GROUND-WATER RESOURCES--RECONNAISSANCE SERIES

REPORT 1

GROUND-WATER APPRAISAL OF NEWARK VALLEY

White Pine County, Nevada

by

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Prepared Cooperatively
by the
Geological Survey
U. S. Department of Interior

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FOREWORD

The 1960 Legislature authorized a special ground-water reconnaissance survey under the supervision of the State Department of Conservation and Natural Resources and in cooperation with the United States Geological Survey. This program, which should extend not over two or three years, is in addition to the regular ground-water cooperative program that has been in operation since 1945.

It was felt that there was a need for a series of such reconnaissance surveys covering all of the valleys of the state where development opportunities exist and where no information as to ground-water possibilities are available.

This report of the ground-water appraisal of Newark Valley is the first of such series. The second report will cover Pine Creek Valley and should be available in January 1961. Several additional reports will follow in the next calendar year.

I am of the opinion that this series of reconnaissance ground-water reports will be of great value to our State.

GRANT SAWYER
Governor of Nevada

December 1960

away from the playa toward the mountains.

Ground water is discharged by evaporation and transpiration in the areas where the water table is at or near the land surface. Transpiration by meadow grasses, greasewood, and rabbitbrush, and direct evaporation from the soil where the water table is very near the land surface, are the principal means of ground-water discharge at present.

The depth to water in and adjacent to the playa area ranges from zero to perhaps 5 feet. In areas where springs occur on the lower parts of the west and east slopes of the valley this same depth range may be expected. At U. S. Highway 50, in the SW cor. T. 18 N., R. 54 E., the depth to water is about 35 feet. The depth to water in the well 19/57-19B1 is about 110 feet, and at the stock well 18/56-2B1 it apparently is about 145 to 150 feet. Several miles east of these two wells, in the middle of R. 57 E., there is a north-trending line of springs and wells, used for stock. The shallow water in this area is believed to be held up by Tertiary rocks of low permeability.

Numerous springs, used for irrigation along the west and east sides of the valley in Tps. 20, 21, and 22, issue from the lower parts of the alluvial apron. (See Photograph 5). Their tendency to discharge in elongate seeps, areas, and pools along the toes of alluvial fans strongly suggests that they are gravity springs--that is, they represent simply an intersection of the gently sloping water table with the more steeply sloping land surface. The Simonsen warm springs, which issue from the alluvium near the NE cor. T. 22 N., R. 56 E., probably is supplied with water moving through bedrock and rising from moderate depth through valley fill. The temperature of water entering the pool is about 74° F, which is about 20 degrees higher than that of unconfined ground water in the valley. The discharge is 2 to 3 cfs (cubic feet per second) and probably varies somewhat seasonally and annually.

A sulfur spring in the SW $\frac{1}{4}$ sec.16 , T. 18 N., R. 56 E., has a small discharge of unpalatable water. It is closely associated with volcanic rocks, which crop out nearby.

Estimated Average Annual Recharge

An estimate may be made of the average annual recharge to the ground water as a percentage of the average annual precipitation within the basin. The general method is described briefly in an earlier report (Eakin and others, 1951, p. 79-80).

For Newark Valley, the precipitation map of Hardman and Mason (1949, p. 10) was compared with the topographic map (pl. 1). Precipitation zones were modified slightly to fit the better controlled topographic map. The division between the zones of less than 8 inches and 8 to 12 inches of precipitation was selected at the 6,000-foot contour; that between the zones of 8 to 12 and 12 to 15 inches at 7,000 feet; that between the zones of 12 to 15 and 15 to 20 inches at 8,000 feet; and that between the zones of 15 to 20 and more than 20 inches at

9,000 feet. The average precipitation assumed for the respective zones, beginning with the 8- to 12- inch zone, is 10 inches (0.83 ft.), 13.5 inches (1.12 ft.), 17.5 inches (1.46 ft.), and 21 inches (1.75 ft.).

The recharge estimated as a percentage of the average precipitation for each zone is as follows: less than 8 inches, 0 percent; 8 to 12 inches, 3 percent; 12 to 15 inches, 7 percent; 15 to 20 inches, 15 percent; more than 20 inches, 25 percent.

Table 2 summarizes this computation. The approximate recharge (column 4) for each zone is obtained by multiplying the figures in columns 1, 2, and 3. Thus, for the zone receiving more than 20 inches, the computed recharge is 3,000 acres x 1.75 feet x 0.25 (25 percent) = 1,300 acre-feet.

Table 2. -- Estimated Average Annual Ground-Water Recharge to Newark Valley

Precipitation zone (inches)	(1) Approximate area of zone (acres)	(2) Average Precipitation (feet)	(3) Percentage Recharged	(4) Estimated Recharge (ac.-ft.) (1)x(2)x(3)
20	3,000	1.75	25	1,300
15-20	19,000	1.46	15	4,200
12-15	70,000	1.12	7	5,500
8-12	270,000	.83	3	6,500
8	150,000	---	---	---
	512,000 (800 sq. mi.)		Total	17,500
Underflow from Fish Creek Valley (estimated).....				1,000
Estimated total recharge, on order of.....				18,000

In addition to the recharge from precipitation in the valley, groundwater underflow from Fish Creek Valley contributes recharge to Newark Valley. No precise data are available from which to estimate the underflow. However,