	17.95A
DEC. 30	25.71A	FEB. 23	25.35A	APR. 26	27.00A	JUNE 19	18.68A
JAN. 6, 1945	25.70A	MAR. 2	25.44A	MAY 3	26.62A	JUNE 26	19.55A
JAN. 13	25.73A	MAR. 9	26.01	MAY 10	25.76A	JULY 3	20.76A
JAN. 20	26.16A	MAR. 16	26.04	MAY 17	25.31A	JULY 10	20.92A
JAN. 27	25.95A	MAR. 23	26.15	MAY 26	25.51A	JULY 31	23.34A
FEB. 3	25.84A	MAR. 30	26.24	MAY 31	24.29A	AUG. 7	23.70A
FEB. 10	25.43A	APR. 6	26.21	JUNE 7	23.74A	AUG. 14	24.27A
FEB. 17	25.88A	APR. 13	26.27	JUNE 16	24.52A	AUG. 21	24.54A
FEB. 24	25.80A	APR. 20	26.22	JUNE 21	24.36A	AUG. 28	24.58A
MAR. 3	25.78A	APR. 27	26.73	JUNE 28	24.44A	SEP. 11	24.62A
MAR. 10	25.65A	MAY 4	26.19	JULY 5	24.69A	SEP. 18	25.10
MAR. 17	25.75A	MAY 11	24.62	JULY 13	25.30A	SEP. 25	25.21
MAR. 24	25.86A	MAY 18	23.83	JULY 19	24.99A	OCT. 2	25.40
APR. 7	26.33A	MAY 25	22.67	JULY 23	26.87A	OCT. 9	25.10
APR. 14	26.03A	JUNE 4	22.40	JULY 26	26.87A	OCT. 16	25.14
APR. 21	26.67A	JUNE 8	22.22	AUG. 2	27.16A	OCT. 23	25.23
APR. 28	27.00A	JUNE 15	22.45	AUG. 9	27.33A	OCT. 28	25.55
MAY 5	27.15A	JUNE 25	23.00	AUG. 16	27.72A	OCT. 30	25.35
MAY 12	26.05A	JULY 1	22.60A	AUG. 23	27.89A	NOV. 6	25.35
MAY 19	25.01A	JULY 9	24.40A	AUG. 30	28.18A	NOV. 13	25.30
MAY 26	24.72A	JULY 16	24.40A	SEP. 6	28.08A	NOV. 20	25.50
JUNE 2	23.84A	JULY 20	24.93A	SEP. 13	28.00A	NOV. 27	25.60
JUNE 9	21.81A	JULY 27	25.30A	SEP. 20	28.27A	DEC. 4	25.92
JUNE 16	22.68A	AUG. 3	25.70A	SEP. 27	28.28A	DEC. 12	25.80
JUNE 17	22.45A	AUG. 10	25.86A	OCT. 4	28.26A	DEC. 18	26.08
JUNE 23	23.14A	AUG. 31	26.50A	OCT. 11	27.95A	DEC. 25	25.72
JUNE 30	23.44A	SEP. 7	26.11A	OCT. 18	27.49A	JAN. 1, 1949	25.00A
JULY 7	23.10A	SEP. 14	26.48A	OCT. 26	27.04A	JAN. 8	25.25A
JULY 14	24.34A	SEP. 21	26.60A	OCT. 30	27.20A	JAN. 15	25.35A
JULY 21	24.94A	SEP. 28	27.02A	NOV. 1	27.15A	JAN. 22	25.20A
JULY 28	25.56A	OCT. 5	27.02A	NOV. 8	27.20A	JAN. 30	25.40A
AUG. 4	26.03A	OCT. 12	26.80A	NOV. 16	26.83A	FEB. 5	25.45A
AUG. 11	26.41A	OCT. 19	27.18A	NOV. 30	26.70A	FEB. 12	25.69A
AUG. 18	26.43A	OCT. 26	27.00A	DEC. 7	26.65A	FEB. 19	25.64A
AUG. 25	27.05A	NOV. 2	26.95A	DEC. 13	26.95A	FEB. 26	25.94A
SEP. 1	27.35A	NOV. 9	27.07A	DEC. 21	26.70A	MAR. 5	26.07A
SEP. 8	27.06A	NOV. 16	26.57A	DEC. 28	26.65A	MAR. 11	26.13A
SEP. 15	27.20A	NOV. 25	26.12A	JAN. 3, 1948	26.85A	MAR. 12	26.08A
SEP. 22	26.66A	NOV. 30	26.20A	JAN. 10	26.85A	MAR. 19	26.20A
SEP. 29	26.60A	DEC. 7	26.53A	JAN. 15	26.95A	MAR. 26	26.36A
OCT. 6	26.64A	DEC. 14	26.70A	JAN. 17	27.00A	APR. 2	26.58A
OCT. 13	26.95A	DEC. 21	26.89A	JAN. 24	26.90A	APR. 9	27.00A

34N26E35R01 CITY OF OMAK (CONTINUED)

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
APR. 17, 1949	27.10A	JULY 9, 1950	21.15A	OCT. 7, 1951	26.90A	JAN. 4, 1953	27.71
APR. 23	26.67A	JULY 16	22.65A	OCT. 14	26.72A	JAN. 11	27.69
MAY 1	26.00A	JULY 23	23.40A	OCT. 21	26.68A	JAN. 18	27.65
MAY 7	25.90A	JULY 30	24.02A	OCT. 28	26.60A	JAN. 25	27.66
MAY 15	23.64A	AUG. 6	25.10A	NOV. 4	26.64A	FEB. 1	27.55
MAY 21	21.70A	AUG. 14	25.90A	NOV. 11	26.66A	FEB. 8	27.50
MAY 28	21.82A	AUG. 20	25.92A	NOV. 18	26.65A	FEB. 16	27.52
JUNE 4	22.36A	AUG. 27	26.03A	NOV. 25	26.64A	FEB. 22	27.56
JUNE 11	22.86A	SEP. 3	26.20A	DEC. 2	26.40A	MAR. 1	27.58
JUNE 18	23.11A	SEP. 10	26.60A	DEC. 9	26.41A	MAR. 8	27.60
JUNE 25	23.92A	SEP. 17	27.00A	DEC. 16	26.45A	MAR. 15	27.62
JULY 2	24.48A	SEP. 24	27.03A	DEC. 23	26.48A	MAR. 22	27.64
JULY 10	24.40A	OCT. 1	26.70A	DEC. 30	26.42A	MAR. 29	27.62
JULY 16	25.84A	OCT. 8	26.20A	JAN. 6, 1952	26.40	APR. 5	27.72
JULY 24	25.81A	OCT. 16	26.15A	JAN. 13	26.34	APR. 12	27.74
JULY 30	26.45A	OCT. 23	26.50A	JAN. 19	26.30	APR. 19	27.77
AUG. 6	26.85A	OCT. 29	26.48A	JAN. 27	26.33	APR. 26	27.72
AUG. 14	26.60A	NOV. 5	26.52A	FEB. 3	26.38	MAY 3	27.48
AUG. 20	26.90A	NOV. 12	25.90A	FEB. 12	26.32	MAY 10	26.92
AUG. 27	26.87A	NOV. 19	26.02A	FEB. 17	26.47	MAY 17	26.40
SEP. 4	27.09A	NOV. 26	26.10A	FEB. 24	26.58	MAY 24	26.21
SEP. 10	27.37A	DEC. 3	26.15A	MAR. 2	26.71	MAY 31	26.42
SEP. 17	27.05A	DEC. 10	26.40A	MAR. 9	26.80	JUNE 7	26.05
SEP. 24	27.11A	DEC. 12	26.73A	MAR. 16	26.72	JUNE 14	25.62
OCT. 1	27.09A	JAN. 1, 1951	26.10A	MAR. 23	26.58	JUNE 21	25.12
OCT. 8	26.96A	JAN. 7	25.82A	MAR. 30	26.68	JUNE 28	25.08
OCT. 15	27.12A	JAN. 14	25.69A	APR. 6	26.71	JULY 6	25.12
OCT. 22	26.60A	JAN. 21	25.60A	APR. 13	26.73	JULY 12	25.18
OCT. 29	26.58A	JAN. 28	25.70A	APR. 20	26.80	JULY 19	25.22
NOV. 5	26.56A	FEB. 4	25.67A	APR. 27	26.76	JULY 27	26.30
NOV. 14	26.55A	FEB. 11	25.70A	MAY 4	26.72	AUG. 2	26.60
NOV. 20	26.44A	FEB. 18	25.55A	MAY 11	26.63	AUG. 9	26.92
NOV. 27	26.32A	FEB. 25	25.57A	MAY 18	26.51	AUG. 16	27.03
DEC. 3	25.43A	MAR. 4	25.62A	MAY 25	26.52	AUG. 23	27.05
DEC. 11	25.17A	MAR. 11	25.84A	JUNE 2	25.80	AUG. 30	27.20
DEC. 17	25.52A	MAR. 18	26.03A	JUNE 8	25.84	SEP. 6	27.32
DEC. 25	25.10A	MAR. 25	26.06A	JUNE 15	25.90	SEP. 13	27.58
JAN. 1, 1950	24.75A	APR. 1	26.10A	JUNE 22	24.02	SEP. 20	27.60
JAN. 8	25.10A	APR. 8	26.15A	JUNE 29	24.10	SEP. 27	27.62
JAN. 15	25.32A	APR. 16	26.01A	JULY 6	24.02	OCT. 4	27.65
JAN. 22	25.60A	APR. 22	25.78A	JULY 13	26.21	OCT. 11	27.66
JAN. 29	25.51A	APR. 29	25.50A	JULY 20	26.76	OCT. 18	27.65
FEB. 5	25.44A	MAY 6	25.45A	JULY 27	26.88	OCT. 25	27.62
FEB. 12	25.40A	MAY 13	23.97A	AUG. 3	26.63	FEB. 28, 1954	27.56
FEB. 19	25.28A	MAY 20	22.40A	AUG. 10	27.12	MAR. 7	27.59
FEB. 26	25.27A	MAY 27	21.90A	AUG. 18	27.28	MAR. 14	27.30
MAR. 5	25.40A	JUNE 3	22.52	AUG. 24	27.49	MAR. 21	27.15
MAR. 12	25.70A	JUNE 10	22.67	AUG. 31	27.20	MAR. 28	27.25
MAR. 26	25.71A	JUNE 17	22.84	SEP. 7	27.10	APR. 4	27.26
APR. 2	26.18A	JUNE 24	23.02	SEP. 14	27.05	APR. 11	27.25
APR. 9	26.32A	JULY 1	23.65	SEP. 21	27.10	APR. 18	27.35
APR. 10	28.98A	JULY 8	23.82	SEP. 29	27.21	APR. 25	27.33
APR. 16	25.97A	JULY 15	24.10	OCT. 5	27.42	MAY 2	27.27
APR. 23	25.93A	JULY 22	24.38	OCT. 12	27.31	MAY 9	27.29
APR. 30	26.00A	JULY 29	24.82	OCT. 19	27.46	MAY 16	27.25
APR. 30	26.00A	AUG. 5	25.52	OCT. 27	27.54	MAY 24	25.55
MAY 7	26.47	AUG. 12	26.10	NOV. 2	27.43	MAY 31	25.35
MAY 14	25.95A	AUG. 19	26.50	NOV. 9	27.40	JUNE 6	25.07
MAY 21	25.08	AUG. 20	27.53	NOV. 17	27.38	JUNE 13	24.93
MAY 28	25.00A	AUG. 26	27.01	NOV. 24	27.40	JUNE 20	24.75
JUNE 4	25.71	SEP. 1	26.98A	NOV. 30	27.42	JUNE 27	24.66
JUNE 11	23.46A	SEP. 9	26.74A	DEC. 7	27.50	JULY 5	24.85
JUNE 18	20.00	SEP. 16	26.85A	DEC. 14	27.53	JULY 11	25.37
JUNE 25	19.50A	SEP. 23	26.92A	DEC. 22	27.54	JULY 18	25.75
JULY 2	20.69A	SEP. 30	26.95A	DEC. 28	27.62	JULY 25	26.15

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DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
AUG. 3, 1954	26.36	DEC. 3, 1955	19.54A	MAR. 2, 1957	27.38	JUNE 2, 1958	19.95A
AUG. 8	26.48	DEC. 10	19.72A	MAR. 10	27.74A	AUG. 26	30.63A
AUG. 15	26.50	DEC. 17	19.88A	MAR. 16	28.07A	DEC. 20	28.68A
AUG. 22	26.55	DEC. 24	19.90A	MAR. 23	28.13A	MAR. 2, 1959	28.65A
AUG. 29	26.58	DEC. 31	19.59A	MAR. 26	28.04A	APR. 28	29.07A
SEP. 5	26.54	JAN. 7, 1956	26.22A	APR. 6	28.14A	JUNE 27	23.00A
SEP. 12	26.51	JAN. 14	26.40A	APR. 12	28.27A	AUG. 29	30.30A
SEP. 19	26.54	JAN. 21	26.55A	APR. 19	28.53A	NOV. 1	28.37A
SEP. 26	26.54	JAN. 28	26.55A	APR. 26	28.93A	DEC. 1	28.30A
OCT. 3	26.55	FEB. 4	26.67A	MAY 3	28.31A	JAN. 26, 1960	28.94A
OCT. 10	26.57	FEB. 11	26.60A	MAY 10	27.64A	APR. 1	29.69A
OCT. 17	26.56	FEB. 18	26.73A	MAY 17	26.15	MAY 26	28.78A
OCT. 21	26.55	FEB. 25	27.34A	MAY 24	24.35A	JULY 21	31.59A
NOV. 28	26.53	MAR. 3	27.58A	MAY 31	24.97A	SEP. 27	31.67A
DEC. 5	26.58	MAR. 10	27.75A	JUNE 7	25.30A	NOV. 28	32.58A
DEC. 12	26.54	MAR. 17	27.87A	JUNE 14	25.36A	JAN. 23, 1961	30.42A
DEC. 19	26.51	MAR. 24	27.80A	JUNE 21	26.69A	MAR. 27	30.33A
DEC. 26	26.53	MAR. 31	27.67A	JUNE 28	27.64A	JULY 24	25.50A
JAN. 2, 1955	26.56	APR. 7	27.76A	JULY 5	27.20A	SEP. 28	31.55A
JAN. 9	26.54	APR. 14	28.41A	JULY 12	27.67A	NOV. 28	29.29A
JAN. 16	26.58	APR. 21	28.63A	JULY 19	28.66	JAN. 30, 1962	28.72A
JAN. 23	26.61	APR. 28	27.26A	JULY 26	28.89A	MAR. 28	29.49A
JAN. 30	26.57	MAY 5	28.27A	AUG. 2	28.84	MAY 28	29.23A
FEB. 6	26.60	MAY 12	28.17A	AUG. 9	28.77A	JULY 24	30.11A
FEB. 13	26.65	MAY 19	27.81A	AUG. 16	29.41	SEP. 21	30.96A
FEB. 20	26.65	MAY 26	23.88A	AUG. 23	29.13A	NOV. 28	29.47A
MAR. 6	26.69	JUNE 2	23.43A	AUG. 30	29.90A	JAN. 25, 1963	29.93A
MAR. 12	22.58A	JUNE 9	23.48A	SEP. 6	29.79A	MAR. 29	29.67A
MAR. 19	27.68A	JUNE 16	24.00A	SEP. 13	29.90A	MAY 30	31.20A
MAR. 26	27.74	JUNE 23	25.04A	SEP. 20	29.91A	JULY 23	31.33A
APR. 2	27.87	JUNE 30	25.55A	SEP. 27	29.59A	SEP. 24	30.88A
APR. 9	27.92	JULY 7	24.75A	OCT. 5	28.93A	NOV. 18	30.20A
APR. 16	27.96	JULY 14	26.42A	OCT. 11	28.67A	JAN. 21, 1964	28.63A
APR. 23	28.02	JULY 21	27.42A	OCT. 18	28.81A	MAR. 26	28.11A
APR. 30	28.19	JULY 28	27.79A	OCT. 25	28.87A	MAY 19	28.14A
MAY 7	28.32	AUG. 4	28.08A	NOV. 1	28.54A	JULY 29	28.26A
MAY 19	28.29A	AUG. 11	28.51A	NOV. 8	28.38A	OCT. 2	29.07A
MAY 21	28.24A	AUG. 18	28.44A	NOV. 16	28.44A	NOV. 12	28.41A
MAY 28	28.26A	AUG. 25	28.32A	NOV. 23	28.81A	DEC. 11	28.82A
JUNE 4	27.88A	SEP. 1	28.70A	NOV. 30	28.51A	JAN. 12, 1965	29.95
JUNE 11	27.47A	SEP. 8	28.87A	DEC. 6	28.53	FEB. 23	30.08A
JUNE 18	25.48A	SEP. 15	28.92	DEC. 13	28.54A	APR. 6	28.61A
JUNE 25	25.21A	SEP. 22	28.67A	DEC. 20	28.50A	MAY 18	29.15A
JULY 2	23.97A	SEP. 29	28.37A	DEC. 27	28.85A	JUNE 19	31.15A
JULY 9	25.89A	OCT. 6	28.45A	JAN. 3, 1958	22.19A	AUG. 3	28.87A
JULY 16	26.34A	OCT. 13	27.99A	JAN. 10	22.24A	SEP. 12	30.43A
JULY 23	27.11	OCT. 20	27.99A	JAN. 17	22.19A	OCT. 27	29.33A
JULY 31	27.86A	OCT. 27	27.98A	JAN. 24	22.19A	DEC. 8	28.64A
AUG. 6	28.19A	NOV. 3	27.89A	FEB. 3	22.18A	JAN. 19, 1966	29.05A
AUG. 13	28.30A	NOV. 10	28.17A	FEB. 7	22.20A	MAR. 2	29.87A
AUG. 20	28.52A	NOV. 17	28.03A	FEB. 14	22.43A	APR. 7	30.41A
AUG. 27	28.84A	NOV. 24	27.91A	FEB. 21	22.17A	MAY 18	30.37A
SEP. 3	28.73A	DEC. 1	28.02A	FEB. 28	22.08	JUNE 25	29.58A
SEP. 10	28.70A	DEC. 8	28.17A	MAR. 7	22.02A	JULY 20	31.20A
SEP. 17	28.15A	DEC. 15	27.91A	MAR. 14	22.05	AUG. 31	31.68A
SEP. 24	28.57A	DEC. 22	28.14A	MAR. 21	22.24	OCT. 4	30.82A
OCT. 1	28.23A	DEC. 29	28.11A	MAR. 28	22.06	NOV. 3	28.72A
OCT. 8	28.22A	JAN. 5, 1957	27.38A	APR. 5	21.99A	DEC. 15	28.59A
OCT. 15	28.17A	JAN. 12	27.31A	APR. 12	22.09A	JAN. 19, 1967	28.20A
OCT. 22	28.15A	JAN. 19	24.20A	APR. 19	22.42A	FEB. 28	28.27A
OCT. 29	27.68A	JAN. 26	26.83A	APR. 26	22.48A	APR. 12	29.55A
NOV. 5	27.42A	FEB. 2	26.86A	MAY 3	22.71A	MAY 17	29.00A
NOV. 12	26.53A	FEB. 10	26.29A	MAY 10	21.93A	JUNE 26	24.29A
NOV. 19	26.08A	FEB. 16	26.89A	MAY 17	22.09A	JULY 27	29.23A
NOV. 26	25.94A	FEB. 23	26.74A	MAY 24	21.31A	AUG. 31	32.05A

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DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
APR. 17, 1949	27.10A	JULY 9, 1950	21.15A	OCT. 7, 1951	26.90A	JAN. 4, 1953	27.71
APR. 23	26.67A	JULY 16	22.65A	OCT. 14	26.72A	JAN. 11	27.69
MAY 1	26.00A	JULY 23	23.40A	OCT. 21	26.68A	JAN. 18	27.65
MAY 7	25.90A	JULY 30	24.02A	OCT. 28	26.60A	JAN. 25	27.66
MAY 15	23.64A	AUG. 6	25.10A	NOV. 4	26.64A	FEB. 1	27.55
MAY 21	21.70A	AUG. 14	25.90A	NOV. 11	26.66A	FEB. 8	27.50
MAY 28	21.82A	AUG. 20	25.92A	NOV. 18	26.65A	FEB. 16	27.52
JUNE 4	22.36A	AUG. 27	26.03A	NOV. 25	26.64A	FEB. 22	27.56
JUNE 11	22.86A	SEP. 3	26.20A	DEC. 2	26.40A	MAR. 1	27.58
JUNE 18	23.11A	SEP. 10	26.60A	DEC. 9	26.41A	MAR. 8	27.60
JUNE 25	23.92A	SEP. 17	27.00A	DEC. 16	26.45A	MAR. 15	27.62
JULY 2	24.48A	SEP. 24	27.03A	DEC. 23	26.48A	MAR. 22	27.64
JULY 10	24.40A	OCT. 1	26.70A	DEC. 30	26.42A	MAR. 29	27.62
JULY 16	25.84A	OCT. 8	26.20A	JAN. 6, 1952	26.40	APR. 5	27.72
JULY 24	25.81A	OCT. 16	26.15A	JAN. 13	26.34	APR. 12	27.74
JULY 30	26.45A	OCT. 23	26.50A	JAN. 19	26.30	APR. 19	27.77
AUG. 6	26.85A	OCT. 29	26.48A	JAN. 27	26.33	APR. 26	27.72
AUG. 14	26.60A	NOV. 5	26.52A	FEB. 3	26.38	MAY 3	27.48
AUG. 20	26.90A	NOV. 12	25.90A	FEB. 12	26.32	MAY 10	26.92
AUG. 27	26.87A	NOV. 19	26.02A	FEB. 17	26.47	MAY 17	26.40
SEP. 4	27.09A	NOV. 26	26.10A	FEB. 24	26.58	MAY 24	26.21
SEP. 10	27.37A	DEC. 3	26.15A	MAR. 2	26.71	MAY 31	26.42
SEP. 17	27.05A	DEC. 10	26.40A	MAR. 9	26.80	JUNE 7	26.05
SEP. 24	27.11A	DEC. 12	26.73A	MAR. 16	26.72	JUNE 14	25.62
OCT. 1	27.09A	JAN. 1, 1951	26.10A	MAR. 23	26.58	JUNE 21	25.12
OCT. 8	26.96A	JAN. 7	25.82A	MAR. 30	26.68	JUNE 28	25.08
OCT. 15	27.12A	JAN. 14	25.69A	APR. 6	26.71	JULY 6	25.12
OCT. 22	26.60A	JAN. 21	25.60A	APR. 13	26.73	JULY 12	25.18
OCT. 29	26.58A	JAN. 28	25.70A	APR. 20	26.80	JULY 19	25.22
NOV. 5	26.56A	FEB. 4	25.67A	APR. 27	26.76	JULY 27	26.30
NOV. 14	26.55A	FEB. 11	25.70A	MAY 4	26.72	AUG. 2	26.60
NOV. 20	26.44A	FEB. 18	25.55A	MAY 11	26.63	AUG. 9	26.92
NOV. 27	26.32A	FEB. 25	25.57A	MAY 18	26.51	AUG. 16	27.03
DEC. 3	25.43A	MAR. 4	25.62A	MAY 25	26.52	AUG. 23	27.05
DEC. 11	25.17A	MAR. 11	25.84A	JUNE 2	25.80	AUG. 30	27.20
DEC. 17	25.52A	MAR. 18	26.03A	JUNE 8	25.84	SEP. 6	27.32
DEC. 25	25.10A	MAR. 25	26.06A	JUNE 15	25.90	SEP. 13	27.58
JAN. 1, 1950	24.75A	APR. 1	26.10A	JUNE 22	24.02	SEP. 20	27.60
JAN. 8	25.10A	APR. 8	26.15A	JUNE 29	24.10	SEP. 27	27.62
JAN. 15	25.32A	APR. 16	26.01A	JULY 6	24.02	OCT. 4	27.65
JAN. 22	25.60A	APR. 22	25.78A	JULY 13	26.21	OCT. 11	27.66
JAN. 29	25.51A	APR. 29	25.50A	JULY 20	26.76	OCT. 18	27.65
FEB. 5	25.44A	MAY 6	25.45A	JULY 27	26.88	OCT. 25	27.62
FEB. 12	25.40A	MAY 13	23.97A	AUG. 3	26.63	FEB. 28, 1954	27.56
FEB. 19	25.28A	MAY 20	22.40A	AUG. 10	27.12	MAR. 7	27.59
FEB. 26	25.27A	MAY 27	21.90A	AUG. 18	27.28	MAR. 14	27.30
MAR. 5	25.40A	JUNE 3	22.52	AUG. 24	27.49	MAR. 21	27.15
MAR. 12	25.70A	JUNE 10	22.67	AUG. 31	27.20	MAR. 28	27.25
MAR. 26	25.71A	JUNE 17	22.84	SEP. 7	27.10	APR. 4	27.26
APR. 2	26.18A	JUNE 24	23.02	SEP. 14	27.05	APR. 11	27.25
APR. 9	26.32A	JULY 1	23.65	SEP. 21	27.10	APR. 18	27.35
APR. 10	28.98A	JULY 8	23.82	SEP. 29	27.21	APR. 25	27.33
APR. 16	25.97A	JULY 15	24.10	OCT. 5	27.42	MAY 2	27.27
APR. 23	25.93A	JULY 22	24.38	OCT. 12	27.31	MAY 9	27.29
APR. 30	26.00A	JULY 29	24.82	OCT. 19	27.46	MAY 16	27.25
APR. 30	26.00A	AUG. 5	25.52	OCT. 27	27.54	MAY 24	25.55
MAY 7	26.47	AUG. 12	26.10	NOV. 2	27.43	MAY 31	25.35
MAY 14	25.95A	AUG. 19	26.50	NOV. 9	27.40	JUNE 6	25.07
MAY 21	25.08	AUG. 20	27.53	NOV. 17	27.38	JUNE 13	24.93
MAY 28	25.00A	AUG. 26	27.01	NOV. 24	27.40	JUNE 20	24.75
JUNE 4	25.71	SEP. 1	26.98A	NOV. 30	27.42	JUNE 27	24.66
JUNE 11	23.46A	SEP. 9	26.74A	DEC. 7	27.50	JULY 5	24.85
JUNE 18	20.00	SEP. 16	26.85A	DEC. 14	27.53	JULY 11	25.37
JUNE 25	19.50A	SEP. 23	26.92A	DEC. 22	27.54	JULY 18	25.75
JULY 2	20.69A	SEP. 30	26.95A	DEC. 28	27.62	JULY 25	26.15

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DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
AUG. 3, 1954	26.36	DEC. 3, 1955	19.54A	MAR. 2, 1957	27.38	JUNE 2, 1958	19.95A
AUG. 8	26.48	DEC. 10	19.72A	MAR. 10	27.74A	AUG. 26	30.63A
AUG. 15	26.50	DEC. 17	19.88A	MAR. 16	28.07A	DEC. 20	28.68A
AUG. 22	26.55	DEC. 24	19.90A	MAR. 23	28.13A	MAR. 2, 1959	28.65A
AUG. 29	26.58	DEC. 31	19.59A	MAR. 26	28.04A	APR. 28	29.07A
SEP. 5	26.54	JAN. 7, 1956	26.22A	APR. 6	28.14A	JUNE 27	23.00A
SEP. 12	26.51	JAN. 14	26.40A	APR. 12	28.27A	AUG. 29	30.30A
SEP. 19	26.54	JAN. 21	26.55A	APR. 19	28.53A	NOV. 1	28.37A
SEP. 26	26.54	JAN. 28	26.55A	APR. 26	28.93A	DEC. 1	28.30A
OCT. 3	26.55	FEB. 4	26.67A	MAY 3	28.31A	JAN. 26, 1960	28.94A
OCT. 10	26.57	FEB. 11	26.60A	MAY 10	27.64A	APR. 1	29.69A
OCT. 17	26.56	FEB. 18	26.73A	MAY 17	26.15	MAY 26	28.78A
OCT. 21	26.55	FEB. 25	27.34A	MAY 24	24.35A	JULY 21	31.59A
NOV. 28	26.53	MAR. 3	27.58A	MAY 31	24.97A	SEP. 27	31.67A
DEC. 5	26.58	MAR. 10	27.75A	JUNE 7	25.30A	NOV. 28	32.58A
DEC. 12	26.54	MAR. 17	27.87A	JUNE 14	25.36A	JAN. 23, 1961	30.42A
DEC. 19	26.51	MAR. 24	27.80A	JUNE 21	26.69A	MAR. 27	30.33A
DEC. 26	26.53	MAR. 31	27.67A	JUNE 28	27.64A	JULY 24	29.50A
JAN. 2, 1955	26.56	APR. 7	27.76A	JULY 5	27.20A	SEP. 28	31.55A
JAN. 9	26.54	APR. 14	28.41A	JULY 12	27.67A	NOV. 28	29.29A
JAN. 16	26.58	APR. 21	28.63A	JULY 19	28.66	JAN. 30, 1962	28.72A
JAN. 23	26.61	APR. 28	27.26A	JULY 26	28.89A	MAR. 28	29.49A
JAN. 30	26.57	MAY 5	28.27A	AUG. 2	28.84	MAY 28	29.23A
FEB. 6	26.60	MAY 12	28.17A	AUG. 9	28.77A	JULY 24	30.11A
FEB. 13	26.65	MAY 19	27.81A	AUG. 16	29.41	SEP. 21	30.96A
FEB. 20	26.65	MAY 26	23.88A	AUG. 23	29.13A	NOV. 28	29.47A
MAR. 6	26.69	JUNE 2	23.43A	AUG. 30	29.90A	JAN. 25, 1963	29.93A
MAR. 12	22.58A	JUNE 9	23.48A	SEP. 6	29.79A	MAR. 29	29.67A
MAR. 19	27.68A	JUNE 16	24.00A	SEP. 13	29.90A	MAY 30	31.20A
MAR. 26	27.74	JUNE 23	25.04A	SEP. 20	29.91A	JULY 23	31.33A
APR. 2	27.87	JUNE 30	25.55A	SEP. 27	29.59A	SEP. 24	30.88A
APR. 9	27.92	JULY 7	24.75A	OCT. 5	28.93A	NOV. 18	30.20A
APR. 16	27.96	JULY 14	26.42A	OCT. 11	28.67A	JAN. 21, 1964	28.63A
APR. 23	28.02	JULY 21	27.42A	OCT. 18	28.81A	MAR. 26	28.11A
APR. 30	28.19	JULY 28	27.79A	OCT. 25	28.87A	MAY 19	28.14A
MAY 7	28.32	AUG. 4	28.08A	NOV. 1	28.54A	JULY 29	28.26A
MAY 19	28.29A	AUG. 11	28.51A	NOV. 8	28.38A	OCT. 2	29.07A
MAY 21	28.24A	AUG. 18	28.44A	NOV. 16	28.44A	NOV. 12	28.41A
MAY 28	28.26A	AUG. 25	28.32A	NOV. 23	28.81A	DEC. 11	28.82A
JUNE 4	27.88A	SEP. 1	28.70A	NOV. 30	28.51A	JAN. 12, 1965	29.95
JUNE 11	27.47A	SEP. 8	28.87A	DEC. 6	28.53	FEB. 23	30.08A
JUNE 18	25.48A	SEP. 15	28.92	DEC. 13	28.54A	APR. 6	28.61A
JUNE 25	25.21A	SEP. 22	28.67A	DEC. 20	28.50A	MAY 18	29.15A
JULY 2	23.97A	SEP. 29	28.37A	DEC. 27	28.85A	JUNE 19	31.15A
JULY 9	25.89A	OCT. 6	28.45A	JAN. 3, 1958	22.19A	AUG. 3	28.87A
JULY 16	26.34A	OCT. 13	27.99A	JAN. 10	22.24A	SEP. 12	30.43A
JULY 23	27.11	OCT. 20	27.99A	JAN. 17	22.19A	OCT. 27	29.33A
JULY 31	27.86A	OCT. 27	27.98A	JAN. 24	22.19A	DEC. 8	28.64A
AUG. 6	28.19A	NOV. 3	27.89A	FEB. 3	22.18A	JAN. 19, 1966	29.05A
AUG. 13	28.30A	NOV. 10	28.17A	FEB. 7	22.20A	MAR. 2	29.87A
AUG. 20	28.52A	NOV. 17	28.03A	FEB. 14	22.43A	APR. 7	30.41A
AUG. 27	28.84A	NOV. 24	27.91A	FEB. 21	22.17A	MAY 18	30.37A
SEP. 3	28.73A	DEC. 1	28.02A	FEB. 28	22.08	JUNE 25	29.58A
SEP. 10	28.70A	DEC. 8	28.17A	MAR. 7	22.02A	JULY 20	31.20A
SEP. 17	28.15A	DEC. 15	27.91A	MAR. 14	22.05	AUG. 31	31.68A
SEP. 24	28.57A	DEC. 22	28.14A	MAR. 21	22.24	OCT. 4	30.82A
OCT. 1	28.23A	DEC. 29	28.11A	MAR. 28	22.06	NOV. 3	28.72A
OCT. 8	28.22A	JAN. 5, 1957	27.38A	APR. 5	21.99A	DEC. 15	28.59A
OCT. 15	28.17A	JAN. 12	27.31A	APR. 12	22.09A	JAN. 19, 1967	28.20A
OCT. 22	28.15A	JAN. 19	24.20A	APR. 19	22.42A	FEB. 28	28.27A
OCT. 29	27.68A	JAN. 26	26.83A	APR. 26	22.48A	APR. 12	29.55A
NOV. 5	27.42A	FEB. 2	26.86A	MAY 3	22.71A	MAY 17	29.00A
NOV. 12	26.53A	FEB. 10	26.29A	MAY 10	21.93A	JUNE 26	24.29A
NOV. 19	26.08A	FEB. 16	26.89A	MAY 17	22.09A	JULY 27	29.23A
NOV. 26	25.94A	FEB. 23	26.74A	MAY 24	21.31A	AUG. 31	32.05A

34N26E35R01 CITY OF OMAK (CONTINUED)

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT. 2, 1967	31.45A	DEC. 8, 1967	30.17A	FEB. 28, 1968	29.78A	APR. 8, 1968	30.40A
NOV. 9	30.01A	JAN. 17, 1968	29.58A				

36N26E24C01 V LESAMIZ

ALTITUDE OF LAND SURFACE 1050.00 FEET.

HIGHEST WATER LEVEL 0.15 ABOVE LSD, MAR. 11, 1949,
LOWEST WATER LEVEL 35.30 BELOW LSD, AUG. 14, 1942.
RECORDS AVAILABLE 1942-58.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
APR. 8, 1942	18.05	APR. 10, 1948	15.90	JUNE 9, 1952	24.04	APR. 29, 1955	18.32
JUNE 2	23.95	AUG. 14	28.35	AUG. 18	23.88	JUNE 24	18.56
AUG. 14	35.30	OCT. 28	28.66	OCT. 23	23.71	AUG. 21	18.84
OCT. 12	34.85	MAR. 11, 1949 +	.15	DEC. 16	17.92	OCT. 26	19.12
DEC. 17	34.46	JUNE 27	29.45	FEB. 26, 1953	21.59	DEC. 20	18.95
JUNE 7, 1943	33.55	NOV. 19	29.29	MAY 1	21.44	APR. 25, 1956	11.38
DEC. 30	32.94	APR. 9, 1950	28.73	JUNE 21	21.33	OCT. 26	18.00
AUG. 26, 1944	27.86	JUNE 26	27.84	AUG. 26	21.24	APR. 24, 1957	17.94
DEC. 3	28.72	OCT. 3	28.37	OCT. 26	21.08	JUNE 21	18.00
JUNE 17, 1945	23.19	DEC. 12	27.97	DEC. 19	20.72	AUG. 26	18.00
APR. 11, 1946	18.96	MAR. 30, 1951	17.13	FEB. 24, 1954	6.32	OCT. 27	17.68
AUG. 21	29.01	JUNE 18	28.02	APR. 19	19.81	DEC. 19	17.28
FEB. 27, 1947	7.77	AUG. 20	27.17	JUNE 23	19.62	FEB. 26, 1958	13.51
MAY 26	29.65	OCT. 23	26.50	AUG. 30	19.47	APR. 28	18.22
JULY 23	29.45	DEC. 17	24.17	OCT. 25	19.39	JUNE 28	18.01
OCT. 30	29.58	APR. 10, 1952	19.57	DEC. 20	19.80	AUG. 26	18.01
JAN. 14, 1948	28.79						

37N26E10H01 LOY MCDANIEL

ALTITUDE OF LAND SURFACE 1450.00 FEET.

HIGHEST WATER LEVEL 87.30 BELOW LSD, FEB. 25, 1965,
LOWEST WATER LEVEL 99.33 BELOW LSD, SEP. 3, 1970.
RECORDS AVAILABLE 1964-70.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT. 1, 1964	93.39A	JAN. 19, 1966	95.90	MAY 17, 1967	97.60B	OCT. 6, 1969	96.78
NOV. 11	92.26A	MAR. 2	90.75	JUNE 24	97.88C	NOV. 17	95.96
JAN. 15, 1965	88.50	APR. 6	88.83	NOV. 8	97.30	JAN. 6, 1970	95.21
FEB. 25	87.30	JUNE 23	94.78	DEC. 7	96.55	FEB. 26	94.50
APR. 9	90.20	JULY 21	96.45	JAN. 11, 1968	98.80	APR. 2	94.05
MAY 20	90.85A	OCT. 6	96.40	FEB. 28	95.63	MAY 14	96.66C
JUNE 20	90.90A	NOV. 1	95.70	APR. 9	94.54	JULY 22	98.47C
AUG. 3	92.91	DEC. 15	96.40	MAY 16	96.17	SEP. 3	99.33
SEP. 12	89.52	MAR. 1, 1967	93.72	JULY 1, 1969	97.46	OCT. 14	97.97
OCT. 26	88.88	APR. 13	93.05	AUG. 25	98.29	DEC. 2	96.13
DEC. 8	91.00						

37N26E10J01 LOY MCDANIEL

ALTITUDE OF LAND SURFACE 1444.00 FEET.

HIGHEST WATER LEVEL 83.37 BELOW LSD, MAR. 26, 1964,
LOWEST WATER LEVEL 100.36 BELOW LSD, SEP. 3, 1970.
RECORDS AVAILABLE 1963, 19 .

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV. 19, 1963	83.81	APR. 9, 1965	95.67	MAY 16, 1968	98.50C	APR. 2, 1970	94.57
JAN. 21, 1964	83.44	MAY 20	89.50	JULY 1, 1969	97.39C	MAY 14	97.07C
MAR. 26	83.37	JUNE 20	90.92	AUG. 25	98.96C	JULY 22	99.18C
JULY 29	88.27C	SEP. 12	92.17	OCT. 6	96.64	SEP. 3	100.36C
NOV. 11	90.04	OCT. 26	91.45	OCT. 7	96.64	OCT. 14	98.32
DEC. 11	88.89	APR. 6, 1966	90.80	JAN. 6, 1970	95.63	OCT. 29	97.73
JAN. 15, 1965	87.27	MAY 13	95.62	FEB. 26	94.94	DEC. 2	96.82
FEB. 25	87.40						

37N26E14P01 FA MUSTARD

ALTITUDE OF LAND SURFACE 1438.00 FEET.

HIGHEST WATER LEVEL 74.27 BELOW LSD, MAR. 26, 1964,
DRY, WATER LEVEL NOT MEASUREABLE, JULY 21, 1966, AUG. 31, 1966, OCT. 6, 1966, NOV. 1, 1966,
DEC. 15, 1966, JAN. 18, 1967.
RECORDS AVAILABLE 1963-68.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV. 19, 1963	75.33	JUNE 20, 1965	86.90A	JUNE 23, 1966	87.28	MAY 17, 1967	86.17C
JAN. 21, 1964	74.63	AUG. 3	84.40A	JULY 21	D	JUNE 24	91.25C
MAR. 26	74.27	SEP. 12	94.60	AUG. 31	D	JULY 27	92.05A
MAY 20	78.61A	OCT. 25	88.60	OCT. 6	D	AUG. 29	94.74A
OCT. 1	80.22	DEC. 8	88.13	NOV. 1	D	OCT. 5	95.40
NOV. 11	79.29	JAN. 19, 1966	89.90	DEC. 15	D	NOV. 8	94.15
DEC. 11	80.60	MAR. 2	84.35	JAN. 18, 1967	D	DEC. 7	96.85
JAN. 15, 1965	78.46	APR. 6	81.32	MAR. 1	85.94	FEB. 28, 1968	86.80
FEB. 25	78.40	MAY 13	83.69C	APR. 13	85.26	APR. 8	81.21
APR. 9	80.84						

37N26E14P02 BEMAN

NO ALTITUDE OF LAND SURFACE AVAILABLE FOR THIS WELL

HIGHEST WATER LEVEL 87.79 BELOW LSD, FEB. 26, 1970,
LOWEST WATER LEVEL 96.90 BELOW LSD, SEP. 3, 1970.
RECORDS AVAILABLE 19 .

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN. 6, 1970	91.36	APR. 2, 1970	88.83	SEP. 3, 1970	96.90A	DEC. 2, 1970	89.60
FEB. 26	87.79	JULY 22	92.40	OCT. 14	91.35		

37N26E25P01 JE YECKEL

ALTITUDE OF LAND SURFACE 1379.00 FEET.

HIGHEST WATER LEVEL 42.16 BELOW LSD, APR. 6, 1966.
LOWEST WATER LEVEL 91.90 BELOW LSD, MAY 14, 1970.
RECORDS AVAILABLE 1965-70.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC. 8, 1965	48.50	DEC. 15, 1966	51.20	SEP. 19, 1968	58.64	JAN. 6, 1970	56.14
JAN. 19, 1966	43.40	JAN. 18, 1967	50.40	OCT. 30	57.41	FEB. 26	55.04
MAR. 2	42.89	FEB. 1	49.54	DEC. 11	56.45	APR. 2	54.26
APR. 6	42.16	APR. 13	48.90	FEB. 19, 1969	55.63	MAY 14	91.90A
MAY 13	65.26	MAY 17	61.60	JULY 15	63.03	JULY 22	80.38A
JUNE 23	80.53	APR. 9, 1968	52.31	AUG. 25	64.41	SEP. 3	62.19C
JULY 21	55.30	MAY 16	78.03	OCT. 6	59.25	OCT. 14	52.13
AUG. 31	63.50	JUNE 26	86.95	NOV. 17	57.21	OCT. 29	44.53
OCT. 6	58.55	AUG. 5	61.62	NOV. 18	57.21	DEC. 2	49.27
NOV. 1	53.80						

37N26E26J01 PLATEAU ORCHARD

ALTITUDE OF LAND SURFACE 1390.00 FEET.

HIGHEST WATER LEVEL 63.30 BELOW LSD, FEB. 25, 1965.
DRY, WATER LEVEL NOT MEASUREABLE, AUG. 25, 1969.
RECORDS AVAILABLE 1964-70.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JULY 29, 1964	66.73	APR. 6, 1966	68.15	AUG. 29, 1967	87.90	MAY 7, 1969	73.84C
OCT. 1	67.66	MAY 13	70.03	OCT. 5	85.00	JUNE 12	78.49C
NOV. 11	66.39	JUNE 23	75.78	NOV. 8	78.70	JULY 15	78.48C
DEC. 10	66.88	JULY 21	73.33	DEC. 7	85.42	AUG. 25	D
JAN. 15, 1965	64.85	AUG. 31	80.10	JAN. 10, 1968	84.46	OCT. 6	78.87
FEB. 25	63.30	OCT. 6	77.40	FEB. 28	74.37	NOV. 17	77.20
APR. 9	64.54	NOV. 1	73.68	APR. 9	73.52	JAN. 6, 1970	76.05
MAY 20	71.00	DEC. 15	72.77	MAY 16	73.86C	FEB. 26	75.10
JUNE 20	71.99	JAN. 18, 1967	72.08	JUNE 26	81.73	APR. 2	74.41
AUG. 3	70.80	MAR. 1	71.65	AUG. 5	83.94	MAY 14	75.98C
SEP. 12	74.73	APR. 13	71.30	SEP. 19	83.63	JULY 22	79.07
OCT. 25	70.45	MAY 17	72.12C	OCT. 30	80.58	SEP. 3	79.27C
DEC. 8	69.35	JUNE 24	76.03C	DEC. 11	76.72	OCT. 14	76.88
JAN. 19, 1966	68.88	JULY 27	78.78C	APR. 1, 1969	75.17	OCT. 29	83.65
MAR. 2	68.40						

37N26E36D01 PLATEAU ORCHARD

ALTITUDE OF LAND SURFACE 1370.00 FEET.

HIGHEST WATER LEVEL 23.08 BELOW LSD, MAR. 26, 1964.
LOWEST WATER LEVEL 54.58 BELOW LSD, JULY 27, 1967.
RECORDS AVAILABLE 1963-64, 1967-70.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV. 20, 1963	24.29	OCT. 5, 1967	49.15	SEP. 19, 1968	43.44	NOV. 17, 1969	39.71
JAN. 21, 1964	23.52	NOV. 8	41.80	OCT. 30	40.36	JAN. 6, 1970	38.16
MAR. 26	23.08	DEC. 7	39.49	DEC. 11	40.47	FEB. 26	37.02
DEC. 10	44.89	JAN. 11, 1968	38.26	FEB. 19, 1969	37.80	APR. 2	36.08
APR. 13, 1967	33.51	FEB. 28	36.24	MAY 7	35.00C	MAY 14	39.90C
MAY 17	42.10	APR. 9	35.04	JUNE 12	42.70C	JULY 22	45.69C
JUNE 24	46.62	MAY 16	36.71C	JULY 15	49.40C	SEP. 3	45.42C
JULY 27	54.58C	JUNE 26	43.40C	AUG. 25	50.02C	OCT. 14	40.62
AUG. 29	54.03C	AUG. 5	46.43C	OCT. 6	43.17	DEC. 2	37.26

40N27E21K01 OLD CO. FAIRGRD

ALTITUDE OF LAND SURFACE 930.00 FEET.

HIGHEST WATER LEVEL 5.79 BELOW LSD, JULY 31, 1950,
LOWEST WATER LEVEL 20.90 BELOW LSD, MAY 8, 1955.
RECORDS AVAILABLE 1947-56.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
APR. 15, 1947	18.83	AUG. 15, 1950	15.81	MAY 11, 1952	18.67	JUNE 21, 1953	17.62
MAY 6	18.72	AUG. 21	16.10	MAY 18	18.33	JUNE 28	17.45
MAY 13	18.23	AUG. 29	16.14	MAY 25	17.84	JULY 5	17.38
MAY 21	16.65	SEP. 7	16.03	JUNE 1	18.37	JULY 12	17.42
JUNE 5	16.32	SEP. 13	16.14	JUNE 8	17.26	JULY 19	17.22
JUNE 24	17.18	SEP. 18	16.17	JUNE 9	17.19	JULY 26	17.38
JULY 14	16.69	SEP. 27	16.22	JUNE 15	16.97	AUG. 2	16.94
JULY 23	16.67	OCT. 3	15.91	JUNE 22	16.87	AUG. 9	16.85
AUG. 12	16.58	OCT. 12	16.46	JUNE 29	16.67	AUG. 16	16.76
AUG. 27	16.29	OCT. 17	16.23	JULY 6	16.54	AUG. 23	16.93
OCT. 14	16.21	OCT. 24	16.40	JULY 13	16.45	AUG. 30	16.68
NOV. 4	17.19	OCT. 31	16.61	JULY 20	16.45	SEP. 6	16.73
NOV. 20	17.82	NOV. 7	16.93	JULY 27	16.61	SEP. 13	16.67
DEC. 2	18.03	NOV. 18	17.17	AUG. 3	16.45	SEP. 20	17.08
DEC. 15	18.28	NOV. 29	17.44	AUG. 10	16.21	SEP. 27	16.62
DEC. 31	18.30	DEC. 12	17.58	AUG. 17	16.25	OCT. 4	16.74
AUG. 24, 1948	15.48	DEC. 29	18.30	AUG. 18	15.96	OCT. 11	16.90
SEP. 10	16.45	JAN. 12, 1951	18.19	AUG. 24	16.37	OCT. 18	16.92
SEP. 27	16.50	JAN. 19	18.26	AUG. 31	16.41	OCT. 25	17.23
OCT. 20	16.79	JAN. 30	18.47	SEP. 7	16.65	NOV. 1	17.54
NOV. 4	17.39	FEB. 16	18.60	SEP. 14	16.57	NOV. 8	17.78
NOV. 16	18.08	FEB. 27	18.74	SEP. 21	16.64	NOV. 15	17.95
DEC. 6	18.34	MAR. 12	18.80	SEP. 28	16.78	NOV. 22	18.24
JAN. 5, 1949	18.64	MAR. 28	18.91	OCT. 5	16.83	NOV. 29	18.34
JAN. 20	18.96	MAR. 30	18.94	OCT. 12	16.84	DEC. 6	18.17
FEB. 2	19.16	APR. 10	18.96	OCT. 19	16.80	DEC. 13	18.35
FEB. 21	19.35	APR. 24	18.72	OCT. 23	16.53	DEC. 20	18.78
MAR. 11	19.45	MAY 8	18.42	OCT. 26	16.83	DEC. 27	18.98
MAR. 29	19.69	MAY 14	18.74	NOV. 2	17.20	JAN. 3, 1954	19.00
APR. 13	19.55	MAY 21	17.44	NOV. 9	17.49	JAN. 10	19.06
APR. 26	20.02	JUNE 1	17.02	NOV. 17	16.85	JAN. 17	19.08
MAY 11	19.21	JUNE 8	18.09A	NOV. 23	17.99	JAN. 31	19.40
JUNE 4	17.50	JUNE 12	17.66	NOV. 30	18.19	FEB. 7	19.43
JUNE 27	17.12A	JUNE 18	15.40	DEC. 7	18.29	FEB. 14	19.48
SEP. 1	16.55	JUNE 26	16.25	DEC. 14	18.45	FEB. 21	19.44
SEP. 14	16.70	JULY 5	16.23	DEC. 16	18.25	FEB. 28	19.54
SEP. 26	15.99	JULY 10	16.10	DEC. 21	18.66	MAR. 7	19.65
OCT. 10	17.28	JULY 17	16.11	DEC. 29	18.84	MAR. 21	19.82
OCT. 18	17.23	JULY 25	16.05	JAN. 4, 1953	18.94	MAR. 28	19.92
NOV. 9	17.90	JULY 30	15.96	JAN. 11	18.99	APR. 4	20.02
NOV. 21	18.18	AUG. 7	15.79	JAN. 18	19.18	APR. 11	20.09
FEB. 20, 1950	18.91	AUG. 20	15.79	JAN. 25	19.21	APR. 18	20.18
FEB. 27	19.48	SEP. 4	15.69	FEB. 1	19.32	APR. 25	20.00
MAR. 4	19.06	SEP. 12	15.68	FEB. 8	19.39	MAY 2	20.28
MAR. 25	19.10	SEP. 20	15.72	FEB. 15	19.49	MAY 9	19.65
APR. 1	19.91	SEP. 28	15.71	FEB. 22	19.55	MAY 16	19.65
APR. 10	19.68	OCT. 8	15.89	MAR. 1	19.55	MAY 23	19.33
APR. 12	19.53	OCT. 29	17.04	MAR. 8	19.82	MAY 30	18.85
APR. 18	19.53	NOV. 8	17.24	MAR. 15	19.63	JUNE 6	18.37
APR. 24	19.50	NOV. 23	17.62	MAR. 22	20.01	JUNE 13	18.17
MAY 11	19.03	DEC. 3	17.74	MAR. 29	20.05	JUNE 20	17.90
MAY 23	18.39	DEC. 14	17.98	APR. 5	20.15	JUNE 27	17.76
MAY 29	17.67	DEC. 17	18.07	APR. 12	20.24	JULY 4	17.52
JUNE 5	17.42	FEB. 8, 1952	18.62	APR. 19	20.28	JULY 11	17.23
JUNE 13	17.01	FEB. 16	18.70	APR. 26	20.16	JULY 18	17.07
JULY 7	16.02	APR. 10	19.25	MAY 3	19.62	JULY 25	16.89
JULY 19	16.44	APR. 13	19.35	MAY 10	19.12A	AUG. 1	16.82
JULY 27	15.71	APR. 20	19.30	MAY 31	18.04	AUG. 8	16.79
JULY 31	05.79	APR. 27	19.20	JUNE 7	18.13	AUG. 22	16.45
AUG. 7	15.67	MAY 4	19.10A	JUNE 14	17.78	AUG. 29	16.34

40N27E21K01 OLD CO. FAIRGRD (CONTINUED)

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
SEP. 5, 1954	16.33	JAN. 23, 1955	19.69	JUNE 12, 1955	19.79	NOV. 6, 1955	18.25
SEP. 12	16.32	JAN. 30	19.79	JUNE 19	18.98	NOV. 13	18.24
SEP. 19	16.27	FEB. 6	19.90	JUNE 26	18.41	NOV. 20	18.61
SEP. 26	16.46	FEB. 13	20.02	JULY 3	18.50	NOV. 27	18.78
OCT. 3	16.87	FEB. 20	20.15	JULY 10	18.35	DEC. 4	19.92
OCT. 10	17.11	FEB. 27	20.25	JULY 17	18.27	DEC. 11	19.04
OCT. 17	17.43	MAR. 6	19.61	JULY 24	18.15	DEC. 18	19.23
OCT. 24	17.70	MAR. 13	20.43	JULY 31	18.06	DEC. 27	19.31
OCT. 31	17.99	MAR. 20	20.54	AUG. 7	17.87	JAN. 1, 1956	19.45
NOV. 7	18.17	MAR. 27	20.61	AUG. 14	17.92	JAN. 8	19.27
NOV. 14	18.36	APR. 3	20.66	AUG. 28	17.49	JAN. 15	19.36
NOV. 21	18.50	APR. 10	20.71	SEP. 4	17.17	JAN. 22	19.43
NOV. 28	18.66	APR. 17	20.73	SEP. 11	16.81	JAN. 29	19.41
DEC. 5	18.70	APR. 24	20.78	SEP. 18	16.57	FEB. 5	19.64
DEC. 12	18.85	MAY 1	20.51	SEP. 25	16.68	FEB. 12	19.95
DEC. 19	19.03	MAY 8	20.90	OCT. 2	17.00	FEB. 19	19.91
DEC. 26	19.15	MAY 15	20.78	OCT. 9	17.27	FEB. 26	19.90
JAN. 2, 1955	19.29	MAY 22	20.53	OCT. 16	17.51	MAR. 4	19.63
JAN. 9	19.42	MAY 29	20.38	OCT. 23	17.85	MAR. 11	19.60
JAN. 16	19.57	JUNE 5	20.13	OCT. 30	18.03	MAR. 25	19.65

40N27E27N01 ZOSEL LUMBER CO

ALTITUDE OF LAND SURFACE 920.00 FEET.

HIGHEST WATER LEVEL 3.65 BELOW LSD, JUNE 19, 1950.
LOWEST WATER LEVEL 10.03 BELOW LSD, MAR. 3, 1967.
RECORDS AVAILABLE 1946-70.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
AUG. 21, 1946	7.40	MAR. 15, 1949	7.65	NOV. 14, 1954	7.80	JULY 24, 1961	7.31
SEP. 12	6.46	MAR. 31	7.76	JAN. 16, 1955	7.65	SEP. 28	7.66
OCT. 3	7.27	APR. 5	7.76	MAR. 13	7.82	NOV. 28	7.84
OCT. 16	7.08	APR. 10	7.57	MAY 15	7.72	JAN. 30, 1962	8.30
NOV. 1	7.16	APR. 30	7.17	JULY 17	6.42	MAR. 28	7.93
DEC. 2	6.88	MAY 5	7.05	AUG. 14	7.02	MAY 28	7.58
FEB. 1, 1947	6.81	MAY 15	5.59	SEP. 18	8.42	JULY 24	7.76
FEB. 18	6.08	JUNE 5	5.90	OCT. 16	7.61	SEP. 21	7.87
FEB. 27	6.35	JUNE 15	6.26	NOV. 13	7.32	NOV. 28	7.81
APR. 4	8.18	JULY 5	6.95	DEC. 18	7.67	JAN. 25, 1963	8.00
APR. 15	8.19	JULY 15	7.20	JAN. 15, 1956	7.27	MAR. 28	8.11
MAY 6	7.85	AUG. 15	7.41	FEB. 12	7.90	MAY 30	7.37
MAY 13	7.14	AUG. 31	7.51	MAR. 11	7.02	JULY 23	7.54
MAY 21	7.25	SEP. 15	7.73	APR. 15	7.58	SEP. 24	7.76
MAY 26	7.25	SEP. 27	7.61	MAY 20	6.40	NOV. 18	7.91
JUNE 5	6.88	OCT. 18	7.70	JUNE 17	5.34	JAN. 21, 1964	8.11
JUNE 17	6.83	NOV. 9	7.25	JULY 15	6.32	MAR. 27	8.01
AUG. 27	7.55	NOV. 19	7.60	AUG. 12	7.42	MAY 19	8.05
SEP. 15	7.59	FEB. 20, 1950	7.77	SEP. 16	7.68	JULY 29	7.01
SEP. 29	7.52	FEB. 27	8.46	OCT. 14	7.48	OCT. 1	7.63
OCT. 14	7.68	MAR. 4	8.15	NOV. 11	7.52	NOV. 11	8.22
OCT. 30	7.88	MAR. 25	8.02	DEC. 16	7.30	DEC. 10	8.25
NOV. 4	7.78	APR. 1	8.15	JAN. 13, 1957	8.03	JAN. 13, 1965	8.55
NOV. 20	7.92	APR. 18	7.96	FEB. 17	8.28	FEB. 27	8.36
DEC. 2	7.95	MAY 11	7.93	MAR. 17	8.08	APR. 8	8.12
DEC. 15	7.92	MAY 29	6.82	APR. 14	7.72	MAY 19	7.40
DEC. 31	7.97	JUNE 5	6.76	MAY 12	6.73	JUNE 20	6.46
JAN. 14, 1948	8.46	JUNE 19	3.65	JUNE 16	6.13	AUG. 4	7.99
JAN. 31	8.41	JULY 7	5.93	JULY 14	6.96	SEP. 11	7.96
FEB. 15	8.65	JULY 22	7.37	AUG. 1	7.30	OCT. 25	8.30
FEB. 29	9.36	AUG. 7	7.33	SEP. 15	7.66	DEC. 6	8.41
MAR. 2	9.58	AUG. 29	7.82	OCT. 13	7.69	JAN. 18, 1966	8.20
MAR. 7	8.62	SEP. 7	8.06	NOV. 17	7.72	MAR. 1	8.70
MAR. 15	8.21	SEP. 18	8.09	DEC. 15	7.85	APR. 5	8.16
MAR. 31	8.15	OCT. 3	7.72	JAN. 19, 1958	7.83	JUNE 22	7.78
APR. 5	7.99	OCT. 17	7.76	FEB. 16	7.85	JULY 22	7.72
APR. 11	8.09	NOV. 7	7.56	MAR. 16	7.80	AUG. 29	8.12
APR. 15	8.07	NOV. 18	7.27	APR. 13	7.42	OCT. 5	8.22
APR. 20	7.95	MAR. 30, 1951	7.51	MAY 18	6.97	NOV. 1	8.40
APR. 25	7.87	JUNE 13	6.95	JUNE 15	6.55	DEC. 12	8.12
APR. 30	7.68	AUG. 20	8.40	JULY 7	7.76	JAN. 17, 1967	8.40
MAY 5	7.45	OCT. 23	7.70	AUG. 26	7.94	MAR. 3	10.03
MAY 10	7.43	DEC. 17	7.69	OCT. 19	7.60	APR. 14	8.33
MAY 15	7.44	APR. 10, 1952	7.78	DEC. 20	7.60	MAY 19	7.74
AUG. 14	6.62	JUNE 9	7.21	MAR. 2, 1959	7.55	JUNE 22	5.60
AUG. 30	6.54	AUG. 18	7.55	APR. 28	8.22	AUG. 2	7.38
SEP. 15	6.71	OCT. 23	7.73	JUNE 27	5.05	AUG. 30	7.97
SEP. 30	6.81	DEC. 16	7.93	AUG. 29	7.55	OCT. 5	8.30
OCT. 15	6.86	FEB. 26, 1953	8.11	NOV. 1	7.39	NOV. 9	8.36
OCT. 31	7.06	MAY 1	7.80	DEC. 1	7.37	DEC. 8	8.48
NOV. 15	7.09	JULY 19	6.97	JAN. 26, 1960	8.13	JAN. 9, 1968	8.49
NOV. 30	7.13	SEP. 20	7.52	APR. 1	8.29	FEB. 21	8.12
DEC. 15	7.21	NOV. 15	7.77	MAY 26	7.13	APR. 8	8.44
DEC. 31	7.36	JAN. 17, 1954	8.26	JULY 21	7.59	JUNE 24	7.56
JAN. 15, 1949	7.50	MAR. 21	8.21	SEP. 27	7.82	FEB. 4, 1969	8.02
JAN. 25	7.52	MAY 16	7.70	NOV. 29	7.93	JUNE 10	6.90
FEB. 25	7.52	JULY 18	6.51	JAN. 24, 1961	8.26	JAN. 5, 1970	8.70
MAR. 7	7.35	SEP. 17	7.20	MAR. 27	7.99	JUNE 3	8.29

40N27E28A01 CITY OF OROVILL

ALTITUDE OF LAND SURFACE 918.00 FEET.

HIGHEST WATER LEVEL 2.45 BELOW LSD, JUNE 19, 1950,
LOWEST WATER LEVEL 7.02 BELOW LSD, MAR. 17, 1948.
RECORDS AVAILABLE 1946-51.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
AUG. 21, 1946	4.75	APR. 11, 1948	6.83	FEB. 10, 1950	5.93	OCT. 24, 1950	5.05
SEP. 12	4.28	AUG. 14	3.99	FEB. 27	6.34	OCT. 31	5.12
OCT. 3	4.05	AUG. 23	3.75	MAR. 4	6.17	NOV. 7	5.20
OCT. 16	4.08	SEP. 10	3.50	MAR. 25	6.32	NOV. 18	5.29
NOV. 1	4.12	SEP. 27	3.96	APR. 1	6.46	NOV. 29	5.42
DEC. 2	4.03	OCT. 20	4.17	APR. 12	6.36	DEC. 12	5.51
FEB. 1, 1947	4.08	OCT. 28	5.33	APR. 18	6.32	DEC. 29	6.44
FEB. 18	6.07	NOV. 4	4.46	APR. 24	5.94	JAN. 12, 1951	5.60
FEB. 27	6.44	NOV. 10	4.90	MAY 11	5.66	JAN. 19	5.71
APR. 4	6.37	DEC. 6	5.15	MAY 23	4.93	JAN. 30	6.02
APR. 15	5.83	JAN. 5, 1949	5.14	MAY 29	4.45	FEB. 16	5.97
MAY 6	5.67	JAN. 20	5.32	JUNE 5	4.31	FEB. 27	5.77
MAY 13	4.98	FEB. 2	5.43	JUNE 13	3.55	MAR. 12	5.90
MAY 21	4.73	FEB. 21	5.59	JUNE 19	2.45	APR. 10	4.97
MAY 26	4.54	MAR. 11	5.74	JULY 7	3.02	APR. 24	4.47
JUNE 5	4.24	MAR. 29	6.11	JULY 19	3.87	MAY 8	3.02
JUNE 24	4.24	APR. 13	6.11	JULY 27	4.26	MAY 14	3.22
JULY 14	4.97	APR. 26	5.64	JULY 31	4.32	MAY 21	4.01
JULY 23	5.10	MAY 11	5.07	AUG. 7	4.51	JUNE 1	3.02
AUG. 12	5.03	JUNE 4	3.18	AUG. 15	4.76	JUNE 8	3.10
AUG. 27	4.75	JUNE 27	4.38	AUG. 21	4.97	JUNE 12	3.16
OCT. 14	4.89	SEP. 1	5.50	AUG. 29	4.98	JUNE 26	3.19
OCT. 30	5.24	SEP. 14	6.05	SEP. 7	5.20	JULY 5	3.30
NOV. 4	5.25	SEP. 26	6.35	SEP. 13	5.23	JULY 10	3.38
NOV. 20	5.64	OCT. 10	5.52	SEP. 18	5.20	JULY 17	3.49
DEC. 2	5.81	OCT. 18	5.94	SEP. 27	5.17	JULY 25	3.60
DEC. 15	5.97	NOV. 9	5.74	OCT. 3	5.05	JULY 30	3.67
DEC. 31	6.12	NOV. 19	5.50	OCT. 12	4.91	AUG. 7	3.79
JAN. 14, 1948	6.36	NOV. 21	5.95	OCT. 17	4.89	AUG. 20	4.00
MAR. 17	7.02						

40N27E28G01 OROVILLE UNITED

ALTITUDE OF LAND SURFACE 930.00 FEET.

HIGHEST WATER LEVEL 9.84 BELOW LSD, MAY 13, 1966.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAR. 12, 1951	17.62	NOV. 2, 1952	17.80	DEC. 27, 1953	17.96	FEB. 27, 1955	18.36
MAR. 28	17.51	NOV. 9	17.83	JAN. 3, 1954	17.95	MAR. 6	18.44
APR. 10	17.42	NOV. 17	17.92	JAN. 10	17.92	MAR. 13	18.47
APR. 24	16.80	NOV. 23	17.91	JAN. 17	17.99	MAR. 20	18.51
MAY 8	16.02	NOV. 30	17.96	JAN. 24	17.91	MAR. 27	18.54
MAY 14	14.81	DEC. 7	18.00	JAN. 31	17.88	APR. 3	18.52
MAY 21	14.21	DEC. 14	18.08	FEB. 7	17.88	APR. 10	18.50
JUNE 1	14.00	DEC. 21	18.08	FEB. 14	17.92	APR. 17	18.35
JUNE 8	14.37	DEC. 29	18.13	FEB. 21	17.89	APR. 24	18.40
JUNE 12	14.50	JAN. 4, 1953	18.19	FEB. 28	17.98	MAY 1	18.46
JUNE 18	14.51	JAN. 11	18.15	MAR. 7	18.09	MAY 8	18.48
JUNE 26	14.71	JAN. 18	18.10	MAR. 21	18.21	MAY 15	18.25
JULY 5	15.11	JAN. 25	18.04	MAR. 28	18.28	MAY 22	18.05
JULY 10	15.33	FEB. 1	18.07	APR. 4	18.29	MAY 29	17.34
JULY 17	15.73	FEB. 8	17.99	APR. 11	18.31	JUNE 5	16.98
JULY 25	16.17	FEB. 15	18.02	APR. 18	18.37	JUNE 12	16.15
JULY 30	16.36	FEB. 22	18.14	APR. 22	18.39	JUNE 19	15.40
AUG. 7	16.70	MAR. 1	18.26	MAY 2	18.39	JUNE 26	15.10
AUG. 20	17.00	MAR. 8	18.34	MAY 9	18.26	JULY 3	14.80
SEP. 4	16.69	MAR. 15	18.38	MAY 16	17.33	JULY 10	15.25
SEP. 12	16.81	MAR. 22	18.40	MAY 23	16.80	JULY 17	15.59
SEP. 20	17.09	MAR. 29	18.38	MAY 30	15.41	JULY 24	15.96
SEP. 28	17.15	APR. 5	18.38	JUNE 6	15.25	JULY 31	16.00
OCT. 8	17.00	APR. 12	18.40	JUNE 13	15.22	AUG. 7	16.48
OCT. 29	17.13	APR. 19	18.50	JUNE 20	15.20	AUG. 14	16.89
NOV. 8	17.20	APR. 26	18.29	JUNE 27	15.13	AUG. 28	17.43
NOV. 23	17.26	MAY 3	17.74	JULY 4	14.79	SEP. 4	17.67
DEC. 3	17.26	MAY 10	17.04	JULY 11	14.86	SEP. 11	17.80
DEC. 14	17.38	MAY 17	16.58	JULY 18	15.29	SEP. 18	17.57
FEB. 8, 1952	17.21	MAY 24	15.90	JULY 25	15.60	SEP. 25	17.51
FEB. 16	17.48	MAY 31	15.59	AUG. 1	16.02	OCT. 2	17.59
APR. 13	17.86	JUNE 7	15.41	AUG. 8	16.39	OCT. 9	17.55
APR. 20	17.58	JUNE 14	15.17	AUG. 15	16.68	OCT. 16	17.60
APR. 27	17.17	JUNE 21	15.02	AUG. 22	16.66	OCT. 23	17.66
MAY 4	16.66	JUNE 28	15.32	AUG. 29	16.63	OCT. 30	17.33
MAY 11	16.57	JULY 5	15.62	SEP. 5	16.61	NOV. 6	17.10
MAY 18	16.00	JULY 12	15.91	SEP. 12	16.68	NOV. 13	17.05
MAY 25	15.37	JULY 19	16.27	SEP. 19	16.75	NOV. 20	17.19
JUNE 1	15.21	JULY 26	16.59	SEP. 26	16.73	NOV. 27	17.31
JUNE 8	15.43	AUG. 2	16.94	OCT. 3	16.91	DEC. 4	17.53
JUNE 15	15.39	AUG. 9	17.10	OCT. 10	17.04	DEC. 11	17.62
JUNE 22	15.92	AUG. 16	17.32	OCT. 17	17.19	DEC. 18	17.68
JUNE 29	16.92	AUG. 23	17.35	OCT. 24	17.24	DEC. 27	17.70
JULY 6	15.93	AUG. 30	17.18	OCT. 31	17.35	JAN. 1, 1956	17.70
JULY 13	16.39	SEP. 6	17.28	NOV. 7	17.42	JAN. 8	17.55
JULY 20	16.69	SEP. 13	17.40	NOV. 14	17.39	JAN. 15	17.54
JULY 27	16.85	SEP. 20	17.43	NOV. 21	17.39	JAN. 22	17.65
AUG. 3	17.11	SEP. 27	17.55	NOV. 28	17.13	JAN. 29	17.58
AUG. 10	17.21	OCT. 4	17.41	DEC. 5	17.26	FEB. 5	17.65
AUG. 17	17.27	OCT. 11	17.50	DEC. 12	17.30	FEB. 12	17.77
AUG. 24	17.28	OCT. 18	17.55	DEC. 19	17.41	FEB. 19	17.81
AUG. 31	17.30	OCT. 25	17.65	DEC. 26	17.49	FEB. 26	17.89
SEP. 7	17.29	NOV. 1	17.75	JAN. 2, 1955	17.60	MAR. 4	17.50
SEP. 14	17.20	NOV. 8	17.74	JAN. 9	17.71	MAR. 11	17.55
SEP. 21	17.34	NOV. 15	17.76	JAN. 16	17.74	MAR. 25	17.62
SEP. 28	17.42	NOV. 22	17.81	JAN. 23	17.92	APR. 1	17.75
OCT. 5	17.44	NOV. 29	17.83	JAN. 30	18.00	APR. 8	17.86
OCT. 12	17.50	DEC. 6	17.85	FEB. 6	18.12	APR. 15	17.92
OCT. 19	17.66	DEC. 13	17.85	FEB. 13	18.20	APR. 22	17.72
OCT. 26	17.70	DEC. 20	17.99	FEB. 20	18.30	APR. 29	17.00

40N27E28G01 OROVILLE UNITED (CONTINUED)

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAY 6, 1956	16.78	MAR. 26, 1957	18.04	FEB. 23, 1958	18.05	SEP. 21, 1962	17.69
MAY 13	16.52	APR. 7	18.03	MAR. 2	17.69	JAN. 25, 1963	18.22
MAY 20	16.11	APR. 14	18.00	MAR. 9	17.68	MAR. 28	18.44
MAY 27	14.40	APR. 21	17.92	MAR. 16	17.81	MAY 30	17.05
JUNE 3	14.00	APR. 24	17.89	MAR. 23	17.89	JULY 23	17.43
JUNE 10	13.85	APR. 28	17.89	MAR. 30	17.86	SEP. 24	17.59
JUNE 17	14.22	MAY 5	17.52	APR. 6	17.67	NOV. 18	18.09
JUNE 24	14.60	MAY 12	16.55	APR. 13	17.66	JAN. 21, 1964	18.11
JULY 1	15.18	MAY 19	15.45	APR. 20	17.53	MAR. 26	18.68
JULY 8	15.56	MAY 26	14.39	APR. 27	17.40	MAY 19	18.08
JULY 15	15.73	JUNE 2	14.54	MAY 4	17.35	JULY 29	16.73
JULY 22	16.11	JUNE 9	14.64	MAY 11	17.28	OCT. 1	17.61
JULY 29	16.56	JUNE 16	15.00	MAY 18	16.57	NOV. 11	10.59
AUG. 5	17.15	JUNE 23	15.50	MAY 25	16.04	JAN. 13, 1965	11.81J
AUG. 12	17.29	JUNE 30	16.26	JUNE 1	15.51	FEB. 27	11.89J
AUG. 19	17.38	JULY 7	16.37	JUNE 8	15.55	APR. 8	11.79J
AUG. 26	17.57	JULY 14	16.95	JUNE 15	15.64	MAY 19	12.60J
SEP. 2	17.62	JULY 21	16.96	JUNE 22	16.24	JUNE 21	15.85
SEP. 9	17.77	JULY 28	17.30	JUNE 29	16.45	AUG. 4	18.04
SEP. 16	17.75	AUG. 1	17.15	JULY 7	16.79	AUG. 11	12.80J
SEP. 23	17.64	AUG. 31	17.76	AUG. 26	18.29	OCT. 25	10.94J
SEP. 30	17.56	SEP. 8	17.61	OCT. 19	17.63	DEC. 6	12.10J
OCT. 7	17.50	SEP. 15	17.69	DEC. 20	17.53	JAN. 18, 1966	10.50J
OCT. 14	17.56	SEP. 22	17.74	MAR. 2, 1959	17.78	MAR. 1	10.30J
OCT. 21	17.52	SEP. 29	17.94	APR. 1	17.78	APR. 5	10.30J
OCT. 28	17.50	OCT. 6	17.63	APR. 28	17.33	MAY 13	9.84J
NOV. 4	17.55	OCT. 13	17.70	JUNE 27	14.07	JUNE 22	18.14
NOV. 11	17.56	OCT. 20	17.77	AUG. 29	17.28	JULY 22	18.24
NOV. 18	17.59	OCT. 27	18.03	NOV. 1	16.87	AUG. 29	12.70J
NOV. 25	17.65	NOV. 3	17.86	DEC. 1	16.96	OCT. 5	10.50J
DEC. 2	17.82	NOV. 10	17.95	JAN. 26, 1960	17.65	NOV. 1	10.70J
DEC. 9	17.87	NOV. 17	17.97	APR. 1	18.18	DEC. 12	11.10J
DEC. 16	17.86	NOV. 24	18.02	MAY 26	16.45	JAN. 17, 1967	11.50J
DEC. 23	17.71	DEC. 1	17.94	JULY 21	17.60	MAR. 3	12.00J
DEC. 30	17.77	DEC. 8	18.06	SEP. 27	17.65	APR. 14	11.70J
JAN. 6, 1957	17.90	DEC. 15	18.12	NOV. 29	18.06	MAY 19	11.60J
JAN. 13	17.95	DEC. 22	18.16	JAN. 24, 1961	18.11	JUNE 22	11.60J
JAN. 20	18.04	DEC. 29	18.29	MAR. 27	18.31	AUG. 2	11.80
JAN. 27	18.07	JAN. 5, 1958	18.18	JULY 24	17.52	AUG. 30	11.70J
FEB. 3	18.11	JAN. 12	18.19	SEP. 28	17.42	OCT. 5	11.70J
FEB. 10	18.13	JAN. 19	18.08	NOV. 28	18.08	NOV. 9	11.60J
FEB. 17	18.17	JAN. 26	18.22	JAN. 30, 1962	18.44	DEC. 8	11.50
FEB. 24	18.21	FEB. 2	18.06	MAR. 28	18.34	JAN. 9, 1968	14.10J
MAR. 3	17.95	FEB. 9	18.06	MAY 28	16.94	FEB. 21	12.85J
MAR. 10	18.02	FEB. 16	18.06	JULY 24	17.82	APR. 8	14.08J
MAR. 17	18.08						

40N27E28G02 NE PETRY

ALTITUDE OF LAND SURFACE 940.00 FEET.

HIGHEST WATER LEVEL 4.90 BELOW LSD, JUNE 3, 1949,
LOWEST WATER LEVEL 10.36 BELOW LSD, JULY 23, 1947.
RECORDS AVAILABLE 1946-50.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC. 28, 1946	9.25	APR. 28, 1947	9.42	MAY 16, 1947	8.34	JULY 23, 1947	10.36A
FEB. 7, 1947	9.67	APR. 29	9.42	MAY 17	8.29	AUG. 12	9.32
FEB. 22	9.20	APR. 30	9.34	MAY 18	8.24	AUG. 22	9.22
MAR. 15	9.81	MAY 1	9.44	MAY 19	8.24	SEP. 5	9.24
APR. 4	9.72	MAY 2	9.54	MAY 20	8.24	OCT. 30	9.39
APR. 8	9.90	MAY 3	9.54	MAY 21	8.27	JAN. 14, 1948	10.00
APR. 13	9.50	MAY 4	9.44	MAY 24	8.24	MAR. 11, 1949	9.21
APR. 16	9.85	MAY 5	9.34	MAY 26	9.26A	APR. 20	10.14
APR. 17	9.84	MAY 6	9.09	JUNE 3	8.04	MAY 27	7.97
APR. 18	9.83	MAY 7	9.04	JUNE 9	7.84	MAY 28	7.77
APR. 19	9.82	MAY 8	8.94	JUNE 14	7.84	MAY 29	7.44
APR. 20	9.80	MAY 9	8.84	JUNE 25	8.34	MAY 30	6.84
APR. 21	9.72	MAY 10	8.74	JUNE 28	8.34	MAY 31	6.34
APR. 22	9.65	MAY 11	8.64	JULY 5	8.64	JUNE 1	5.94
APR. 23	9.55	MAY 12	8.59	JULY 7	8.69	JUNE 2	5.20
APR. 24	9.49	MAY 13	8.49	JULY 10	8.84	JUNE 3	4.90
APR. 25	9.49	MAY 14	8.42	JULY 17	9.14	JUNE 27	7.92
APR. 26	9.44	MAY 15	8.34	JULY 22	9.24	APR. 10, 1950	9.79
APR. 27	9.42						

40N27E28L01 CITY OF OROVILLE

ALTITUDE OF LAND SURFACE 925.00 FEET.

HIGHEST WATER LEVEL 13.34 BELOW LSD, JUNE 3, 1956,
LOWEST WATER LEVEL 26.88 BELOW LSD, SEP. 21, 1962.
RECORDS AVAILABLE 1941-68.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
AUG. 5, 1941	17.26	JULY 7, 1950	18.34	MAY 25, 1952	19.04A	JUNE 21, 1953	15.17
OCT. 6	16.43	JULY 19	21.77	JUNE 1	15.53	JUNE 28	18.84A
DEC. 5	16.61	JULY 27	23.21A	JUNE 8	17.23	JULY 5	19.90A
FEB. 9, 1942	17.05	JULY 31	20.12	JUNE 9	22.06A	JULY 12	22.59A
APR. 8	19.29A	AUG. 7	20.75	JUNE 15	19.85A	JULY 19	22.17A
JUNE 2	15.91A	AUG. 14	21.22	JUNE 22	19.05A	JULY 26	20.20A
AUG. 14	20.43A	AUG. 21	21.38	JUNE 29	15.92	AUG. 2	19.14A
OCT. 12	18.62A	AUG. 29	21.46	JULY 6	20.10A	AUG. 9	21.35A
DEC. 17	18.89A	SEP. 7	21.77	JULY 13	20.39A	AUG. 16	23.09A
JUNE 7, 1943	15.71	SEP. 13	22.26	JULY 20	18.52A	AUG. 23	19.30A
DEC. 30	20.00A	SEP. 18	18.78	JULY 27	24.56A	AUG. 30	17.27
AUG. 26, 1944	21.89A	SEP. 27	20.49	AUG. 3	24.68A	SEP. 6	21.82A
DEC. 3	18.31	OCT. 12	21.62	AUG. 10	22.31A	SEP. 13	21.98A
JUNE 17, 1945	18.20A	OCT. 17	17.73	AUG. 17	24.35A	SEP. 20	18.27
APR. 11, 1946	17.82	OCT. 24	21.98	AUG. 18	23.53A	SEP. 27	17.71
AUG. 21	17.61	OCT. 31	17.42	AUG. 24	21.19A	OCT. 4	19.32
FEB. 27, 1947	17.98	NOV. 7	21.78	AUG. 31	21.67A	OCT. 11	21.56A
MAY 26	20.04A	NOV. 18	21.81	SEP. 7	20.83A	OCT. 18	17.57
JULY 23	24.21A	NOV. 29	21.99	SEP. 14	17.62	OCT. 25	18.23
JAN. 14, 1948	19.93A	DEC. 29	22.73	SEP. 21	21.14A	NOV. 1	20.19A
APR. 10	20.09A	JAN. 12, 1951	17.36	SEP. 28	21.77A	NOV. 8	21.77A
AUG. 14	19.40A	JAN. 19	18.71	OCT. 5	18.22	NOV. 15	19.72A
SEP. 10	19.77A	FEB. 16	18.80	OCT. 12	22.15A	NOV. 22	22.38A
SEP. 27	20.10A	FEB. 27	18.88	OCT. 19	18.09	NOV. 29	17.86
OCT. 20	20.28A	MAR. 12	19.21	OCT. 23	22.11A	DEC. 6	21.54A
OCT. 28	17.28	MAR. 28	18.92	OCT. 26	17.95	DEC. 13	22.36A
NOV. 6	20.88	APR. 10	18.50	NOV. 2	18.06	DEC. 20	17.88
NOV. 16	21.50	APR. 24	18.37A	NOV. 9	18.95A	DEC. 27	17.98
DEC. 6	21.45A	MAY 8	19.30A	NOV. 17	22.35A	MAY 2, 1954	18.77
FEB. 2, 1949	17.20	MAY 14	18.38A	NOV. 23	18.29	MAY 9	20.55A
FEB. 21	17.35	MAY 21	17.62A	NOV. 30	22.18A	MAY 16	21.32A
MAR. 11	18.99	JUNE 1	17.85A	DEC. 7	18.88	MAY 23	20.23A
MAR. 29	19.26A	JUNE 8	14.33	DEC. 14	20.94A	MAY 30	19.30A
APR. 13	19.06A	JUNE 12	18.08A	DEC. 16	18.46A	JUNE 6	15.02
APR. 26	18.60	JUNE 28	16.79A	DEC. 21	22.22A	JUNE 13	18.88A
MAY 11	20.34	JULY 5	14.47	DEC. 29	21.91	JUNE 20	19.38A
JUNE 4	19.11	JULY 10	25.30A	JAN. 4, 1953	18.97	JUNE 27	15.36
JUNE 27	19.24A	JULY 17	26.30A	JAN. 11	18.54	JULY 4	14.52
SEP. 1	22.75	JULY 25	24.79A	JAN. 18	19.03A	JULY 11	18.71A
SEP. 14	22.75	JULY 30	20.93A	JAN. 25	18.75A	JULY 18	21.89A
SEP. 26	22.62	AUG. 7	25.33A	FEB. 1	19.33A	JULY 25	19.92A
OCT. 10	22.95	AUG. 20	21.76A	FEB. 8	18.14A	AUG. 1	17.53
OCT. 18	22.80	SEP. 4	22.65A	FEB. 15	18.10	AUG. 8	17.49
NOV. 10	21.08	SEP. 12	19.00	FEB. 22	19.83A	AUG. 22	17.64
NOV. 21	17.65	SEP. 20	21.94A	MAR. 1	20.19A	AUG. 29	16.61
FEB. 20, 1950	18.89	SEP. 28	22.95A	MAR. 8	19.92A	SEP. 5	16.81
FEB. 27	19.29	OCT. 8	21.89A	MAR. 15	18.53	SEP. 12	16.98
MAR. 4	19.22	OCT. 29	23.12A	MAR. 22	18.76	SEP. 19	20.37A
MAR. 25	19.63	NOV. 8	23.36A	MAR. 29	20.07A	SEP. 26	16.75
APR. 1	19.70	NOV. 23	22.51A	APR. 5	19.62A	OCT. 3	16.90
APR. 10	19.45	DEC. 3	20.04A	APR. 12	18.49A	OCT. 10	20.53A
APR. 12	19.32	DEC. 14	20.96A	APR. 19	20.32A	OCT. 17	17.97
APR. 18	19.58	FEB. 8, 1952	20.84A	APR. 26	20.02A	OCT. 24	17.47
APR. 24	19.36	FEB. 16	21.13A	MAY 3	18.64	OCT. 31	17.34
MAY 11	21.95	APR. 13	18.81A	MAY 10	20.37A	NOV. 7	17.41
MAY 23	20.51	APR. 20	17.70	MAY 17	16.50	NOV. 14	18.12A
MAY 29	19.56	APR. 27	18.43A	MAY 24	16.30	NOV. 21	20.10A
JUNE 5	19.02	MAY 4	18.02A	MAY 31	15.54	NOV. 28	16.96
JUNE 13	17.40	MAY 11	20.10A	JUNE 7	15.21	DEC. 5	17.02
JUNE 19	16.30	MAY 18	15.51	JUNE 14	14.92	DEC. 12	17.10

40N27E28L01 CITY OF OROVILLE (CONTINUED)

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC. 19, 1954	17.22	MAR. 25, 1956	17.77	JUNE 9, 1957	14.54	NOV. 1, 1959	20.68A
DEC. 26	17.48	APR. 1	19.77A	JUNE 16	14.94	JAN. 26, 1960	21.17A
JAN. 2, 1955	17.40	APR. 8	17.96	JUNE 23	16.53	APR. 1	18.27
JAN. 9	17.50	APR. 15	19.57A	JUNE 30	16.45	MAY 26	21.01A
JAN. 16	17.60	APR. 22	21.45A	JULY 7	20.71A	JULY 21	21.87A
JAN. 23	17.78	APR. 29	17.30	JULY 14	18.96A	SEP. 27	20.07A
JAN. 30	17.90	MAY 6	16.85	JULY 21	20.45A	NOV. 29	22.32A
FEB. 6	17.90	MAY 13	16.43	JULY 28	20.86A	JAN. 24, 1961	18.55
FEB. 13	18.06	MAY 20	16.80	AUG. 1	21.13A	MAR. 27	18.87
FEB. 20	19.85A	MAY 27	17.90A	AUG. 31	22.30A	JULY 24	21.87
FEB. 27	18.23	JUNE 3	13.34	SEP. 8	22.00A	SEP. 28	22.70A
MAR. 6	18.36	JUNE 10	13.62	SEP. 15	22.38A	NOV. 28	18.63
MAR. 13	18.56	JUNE 17	14.07	SEP. 22	20.74A	JAN. 30, 1962	18.57
MAR. 20	19.78A	JUNE 24	14.67	SEP. 29	18.20	MAR. 28	18.70
MAR. 27	19.56A	JULY 1	15.27	OCT. 6	22.59A	MAY 28	21.25A
APR. 3	19.52A	JULY 8	19.25A	OCT. 13	19.50A	JULY 24	25.65
APR. 10	18.63	JULY 15	19.30A	OCT. 20	20.06A	SEP. 21	26.88A
APR. 17	18.87A	JULY 22	20.29A	OCT. 27	20.15A	NOV. 28	20.01A
APR. 24	18.94A	JULY 29	20.63A	NOV. 3	18.51	JAN. 25, 1963	22.57A
MAY 1	20.53	AUG. 5	17.28	NOV. 10	20.68A	MAR. 28	20.72
MAY 8	18.53	AUG. 12	17.75	NOV. 17	21.69A	MAY 30	25.16A
MAY 15	18.37	AUG. 19	17.58	NOV. 24	20.23A	JULY 23	25.34A
MAY 22	19.37A	AUG. 26	21.30A	DEC. 1	21.85A	SEP. 24	24.02A
MAY 29	20.99A	SEP. 2	18.38	DEC. 8	19.73A	NOV. 18	19.60
JUNE 5	20.33A	SEP. 9	20.61A	DEC. 15	20.27A	JAN. 21, 1964	19.31
JUNE 12	18.01A	SEP. 16	18.10	DEC. 22	22.70A	MAR. 26	22.89A
JUNE 19	14.50	SEP. 23	21.91A	DEC. 29	18.89	MAY 19	23.19A
JUNE 26	17.62A	SEP. 30	22.24A	JAN. 5, 1958	21.47A	JULY 29	21.45A
JULY 3	18.19A	OCT. 7	17.80	JAN. 12	18.40	OCT. 1	22.53A
JULY 10	15.22	OCT. 14	17.87	JAN. 19	18.21	NOV. 11	18.56
JULY 17	18.58A	OCT. 21	18.00	JAN. 26	18.21	DEC. 10	22.89A
JULY 24	17.76A	OCT. 28	17.80	FEB. 2	21.90A	JAN. 13, 1965	18.97
JULY 31	15.88	NOV. 4	18.26	FEB. 9	18.23	FEB. 27	22.82A
AUG. 7	18.95A	NOV. 11	18.25	FEB. 16	18.18	APR. 8	23.07
AUG. 14	20.98A	NOV. 18	17.85	FEB. 23	18.34	MAY 19	22.00A
AUG. 28	21.70A	NOV. 25	17.87	MAR. 2	17.99	JUNE 21	19.88A
SEP. 4	25.80A	DEC. 2	18.03	MAR. 9	17.96	AUG. 4	22.59A
SEP. 11	20.27A	DEC. 9	18.50	MAR. 16	18.38	SEP. 11	23.45A
SEP. 18	17.86	DEC. 16	21.63A	MAR. 23	18.13	OCT. 25	19.06
SEP. 25	18.00	DEC. 23	18.00	MAR. 30	18.10	DEC. 6	23.55A
OCT. 2	17.75	DEC. 30	21.32A	APR. 6	21.35A	JAN. 18, 1966	23.13A
OCT. 9	19.14A	JAN. 6, 1957	18.00	APR. 13	17.98	MAR. 1	19.64
OCT. 16	18.19	JAN. 13	18.17	APR. 20	17.80	APR. 5	23.78A
OCT. 23	21.06	JAN. 20	18.37	APR. 27	18.00	MAY 13	22.52A
OCT. 30	21.44A	JAN. 27	18.20	MAY 4	21.00A	JUNE 22	22.10A
NOV. 6	21.13A	FEB. 3	18.18	MAY 11	20.84A	JULY 22	23.06
NOV. 13	21.00A	FEB. 10	21.90A	MAY 18	19.26A	AUG. 29	19.23
NOV. 20	17.49	FEB. 17	18.28	MAY 25	22.04A	OCT. 5	23.04A
NOV. 27	21.47A	FEB. 24	18.46	JUNE 1	15.48	NOV. 1	19.04
DEC. 4	21.55	MAR. 3	18.06	JUNE 8	18.45A	DEC. 12	23.82A
DEC. 11	17.70	MAR. 10	17.27	JUNE 15	15.68	JAN. 17, 1967	21.27A
DEC. 18	21.70	MAR. 17	19.82A	JUNE 22	18.33A	MAR. 3	23.92A
DEC. 27	17.78	MAR. 26	18.22	JUNE 29	19.52A	APR. 14	23.93A
JAN. 1, 1956	17.85	APR. 7	19.83	JULY 7	18.66A	MAY 19	23.29A
JAN. 8	21.52A	APR. 14	18.22	AUG. 24	20.74A	JUNE 22	18.30A
JAN. 15	21.67A	APR. 21	19.45A	AUG. 26	26.73A	AUG. 2	22.10A
JAN. 22	21.39A	APR. 24	19.77	OCT. 19	19.45	AUG. 30	23.49A
JAN. 29	21.48A	APR. 28	18.04	DEC. 20	21.75A	OCT. 5	23.94A
FEB. 5	21.16A	MAY 5	17.65	MAR. 2, 1959	21.18A	NOV. 9	23.15
FEB. 12	17.82	MAY 12	16.27	APR. 26	17.45	DEC. 8	23.94A
FEB. 19	18.20	MAY 19	17.43A	APR. 28	21.44A	JAN. 9, 1968	18.98
FEB. 26	17.85	MAY 26	14.15	JUNE 27	20.04A	FEB. 21	22.54
MAR. 4	17.85	JUNE 2	16.65A	AUG. 29	17.51	APR. 8	19.28
MAR. 11	17.94						

40N27E33B01 CHRISTIANSON

ALTITUDE OF LAND SURFACE 950.00 FEET.

HIGHEST WATER LEVEL 4.41 BELOW LSD, JUNE 19, 1948,
LOWEST WATER LEVEL 11.93 BELOW LSD, APR. 11, 1948.
RECORDS AVAILABLE 1946-51.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
AUG. 21, 1946	10.88	OCT. 14, 1947	11.04	JAN. 5, 1949	10.28	MAR. 25, 1950	11.03
SEP. 12	11.02	OCT. 30	10.92	JAN. 20	10.38	APR. 1	11.12
OCT. 3	10.76	NOV. 4	10.89	FEB. 2	10.33	APR. 10	10.91
OCT. 16	10.75	NOV. 20	11.12	FEB. 21	10.51	APR. 12	11.41
NOV. 1	10.54	DEC. 2	11.21	MAR. 11	10.52	APR. 18	11.27
DEC. 2	10.61	DEC. 15	11.26	MAR. 29	10.88	APR. 24	11.08
FEB. 1, 1947	10.38	DEC. 31	11.33	APR. 13	10.71	OCT. 17	10.69
FEB. 18	11.17	JAN. 14, 1948	11.42	APR. 26	9.90	OCT. 24	10.80
FEB. 27	11.50	MAR. 17	11.84	MAY 11	8.73	OCT. 31	10.77
APR. 4	11.40	APR. 11	11.93	JUNE 4	7.03	NOV. 7	10.70
APR. 15	10.94	APR. 26	11.21	JUNE 27	8.64	NOV. 18	10.70
MAY 6	9.66	JUNE 19	4.41	SEP. 1	10.81	NOV. 29	10.59
MAY 13	8.98	AUG. 14	9.27	SEP. 14	11.25	DEC. 29	11.64
MAY 21	9.06	AUG. 23	9.07	SEP. 26	11.10	JAN. 12, 1951	11.37
MAY 26	9.01	SEP. 10	9.72	OCT. 10	11.16	JAN. 19	11.46
JUNE 5	8.48	SEP. 27	9.80	OCT. 18	11.00	JAN. 30	11.68
JUNE 24	9.28	OCT. 20	9.96	NOV. 9	10.85	FEB. 16	11.13
JULY 14	10.57	OCT. 28	9.86	NOV. 21	10.88	FEB. 27	11.27
JULY 23	11.05	NOV. 4	10.11	FEB. 20, 1950	10.17	MAR. 12	11.57
AUG. 12	11.16	NOV. 16	10.30	FEB. 27	11.33	MAR. 28	11.48
AUG. 27	11.35	DEC. 6	10.41	MAR. 4	10.74	MAR. 30	11.23