UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
GROUND WATER BRANCH

GROUND-WATER RECONNAISSANCE IN ROUND VALLEY, CUSTER COUNTY, IDAHO

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Prepared for the U.S. Bureau of Reclamation

U.S. Geological Survey

Open-file report

Boise, Idaho
October 1962

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GROUND-WATER RECONNAISSANCE IN ROUND VALLEY, CUSTER COUNTY, IDAHO

By E. G. Crosthwaite

Abstract

Round Valley in central Idaho contains alluvial deposits of Pleistocene and Recent age which yield adequate supplies of ground water for stock and domestic wells. The alluvial deposits are underlain by Challis Volcanics of Oligocene or Early Miocene age and a few wells obtain domestic and stock water from the basalt, latite, andesite, and rhyolite which are the principal rocks in the Challis. Very crude estimates indicate that the average annual recharge to the alluvium and Challis Volcanics from precipitation and irrigation is 50,000 acre-feet.

Geologic and well data suggest that sufficient ground water might be obtained for irrigation supplies at some places.

Introduction

Round Valley is one of the few areas along the Salmon River in central Idaho which is large enough to be suitable for farming. Much of the course of the Salmon River is in a deeply entrenched canyon or narrow valley with the adjacent mountains rising to altitudes of 9,000 to 10,000 feet. Round Valley is 3 to 6 miles wide and about 8 miles long (fig. 1).

Figure 1.—Geologic and well location map.

The Salmon River Mountains bound the valley on the west and the Lost River Range on the east.

The altitude of the valley ranges from about 4,800 feet to a little above 5,300 feet above sea level. The axis of the valley trends a little west of north. Salmon River enters the valley from the southwest, flows slightly east of north to the east side of the valley and leaves at the northeast corner. Warm Springs Creek and some small ephemeral streams drain the southeast part of the valley. Garden and Challis Creeks drain the west side of the valley.

Garden Creek has built an alluvial fan where it enters Round Valley but Challis Creek has no significant fan. Warm Springs Creek has contributed a large amount of gravel to Round Valley but this part of the valley is a reentrant in the mountains and the alluvial deposits do not have the surface configuration of an alluvial fan. The west side of Round Valley between Challis and Garden Creek is a steep alluvial slope while the central part of the valley is a swampy stream terrace a few feet above the Salmon River.

The Village of Challis, with a population of about 800, is the county seat of Custer County and is the only settlement in the valley. Access to Round Valley is by U.S. Routes 93 and 93A.

Agriculture is the principal occupation in the valley although some mining is done in the surrounding area. Lumbering is of minor importance and there is a small sawmill at Challis. Raising livestock and feed for livestock are the major agricultural activities. Some potatoes are grown both for consumption and for seed.

According to the county agent (L. T. Stevenson, personal communication, May 21, 1962) about 3,300 acres is irrigated including land that is subirrigated in the lowland along Salmon River and some land which receives a single irrigation from high water during the spring snowmelt and runoff. This also includes land along the central part of Warm Springs Creek valley and scattered land along Salmon River upstream 2 or 3 miles from the junction of U.S. Routes 93 and 93A which are not in the area of this report. The principal irrigated areas in Round Valley are along the alluvial slopes north of Challis, and in the southeast part of the valley across the river from Challis, but a small area is irrigated on the Garden Creek fan. Challis Creek is the source of irrigation water for the alluvial slope north of Challis but almost every year the supply is inadequate for late season needs. The same situation exists in the area irrigated from Garden Creek where the irrigated area is much smaller. The remainder of the irrigated area has an adequate water supply from Salmon River.

The U.S. Bureau of Reclamation has considered a dam in Sec. 2, T. 14 N., R. 18 E., on Challis Creek, to store water for late season use and to develop some new land. The following table shows the distribution of land in the considered project (U.S. Bureau of Reclamation, written communication, July 24, 1962).

Area	Acres irrigated	Non irrigated but suitable for development	Total acres
Challis Creek			
Below dam	2,330	150	2,480
Above dam	168	2	170
Garden Creek	105	20	125
Total	2,603	172	2,775

Alluvial filled valleys such as Round Valley may contain aquifers which will yield water in sufficient quantity for irrigation use. This reconnaissance was made to evaluate the ground-water resources of the Round Valley (Challis area) for the Bureau of Reclamation. Field work was done in May 1962 and consisted of interviewing well owners and a well driller and making a brief geologic reconnaissance. Two short aquifer tests were made on pumped wells. The cooperation of Clarence H. Cole, well driller at Challis, and well owners is gratefully acknowledged.

The U.S. Weather Bureau has maintained temperature records for 40 years and precipitation records for 45 years at Challis. The mean annual temperature is 44.1°F and ranges from 18.7°F in January to 67.9°F in July. Extremes range from 103°F to minus 33°F. There is an average of about 110 days between the last 32°F in the spring and 32°F in the autumn and about 140 days between 28°F. Precipitation averages 7.09 inches and has ranged from 2.62 inches in 1935 to 10.49 inches in 1925. The average precipitation by months is as follows:

Jan.	0.49	May	1.04	Sept.	0.61
Feb.	.34	June	1.27	Oct.	.45
March	.35	July	.64	Nov.	.33
April	.54	Aug.	.54	Dec.	.49

Snow survey data from the Soil Conservation Service, U.S. Dept. of Agriculture (Nelson and others, 1962) indicate that precipitation at high altitudes in the Salmon River Mountains exceeds 24 inches. April 1 snow measurements averaged 24 inches of water content at Mill Creek Summit in sec. 8, T. 13 N., R. 17 E. for the period 1943-62. The altitude of the snow course is 8,870 feet above sea level.

Streamflow is measured on Challis Creek in sec. 2, T. 14 N., R. 18 E. The average flow for the period 1943-60 was 45.2 cfs (cubic feet per second) or 32,720 acre-feet per year. The discharge has ranged from 508 cfs on June 1, 1956 to 4.7 cfs on March 11, 1960. The drainage area above the gage is approximately 85 square miles and the mean altitude is 7,830 feet. The drainage basin yields about 0.6 acre-foot per acre as surface water flow.

Flow of the Salmon River is measured at a gaging station 9 miles south of Challis. Average discharge was 1,450 cfs (1,050,000 acre-feet per year) for the period October 1928 to September 1960. Extremes were 15,400 cfs on May 25, 1956 and 160 cfs on December 14, 1940.

Well-numbering system

The well-numbering system used in Idaho by the Geological Survey indicates the locations of wells within the official rectangular subdivisions of the public lands, with reference to the Boise base line and meridian. The first two segments of a number designate the township and range. The third segment gives the section number, followed by two letters and a numeral, which indicate the quarter section, the 40-acre tract, and the serial number of the well within the tract. Quarter sections are lettered a, b, c, and d in counterclockwise order, from the northeast quarter of each section (see diagram). Within the quarter sections 40-acre tracts are lettered in the same manner. Well 13N-19E-12ba1 is in the NE$\frac{1}{4}$NW$\frac{1}{4}$ sec. 12, T. 13 N., R. 19 E. and is the well first visited in that tract.

Records of wells are given in a table at the end of this report.

Geology and water-bearing character of the rocks

The geology of Round Valley and the adjacent mountains was described by Ross (1937), and much of the following information is from his report. The mountains surrounding the valley consists of the Challis Volcanics of Eocene(?), Oligocene and early Miocene(?) age (Ross, 1961). The Kinnikinic Quartzite of Late Ordovician age (Ross, 1947) is exposed in one small area on the east side of the valley (fig. 1). The geologic map and cross section of Ross (1937, plate 1) suggest that most of the valley is underlain by the Challis Volcanics. That formation also crops out in a prominent ridge in secs. 10 and 15, T. 14 N., R. 19 E. The Challis Volcanics consist of latite, andesite, basalt, and the Yankee Fork Rhyolite and Germer Tuffaceous Members. Latite and andesite are exposed along the southwest, south, and east sides of Round Valley, basalt is exposed along the northwest and north sides of the valley and in the ridge mentioned above, and the Germer Tuffaceous Member is exposed on the northeast side (fig. 1). The Yankee Fork Rhyolite Member caps the ridge north of Challis and the bluff along the northeast side of the valley. The basalt consists of flows of dark colored rocks in part of andesitic composition with inconspicuous phenocrysts of feldspar. The latite-andesite member is a diversified aggregate of flows, somewhat lighter colored than the basalt member, with numerous small phenocrysts of feldspar. The Germer Tuffaceous Member is a medium- to fine-grained series of sediments composed mostly of fragments of crystals and glass shards of volcanic origin. There are a few beds of clay and silt and, especially near the base, conglomerate. Ross (1937, p. 56) estimates that the total thickness near Challis exceeds 1,000 feet; the base is not exposed. The rhyolite flows of the Yankee Fork Rhyolite Member are usually light brown to red in color and contain phenocrysts of quartz and feldspar. Ross (1937, p. 60-61) reports that north of Challis the rhyolite is somewhat more than 300 feet thick.

The water-bearing characteristics of the Challis Volcanics are poorly known. Wells 14N-18E-12bal, 14N-19E-15dbl, 14N-19E-9acl, 13N-19E-11adl, 14N-19E-32ab2, and 13N-19E-11ddl, which obtain water from the Challis Volcanics, are adequate for domestic and stock purposes. The first three wells probably produce from the basalt member and the last two from the latite-andesite member. Well 14N-19E-32ab2 yielded less than 100 gpm with 100 feet of drawdown during a pumping test. Well 13N-19E-12dcl, which was drilled for irrigation, may have bottomed in the latite-andesite member. At the time the well was visited it had not been tested.

Several small springs in the drainage of Challis and Garden Creeks apparently issue from the basalt and latite-andesite members. A spring in the SW$\frac{1}{4}$ of section 28, T. 14 N., R. 19 E. at the north edge of Challis was flowing about 10-15 gpm on May 23, 1962. Although the rocks are covered with alluvium, the water apparently flows to the surface from the base of the Yankee Fork Rhyolite Member which overlies the Germer Tuffaceous Member at this locality (fig. 1).

The extrusive volcanic rocks contain joints and other fractures but very few vesicles formed by expanding gas when the rock was emplaced. The jointing is highly variable but joints are of sufficient frequency and size to yield water to domestic and stock wells.

Rocks of the Challis Volcanics have been warped into a shallow syncline whose axis approximately coincides with the axis of Round Valley (Ross, 1937, p. 83 and pl. 1). This structure is favorable for the occurrence of artesian pressures. Well 14N-19E-32abl flows a small amount of water but only because a trench has been dug from the well head to intersect the land surface at a lower elevation. No artesian pressure was detected in the wells inventoried during this study.

There are extensive deposits of alluvium overlying the Challis Volcanics at most places in Round Valley and these deposits extend up the valleys of the streams tributary to Salmon River. Ross (1937, p. 69-72, pl. 1) divides the alluvial deposits in Round Valley into 3 units (fig. 1) older alluvium, younger alluvium, and flood-plain alluvium. Older alluvium of Pleistocene age flanks the Challis Volcanics on the west and southeast sides of the valley. It appears to be mostly alluvial fan material, but may be in part remnants of high level terraces, and is composed of material ranging in size from silt and clay to boulders. The surface ranges from rough and uneven to broadly rolling. A gravelly soil is the surficial layer at many places.

At lower elevations younger alluvium lies on the older alluvium (fig. 1). In general the younger alluvium consists of clay, silt, sand, and small gravel. The surface is smoother than the surface of the older alluvium and the few streams crossing it have only shallow channels.

The flood-plain alluvium occupies a relatively flat terrace a few feet above the Salmon River and Challis Creek and is separated from the younger alluvium by an escarpment 25 to 50 feet high. Several creeks and sloughs rise in the flood plain and discharge into Salmon River. Reportedly, there are no definite springs; the creeks rise in swampy land and their flow increases progressively downstream. Two of the "drains" rise in swampy parts of the younger alluvium.

All of the wells inventoried, with the exception of those in the Challis Volcanics, obtain water from the alluvial deposits. The alluvial deposits yield adequate supplies to domestic and stock wells. The driller reports bailing 20 to 50 gpm during development of most wells. Drawdowns ranged from 3 to 20 feet. Many wells are completed by cutting ¼x6-inch slots in the casing opposite water-bearing gravel and sand. Pumping of sand was not reported or observed during the study.

Two small scale aquifer tests were made on wells 14N-19E-32ab1 and 14N-19E-33ab1 at the upper and lower end of the village of Challis respectively. Well 14N-19E-32ab1 is in younger alluvium and well 14N-19E-33ab1 is in older alluvium. The aquifers had transmissibilities on the order of 4,000 gpd per foot.[1/] The aquifer sampled by well 14N-19E-33ab1 probably has a higher transmissibility than shown by the aquifer test because much of the drawdown of the water level during pumping appeared to be caused by large entrance losses; specifically, the perforations in the well casing were largely obstructed and much of the water entered the well from below the bottom of the well casing.

With the exception of wells 14N-19E-32ab2 and 13N-19E-12dc1 no attempt has been made to develop large capacity irrigation wells. Data from domestic and stock wells suggest that specific capacities, yield in gallons per minute per foot of drawdown, range from 2 to 15. The specific capacity of a well varies with the duration of pumping and to some extent with the pumping rate. With the exception of the 5 wells drilled into the

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1/ See Mundorff and others, 1960, Ground water for irrigation in the Snake River basin; U.S. Geol. Survey open-file report for definition and discussion of transmissibility and other aquifer properties.

Challis Volcanics none of the wells penetrate the full saturated thickness of the alluvium.

At McNabbs Point where the Salmon River leaves Round Valley, the river has cut a deep narrow canyon in basalt of the Challis Volcanics. The narrow gap suggests that the bedrock floor of Round Valley probably is not lower than an altitude of about 4,800 feet above sea level, the same as the altitude of the river surface in the gap. If this is true the maximum thickness of the alluvium probably would not exceed 400 feet and in the area of the considered Challis Project might not exceed 300 feet. The maximum saturated thickness probably would not exeeed 200 to 250 feet.

Recharge and discharge

Recharge to the Challis Volcanics is by precipitation on the outcrop areas and underflow from adjacent and higher rocks older than the Challis Volcanics. Discharge is by mass underflow moving into the alluvium. Total underflow probably is moderate but per unit area it probably is very small. The following discussion serves only to suggest the order of magnitude of recharge to the Challis Volcanics and to the alluvium and cannot be regarded as being accurate. Considering only the drainage basin of Challis Creek above the gage, precipitation probably averages 24 inches. Surface runoff is 7 inches, evapotranspiration probably is about 15 inches. Thus, recharge is roughly 2 inches on an area of 85 square miles or about 10,000 acre-feet a year. This estimate of ground-water yield agrees well with the relationship between precipitation and water yield developed by Mundorff and others (1960, p. 51-53, fig. 10). Drill holes at the gaging station on Challis Creek indicate that the alluvium is not more than 25 feet thick and is less than 200 feet wide. Underflow in the alluvium probably is only a few hundred acre-feet a year.

The U.S. Bureau of Reclamation (1958, p. 15) estimated that runoff in Mill Creek, a tributary to Challis Creek below the gage, averaged 31 percent of the runoff in Challis Creek. It is arbitrarily assumed that recharge is about 30 percent of the recharge in the Challis Creek drainage above the gaging station or about 3,000 acre-feet.

The Garden Creek drainage area above Challis is about 45 percent as large as the Challis Creek drainage area above the gaging station and assuming that recharge in Garden Creek is 45 percent of the recharge in Challis Creek, recharge would be 5,000 acre-feet. This total for the three areas of about 150 square miles of drainage area is less than 20,000 acre-feet of ground-water recharge.

The remainder of the drainage area, other than the Salmon River, that is tributary to Round Valley is estimated to be 250 square miles. Much of this area is east of Round Valley and in the rain shadow of Salmon River Mountains. Only the highest part of the range receives a substantial amount of precipitation. The only perennial stream is Warm Springs Creek which receives its flow from warm springs. Again, arbitrarily applying the ratio of the Challis Creek area to the remainder of the drainage area and assuming that only half as much precipitation is available for recharge a value of about 15,000 acre-feet is obtained. The rounded value of total annual recharge to the Challis Volcanics is 25,000 acre-feet of 35 cfs.

The rate of precipitation on the valley floor is very low, only slightly more than 7 inches at Challis (p. 5) of which 70 percent falls from April to October inclusive when the ground is not frozen. Because it is sandy and gravelly the alluvium has a low water holding capacity; thus even though the rate of precipitation is low some water probably becomes recharge. Blaney and Criddle (1949, p. 9) estimated that it takes about 6½ inches of precipitation to sustain the type of sparse vegetation that is native to the area. This suggests that about 1 inch might become ground-water recharge or about 2,000 acre-feet on 25,000 acres.

The U.S. Bureau of Reclamation (1958, p. 19) estimates that the gross diversion requirement is 9.80 acre-feet to irrigate land served by Challis Creek. Some years that amount is not available to irrigate lands from Challis and Garden Creeks, but the lands served from Salmon River have an adequate supply. An average of 9 acre-feet per acre seems to be a reasonable value to assume for the annual diversions. This amounts to 30,000 acre-feet on 3,300 acres of land. About 85 percent of the farmed area is in alfalfa and pasture and 15 percent in grain and potatoes (U.S. Bureau of Reclamation, 1958, p. 36). Jensen and Criddle (1952, p. 12) computed the annual irrigation requirements for pasture and alfalfa as 16.1 inches (average of the 2 crops) and grain and potatoes as 13.9 inches (average of 2 crops) in the Challis area. This is about 4,500 acre-feet on 3,300 acres. Thus, net recharge from irrigation is on the order of 25,000 acre-feet (30,000 - 3,300, rounded).

It is believed that underflow into Round Valley along the Salmon River is not very large because just before it enters the valley the river flows in a deep narrow valley similar to that at McNabbs Point.

In summary, the crude estimates suggest that average annual recharge to the Challis Volcanics is 25,000 acre-feet, all from precipitation. Recharge to the alluvial deposits includes about 2,000 acre-feet from precipitation and 25,000 acre-feet from irrigation. Thus total recharge in the area is about 50,000 acre-feet.

Geologic conditions suggest that most of the ground water discharges into the Salmon River above McNabbs Point.

The discharge of ground water in the swampy area on the terrace along the river varies with the season. Flow from the sloughs is least in April but the discharge begins to increase in May and the increase continues into the late summer and early autumn. Thereafter the flow decreases until the following spring.

Salmon River reaches its peak discharge about the last part of May or the first part of June and high water in the river undoubtedly affects the water table beneath the terrace. However, much of the water-table rise is caused by irrigation and underflow from Challis, Garden, and Warm Springs Creek, and minor drainages. Reportedly after irrigation was started in sections 1, 2, 11, and 12, T. 13 N., R. 19 E. in the early 1940's parts of section 35, T. 14 N., R. 19 E. and section 2, T. 13 N., R. 19 E. became waterlogged in late summer so that crops could not be harvested. Also, water is at the surface in the SW$\frac{1}{4}$ of section 10 and the NW$\frac{1}{4}$ of section 15, T. 14 N., R. 19 E. at an elevation of 150 to 200 feet above the Salmon River. The areas are swampy in the early spring and the discharge increases steadily during the summer.

The reservoir site

An important factor in reservoir location is the possibility of water loss by seepage into the rocks of the reservoir basin or beneath the dam. Most of the reservoir basin is covered by alluvium, slope wash, and talus. These materials transmit water. However, the alluvium at the dam site is not extensive (p. 11) and a dam founded on bedrock eliminates any possibility of leakage through alluvium.

The basalt member of the Challis Volcanics which underlies the reservoir area contains joints and other fractures and yields small supplies of water to wells (p. 8). The joints at the surface of the formation tend to be choked with material from the overlying alluvial deposits and this material restricts to some extent movement of water into the joints. There are no interconnected openings in the basalt other than joints and other fractures. The yield of wells and the character of the formation suggests that no appreciable loss of water would be expected from a reservoir constructed at the considered site.

Summary and conclusions

The Challis Volcanics yields water to domestic and stock wells but because of inadequate data it is not known if they will yield large supplies to irrigation wells. The alluvium yields a plentiful supply to domestic and stock wells, but like the Challis Volcanics it never has been adequately tested for an irrigation supply. Crude estimates suggest that as much as 50,000 acre-feet of ground water is moving annually from the Challis Volcanics and alluvium into Salmon River.

The chances of obtaining on the order of 1 cubic foot per second from the alluvium from a properly constructed large diameter well probably are sufficient to warrant drilling a test well. A suitable location for such a test well would be in the area south of Challis Creek, west of U.S. Route 93, north of the Challis Airport, and east of the county road leading north out of Challis. The well should extend through the alluvium to the Challis Volcanics.

Irrigation wells probably would be successful on the terrace along the Salmon River, but much of the problem there is excess water and not a shortage of surface water. Dug or dredged wells or pits probably would be adequate.

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Logs of wells

The following well logs were obtained from Clarence H. Cole, well driller, Challis, Idaho. The terminology has been modified for uniformity and clarity.

14N-18E-12ba1. Jess Pearson

Material	Thickness (feet)	Depth (feet)
Boulders and clay	25	25
Gravel, soft and rock (Challis Volcanics)	19	44

14N-19E-9ac1. Joe Blackburn

Soil	4	4
Clay and rock	23	27
Rock with small amount of gravel	13	40
Rock and clay	6	46
Clay and gravel	31	77
Clay	3	80
Rock, green (Challis Volcanics)	22	102

14N-19E-15db1. Piero Piva

Material	Thickness (feet)	Depth (feet)
Soil and rock	6	6
Clay, blue	1	7
Clay and small gravel	12	19
Gravel, coarse	3	22
Rock, soft (Challis Volcanics)	8	30
Rock, hard (Challis Volcanics)	43	73

Cased with 6-inch casing to 27 feet.

14N-19E-16cc2. C. B. Stark, Jr.

Soil and clay	105	105
Sand, gravel, and clay	4	109
Clay and small rock (some water at 105 ft.)	6	115
Clay and gravel	27	142
Sand, gravel, and clay	5	147
Gravel; water	5	152

6-inch casing perforated with 40 slots between 137 and 150 feet.

14N-19E-21aa1. Piva Bros.

Material	Thickness (feet)	Depth (feet)
Clay, sandy	10	10
Gravel and clay	5	15
Gravel and small amount of clay	8	23
Sand	4	27
Gravel, fine	8	35

6-inch casing perforated with 50 slots between 14 and 34 feet.

14N-19E-26bd2. Lynn Wilson

Soil and clay	9	9
Boulders and clay	13	22
Gravel	24	46

6-inch casing perforated with 22 slots between 35 and 44 feet.

14N-19E-32ab1

Soil and clay	7	7
Clay and rock	3	10
Rock and clay; some water	20	30
Boulders	3	33

14N-19E-33ba1. Lawrence Bradbury

Material	Thickness (feet)	Depth (feet)
Gravel, boulders, and clay	24	24
Clay and gravel	4	28
Clay	7	35
Clay and gravel	9	44
Gravel	6	50
Clay, red, and gravel	5	55
Clay, red, and coarse gravel	10	65
Clay, red, sandy	27	92

13N-19E-12dc1. Glenn Hunt

Soil	2	2
Rock, gravel, and clay	48	50
Gravel with streaks of clay	20	70
Gravel and clay; some water at 107 feet	40	110
Gravel, fine, loose	27	137
Gravel, tighter formation	24	161
Clay and gravel	12	173
Sand, soft	4	177
Clay and gravel	15	192
Clay, soft, and gravel	5	197
Clay and gravel	17	214

16-inch casing perforated with 193 slots from 108 to 187.

Cased to 187 feet.

Table 1. Records of wells in

Type of well: D, drilled; Dr, driven; Du, dug.

Character of aquifer: S, sand; G, gravel; CV, Challis Volcanics.

Pump: P, piston; J, jet; Sub, submersible; N, none.

Well number	Owner	Year drilled	Type of well	Depth of well (feet below land surface)	CASING Dia. (inches)	CASING Depth (feet)
14N-18E-						
12ba1	Jess Pearson	1962	D	44	6	24
36	Alex Klug	1961	D	40	6	22
14N-19E-						
8bc1	Sylvester Dobbs	-	D	-	-	-
9ab1	Evelyn Tibbitts	1954	Dr	30	2	30
9ac1	Joe Blackburn	1960	D	102	6	102
9bd1	Mrs. Ethel Phillips	-	D	65	6	-
10da1	do	1940±	Du,D	50	36-6	50
15db1	Piero Piva	1961	D	73	6	27
16ba1	R. M. Kimble	-	D	65+	6	65+
16bd1	Wendell Kimble	-	D	-	-	-
16cc1	C. D. Stark, Jr.	-	D	200	6	-
16cc2	do	1959	D	152	6	152
17ad1	C. A. Green	1946	D	147	6	147
20aa1	Mrs. Ethel Philips	-	D	220	4	220
21aa1	Piva Bros.	1960	D	35	6	35

Round Valley, Custer County, Idaho

Use of water: D, domestic; S, stock; I, irrigation; U, unused.

Remarks: L, log given in table; Yield, reported by driller; drawdown data generally not available.

Character of aquifer	WATER LEVEL Depth to water (feet)	Date	PUMP Type	H.P.	Use of water	Remarks
CV	3.7	5/22/62	N		D	L., bailed 10 gpm.
CV	8	1/ /61	-	-	D,S	L., bailed 12 gpm.
S,G	-	-	P	1/6	D,S	
S	4	-	J	-	D	
CV	40	3/ -/60	J	3/4	D,S	L., bailed 25 gpm.
-	-	-	J	1/2		
S,G	30	-	J	1/2	D,S	
CV	-	-	J	-	D,S	L., bailed 18 gpm.
S,G	15	-	J	1/2	D,S	
do	-	-	P	1	D,S	
do	-	-	N	-	U	
do	117	12/ -/59	Sub	1	D,S	L., bailed 20 gpm.
do	140	-	P	3	D,S	
S,G	189.7	5/23/62	N	-	U	
do	14	1/ -/60	C	-	S	L., bailed 45 gpm.

Table 1. Records of wells in Round

Well number	Owner	Year drilled	Type of well	Depth of well (feet below land surface)	CASING Dia. (inches)	CASING Depth (feet)
14N-19E—Continued						
21ba1	Marion Piva	1947	D	156	6	156
22aa1	Kenneth Bradbury	1940	D	45	6	30
25bc1	C. B. Stark, Jr.	-	D	80	6	-
26ab1	Allan Ellis	-	Du	-	-	-
26bc1	Worth Empey	1935±	D	80	4	80
26bd1	Lynn Wilson	-	D	50	6	-
26bd2	do	1962	D	46	6	44
27ad1	do	-	D	-	6	-
27cd1	Bruno Piva	1955	D	135	6-5	135
28cb1	Raymond Gossi	-	D	192	6	-
32ab1	Tony Yacomella	1961	D	33	8	33
32ab2	Lawrence Bradbury	1954	D	265	18-16	165
33ab1	U.S. Forest Service	1937±	D	70	6	70
33ac1	Lawrence Bradbury	1959	D	105	8	105
33ba1	do	1961	D	92	6	65½
34bb1	Sawmill	1962	D	-	-	-
36cd1	Garth Chivers	-	D	60	6	-

Table 1. Records of wells in Round

Well number	Owner	Year drilled	Type of well	Depth of well (feet below land surface)	CASING	
					Dia. (inches)	Depth (feet)
13N-19E-						
1bdl	Wm. Hammond	1950±	D	90	6	—
1dcl	Johnson Bros.	1940±	D	90	6	-
1ddl	George Luizenger	1940±	D	120	6	-
2abl	Frank Burstedt	1935±	D	32	6	32
11adl	G. C. Westergard	1954±	D	86	6	60
11ddl	Hugh Johnson & Son	do	D	300	8	110
12bal	G. C. Westergard	-	D	90	6	-
12dcl	Glenn Hunt	1962	D	214	16	-

Valley, Custer County, Idaho—Continued

Character of aquifer	WATER LEVEL Depth to water (feet)	Date	PUMP Type	H.P.	Use of water	Remarks
S,G	-	-	J	-	D,S	
do	60	-	J	3/4	D,S	
-			P	-	D,S	
-	15	-	J	1/2	D	
CV	-	-	J	-	D	
do	-	-	J	-	D,S	
S,G	-	-	P	0	U	
-	106.7	5/24/62	N	-	U	L., drilled for irrigation.

62-33

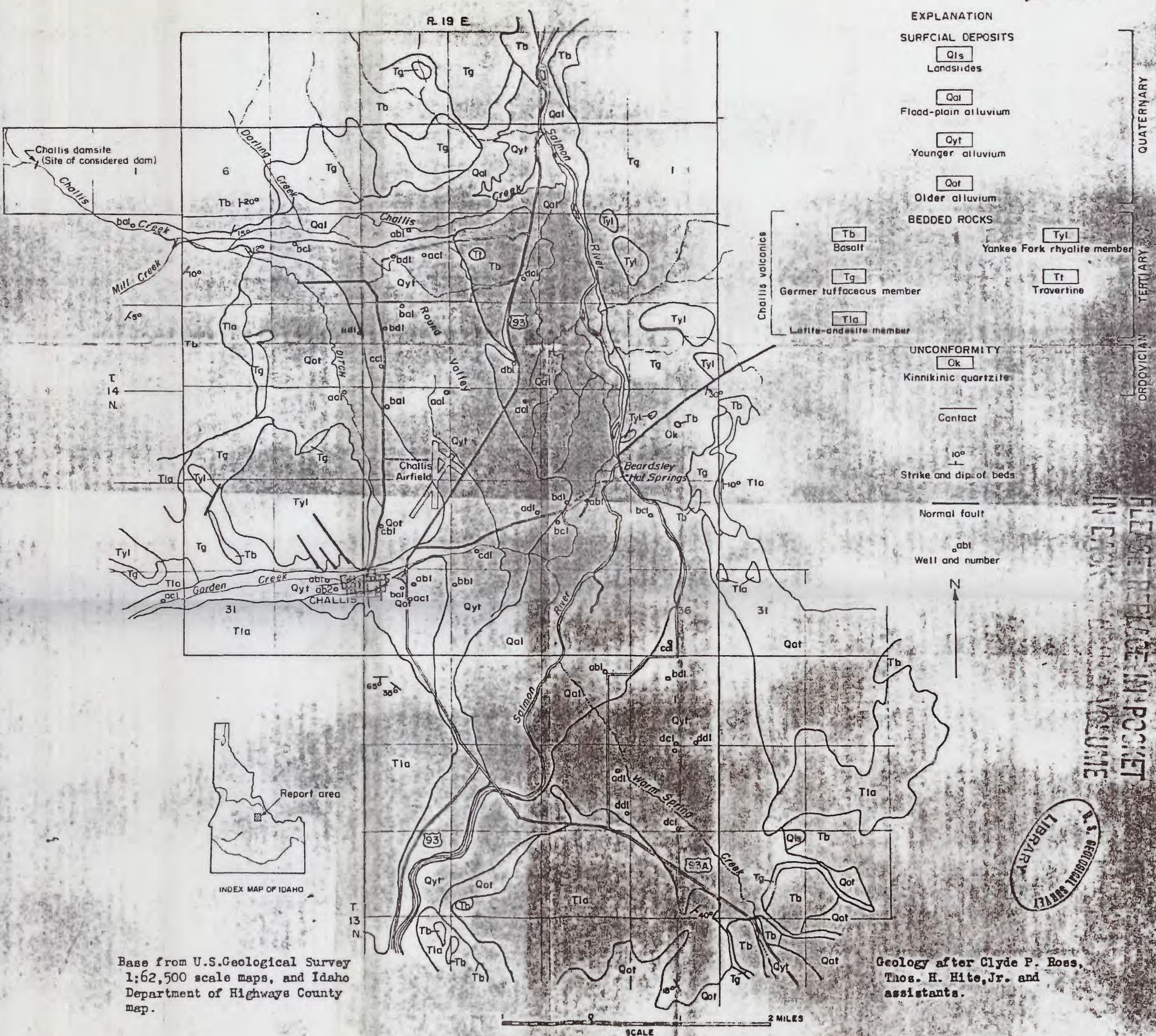

Figure 1.—Geologic and well location map of Round Valley, Custer County, Idaho.