# RECONNAISSANCE REPORT

of

# RECREATION USE AND DEVELOPMENT
# ALLENSPUR RESERVOIR
# YELLOWSTONE DIVISION
# MONTANA

July 1962

Prepared by

MISSOURI RIVER BASIN SURVEY
RESOURCE PLANNING
NATIONAL PARK SERVICE, MIDWEST REGION
DEPARTMENT OF THE INTERIOR

for

BUREAU OF RECLAMATION
REGION 6
BILLINGS, MONTANA

River Basin Code XXVI/71

Chester C. Brown
Assistant Regional Director

Report by
Russell L. McKown
Chief, Division of
Cooperative Services

In reply refer to:
L7423 Allenspur Reservoir

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
MIDWEST REGION
OMAHA 2, NEBRASKA

July 20, 1962

Memorandum

To: Regional Director, Bureau of Reclamation, Region 6, Billings

From: Assistant Regional Director, National Park Service, Midwest Region

Subject: Reconnaissance Report of Recreation Use and Development, Allenspur Reservoir, Yellowstone Division, Montana

Enclosed are 25 copies of the subject report as you requested in your memorandum of June 7, 1962. Distribution to the agencies noted below is also being made at this time.

Comments received from your agency as well as from others concerning our draft of the report are incorporated.

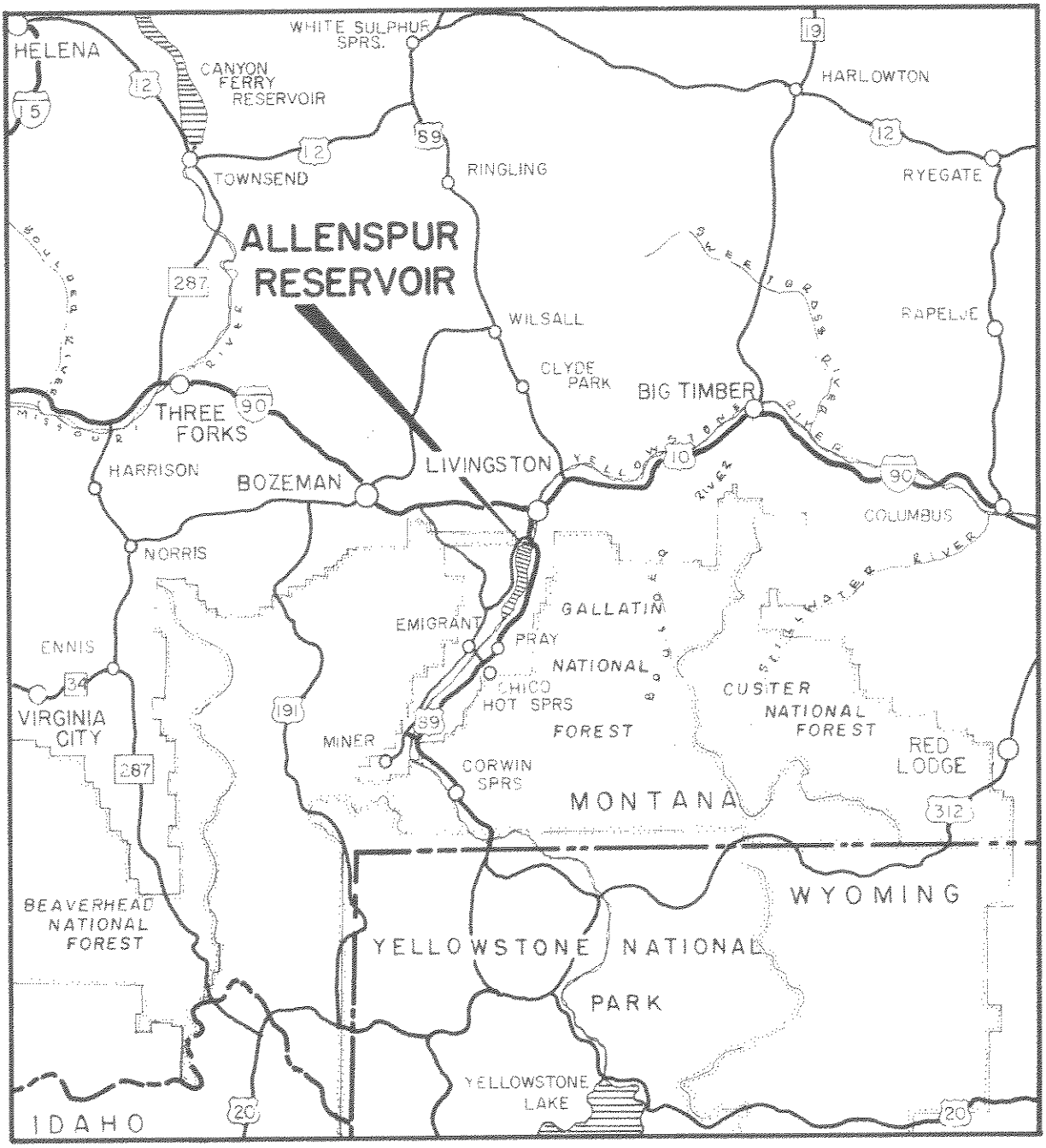
We will appreciate receiving your written authorization for our release of the report to outside agencies or individuals upon request.

Chester C. Brown
Assistant Regional Director

Enclosures 25

Copy to: The Director, w/3 copies
Commissioner, Bureau of Reclamation, w/copy, Attn.: 430
Director, Bureau of Outdoor Recreation, w/copy
Chairman, Interior Missouri Basin Field Committee, w/copy
Supervisor, Missouri River Basin Studies, Bureau of Sport Fisheries and Wildlife, w/3 copies
River Basin Representative, Bureau of Land Management, Denver, w/copy
State Director, State Office for Montana, Bureau of Land Management, Billings, w/2 copies
Area Director, Bureau of Indian Affairs, Billings, w/2 copies
Regional Director, Region III, Bureau of Mines, Denver, w/3 copies

S.K. Jackson, Division Hydrologist, U.S. Geological Survey, Denver, w/copy
District Director, U.S. Public Health Service, District No. 8, Denver, w/2 copies
Chief, Missouri Basin Projects, Smithsonian Institution, Lincoln, w/copy
State Park Director, Montana Highway Department, Helena, w/copy
State Game Warden, Department of Fish and Game, Helena, w/copy
Director, Division of Sanitary Engineering, State Board of Health, Helena, w/copy
Director, Historical Society of Montana, Helena, w/copy




# VICINITY MAP

# ALLENSPUR RESERVOIR

## YELLOWSTONE DIVISION

## MONTANA

NATIONAL PARK SERVICE — REGION TWO—OMAHA, NEBR.

APRIL 1962

SCALE

1" = APPROXIMATELY 22 MILES

NORTH

c.e.d

CONTENTS

# RECREATION RECONNAISSANCE REPORT
# ALLENSPUR RESERVOIR
# YELLOWSTONE DIVISION
# MONTANA

## I. INTRODUCTION

This reconnaissance report covers a study made of Allenspur Reservoir to determine what might be the recreation potential, if any, if the impoundment were created and what effect it might have upon existing recreation value of the area. It is prepared under authority of the Park, Parkway and Recreational Area Study Act of June 1936 and in accordance with the Memorandum of Understanding of April 5, 1955, between the Bureau of Reclamation and the National Park Service.

A field investigation was made of the area on May 25, 1961 by a representative of the Midwest Regional Office of the National Park Service, accompanied by representatives from the Bureau of Reclamation Region 6 Office and the Bureau of Sport Fisheries and Wildlife Office, Billings.

The Bureau of Reclamation, Region 6, requested this report for use in their reconnaissance report on the Yellowstone Division. It is compiled as part of the Department of Interior's program for development of the Missouri River Basin and is based on Bureau of Reclamation plans which can only be considered tentative until they have been approved by the Department of Interior. This report is for United States Government use only and is not to be publicly quoted in whole or in part without express permission from the Bureau of Reclamation.

## II. SUMMARY

### A. Findings and Conclusions

Allenspur Reservoir is one of five sites studied by the Bureau of Reclamation on the Yellowstone River.

The project will result in an impoundment in the Yellowstone River of approximately 33 miles long with the dam $2\frac{1}{2}$ miles above (south of) the town of Livingston. The extreme upper end of the impoundment would tail out approximately 40 miles downstream or north of the entrance to Yellowstone National Park. Consequently, there would be no direct adverse effect on the Park.

The Bureau of Sport Fisheries and Wildlife believes that if any stream is worthy of being reserved for fish and wildlife purposes, it is the section of the Yellowstone River from the mouth of Boulder River to the north boundary of Yellowstone National Park.

A very pleasant scenic drive follows the Yellowstone River south from Livingston to Yellowstone National Park. The entire stretch of the river from the Park downstream for 183 miles to Billings has been listed by the National Park Service as a free-flowing stream which we think should be preserved. This is considered to be an outstanding example of a large, top-quality trout stream, and one of the few such remaining streams in the United States which has remained in a relatively unchanged condition.

### B. Recommendations

1. Because of the outstanding character of the undisturbed section of Yellowstone River from Billings to the north boundary of Yellowstone National Park, and

2. Because the National Park Service listed this section of the Yellowstone River as a free-flowing stream which we think should be preserved, and

3. Since the Bureau of Sport Fisheries and Wildlife has estimated there will be a loss of fisherman days with the project, and that 33 miles of the most valuable stream-fishing in Montana and the Nation would be eliminated by construction of the reservoir, and

4. Since Montana fishermen have expressed a preference of stream-fishing over reservoir fishing,

It is recommended that from a recreation standpoint, the Allenspur project not be undertaken.

## III. GENERAL DESCRIPTION OF THE AREA

Allenspur Reservoir will be approximately 33 miles long with the dam located 2½ miles upstream or south of the town of Livingston. The extreme upper end of the reservoir would still be about 40 miles downstream or north of the north entrance to Yellowstone National Park. It is one of the following five sites studied by the Bureau of Reclamation as alternates.

1. Lissa, about 2 miles downstream from the confluence of the Yellowstone and Bighorn Rivers.

2. Absaroka, about 16 miles below Livingston.

3. Allenspur, about 2½ miles above Livingston.

4. Wanigan, about 3/4 mile below Emigrant.

5. Yankee Jim, about 11 miles below Gardiner.

The Absaroka site was determined too expensive for development and too limited in impoundment capacity and was dropped from further consideration.

The Lissa and Yankee Jim sites did not meet economic feasibility and were also dropped, and it was the consensus of the Bureau of Reclamation engineers that development of the Wanigan site appeared less attractive than Allenspur. Consequently, these four sites have been rejected, and Allenspur was selected as offering the most promising potential.

Irrigation storage will not be required, but Allenspur is proposed by the Bureau of Reclamation for power reduction, flood control, fish and wildlife, and recreation.

The damsite is in a relatively narrow gorge at the lower end of Paradise Valley. The reservoir site is a well-developed valley up to three miles in width with numerous farms devoted primarily to alfalfa and other forage crops, supporting dairy and livestock farms.

According to the 1960 Census, there were approximately 26,300 people living within a 50-mile radius of the proposed dam, but 179,500 drove along the section of highway between Livingston and Yellowstone National Park during the year 1961 en route to the Park. While there is no record on the number of people leaving the park, it appears perhaps twice that number leave on this route.

Present U.S. Highway 89 would have to be relocated higher on the side slopes if the dam were constructed.

The Northern Pacific Railroad branch line, serving Gardiner and Yellowstone National Park, runs through the reservoir site and would have to be relocated along with Highway 89. The railroad, however, serves mainly to transport ballast and riprap for railroad use, since passengers to the Park are transported by bus or personal car, and supplies are delivered by truck. The relocations of both the railroad and the highway are estimated by the Bureau of Reclamation to be quite costly.

The Bureau of Reclamation studied seven different heights for the dam and the following reservoir data was determined for the one selected:

| | Elevation | Surface Area (Acres) | Capacity (Acre-feet) |
|---|---|---|---|
| Crest of dam | 4915 | | |
| Maximum water surface | 4907 | 32,280 | 4,200,000 |
| Top conservation storage | 4890 | 28,117 | 3,700,000 |
| Top inactive storage | 4820 | 19,472 | 2,000,000 |
| Stream bed | 4535 | | 0 |
| Height of dam | 380 feet | | |

An afterbay dam and rather small reservoir are planned in order to minimize river fluctuations. This would be about 7/8 mile below the axis of the dam and adjacent to the suburban development south of Livingston. It would be 26 feet high and 2,900 feet in crest length. The afterbay reservoir would have a capacity of 1,094 acre-feet. It would fill during the period of peak power plant load and gradually empty during the off-peak period.

A study by the Bureau of Reclamation, covering possible reservoir operation during the years from 1926 to 1958, indicates some fluctuation of the water level could be expected. During the recreation season, May through September, the conservation pool would seldom ever reach the planned elevation of 4890. Reservoir levels would generally be at their best by the end of July and the end of August with the highest elevation 4886. The average fluctuation during this period 1926-58 would have been about 18 feet from May through August.

The only known feature of historic interest to the area around the Allenspur site is the Old Yankee Jim Toll Road which is still visible from the present highway leading into Yellowstone National Park. This old toll road served as an entrance to the Park prior to the 20th century.

Of archeological interest are several old "bison kills" around the town of Emigrant, where investigations were made several years ago. This area might be in the upper end of the impoundment, but cannot be definitely located until the different pool levels are known.

Temperatures in this general area cover quite a range from -20° or -25° in the winter to 100° or slightly higher in the summer. Summers are rather short with hot days and cool nights. Winters are cold

and long but occasionally moderate for brief periods. Precipitation averages about 15 inches annually.

There are no state or local parks which would be affected by the impoundment of Allenspur Reservoir. The only nearby National Park is Yellowstone which is approximately 35 miles south, or upstream from the upper part of the reservoir, and consequently, would not be directly affected by the impoundment.

The Bureau of Sport Fisheries and Wildlife reports that with the known presence of goldeye in the vicinity of Livingston, plus the favorable habitat that goldeye would have in Allenspur Reservoir, a definite threat poses of eventual invasion of the streams of Yellowstone National Park by this nuisance fish.

## IV. RECREATION USE OF THE AREA

The Bureau of Sport Fisheries and Wildlife is of the opinion that the Yellowstone River provides an abundance and variety of trout-stream fishing that is believed to be without equal in the United States. It supports year-long fishing, and with no closed season, it is fished nearly as much in other seasons of the year as in the summer. Some of the most valuable stream-fishing in Montana and the Nation would be eliminated in the 33 miles of the Yellowstone River inundated by Allenspur Reservoir. Fisherman day use of the proposed reservoir would probably be about 1/6 of the same use of the existing river. The Bureau of Sport Fisheries and Wildlife estimates that over a 50-year period, the 77 miles of the Yellowstone River which would be affected by the proposed project would sustain an estimated 250,000 fisherman days of use annually. Fisherman use of the reservoir would average about 20,000 fisherman days annually over a 50-year period. It is felt that the reservoir would not attract many non-resident fisherman. There would be some stream improvement due to retention of silt in the reservoir. The Bureau of Sport Fisheries and Wildlife estimates that as the result of this, the river below Livingston would support 165,000 fisherman days annually. They see no possibility of compensating for the loss of the 33 miles of top-quality trout stream of the Nation.

There is some picnicking now along the stream in connection with fishing and some horseback riding. Other than this, there is not much general recreation use in the proposed reservoir area.

Numerous dams have now been built along the Missouri River as well as its tributaries resulting in the impoundment of many reservoirs. Most of these reservoirs offer considerable lake fishing from shore, boat or dock, and a high attendance is experienced each year.

Opportunities for this type of lake fishing are being greatly increased, but much of the natural, high-quality stream fishing is being lost, and more attention is needed to assure its preservation. The Montana Fish and Game Department found by studies they made that the Montana fisherman prefers stream fishing over reservoir fishing. The proposed Allenspur Reservoir is a case in point, where 33 miles of the very highest quality stream fishing would be lost. With the accelerated program for construction of dams in the central and western parts of the United States, along with other affects of our expanding population and economy which destroy or alter our natural resources, it is all the more important that some sections of the remaining streams should be preserved in their natural state. This would not only assure the stream-type of fishing which has a strong appeal but would also preserve the aesthetic attraction of natural rivers. It would also further support the importance of identifying and preserving free-flowing streams or sections of streams as such that have significant recreation values in order to maintain a desirable variety in outdoor recreation opportunities.

If the dam is built with the resultant impounded reservoir, the body of water will, of course, have some appeal for recreation use. To provide for this use, the installation of certain facilities would be necessary: roads, parking areas, picnic areas, boat launching ramps, and perhaps, campgrounds. Most of the recreation use would be for boating and water skiing but not particularly for swimming because of the high elevation and low temperature of the water. The area adjacent to the reservoir would be fine for camping and picnicking even though, as the Bureau of Sport Fisheries and Wildlife estimates, fishing in the reservoir would be greatly reduced.

During 1961, approximately 180,000 people entered Yellowstone National Park through the north entrance. They would have traveled the section of road passing the Allenspur Reservoir site. It can not be assumed, however, that a very large percentage of this number would stop for any length of stay. Their destination would be the Park, and it is expected that all but a small percentage would pass up the reservoir for their scheduled experience at Yellowstone.

It is true that the reservoir, if built, would attract some travelers and would help relieve the Park of some less compatible use. It is estimated that the use at the reservoir would be approximately 75,000 visitors annually in addition to fishing and hunting, and casual sightseeing stops. A great percentage of this use would be local by people from nearby Livingston and Gardiner and possibly, Bozeman.

## V. EFFECT OF THE PROJECT ON NATURAL VALUES AND MONETARY BENEFITS

Important fishing values will be lost by the construction of this project, as determined by the Bureau of Sport Fisheries and Wildlife study of the fisherman use.

The pleasant experience of driving 100 miles from Big Timber to the north entrance of Yellowstone National Park along a scenic section of valley and stream would change at the lower end of Paradise Valley with the impoundment. The waterway would be a lake instead of the farmed valley with attractive vistas across fields, meadows, cultivated farmland and the meandering course of the Yellowstone River.

A top-quality fishing stream would be lost for a diversified, not too heavily used recreation area for the length of the impoundment.

The reach of the river covered by the impoundment already has a high aesthetic value and the stream is easily accessible from many points along the highway.

However, if the project should be constructed, the estimated visitor day use for general recreation at the reservoir is approximately 75,000 annually. Fisherman day use would be in addition.

The reservoir would provide activities other than a lower quality of fishing, such as: picnicking, camping and boating.

Net result of recreation use with the project:

| | | | |
|---|---|---|---|
| 1. | General recreation, annual visitor days | | 75,000 |
| 2. | Benefits @ $1.60 per visitor | | $120,000 |
| 3. | Present annual fisherman use of 77 miles of the Yellowstone River which would be affected by the project | | 250,000 |
| 4. | Fisherman use of the reservoir | 20,000 f.d.'s | |
| 5. | Fisherman use of the river below Livingston with the project | 165,000 | |
| | With the project | | 185,000 f.d.'s |
| Loss of fisherman days with the project | | | 65,000 f.d.'s |

## VI. ESTIMATED COST OF RECREATION DEVELOPMENT

With the type of rather limited recreation development proposed and based on other impoundments of similar size and nature, it is estimated that the cost of development for recreation facilities would be approximately $200,000 of Federal funds.

Annual development costs based on a 25-year amortization would be $10,800.

Annual AO&M costs to an administering agency would approximate $10,000 - $15,000.

No tentative takeline has been determined by the Bureau of Reclamation, so it is not known whether additional land will be necessary. Generally, if the project is constructed, ample land should be acquired above the flood pool to adequately provide for both present and future recreation use.

## VII. RECOMMENDATIONS

On the basis of:

1. Listing by the National Park Service of the 183-mile stretch of the Yellowstone River from Yellowstone National Park downstream to Billings as a free-flowing stream and recommending it be preserved as such; and

2. The Bureau of Sport Fisheries and Wildlife estimates that the 77 miles of Yellowstone River which would be affected by the impoundment would support 185,000 fisherman days with the project as against 250,000 fisherman days without the project; and

3. Since important fishing values will be destroyed; and

4. Montana fishermen have expressed a preference of stream fishing over reservoir fishing; and

5. Weighing the top-quality trout stream fishing against the diversified recreation use, totaling little more than the potential which the stream would provide;

It is recommended that:

From a recreation standpoint, the Allenspur project not be constructed.

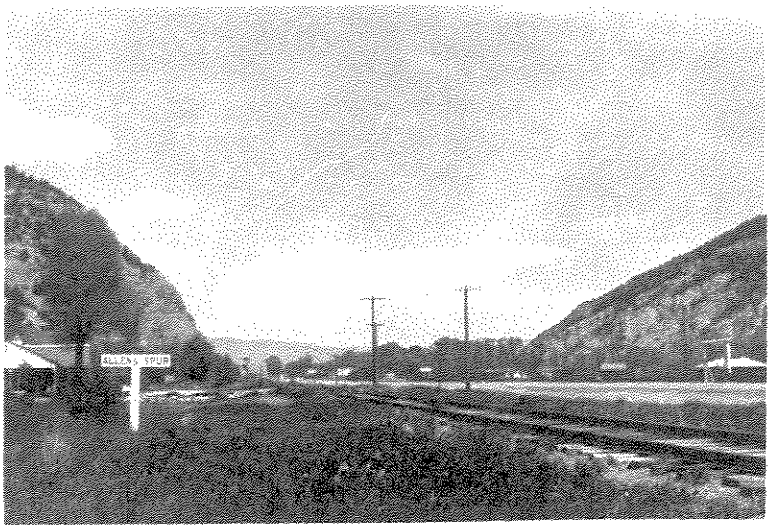
## VIII. ADMINISTRATION

If the project is constructed, the recreation areas should be administered by a state or county governmental agency. The reservoir would probably be of state significance, but administration would be based on a final evaluation study and a development plan.

## IX. FURTHER STUDY AND PLANNING

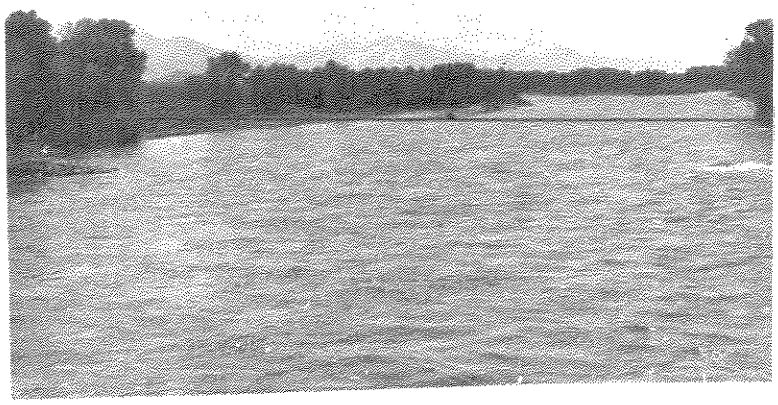
Additional study will be needed if the Bureau of Reclamation pursues this project further.

If this project is authorized, a more detailed recreation study and report should be made to decide needed development. Land requirements should be determined; necessary archeological investigations scheduled; road relocations should be studied cooperatively; and the most suitable type of recreation development determined which would best fill the potential of the reservoir to meet local needs, serve the tourist, and complement the objectives and use of Yellowstone National Park.



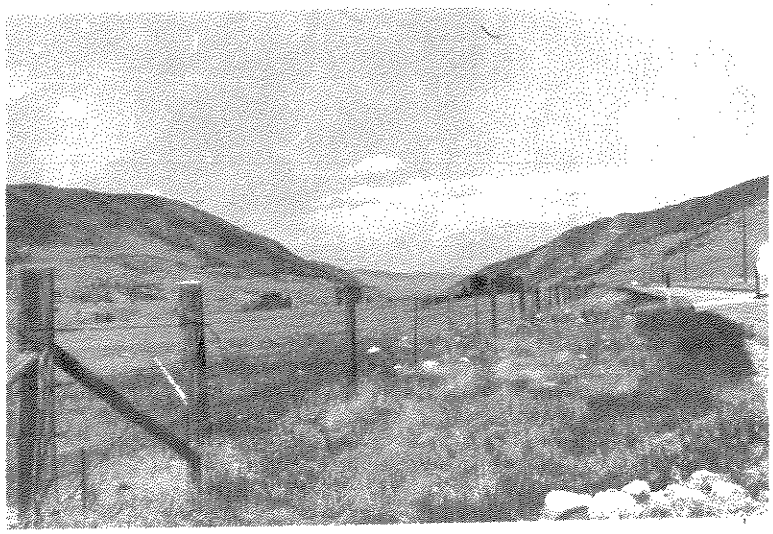
About 3/4 mile above axis of dam looking north toward axis.

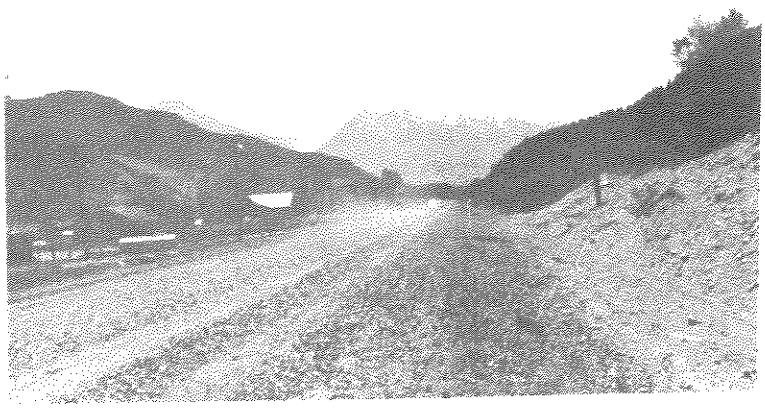
At south end where reservoir pinches out at Mill Creek. About 16-17 miles above (upstream and south) of dam.



Yellowstone River from Road Bridge looking south upstream.

Four and one-half miles above (south) of dam, looking north.





On axis of dam looking south.