

MANAGEMENT IMPLICATIONS
FOR THE
STALKER CREEK RANCH PROPERTIES
AND ADJACENT
SILVER CREEK PRESERVE, IDAHO

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Science file



THE NATURE CONSERVANCY
Idaho Chapter: Liven A. Peterson, Chairman
2015 Sunrise Rim Road, Boise, Idaho 83705
Preserve Manager: Gordon Beebe
Post Office Box 624, Picabo, Idaho 83348

Prepared By: William R. Meiners and E. G. Crosthwaite
Resource Planning & Management Associates, Inc.
885 South Locust Grove Road, Meridian, Idaho 83642

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ABSTRACT

This assessment of Management Implications For The Stalker Creek Ranch Properties and Adjacent Silver Creek Preserve, Idaho further explores the potential water supply problem and soil characteristics which prescribe and constrain use(s) of these properties. Identity of the specific water supply, evaluation of factors which had been posed by Meiners (1979) as having potentially adverse impact upon the future viability of Silver Creek and its environs, and review of inherent soil characteristics and capability leads to the conclusions and recommendations of impact, management, and retention/disposal of affected lands.

In sum, it was found that:

- potentially adverse water supply problems could occur (either by and through man's activities or as a result of drought) and are applicable to both the Silver Creek Preserve and Stalker Creek Ranch;
- current water rights are firm and require continued use to assure their continued viability;
- all water rights should be retained, in those instances where lands may be sold, to assure a water source at those times when or if natural streamflow should decline;
- land capability is one that imposes the need for systematic crop rotations that include a soil-building/soil-conserving crop a minimum of fifty percent of the rotation cycle, minimum tillage, crop residue utilization, and other conservation farming practices for maintenance and stabilization of the soils resource;
- buffer strips along stream courses and/or retirement of highly erosive soils to permanent vegetative cover are needed for erosion control, streambank/riparian vegetative cover protection, and access;

all lands should be retained and managed by The Nature Conservancy to achieve desired protection and rehabilitation of Conservancy properties;

- if all lands cannot be retained, a limited disposal of certain tracts may be possible. However, if done, strict conservation easement requirements for implementation and use of conservation farming practices are required to assure maximum protection and rehabilitation of Silver Creek and its tributaries. And, all water should be retained if possible, legally; and,

- a lease be drawn for farming those lands kept by the Conservancy wherein the necessary conservation farming practices are implemented to achieve desired protection and rehabilitation of these properties.

INTRODUCTION

The Nature Conservancy has optioned (1979) to purchase the Stalker Creek Ranch. This is a property adjacent to and upstream from the Silver Creek Preserve. Thus, the basic resources of soil, water, vegetation, and wildlife are similar if not identical. Likewise, the climate, problems of use, management, enhancement, and preservation are similar if not identical.

A Concept of Natural Vegetational Patterns and Other Observations, Silver Creek Preserve, Idaho (Meiners, 1979), hereinafter referred to as the Silver Creek report, was completed in which the geohydrologic, soil, vegetation, management, and other observations were addressed. Management recommendations were made based on recently released reports by Moreland (1977) and Brockway (1978) which suggested that further evaluation of the geohydrologic resources was required to assess the potential impact(s) identified. Meiners (1979) further suggested that resolution of the potential impacts and current problems, as associated with land management activities, rested more upon an awareness and action by "community" rather than specific Conservancy action on Conservancy property. There are, however, certain actions the Conservancy can take and these were identified.

Concurrent with compilation of the Silver Creek report, The Nature Conservancy initiated action for purchase of the Stalker Creek Ranch. Accordingly, it was determined that identity and evaluation of resources was needed for this property. Further, that management guidelines were required to facilitate drafting an applicable management program for lands retained and/or as conservation easement criteria for lands that may be sold. Thus, this report is compiled to meet these requirements.

OBJECTIVES

The purpose of this report is to identify and evaluate available geohydrologic soils and other data for determination of applicable management recommendations for the Stalker Creek Ranch. Achieving this objective will be accomplished by:

- researching available data applicable to the Stalker Creek Ranch;
- assessing these data to determine trends, potential and specific impacts, and applicability to the Stalker Creek Ranch and the Silver Creek Preserve;
- making necessary field reconnaissance to become acquainted with area, interviewing knowledgeable individuals, and acquiring needed photographs;
- compiling a report to supplement the Silver Creek Preserve report (Meiners, 1979) to further explore points raised in the document and to build upon rather than duplicate materials contained in the report; and,
- providing recommendations for management and "easement criteria" for the Stalker Creek Ranch and Silver Creek Preserve.

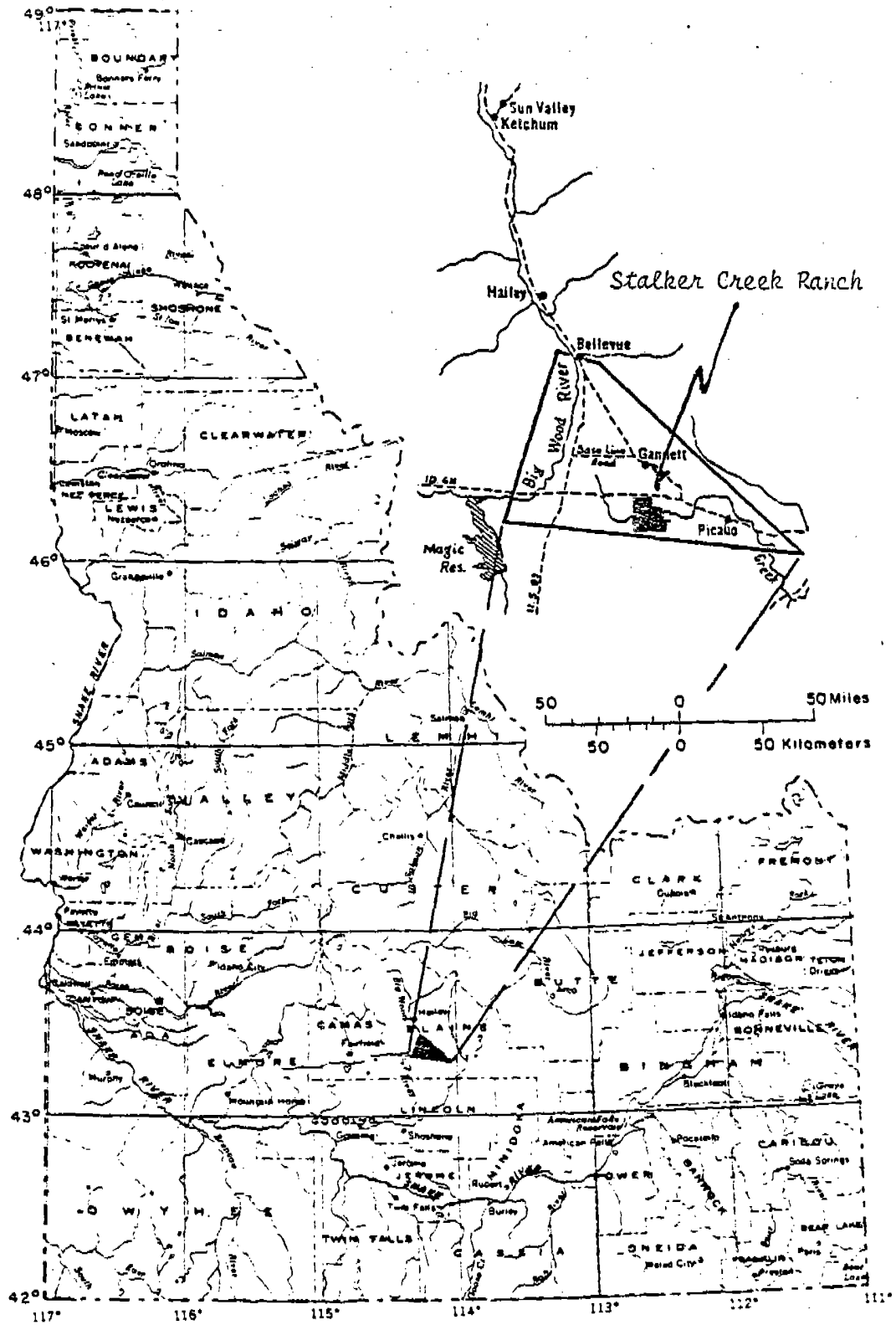


Figure 1. Location Map: Stalker Creek Ranch



Figure 2. Stalker Creek Ranch, an area like the Silver Creek Preserve that excites man's sense and admiration for beauty, that provides a wildlife sanctuary and opportunity to see and enjoy nature.

LOCALE and LEGAL DESCRIPTION

The Stalker Creek Ranch is a property adjacent to and immediately upstream of the Silver Creek Preserve located in Blaine County, Idaho (Figure 1). It lies about thirty miles south of Sun Valley via State Highway 75; fifty miles north of Twin Falls via U.S. Highway 95; and some one hundred fifty miles east of Boise via U.S. Highway 20. Access to the property is south off Highway 20 at Punkin Center via Kilpatrick Road (Punkin Center Road), a gravelled road that intersects Highway 20 (formerly State Route 68) two miles south of Gannett, Idaho.

Kilpatrick Road provides a major portion of the eastern boundary of the Stalker Creek Ranch starting at the northeastern corner of the property (one-half mile south of Punkin Center intersection) and extending southerly along the road to a point just north of the

bridge across Stalker Creek. At this point the boundary turns due east approximately one-quarter mile, thence south one-half mile (a quarter mile of this distance is shared in a common boundary with the Silver Creek Preserve) before turning west one and one-quarter miles, north one and one-quarter miles, and east three-quarters of a mile to the point of beginning (Figure 4).

The Stalker Creek Ranch, like the Silver Creek Preserve, lies in the broad Big Wood River/Silver Creek valley - an approximate 800 acre tract surrounded by a mixture of cultivated land, pasture, and rangeland that compose the valley floor and adjacent hills (Figure 2). It encompasses the lower reach of Chaney, Cain, Mud, and Stalker Creeks, an area of interspersed spring-fed streams in the headwaters of the Silver Creek drainage.

It is described, legally, as:

TOWNSHIP 1 SOUTH, RANGE 19 EAST, BOISE
MERIDIAN, BLAINE COUNTY, IDAHO

SECTION 22: E $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$;
SECTION 26: S $\frac{1}{2}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, and that
portion of the NW $\frac{1}{4}$ NW $\frac{1}{4}$ lying
westerly of the County Road;
SECTION 27: E $\frac{1}{2}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$,
NE $\frac{1}{4}$.

HISTORICAL NOTE

Interviews by Gordon Beebe, Silver Creek Preserve Manager, provide insight to the "settling-up" of the Big Wood River and Silver Creek valley and to the Stalker Creek Ranch. His conversations with such individuals as Dean Rogers, Winton Gray, Harvey Bickett, Warren Nisson, Les Bushby, Vernile Byington, and others indicate the area was homesteaded about 1882. Investigation of water records finds a "junior" filing date of 1886 as applicable to the Stalker Creek area thus demonstrating that settlement dates to an earlier time than 1886 although many of the senior water rights are for downstream areas near Shoshone, Gooding, and Carey, Idaho.

Various places, terms, and events such as "Park 80," "Mad Russian 80," "Garden Spot" - a homestead with appropriate buildings (now obliterated) located just east of the Stalker Creek cabin and other historical items stimulates the imagination. The homestead was once occupied by the Byington family in the 1930s who reportedly grew potatoes, garden vegetables, oats, sheep, dairy cattle, and turkeys at one time or another by dry farm methods, subirrigation, and much blood, sweat, and tears.

Cottonwood trees found their way into the area as a result of the "timber culture" governmental regulation for proving-up a homestead. Farming was confined to dry farming and cereal grains in suitable, limited areas or on lands adjacent to water where subirrigation could be encouraged or developed for crop production. The area was reportedly too wet to permit extensive livestock grazing.

In the 1950s change came to the Big Wood River/Silver Creek area. More lands were cleared for production of irrigated crops and areas too wet to permit development were drained. This "change" was duly reported in the Twin Falls News of December 27, 1959.

As reported, drainage was introduced into the valley. Winton Gray, a former owner of the Stalker Creek Ranch, was among the first

who, in cooperation with the Soil Conservation Service, "cleared, leveled, and ditched about 600 acres in an area that would have been considered worthless two years ago." Drainage, however, necessitated the need for supplemental irrigation and the advent of wells for irrigation purposes.

Numerous owners have "owned" portions of lands now embraced in the Stalker Creek Ranch. As noted, the "Park 80" and perhaps, a "Mad Russian" once owned lands in the northern part. Others who have owned portions or all of the property and their approximate dates of ownership are: Stalker (who homesteaded the original tract, 1880-1936), Byington (1936-1959), Gray (1959-1963), Prins (1963-1967), and most recently, the Stalker Creek Group (an association of individuals who purchased the property in the late 1960s as a hunting and fishing retreat). Each owner has made their "mark" in the development of the area.

PHYSICAL DATA

The general climate, geology, and hydrology of the Big Wood River/Silver Creek area (the Bellevue Triangle) have been described in the Silver Creek report (Meiners, 1979). Description of soils and vegetative characteristics for the preserve was also made. These data are applicable to the Stalker Creek Ranch except for certain soils data. Such differences are minimal, a matter of deleting some soils and adding others to reflect the soil distribution in the area. Thus, this report enumerates those soils mapped on the Stalker Creek Ranch but will describe only those additional soils which occur and not described in Appendix A of the Silver Creek report.

Soils

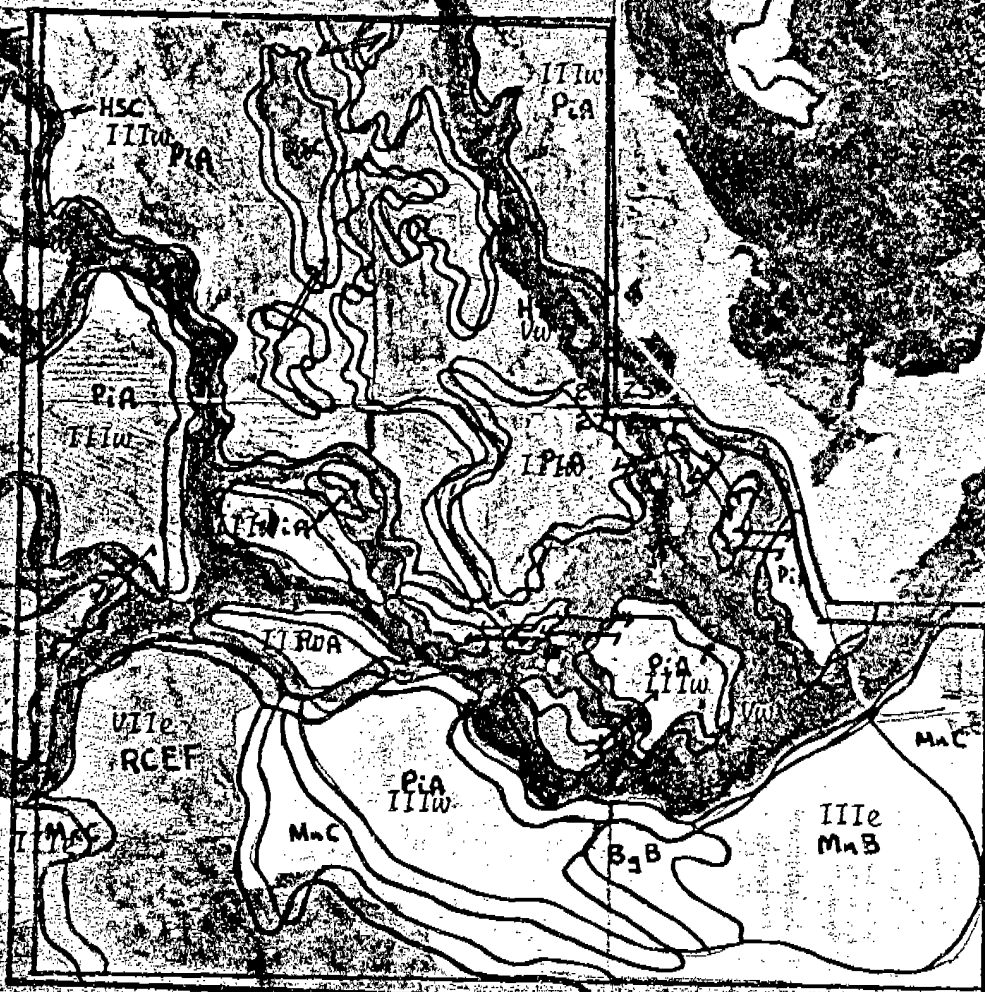
Soils reflect the various soil-forming processes, the geologic origin of the area, the climate in which they occur, and the interaction of these factors and vegetation over time. Two separate soil surveys, one a Utilitarian Soil Survey in 1955 covers the entire ranch and a later Standard Soil Survey in 1973 covers approximately the southern two-thirds of the ranch. These surveys have been interpreted to an overall Standard Soil Survey basis, Figure 3, and are listed below, thus:

<u>Mapping Symbol</u>	<u>Series</u>
* BgB	Brinegar loam, 2-4 percent slope
HSC	Hayspur silty clay loam, 0-2 percent slope
MnB	Molyneux silt loam, 2-4 percent slope
MnC	Molyneux silt loam, 4-8 percent slope
PiA	Picabo silt loam, 0-2 percent slope
* RCEF	Rands very rocky loam, 30-60 percent slope

(* New soils occurring on the Stalker Creek Ranch, series descriptions are found in Appendix A.)

Brinegar loam is a deep, moderately well-drained soil occurring on nearly level to gently sloping alluvial terraces. They are associated

RR. 19 E. B. M.

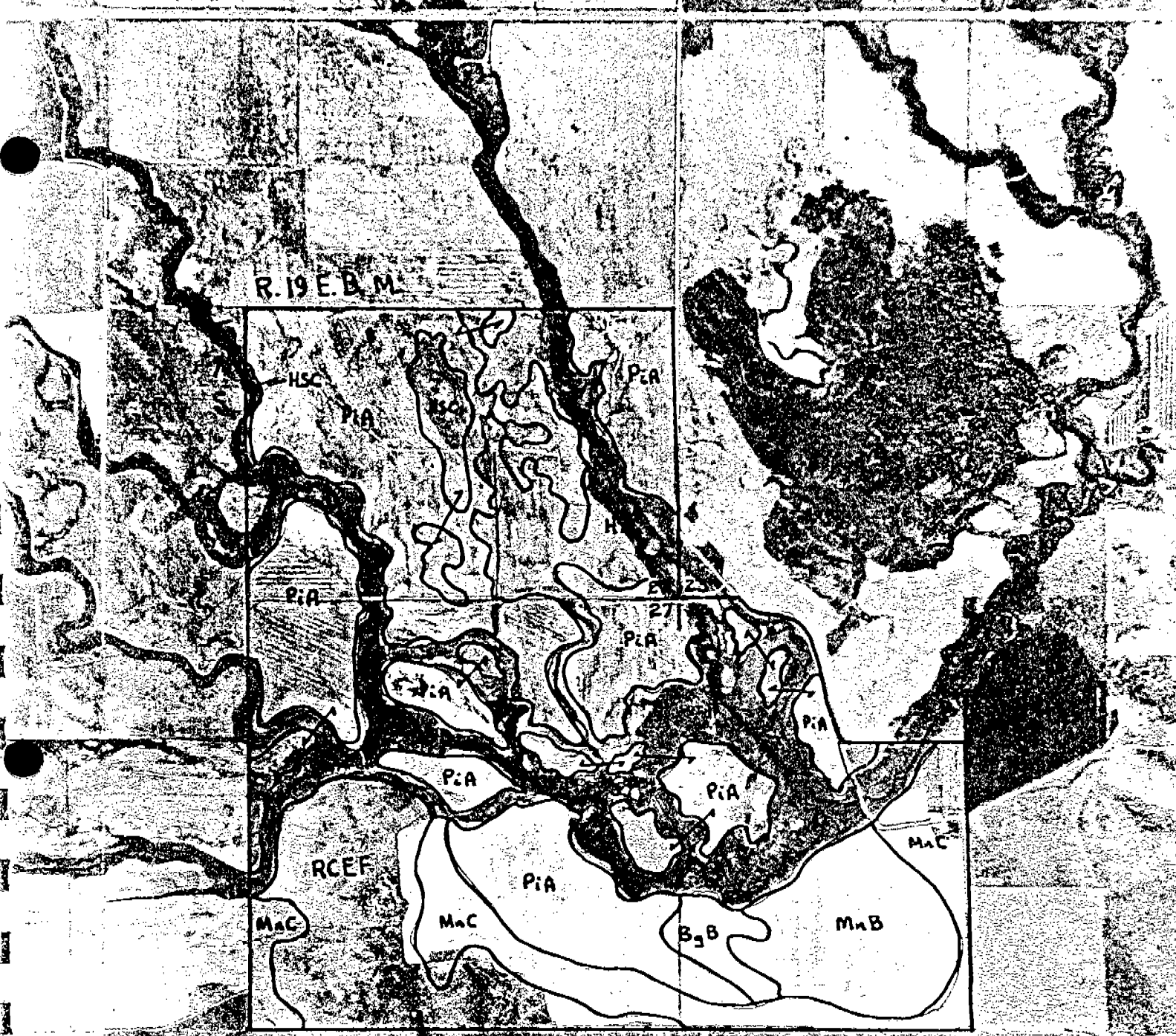


Approximate scale 500 ft = 1 in

Figure 3. Land Crab Creek Branch - Soils Map

- | | Capability Class/Subclass | |
|------------------|---------------------------|--|
| B ₁ B | B ₁ B | Benning loam, 2-4% slope, Nonirrigated |
| HSC | HSC | HSC - HSC pur silt clay loam, 0-2% slope |
| M ₁ B | M ₁ B | M ₁ B - Madynex silt loam, 2-4% slope |
| M ₁ C | M ₁ C | M ₁ C - Madynex silt loam, 4-6% slope |
| P ₁ A | P ₁ A | P ₁ A - Picabo silt loam, 0-2% slope |
| RCEP | RCEP | RCEP - Rands very rocky loam, 30-60% slope |





Approximate Scale: 4" / mile

Figure 3. Stalker Creek Ranch - Soils Map

- BgB - Brmegea loam, 2-4% slope
- HSC - Hayspur silty clay loam, 0-2% slope
- MnB - Molyneux silt loam, 2-4% slope
- MnC - Molyneux silt loam, 4-8% slope
- PiA - Picabo silt loam, 0-2% slope
- RCEF - Rands very rocky loam, 30-60% slope



with the Molyneux silt loams and, like the Molyneux, derive from a mixed minerology of granite, andesite, basalt, and some sedimentary rocks. It is a productive soil although it has a limitation of being slightly wet. Frost-free period is 80-110 days.

Rands very rocky loam is a medium textured mixed alluvium, mainly from andesite, volcanic tuff and related igneous rocks, and lesser amounts of sedimentary rocks. This phase of the Rands Series occurs on strongly sloping, 30-60 percent, high alluvial fan bordering the southern boundary of the ranch. Rock and rubble occur both on the surface and within the 20-40 inch depth profile to limit use. Frost-free period is 80-110 days.

Vegetation

The vegetative cover, potential and present, is similar to that described for the Silver Creek Preserve. The two "new" soils are placed in the Wet Meadow (Brinegar loam) and Dry Gravelly, 13-16" ppt.^{1/} (Rands very rocky loam) range sites. Brinegar loam, although mapped as associated with the Molyneux soils in this area, are classed as being slightly wet and therefore reflects a vegetative cover of more water tolerant species such as blue camas and other meadow-type plants (in this instance, however, the limited acreage mapped on the Stalker Creek Ranch has been cleared and is cultivated). Range Site Descriptions are found in Appendix C of the Silver Creek report.

Water Supply

Records of the Watermaster for the Big Wood-Little Wood Water District at Shoshone, Idaho show that the Silver Creek Preserve is entitled to 0.85 cubic feet per second (42.5 miner's inches or 382 gallons per minute) for irrigation and none for the Stalker Creek Ranch. The priority date is June 1, 1886 which is a relatively late date compared

^{1/} ppt., abbreviation for annual precipitation.

to other water rights on Silver Creek. In years of short supply irrigation water may not be available in July, August, and September. In recent years the point of diversion is the so-called Sun Valley pump near the upper end of the preserve. The records show that this is Canal P-3, Priority No. 62-A1, and was finalized by the courts as the "Frost Decree" (S.C. Frost vs Alturus Water Company, October 6, 1909) to Johnson and Nisson and to H.P. Johnson.

An abstract of the Frost Decree at the Idaho Department of Water Resources, Boise, Idaho shows that seven water rights were adjudicated to lands which now comprise the Silver Creek Preserve and adjacent land and one to a portion of the Stalker Creek Ranch and adjacent land (Table 1). Except for the June 1, 1886 right, all are junior rights for Conservancy lands and some sources of water are from creeks not identified on modern maps. These later rights may be so-called "flood water rights," and only rarely during high stream flow is water available for irrigation use. A review of the Frost Decree abstract shows that on the order of 300 cubic feet per second is senior to The Nature Conservancy rights. Most of these rights are downstream from Picabo on Silver Creek and Little Wood River.

One well has been drilled for irrigation on the Silver Creek Preserve and three for irrigation on the Stalker Creek Ranch. In addition, there is a domestic well at the ranch house and a domestic well at the Silver Creek Preserve headquarters. For convenience in identifying the wells in the text and Appendix B, each well has been assigned an arbitrary number and are located as shown on Figure 4. (The Nature Conservancy may want to establish their own identification system.) Well logs, well data, and copies of water licenses have been collected and are contained in Appendix B. The well on the Silver Creek Preserve (Well No. 4) is about 200 feet northwest of the head of the west arm of Sullivan Lake. The License and Certificate No. G-25922 is for 2.01 cubic feet per second and has a priority date of September 1, 1955.

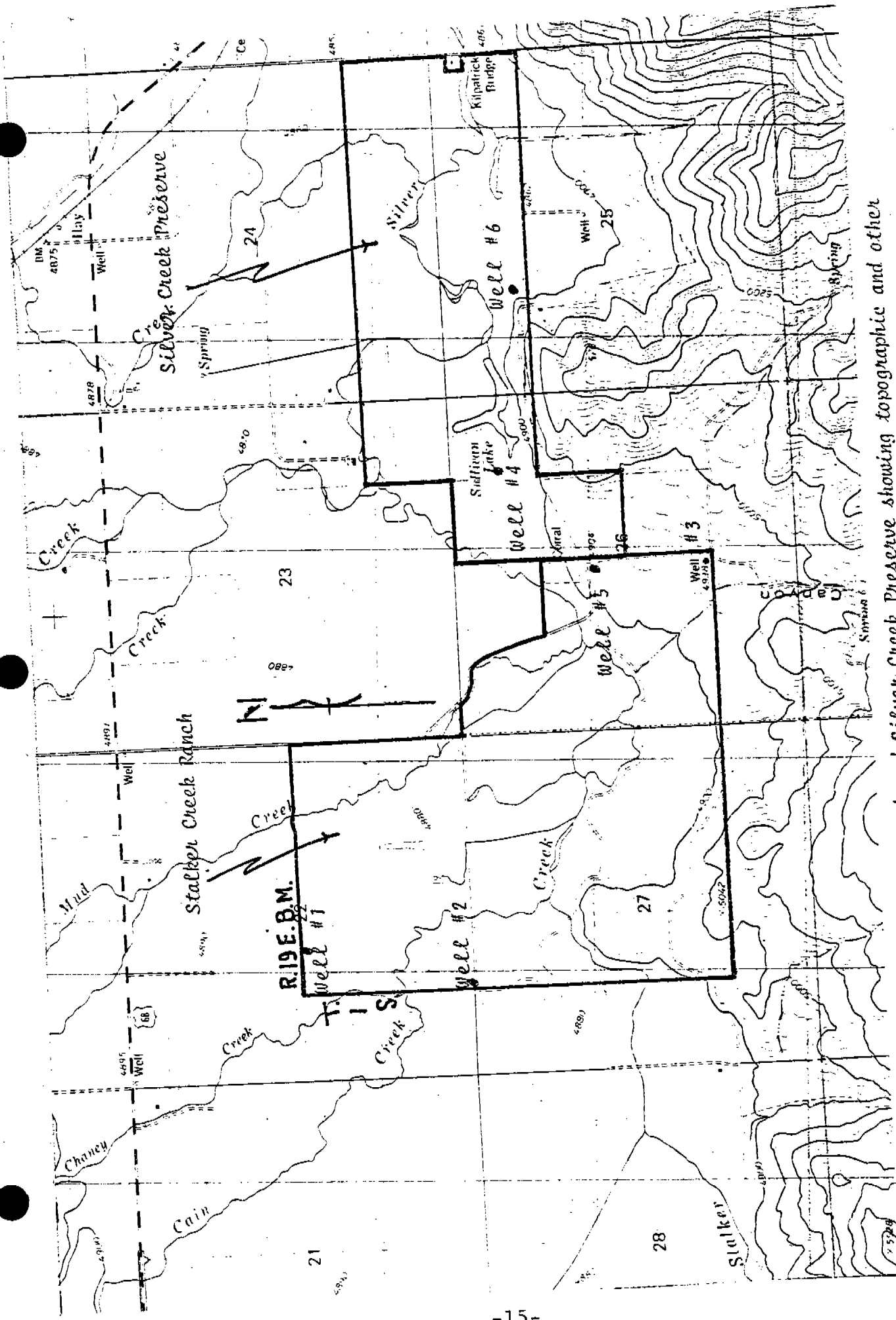


Figure 4. Site Map: Stallker Creek Ranch and Silver Creek Preserve showing topographic and other physical and cultural features (well locations).

Table 1. Decreed Water Rights, Little Wood River and Tributaries
Water District 37-M

S. C. Frost vs Alturas Water Company, Judge
Alfred Rudge, 4th Judicial District, October 6, 1909

Decree No.	Decreed Owner	Cubic Feet per Second	Priority Date	Land to be Irrigated, Remarks, etc.
1063	Lawrence, J. B.	0.5	6-1-86	Lot 4, SE $\frac{1}{4}$ SW $\frac{1}{4}$ Sec 19, T. 1 S., R. 20 E. SE $\frac{1}{4}$ SE $\frac{1}{4}$ Sec 24; NE $\frac{1}{4}$ NE $\frac{1}{4}$ Sec 25, T. 1 S., R. 19 E.
0351	Johnson, H. P. & Misson, Christian	0.5	6-1-86	SE $\frac{1}{4}$ SE $\frac{1}{4}$ Sec 24, NE $\frac{1}{4}$ NE $\frac{1}{4}$ Sec 25, T. 1 S., R. 19 E. <u>Butte Creek.</u>
0352	Ditto	1.2	6-15-87	Ditto
1064	Lawrence, J. B.	1.2	6-15-87	Water for same land as Decree No. 1063.
0348	Johnson, H. P.	0.8	4-1-88	Water from <u>Mallett Creek</u> for same land as Decree No. 0351.
1103	Chaney, Samuel	2.4	5-1-89	E $\frac{1}{2}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$, Sec 21; NE $\frac{1}{4}$ SW $\frac{1}{4}$, Sec 22, T. 1 S., R. 19 E.
0349	Johnson, H. P.	1.6	4-1-90	Water from <u>Mallett Creek</u> for same land as Decree No. 0351.
0350	Ditto	2.0	6-15-91	Water from <u>Gannett Creek</u> for same land as Decree No. 0351.

Of the three irrigation wells on the Stalker Creek Ranch two are flowing artesian wells without pumps but equipped with valves. The third well is nonflowing and has a pump. The artesian well near the north end of the property (Well No. 1) has a License and Certificate of Water Right No. G-27591 for 2.0 cubic feet per second with a priority date of October 8, 1958. The artesian well near the west edge of the property (Well No. 2) has a License and Certificate of Water Right No. G-27592 for 4.04 cubic feet per second with the same priority date as Well No. 1. The well at the southeast corner of the property (Well No. 3) has a License and Certificate of Water Right No. 28017/37-2618 for 2.39 cubic feet per second with a priority date of June 29, 1959. The following is a summary of the foregoing data:

Well No. 1	G-27591	2.00 cfs	October 8, 1958
" 2	G-27592	4.04 cfs	October 8, 1958
" 3	28017/37-2618	2.39 cfs	June 29, 1959
" 4	G-25922	2.01 cfs	September 1, 1955
	Total	10.44 cfs	

DISCUSSION

Water and Land Use

Geological events have provided the present land forms in which Silver Creek and its tributaries flow. They are relatively slow-flowing streams once having an abundant natural vegetative cover along their banks and on much of the area between stream channels. The streams are spring fed but do receive some water through overland runoff of snowmelt. The source of the spring water discharged by Silver Creek and its tributaries is seepage losses in the channel of Big Wood River near Bellevue and infiltration of precipitation on the Big Wood/Silver Creek basin. This natural recharge regimen to the aquifer system has been modified by agricultural development which began in the basin in the 1870s or 1880s. By 1954 there were 23 canals diverting water from the Big Wood River between Hailey and Stanton Crossing (near the back waters of Magic Reservoir) and 19 canals from Silver Creek (Smith, 1959, p. 8). Many of the canals diverting water from Big Wood River carried water to irrigate the gravelly, permeable soils southeast of Bellevue. Seepage losses from irrigation resulted in increased recharge to the aquifer systems in the basin and an increase in the flow of Silver Creek.

Because late season irrigation water was unavailable from the Big Wood River in many years, irrigation wells were drilled to supplement the surface water supply and to develop new land. Smith (1959, p. 9) reports that there were few irrigation wells before 1947 but by the end of 1954 there were 45 irrigation wells. Moreland (1977, pp. 16 and 18) reports that there were about 60 pumped irrigation wells and about 50 flowing artesian wells used for irrigation in 1975. In recent years there has been a change from flood irrigation using open ditches to sprinkler irrigation. Gale Roberts (personal communication), Soil Conservation Service, Hailey, estimates that 70 percent of the land is irrigated by surface water supplied by canals and 30 percent is irrigated by ground water

supplied by wells. This change results in more efficient use of the surface water supply and less seepage loss from ditches and fields to the water table. Brockway and Grover (1978, p. 19) comment that conversion of flood-irrigated land to sprinkler irrigation is occurring rapidly. Moreland (1977, p. 20) reports that water levels have not changed substantially between the early 1950s and 1975. This statement seems to be true as evidenced by the water level measurements made in an artesian well at the Punkin Center intersection of U.S. Highway 20 and Kilpatrick Road, one-half mile north of the Stalker Creek Ranch. The record shows that there has been a small decline with the lowest record occurring during the drought year of 1977 as shown in the generalized hydrograph for the well (Figure 5). (The detailed hydrograph of the well is included in Appendix B.)

As Silver Creek is fed principally by a non-artesian system, a long term record on a non-artesian (water table) well would be more useful in assessing the effects of land use change and drought on the flow of Silver Creek and its tributaries. But, none is available. However, the record of a gaging station on Silver Creek three miles downstream from Picabo shows considerable variation in discharge when drought years are compared to wet years. This variation in flow will be discussed later.

Brockway and Grover (1978) have developed and applied a digital (mathematical) model to the Big Wood River/Silver Creek area. Although the numbers used in their model may not be correct, the model serves a useful purpose in that it indicates what stresses on the aquifer will produce the largest adverse or beneficial effects. They simulated changes in recharge to and discharge from the aquifer caused by certain land use changes, i.e.: subdivision development, lining of canals to reduce seepage losses, artificial recharge, sprinkler irrigation development, and other changes such as drought conditions. They found that complete development by sprinkler

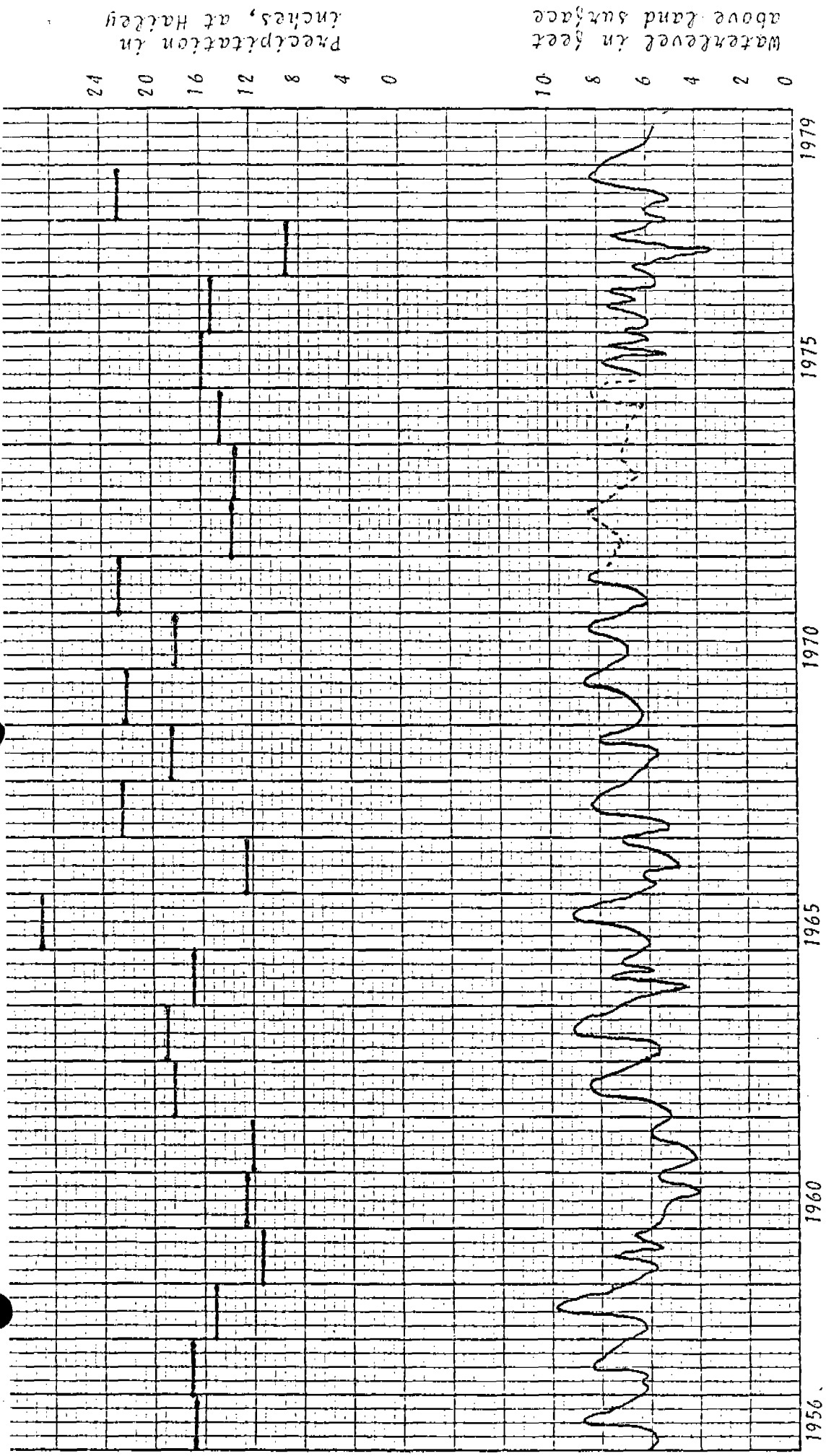


Figure 5. Generalized hydrograph of U.S. Geological Survey observation well at U.S. Highway 20 and Punkin Center. See Appendix B for details of hydrograph. Precipitation at Hailey, Idaho by water years (October 1 to September 1).

irrigation from ground water sources caused the greatest impact on the aquifer system and that spring flows would be reduced about one-third. The 1977 drought was also simulated by the model but a combination of drought and sprinkler irrigation of all the area from ground water sources was not simulated. Sprinkler irrigation and a succession of drought years could reduce springflows more than one-third.

According to Brockway and Grover (1978, p. 44) about one-fourth of the 1977 irrigated acreage was planted to small grains, mostly barley. Small grains require about 25 percent less water than alfalfa and irrigated pasture to mature. Thus, if the entire area was planted to grain, the water requirement would be less. In other words alfalfa, pasture, willows, and other vegetation that grow in semi-wet to wet areas require more water than does grain. However, this does not consider the impact of such a cropping system on erosion, sedimentation and other land use considerations.

This discussion shows how some of man's activities have and can influence the water supply that is available for fish and wildlife in the Big Wood River/Silver Creek area. Uncertainty in forecasting land use change and the certainty that drought will reoccur, makes necessary the recommendation that The Nature Conservancy retain all water rights pertinent to the land. If land use change or drought (or a combination of both) diminish the streamflow to dangerously low levels, the irrigation wells on the property could be used to supplement streamflow. It then follows that The Nature Conservancy determine and apply those means necessary to retain a valid water right. (This is accomplished by the continued utilization of water; water rights may be forfeited by five years of non-use.) Idaho law and the legal aspect of this matter are beyond the scope of this report.

Neither does this report address directly the impact that urbanization of the Sun Valley-Ketchum-Hailey area might have on the

water supply of Silver Creek. Urbanization has traditionally imposed a stress on the water resources of an area, principally because of commercial and industrial demand. Also, urbanization commonly degrades water quality. Cornell, Howland, Hays, and Merryfield, Inc. (1974) estimate that the population will increase three-fold by 1990. Due to the resort-second home atmosphere of the area and the unlikely establishment of industries requiring substantial amounts of water, consumptive use (depletion) of the water resource will probably be by irrigation of lawns, golf courses and commercial and small industries. The wide spread use of septic tanks and possibly inadequate treatment of municipal, commercial, and industrial waste may cause a water quality problem. At this time, water use and water quality degradation in the urban area appear to pose no threat to Silver Creek water. However, The Nature Conservancy may wish to consider some projection of conditions 25 to 50 years hence to assess possible impact and formulate appropriate action.

The State Water Plan, adopted in 1977, provides for establishing minimum streamflows in rivers and streams in Idaho. The Idaho Water Resource Board has petitioned for and the Idaho Department of Water Resources have approved their request to establish minimum streamflows in Silver Creek, subject to approval by the State Legislature. The Legislature may or may not approve the petition due the probable objection to the petition by downstream irrigators. There could be legal as well as physical implications and/or impacts of minimum flow prescription upon the Silver Creek Preserve and Stalker Creek Ranch. At this time it is unknown what, if any, concern may arise. It is suggested that The Nature Conservancy monitor the situation and take that action which best protects the integrity of Silver Creek and its tributaries.

Drought

As is mentioned in prior text, drought reduces the flow of Silver Creek and its tributaries. Less water is diverted from Big Wood River for irrigation and also there is less infiltration to the aquifer during the spring snowmelt period. Streamflow records on Silver Creek show that the "carryover" effect of water recharge during a normal or wet year is not large. The model of Brockway and Grover (1978, pp. 90-94) would seem to verify this fact.

It is risky to project streamflow to the Stalker Creek property using the existing gaging station record, but a very rough idea of flow during a drought year can be estimated. The U.S. Geological Survey gage record for Silver Creek near Picabo indicates that stream flow in a drought year is on the order of 75 percent of the average flow. A late spring measurement on Stalker Creek just below Chaney Creek was 36 cubic feet per second (16,000 gallons per minute) on May 19, 1975, a year of about average water supply (Moreland, 1977, p. 38. note, Stalker Creek is misnamed as Silver Creek in the report).. Because late spring flows are larger than the average flow an adjustment in flow must be made, possibly as much as 10 percent. Thus, low flow during a drought year at the junction of the two creeks might be on the order of 20 to 25 cubic feet per second in late spring. Late summer flows could be considerably less, possibly as much as one-third of the average. These estimates are subject to considerable error and must be used with caution. They are presented to illustrate a point that low flow conditions can occur without land use change.

Silt

Most spring-fed streams flow relatively clear water in their natural state. Casual observation of the streams on the Stalker Creek Ranch reveals a considerable amount of silt in their channels, especially

in slack water areas (Figure 6). (Reportedly this is also true on the Silver Creek Preserve.) The report by Manuel, Griffith, and Minshall (1979) shows that Silver Creek and some of its tributaries, at times, transport relatively large amounts of fine grained sediments and deposits some of the sediments in slack water. They report (p. 52) that Stalker Creek contributes 62 percent of the sediment with 32 percent of the streamflow from 52 percent of the drainage area above Kilpatrick Bridge (located at the east end of the Silver Creek Preserve). They also discuss the man-made changes to the drainage system (pp. 3 & 4). The most significant change was the construction of the Patton Drain and associated canals which greatly reduced the flow of Stalker Creek upstream from the Stalker Creek Ranch.

All streams in their natural state tend to meander, those with low gradients more so than those with steep gradients. They also appear to adjust their regimen in a manner that permits their gradient and sediment load to remain somewhat in balance. The thread of the current in a meandering stream tends to be kept clear of sediment while the slower moving parts receive sediment. During flood stage some of the deposits may be flushed downstream and also the main thread of the channel may change. Volume of flow, grain size, and cross-sectional area of a stream are also factors in moving sediment, but are not discussed in this text. The point to be made is that straightening of stream channels and construction of drains and canals to bypass the original channel result in increased flow gradients and confinement of flow to relatively narrow channels. Sediment entering the new channels is immediately flushed downstream to areas of lower gradient. The area occupied by the new channels is much less than that of the original stream and the once orderly transport of sediment is accelerated in the upstream reach and overloads the ability of the relatively undisturbed downstream flow to effectively move the material. Also, drains discharging to a stream results in a higher peak flow during snowmelt and lower low flow during the remainder of the year because water stored in the soil adjacent to the drains discharges more rapidly than under non

or pre-drain conditions.

Interim control of part of the silt could be accomplished by constructing canals on a low gradient from Stalker, Chaney, and Mud creeks to the area excavated by the former owners for a duck pond. With control structures on the creeks much of the water could be diverted to the pond during periods of turbid flow and the silt allowed to settle out as the water passes through the pond. During periods of relative silt-free flow, water could be passed downstream in the natural channels. The dam that creates the pond needs repair with the outlet gate relocated higher in the embankment. This repair, regardless of whether the pond is used as a duck pond or settling basin, is an immediate necessity (failure of the dam would flush the accumulated silt within the pond to Stalker Creek and downstream areas).

The present pond does not serve as a valuable asset. It has no fishery and when frozen it attracts no ducks. It could, however, have some short-term use as a settling basin while a more permanent solution to the silt problem is accomplished.

A final solution to the silt/sedimentation problem will not be achieved until there is some control (either natural or man-made) of silt in the Stalker, Loving, and Chaney Creek basins. It will do little good to remove silt from the Stalker Creek Ranch/Silver Creek Preserve or to otherwise deliberately disturb the sediment unless or until the source areas are "controlled." Resolution of this problem may require additional land acquisition (particularly in the Stalker Creek-Patton Drain area), conservation easement, and above all the cooperation of land owners/operators in alleviating the silt problem through adoption and practice of conservation-farming techniques.



Figure 6. Drainage has changed the abilities of certain streams to cleanse their channels. A result on the Stalker Creek Ranch, Silver Creek Preserve, and elsewhere in the Big Wood River/Silver Creek area is an accumulation of sediment (silt) in and along water courses, an apparent threat to a viable fishery resource.



Livestock

Livestock grazing has been an historic use in the Big Wood River/Silver Creek area. Byington (personal interview) and others speak of this use and relate that early use along Stalker, Silver, and other creeks was "light," it was simply too wet for livestock to venture into the stream and spring areas. Apparently this changed with the change in class of livestock grazed (i.e.: from sheep and dairy cattle to beef cattle), with drainage, and with land use as more land was broken out and irrigated. What effect has this had on streams or the riparian habitat? Recent research is beginning to shed some light upon what occurs.

Platts (1979) reports on some on-going work that indicates heavily grazed stream-riparian habitats do differ from ungrazed areas. He reports that "Channels in the heavily grazed site have widened, streambanks are set back, depth has been greatly reduced, more surface area is exposed to solar radiation, and water depth at the water surface-channel interface is reduced," (Figure 7). He continues, "The changes occurred over a long period of time and it may take even a longer period of time for the stream to revert back to natural condition."

It seems, therefore, that excessive livestock use and a stable, productive stream-riparian habitat are not compatible. This, in part, is perhaps basic to recurring comments heard relative to present stream configuration of shallow, wide-widths, etc., vs narrow, deeper stream channels remembered in earlier years as applicable to the Stalker Creek Ranch-The Silver Creek Preserve.

Additionally, elimination of streamside vegetation by grazing, spraying, and sedimentation derived both by siltation off exposed cultivated lands and adjacent heavily grazed uplands create a further degradation of the stream-riparian habitat.

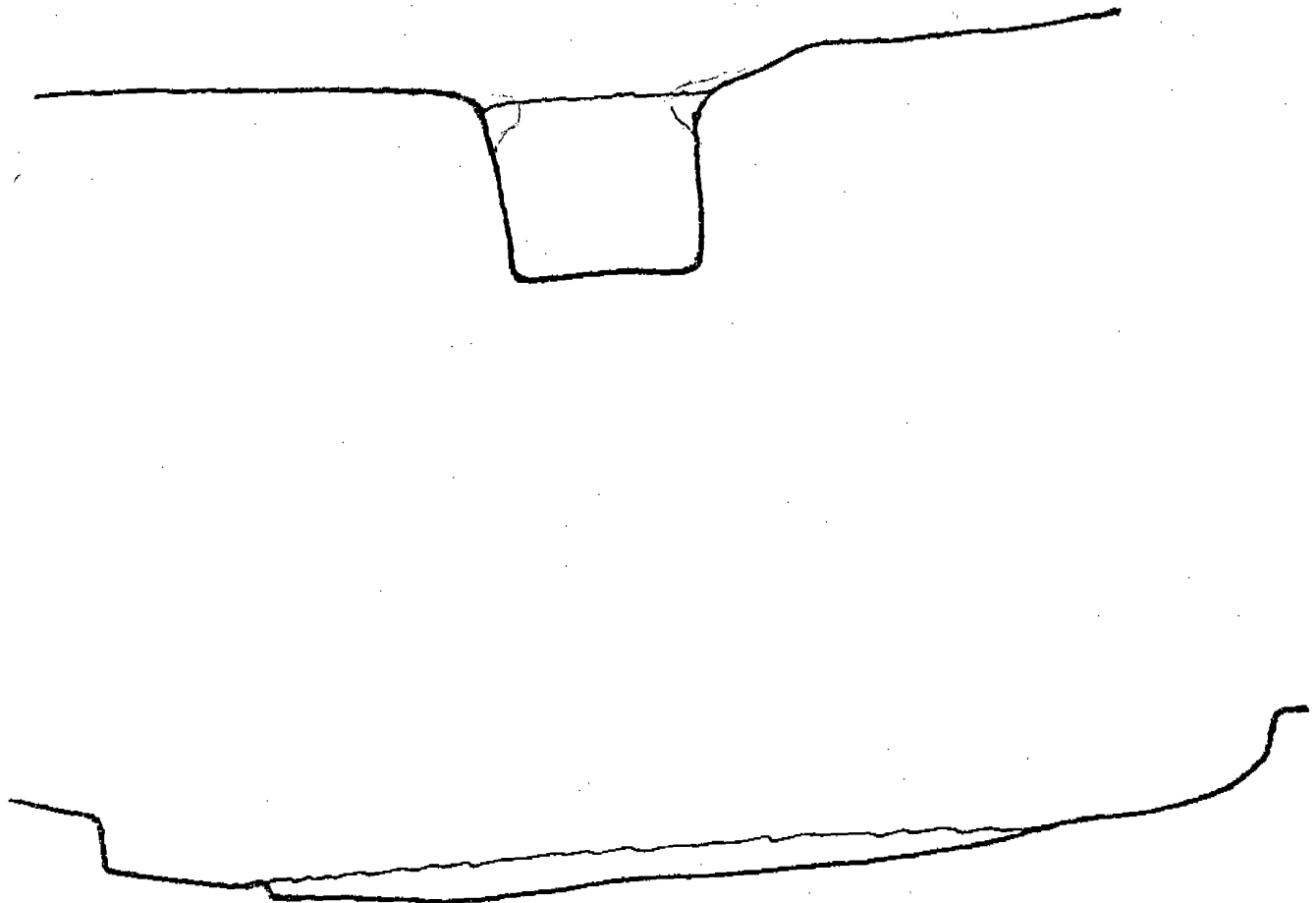


Figure 7. Stream channel cross sections: top - typical stream channel cross section on an ungrazed area; bottom - typical stream channel cross section on a heavily grazed area.

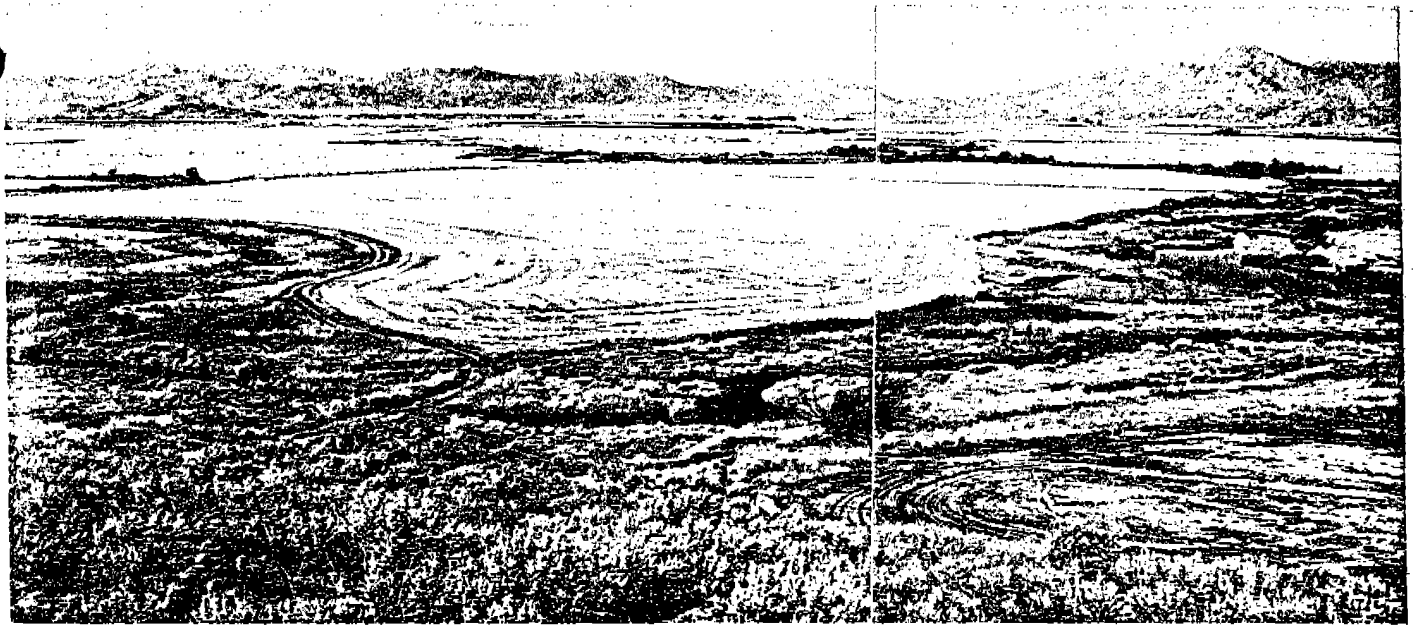


Figure 8. *Stalker Creek Ranch along western boundary, NW ¼ Section 27. Extensive agricultural development creates a land use problem as well as sedimentation threat to Stalker, Cain, Mud, and other streams and springs in the Big Wood River/Silver Creek area.*

Agricultural Development

Like the Silver Creek Preserve, the Stalker Creek Ranch has undergone and is subject to the many factors associated with agricultural development in the area (Figure 8). The original ranch was a homestead, established about 1880-1882, followed by a limited amount of lands "broke out" for production of cultivated crops. The Silver Creek report (Meiners, 1979, pp. 26-29) outlines what has happened in the area starting in the early 1950s. This report also identifies certain factors which are or may become major problems in land use, community life-styles, and the continued viability of Silver Creek and other spring-fed streams.

Intrusion into and conversion of what was once a wet, marshy saline meadow to production of cereal crops through clearing, plowing,

drainage, and supplemental irrigation has interrupted and destroyed the natural state. This is an extension of factors identified for the Silver Creek Preserve and pictured in Figure 14 of that report. And, like the Silver Creek Preserve, a majority of the soils "converted" (Picabo) are ill-suited for this purpose. Additionally, on the Stalker Creek Ranch many acres of Hayspur soils (NE ¼ Section 22) appear to have been cleared and now farmed. The Hayspur soils are even less suited to cultivation than are Picabo soils. Thus, farming is imposed on soils poorly suited for this purpose and which, according to Soil Conservation Service^{1/} criteria, are soils classified into Land Capability Classes III or IV (irrigated or non-irrigated) and V, respectively.

The local Soil Conservation District Technical Guide provides the means for land capability class and subclass classification of soils mapped as occurring on the Stalker Creek Ranch as follows:

<u>Mapping Symbol</u>	<u>Soil</u>	<u>Class/Subclass</u> ^{2/}	
		<u>Irrigated</u>	<u>Nonirrigated</u>
BgB	Brinegar loam, 2-4 percent slopes	IIe	IIIe
HSC	Hayspur silty clay loam, 0-2 percent slopes	Vw	Vw
MnB	Molyneux silt loam, 2-4 percent slope	IIIe	IVs
MnC	Molyneux silt loam, 4-8 percent slope	IIIe	IVe
PiA	Picabo silt loam, 0-2 percent slope	IIIw	IVw
RCEF	Rands very rocky loam, 30-60 percent slopes	-	VIIe

(This classification is shown on an overlay to the Soils Map, Figure 3A.)

^{1/} Soil Conservation Service, U.S.D.A., Soil Memorandum SCS-22, Soils - Land Capability Classification, May 19, 1958.

^{2/} Capability class assignment differs between irrigated and non-irrigated use of land assuming that certain of the limiting factors, i.e.: available moisture, drainage, etc., can be corrected thereby permitting a wider choice of adapted crops and application of less intense management practices. Where limitations cannot be corrected the capability class remains unchanged.

Subclass designation of "e" (erosion), "w" (wetness), "s" (soil limitation as by salinity, alkalinity, depth, etc.), and "c" (climate) are appended to indicate the predominant limiting factor effecting use of the land. In some instances the limiting factor can be corrected as by drainage, irrigation, etc., in which case the "w" or "s" is replaced by "e" to reflect the remaining, predominant limitation to land use.

All cultivated lands on the Stalker Creek Ranch are irrigated, hence the irrigated land classification applies. Nonirrigated lands, either Class V or VII are classified and described for applicable management as range sites, i.e.: (HSC) Hayspur silty clay loam, Capability class/subclass Vw translates to the Wet Saline Meadow/Wet Meadow Range Site; and, (RCEF) Rands very rocky loam, Capability class/subclass VIIe equates to the Dry Gravelly 13-16" ppt. Range Site. These range sites are described in Appendix C of the Silver Creek Preserve report.

Class II lands are represented on the Ranch by the Brinegar soils. It is an approximate ten acre tract and for purposes of this report will be considered the same as Class III lands by which it is surrounded.

Class III and IV lands (Molyneux silt loam and Picabo silt loam) are lands suited for cultivation but have severe to very severe limitations that reduce choice of adapted plants or special conservation farming practices, or both. These are lands that require systematic crop rotation, inclusive of soil-building/soil-conserving crops (such as grass and legumes) for as much as fifty to seventy-five percent of the rotation period, to maintain soil fertility and tilth; wind strip cropping or other cultural practice to break up long slopes and/or expanse of exposed soil surface for control of wind and water erosion; minimal tillage methods to preserve soil structure, a rough surface and maximum amounts of crop residues at or near the soil surface; and, other conservation farming prac-

tices. It is obvious that annual cereal grain production, even with commercial fertilization supplementation, does not meet this test.

Class V lands (Hayspur silty clay loam) are those lands, generally, that are not suited for cultivation. In this instance salinity, alkalinity, high water table, and flooding with free-standing water over the surface of the ground combine to form the severe limitation of "w" (wetness) that precludes cultivation. In some situations where these limitations can be corrected, in a practical manner, Class V lands may be cropped. On the Stalker Creek Ranch, however, reclamation is not feasible economically nor in a manner that does not create or aggravate new or existing soil limitations.

In sum, land capability class/subclass and range site designation provides guidance to the use and management of soils occurring on the Stalker Creek Ranch. Class IIe and IIIe (Brinegar and Molyneux soils) are those best suited for cultivation. Class IIIw and Vw (Picabo and Hayspur soils) are those ill-suited or not suited for cultivation. In all cases Class III lands require careful selection of crops to be grown and a systematic cropping system and conservation farming practices. This translates to selection of an adapted crop for the area; a crop rotation that includes a grass or grass/legume cover for a minimum fifty percent of the rotation cycle (i.e.: four out of an eight year rotation cycle); and rough tillage, stubble mulch, or other farming practice to reduce and control wind and water erosion. In practice, due to the soil characteristics and limitations and proximity to streams and other water sources, Class IIIw and Vw (Picabo and Hayspur soils) should be kept in permanent cover to assure maximum protection and continued viability of the streams and springs that flow through and/or rise on the Stalker Creek Ranch.

Similarly, livestock use must be timed and spaced in a manner that keeps animals out of streams, springs, or other water sources.

Alternative? Perhaps. Disposal of the E $\frac{1}{2}$ SW $\frac{1}{2}$ Section 22 is a possibility. However, if done, a significant reach of Chaney Creek is lost to the Conservancy. Moreover, nearly all of this area is presently cultivated, is comprised of Picabo and Hayspur soils, and is a significant contributor of silt/sediment to the drainage system. Thus, if these lands were to be sold, strict conservation easements relative to cropping systems/rotations, tillage methods, and other conservation farming practices must apply to assure soil stability and a compatible land use with The Nature Conservancy purpose.

In either event conservation easements must be negotiated that embrace applicable land use constraint with, as pointed out in earlier text, retention of all water rights.

Given the foregoing factors and background in determination of lands "suitable" for retention/disposal leads to the conclusion and recommendation that all lands be retained by The Nature Conservancy. Only by such action can the Conservancy be assured of their achieving the purpose(s) for which the lands were acquired. It is further recommended that a lease be drawn by and through which necessary conservation farming practices may be applied, land retirement be achieved, and overall management implemented to protect and rehabilitate the lands and waters involved. Also, in this manner, all water rights can be kept active and available for present and future use(s). The foregoing to be accomplished utilizing the criteria outlined in earlier text.

SUMMARY/RECOMMENDATION

Using the Silver Creek report (Meiners, 1979) as a base departure point, this report for the Stalker Creek Ranch has been drafted to further examine the basic resources common to each. Their further identity, characteristics, and "condition" are assessed. Recommendations are made for guidelines in management decisions as applicable to both those lands retained or those which may be released. Thus:

- The soils resource for the Stalker Creek Ranch is essentially that described for the Silver Creek Preserve. Thus, soils data described in this report is that which is new or additional to those soils found on the Silver Creek Preserve. Two additional soils occur (Brinegar and Rands) and are described as to characteristics, limitations, and use.
- All soils occurring on the Stalker Creek Ranch are classified and placed into the Land Capability System as described by the Soil Conservation Service. Utilizing land capability class/subclass as a basic to determining land management needs suggests that lands farmed, be farmed using applicable conservation farming criteria; thus, applicable criteria is as follows:
 - Systematic crop rotations to include a soil-building/soil-conserving crop (grass, grass/legume) a minimum of fifty percent of the rotation cycle (i.e.: 4 years out of an eight year rotation period).
 - Minimal tillage that achieves and retains a rough soil surface with crop residues kept at or near soil surface.
 - Set backs (buffer strips) a minimum of one hundred and fifty feet (150') along windward sides and fifty feet on leeward sides of all streams and other waters.
 - A weed control program, using best management practices, a combination of clipping, spraying, burning, etc., geared to control noxious weeds but applied in a manner that does not adversely impact the fishery resource through use of toxic substances in close proximity to streams or other water sources.

- Restoration of a permanent vegetative cover is (as recommended for the Silver Creek Preserve) a high priority management need to stabilize highly erosive soils and eliminate the threat of siltation to adjacent streams and water bodies. Hence, where "conservation farming" is not implemented, restoration of permanent cover becomes necessary to reduce and/or eliminate current siltation problems. Applicable seeding mixtures have been suggested in the Silver Creek report (pp. 31 and 32).
- Recent, emerging research relative to the effect of livestock grazing on aquatic/riparian habitats is reviewed. Such data reveals that heavy livestock grazing does in fact alter stream channel configuration. Alteration takes form in changes from narrow, deep, and cooler stream courses and waters to those that are wider, shallower, exposed to increased solar radiation, and which have stream banks set further back from the water's edge. Other research suggests an interaction of livestock, bacterial pollution of streams, and sedimentation and further suggests that microbiological analysis of sediments should be a part of stream water quality evaluations.

In sum, livestock grazing has been and continues on lands in the Big Wood River/Silver Creek area. The recent research data provide insight into impacts which have or may occur relative to the land and fishery resources. Such use, therefore, requires exclusion and/or control of numbers, timing, and intensity so that animals are kept from or dispersed in a manner that does not adversely impact the aquatic/riparian habitat.

- Changes in land use and irrigation methods that appear as a threat to the Silver Creek Preserve (Meiners, 1979) are also applicable to the Stalker Creek Ranch. Drought is an additional factor that can serve to diminish flows of Silver Creek and its tributaries. Protection and retention (in those instances where lands are sold, water rights should be retained if possible, legally) of water rights, particularly ground water rights, is therefore necessary to provide a water supply adequate to maintain streamflows and dependent life forms.

- Further assessment of the continuing urbanization of the Sun Valley - Ketchum - Hailey area is needed to ascertain future impacts upon water supply available to Nature Conservancy properties. This should be undertaken in the relatively near future to project probable future impacts, say 50 or so years hence.
- Current water supply for the Silver Creek Preserve and Stalker Creek Ranch is a mixed bag of surface and ground water use and water rights. Surface water rights date from 1886, a junior filing relative to other filings in the Big Wood River/Silver Creek area. Ground water rights, however, are relatively good when compared to other, later ground water rights but must be protected through continued use of such waters, otherwise they become void after a five year period of non-use.
- The "duck pond" (located near the Stalker Creek cabin) does not appear a valuable asset for attracting and holding ducks. It could serve, however, as an interim collection basin for silt during spring snowmelt events. This can be accomplished by construction of low gradient canals from Stalker, Chaney, and Mud creeks but cannot be considered a permanent solution for the silt problem. A permanent solution will require community cooperation through conservation farming efforts throughout the Stalker, Loving, and Chaney creek basins.
- Any disposal of acquired lands (Silver Creek Preserve - Stalker Creek Ranch) is a likely detriment to the protection and restoration of these properties and their waters. All parcels are an integral part (both asset and liability) to the total area and each contributes and serves its separate function. Therefore, it is recommended that no land be sold and, instead, a lease be drawn by and through which necessary conservation farming practices may be applied, land retirement be achieved, water rights be retained, and overall management implemented to protect and rehabilitate the lands and waters involved.
- If all lands cannot be retained, limited disposal of certain tracts could be achieved. Two options are available: 1) a dis-

posal of upland areas along southern boundary composed, primarily of Molyneux soils; or, 2) disposal of E $\frac{1}{4}$ SW $\frac{1}{4}$ Section 22. If either option is chosen, strict conservation easement requirements of conservation farming practices, crop rotation, buffer strips, and retention of water rights should be sought to achieve protection of the area and complement the overall Conservancy goal for protection and rehabilitation of the Stalker/Silver Creek properties.

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SOIL SERIES DESCRIPTIONS

Acknowledgement and thanks is given the Soil Conservation Service for the following soil descriptions. They represent "Tentative" draft copies as may contribute to the National Cooperative Soil Survey, and as such, are subject to revision.

Other descriptions for soils named in this report are found in Appendix C of the Silver Creek report (Meiners, 1979).

Depth to mottles in the C horizon in most places is below 45 inches, but where Brinegar soils border poorly drained soils or near wet spots, mottles occur at about 30 inches.

Brinegar soils are extensive, occurring in large bodies along the larger streams in the western part of the county. One type, loam, with 2 slope phases is mapped.

By Brinegar loam, over 40 inches deep, 0-1 percent slope, slightly wet. -- A good description of a typical profile has not been described in Blaine County, as only a small acreage on scattered farms has been mapped. The following description from Camas County is being used as representing Brinegar soils until a large acreage is mapped and better profile descriptions are obtained. The following description of a typical profile was taken at a point 150 feet north and 100 feet west of the southeast corner of the NW $\frac{1}{2}$, SW $\frac{1}{2}$, Section 16, Township 1 South, Range 13 East, approximately 1 $\frac{1}{2}$ miles east and $\frac{3}{4}$ miles south of corral, in a winter wheat stubble field; slope at this site is 0.5 to 1.0 percent, simple.

Ap 0-8" Dark-gray (10 YR 4/1) gritty loam; black (10 YR 2/1) when moist; moderate fine granular structure; slightly hard; friable; slightly sticky; slightly plastic; plentiful fine roots; many fine interstitial pores; noncalcareous; slightly acid (pH 6.4 bromthymol blue); clear, wavy boundary; 7 to 9 inches thick.

A₁ 8-13" Dark-gray (10 YR 4/1) gritty loam; black (10YR 2/1) when moist; weak fine granular structure; slightly hard; friable; slightly sticky; slightly plastic; plentiful fine roots; many fine interstitial pores; noncalcareous; neutral (pH 6.6 b.t.b.); clear, smooth boundary; 5 to 6 inches thick.

B₁t 13-16" Grayish-brown (10YR 5/2) gritty loam approaching clay loam; very dark grayish brown (10 YR 3/2) when moist; weak medium subangular blocky structure; hard; friable; slightly sticky; plastic; few fine roots; many, fine and medium tubular pores; thin patchy clay films, mostly in pores and root channels; noncalcareous; neutral (pH 6.8 b.t.b.); clear, smooth boundary; 3 to 4 inches thick.

B₂t 16-29" Brown (10 YR 5/3) gritty clay loam; dark brown (10 YR 3/3) when moist; weak medium prismatic structure, breaking to moderate medium angular blocks; very hard; friable; sticky; plastic; few fine roots; many fine and medium tubular pores; thin continuous clay films on all ped surfaces; noncalcareous; neutral (pH 7.0 b.t.b.); clear smooth boundary; 12 to 14 inches thick.

C₁ 29-47" Pale-brown (10 YR 6/3) sandy loam approaching loam; brown to dark brown (10 YR 4/3) when moist; weak medium subangular blocky structure; soft; friable; nonsticky; slightly plastic; very few fine roots; many fine and medium tubular pores; noncalcareous; neutral (pH 7.2 b.t.b.); gradual, smooth boundary; 17 to 20 inches thick.

IIC₂g 47-52" Pale-brown (10 YR 6/3) loam with thin strats of sandy loam; brown to dark brown (10 YR 4/3) when moist (hues are between 10 YR and 2.5Y); common, fine prominent brown (7.5 YR 5/3) mottles; dark brown (7.5 YR 3/3) when moist; massive; slightly hard; friable; slightly sticky; slightly plastic; roots absent; few fine tubular pores; noncalcareous; neutral (pH 7.0 b.t.b.); gradual, smooth boundary; 5 to 6 inches thick.

III C_{3g} 52-63"+ Light-gray (2.5 Y 7/2) clay; grayish-brown (2.5 Y 5/2) when moist; common fine distinct olive-yellow (2.5Y 6/6) mottles; olive brown (2.5Y 4.6) when moist; massive; extremely hard; very firm; very sticky; very plastic; roots and pores absent; noncalcareous; mildly alkaline (pH 7.8 cresol red).

Variations: Color of the A₁ horizon ranges in value from 3.5 to 4.5 when dry; chroma ranges from 1 to 2. Texture of the A₁ horizon is dominantly loam, but areas of gravelly loam are included; in a few areas texture approaches coarse sandy loam. Thickness of the A₁ horizon ranges from 8 to 15 inches. Pebbles are common throughout the profile. The texture of the B₂ horizon is dominantly clay loam, but in places approaches loam; structural development ranges from weak to moderate. The water table is near 45 inches in the spring but lowers to below 70 inches in late summer and fall. Surface drainage is slow. In many places a gravelly loam or coarse sandy loam horizon occurs just above the clayey C_g horizon. Slope is dominantly 0 to 4 percent, with slopes less than 1 percent being most common.

Inclusions: About 90 percent of the areas of this mapping unit consist of Brinegar loam. The remaining 10 percent is estimated to consist of inclusions as follows:

Riceton loam	2%
Simonton loam	2%
Chimney coarse sandy loam	3%
Vaught clay loam	3%

The erosion hazard is slight and runoff is slow. Permeability is .8 to 2.5 inches per hour while infiltration is .2 to .8 inches per hour. The available water-holding capacity is 2.2 inches per foot of soil. Organic matter content ranges from 3.5 to 5.5 percent. This phase is slightly wet.

RANDS SERIES

The Rands series is a member of a fine, montmorillonitic, frigid family of Typic Argiustolls developed in medium textured mixed alluvium, mainly from andesite, volcanic tuff, and related igneous rocks, with lesser amounts of sedimentary rocks. These well drained soils occur on gently to strongly sloping high alluvial fans, under low sagebrush, Sandberg's bluegrass, blue-bunch wheatgrass, and various forbs. The mean annual soil temperature is less than 47°F. and the mean summer soil temperature at 20 inches is more than 60°F. The mean annual precipitation is 13 to 16 inches.

Rands soils have a grayish-brown, loamy A1 horizon, 7 to 10 inches thick; a brown clay loam B1 horizon; a strongly developed, clay B2 horizon; and a sandy loam C horizon.

Rands soils are associated with the Simonton, and Vodermaier soils. Simonton soils have a grayish-brown A1 horizon, and a moderate textural B2 horizon; and occur on younger, lower lying alluvial fans. Vodermaier soils are moderately coarse textured, have a grayish-brown A1 horizon, lack a textural B2 horizon, and occur along the edges of the fans.

Similar Soils

Differences

<u>Similar Soils</u>		<u>Differences</u>
Rands	Typic Argiustoll F Mont. f	
Goodington	same	11-13" Prec.
Manard	same	Less than 40" deep
Diebenow	same	Less than 40" deep
Decree	same	Less than 40" deep

Rands soils are extensive on the high alluvial fans in the western part of Blaine County, where they are dryfarmed or used as grazing land.

This soil is well drained. Permeability is moderate (.80 - 2.50 inches per hour) and the infiltration is very slow (less than .05 inches per hour). Runoff is slow, the erosion hazard is slight to moderate. Organic matter content is moderate (2.2 - 3.5%) and the available water-holding capacity is about 2.2 inches per foot of soil.

RqC Rands loam, over 40 inches deep, 4 to 8 percent slope.--This moderately sloping phase of Rands loam has the same number, kind and sequence of horizons as the gently sloping phase described. Runoff is medium; the erosion is moderate.

RqD Rands loam, over 40 inches deep, 8 to 12 percent slopes.--With the exception of a medium runoff and high erosion hazard, this phase is very similar to the very gently sloping phase described.

RqE Rands loam, over 40 inches deep, 12 to 20 percent slope.--This steeply sloping phase of Rands loam occurs on the edges of high alluvial fans. With the exception of having more gravel and stones throughout the profile, this phase has the same number, kind, and sequence of horizons as the gently sloping phase described. Runoff is medium and the erosion hazard is high.

RqI MODERATELY DEEP VARIANT - Rands very rocky loam, 20 to 40 inches deep, 0 to 30 percent slopes. --This sloping phase occurs at the foot of more steeply sloping phases and is shallower to bedrock limiting the total water-holding capacity. The rockiness and slope limits it to range production. Otherwise, it is very similar to the very gently sloping phase described.

RqJ MODERATELY DEEP VARIANT - Rands very rocky loam, 20 to 40 inches deep, 30 to 60 percent sluth slopes. --The very steep south slopes of Rands very rocky loam are generally shallower and stonier than the profile described, but still have the characteristic dark-brown, prismatic clay B2 horizon.

WATER DATA

- a) Ground Water Licenses and Certificates of Water Right pp B1 - B4
- b) Well logs and other well data pp B5 - B17
- c) Hydrograph of U.S. Geological Survey observation well at intersection of U.S. Highway 20 and Kilpatrick Road (Punkin Center) pp B18 - B23

State of Idaho
License and Certificate of Water Right

Well No. 1

Water License No. G-27591 Amount 2.0 cfs
Water District No. _____ Priority October 8, 1958

THIS IS TO CERTIFY that WINTON S. GRAY - Assignees - FRED PRINS & MARGARET F. PRINS of Sun Valley, Idaho, made application for a permit to appropriate the public waters of the State of Idaho, dated October 8, 1958; that Permit No. G-27591 was issued under said application; that Certificate of Completion of works, with a carrying capacity of 2.0 second feet, was issued thereunder on September 16, 1964, showing that said works were completed on the 30th day of December, 1963; and that on the 30th day of December, 1963.

WINTON S. GRAY - Assignees - FRED PRINS & MARGARET F. PRINS of Escondido, State of California, made proof to the satisfaction of the State Reclamation Engineer of Idaho, of the right to use the waters of a well, a tributary of suterranean flow, for the purpose of irrigation, under Use Permit No. G-27591 of the Department of Reclamation and that said right to the use of said waters has been perfected in accordance with the laws of Idaho, and is hereby confirmed by the State Reclamation Engineer of Idaho and entered of record in Volume

13 of Licenses at page 7992, on the 16 day of September, 1964;
The right hereby confirmed dates from October 8, 1958;

The Point of Diversion is located in the NE 1/4 SW 1/4, Sec. 22, Tp. 1 S., R. 19 E., B. M. Blaine County

That the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually needed and beneficially used for said purposes, and shall not exceed 2.0 cubic feet per second.

Description and location of use:

Twp.	Range	Sec.	Forty-acre Tract	No. Acres Described in Permit	No. Acres Actually Irrigated
1 S.	19 E.	22	NE 1/4 SE 1/4	10	10
			NE 1/4 SE 1/4	10	10
			NE 1/4 SW 1/4	10	10
			SE 1/4 SW 1/4	10	10
Total number of acres to be irrigated:				100	100

The right to the use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described, as provided by the laws of Idaho.

WITNESS the seal and signature of the State Reclamation Engineer, Office at Boise, Idaho, this _____ day of _____, 19____

(SEAL)

17950

State of Idaho License and Certificate of Water Right

Well No. 2

Water License No. G-27592

Amount 4.04 c.f.s.

Water District No. _____

Priority Oct. 8, 1958

THIS IS TO CERTIFY that WINTON S. GRAY - Assignees - FRAD FRINS & MARGARET F. FRINS of Sun Valley, Idaho, made application for a permit to appropriate the public waters of the State of Idaho, dated October 8, 1958; that Permit No. G-27592 was issued under said application; that Certificate of Completion of works, with a carrying capacity of 4.04 second feet, was issued thereunder on September 16, 1964, showing that said works were completed on the 30th day of December, 1963; and that on the 30th day of December, 1963,

WINTON S. GRAY - Assignees - FRAD FRINS & MARGARET F. FRINS of Sun Valley, State of Idaho, made proof to the satisfaction of the State Reclamation Engineer of Idaho, of the right to use the waters of a well

, a tributary of subterranean flow, for the purpose of irrigation, under Use Permit No. G-27592 of the Department of Reclamation and that said right to the use of said waters has been perfected in accordance with the laws of Idaho, and is hereby confirmed by the State Reclamation Engineer of Idaho and entered of record in Volume 13 of Licenses at page 7993, on the 19 day of September, 1964:

The right hereby confirmed dates from October 8, 1958:

The Point of Diversion is located in the SE 1/4 SW 1/4, Sec. 22, Tp. 1 S., R. 19 E., B. M. Blaine County

That the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually needed and beneficially used for said purposes, and shall not exceed 4.04 cubic feet per second.

Description and location of use:

Twp.	Range	Sec.	Forty-acre Tract	No. Acres Described in Permit	No. Acres Actually Irrigated
1 S.	19 E.	22	SE 1/4 SW 1/4	30	30
			NE 1/4 NE 1/4	30	30
		27	NW 1/4 NE 1/4	40	40
			SW 1/4 NE 1/4	30	30
		SE 1/4 NE 1/4	15	15	
		NW 1/4 NW 1/4	40	40	
		SE 1/4 NW 1/4	10	10	
		NW 1/4 SE 1/4	40	40	
		NW 1/4 SE 1/4	15	15	
		Total number of acres to be irrigated:			

The right to the use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described, as provided by the laws of Idaho.

WITNESS the seal and signature of the State Reclamation Engineer, affixed at Boise, Idaho, this 10th day of September, 1964.

(SEAL)

-B2- _____
Deputy State Reclamation Engineer.

37 2609

Department of Water Resources

WATER RIGHT LICENSE

License of Water Right No. 28017/37-2618 Priority June 29, 1959 Amount 2.39 cfs

THIS IS TO CERTIFY that WINTON S. GRAY

of Sun Valley, Idaho has complied with the terms and conditions of Permit No. 28017/37-2618 issued pursuant to Application for Permit dated June 29, 1959 and has submitted proof to the Department of Water Resources on June 29, 1964 that he has applied water to a beneficial use, an examination by the Department indicates that the works have a capacity for the diversion of 2.39 cfs of water from a ground water source tributary to _____ and that the permit holder has applied to a beneficial use and established a right to use water as follows:

Beneficial Use	Period of Use	Rate of Diversion	Annual Volume
<u>Irrigation</u>	from <u>April 1</u> to <u>Nov. 1</u>	at <u>2.39</u> cfs and	<u>705</u> acre feet or <u>3.0</u> af per acre
_____	from _____ to _____	at _____ cfs and	_____
_____	from _____ to _____	at _____ cfs and	_____

(both dates inclusive)

Subject, however, to the condition that no more than 2.39 cfs of water be diverted at any one time, and that the amount of water so diverted and to which such right is entitled and confirmed is for the purpose aforementioned and is limited to the amount which can actually be beneficially used and shall not exceed 705 acre feet per year, said waters to be diverted within the NE 1/4 SW 1/4 of Sec. 26, Twp. 1 S, Rge. 19 E, B. M. in the County of Blaine

Description and location of place of use:

Twp.	Range	Sec.	NE 1/4				NW 1/4				SW 1/4				SE 1/4				Totals		
			NE 1/4	NW 1/4	SW 1/4	SE 1/4	NE 1/4	NW 1/4	SW 1/4	SE 1/4	NE 1/4	NW 1/4	SW 1/4	SE 1/4	NE 1/4	NW 1/4	SW 1/4	SE 1/4			
1S	19E	26							22	20	40	40									122
		27			36	28											35	14			113

Total number of acres irrigated 235

NOTE: Modifications to or variance from this license must be made within the limits of Section 42-222, Idaho Code, or the applicable Idaho Law. This right may be forfeited by five years of non-use.

The right to the use of the water hereby confirmed is restricted and appurtenant to the lands or place of use herein described, as provided by the laws of Idaho.

Witness the seal and signature of the Director, affixed at Boise, Idaho, this 19 day of November 19 75

[Signature]
Director

State of Idaho
License and Certificate of Water Right

Well No. 4

Water License No. G-25922

Amount 2.01 c.f.s.

Water District No. _____

Priority Sept. 1, 1955

THIS IS TO CERTIFY that UNION PACIFIC R. R. CO. - SUN VALLEY OPERATIONS of Sun Valley, Idaho, made application for a permit to appropriate the public waters of the State of Idaho, dated September 1, 1955; that Permit No. G-25922 was issued under said application; that Certificate of Completion of works, with a carrying capacity of 2.01 second feet, was issued thereunder on October 15, 1964, showing that said works were completed on the 31st day of August, 1960; and that on the 31st day of August, 1960,

UNION PACIFIC R. R. CO. - SUN VALLEY OPERATIONS

of Sun Valley, State of Idaho, made proof to the satisfaction of the State Reclamation Engineer of Idaho, of the right to use the waters of a well, a tributary of subterranean flow, for the purpose of irrigation, under Use Permit No. G-25922 of the Department of Reclamation and that said right to the use of said waters has been perfected in accordance with the laws of Idaho, and is hereby confirmed by the State Reclamation Engineer of Idaho and entered of record in Volume 13 of Licenses at page 8022, on the 13 day of October, 1964:

The right hereby confirmed dates from September 1, 1955; (September 1)

The Point of Diversion is located in the NE 1/4, N 1/4, Sec. 26, Tp. 1 S, R. 19 E, B. M. Blaine County

That the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually needed and beneficially used for said purposes, and shall not exceed 2.01 cubic feet per second.

Description and location of use:

Twp.	Range	Sec.	Forty-acre Tract	No. Acres Described in Permit	No. Acres Actually Irrigated
1 S	19 E	26	SE 1/4	25	25
			SW 1/4	25	25
			NE 1/4	25	25
			NW 1/4	25	25
			SW 1/4	25	25
Total amount of acres to be irrigated				125	125

The right to the use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described, as provided by the laws of Idaho.

WITNESS the seal and signature of the State Reclamation Engineer, affixed at Boise, Idaho, this 15th day of October, 1964.

-B4- JAMES H. THOMAS
Deputy State Reclamation Engineer.

(SEAL)

37 2507

Well No. 1

WELL LOG AND REPORT TO THE
STATE RECLAMATION ENGINEER OF IDAHO

RECEIVED
 FEB 2 5 1958
 Department of Reclamation
 Well No. _____
 Permit No. _____

DO NOT FILL IN

Owner Winston Gray Address Sun Valley
 Driller Eugene H. Kelly Address Turn Falls Lic. No. 15
 Location of Well SW 1/4 SW 1/4 Sec. 22, T. 1 N/S, R. 19 E/W P.L. County,
 and _____ foot N/S, and _____ foot E/W from _____ Corner of _____ 1/4 Sec.
 Size of Drilled Hole 8 in Total depth of Well 182
 Give depth of standing water from surface _____ Water Temp. 79 °Fahrenheit
 On pumping test delivery was _____ g.p.m. or _____ c.f.s. Drawdown was _____ feet.
 Size of pump and meter used to make the test _____
 Length of time pumped during check was _____ hr., _____ minutes.
 If flowing well, give flow in c.f.s. 4 or g.p.m. 1800 and shut in pressure 7
 If flowing well, describe control works 8 in Gate Valve
 (TYPE AND SIZE OF VALVE, ETC.)
 Water will be used for Irrigation Weight of casing per linear foot 25 lb
 Thickness of casing 2800 Casing material Steel
 (E.G., PIPE, CONCRETE, WOOD)
 Diameter, length and location of casing 152 1/2 ft 8 in
 (CASING 12" IN DIAMETER AND UNDER GIVE INSIDE DIAMETER;
 CASING OVER 12" IN DIAMETER GIVE OUTSIDE DIAMETER.)
 Number and size of perforations None located _____ feet to _____ feet
 from surface of ground.
 Other perforations None
 Date of commencement of well 22 Sept Date of completion of well 6 Oct
 Type of well rig Chain

CASING RECORD

DIAM. CASING	FROM FEET	TO FEET	LENGTH	REMARKS - SEALS, GROUTING, ETC.
8	0	152 1/2	152 1/2	

GENERAL INFORMATION—Pumping Test, Quality of Water, Etc.

SWSW 5.22 15 19 E

Well No. 1

WELL LOG

From Feet	To Feet	Type of Material	Drilling Time		Water-bearing Formation Ass. Test or No.	Casing Perforated Ass. Test or No.
			Hrs.	Min.		
0	7	Surface		40	Yes	Yes
7	25	Water			Yes	Yes
7	25	Gravel-sand bank & clay	6		Yes	Yes
25	30	Light Brown clay	1		Yes	Yes
30	41	Gravel-sand bank & clay	6		Yes	Yes
41	83	Blue Pressing Sand	12	10	Yes	Yes
83	107	Blue Pressing Sand	11		Yes	Yes
107	121	Blue + tan siltstone	3	20	Yes	Yes
121	140	Blue Pressing Sand	4		Yes	Yes
140	180	Blue Clay	8		Yes	Yes
180	180 1/2	Brown clay - shaly	1		Yes	Yes
180 1/2		Petroleum water	13		Yes	Yes
180 1/2		Brown clay - Petroleum water				
				12	Yes	Yes

If more space is required use Sheet No. 2

WELL DRILLER'S STATEMENT

This well was drilled under my jurisdiction and the above information is true and correct to the best of my knowledge and belief.

Signed Eugene H. Waller

By

Dated 9 Feb 1957

License No. 123

Well No. 2

WELL LOG AND REPORT TO THE STATE RECLAMATION ENGINEER OF IDAHO

RECEIVED
Log No. 552-51955
DEPARTMENT OF RECLAMATION
Well No.
Permit No.

DO NOT FILL IN

Owner Winston Gray Address Sun Valley
Driller Eugene H. Walker Address Twin Falls Lic. No. 15
Location of Well NW 1/4 SW 1/4 Sec. 22, T. 1 N. 2 R. 19 E. Blaine County,
and _____ feet N/S, and _____ feet E/W from _____ Corner of _____ 1/4 _____ 1/4 Sec.
Size of Drilled Hole _____ Total depth of Well 192
Give depth of standing water from surface _____ Water Temp. 50 °Fahrenheit
On pumping test delivery was _____ g.p.m. or _____ c.f.s. Drawdown was _____ feet.
Size of pump and motor used to make the test _____
Length of time pumped during check was _____ hr. _____ minutes.
If flowing well, give flow in c.f.s. _____ or g.p.m. 1080 and shut in pressure 6.5
If flowing well, describe control works Gate Valve
(TYPE AND SIZE OF VALVE, ETC.)
Water will be used for Irrigation Weight of casing per linear foot 19
Thickness of casing 2 3/4 Casing material Steel
(E.G. PIPE, CONCRETE, WOOD)
Diameter, length and location of casing 16 1/2 ft 6 in
(CASING 12" IN DIAMETER AND UNDER GIVE INSIDE DIAMETER; CASING OVER 12" IN DIAMETER GIVE OUTSIDE DIAMETER.)
Number and size of perforations none located _____ feet to _____ foot
from surface of ground.
Other perforations none
Date of commencement of well 9 Oct 53 Date of completion of well 19 Oct 53
Type of well rig Churn

CASING RECORD

DIAM. CASING	FROM FEET	TO FEET	LENGTH	"REMARKS" -- SEALS, GROUTING, ETC.

GENERAL INFORMATION—Pumping Test, Quality of Water, Etc.

This Well was drilled 1948, by Alvin
Diehagen in business,
I own it. It is in the Sun Valley
area. I am interested in additional
information for additional purposes.

NW 1/4 SW 1/4 22 19 E

Well No. 3

WELL LOG AND REPORT TO THE
STATE RECLAMATION ENGINEER OF IDAHO

RECEIVED
OCT 28 1958

Log No. _____
Department of Reclamation

Well No. _____

Permit No. _____

DO NOT FILL IN

Owner Winton & Gray Address Sun Valley
 Driller Eugene W. Walker Address Twin Falls Lic. No. 15
 Location of Well NE 1/4 SW 1/4 Sec 26 T. 1 R. 19 W. 19 PLAINS County,
 and _____ feet N/S, and _____ feet E/W from _____ Corner of _____ 1/4 _____ 1/4 Sec _____
 Size of Drilled Hole 16 in Total depth of Well 270
 Close depth of standing water from surface 69 Water Temp. 52 °Fahrenheit
 On pumping test delivery was 1500 g.p.m. or _____ c.f.s. Drawdown was 111 feet.
 Size of pump and motor used to make the test 12 Bowl - 300 HP
 Length of time pumped during check was 9 hr. _____ minutes.
 If flowing well, give flow in c.f.s. _____ or g.p.m. _____ and shut in pressure _____
 If flowing well, describe control works _____
 (TYPE AND SIZE OF VALVE, ETC.)
 Water will be used for Irrigation Weight of casing per linear foot 42 lb
 Thickness of casing 1/2 Casing material Steel
 (E.G., PIPE, CONCRETE, WOOD)
 Diameter, length and location of casing 249 ft 16 in
 (CASING 12" IN DIAMETER AND UNDER GIVE INSIDE DIAMETER.
 CASING OVER 12" IN DIAMETER GIVE OUTSIDE DIAMETER.)
 Number and size of perforations 1600-513 located 112 feet to 247 feet
 from surface of ground.
 Other perforations 67 - one Row
 Date of commencement of well 20 April Date of completion of well 13 June 59
 Type of well rig Phurn

CASING RECORD

FEET DOWN	FROM FEET	TO FEET	LENGTH	REMARKS - SEALS, BRIDGING, ETC.

GENERAL INFORMATION—Pumping Test, Quality of Water, Etc.

Mills K-mpe used to Perforate
NE SW 1/4 26 15 19B

Well No. 3

WELL LOG

From Foot	To Foot	Type of Material	Drilling Time		Water-bearing Formation Abn. Yes or No	Casing Perforated Abn. Yes or No
			Hrs.	Min.		
0	6	Surface	1		No	No
6	67	Clay & gravel	6		No	No
67		Trace water			Yes	Yes
67	75	Clay	1	30	Yes	Yes
75	87	Sticky Tan Clay	3		No	No
87	112	Clay - sticky (1)	4		No	No
112	117	Clay & gravel	2		?	No
117	1143	Loose Gravel - Wash	1		Yes	Yes
114	178	Loose shale & gravel	55		?	Yes
178	186	Gravel, Clay & shale	8		Yes	Yes
186	206	Shale, trace of gravel & clay	16		?	Yes
206	217	Shale - some clay	8		?	Yes
217	222	gravel	2		?	Yes
222	225	gravel & shale	1		Yes	Yes
225	229	Clay	1		No	Yes
229	244	gradual shale & clay	20		?	Yes
244	270	Shale & clay	27			

If more space is required use Sheet No. 2

WELL DRILLER'S STATEMENT

This well was drilled under my jurisdiction and the above information is true and correct to the best of my knowledge and belief.

Signed Eugene A. Welch
By _____

Dated 16 Sept 1959

License No. 15

STATE OF

Owner *W. J. ...*
 Address *...*
 Location of Well
 and
 Water will be used
 Size of drilled hole
 Thickness of casing
 Diameter, long

Number and
 from surface
 Other parts
 If flowing
 If non-flow
 If flowing
 On pump
 Length of
 Date of
 Type of

Drilling Time		Whether Casing Set or No	Casing Finished Set or No
Min	Sec		
	10	Yes	Yes
1		Yes	Yes
6		Yes	Yes
1		Yes	Yes
1		Yes	Yes
3		?	Yes
14		Yes	Yes <i>634</i>
20		Yes	—
25		Yes	—
53		Yes	—
50		Yes	—
10		Yes	—
	20	Yes	—
7		Yes	—
	30	Yes	—
7		Yes	—
	30	Yes	—
9		Yes	—

true and correct to the best of my knowledge

W. J. Walker

License No. *10*

19

Survey Filed

Booked in

REGISTRATION NOT NECESSARY
 UNDER NEW LAW.

Well No. 4

WELL LOG

To	From	Type of Material	Drilling Time		Watering Production Per Sec. or Per Min.	Casing Production Per Sec. or Per Min.
			Hrs.	Min.		
0	1 1/2					
0	7	Surface		10	700	700
1 1/2	7	Clay & gravel	1		700	700
7	17	Clay sand - decomposed tan	6		700	700
17	21	gravel & sand	1		700	700
21	25 1/2	Brown clay	1		700	700
25 1/2	31	Clay & Cinder	3		700?	700
31	45	Loose Lava Rock & clay	14		700	700 634
45	65	Black solid Lava	20		700	—
65	90	Gray solid Lava	25		700	—
90	125	Hard Gray Lava	33		700	—
125	140	Red Hard Gray Lava	50		700	—
140	150	Greenish Black Lava	10		700	—
150	151	Black washed Cinder		20	700	—
151	176	Soft Black Lava	7		700	—
176	180	Soft Red Cinder		30	700	—
180	199	Red Lava	7		700	—
199	201	Dark Cinder		30	700	—
201	220	Layers of Cinder & talc	9		700	—

If more space is required use Sheet No. 2

WELL DRILLERS STATEMENT

This well was drilled under my jurisdiction and the above information is true and correct to the best of my knowledge and belief.

Signed Eugene H. Walker

By _____

Dated _____, 19____

License No. 10

Subscribed and sworn before me this _____ day of _____, 19____

Notary Public

My commission expires _____

Residing at _____

REGISTRATION NOT NECESSARY UNDER NEW LAW.

Water Level Measurements

Owner U.P.P. Company Conventions No.

Location NE NE 26. 15. 22E

Meas. Pt. HOLE IN E SIDE 1.0 ft above below LSD

OF PUMP BASE PLATE 1.00 S. Side Under
Platform

Date	Hour	Tape reading		D/W below		Meas. by	Remarks
		Field	Cut.	M.P.	LSD		
1/25							
5/16					2.1	PMC	same
1970				2.23	1.23	PMC	same
5/5	1045	10.00	7.77			PMC	same
8/13	1015	4.00	2.09	1.91	0.91	PMC	same
9/29	1725	3.00	1.24	1.76	0.76	PMC	same
1971							
10/1	1725	5.00	3.61	1.39	0.39	GLS	same
				3.59	2.89		
				3.89	2.89		
1975	0745	7.00	5.14	1.86	0.86	GLS	same
1/22	0745	8.00	6.15	1.85	0.85	GLS	same
7/28							need not be lowered, inaccessible BH

Well No. 15-19-26-ANC1

Well No. 5

Domestic well at Stalker Creek Ranch
WELL LOG AND REPORT TO THE
STATE RECLAMATION ENGINEER OF IDAHO

RECEIVED
FEB 2 5 1958
Department of Reclamation
Well No. _____
Permit No. _____

(DO NOT FILL IN)

Owner Winton Gray Address Shim Valley
Driller Eugene W. Walker Address _____ Lic. No. _____
Location of Well SE 1/4 NW 1/4 Sec 26, T. 1 N/S, R. 19 E/W Blaine County, _____
and _____ feet N/S, and _____ feet E/W from _____ Corner of _____ 1/4 Sec. _____
Size of Drilled Hole 8 in 12 in - 6 1/2 in Total depth of Well 200
Give depth of standing water from surface 25 Water Temp. 51 *Fahrenheit
On pumping test delivery was _____ g.p.m. or _____ c.f.s. Drawdown was _____ feet.
Size of pump and motor used to make the test _____
Length of time pumped during check was _____ hr. _____ minutes.
If flowing well, give flow in c.f.s. _____ or g.p.m. _____ and shut in pressure _____
If flowing well, describe control works _____
(TYPE AND SIZE OF VALVE, ETC.)
Water will be used for irrigation Weight of casing per linear foot 13 lb
Thickness of casing 1.58 Casing material Steel
E.S., PIPE, CONCRETE, WOOD.
Diameter, length and location of casing 1 1/4 ID 12 ft
(CASING 12" IN DIAMETER AND UNDER GIVE INSIDE DIAMETER;
CASING OVER 12" IN DIAMETER GIVE OUTSIDE DIAMETER.)
Number and size of perforations None located _____ feet to _____ feet
from surface of ground.
Other perforations None
Date of commencement of well 17 Aug Date of completion of well 20 Aug 1958
Type of well rig _____

CASING RECORD

DIAM CASING	FROM FEET	TO FEET	LENGTH	REMARKS - SEALS, GRouting, ETC.

GENERAL INFORMATION—Pumping Test, Quality of Water, Etc.

Important information re location of domestic supplies
found in the area. The casing was installed
and a permit to drill for domestic casing
was obtained. The well is located 19 ft above surface
water level
SENW S. 26 15 19E

Well No. 5

Domestic well at Stalker Creek Ranch

WELL LOG

From Foot	To Foot	Type of Material	Drilling Time		Water-bearing Formations Acut. Yes or No	Casing Sectioned Acut. Yes or No
			No.	Mins.		
0	4	Surf		30	Yes	Yes
4	46	Clay & Gravel	6	30	Yes	Yes
46		Trace of water			Yes	Yes
46	74	Clay & Gravel	3		Yes	Yes
74	75	Thin Harder Formation	1		Yes	Yes
75	78	Clay & Gravel	4			Yes
78	112	Blackish Sandst.	1	30	Yes	Yes
112	115	Clay		20	Yes	Yes
115	116	Black Sandst.	3			Yes
116	117	Clay - water	6.0		Yes	Yes
117	123	Black Sandst.	5		Yes	Yes
123	141	Red Sandst.	2		Yes	Yes
141	150	Clay Sandst.	7		Yes	Yes
150	158	Red Sandst. - thin		30	Yes	Yes
158	160	Black Sandst.	6		Yes	Yes
160	183	Soft Red Sandst. & Gravel	1	20	Yes	Yes
		Clay Sandst.	2	30	Yes	Yes

If more space is required use Sheet No. 2

WELL DRILLER'S STATEMENT

This well was drilled under my supervision and the above information is true and correct to the best of my knowledge and belief.

Signed: *Frank J. [Signature]*

By: _____

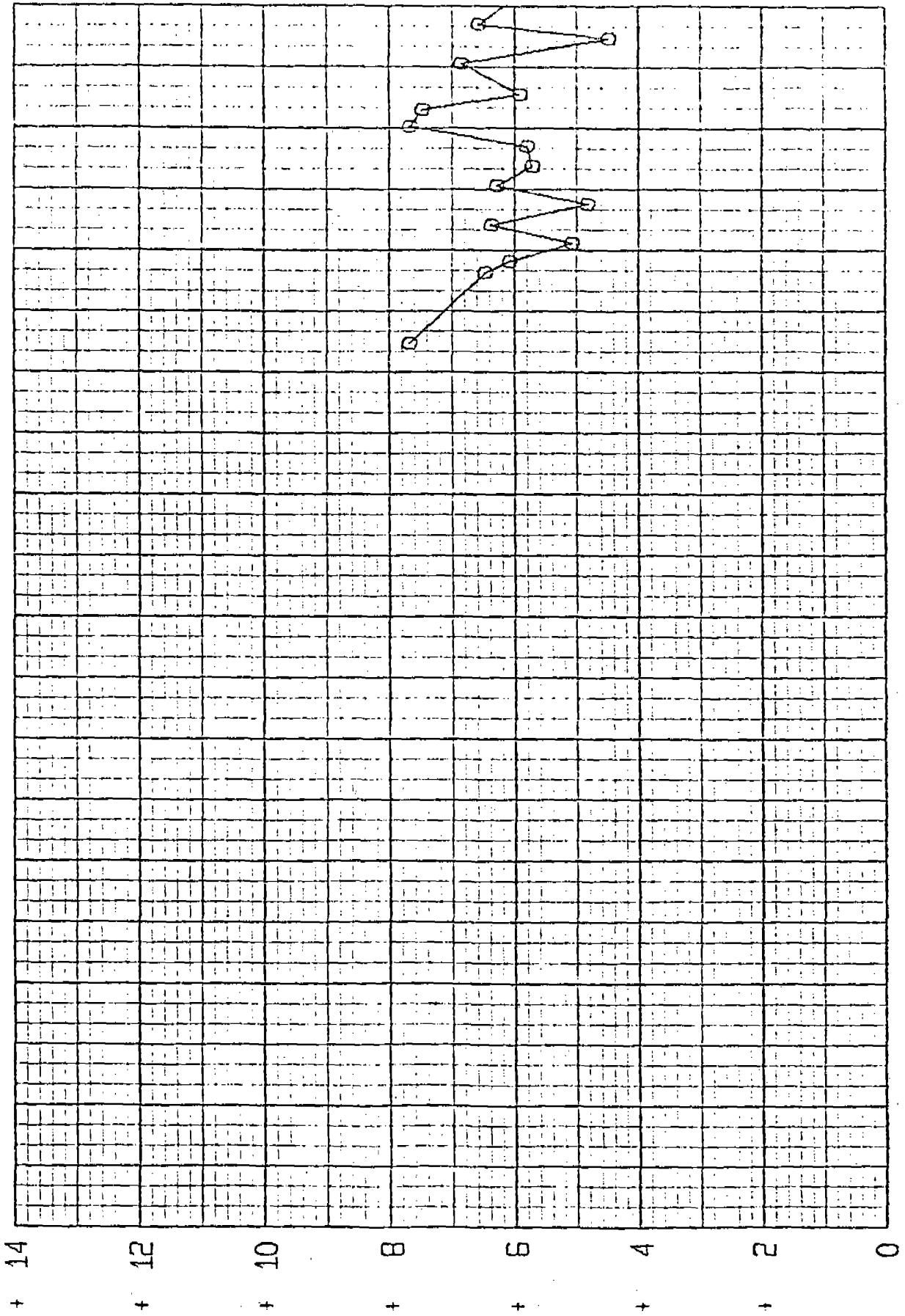
License No. 12

Dated: 12/1/50 1950

BLAINE COUNTY, IDAHO

CAT-LONG NO. 431944N1141035

WELL NO. 01S 19E 22AAA1 DEPTH OF WELL 150 ELEV. OF LSO 4885.39 AQUIFER O R ART.

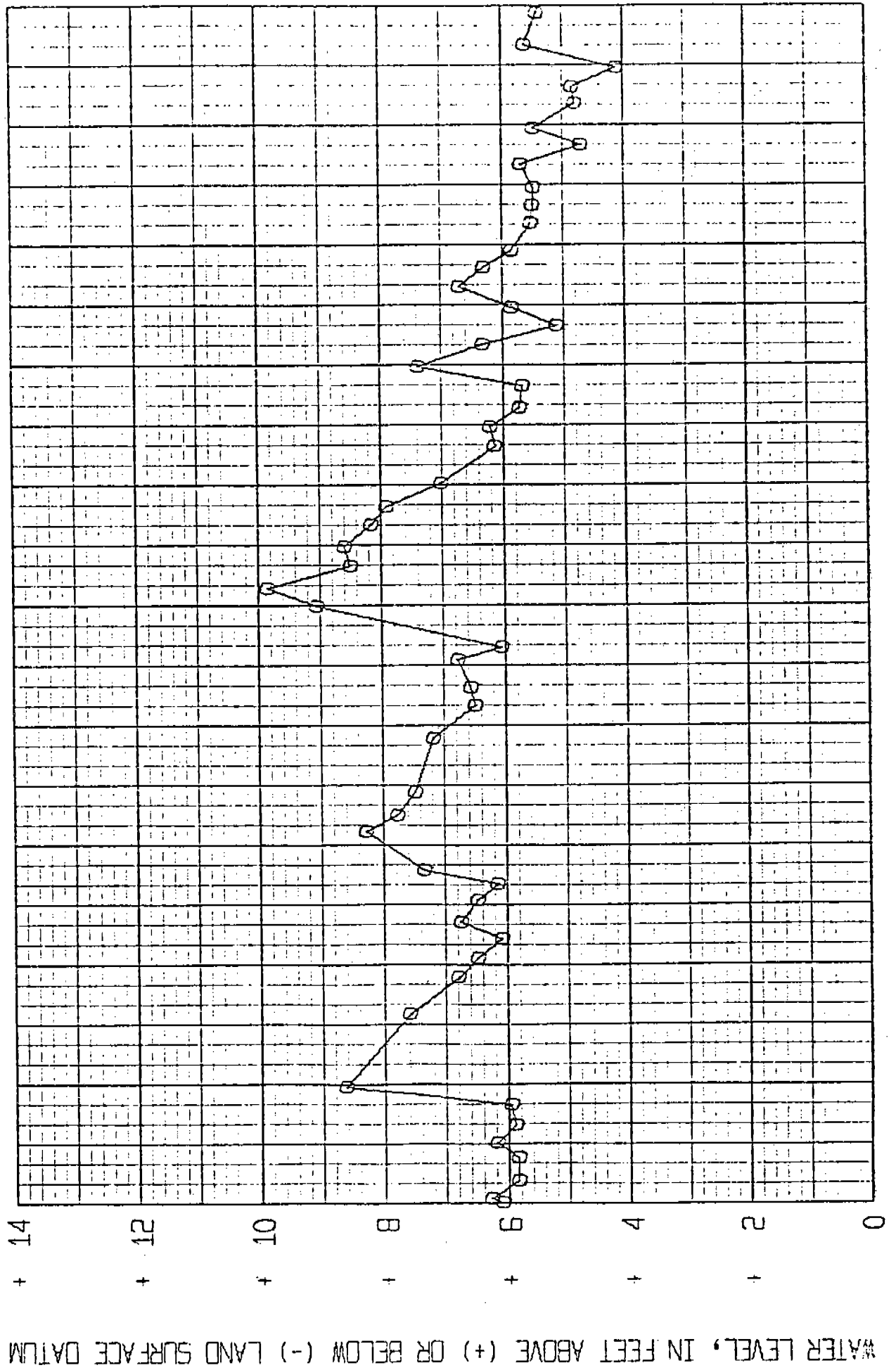


WATER LEVEL, IN FEET ABOVE (+) OR BELOW (-) LAND SURFACE DATUM

BLAINE COUNTY, IDAHO

LAT-LONG NO. 431944N1141033.1

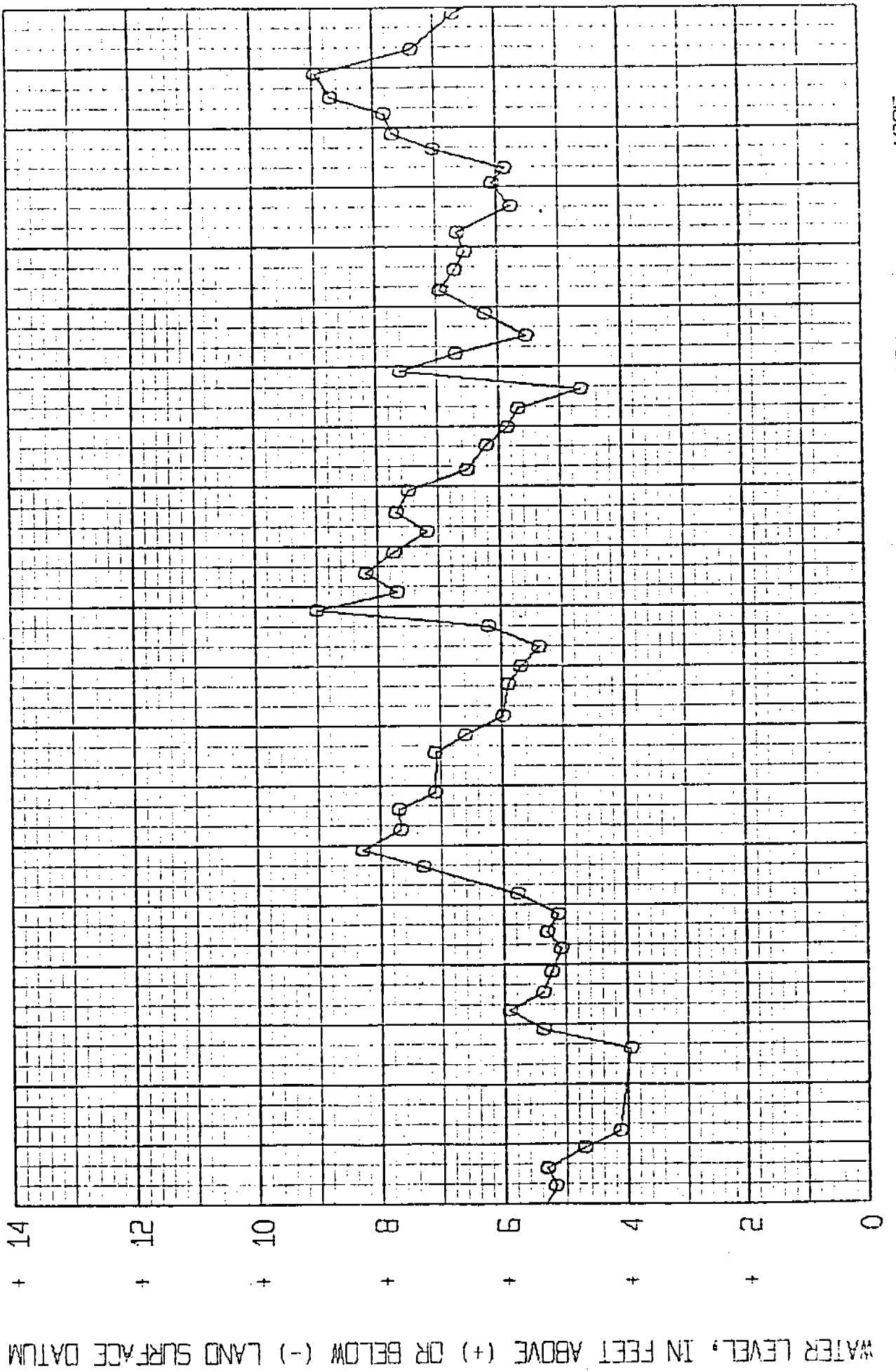
WELL NO. 015 19E 22AAA1 DEPTH OF WELL 150 ELEV. OF LSD 4885.39 AQUIFER 0 R ART.



BLAINE COUNTY, IDAHO

LAT-LONG NO. 431944N1141033.1

WELL NO. Q1S 19E 22AM1 DEPTH OF WELL 150 ELEV. OF LSD 4885.39 AQUIFER O R ART.

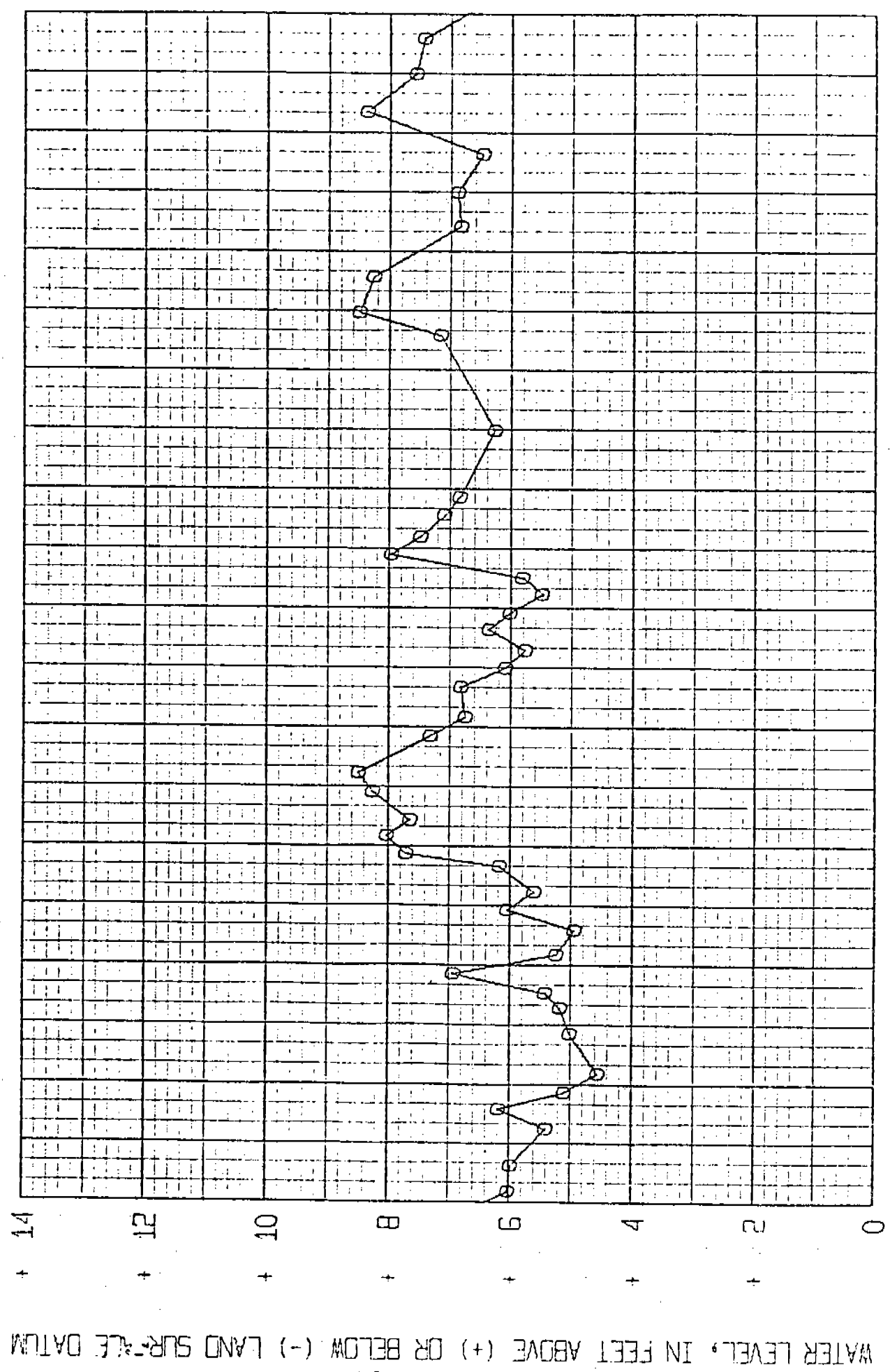


BLAINE COUNTY, IDAHO

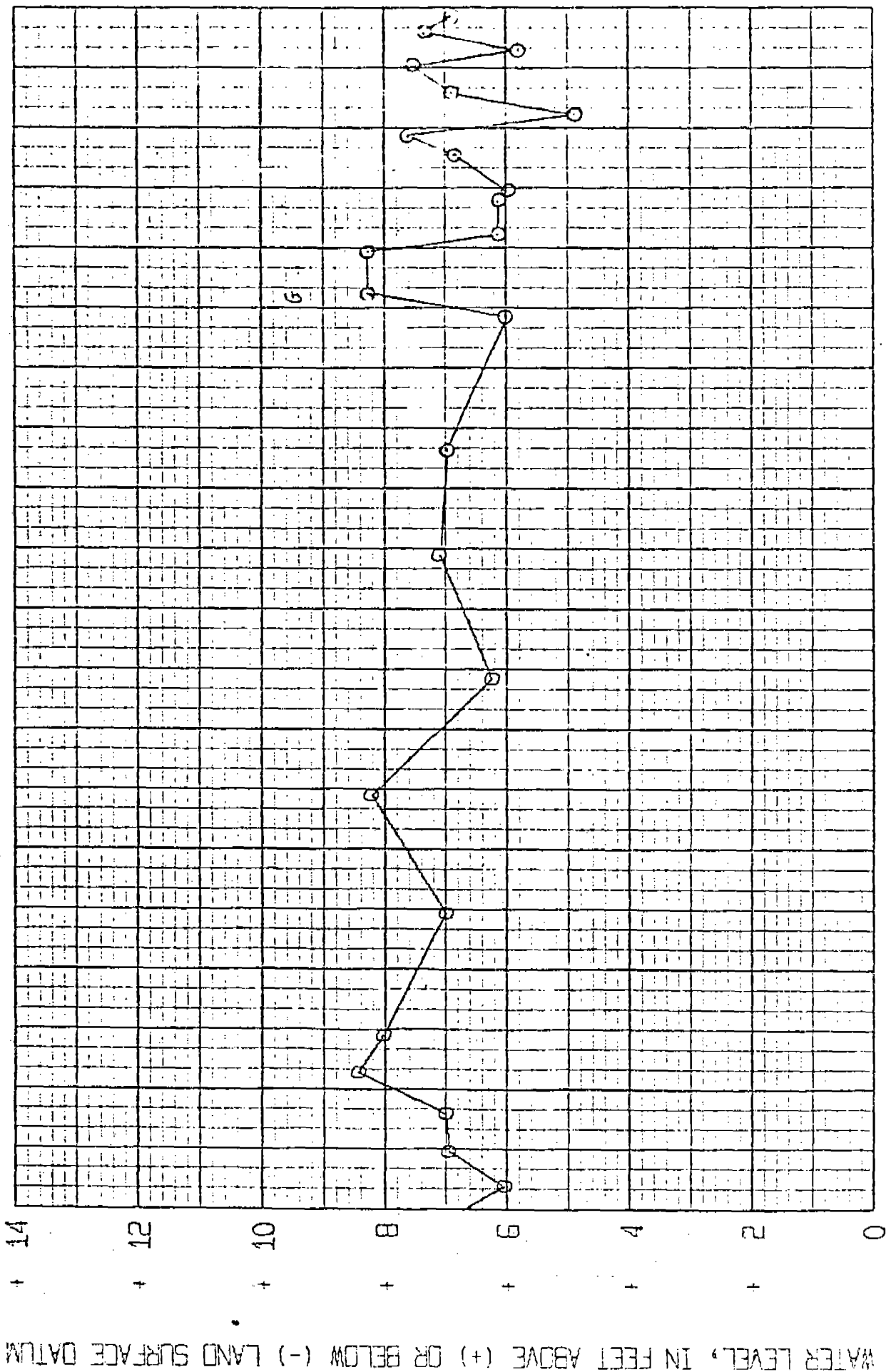
LAT-LONG NO. 431944N1141035.1

WELL NO. 015 19E 22AAA1 DEPTH OF WELL 150

ELEV. OF LSD 4885.39 AQUIFER O R ART.



BAINES COUNTY, IDAHO
 WELL NO. 015 19E 22AAA1 DEPTH OF WELL 150 ELEV. OF LSO 4885.39 AQUIFER Q R ART.
 LONG NO. 431944N1141035.1



1971 1972 1973 1974 1975

Blaine County, Idaho
15-19E - 22 NAAI

