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DEPARTMENT OF
WATER RESOURCES

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Counsel for the United States

IN THE DISTRICT COURT OF THE FIFTH JUDICIAL DISTRICT OF THE STATE OF IDAHO, IN AND FOR THE COUNTY OF TWIN FALLS

In Re SRBA	)	Subcase No. 63-03618
	)	
Case No. 39576	)	**AFFIDAVIT OF DAVID A. JARVIS**
	)	

STATE OF COLORADO)
)ss.
City and County of Denver)

AFFIDAVIT

I, DAVID A. JARVIS, being of lawful age and having been first duly sworn, state the following:

1. I make the following statements based upon personal knowledge and am competent to testify thereto.

2. I am a paralegal with Labat-Anderson, Inc., a government contractor which provides paralegal services to the U.S. Department of Justice.

3. I provide paralegal support to Environment and Natural Resources Division

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attorneys who represent the interests for the United States in the Snake River Basin Adjudication. I have performed this role for approximately seven (7) years. As part of my duties, I act as the custodian of SRBA files for the Denver Field Office, and am familiar with the court filings served upon the United States and the documents filed by the United States in the SRBA.

4. I attest that attached as Exhibit A is a true and correct copy of excerpts from Susan M. Stacy, WHEN THE RIVER RISES (Institute of Behavioral Sciences 1993).

5. I attest that attached as Exhibit B is a true and correct copy of U.S. Engineer Office, REVIEW OF SURVEY REPORT, BOISE RIVER, WITH A VIEW TO CONTROL OF FLOODS (2 Jan. 1946).

6. I attest that attached as Exhibit C is a true and correct copy of House Document No. 81-473, Mar. 1950.

7. I attest that attached as Exhibit D is a true and correct copy of Initial Unit, Mountain Home Project, Idaho, Project Planning Report No. 69-A (April 1944).

8. I attest that attached as Exhibit E is a true and correct copy of Memorandum of Agreement Between the Dept. of the Army and the Dept. of the Interior for Flood Control Operation of Boise River Reservoirs, Idaho, Nov. 20, 1953.

9. I attest that attached as Exhibit F is a true and correct copy of Proceedings of Meeting, Jun. 6, 1957.

10. I attest that attached as Exhibit G is a true and correct copy of Scanlan Engineering, Letter of Feb. 25, 2004.

11. I attest that attached as Exhibit H is a true and correct copy of Proceedings of Meeting, Nov. 23, 1954.

12. I attest that attached as Exhibit I is a true and correct copy of Idaho Fish and Game

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Dept. Protest, Jan 20, 1958.

13. I attest that attached as Exhibit J are true and correct copies of Protest of Farmers' Co-Operative Ditch Company, Ltd., Jan. 23, 1958; Protest of Boise Project Irrigation Districts, June 1959.

14. I attest that attached as Exhibit K is a true and correct copy of Letter from Regional Director of BOR to State Reclamation Engineer, Apr. 3, 1963.

15. I attest that attached as Exhibit L is a true and correct copy of Letter from Idaho Fish & Game Dept. To State Reclamation Engineer, Feb. 27, 1964.

16. I attest that attached as Exhibit M is a true and correct copy of Idaho State Water Plan, Jan. 19, 1982.

17. I attest that attached as Exhibit N is a true and correct copy of Minutes of the Idaho Water Resource Board, Dec. 13, 1984.

18. I attest that attached as Exhibit O is a true and correct copy of Boise Project Power and Modification Study, Potential Solutions to Problems and Needs for BOR Agency Meeting Apr. 15, 1982.

19. I attest that attached as Exhibit P is a true and correct copy of Boise Project Power and Modification Study, Information Update (Dec. 1983).

20. I attest that attached as Exhibit Q is a true and correct copy of Letter from Idaho Governor to Division Engineer of Army Corps of Engineers, Jul. 15, 1976.

21. I attest that attached as Exhibit R is a true and correct copy of Letter from Mayor of Boise to Idaho Congressional delegation, July 2, 1976.

22. I attest that attached as Exhibit S is a true and correct copy of Order Issuing License (Major), Jun. 10, 1980 [Federal Energy Regulatory Comm.].

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23. I attest that attached as Exhibit T is a true and correct copy of Order Setting Minimum Flows, Apr. 7, 1987 [Federal Energy Regulatory Comm.].

24. I attest that attached as Exhibit U is a true and correct copy of Order Superseding the Amendment to Article 35, May 6, 1987 [Federal Energy Regulatory Comm.].

25. I attest that attached as Exhibit V is a true and correct copy of Letter from Regional Planning Director of BOR to IDWR Director, July 16, 1982.

26. I attest that attached as Exhibit W is a true and correct copy of Idaho Water Resource Board, Agenda Item No. 8, Dec. 13, 1984.

27. I attest that attached as Exhibit X is a true and correct copy of 1985 Permit for Water Right 63-3618.

28. I attest that attached as Exhibit Y is a true and correct copy of Memorandum of Understanding for Confirmation, Ratification, and Adoption of Water Control Manual Boise River Reservoirs, Sep. 25, 1985.

29. I attest that attached Exhibit Z is a true and correct copy of U.S. Army Corps of Engineers, WATER CONTROL MANUAL FOR BOISE RIVER RESERVOIRS, April 1985.

30. I attest that attached as Exhibit AA are true and correct copies of Protest of Settlers Irrigation Dist. and Pioneer Irrigation Dist., Apr. 6, 1987; Petition for Leave to Intervene by Middleton Mill Ditch Co., *et al.*, May 8, 1987.

31. I attest that attached as Exhibit BB are true and correct copies of Application for Amendment of Permit, Mar 11, 1987; Stipulation for Withdrawal of Protect, May 14, 1987; Application for Amendment of Permit, Jun. 5, 1987; Memorandum Decision and Order Granting Amendment to Permit, Jun. 5, 1987.

32. I attest that attached as Exhibit CC is a true and correct copy of July 11, 1990

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Amended Permit for Water Right 63-3618.

33. I attest that attached as Exhibit DD is a true and correct copy of February 19, 2002 IDWR Memo RE: Beneficial Use Examination for Permit No. 63-3618.

34. I attest that attached as Exhibit EE is a true and correct copy of License for Water Right 63-3618.

35. I attest that attached as Exhibit FF is a true and correct copy of Affidavit of Publication, April 12, 1984.

36. I attest that attached as Exhibit GG are true and correct copies of Standard Form 1 – Objection (Nampa & Meridian Irrigation Dist.), Jan. 29, 2003; Standard Form 1 – Objection (Amended) (Settlers Irrigation Dist.), Jan. 30, 2003; Standard Form 1 – Objection (Amended) (Pioneer Irrigation Dist.), Jan. 30, 2003.

37. I attest that attached as Exhibit HH are true and correct copies of License for Water Right 31-7301; License for Water Right 43-7007; License for Water Right 98-7003; License for Water Right 98-7004; License for Water Right 98-7366.

38. I attest that attached as Exhibit II is a true and correct copy of 1963 Permit for Water Right 63-3618.

39. I attest that attached as Exhibit JJ is a true and correct copy of January 21, 1994 IDWR Memo RE: conveyance of Boise River Maintenance Storage Flows.

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DATED this 15 day of October, 2007.

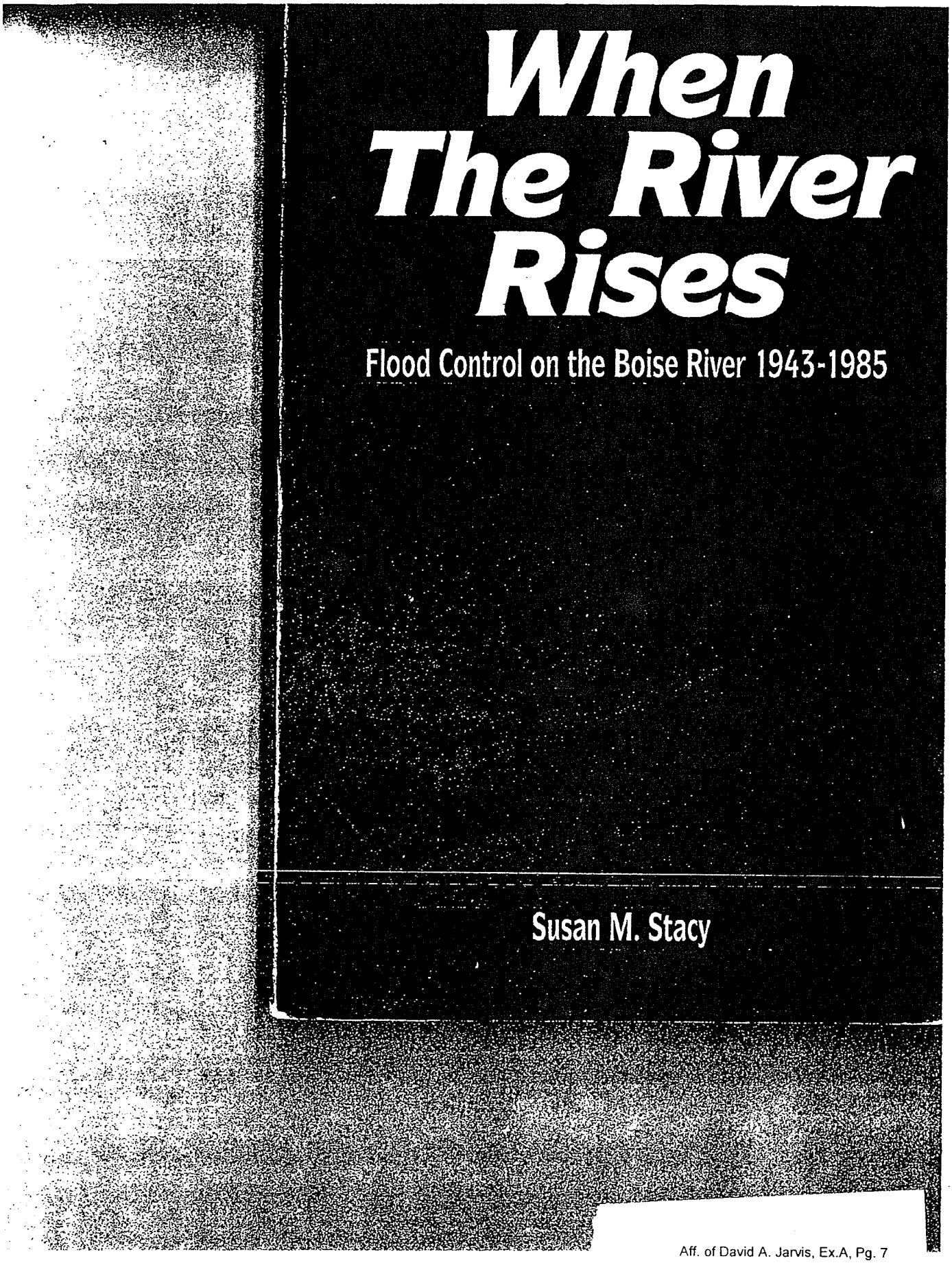
David A. Jarvis

SUBSCRIBED AND SWORN to before me this 15th day of October, 2007

KATHERINE M. SVINARICH
NOTARY PUBLIC
STATE OF COLORADO
MY COMMISSION EXPIRES 4/5/2011

Katherine M. Svinarich
Notary Public for Colorado
Residing at: Denver County, CO
My Commission Expires: 4/5/2011

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When The River Rises
Flood Control on the Boise River 1943-1985
Susan M. Stacy

When The River Rises

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Program on Environment and Behavior
Special Publication No. 27

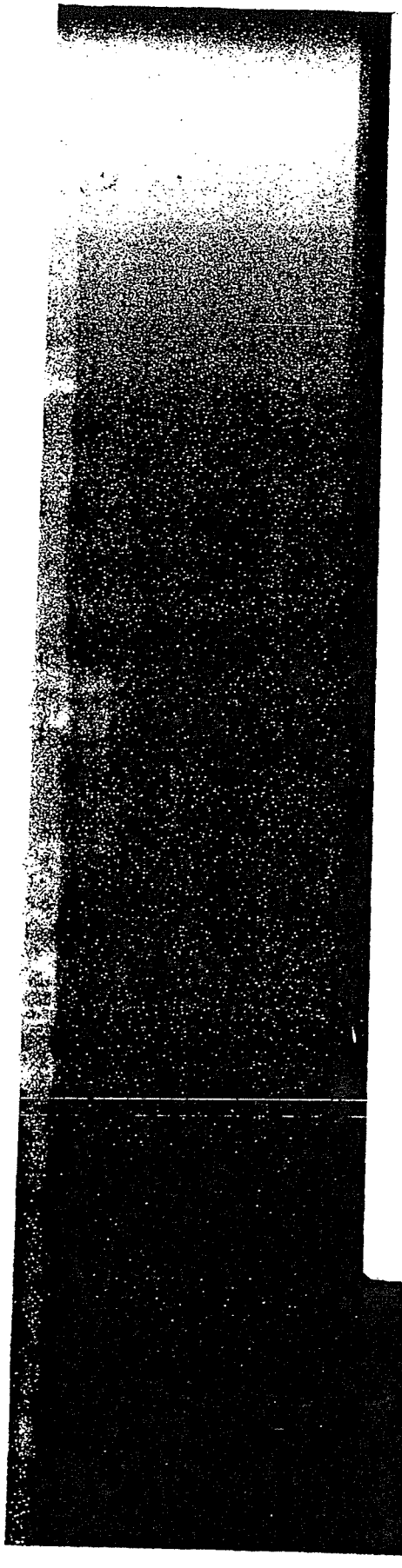
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University of Colorado

Published jointly with
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1993





Aff. of David A. Jarvis, Ex.A, Pg. 8



Front cover: Corps of Engineers aerial photograph dated May 1950 courtesy of U.S. Army Corps of Engineers, Walla Walla District,. The proposed bridge was the 16th Street Bridge, now called the Americana Bridge, which was completed in 1951. Boise's "proposed channel improvement" above and below the new bridge was not implemented, although fill at the north bank between the bridge and the Union Pacific railroad bridge eventually narrowed the channel. Cover design: Pete Wilson, DesignWorks

University of Colorado
Natural Hazards Research Applications and Information Center
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in the 1920s came a discouraging period of drought. In a series of low-water years, the reservoirs were unable to supply enough water to those irrigators with the most recently acquired water rights. Combined with low crop prices in the 1920s, the drought meant disaster for many.

Irrigators were organized into irrigation districts, which were single-purpose governing bodies that each had its own elected board of directors and the power to collect revenues and establish policy. Five of these districts organized themselves as the Boise Project Board of Control in 1927. This board took over from the Bureau of Reclamation (formerly named the Reclamation Service) the responsibility for collecting water-use fees from individual farmers and for managing the water distribution system in the project. In 1937 the Bureau added five feet to the crest of Arrowrock Dam, providing storage for another 30,000 acre-feet.[25] It was still not enough. In 1940 the Bureau started Anderson Ranch Dam, a huge structure 42 miles upstream of Arrowrock on the South Fork of the Boise. It was designed to hold 500,000 acre-feet, which was enough to end drought insecurities in all but one year out of 20.[26]

Anderson Ranch was a multiple-purpose reservoir. The top 212,500 acre-feet of storage capacity were set aside for flood waters. Preliminary studies had indicated that the reservoir would satisfy both irrigation and flood-control needs. The Bureau and Corps analysts considered the channel capacity in the Boise Valley to be 10,000 cfs, and the new reservoir was designed to control floods to that flow.[27] With the outbreak of World War II, however, the War Production Board ordered most of the equipment and labor at the dam site put to other uses. Unfinished Anderson Ranch played no role in mitigating the 1943 flood.

That flood was to visit a town and valley vastly changed since the 1890s. The increase in irrigated acreage helped propel the population in the Boise Valley from 10,000 in 1890 to 95,000 in 1940. Boise became the largest town along the river with 26,130 people in 1940. As in many parts of the arid West, urban growth was a side effect of irrigation development.[28] Boise's physical expansion was blocked on the north by the foothills of the Boise Front, so the city jumped across the river to the south, and also spread east and west. In addition, some land uses became situated closer to the river. Local government began to fill lowlands and straighten the river channel to protect bridges, particularly below Ninth Street.[29]

In the 1930s, Great Depression employment programs and federal flood policy each served to enhance flood control along the Boise. After severe floods on the Ohio River, Congress in 1936 declared flood control to be a national issue and gave the Corps of Engineers a nationwide flood-control mission and budget.[30] Boise Valley farmers secured a modest share of these funds to improve their levees. The Idaho Legislature responded to a Boise River flood in 1936 by appropriating $10,000 for work to confine the channel. The state highway department and the Works Progress Administration added more funds and labor for levee repair.[31]

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A few riverfront farms now gave way to food processing plants that used the river to dispose of their untreated wastes. Eighth and Ninth streets filled up with warehouses and manufacturing establishments all the way to the bridge. A number of gravel extraction operations mined the flood plain for its high-quality river rock.

After 1940 farmers on many riverfront farms west of Boise changed the way they farmed their flood-plain lands. They started planting row crops. But when they switched over to row cropping, they did not necessarily improve their flood defenses. C. Ben Ross, one of Idaho's governors and a Boise Valley farmer, once spoke of the way prudent farmers had learned over the years to keep their flood-prone fields in pasture, planting grasses, shrubs, and trees. When the floods came, the soil resisted erosion, held in place by tight root systems. In this way the land continued to be productive, if not lucrative. To plow up floodable land was to risk its complete loss. After the United States entered World War II, however, farm produce prices rose dramatically. Farmers, encouraged by the government, tempted by high market prices, and inspired by patriotism, took the risk and planted their low-lying lands to row crops. They harvested excellent yields and commensurate profits.[32] Then came the 1943 flood.

Arrowrock and Deer Flat reservoirs mitigated the flooding on the Boise in most years. The annual flow volume of the river ranged between 890,000 acre-feet in a low snow year to a maximum of 3.57 million acre-feet in a high one. The average



Figure 1.7 U.S. Army Corps of Engineers
Aerial view of Plantation Golf Course, April 21, 1943. A failed levee allowed water out of the river channel. State Street in lower part of picture.

was 1.8 million acre-feet. The two reservoirs held 463,500 acre-feet, about a quarter of the average yearly flow. In moderate runoff years the dam caught the spring gush and reduced the impact of the flood. Occasionally, nature sent snowmelt into the reservoir faster than its 10,000 cfs capacity discharge ports could let it out. It was just a matter of waiting for the reservoir to fill up before water went over the spillway. After that, whatever entered the reservoir flowed out as though the dam were not there. Some could be diverted to Deer Flat, but the canal could only take about 2,820 cfs. The Corps estimated that between 1915 and 1943 Arrowrock reduced the spring high water by an average of 3,443 cfs each year. Such buffering had a less welcome side effect of reducing river channel capacity.[33]

The Arrowrock buffer was not enough to prevent a damaging flood in 1943. An unseasonable warm spell in early April accelerated the snowmelt. Boise River watermaster William Welsh warned Governor C.A. Bottolfsen that without a drastic change in the weather the water behind the dam would tumble uncontrolled over the spillway in another 15 days.[34] Considering the substantial snowpack, Welsh anticipated the flooding of 500 farms between Boise and the Snake River.

Welsh mobilized the resources in the community and activated plans providing for typhoid inoculations, evacuations, and emergency levee repair. Property owners in the flood plain prepared to do as their predecessors had done: stand their ground, guard the levees, and fight the flood. This time, however, there was a two-week notice, modern communications, a supply of U.S. Army troops, and highly centralized professional leadership. Welsh organized the river into eight districts, each with committees to deal with communications, evacuations, and emergency loans. Since most residents had radios but not telephones, organizers decided to broadcast flood information at 11:30 a.m. and 12:30 p.m. daily while farmers were in from the fields at their midday meal.[35]



Idaho State Historical Society #3535

Figure 1.8
William Welsh, Boise River Watermaster during the 1943 flood.

The principles of levee reinforcement were the same as they had always been, but now bulldozers and other heavy equipment supplemented the work. In addition to stones and escaped timbers, rip-rap material now included the 20th-century innovation of automobile bodies filled with rock.[36] Military detachments stationed at Gowen Air Field near Boise provided the kind of concentrated labor

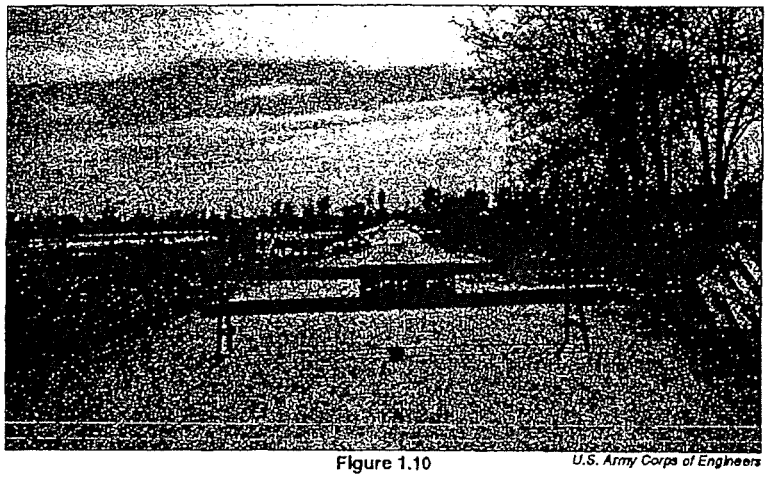
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U.S. Army Corps of Engineers

Figure 1.9

Aerial view on April 21, 1943, shows town of Eagle in lower part of picture and Eagle Road with washed out culvert.



U.S. Army Corps of Engineers

Figure 1.10

The Linder Bridge was one of the many swamped by the 1943 flood.

needed at bridges, the Chinese gardens, and other sites down the valley. The Corps of Engineers supervised construction work at levees.

At its peak, about 20,000 cfs churned down the river.[37] Islands, eroded banks, and lowlands were inundated as usual. Listings of threatened places included a number of new land uses in the flood plain: the grounds of the Old Soldiers Home at Veterans Park, the access road to the Idaho Fish and Game Hatchery, a tavern south of the Broadway Bridge, and parts of the Plantation Golf Course and the Triangle K construction and scrap yard.[38] Near the mouth of the river, several houses took in water above the first floor amidst rumors that this particular flooding had occurred because someone had deliberately blown up a ditch.[39] In total, 200 families and their livestock evacuated their farms while Idaho Volunteer Reserves guarded them against pilfering.[40]

Damage on lands where levees had failed (or where there were no levees) included loss of topsoil, deposits of sand and gravel, potholes, loss of rip-rap and dike work, washed out culverts, damaged ditches, piles of debris, and loss of crop yield at harvest. Landowners had to move livestock and buy feed, then reseed and relevel fields later.[41]

Bridge failures constituted costly damage. Not counting the railroad bridges, there were 14 highway bridges across the Boise River. Authorities shut down all but three for five days or more during the flood emergency.[42] The bridges' chief weaknesses were unstable piers and foundations. At the Fairview Avenue Bridge, crews cut a hole in the surface of the bridge through which heavy trucks dumped ton



Figure 1.11 *U.S. Army Corps of Engineers*
Plantation Golf Course on April 22, 1943.

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after ton of lava rock hauled from the Boise Canyon. The rock bulwarked the south abutment, where wave action and current battered and weakened it.

With bridges closed, flood damage now included losses by dairies and other businesses that had extra costs for out-of-way travel to a functioning bridge.[43] The proprietors of establishments near the river took preventive measures such as moving goods out of basements and sandbagging the grounds, and apparently avoided flood losses. Several house basements flooded in the Broadway Avenue area south of the river, but this flooding was caused by sewers that took in water at their riverbank outlets. These were homes where residents failed to carve wooden plugs and stuff them into their sewer pipes as local plumbers advised.[44]

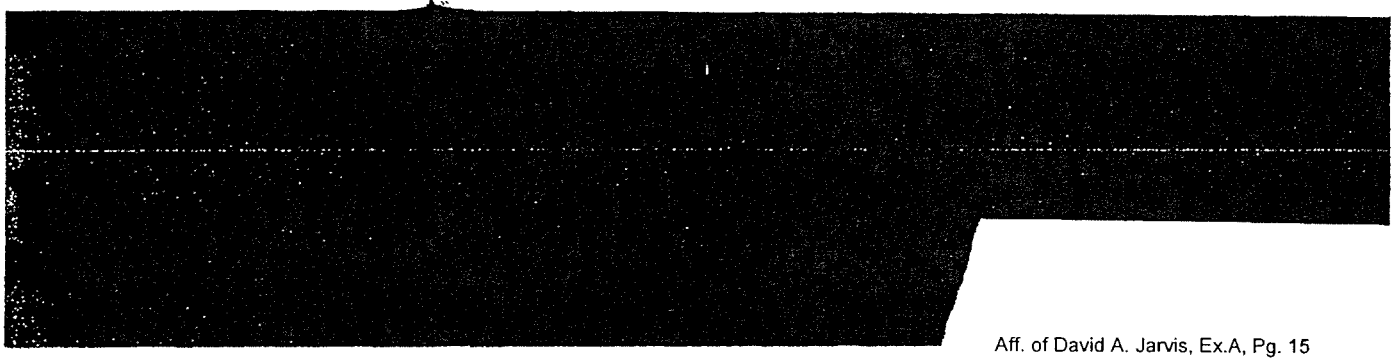
The Corps of Engineers' first impression of the flood was that "only a very small amount of damage has been done in Boise Valley. The fact damage has been held to a minimum is . . . due to excellent organizational work of you [Gov. Bottolfsen] and your associates."[45] This appraisal seemed premature and rather brief to Idaho Senator Henry Dworshak. He asked Corps Portland District Engineer Oliver Lewis to perform a damage survey.

The Corps published a summary of the information from the survey in its 1946 proposal to Congress to build Lucky Peak Dam.[46] This report also contained a transcript of a 1944 public hearing the Corps conducted about the flood.[47]

The Corps tallied the damage as follows:[48]

Type of Damage	Amount in $	Percent of Total Damage
Agriculture	$649,710	65.1 %
Urban/Suburban	0	0.0
Industrial	18,640	1.8
Roads/Bridges	76,040	7.6
Utilities	200	0.0
Railroads	0	0.0
Levees	205,440	20.6
Emergency activity	18,220	1.8
Indirect	29,100	3.0
TOTAL	$997,350	99.9 %

The testimony contained details that, while differing somewhat from the Corps' generalized figures, provide additional insight into the nature of the flood damage. Mayor Austin Walker, the only Boise witness among the 87 who testified, had asked the city's households and businesses to send him a list of their flood-related damage. These totaled $6,769 for private costs, of which a small portion was submitted by utilities. State and county highway officials reported that bridge and road repair costs were in excess of $200,000, somewhat higher than the Corps' reported $76,040. Repair of the Star Bridge alone, where a pier had settled two feet,



was accounted at $104,500. The state spent at least $7,000 to protect Fairview Bridge during the flood and then $24,724 to raise the one pier that had settled.

The "indirect" damage of $29,100 consisted of interruptions in traffic and communications due to the bridge closures. The Corps particularly noted the handicap to large dairy creameries. In addition, the flood temporarily interfered with the delivery of water to irrigated lands beyond the flood plain.

In summary, Boise Valley managed the 1943 flood fight with no loss of life and little structural damage in the city except for the bridges. The rural areas absorbed most of the damage, with two-thirds of the $1 million in losses spread across hundreds of flood-plain farms.

If there had been a flood-control dam above the Boise Valley, most or all of the 1943 flood damage might have been prevented. Naturally, the damage that could be predicted for the years to come would also be prevented. But, as Corps benefit/cost analysis would soon show, all of the benefits of avoiding future damage would prove to be less than the cost of building and operating the dam. If a dam was to be built, other benefits would have to be added to the benefit/cost equation.

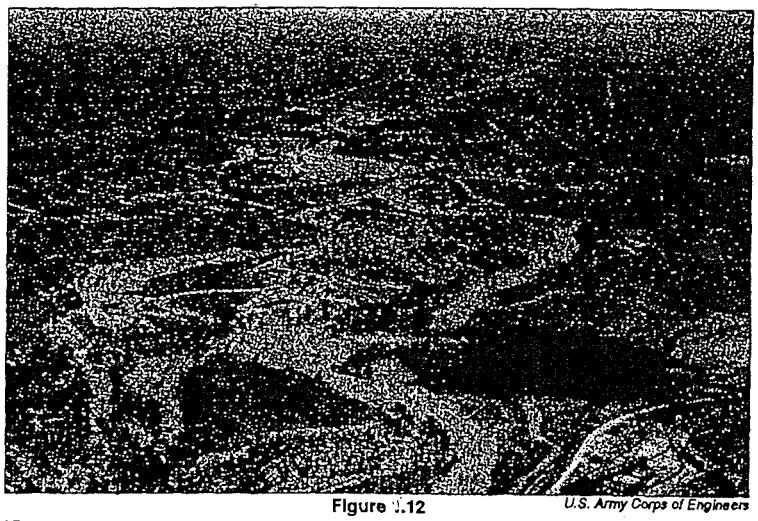


Figure 1.12 U.S. Army Corps of Engineers

View to the west (downstream) on April 22, 1943. The flooded areas in the foreground and center, later protected by levees, became the site of the River Run housing development and ParkCenter office building complex. At upper center of picture, just beyond the Broadway Bridge, the river remained within its banks behind a levee on left side and the railroad right-of-way and fill on right. Olson City Steel, later Gate City Steel, at the end of Warm Springs Avenue can be seen at lower right.

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Boise Project Board of Control
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the lower face of Arrowrock Dam,
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been given the rights to any profits



Lucky Peak Power Plant Project

Figure 4.6
A rare sight: discharge from Lucky Peak Reservoir is switched from the new auxiliary tunnel to the Corps of Engineers' tunnel on July 1, 1988. The old tunnel is used for hydroelectric power production.

from power sales at Arrowrock, and Lucky Peak's reservoir had caused a loss of available head. The irrigators would use the income to modernize and improve the irrigation system and help reduce the impact of rising costs of operations and maintenance. Second, federal construction meant delays; private industry could build this hydroelectric plant faster. Federal authorities would market the power outside the region, but the irrigators would see to it that the power stayed home. The irrigators deserved a "small measure of return" for all their investments in Arrowrock and other irrigation works. And finally, they did not want any power plant on the Boise River to operate to the detriment of irrigation. Having irrigators control the power plant would guarantee that this would not happen.[66]

After initial resistance, the Corps acceded to the irrigators' plan. Idaho Senator James McClure supported the irrigators and charged the Corps with "holding hydroelectric power development at Lucky Peak for ransom to the detriment of power consumers in Idaho."[67] Congress quickly passed an amendment to the second outlet authorization, supported by both Idaho senators, allowing an enlargement of the diameter from seven to 23 feet and permitting the Boise Project Board of Control to install the power plant.

The solution had something in it for everyone. The technical/engineering barrier to a reliable minimum flow would now be eliminated. The Corps of Engineers acknowledged that the missing second outlet tunnel had been a "design

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DAEN–CWP–V.) See also Jeffrey Stine, "Environmental Politics and Water Resources Development: The Case of the Army Corps of Engineers During the 1970s." (Ph. D. dissertation, University of California at Santa Barbara, 1984); and also *Code of Federal Regulations*, "Protection of the Environment," 40, Section 1506.12 (b), "NEPA shall continue to be applicable to actions begun before Jan. 1, 1970, to the fullest extent possible." See also Frederick R. Anderson, *NEPA in the Courts: A Legal Analysis of the National Environmental Policy Act* (Baltimore: Johns Hopkins Press, 1973), particularly Chapter V, "Problems of Transition: Projects and Programs in Progress when NEPA was Enacted;" Richard A. Liroff, *A National Policy for the Environment: NEPA and its Aftermath* (Bloomington: Indiana University Press, 1976); and Beatrice Hort-Holmes, *History of Federal Water Resources Programs and Policies* (U.S. Dept. of Agriculture, Economics, Statistics, and Cooperative Service Miscellaneous Publication No. 1379, 1979).

58. United States, Corps of Engineers, *Draft Environmental Impact Statement: Lucky Peak Dam and Lake, Boise River, Idaho* (Walla Walla: Office of the District Engineer, 1974), pages 1, 105.

59. William Ancell to Col. Conover, May 29, 1974, Boise City Public Works Department, "Lucky Peak."

60. Harold Geren, EPA, to William Ancell, June 26, 1974, Boise City Public Works Department, "West Boise Water Quality Standards for Flow."

61. Vic Armacost, Corps, to Engineering Division Files, 5 June 1974, SRC, 77, 86–0006, Box 1/3, Book 3.

62. United States, Corps of Engineers, *Lucky Peak Dam and Reservoir Modification Study Informational Brochure #2* (Walla Walla: Office of the District Engineer, November 1975) p. 4.

63. William Ancell, August 28, 1986.

64. Senator Frank Church to Mayor Dick Eardley, October 8, 1976, Boise City Public Works Department, "Lucky Peak." See also "Lucky Peak Dam Outlet Approved by Congress," *IDS*, October 5, 1976, p. B-6; and PL 94–587, 94th Cong., 2nd. Sess., 1976.

65. In addition, there would be little advantage to one of the traditional allies of the irrigators, the Idaho Power Company. The irrigators initially sought an arrangement with Idaho Power before taking up negotiations with other interests. See Susan M. Stacy, *Legacy of Light* (Boise: Idaho Power Company, 1991), p. 225.

66. "Lucky Peak Proposal Unveiled, Irrigation Districts Seek Power Plant," *IDS*, October 7, 1976, p. B-1.

67. John Jameson, Keith Petersen, Mary Reed, *Walla Walla District History, Part III, 1975–1980* (Walla Walla: Army Corps of Engineers District Office, 1980), p. 14.

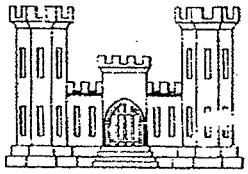
68. Board of Control members, as they argued among themselves, entertained

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BOISE RIVER, IDAHO

WITH A VIEW TO CONTROL OF FLOODS

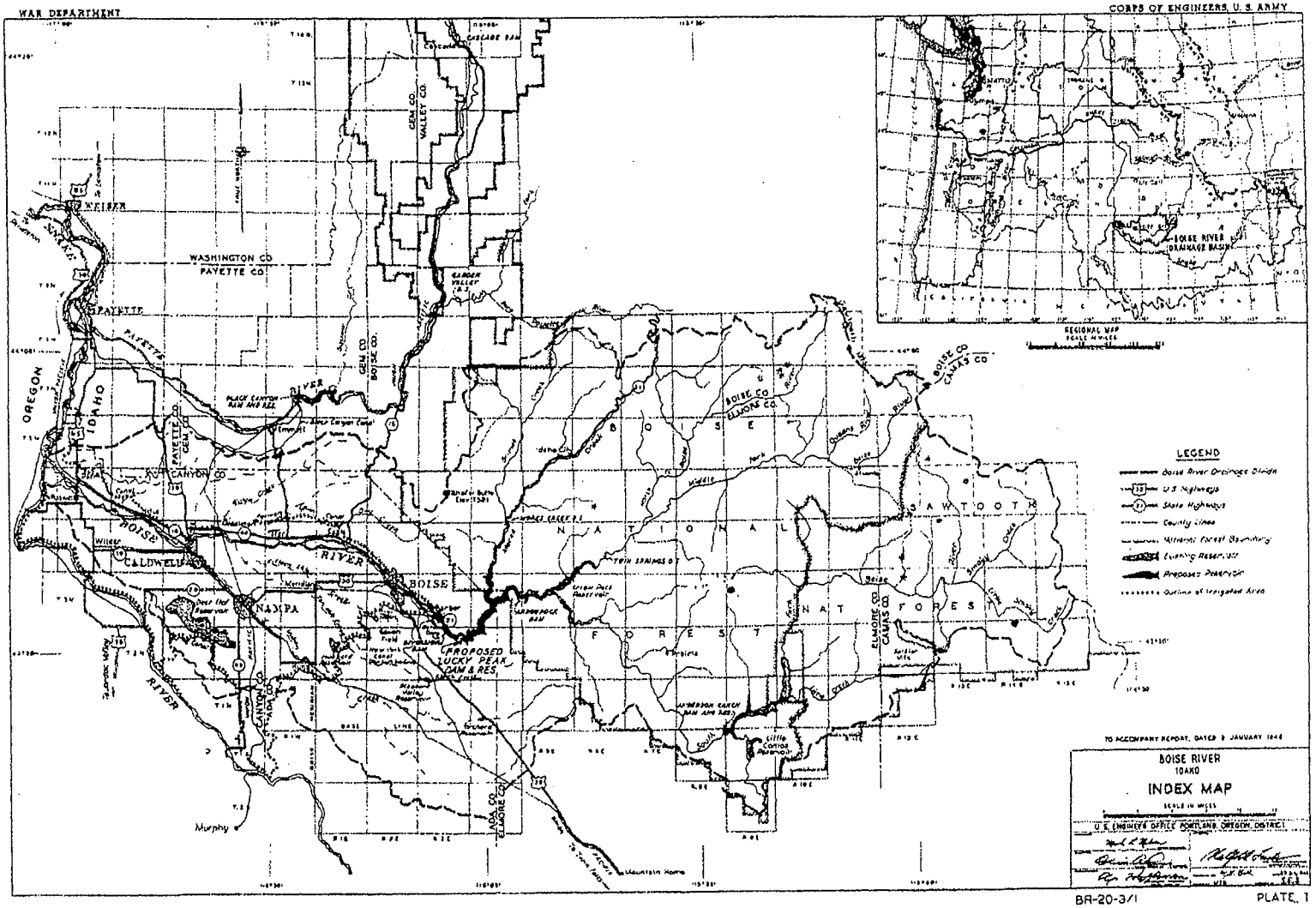


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BOISE RIVER
IDAHO
INDEX MAP
U.S. ENGINEER OFFICE PORTLAND, OREGON, DISTRICT
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REVIEW OF SURVEY REPORT

BOISE RIVER, IDAHO

With a View to Control of Floods

Prepared in the U. S. Engineer Office

Portland, Oregon, dated January 2, 1946

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SYLLABUS

The district engineer finds a need for flood protection in Boise Valley in addition to that now provided. He further finds that such additional protection can be provided at a cost which is fully justified by the benefits to be derived. Locally owned and somewhat disconnected levees in the valley in conjunction with Arrowrock Reservoir, which is operated primarily for irrigation, and Anderson Ranch Reservoir, which is now being constructed by the Bureau of Reclamation, enable benefits to be realized through control of the smaller and more frequent floods in the basin. A large measure of additional flood protection is expected to be realized from the plan of improvement recommended in this report.

The plan consists of the construction and operation by the War Department of a reservoir of 306,000 acre-feet gross capacity at the Lucky Peak site on Boise River, 9 miles upstream from Boise; installation and operation by the Bureau of Reclamation of a 13,000-kilowatt power plant at Arrowrock Dam, together with certain minor alterations in the drainage system at that dam; installation and operation of a network of meteorological and hydrological stations for the forecasting of flood and other run-off; and operation as a system, as run-off conditions dictate, of the storage space in Anderson Ranch, Arrowrock, and Lucky Peak Reservoirs in the combined interests of flood control, irrigation, and power. The first cost of the Recommended Plan is estimated at $11,544,000, and the annual cost of operation and maintenance is estimated at $35,000. The average annual flood control benefits creditable to the Recommended Plan are estimated at $444,810, and the irrigation, power, and recreation benefits are estimated at $188,100, or a total of $632,910, annually. The estimated annual benefits exceed the estimated annual cost by 25 percent; therefore, the improvement is economically feasible.

Lucky Peak Reservoir, the principal feature of the Recommended Plan, would be created by Lucky Peak Dam, a rolled earth-fill embankment approximately 250 feet high and 1,700 feet long at the crest. A gated spillway would be of the chute type, straight in alignment with a stilling basin. It would cut diagonally through the left abutment and join the river about 2500 feet downstream from the dam. The outlet works would be of the tunnel type, 20 feet in diameter, with valve control. The tunnel would follow somewhat the alignment of the spillway and would discharge into the spillway stilling basin. Relocation of approximately 11 miles of state highway and about 10 miles of county and farm roads would be necessary.

The success of the plan is contingent upon joint participation of the several interests of the valley in the operation of the three reservoir system to the maximum benefit of all concerned.

January 2, 1946

Subject: Review of Report on Boise River, Idaho.

To: Division Engineer, Pacific Division, 351 California Street, San Francisco 19, California.

SECTION I - GENERAL

AUTHORITY

1. This report is submitted under authority of the resolution adopted October 12, 1943, which reads as follows:

> "Resolved by the Committee on Commerce of the United States Senate, That the Board of Engineers for Rivers and Harbors, created under Section 3 of the River and Harbor Act, approved June 13, 1902, be, and is hereby, requested to review the report on the Boise River, Idaho, contained in House Document Numbered 957, Seventy-sixth Congress, with a view to determining whether or not additional improvements in the interest of flood control are advisable at the present time."

and under the authority of the resolution adopted November 10, 1943 which reads as follows:

> "Resolved, by the Committee on Flood Control, House of Representatives, That the Board of Engineers for Rivers and Harbors created under Section 3 of the River and Harbor Act approved June 13, 1902, be, and is hereby, requested to review the report on the Boise River and tributaries in Idaho, published as House Document Numbered 957, Seventy-sixth Congress, Third Session, with a view to determining whether improvements for flood control on the Boise River and tributaries in Idaho are advisable at this time."

PRIOR REPORTS

2. A survey report of Boise River was made under authority of Public No. 761, 75th Congress, 3d Session, approved August 4, 1938.

This report, forwarded to Congress on September 19, 1940, printed as House Document Numbered 957, 76th Congress, 3d Session, is the one under review herein. The report recommended the construction of Anderson Ranch Reservoir and power plant and modification of the outlets at the existing Arrowrock Dam, all as a part of a comprehensive plan for development of the water resources of the Boise River in the combined interests of irrigation, flood control, and power development.

DESCRIPTION

3. Boise River has its origin in the Sawtooth Mountains in southwestern Idaho at the confluence of the Middle and North Forks, 95 miles from its mouth. The principal tributaries in the upper reaches are the North Fork, Middle Fork, and South Fork. Boise River flows generally southwestward through Arrowrock Reservoir to its debouchment from the rugged mountainous terrain of the Sawtooth Range onto the fertile alluvial plain of the Boise Valley. Just above the head of the valley, it receives the flow of Mores Creek, which is the last downstream tributary of any consequence. The stream valley extends about 60 miles from the mouth of the river to the foothills of the Sawtooth Range and the basin varies in width from 10 to 65 miles. Bordering the valley floor on both sides, are higher benchlands, which extend many miles to the foothills. From its entrance into the Boise valley, the stream flows generally northwesterly and empties into Snake River near Parma, close to the point where Snake River turns north to form the boundary between Idaho and Oregon. The elevation at the mouth is approximately 2,200 feet mean sea level. Boise, the capital of Idaho, is located on the stream near the head of the valley.

The eastern part of the watershed lies in the rugged Sawtooth Range, which has a general elevation ranging between 6,000 and 8,000 feet with many peaks approximately 10,000 feet in elevation. Seventy percent of the area in the watershed is more than 5,000 feet in elevation, and 20 percent is more than 7,000 feet. A survey conducted by the Forest Service discloses that the slopes average in excess of 45 percent with deep, V-shaped canyons and narrow ridges, indicating the region is in an early stage of peneplanation. A general map of the basin is shown on plate III.

4. Drainage areas of tributaries. - The Boise River has a total drainage area of 4,134 square miles. The drainage areas of the principal tributaries, and of the main stream and certain forks above certain points are as follows:

Item	Drainage area square miles	Item	Drainage area square miles
North Fork	382	Dry Creek	70
Middle Fork	380	Boise R. above Twin Springs	830
South Fork	1,300	Boise R. above Dowling Ranch	2,220
Mores Creek	426	Boise R. above Diversion Dam	2,650
Indian Creek	500	South Fork above Anderson Ranch	970
Willow Creek	78	South Fork above Lenox	1,090
Fifteenmile Creek	187		

5. Physiography. - Two contrasting physiographic sections are in the basin. Above Diversion Dam (mile 62.0 above mouth of Boise River), the topography is rough, mountainous, and well dissected. Both the main stream and its tributaries are well incised in deep canyons that dissect extremely rugged, mountainous areas. Below Diversion Dam, the area is comparatively flat and is divided topographically into two sub-zones: the alluvial valley bottom, which is about 60 miles long and occupies an area of roughly 120 square miles; and the bench lands, which occur on both

sides of the stream adjacent to the river bottom. These terraces, ranging from 50 to 100 feet higher than the valley floor, usually are delineated by a well-defined bluff and extend many miles laterally to the steep and barren bordering foothills. The alluvial bottom lands are divided into two distinct reaches by a constriction near Caldwell, where the river has cut a narrow gorge through overlying basalt layers. The land forms of the basin are indicated by plate II.

6. Geology. - The oldest of the formations in the basin are altered limestones, argillites, and quartzites; all pre-Idaho batholith and presumably Paleozoic in age. These metamorphics occur as erosional remnants and occupy relatively little of the area. The granitic Idaho batholith occupies the major portion of the basin, and grantic materials are predominant. The granites, intricately dissected by a complex drainage pattern, are generally coarse grained and weathered and erode comparatively rapidly; later, thin basaltic and rhyolitic feeder dikes locally cut the granite. Following the erosional interval, which stripped the overlying unstoped metamorphic rocks from above the granite batholith and in which the granites were further dissected and eroded, basaltic lavas of the Miocene Columbia River group blocked the valleys of the ancient Snake River plain, forming ancient Lake Payette and co-related basins. The lake became a basin for the deposition of granitic sands and gravels to a known depth of nearly 1,300 feet. Intercalated basalt flows are also known within the Payette beds. The later Tertiary Payette beds were covered by succeeding basaltic lava flows, which filled or occupied in part the Boise River valley and some of its tributary valleys. Succeeding erosion has removed much of the basalt, Payette beds, and Columbia River basalts.

The alluvial Pleistocene terrace materials are coarse river gravels, with sparse clay streaks, capped by a younger fine, sandy loam. The Recent alluvium consists of granitic sands and gravels with occasional clay beds.

7. River profiles. - The fall from the confluence of the North Fork and Middle Fork to the mouth of Boise River, a distance of about 95 miles, is about 1,250 feet, or an average of 13 feet to the mile. In the valley alone, the fall from Boise to the mouth is approximately 500 feet, or 11 feet to the mile. The tributaries are much steeper; the North Fork drops 900 feet in 35 miles, an average of 23 feet to the mile. The Middle Fork drops 2,000 feet in 40 miles, or an average of 50 feet to the mile. The South Fork drops 3,000 feet in 90 miles, or an average of 33 feet per mile. Profiles of Boise River are shown on plate II of appendix A.

8. Channel flow capacity. - The channel of Boise River through its valley reach meanders over the flood plain, seeking new courses with each major flood. Plate IV shows historically some of these changes. The capacity of the channel is estimated to be 6,500 c.f.s. without overflow on cultivated areas. However, damage through siltation of irrigation canals and ditches starts at about 2,500 c.f.s.

9. Climate. - The climate in the Boise valley is characterized by an abundance of sunshine and little precipitation. Records of the Weather Bureau at Boise show a range in temperature from 121 degrees Fahrenheit in summer to minus 28 degrees Fahrenheit in winter. The annual precipitation over the basin ranges from an average of less than 8 inches at the mouth of the river to 13 inches at Boise and to over 50 inches at the headwaters of the tributaries in the Sawtooth Mountains. The annual snowfall varies from a few inches at the lower elevations to 10 feet or more

in the higher mountains, where at least 75 percent of the precipiation falls in the form of snow.

10. Present developments. - Present major developments on Boise River and tributaries consist of Anderson Ranch Dam, now under construction on the South Fork about 63 miles upstream from Boise; Arrowrock Dam, on the main stem 22 miles above Boise; Diversion Dam, about 7 miles upstream from Boise; and Deer Flat Reservoir, which, although located off the main stream a few miles southwest of Boise, is supplied with water by diversion from Boise River. All the above are projects of the Bureau of Reclamation. Other developments include Barber Dam and power plant, constructed by a lumber company and now owned by the Idaho Power Company, located on Boise River about 4 miles above Boise; and four small reservoirs located on Little Camas, Indian, and Black Creeks, all tributaries of Boise River.

11. Published maps. - Water Supply Paper 657 of the U. S. Geological Survey, entitled "Water Utilization in the Snake River Basin," published in 1935, contains maps of the Snake River Basin, which show considerable data with respect to the Boise River watershed.

12. Reference is made to plates I, II, III, and IV of this report entitled, respectively, "Index Map," "Land Forms," "Basin Map," and "Flood Plain," which contain much material pertinent to the region.

ECONOMIC DEVELOPMENT

13. Population. - The population of the Boise River watershed is approximately 100,000. Principal towns in the basin and their population according to the 1940 Federal census are as follows:

Boise	26,130	Meridian	1,465
Nampa	12,194	Parma	1,085
Caldwell	7,272		

14. Railways and highways. - The main line of the Union Pacific Railroad traverses the lower valley from the mouth of Boise River to Caldwell, and connects Boise, Nampa, Caldwell, and other towns with Pacific Coast and eastern points. A branch line of the Union Pacific connects Nampa with Emmett and McCall in the Payette River Basin to the north and with Murphy, Idaho, south of the Snake River. The principal highways in the area are U. S. 30, which connects the valley with Pacific Coast and eastern points, and with Salt Lake City, Utah, to the southeast; and U. S. 95, which connects the basin with Lewiston and Moscow, Idaho, and Spokane, Washington, to the north, and Reno and Carson City, Nevada, and California points to the south. A network of paved and gravel-surfaced state and county roads forms an adequate farm-to-market system in the basin below Arrowrock Dam. The mountainous area above Arrowrock Dam is well served by a system of state, county, and forest service roads; some are gravelled and some are merely graded earth roads, passable only during dry weather.

15. Federal reservations. - Practically the entire Boise watershed above Arrowrock Dam lies within boundaries of national forests. Other Federal reservations in the valley are Gowen Field Army Air Base, a few miles south of Boise, and a U. S. Military Reservation of about 750 acres lying just outside the eastern limits of Boise. This reservation was formerly a military barracks and is, at this time, used as a veterans hospital and a national guard headquarters.

16. Irrigation. - Irrigation in Boise Valley began early in the 1860's. The earliest evidence is contained in the "Stewart Decree," which gives certain water rights the priority date of June 1, 1864. At the present time, about 342,000 acres are irrigated.

Because Boise River has its highest flow during the spring months and its lowest during or just after the irrigation season, storage reservoirs to conserve water for irrigation purposes are necessary. The reservoirs used for storing water in the Boise River basin and their capacities are as follows:

Reservoir	Storage capacity, acre-feet
Anderson Ranch (under construction)	500,000
Arrowrock	286,500
Deer Flat	177,000
Little Camas	22,300
Pleasant Valley	7,900
Hubbard	7,500
Orchard	4,800
Total	1,006,000

The irrigated lands of Boise Valley are served by 554 miles of main canal and 1,372 miles of lateral canals. In addition to these canals, the Black Canyon Canal diverts water from Payette River and supplies water for irrigation of a considerable area in Boise Valley northwest of Caldwell. The canals diverting from Boise River and the total discharge of each in acre-feet during the irrigation season of 1943 at the point of diversion are as shown on the following page:

Name of canal	Diversion - acre-feet
Main South Side Canal (New York Canal)	767,530
Penitentiary	2,062
Bubb	4,874
Ridenbaugh	161,430
Settlers	50,082
Thurman Mill	9,098
Consumers	6,884
Boise City	9,966
Farmers Union and Boise Valley	56,156
New Union	3,896
New Dry Creek	18,080
Ballantine	3,962
Middleton Water	38,602
Middleton Mill	16,760
Little Pioneer	7,994
Canyon County	19,968
7 Eagle Island Canals	11,394
Phyllis	117,060
Eureka #1	8,348
Caldwell High Line	17,618
Farmers Cooperative	98,038
Campbell	5,510
Siebenburg	2,298
Riverside	54,118
Pioneer Dixie	12,706
Eureka #2	16,294
Upper Center Point	3,782
Lower Center Point	3,344
Miscellaneous	7,800
Total	1,535,654

The first two canals listed are property of the Boise Project Board of Control. The remainder of the canals listed are owned by private interests and by numerous irrigation districts. In addition to the two canals mentioned, the Board of Control owns a network of laterals for distributing the water from the canals and from Deer Flat Reservoir. Arrowrock Reservoir was constructed by the U. S. Bureau of Reclamation for irrigation interests. The Board of Control contracts for the waters impounded in this reservoir.

The construction costs of Arrowrock Reservoir have been practically repaid by the water users. Flood control has met no part of these costs. Anderson Ranch Reservoir, now under construction by the U. S. Bureau of Reclamation, will deliver water under contracts, to the Board of Control and to other interests in the valley. Irrigated lands under the jurisdiction of the Board of Control are supplied with water largely from storage directly, with many of the lower lying areas being supplied by return flow. Some of the main canals and the irrigated areas are indicated on plate III.

17. Resources and industries. - The principal natural resources of the basin are timber, grazing and irrigable farm lands, and mineral deposits. The principal industries are farming and allied industries. These latter consist of sugar refining, milk condensing, cheese and butter making, fruit and vegetable canning, and meat and fruit packing. Minor industries consist of logging, lumbering, mining, and manufacturing. The principal products of irrigated lands are potatoes, sugar beets, vegetables, hay, pasture, specialty and fruit crops; and of the nonirrigated lands, hay and wheat and other small grains. The following tabulation gives the quantities of various farm products produced in Boise Valley during the year of 1939, as contained in the 1940 census:

Potatoes	1,458,302 bushels
Corn	486,467 bushels
Wheat	1,119,417 bushels
Oats	384,325 bushels
Barley	600,013 bushels
Mixed grains	224,019 bushels
Hay	324,281 tons
Wool	896,775 pounds
Eggs	2,438,775 dozen
Milk	33,916,500 gallons
Apples	426,654 bushels
Prunes	14,699,120 pounds
Sugar beets	84,486 tons

The 1940 census gave the total value of farm products in Boise Valley in 1939 as $15,000,000. In 1944, the valley produced 15,920,000 pounds of butterfat valued at $11,354,000; and the Boise Project, comprising 167,000 acres, or about one-half the acreage in the valley, produced crops valued at $11,588,000 according to data furnished by the State Dairy Inspector of Idaho and from the Annual Report of the Boise Project. The greater return to the producer in 1944 was due to increased acreages of specialty crops yielding a larger income per acre and to general increases in prices. Ninety-six factories were operating in Boise Valley in 1939, employing 1,169 persons, with a production value of $13,466,000; in 1944, the number of factories operating was still 96, but the number of people employed had increased to 3,296, and the value of the manufactured products had increased to $42,000,000.

18. Timber. - The timber stand, located mainly in the mountains of the upper reaches of the tributaries of Boise River, is predominately ponderosa pine with other mixed conifers. The total forest area by drainage basins of the main stream and principal tributaries is as follows:

Stream	Acres
Main Stream	1,500
Mores Creek	181,000
South Fork	241,000
Middle Fork	33,000
North Fork	130,000
Total	586,500

The timber lies almost wholly within national forests. The estimated stand is 1,600,000,000 board-feet of merchantable saw-timber, 60 percent of which is pine and 40 percent is mixed conifers.

An estimated 390,000 cords of other than merchantable saw-timber remains in the area. The stand is for the most part less accessible than others in the Snake River basin, and heavy marketing is not expected for years to come.

19. Bridges. - Numerous highway and railroad bridges cross Boise River and its tributaries. Most of these are in the valley below Arrowrock Dam. Three of the bridges are on the Union Pacific Railroad between Boise and the mouth of the river. These bridges have adequate foundations and sufficient clearances to pass large floods. Most highway bridges in the lower valley have adequate clearance to pass minor floods. However, during the flood of April 1943, which reached a discharge of about 21,000 c.f.s. at Boise, ten of the fourteen highway bridges were closed to traffic for 5 days or more.

CLIMATE

20. Climate. - The climate of the Boise River watershed is characterized by warm, dry summers and cold winters. The lower valley experiences an abundance of sunshine, but little precipitation. The mountainous area, however, receives moderate precipitation. July is the only month at Boise that has been frost-free. The growing season in the valley averages 178 days. Extreme temperatures observed in the watershed are 121 degrees Fahrenheit at Boise, elevation 2,759 feet, and minus 39 degrees Fahrenheit at Prairie, elevation 4,650 feet.

21. Precipitation. - The mean annual precipitation for the Boise River watershed is 18.2 inches. Observed records show the mean annual precipitation to vary from 8.7 inches at Parma, a few miles above the river's mouth, to 27.9 inches at Boulder Mine, situated in the headwaters of the North Fork Boise River at an elevation of 6,000 feet. Climatological records show that the heaviest precipitation falls from October through May. Much of this precipitation falls in the form of snow, particularly at the higher elevations. It accumulates and contributes to spring and summer stream flow. The average snowfall varies from 20 inches in the lower valley to more than 120 inches in the headwaters.

22. Nine snow courses at an average elevation of 6,500 feet are operated in and near the Boise watershed. Measurements of the snow pack are made by the Soil Conservation Service from January through May. These measurements, which are largely financed by local interests, provide an index for the run-off forecasts. Location of the snow courses is indicated on plate III.

23. Storms. - Winter storms within the watershed are of low intensity and long duration. Records of significant storms that cover the watershed show a large number to be of 3-day duration, but in general winter storms do not produce damaging floods. Summer storms are characterized by high intensities of the cloudburst type that cover a small area. These summer storms do not cause floods of great significance except in local areas, where flash floods rush down from steep canyons and flood lands on the terraces.

RUN-OFF

24. Characteristics. - The run-off of Boise River is characterized by low flows from August through February and by high flows from March through July. This type of run-off is typical for a watershed in which snow melt is the principal source of the stream flow. Occasionally in early winter, an intense storm will cause moderately high water in the lower valley. Significant rain floods in the Boise Valley occurred in November 1909, December 1918, and December 1937. The largest of these three floods was the November 1909 flood with a maximum discharge of 15,200 c.f.s. In the last 50 years, from observed records, the maximum annual discharges are within the 4-month period, March-June. Furthermore, 69 percent of the peak discharges occur in May.

25. Records. - Records of run-off are available for the major tributaries and at four stations on Boise River; namely, South Fork Boise River near Lenox, drainage area 1,090 square miles; Mores Creek near Arrowrock, drainage area 426 square miles; Boise River near Twin Springs, drainage area 830 square miles; Boise River at Dowling Ranch, drainage area 2,220 square miles; and Boise River at Diversion Dam, drainage area 2,650 square miles; and Boise River at Notus, drainage area 3,820 square miles. At Diversion Dam, a continuous daily record from 1895 to date has been compiled, the longest record of any station in the basin. In addition, the maximum annual discharges of Boise River at Diversion Dam have been estimated as far back as 1865 from Boise, Idaho, precipitation and temperature data. Discharge records for the other stations date from 1912.

26. Run-off and discharge. - The mean, maximum, and minimum annual run-offs and the maximum recorded discharge for each of the principal gaging stations within the basin are shown in the following tabulation:

Stream	Station	Annual run-off in acre-feet			Maximum recorded discharge
		Mean	Max.	Min.	c.f.s.
S. Fk. Boise R.	Near Lenox	705,200	1,339,000	338,000	9,500
Mores Creek	Near Arrowrock	213,800	477,400	70,900	6,610
Boise River	Near Twin Spgs.	811,100	1,408,500	416,000	10,300
Boise River	At Dowling Ranch	1,629,700	3,005,800	827,000	*18,800
Boise River	At Diversion Dam	1,800,000	3,570,000	890,000	35,500

* Modified by the operation of Arrowrock Reservoir.

27. The annual run-off in 1943 was the maximum of record at all of the gaging stations within the watershed. Weather conditions during the snow melting season were subnormal, and the resulting flood, although of major proportions, had a peak discharge considerably smaller than normally would have occurred in a year with this volume of run-off.

FLOODS

28. Flood characteristics. - High flood discharges on Boise River occur from early spring to early summer and result from rapid melting of snow. The magnitude and duration of the annual snow-melt floods are dependent upon the depth of the snow cover and the temperatures. One of the outstanding features of floods on Boise River is the duration of the flow above bankfull capacity, which is usually 60 to 90 days. During a high-water season, the flood hydrograph generally has 4 to 6 separate peaks caused by short periods of high temperature. The maximum discharge for the year occurs in the 4-month period, March through June.

In the past 50 years, 69 percent of the maximum annual discharges have occurred in the month of May. Occasionally, a damaging flood results from a general rain storm over the basin. Notable floods of this type occurred in November 1909 and December 1937. In late spring and early summer, the basin experiences an occasional cloudburst. These storms have their origin in the upper basin and affect only small areas.

29. History of floods. - The first settlement in Boise Valley began in the early 1850's. Since that time, major floods have occurred on Boise River at frequent intervals, causing serious damage to both urban and agricultural areas. Many of the smaller floods affected only agricultural lands. The earliest major floods for which historical records are available date from 1865. The largest of the historical floods occurred in May 1872. Other significant historical floods occurred in 1871, 1874, 1875, and 1894. Since 1895, a continuous daily record of the natural discharge of Boise River at Diversion Dam has been compiled from recorded readings at nearby stations. During the period of observed records, the five largest floods occurred in 1896, 1897, 1943, 1928, and 1927. In the period of the historical and observed record (80 years), 27 major floods were experienced in Boise Valley. The most recent are the 1943, 1928, and 1936 floods.

30. Magnitude of floods. - Since 1916, floods in the lower Boise Valley have been regulated to a minor degree by the operation of Arrowrock Reservoir and by the water diverted from the river above Boise for irrigation. The amount of regulation effected with Arrowrock Reservoir and the irrigation diversions has been variable and unreliable.

In years of large run-off, the storage volume in Arrowrock Reservoir usually is depleted before the end of the high-water season, and the discharges over the spillway would be about the same as if no reservoir existed. The main diversion canals above Boise have a combined capacity of approximately 3,500 c.f.s.; however, they are not always operating at capacity at the peak of the flood. A discharge of 2,000 c.f.s. is a reasonable estimate of the water that might be diverted from Boise River above Boise during any flood of less than 35,000 c.f.s. discharge. For flood discharges in excess of 35,000 c.f.s. at Diversion Dam, the banks of the main diversion canals would be overtopped near the intakes, rendering the canals inoperative, after which no relief can be expected from them.

31. The tabulation on the following page shows a list of the larger historical and observed floods between 1865 and 1944. For floods occurring since Arrowrock Reservoir became operative in 1916, the maximum natural and regulated discharges at Diversion Dam are shown to illustrate the regulation effected by Arrowrock Reservoir and by diversions. Table 2 contains a complete list of the floods between 1865 and 1944.

Year	Month	Day of highest natural discharge*	Peak discharge passing Diversion Dam in c.f.s.	
			Natural	Regulated by Arrowrock and diversions
1872	May	20	50,000	—
1871	May	28	43,000	—
1874	May	25	36,000	—
1875	April	18	36,000	—
1896	June	14	35,500	—
1894	April	24	35,000	—
1881	April	20	29,600	—
1897	April	19	29,500	—
1943	April	18	25,040	20,000
1865	May	4	21,600	—
1890	May	3	20,800	—
1928	May	10	20,710	16,500
1867	April	30	20,200	—
1927	May	18	20,060	13,600
1936	April	24	19,790	16,100
1904	April	15	19,700	—
1886	May	22	19,300	—
1938	May	2	19,290	13,700
1899	May	10	19,000	—
1921	May	17	18,740	16,100
1922	May	26	18,170	13,900
1892	May	26	18,000	—
1917	May	15	17,850	14,600
1893	May	16	17,800	—
1907	April	15	17,000	—
1910	March	22	16,600	—
1916	May	7	16,550	12,600

* Regulated discharges may or may not fall on these dates.

32. Flood frequencies. - Estimates of the probability of flood occurrences on Boise River at Diversion Dam were made for use in economic studies of damages and flood control benefits. In the determination of the magnitude and frequencies of floods that may be expected to occur in the future, study was made of flood occurrences in the past 80 years, 1865-1945.

33. Records of flood discharges immediately above Diversion Dam are available only since 1895. From these records the peak discharges at Diversion Dam were computed for the 50-year period, 1895-1945. The reconstruction of the floods prior to 1895 was accomplished in connection with the investigations reported in H. D. 957, 76th Congress, 3d Session. The construction of the early flood hydrographs was based upon the precipitation and temperature records at Boise, that are available since 1865. No other station in or adjacent to the basin has climatic records for the 30-year period, 1865-1894, for which stream flow records are missing. In the basin are 20 stations with precipitation records and 12 with temperature records for 20 years or longer. Other stations with records shorter than 20 years are shown in table 1 of the appendix. In conjunction with the run-off records, the data collected from these precipitation and temperature records were studied to determine the periods of sustained temperatures, precipitation, the amount and the quality of snow on the basin, and the relationship to actual run-off. The annual peak discharges were then estimated for the missing 30 years. Details of the studies of frequencies are given in appendix A; and chart 6 in appendix A shows the maximum annual flood probability curves. The tabulation on the following page shows the natural and regulated discharges passing Diversion Dam. The indicated regulated discharges are for present storage and diversion conditions in the Boise watershed.

Probable frequency	Natural flow	Flow passing Diversion Dam: With Arrowrock Dam and irrigation diversions	Flow passing Diversion Dam: With Arrowrock, Anderson Ranch, and irrigation diversions
Annual	4,500	2,500	2,500
Once in 2 years	13,500	11,500	6,500
Once in 5 years	21,200	17,300	10,300
Once in 10 years	27,000	24,100	19,000
Once in 25 years	35,300	35,300	33,000
Once in 50 years	42,000	42,000	42,000
Once in 100 years	50,000	50,000	50,000

EXTENT AND CHARACTER OF FLOODED AREA

34. Extent and character of flooded area. - Older residents relate that in early years of the settlement of the Boise River Valley, approximately 50,000 acres were frequently flooded, and that, in some years, about 70 percent of the valley floor was inundated for about two and one-half months. The construction of levees, supporting embankments, and bank protective works, was started at an early date. These improvements materially decreased the area subject to overflow by smaller floods. Under present conditions, siltation of the stream channel, diverting canals, and ditches, results in physical damages in non-flood years. Discharges of 10,000 c.f.s. have ordinarily flooded about 13,000 acres of agricultural land. Each of the floods of 1936 and 1943 inundated about 29,000 acres, but the pattern of inundation was considerably different. Also, these floods covered portions of urban and suburban areas. A flood of 1896 proportions would inundate about 48,000 acres. Estimates indicate that a flood of 55,000 c.f.s. is the maximum-controllable by the project recommended in section II of this report. Accordingly, such a flood hereinafter will be termed the "maximum-controllable flood."

A flood of this magnitude would subject about 58,000 acres to overflow. Plate IV outlines the areal extent of the 1936, 1943, and 1896 floods. The river channel of 1868 and the channel as it existed in 1939 are also shown on this plate.

35. The floods of 1894 and 1896 inundated about 29 blocks in Boise. This area is now largely industrial and is contiguous to considerable suburban area that also is subject to inundation. An area of approximately 6 blocks was flooded in each of the towns of Eagle and Star by past major floods. The flood of 1943 inundated about 5 blocks in Caldwell, and a flood of 1894 or 1896 proportions would extend over approximately 15 city blocks; the "maximum-controllable flood" would subject about 25 blocks to overflow. The town of Notus is above the flood plain, but it is considerably inconvienced by floods of 1943 magnitude or higher. Two business blocks in the town of Parma were flooded in 1943, and 6 to 10 blocks would be subject to overflow in floods of 1896 or "maximum-controllable" magnitudes.

36. Except for urban, suburban, and industrial interests in the cities and towns in the flood plain, the activity in the areas subject to overflow is predominantly agricultural. Waste and marginal lands in the flood plain are comparatively small, but areas that are subject to frequent flooding are for that reason useful only for uncultivated pasture. The acreage and the classifications of areas in the Boise River valley that would be subject to inundation by representative floods of various magnitudes are shown by zones in table 3 and are summarized in the tabulation shown on the following page:

Areas in flood plain
based on protection afforded by levees existent in 1945

Classification of lands	Acreage inundated: Peak discharge below Diversion Dam [1] 1935 7,500 c.f.s.	1918 10,300 c.f.s.	1936 16,100 c.f.s.	1943 20,000 c.f.s.	1896 35,500 c.f.s.	Maximum controllable flood 55,000 c.f.s.
Waste	800	1,100	1,510	1,440	2,350	2,370
Marginal	650	1,120	1,620	1,550	2,370	2,400
Pasture	1,200	4,400	11,230	11,410	18,900	20,850
Hay	1,100	2,700	5,750	5,780	9,470	11,900
Crop	1,450	3,350	8,640	8,660	14,200	19,100
Total agricultural area	5,200	12,670	28,750	28,840	47,290	56,620
Urban and suburban	---	---	210	350	1,100	1,780
Estimated total acreage	5,200	12,670	28,960	29,190	48,390	58,400

[1] Except for minor irrigation diversions, the flood peaks are approximately equal to the discharges at Boise.

37. In this investigation, no actual field appraisal has been made of the value of lands or improvements in the flood plain. A search of county and city records was made, however, to obtain the assessor's appraised valuation for tax purposes of properties within the flooded areas and to obtain the adjustments of these appraised values as made by the Board of Equalization. After the appraised valuations of agriculture lands and development were compared with data obtained from the Federal Land Bank, adjustments were made to approximate actual values. The values of lands and improvements subject to damage range from $2,815,000 for a flood of 1935 magnitude to $21,417,000 for the "maximum-controllable flood". Classification and valuation of lands and improvements in areas inundated by floods of various magnitudes are listed in table 15 of appendix A and summarized on the following page:

Valuation of lands and improvements in flood plain
based on developments existent in 1944

Classification of properties	Estimated valuations: Peak discharge below Diversion Dam [1] 1935 7,500 c.f.s.	1918 10,300 c.f.s.	1936 16,100 c.f.s.	1943 20,000 c.f.s.	1896 35,500 c.f.s.	Maximum controllable flood 55,000 c.f.s.
	(Values are expressed in thousands of dollars)					
Agricultural	80	341	2,648	2,723	4,575	6,200
Irrigation developments	205	205	285	350	671	705
Flood control works	1,630	1,630	1,630	1,630	1,630	1,630
Urban	---	---	45	188	2,508.5	7,480
Municipal	---	---	---	8	175	1,040
Industrial	---	---	50	72	388	648
Highways	575	575	1,034	1,061	1,529	1,925
Railroads	325	325	325	325	365	1,605
Utilities	---	59.6	80.4	88	177	357
Estimated total valuations	2,815	3,135.6	6,097.4	6,445	12,018.5	21,590

[1] Except for minor irrigation diversions, the flood magnitudes are approximately equal to the discharges at Boise.

FLOOD DAMAGES

38. Damage surveys. - The first extensive mapping of the flood plain in the Boise River Valley was made in 1938-1939. Detailed investigations of flood damages, run-off and water flow retardation, and soil erosion prevention, were made cooperatively by the U. S. Bureau of Agricultural Economics, U. S. Forest Service, U. S. Soil Conservation Service, and the Corps of Engineers in 1939-1940. In this survey, detailed appraisals were made of the damages incurred in the flood of 1936. The flood plain was divided into vertical zones, and the damages were computed for theoretical floods ranging from 2-year to 300-year frequencies by using the 1936 flood damage appraisals as basic data.

39. A survey of the damages suffered in the flood of 1943 was made cooperatively with state and county agencies from June 2 to June 26, 1943, when physical evidence of the damage still existed. Appraisals by each agency were made by direct interviews with property owners. In order to facilitate the appraisals and to obtain the distribution of damages, the flood plain was divided into six zones ranging from about 5 to 15 miles in length. The several zones are shown on plate IV. The upper and lower limits and the length of the respective zones are as follows:

Zone number	Upper limit	Lower limit	Length of zone in river miles
1	Barber Dam	Strawberry Glen Bridge	12.2
2	Strawberry Glen Bridge	One mile below Eagle Bridge	5.2
3	One mile below Eagle Bridge	Star Bridge	7.2
4	Star Bridge	Highway U. S. 30 Bridge (Caldwell)	11.7
5	Highway U. S. 30 Bridge (Caldwell)	Notus Bridge	8.5
6	Notus Bridge	Mouth	15.2
		Total length of flooded area	60.0

40. Siltation of stream channels and irrigation and drainage canals, and damage to bank protective improvements were severe in the 1943 flood. Information was obtained late in 1943 and in 1944 throughout the valley on high-water marks for several past major floods, and adequate data were obtained for estimating the damages for these floods under present conditions of development. Levees and revetments in 28 locations were reconstructed by the Engineer Department in 1944 and 1945. Rehabilitation of levees at seven additional locations has been recommended. The locations for these improvements are shown on plate VIII.

Inasmuch as these improvements will provide considerable protection at the respective locations, appraisals were made in 1945 of the benefits that would result at each location and the damages that would be suffered by each installation and adjacent lands in high floods. Adequate information was obtained in the flood plain for revising those data previously obtained.

41. Past damages. - Considerable information is given on past flood damages in newspaper accounts, in county, city, and town records, in railroad and highway maintenance cost records, and in statements made at hearings, but no attempt has been made by any agency to collect or recapitulate these data. Overflow conditions and economic development have materially changed since the occurrence of past major floods so that damage data on floods prior to 1936 would be of very little value in computing damages under present conditions.

42. Estimate of future damages based on 1945 conditions of control. - Existing flood control improvements and irrigation developments in the Boise River valley are such that damages that have resulted from past floods are only partly indicative of future damages. Under present conditions of development, a few items of damage will be less during the next 50-year period, but the damages for most items will be materially increased. In the future, damages to the principal state highways and to railroad lines will be relatively small for minor and moderate floods; but for floods of large volume, long periods of ponding, and high peak discharges, the damages will be much greater. Developments on industrial, municipal, and suburban properties near the river in the vicinity of Boise and of other community centers have been extended farther into the flood plain since the 1943 flood.

Although the areas inundated by minor and moderate floods have been decreased by levees and other improvements, the protection afforded affects local areas only. The embankments have not been constructed to withstand prolonged saturation and erosion, and it is reasonable to expect that a large part of the agricultural area would be inundated during floods of either moderate or large volumes. Should breaks occur in the levees, the damages to areas behind the levees will be greater than in the past, due to increased land use. Agricultural losses will continue to be the largest single item of flood damage. In agricultural areas, damages will continue to be erosion of banks and top soil; deposits of drift, debris, and weed seeds; loss of fences, crops and livestock; impairment of farm improvements and irrigation and flood control works; disfiguration of irrigated lands necessitating releveling; and loss of land use.

43. Direct damages under 1944 economic development were estimated for five floods on Boise River corresponding to past flood magnitudes and duration, for a 50-year flood, and for a "maximum-controllable flood". Inasmuch as the floods of 1935, 1918, 1936, 1943, and 1896 appeared to be the most representative, they, with the two theoretical floods mentioned above, were selected for special investigation and appraisal. The 50-year flood, 42,000 c.f.s., is about 1,000 c.f.s. less than the flood of 1871, and the discharge of the "maximum-controllable flood", 55,000 c.f.s., is 10 percent in excess of the flood of 1872. Based on 1944 economic development and existing flood control facilities in 1945, detailed estimates of the direct damages for six of the seven floods are shown in appendix A, table 16.

Direct damages range from $80,000 for a discharge of about 7,500 c.f.s., similar to the flood 1935, to about $9,095,000 for the "maximum-controllable flood".

44. Under present conditions of development in the Boise River valley, losses to crops outside the flood plain resulting from major floods would be severe, due to the dependence of these crops on the delivery of water from the canal system. Forty-nine main irrigation canals divert water from the river across the flood plain to serve 167,500 acres, of which only 55,500 acres are in the flood plain. Numerous irrigation laterals and drainage ditches extend throughout the flood plain. Damages to headworks and the impairment of main canal and lateral capacities by flooding and by siltation would occur when water would be required for growing crops. Inasmuch as repairs could not be accomplished until the flood waters subsided, from 5 to 50 days would elapse after interruption of service before water could again be delivered to the irrigation systems. The time of flood occurrence would be one of the most important factors. If a major flood should occur in April, losses would not be heavy; but should it occur in June, the loss of crops due to interference with the irrigation supply would be very severe. As bottom lands normally could be classed as semi-arid, and the bench lands undoubtedly as arid, agriculturists state that 15 days to a month of drought on these lands during June would mean at least the loss of one crop of hay, of the entire grain crop, of all new spring seeding, and of most row crops.

45. Officials of various irrigation and ditch companies collected data from operating irrigators in their respective districts on the length of time, subsequent to floods of various stages, that would be required before equipment could be used to repair headworks, canals and laterals, on the length of time required to make repairs, and on the crop acreages that would be affected by interruption in the delivery of water. Officials of 24 irrigation districts and ditch companies met in June 1945 at Star, Idaho, and consolidated the collected data under the direction of the Boise River Watermaster. This office has examined these data, and the estimates made therefrom appear to be substantially correct. Deductions in crop values were made from the estimates by local interests to represent more nearly average prices and returns. The canals and the acreage affected, with estimated number of days of interruption in the delivery of water and with the loss to the irrigators in each irrigation district and ditch company area are shown in table 17 in appendix A. Damages to the Main South Side Canal to Deer Flat Reservoir, which serves about 166,000 acres, are included in this estimate for the "maximum-controllable flood" only. Local interests, however, believe that any flood above 35,000 c.f.s. would tax the capacity of Diversion Dam and might possibly break through and around the headgate and into this canal. Such a break would probably damage the canal somewhere along the sidehill section and would require such time for repairs that might involve tremendous crop loss on all lands served by this canal. However, for floods below 55,000 c.f.s., the possible losses to lands served by this canal are excluded from the estimate for conservative reasons.

Direct losses to agricultural interests outside the flood plain amounted to about $199,000 in the flood of 1943. Similar losses to these interests would amount to about $2,007,000 and $3,662,000 for floods comparable in magnitude to the 1896 and of the "maximum-controllable" floods, respectively.

46. Transportation and communication facilities were seriously disrupted during the 1943 flood. In several places, flood waters not only overflowed and cut through local county roads, market roads, and nighways, but also washed out many small culverts and bridges, not all of which were completely repaired for several months. During the 1943 flood, all of the bridges across the river with the exceptions of the Caldwell Bridge, and the Capitol Boulevard and Ninth Street bridges in Boise, were out of commission. Traffic was disrupted for the full length of the valley. This was an especially serious handicap to dairy interests, which is the largest and one of the most important industries of the valley. Some of the large cooperative creameries operate from 30 to 75 milk trucks, and interruption of this traffic is a serious handicap, curtailing the output of butterfat in the valley. Indirect losses for all interests in the 1943 flood amounted to about $29,100. The indirect losses would amount to about $264,600 and $844,500, respectively, for floods of a magnitude similar to those of 1896 and the "maximum-controllable flood". Detailed estimates of the indirect losses that may reasonably be expected for the six floods considered and their distribution to various classifications of property and zones are shown in table 18 in appendix A.

The total estimated damages, direct and indirect, under 1944 economic development with existing flood control facilities in 1945, would range from about $80,000 for a flood similar to that of 1935 to about $9,940,000 for the "maximum-controllable flood". The estimated direct damages and indirect losses to general property classifications are summarized in the tabulation shown on the following page for floods similar to the 1935, 1936, 1943, 1896, and "maximum-controllable" floods.

Summary of estimated future flood damages
based on economic developments existent in 1944

General classification of damages	1935 7,500 c.f.s.	1936 16,100 c.f.s.	1943 20,000 c.f.s.	1896 35,500 c.f.s.	Maximum controllable flood 55,000 c.f.s.
Direct damage					
Agricultural	$ 9,950	$165,740	$465,840	$2,647,870	$4,653,200
Urban and suburban	--	--	--	385,570	1,061,000
Industrial	--	12,100	18,640	131,640	271,500
Irrigation & drainage structures	1,250	31,970	45,670	157,030	306,900
Siltation	58,020	109,310	138,200	305,530	623,500
Railroads	--	--	--	20,390	105,000
Highways	1,100	34,020	76,040	289,230	989,000
Utilities	--	--	200	34,700	83,000
Channel & bank improvements	9,500	88,100	205,440	537,300	881,000
Emergency expenditures	--	10,350	18,220	72,840	121,300
Estimated direct damages	$79,820	$451,590	$968,250	$4,582,100	$9,095,400
Indirect losses					
Agricultural	$ --	$ 1,500	$ 5,000	$ 12,000	$ 20,000
Interruption of traffic, communications, and power:					
Railroads	--	--	--	60,000	299,000
Highways	--	500	15,000	110,000	155,000
Utilities	--	--	500	2,200	34,500
Interruption to industry:					
Loss of wages	--	1,800	4,000	28,000	74,000
Loss of profits	--	600	1,000	15,000	50,000
Urban and suburban:					
Commercial	--	--	--	25,000	116,500
Public property	--	--	--	2,500	15,000
Residential property	--	--	3,600	10,000	80,500
Estimated indirect losses	$ --	$ 4,400	$ 29,100	$ 264,700	$ 844,500
Estimated total damages	$79,820	$455,990	$997,350	$4,846,800	$9,939,900

NOTE: - Discharges as partially regulated by Arrowrock Reservoir and passing Diversion Dam which would be approximately the discharges at Boise.

47. Estimate of total and annual damages. - Floods on Boise River may be expected to occur with about similar frequency and similar magnitudes as in the past. The information available from present owners being inadequate for evaluating flood damages over a long period of years on the basis of a historical method, the total damages in the future 50-year period are estimated by frequency methods, using the damages estimated for floods similar to the 1935, 1918, 1936, 1943, 1896, a 50-year, and "maximum-controllable" floods. The annual flood, about 4,500 c.f.s., is reduced by regulation of Arrowrock Reservoir and diversions to a discharge of 2,500 c.f.s. This discharge is taken to be the nondamage stage at all critical sections. Since the flood discharge records are too short to include the higher historical floods of 1871, 1872, 1874, and 1875, it is reasonable to expect that one major flood of 42,000 c.f.s. similar in magnitude to these historical floods and that one flood higher than the largest flood of historical record would occur during a 50-year period. The probable occurrences for each of the foregoing floods as used in economic studies and as determined from the frequency table shown in paragraph 33 and from the frequency curve shown on chart 3 in appendix A are tabulated on the following page.

Flood occurrences

Floods similar to:	Peak discharge c.f.s. Natural	Peak discharge c.f.s. Passing Diversion Dam [1]	Probable number of times in a 50-year period that discharge would be equalled or exceeded
Nondamage stage	4,500	2,500	50
Bankfull [2]	8,500	6,500	42
1935	9,500	7,500	38
1918	12,600	10,300	29
1936	19,790	16,100	12
1943	25,040	20,000	7
1896	35,500	35,500	2
50-year [3]	42,000	42,000	1
Maximum-controllable flood [4]	55,000	55,000	1

[1] Approximately the discharges at Boise.
[2] Bankfull stage at critical sections where damage begins to be important.
[3] Discharge of 1871 flood was about 43,000 c.f.s.
[4] Discharge of 1872 flood is estimated at 50,000 c.f.s.

48. Without further flood control measures than those existing in 1945, the total flood damage which may be expected in Boise River Valley in a future 50-year period, based on 1944 economic development, is estimated to be $40,256,000, or an average of $805,110 annually. The total direct damage is $38,182,000, an annaul average of $763,650, of which about 49 percent is agricultural. The detailed estimates of the total and direct damages by zones are shown in table 19 in appendix A. The total indirect flood losses in a future 50-year period are estimated to be $2,073,000, an annual average of $41,460. The detailed estimates of total and annaul indirect losses by zones are shown in table 20 in appendix A. The distribution of estimated total and average annual damages for general property classifications in a future 50-year period is summarized in the tabulation shown on the following page:

Summary of total and annual future damages
based on economic developments existent in 1944

Classification of properties and damages	Direct		Indirect		Total average annual damage [1]
	Total damage in 50 years	Average annual damage	Total losses in 50 years	Average annual losses	
Agricultural	$18,836,700	$376,740	$107,600	$ 2,150	$378,890
Urban and suburban	2,522,710	50,450	385,000	7,700	58,150
Industrial	982,620	19,650	344,400	6,890	26,540
Irrigation headworks and structures	1,357,430	27,150	--	--	27,150
Drainage ditches	192,150	3,840	--	--	3,840
Siltation	5,224,910	104,500	--	--	104,500
Railroads	188,670	3,770	553,750	11,070	14,840
Highways	2,855,960	57,120	633,000	12,660	69,780
Utilities	212,250	4,250	49,600	990	5,240
Channel and bank improvements	5,223,760	104,480	--	--	104,480
Emergency expenditures	585,170	11,700	--	--	11,700
Estimated total damage	$38,182,330	$763,650	$2,073,350	$41,460	$805,110

[1] Existing flood control facilities in 1944, consisting of partial regulation by Arrowrock Reservoir, diversions to canals, and protection afforded by levees constructed to August 1944.

EXISTING FLOOD CONTROL PROJECT

49. General. - The existing flood control project provides for the construction of Anderson Ranch Reservoir on South Fork Boise River and for the alteration of the outlet works of Arrowrock Dam. The construction of the existing project, which has been investigated and reported on in various phases by the War Department, the Department of Agriculture, the Federal Power Commission, and the Bureau of Reclamation, is the responsibility of the latter agency. The existing project contemplates the operation of Anderson Ranch and Arrowrock Reservoirs in the joint interests of irrigation, flood control, and power. As indicated in paragraph 16, however, no definite agreement was ever made for the use of Arrowrock storage for flood control, and lack of downstream re-regulation has made the generation of power at Arrowrock Dam impracticable.

50. Storage capacity. - Anderson Ranch Reservoir, which is being constructed as a multiple-purpose project, will have a reservoir capacity of 500,000 acre-feet, which has been allocated as follows:

Item	Acre-feet
Flood control	212,500
Irrigation	212,500
Power	45,000
Silt control	30,000
Total	500,000

In the operation of the top 212,500 acre-feet for flood control, an increased storage for irrigation use will be realized. This flood control storage will be operated in accordance with flood forecasts to be provided by snow surveys, mainly financed by local interests. The remaining storage in the project will provide only such incidental flood control as is obtained during the irrigation filling period.

51. Power installation. - The existing project includes the installation of two 15,000-kilowatt generators at Anderson Ranch Dam.

52. Alterations at Arrowrock Dam. - For more efficient joint operation, the existing project provides for increasing the outlet capacity at Arrowrock Reservoir by substituting 52-inch tube valves for the existing 58-inch balanced valves at elevation 3,018; installing three steel pipes and 52-inch tube valves in the penstock openings at elevation 3,018; and excavating a short tunnel to connect the most easterly of the penstock openings with the old diversion tunnel. The cost of this work, together with minor improvements in the old diversion tunnel, is estimated to be $400,000.

53. Emergency repairs to flood control structures. - Subsequent to the destructive flood in the spring of 1943, funds in the amount of $460,000 were provided for replacement and reconstruction of existing flood control works along Boise River. These funds were allotted from emergency funds for repairs to flood control structures under authority of Sec. 1, Public 138, 78th Congress. Up to December 1945, approximately $450,000 of these funds had been expended, and practically all the work has been completed as planned. The locations at which repairs were accomplished are shown on plate VIII.

IMPROVEMENTS BY OTHER FEDERAL AND BY NON-FEDERAL AGENCIES

54. General. - During the period 1937 to 1939, inclusive, approximately $252,300, including the sponsor's contribution of $20,700, was spent by the Work Projects Administration along Boise River in constructing diverting embankments of river bed material to prevent overflow through side channels and over lower areas in agricultural uses. Individual land holders and Ada and Canyon Counties, also did similar work. An estimate of expenditures by all interests for flood control covering the period of flood record could not be secured. An estimate of the cost of protective work incidental to the 1936 flood gave a total of $91,800 from Federal, state, city, and private funds. The flood of 1943 had the highest natural peak discharge since the flood of April 1897. The State of Idaho, Ada and Canyon Counties, and the City of Boise made emergency expenditures totaling $16,220 for the protection of bridges, levees, and other improvements during and following this flood.

55. Arrowrock Reservoir. - This reservoir, completed in 1916 by the Bureau of Reclamation, is a part of the storage system for the Boise irrigation project, which has an area of 166,000 acres, practically all irrigated. In addition to the storage of 286,500 acre-feet provided in Arrowrock Reservoir, Deer Flat Reservoir has a storage capacity of 177,000 acre-feet. Four smaller reservoirs in the valley bring the aggregate storage to 506,000 acre-feet. At the time of its completion in 1916, Arrowrock Dam was 349 feet high above its lowest foundation; later, its height was increased 5 feet. The dam is a concrete structure of the curved, gravity type, 223 feet thick at the base. It is located about 4 miles below the junction of the main stem and South Fork Boise River, about 22 miles above Boise. Due to the confluence of the two branches, the reservoir is in the shape of a Y about 17 miles long and covers an area of approximately 3,000 acres. The maximum pool elevation is 3,216 feet mean sea level, and the tailwater elevation is about 2,962 at low stage. The storage at Arrowrock Reservoir is used entirely for irrigation with such incidental flood control as is obtained during the irrigation filling period. The control of irrigation storage is based primarily upon run-off forecasts financed largely by local water using agencies.

56. Anderson Ranch Reservoir. - Anderson Ranch Dam, now under construction by the Bureau of Reclamation, is an earth- and rock-fill type structure 42 miles upstream from Arrowrock Dam on South Fork Boise River. This structure will be 336 feet high above stream bed, with normal water surface elevation 4,196. It will have a crest length of 1,350 feet and a base width of 2,500 feet. It will be a part of a multiple-purpose project being constructed in the joint interests of irrigation, flood control, and power.

The reservoir will have a capacity of 500,000 acre-feet, and provision will be made for the generation of 30,000 kilowatts of hydroelectric power.

IMPROVEMENT DESIRED

57. The desires of local interests pertaining to flood conditions on Boise River were made known at a public hearing held in Boise, Idaho, by the district Engineer on December 14, 1944. Representatives from the entire Boise Valley appeared and described the need for flood control, in addition to improvements already authorized. In general, the testimony brought out the desire for a long-range, comprehensive plan of improvement embracing the entire length of the river for permanent protection from floods. Detailed estimates of damages from the 1943 flood were presented, and information also was presented regarding the heights and the damaging nature of earlier floods. The desires of local interests as summarized from statements made at the hearing include the following:

a. Additional multipurpose storage space to regulate flow in the interest of flood control and irrigation.

b. Continued channel improvement along the full length of the river in the alluvial plain, including deepening, widening, and straightening of the channel, to pass a flood of 10,000 to 12,000 c.f.s. without damage to adjacent property.

c. Development of power for pumping irrigation water.

d. Silt control by reservoirs and watershed improvements.

No statements were made as to the extent or possibility of local cooperation.

FIELD SURVEYS

58. Reconnaissance surveys. - Reconnaissance surveys were made for Twin Springs dam site on the main stream above Arrowrock Reservoir, for two dam sites on Mores Creek below the mouth of Grimes Creek, and for three dam sites on the main stream between Diversion Dam and Arrowrock Dam. Reconnaissance reservoir maps were prepared for these sites by photogrammetric methods, using aerial pictures taken in 1939 by the Forest Service. State highway plans and profiles were used for ground control. These reconnaissance maps furnished information from which a site about 2 miles above Diversion Dam, herein referred to as the Lucky Peak dam site, was selected for detailed study.

59. Survey of Lucky Peak dam site. - A plane table survey of Lucky Peak dam site was made to a scale of 1 inch equals 100 feet, with a contour interval of 5 feet. The proposed reservoir and the highway relocation route were mapped by photogrammetric methods to a scale of 1 inch equals 1,000 feet with a contour interval of 20 feet. The reservoir survey was extended to cover the borrow areas.

60. Ground exploration. - Foundation investigations at the Lucky Peak site included a number of seismic lines on each abutment and in the river bed, three core-drill holes along the dam axis, and some shallow test pits on the left abutment. In addition, a number of auger holes and test pits were put down in the borrow areas. Seismic foundation investigations were also made at the two dam sites on Mores Creek and on the right abutment at Twin Springs dam site.

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FLOOD PROBLEMS

61. Flood problems. - Practically every year, high water causes inundation, erosion, and siltation damages in the Boise Valley. History relates that the Hudson Bay Company post at Old Fort Boise near the mouth of the Boise River was destroyed by floods in 1853, and the factor, Frances Payette, became disgusted and moved to Fort Hall. The areas affected are the valleys in the upper tributaries and lower Boise Valley between Diversion Dam and the mouth of Boise River. The average annual damages in the lower Boise Valley amount to about $805,000. Because of the shifting nature of the river channel in the lower valley and because of the high ground water which would result each season during the passage of the flood, the construction of levees is impracticable except for protection of local areas. Prior investigations indicate storage reservoirs are the most practicable and economical means for effecting additional flood protection.

62. The existing project in the Boise Basin provides for 212,500 acre-feet of storage in Anderson Ranch reservoir for the control of floods with such incidental flood control as is obtained from the balance of storage at Anderson Ranch and from storage at Arrowrock Reservoir through filling for irrigation purposes. Due to the type of floods experienced in the Boise Valley, a large storage capacity is required to effect adequate flood control of the river. The system of two reservoirs can render control only of the minor floods.

This storage could not be used to its maximum advantage through the use of run-off forecasting for flood flows due to the fact that the reservoirs would have to be drawn down early in the year to permit a maximum degree of control. Under present conditions, early draw-down of the reservoirs would be objected to by irrigation interests due to their fear that the two reservoirs would not be completely filled before the season's snow-melt run-off ends. The irrigationists are not in favor of any plan which might jeopardize the storage of water required for irrigation.

63. Studies reveal that if about a million acre-feet of usable storage in the Boise watershed were provided, and if operation of this storage is accomplished by adequate methods of forecasting the run-off, control for all but the most infrequent floods could be realized. The needed storage for flood control could be obtained by using 425,000 acre-feet at Anderson Ranch, 275,000 acre-feet at Arrowrock with enlargement of the outlets, as authorized, and 280,000 acre-feet additional. Accordingly, if an additional reservoir of 280,000 acre-feet capacity is provided below Arrowrock Reservoir, and all three reservoirs are operated in conjunction with an adequate forecasting system, irrigationists' objections to the use of the storage capacities in Anderson Ranch and Arrowrock Reservoirs, indicated above as needed for flood control, would be eliminated.

64. The capacity of the Boise River channel from Diversion Dam through the lower valley varies from 3,700 to 10,000 c.f.s. The safe channel capacity at critical sections is 6,500 c.f.s., but at this flow damages result from movement of stream bed materials and siltation of irrigation canals.

It appears to be impracticable, however, to reduce discharges to less than 6,500 c.f.s. With the operation of Anderson Ranch and Arrowrock Reservoirs, control to 6,500 c.f.s. could be obtained for only minor frequently recurring floods. These two reservoirs would have little or no control of floods such as those which occurred in 1897, 1896, 1894, 1881, 1875, 1874, 1872, and 1871. With 280,000 acre-feet of additional storage in the system, advantageously located, effective control of the river to 6,500 c.f.s. would be possible. The practicability of complete control of all possible floods would depend upon future development in the valley.

IRRIGATION PROBLEMS

65. Irrigation problems. - Irrigation in the Boise River valley began in 1864, and by 1900 about 148,000 acres were under irrigation in the lower sections of the valley. By 1908, a Goverment project with Diversion Dam and Deer Flat Reservoir added about 166,000 acres of higher bench lands. As the natural run-off pattern of the river was such that the supply of water was inadequate after June, additional storage was necessary. Arrowrock Reservoir was completed in 1916, with a capacity of 276,500 acre-feet, and was raised 5 feet in 1936-37 to provide a total capacity of 286,500 acre-feet. Even with this storage development, lands have suffered a shortage of water about three seasons out of five for the past 30 years. In the worst years, notably in 1924 and 1931, the shortage reached 34 percent, and crop losses amounted to millions of dollars. Anderson Ranch Reservoir, now under construction, was planned to relieve this situation, and irrigation authorities are of the opinion that this storage with contemplated trans-basin diversions always would provide adequate water for practically all lands, with the exception of some shortage in one dry season in 20.

66. The only good lands unirrigated in Boise Valley proper are about 20,000 acres above the present canals in the Willow Creek area and about 10,000 acres in the Mora district. The irrigation of these lands is planned with water brought from Payette River in connection with the proposed Mountain Home project. This project would be partly supplied by storage at Anderson Ranch Reservoir, and the water taken out of Boise River would be replaced by stored water from Cascade and Garden Valley Reservoirs on Payette River, which would be brought by conduit into the Boise River valley. Part of this conduit would border the Boise River basin at an elevation enabling water to be supplied to the Willow Creek lands by gravity and the Mora lands by pumping.

67. Some part of the remaining water shortage in the lower Boise River valley would be relieved by return flow from irrigation of these new lands. The balance of the shortage, however, could not be provided for without additional storage on Boise River.

POWER PROBLEMS

68. Power problems. - Irrigation interests have priority on the use of water in the Boise River watershed. Although the demand for cheap power to pump irrigation water is growing, power generation occupies a secondary position in its demands upon available water. The power demand for irrigation pumping results in an annual peak load during the irrigation season from April to September. The power generated from existing multiple-purpose reservoirs in the basin would be dependent almost entirely upon using water released to meet irrigation demands.

Due to the demands of irrigation interests to carry over water from years of surplus flow to years of deficient flow, less power can be developed in the winter months than during the irrigation season.

69. Southern Idaho is served by the Idaho Power Company, and southeastern Idaho is served by the Utah Power and Light Company. The Idaho Power Company generates its power entirely by hydroelectric plants. Most of them are run-of-river plants and have little storage other than the pondage required for daily peaking purposes. Consequently, the power capability of the system follows the flow characteristics of the streams of the region; i. e., high summer capability and low winter capability.

70. Southern Idaho is unique in that it has an annual load curve that matches the stream flow characteristics of the region quite closely. Because of this situation, power which can be generated during the irrigation pumping season will have maximum value. The load curve of southern Idaho is made up of domestic, commercial, mining, irrigation pumping, and food processing requirements. The food processing and irrigation pumping requirements are growing loads that, coupled with heavy summer export loads to Utah, make the summer power demands the essential part of the annual load curve. The export load in the summer is a repayment for the power obtained during the winter from steam and hydroelectric plants in Utah.

71. An illustration of the close interrelation of the use of water for irrigation and for the generation of power is found in the operation of the existing Black Canyon Plant on Payette River. This plant, owned and operated by the Bureau of Reclamation, delivers its output into the Idaho Power Company system for transfer to certain government pumping projects during the irrigation pumping season.

The balance of the annual plant output is fed into the Power Company's system to compensate for lost generating capacity at the Power Company's plants on Snake River due to storage of irrigation water in American Falls Reservoir.

72. The U. S. Bureau of Reclamation has plans underway for irrigating the Mountain Home area about 40 miles southeast of Boise. Since a large part of this development will depend on pumping for its water supply, power demand in this area during the summer months is expected to increase.

RECREATION PROBLEMS

73. Recreation. - Recreation in the Boise basin is largely confined to the forested upper watershed within the Boise and Sawtooth National Forests, due primarily to the fact that the lowlands are largely without tree cover or scenic attraction. The Forest Service maintains roads, trails, and improved camp grounds that can be used by the public, and all parts of national forests are open to recreationists, except during periods of high fire hazard. Numerous summer home and resort sites have been leased within these reserves. Of the 57,000 people that entered the national forests within the watershed in 1938, approximately 42 percent came to fish, 17 percent to hunt, and 9 percent for winter sports, the rest being unclassified.

74. Although stocking has increased yearly, the number of fish in the mountain streams has decreased steadily, especially in those streams which are readily accessible. The retention of dead storage at the various reservoirs within the basin probably would result in larger fish population.

75. It is doubtful whether recreational development in the reaches below the mouth of the canyon will ever prove feasible due to the excessive cost of development, lack of a sustained summer flow of sufficient quantity and pollution resulting from sewage plants.

76. In the event an additional reservoir is created nearer Boise, it should prove popular. With the maintenance of dead storage space, a permanent pool would be assured, which would offer numerous recreation possibilities, particularly if adequate access to the area is provided.

SECTION II - PLAN OF DEVELOPMENT

PLANS INVESTIGATED

77. General. - As channel improvement and levees alone were considered in the report under review and found to have an unfavorable benefit-to-cost ratio, and as preliminary studies still indicate the ratio to be unfavorable, this method of improvement by itself is not considered as the best plan to correct flood problems of the valley. Inasmuch as multiple-purpose storage appeared to offer the fullest use of the resources and the most economical development, all plans studied herein considered additional storage sites with incidental channel improvement and levee protection.

78. Storage sites investigated. - Based on reconnaissance investigations, the following storage sites or combination of storage sites with alterations to existing structures are considered in this report: Mores Creek reservoir site with an increase in the capacity of Arrowrock Reservoir by raising Arrowrock Dam; Twin Springs and Mores Creek reservoir sites; and Lucky Peak reservoir site on the main river near the mouth of the canyon.

79. Arrowrock Dam does not develop the maximum storage capacity of the site, and it would be possible to increase the capacity of this reservoir to provide adequate control of Boise River. However, the Bureau of Reclamation questions the feasibility of raising Arrowrock Dam to provide the capacity required, due to structural reasons and also due to the necessity of maintaining the present supply of irrigation water during the construction period. As the Bureau of Reclamation does not favor raising Arrowrock Dam, only very preliminary studies were made of this plan.

80. Twin Springs storage site, located about 23 miles upstream from Arrowrock Dam on the main river, was considered. A dam at this general site with the reservoir capacity needed for flood control would be very costly, and investigation of this site, therefore, was limited. The Bureau of Reclamation made an investigation at one location and found unfavorable foundation conditions. However, by moving immediately upstream suitable foundation for a rock-fill dam could be obtained.

81. As Mores Creek in 1943 contributed approximately 13 percent of the run-off in the Boise River watershed, and as its discharge is uncontrolled, a storage site was investigated on this tributary in conjunction with the Twin Springs site. However, preliminary estimates showed these two reservoirs to have an unfavorable benefit-to-cost ratio if developed to give the degree of flood control desired.

82. Lucky Peak dam site. - In view of apparent unfeasibility of the above plans, an adequate storage site below Arrowrock Dam and below the mouth of Mores Creek was desirable. Investigation showed that Lucky Peak dam site located about 12 miles below Arrowrock Dam met requirements. Preliminary studies and cost estimates indicated that Lucky Peak dam site would provide the flood control desired and would show a favorable benefit-to-cost ratio. A reservoir at this site, therefore, was selected as the principal feature of the plan of improvement to be studied in this review. Lucky Peak Reservoir would provide 280,000 acre-feet of usable storage with a maximum pool at elevation 3,060 mean sea level, which, when operated in the interest of flood control in conjunction with Arrowrock Reservoir and Anderson Ranch Reservoir, would provide control of all floods up to 300-year frequency.

Preliminary studies were made to determine whether channel improvement would be feasible in conjunction with the reservoir control. All channel improvements studied with this storage proved to be uneconomical.

RECOMMENDED PLAN

83. Recommended plan. - The recommended plan of improvement consists of the following:

a. Construction of a reservoir of 306,000 acre-feet gross capacity (280,000 acre-feet active capacity) at the Lucky Peak site.

b. Installation and operation of a 13,000-kw. capacity power plant at Arrowrock Dam, together with certain minor alterations in the drainage system at that dam.

c. Installation and operation of a flood forecasting network consisting of present stations to be modified and several additional stations to be operated for the determination of seasonal run-off and its characteristics.

d. Operation as a system, as run-off forecasts dictate, of the storage space in Anderson Ranch Reservoir, Arrowrock Reservoir, and the proposed Lucky Peak Reservoir, in the combined interest of flood control, irrigation, and power.

The location of the reservoirs pertaining to the Recommended Plan are shown on plate III. Details of the Lucky Peak dam and reservoir are shown on plates V, VI, and VII.

84. Lucky Peak Dam and Reservoir. - The dam would be of the rolled earth-fill type with a crest length of 1700 feet at elevation 3,068 feet mean sea level, or 251 feet above low water.

Top width of the dam would be 24 feet, and upstream and downstream slopes would vary from 1 on 2.5 to 1 on 3. The central core of the dam would consist of impervious earth, flanked upstream and downstream by a section of gravel, sand and gravel, decomposed granite or rock, and stabilized both upstream and downstream by a rock blanket. The proposed dam, with normal pool elevation 3,060, would provide a reservoir with live storage capacity of 280,000 acre-feet. Due to physical conditions at the site and to economic considerations, a higher dam with larger reservoir capacity is not justified.

85. Foundations. - The foundation conditions at Lucky Peak Dam were sufficiently explored by seismic methods and drill holes to prove the feasibility of constructing a dam of the height proposed. The left abutment is composed of Miocene basalt, which is dense and hard. The right abutment is composed of granite, rather badly weathered near the surface, but adequate as a foundation for an earth-fill dam. A layer of relatively impervious sedimentary material, lying beneath the proposed dam, separates the basalt and granite. Geologic data are shown on plate VII and, in more detail, in appendix A on plates XXVI and XXVIII.

86. Spillway. - The spillway would be located on the left abutment, and it is proposed to have a curved crest with a 500-foot radius to improve the hydraulic characteristics of the converging spillway chute. The spillway crest would be at elevation 3,033 and would be 224 feet long divided into five 40-foot bays, which are separated by four 6-foot piers. The spillway would be designed to pass 94,500 c.f.s. at maximum pool, and the discharge would be controlled by five 27- by 40-foot automatically operated tainter gates.

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87. Stilling basin. - The stilling basin as proposed would dissipate the energy of 35,000 c.f.s., which is the maximum flood in the 50 years of record. It would have a length of 150 feet and a depth of 37 feet and would have two rows of baffles and an end sill.

88. Outlets. - Outlet discharges would be controlled by seven valves at the downstream end of the tunnel which would terminate in the stilling basin. The tunnel would be steel lined from the valve house to the axis of the dam. The tunnel would be through the left abutment, would be 20 feet in diameter, protected at the upstream end by steel trash racks. Control would be provided by two 96-inch Howell-Bunger valves and five 96-inch ring-follower gates. Emergency control will be furnished by seven 96-inch ring-follower gates immediately upstream from the regulating valves. Two 10-by 16-foot tractor gates would be located approximately at the axis of the dam. Access to these gates would be provided by a shaft from the ground surface.

89. Relocations. - The construction of Lucky Peak Reservoir would require the relocation of 11.4 miles of Idaho State Highway No. 21 and 9.85 miles of county and farm roads. The State Highway would be relocated through a pass in the hills north of the dam site. Grades and curvature would be in accordance with the standards set up by the Idaho State Highway Department. Some minor power and telephone line relocations would be involved. These relocations are shown on plate V.

90. Construction time. - Construction of Lucky Peak Dam is estimated to require two years under favorable working conditions and with an accelerated schedule. Before the first year's high water, it would be necessary to drive the diversion tunnel and to construct the control works to

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such an elevation as to permit the installation of tractor type gates. Construction of the diversion dam and work on the abutments above the river level would be conducted concurrently. Construction of the embankment would begin after the first high water season and would require about 16 months to complete. The dam and all appurtenant works would be completed within the two-year period. Utility relocations would be started during the first year and would be completed before the end of the second year. This program would permit regulation of the river during the third flood season after initiation of construction.

91. Changes in Arrowrock Dam. - The Bureau of Reclamation's report, House Document 916, 76th Congress, 3d Session, recommended changes in the outlet works at Arrowrock Dam in the amount of $400,000 to provide more effective operation in the interest of flood control. With the construction of Lucky Peak Reservoir, certain other features of Arrowrock Dam would require revision. Maximum pool at Lucky Peak Reservoir would raise the tailwater approximately 95 feet at Arrowrock Dam. Outlets to the drainage galleries of the dam would be approximately 85 feet below maximum pool of Lucky Peak Reservoir making it necessary to install pumps, one for the right abutment and one for the left, to provide for drainage of these galleries. Also, revision of the main entrance to the drainage and inspection gallery would be required. The estimated cost of these additions and revisions at Arrowrock Dam is $25,000.

92. Power installation. - Though power penstocks were installed at Arrowrock Dam at the time of its construction, no power plant has been provided, due largely to the fluctuations in flow that would result from power production.

With the construction of a dam at the Lucky Peak site, reregulation of the discharge from a power plant at Arrowrock Dam would be possible, and operation studies indicate that an installation of 13,000-kilowatts would be justified. This plant would be used mainly for the development of power during the irrigation season. These operation studies are based on the release schedule proposed by the Bureau of Reclamation for development of the Mountain Home project.

93. Provisions for recreation. - The facilities proposed under the contemplated plan at Lucky Peak to make recreational facilities in the reservoir available to the people of Boise Valley would include the construction of a road providing access to the reservoir. A park would be constructed on a ridge north of and adjacent to the reservoir. In the summer time a pool varying in size between about 2,500 and 1,000 acres would be available to sports enthusiasts for boating, fishing, swimming, and picnicking. The proximity of the reservoir to Boise would afford many of the residents of that city as well as other communities in the area excellent opportunities for recreation.

94. Run-off and flood forecasting. - At the present time, nine snow courses within the basin are measured intermittently on the first of February and the first of March, and regularly on the first of April. These data are used to formulate a run-off forecast for the period April through September. This forecast is used primarily for scheduling irrigation storages and is largely financed by local water using agencies.

95. Impending floods on the Boise River can be predicted several months in advance of the flood crest from precipitation, temperature, and snow survey data. For scheduling storage reservation for flood control, investigations show that a forecast procedure based upon climatological data rather than snow survey data would give a more accurate forecast over a period of years, and also would have the advantage that a fairly reliable forecast could be made earlier, even as early as the first of January. A relationship between precipitation, temperature, and run-off was derived from studying 26 years of record. The accumulated precipitation at representative stations within the basin for the period October through May was found to give a consistent and reliable indication of annual run-off when mean temperatures for these same months were used as a parameter. Forecasts made prior to June would be based on the known precipitation and temperatures, October to date of forecast, plus the mean precipitation and temperatures for the other months. The magnitude of the flood would be determined from a correlation curve showing the relationship between flood volume and maximum discharge. When the magnitude and volume of the impending flood are known, the storage required to control the flood to 6,500 c.f.s. at Diversion Dam would be ascertained from a curve showing the relationship of flood volume, peak discharge, and storage that would be required to regulate a given flood to a prescribed maximum discharge. In operating the 3-reservoir system, the plan for evacuating the storage would be to draw down the reservoirs in the following order: Lucky Peak, Arrowrock, and Anderson Ranch. The filling of the reservoirs would be accomplished in the reverse order.

Paragraphs 66 to 71, inclusive, in appendix A discuss the details of the forecast procedure. Snow surveys should be continued as part of the hydrologic network until their records are of sufficient length that minor inconsistencies in the present short term record do not influence a forecast. Furthermore, while the proposed forecast method gave satisfactory results for the studies in the report, it is nevertheless subject to improvement. Additional stations also are needed in the hydrologic network.

96. The method used to predict run-off and floods for the reservoir operational studies shown in this report is based upon climatic data for seven stations within the Boise River Basin. All of the stations are in the lower 50 percent of the basin. The present climatological and hydrological network should be improved as part of the Recommended Plan. Some of the existing climatological stations should be moved to higher elevations nearby and several additional stations should be established. All stations in the network should be equipped with adequate communication facilities in order to maintain close contact at all times with the central control office.

97. A forecast of the annual run-off that is within 300,000 acre-feet of the actual run-off is of sufficient accuracy to effect a joint operation of the reservoir system without jeopardizing irrigation or flood control interests. This accuracy in forecasting the run-off could have been obtained in each of the 22 years investigated. The proposed additions to the hydrologic network would permit improvement in the method of forecasting and provide a larger safety factor for scheduling the storages in the respective reservoirs.

98. Results expected. - Operation of a three-reservoir system on Boise River by the addition of Lucky Peak Reservoir is expected to greatly alleviate the flood problem of the valley, assure the required yield of water for irrigation, permit added power to be generated, and afford recreational opportunities to the inhabitants of the valley as well as provide other incidental advantages to those in the immediate and surrounding areas.

99. The Bureau of Reclamation proposed in its report dated June 1940 published as House Document No. 916, 76th Congress, 3d Session, that 212,500 acre-feet of storage space be used at Anderson Ranch Reservoir for flood control; and the Chief of Engineers proposed in his report dated August 20, 1940, published as House Document 957, 76th Congress, 3d Session, that modifications be made to the outlets at Arrowrock Reservoir to enable the use of 130,000 acre-feet of storage space in this reservoir for flood control when snow surveys indicated the necessity therefor. Both of these reports agree that modifications to the outlets at Arrowrock Dam are necessary to permit more effective use of the storage space for flood control which can be obtained incidental to irrigation use. Under present conditions irrigation interests having contracts for storage at Arrowrock Reservoir have objected to any reservation of its storage space for flood control. As far as known, there is no legal way to reimburse the irrigationists in money for the use of Arrowrock Reservoir for flood control and for the damages they might suffer through water shortages and the loss of crops if such a contingency might arise as a result of reservoir operation.

The capacity of Arrowrock Reservoir in the two-reservoir system has been considered only to the full use of the proposed outlet capacity and to the use of such storage space as would be available incidental to irrigation use. The two-reservoir system with 212,500 acre-feet of storage for flood control at Anderson Ranch Reservoir and with the use of Arrowrock Reservoir as indicated above would reduce frequent and recurring floods up to those similar to the flood of 1918 to a bankfull capacity of 6,500 c.f.s. or less. In floods similar to those of 1936 and 1943, discharges would be reduced 33 percent and 30 percent, respectively. Floods similar to those of 1897 and 1881 would be reduced about 16 percent. Floods similar to those of 1894 and 1896 would be reduced about 6 percent. The two-reservoir system would have little or no effect on major floods similar to those of 1875, 1874, 1871, and 1872, and the "maximum-controllable flood".

100. The three-reservoir system, which includes 280,000 acre-feet of storage in Lucky Peak Reservoir for flood control, would permit full use of forecasting methods for system operation. By the use of an adequate factor of safety in forecasting run-off, storage space would be made available for flood control in Anderson Ranch and Arrowrock Reservoirs without endangering irrigation water supply. The system of three reservoirs would reduce the flood peak in all years when the stream would normally be about bankfull, and for floods up to that of 1935, to about 2,500 c.f.s. which is about the flow required for irrigation diversions below Diversion Dam.

It also would reduce the discharge of the 1896 flood and the "maximum-controllable flood" from 35,500 c.f.s. to 10,000 c.f.s., and from 55,000 c.f.s. to 40,000 c.f.s., respectively. In the period 1865 to 1945, the two-reservoir system would have lost control of 21 floods. The regulated discharge for these floods would have varied between 11,000 and 50,000 c.f.s. The three-reservoir system would control all of these 21 floods to 10,000 c.f.s. or less, with 50 percent of them being controlled to 6,500 c.f.s. excepting the floods of 1871 and 1872, where the controlled discharge would have reached a maximum below Diversion Dam of 20,000 and 28,000 c.f.s., respectively. Table 2 clearly indicates the greatly increased effectiveness in controlling floods of the three-reservoir system over the two-reservoir system.

ESTIMATES OF FIRST COST AND ANNUAL CHARGES

101. Estimated cost. - The estimated total cost of Lucky Peak Reservoir is $10,659,000. Revisions required in Arrowrock Dam are estimated to cost $25,000, and power installations at Arrowrock Dam are estimated at $860,000. The total cost of the project, not including interest during construction, is estimated at $11,544,000 based upon 1940 cost index. Due to the nature of the project works, contributions from local interests are not required. The estimated cost of various features of the project are shown in the table on the following page.

Feature	Feature cost
Preliminary work	$ 180,000
Hydrometeorological network	25,000
Diversion and care of river	100,000
Permanent buildings and grounds	35,000
Recreation facilities	50,000
Spillway	1,519,000
Outlet works	2,403,000
Earth dam	4,220,000
Relocations	1,891,000
Lands	236,000
Arrowrock Dam revisions	25,000
Powerhouse and equipment (at Arrowrock Dam)	800,000
Operator's colony and station yard (at Arrowrock Dam)	60,000
Total project cost	$ 11,544,000

102. Annual charges. - Operation and maintenance of the Recommended Plan are assumed to be functions of the Federal Government, as no local contributions are required. Additional meteorological stations are proposed to secure more representative precipitation data upon the upper watershed. The estimated annual operation and maintenance costs for the project are shown in the table on the following page.

Lucky Peak Reservoir

Operation		
Dam tenders	$ 6,000	
Reservoir operation studies and additional meteorological station operation	3,000	$ 9,000
Maintenance		
Reservoir	$ 1,500	
Dam	1,000	
Spillway	4,000	
Outlets	6,000	
Buildings and grounds	1,500	
Emergency	2,000	16,000

Arrowrock Power Plant

Operation		
Operators [1]	$ 6,000	6,000
Maintenance		
Power plant	$ 3,000	
Building and grounds	1,000	4,000
Total		$ 35,000

[1] Additional personnel required over that now employed at Arrowrock Dam.

103. Allowances have been made and consideration given to maintenance in computing annual costs. Features of the project that will require maintenance after construction are reservoir, earth dam, spillway, outlet works, permanent building, and grounds at Lucky Peak; and the power plant, with operators colony and grounds, at Arrowrock.

104. The estimated annual charges for the Recommended Plan are as follows:

	Lucky Peak Reservoir	Power at Arrowrock Dam
Federal investment		
a. Estimated first cost to the United States	$10,684,000[1]	$860,000
b. Interest during construction, 3 percent for one-half construction period	321,000	---
Total Federal cost	$11,005,000	$860,000
Federal annual charges		
a. Interest, 3 percent	$ 330,150	$ 25,800
b. Amortization		
(1) 35-year life	17,150	7,770
(2) 50-year life	88,300	3,460
c. Maintenance and operation	25,000	10,000
Total annual charges	460,600	47,030

[1] Includes cost of revisions at Arrowrock Dam and the installation of flood forecasting network.

BENEFITS

105. Flood control. - The flood control benefits comprise the elimination or reduction of direct flood damages and indirect flood losses that would be afforded each community and rural area, and the increased productive capacity or higher use of marginal, pasture and crop lands that are now subject to frequent flooding. In the determination of flood control benefits consideration has been given to the protection afforded by the levee and revetment improvements reconstructed by the Department in 1944 and 1945, and the control obtained by the authorized two-reservoir system with the levees and the control that would be obtained by a three-reservoir system with the levees. The flood control benefits creditable to the proposed Lucky Peak Reservoir would be the difference in these two benefits. Under this method of calculation the annual flood control benefits creditable to the Recommended Plan when constructed and placed in operation are thus estimated to be $444,810, of which $426,870 would result from reduction of future direct and indirect flood damages and $17,940 would result from increased land use. A summary of flood control benefits is shown in table 4. (The Recommended Plan is termed "Lucky Peak Reservoir" in this table and in table 5.)

106. The reduction of damages that would be creditable to the existing levees and revetments reconstructed in 1944 and 1945 and those further proposed under emergency expenditures have been determined for each individual location, as shown for each zone, in table 19 in appendix A. The estimated reduction of damages and increased land use afforded by these levees and revetments is estimated to be $27,560 annually.

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As previously discussed in paragraph 100, the three-reservoir system greatly increases the control of floods of Boise River and materially reduces the damages that would be experienced with only a two-reservoir system. The total annual reduction of damages creditable to the system of three reservoirs is estimated to be about $612,000, a reduction of 76 percent of the damages under present conditions. Flood routing and reservoir operation studies for the key floods considered are shown in table 2 and appendix A. The determination of the reduction of flood damages in each zone through regulation by the three reservoirs is shown in tables 19 and 20 of appendix A for direct damages and indirect losses, respectively.

107. Although a large part of the pasture, marginal, and brush lands in the flood plain are conveniently situated for agricultural use, examination and studies of soil conditions indicate that only about 31 percent of these lands would be suitable for reclamation and production of crops if flooding were prevented. About 800 acres of present marginal lands could be cleared and reclaimed to produce an increased net return creditable to flood control of about $1,990 annually. Uncultivated pasture lands amounting to about 6,500 acres could be reclaimed and cultivated, if flooding were prevented, to produce an annual increased net return creditable to flood control of about $26,000. Present low value crop lands, amounting to about 1,550 acres, could be brought into increased productive capacity by flood prevention and produce an annual increased net return creditable to flood control of about $5,800.

The total annual benefit from increased land use creditable to flood control is accordingly estimated to be $33,800. Of the total annual benefit for increased land use, $1,140 would be creditable to levees and revetments, $14,720 would be creditable to a system of two reservoirs, and $32,660 could be creditable to the system of three reservoirs. The acreage benefited in each zone, with the estimated annual net increased returns per acre and total benefits for increased land use creditable to flood control, are shown in table 21 in appendix A. The estimated annual flood control benefits for the two and three reservoir systems, with the annual flood control benefits creditable to the Recommended Plan are shown in the following summary:

Summary of annual flood control benefits

Classification	2-Reservoir system with levees	3-Reservoir system with levees	Benefits creditable to the Recommended Plan
Elimination or reduction of damages:			
Direct damages	$ 206,070	$ 605,730	$ 399,660
Indirect losses	5,380	32,590	27,210
Increased productive capacity from higher use of bottom lands	15,860	33,800	17,940
Totals	$ 227,310	$ 672,120	$ 444,810

108. Value of supplemental water for irrigation. - Operation studies by the Bureau of Reclamation for Arrowrock and Anderson Ranch Reservoirs with diversions from the Payette River Basin, based on the water supply available in the recent 20 years, indicate a critical shortage only in one year of that period.

Studies by this office indicate minor shortages in two other years. The total shortage might range from 230,000 to 270,000 acre-feet. The addition of Lucky Peak Reservoir to the system would provide for the capture of the latter part of flood flows and somewhat increase the storage for irrigation in most years and aid in eliminating shortages in critical years. Although such supplemental water in the Boise River valley is desirable, evaluation on an annual basis is difficult to determine. Irrigation authorities state that supplemental water in this valley would have a gross value ranging from $3.00 to $8.00 per acre foot in the years when such supplemental water is needed. The lower estimate of the total shortage amounts to 11,500 acre-feet on an annual basis. Using a nominal net return of $1.00 per acre foot, the annual value for supplemental water that might be creditable to a third reservoir in the system would be $11,500. This amount is the credit used for the Recommended Plan for the supplemental water it would provide for the Boise River valley.

109. Reduction of pumping lift. - The Bureau of Reclamation has investigated the advantages of holding the dead storage level in the proposed Lucky Peak Reservoir to elevation 2,905 m.s.l., which would provide dead storage of 26,000 acre-feet and result in reduction of pumping head to the proposed Mountain Home Project from 285 feet to 205 feet. The savings would be obtained in construction cost, operation and maintenance, and depreciation on the pumping plant and a lower power consumption. These savings would be partly offset by the cost of a tunnel outlet from the dam, a syphon, and bench flume.

The Bureau finds that the net saving to the proposed Mountain Home Project on an annual basis, by the construction of Lucky Peak Reservoir with dead storage elevation as indicated, assuming a 2 mill pumping rate, would be $85,400. This amount, therefore, is credited as a benefit to the Recommended Plan.

110. Power. - Although penstocks were installed at Arrowrock Reservoir during its construction in 1915-1916, they could not be advantageously utilized for power since the fluctuation of the power plant discharge would not fit the irrigation demand. The construction of Lucky Peak Reservoir and its use for reregulation of flows would allow the utilization of head and the installation of a power plant with a capacity of 13,000-kw. at Arrowrock Dam. The total annual power benefits are estimated to be $89,200 as shown in the following tabulation:

Feature	Unit	Quantity	Annual rate	Annual benefits
Installed capacity	kw	13,000		
Power capability	kw	13,000	$ 3.625	$47,100
Salable energy	1,000 kw.-hr.	38,150	1.1035	42,100
Total power benefit				$89,200

111. Recreation. - The recreational facilities proposed at Lucky Peak Reservoir include a road that would provide access to the reservoir, and also a park on a ridge adjacent to the reservoir. The benefits from these improvements are believed to be at least equal to the expenditures required to obtain the recreational facilities. On this basis, therefore, recreation benefits would amount to about $2,000 annually.

112. Summary of benefits. - The total annual benefits creditable to the Recommended Plan are estimated to be $632,910 and are summarized in the following table:

Summary of annual benefits

Classification of benefits	Average annual benefits
Flood control:	
Reduction of direct damages and indirect losses	$ 426,870
Increased land use	17,940
Irrigation:	
Supplemental water	11,500
Reduction of pumping lift, proposed Mountain Home project	85,400
Power	89,200
Recreation	2,000
Total annual benefits	$ 632,910

113. Benefits not evaluated. - Fish and wildlife would be benefited by the system of storage reservoirs through better regulation of stream flow, but no attempt has been made to evaluate the benefits to these interests.

Other benefits creditable to the proposed improvements which have not been evaluated comprise the prevention of the probable loss of life in major floods, allaying the fear of floods, expansion of local business and residential areas, enlargement of the local tax base, and increased social security of all the residents of the Boise River valley.

ECONOMIC JUSTIFICATION, ALLOCATION AND REPAYMENT OF COSTS

114. Comparison of annual costs and benefits. - A summary of the estimates of total costs, annual charges, and annual tangible benefits of the proposed flood control storage, power, and recreation facilities, together with the ratio of benefits to costs, are listed in table 5, "Economics of Improvements". The estimated annual tangible benefits for the Recommended Plan exceed the estimated annual cost by 25 percent. A comparison of the annual costs and annual benefits is shown in the summary on the following page.

Economic justification for the Recommended Plan

Annual costs and benefits

Annual costs:	
Storage for flood control and multiple-purpose uses	$ 460,600
Power facilities	47,030
Recreation facilities	—
Total annual costs	$ 507,630
Annual benefits:	
Flood control	$ 444,810
Irrigation	96,900
Power	89,200
Recreation	2,000
Total evaluated annual benefits	$ 632,910
Total annual benefit-cost ratio	1.25:1

115. Allocation of costs. - The project cost might be allocated to the various features of the project on the basis of one of three methods; by relative use of storage, by the cost of alternative measures to obtain the benefits, or by the relative benefits. Flood control would use from 92 to 99 percent of the storage capacity. On the basis of relative use, practically all of the costs would be allocated to flood control. The cost of obtaining the benefits for the various features by alternative means would increase the allocation to flood control. The flood control benefits are more than 70 percent of the total benefits, and it appears reasonable to allocate the initial cost in proportion to the benefit. The initial cost, therefore, is allocated to each feature in proportion to its percentage of the total benefits.

Since it is necessary to pass irrigation releases from Arrowrock Reservoir through Lucky Peak Reservoir, the additional annual cost of releasing supplemental water would be negligible. The annual cost of maintaining dead storage in Lucky Peak Reservoir also would be negligible. It is believed, therefore, that none of the operation and maintenance charges should be allocated to irrigation. The estimated annual operation and maintenance costs chargeable to power are allocated to that feature with the remainder of these costs allocated to flood control.

116. The summarized estimates for allocation of total initial costs and total annual operation and maintenance charges are shown in table 5, "Economics of Improvements". The total first cost, including interest during construction, and annual costs are allocated to flood control, irrigation, power, and recreation, as shown in the following summary.

Theoretical allocation of initial costs

Feature of project	Percent of benefits	Initial costs	
		Percent	Amount
Flood control	70.3	70.3	$ 8,340,000
Irrigation:			
Supplemental water	1.7	1.7	202,000
Reduction of pumping lift, proposed Mt. Home project.	13.5	13.5	1,601,000
Power	14.1	14.1	1,672,000
Recreation	0.4	0.4	50,000
Totals	100.0	100.0	$ 11,865,000

Theoretical allocation of annual costs

Feature of project	Interest and amortization	Estimated operation and maintenance	Total annual costs
Flood control	$332,200	$25,000	$357,200
Irrigation:			
Supplemental water	8,000	0	8,000
Reduction of pumping lift proposed Mt. Home project	63,800	0	63,800
Power	66,630	10,000	76,630
Recreation	2,000	0	2,000
Totals	$472,630	$35,000	$507,630

117. Repayment of costs. - It is estimated that irrigators in the Boise River valley could afford to pay approximately $1.00 per acre-foot for supplemental water supplied by trans-basin diversion from Payette River. On this basis the total amount of irrigation repayments for supplemental storage in Lucky Peak Reservoir would amount to less than 2 percent of the project costs. Moreover, due to the large number of diversion rights and water users in the valley, the equitable distribution to individual users and the amount of repayment by those individual users would be almost impossible to determine. In general, however, it might be assumed that the beneficiaries of this supplemental water supply would be the same irrigationists who practically have paid for Arrowrock Reservoir. As explained above, no agreement has been executed for the use of Arrowrock Reservoir for flood control purposes, nor has any payment been made for such use. Accordingly, it is proposed to furnish the supplemental water from the project to the irrigationists who use Arrowrock Reservoir water as recompense for the proposed seasonal flood control use of that reservoir.

118. The saving to the proposed Mountain Home project by reduction in pumping lift has been evaluated on the basis of a rate for pumping of 2 mills per kilowatt hour. Inasmuch as it has been proposed by the Bureau of Reclamation that the Mountain Home project water user's repayment be limited to his ability to pay, which is considerably less than the cost of furnishing him water, the saving will be realized not by the water user, but through the sale by the government to other users of the power saved in pumping the lesser lift. It is believed, therefore, that an agreement should be entered into between the Bureau of Reclamation and the War Department which would provide that after the Mountain Home project is in operation, the accounts of that project and the accounts of the Recommended Plan be adjusted for the saving in pumping effected by Lucky Peak Reservoir. The cost to be allocated to power would be reimbursible to the Federal Government when power facilities are installed at Arrowrock Dam and when revenues from power are obtained. At that time, an agreement should be entered into between the Bureau of Reclamation and the War Department to determine the portion of the cost of the Recommended Plan that should be allocated to power generated at Arrowrock Dam, made possible by Lucky Peak Reservoir reregulation. Such operation and maintenance costs as may occur also would be borne by flood control until power revenues are available to defray power's share of these costs. The costs of flood control and recreation features are not reimbursible.

SECTION III - DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

DISCUSSION

119. The Boise Valley experiences damaging floods practically every year. The area has been harassed by floods since the earliest settlement of the valley. History relates that the Hudson Bay Company post at Old Fort Boise near the mouth of Boise River was destroyed by floods in 1853, and the factor, Francis Payette, became disgusted and moved to Fort Hall. Flood discharges for the period 1865 to 1894 have been reliably estimated. For the period 1895 to date observed records of flood discharges are available. The 12 most notable floods since 1865 in order of their magnitude are those of 1872 - 50,000 c.f.s.; 1871; 1874; 1875; 1896 - 35,500 c.f.s.; 1894; 1881; 1943 - 25,000 c.f.s.; 1865; 1890; 1928; 1927 - 20,000 c.f.s. Recurrence of any of these floods would cause serious losses in the valley due to present economic developments. Agricultural losses continue to be the largest single item of flood damage. The damages experienced in the agricultural areas consist principally in the erosion of banks and top soil; deposits of drifts, debris, and weed seeds; loss of fences, crops, and livestock; impairment of farm improvements and irrigation works; disfiguration of irrigated lands necessitating releveling; and loss of land use. In addition, losses to crops outside the flood plain from major floods would be severe due to the disruption of the delivery of irrigation water by the canal systems. This damage would be caused by destruction of the head works, and impairment of the main canals and laterals by deposition of silt and other debris.

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The floods in Boise Valley occur at a time when crops are in their maturing and growing stage. These crops are dependent on irrigation for complete maturity. Interference in any manner with the delivery of water will result in serious crop losses. In addition to the damage in agricultural areas, major floods would seriously affect the industrial, municipal, and suburban areas of Boise and other communities in the flood plain. The total direct and indirect damages as a result of floods in the valley range from about $80,000 for a discharge of 7,500 c.f.s., similar to the flood of 1935, to about $9,940,000 for a flood of 55,000 c.f.s., the magnitude of the "maximum-controllable flood", which is only slightly greater than the flood of 1872. The total damage which may be expected in Boise Valley in a future 50-year period based on 1944 economic development is estimated to be $40,256,000 or an average of $805,110 annually, of which $41,460 is the estimated indirect damage.

120. The recommended plan of improvement provides for the construction of a reservoir having a gross capacity of 306,000 acre-feet at the Lucky Peak site; installation and operation of a 13,000-kilowatt capacity power plant and minor alterations in the drainage system at Arrowrock Dam; installation and operation of an adequate flood forecasting network; and the operation as a system, in accordance with run-off forecasts, of the storage space in Anderson Ranch, Arrowrock, and the proposed Lucky Peak Reservoirs in the combined interests of flood control, irrigation, and power.

121. Studies and surveys indicated that foundation conditions at Lucky Peak site are suitable for an earth-fill dam of the height proposed. Designs propose an earth-fill dam with a height of about 250 feet above the stream bed and a spillway over the left abutment. This spillway would have a capacity of about 95,000 second-feet at normal pool and would be controlled by automatically operated tainter gates. An outlet works controlled by valves discharging into the spillway stilling basin would provide outlet capacity for flood control purposes and irrigation needs. State Highway No. 21 would be relocated over a saddle in the hills north of the proposed dam. Very little development is existent in the reservoir area, and the principal flowage costs are the result of the highway relocation. The proposed reservoir would raise the low water at the downstream face of Arrowrock Dam, about 95 feet. Minor revisions to the drainage facilities in the galleries at Arrowrock Dam would be necessary. Power penstocks were provided at Arrowrock Dam when that structure was built, but no power plant has been constructed due largely to the lack of a re-regulating reservoir. Lucky Peak Reservoir, when constructed, would provide the re-regulation required to permit the installation and operation at Arrowrock Dam of a power plant having a capacity of 13,000 kilowatts.

122. The inadequacy of the two-reservoir system for flood control cannot be overemphasized. This system includes 212,500 acre-feet of storage at Anderson Ranch Reservoir; contemplated enlargement to the outlet capacity at Arrowrock Dam with such incidental flood control as is obtained during the filling period; and the existing levee system.

In the period of 1865 to 1945 the two-reservoir system with the levees and channel improvements, as now reconstructed, would have lost control of 21 floods and damages averaging several hundred thousand dollars annually would have been experienced.

123. The two-reservoir system cannot be augmented economically by overall channel and levee improvement to correct the flood problems in the valley. Prior reports, and studies for this report, found an unfavorable benefit-to-cost ratio for this method of improvement. Work of this type in Boise Valley results in a high first cost and a large annual maintenance cost. Due to these considerations, such a plan of improvement for flood control was found to be impracticable. In addition, this method would not permit the maximum use of the waters of Boise River.

124. Studies of the various methods of controlling floods in Boise Valley indicate that protection can be accomplished economically only by the use of storage. By increasing the total storage on the stream to approximately 1,000,000 acre-feet it would have been possible to have controlled all floods since 1865 to 10,000 c.f.s. or less, excepting the floods of 1871 and 1872, whereas, with the present plan of flood control, 21 floods would not have been adequately controlled. The extent of the control achieved by the additional storage proposed is shown in table 2 of this report. The addition of another reservoir will enable the use for flood control of storage space at Anderson Ranch and Arrowrock Reservoirs, now reserved for irrigation water. Further, the use of the above reserved storage can be effected without jeopardizing the supply of irrigation water so vital to the economy of the valley.

The proposed additional storage capacity would provide the safety factor necessary to allow operation of the reservoir system, consisting of Anderson Ranch, Arrowrock, and Lucky Peak Reservoirs, as an efficient multiple-purpose project in conjunction with the proposed flood forecasting network. Operation studies show that this combined reservoir system could control all floods of record to practically nondamaging stages and would reduce damages of larger floods up to one of a 300-year frequency as well as provide a more dependable water supply for irrigation. The needed storage for flood control could be obtained by using 425,000 acre-feet at Anderson Ranch, 275,000 acre-feet at Arrowrock with enlargement of the outlet capacity as authorized, and 280,000 acre-feet at the Lucky Peak site.

125. Although the storage in Lucky Peak Reservoir would be primarily for flood control, other uses would be made of it. Enough supplemental water would be made available to eliminate irrigation shortages. By maintaining a permanent pool at Lucky Peak Reservoir, the pumping lift to the proposed Mountain Home project would be reduced 80 feet, thereby enabling the power which would be required to overcome this lift to be made available for other uses in the general area. Construction of Lucky Peak Reservoir would permit the installation of a 13,000-kw. power plant at Arrowrock to supply power mainly during the irrigation season.

Other benefits which would be realized by the construction of a dam and reservoir at the Lucky Peak site include added recreational facilities and its advantages to the people of the valley, betterments for fish and wildlife by the increased regulation of streamflow, prevention of probable loss of life during floods, allaying the fear of floods, expansion of local business and residential areas, enlargement of the local tax base, and increased social security.

126. The Recommended Plan is economically sound in that the average annual benefits exceed the average annual costs. The total first cost excluding interest during construction, of the Recommended Plan is estimated to be $11,544,000. The annual benefits would be $444,810 to flood control, $96,900 to irrigation, $89,200 to power, and $2,000 to recreation. The total annual costs including interest, amortization, operation and maintenance, is estimated to be $507,630, resulting in a benefit-cost ratio of 1.25 to 1.

127. Benefits to irrigation are so diversified that the amount of repayment by the individual water user would be practically impossible to determine. Moreover, no agreement has been executed for the use of Arrowrock Reservoir for flood control purposes, nor has any payment been made for such use. It is proposed, therefore, to furnish supplemental water to the irrigationists from Lucky Peak Reservoir as payment for the flood control use of Arrowrock Reservoir.

At the time power facilities are installed at Arrowrock Dam, an agreement should be entered into between the Bureau of Reclamation and the War Department to arrive at the portion of the cost of the Recommended Plan that should be borne by power from the revenues to be derived through its sale. Furthermore, another agreement should be entered into between these same two agencies to cover the adjustment in the accounts of the Mountain Home project when constructed and those of the project contemplated in the Recommended Plan to cover the capitalized value resulting from the savings in pumping costs for Mountain Home project which would be effected by the construction of Lucky Peak Reservoir.

128. By the addition of a third reservoir to the Boise River system, the desires of the local interests will be met in that it will create additional multipurpose storage to further control the river so as to provide adequate flood protection for all but the most infrequent floods, and to permit development of power for pumping irrigation water as well as to provide additional recreation facilities. According to information available from public hearings and other contacts with local interests, the project as proposed will meet their desires.

CONCLUSIONS

129. Floods in the Boise River valley cause damages and losses practically every year. The two reservoir system cannot be used to provide adequate control of the floods. Additional improvement, primarily in the interest of flood control, is advisable.

The most suitable plan for providing additional flood protection compatible with the desires of local interests is to supplement existing improvements by adding a storage reservoir at the Lucky Peak site, about nine miles about Boise, Idaho. The recommended plan, in conjunction with revisions to the outlet works at Arrowrock Dam would provide additional flood protection as well as benefits in the way of supplemental irrigation water, power, and recreation at a cost commensurate with the benefits. The total annual benefits which would result from the construction of Lucky Peak Dam and the power plant at Arrowrock are estimated to be about $632,910, and the annual costs $507,630, resulting in a benefit-cost ratio of 1.25 to 1. An efficient flood forecasting system is a very necessary part of such a project, and the plan of operation used in this report is based on such a system.

RECOMMENDATIONS

130. The district engineer recommends that a dam and reservoir, with a gross capacity of 306,000 acre-feet to be used primarily for flood control, with an estimated first cost of $10,634,000 and annual maintenance and operation at $22,000, be authorized for construction and operation by the War Department at the Lucky Peak site on Boise River; that a generating plant of 13,000-kilowatt capacity, and certain drainage features, at an estimated first cost of $885,000, and annual maintenance and operation at $10,000, be authorized for construction and operation by the Bureau of Reclamation at Arrowrock Dam, the power facilities to wait until justified by the demand for power; that the War Department be authorized to install

and operate a flood forecasting network of climatological and hydrological stations at an estimated first cost of $25,000, and an annual cost of $3,000. He further recommends that initiation of construction on this project be conditioned upon obtaining satisfactory assurances from interested water users concerned that, in consideration of the irrigation benefits to be derived from the additional storage space provided by Lucky Peak Reservoir, use of Anderson Ranch and Arrowrock Reservoirs for flood control as proposed in this report will be agreed to.

G. J. Zimmerman,
Colonel, Corps of Engineers,
District Engineer.

Subject: Review of Report on Boise River, Idaho (Basic: 2 Jan. 1946)

800.922(Boise River, Id.)
Port Dist. PADGB 1st Ind.

Office, Division Engineer, Pac. Divn., San Francisco, Calif., 4 Feb. 1946.

To: The Chief of Engineers, U. S. Army, WASHINGTON, D. C.

1. Basic control of floods in the Boise River valley is accomplished by locally owned levees and through incidental benefits obtained during the storing of irrigation water in Arrowrock Reservoir. Federal flood control improvements have been authorized to supplement that control. These improvements consist of Anderson Ranch Reservoir, now under construction, where 212,500 acre-feet, or 42.5% of the gross storage capacity, has been allotted to flood control; and changes to increase the discharge capacity of the outlet works at Arrowrock Dam which will provide increased control of floods incidental to storing water there for irrigation purposes. Collectively, the existing and authorized improvements for the control of floods are inadequate, because they furnish protection against only the smaller and more frequent floods. With those improvements only and with economic developments as existing in 1944, annual damages are estimated to average approximately $600,000.

2. Additional protection against floods is economically feasible only by scientific and system operation of Arrowrock Reservoir, Anderson Ranch Reservoir, and the proposed Lucky Peak Reservoir in the combined interests of flood control, irrigation and power. Such operation would be accomplished through the efficient forecasting of runoff from data obtained from an adequate network of meteorological and hydrological stations. Interest in the operation of those reservoirs as a system is threefold, since local water users, the Bureau of Reclamation, and the Corps of Engineers are vitally concerned in them.

3. The District Engineer's recommended plan of improvement would provide a large measure of additional protection from floods, and more dependable water supply for irrigation and power.

4. The average annual flood control benefits creditable to the recommended plan have been conservatively estimated at $444,810, and the irrigation, power, and recreation benefits at $96,900, $89,200 and

PADGB-295-46

and $2,000, respectively. The annual tangible benefits total $632,910, which exceeds the estimated annual cost of the plan by about 25 per cent. Without the installation and operation of power facilities at Arrowrock Dam, which is to await the demand for power, and without the saving in the cost of pumping water from Lucky Peak Reservoir for use in the proposed Mountain Home irrigation project, which conceivably might not be realized, the average annual tangible benefits would be $458,310, or about equal to the estimated annual cost, $460,600. The ratio of benefits to costs is practically 1 to 1 without consideration of the benefits to be derived from future power, to any intangible benefits, or to any savings in future pumping costs for irrigation. The recommended plan, therefore, is fully justified.

5. I concur in the conclusions and recommendations of the District Engineer.

S. E. NORTNER
Colonel, Corps of Engineers
Acting Division Engineer.

PADGB-295-46

WAR DEPARTMENT
THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS
WASHINGTON

April 30, 1946.

824.02(Boise River, Idaho)

Subject: Boise River, Idaho.

To: The Chief of Engineers, U. S. Army.

1. This report is in response to the following resolutions adopted October 12, 1943, and November 10, 1943, respectively:

> "Resolved by the Committee on Commerce of the United States Senate, That the Board of Engineers for Rivers and Harbors, created under Section 3 of the River and Harbor Act, approved June 13, 1902, be, and is hereby, requested to review the report on the Boise River, Idaho, contained in House Document Numbered 957, Seventy-six Congress, with a view to determining whether or not additional improvements in the interest of flood control are advisable at the present time."

> "RESOLVED, BY THE COMMITTEE ON FLOOD CONTROL, HOUSE OF REPRESENTATIVES, That the Board of Engineers for Rivers and Harbors created under Section 3 of the River and Harbor Act approved June 13, 1902, be, and is hereby requested to review the report on the Boise River and tributaries in Idaho, published as House Document No. 957, Seventy-six Congress, Third Session, with a view to determining whether improvements for flood control on the Boise River and tributaries are advisable at this time."

2. Boise River, which drains 4,134 square miles in southwestern Idaho, is formed by the junction of its Middle and North Forks, flows west for 95 miles and empties into Snake River near Parma, Idaho. Other large tributaries are its South Fork and Mores Creek which join the river about 80 and 70 miles above the mouth, respectively. The upper river and these tributaries flow in deep canyons through mountains and their foothills. About 60 miles above its mouth, Boise River leaves the canyon section and meanders to Snake River through the fertile alluvial plain of Boise Valley. This valley contains approximately 120 square miles divided into two parts by a short narrow section in the vicinity of Caldwell about 25 miles above the river mouth. Bordering the valley and 50 to 100 feet above its floor are benchlands which extend laterally for many miles. The average annual precipitation ranges from less than 8 inches at the river mouth to over 50 inches in the mountains drained by the headwaters where at least 75 percent is snowfall. The population of the watershed,

about 100,000, is concentrated in the western part of the basin. Boise, Idaho, the state capital and the largest city in the watershed, has a population of 26,130 and is located on the river a short distance below the head of Boise Valley. Principal natural resources of the area are timber, grazing and irrigable farm lands and mineral deposits.

3. At present about 342,000 acres of the basin are irrigated. Included is a considerable area northwest of Caldwell supplied with water by canal from Payette River which drains the adjoining watershed to the north. In addition the irrigated lands are served by 1,926 miles of other main and lateral canals. Water for irrigation is conserved by six completed reservoirs in the basin. However, four of these have a combined storage of only 42,500 acre-feet. Deer Flat Reservoir, located off the river south of Caldwell, has 177,000 acre-feet of storage and is supplied with water principally through Main South Side Canal by diversion from Boise River at the Diversion Dam 62 miles above the river mouth. Arrowrock Reservoir constructed by the Bureau of Reclamation on Boise River about 22 miles above Boise has a capacity of 286,500 acre-feet. The Boise Project Board of Control owns the Main South Side Canal and several others and contracts for the waters stored in Arrowrock Reservoir. Although all the storage is used for irrigation, some incidental flood control is obtained during the filling period. Penstocks for possible use in the development of hydroelectric power were included in Arrowrock Dam when it was constructed, but a power plant has not been provided for the reported reasons that the power plant discharge would not fit the irrigation demand for water and a reservoir below to suitably reregulate the power flows is not available. With these improvements the irrigated lands have experienced a shortage of water during about 60 percent of the seasons. Hydroelectric power is developed by the Idaho Power Company at Barber Dam about 4 miles above Boise.

4. To supply additional water for irrigation, provide storage for flood control and develop hydroelectric power, the Bureau of Reclamation has under construction Anderson Ranch Reservoir on the South Fork of Boise River about 63 miles above Boise. This reservoir will have a capacity of 500,000 acre-feet and provision will be made for the generation of 30,000 kilowatts of hydroelectric power. The storage has been allocated 212,500 acre-feet for flood control, an equal amount for irrigation, 45,000 acre-feet for power and 30,000 acre-feet for silt. In operation of the flood control storage on the basis of flood forecasts from snow surveys largely financed by local interests, increased storage for irrigation will be realized. The project contemplates coordinated operation of the Arrowrock and Anderson Ranch Reservoirs. The district engineer finds that use of the storage to maximum advantage, including flood control, would require drawdown of the reservoirs early in the year and refilling on the basis of runoff forecasts. Irrigationists oppose this method of operation as they fear that it might jeopardize the storage of water for

irrigation. Hence, no definite agreement has been made for the use of Arrowrock storage for flood control. The project provides for increasing the outlet capacity of Arrowrock Dam in the interest of more efficient joint operation.

5. The basin contains good unirrigated land in the Willow Creek area northeast of Caldwell. Also south of Boise, partially within the Boise River basin and partially outside the basin draining directly to Snake River, is a large tract of irrigable land which the Bureau of Reclamation refers to as the Mountain Home Area. The Bureau has developed a plan for the Mountain Home project to irrigate these lands which provides among other works the construction of a reservoir in the Payette River basin; an aqueduct to convey water from this reservoir to the Boise River Diversion Dam; pumping plants and a canal system to deliver water from the Diversion Dam to the Mountain Home Area; and a diversion dam on the South Fork of Boise River about 5 miles below Anderson Ranch Reservoir with a tunnel leading therefrom to the Mountain Home Area. Under this tentative plan, the Bureau contemplates that water imported from the Payette Basin will be exchanged for the Boise River water from Anderson Ranch Reservoir which will be used in the Mountain Home Area. The district engineer indicates that some of the imported water is expected to be used for gravity irrigation of land in the Willow Creek area and that some will have to be pumped through a lift of 285 feet to serve the Mountain Home Area. His studies indicate that under this plan, occasional shortage of irrigation water will occur amounting to an average of 11,500 acre-feet annually.

6. Commencing at an early date local interests have constructed various levees and bank protective works in the basin. While the levees have materially decreased the area subject to inundation by minor floods they do not afford protection from larger floods. During the period 1937-1939, the Work Projects Administration spent about $231,600 plus a local contribution of $20,700 in constructing embankments along Boise River to prevent overflow through side channels and inundation of certain low areas. Subsequent to the flood of 1943 about $450,000 of Federal emergency funds have been spent in the repair of the existing minor flood control works.

7. Boise River is subject to frequent destructive floods which occur in spring and early summer as a result of rapid melting of snow in the headwater area and are characterized by a duration of two or three months above bankfull stage. Since 1865, inclusive, 27 major floods and many smaller floods have been experienced in Boise Valley. Natural peak discharges of the major floods at the Diversion Dam, as estimated, or obtained from records since 1895, range from 16,550 cubic feet per second to 50,000 cubic feet per second for the flood of May 1872. The largest recent flood was that of April 1943 which had an actual peak discharge at

the Diversion Dam, as reduced by the effects of Arrowrock Reservoir and irrigation canal diversions, of 20,000 cubic feet per second and an estimated natural peak discharge of 25,040 cubic feet per second. The safe channel capacity is 6,500 cubic feet per second. Lower flows result in some damage from stream bed movement and siltation of irrigation canals. With Arrowrock and Anderson Ranch Reservoirs in operation and including irrigation diversions, studies of the district engineer indicate that the safe channel capacity discharge or greater can be expected with an average frequency of once in two years and a flow of 50,000 cubic feet per second once in 100 years. The flood of 1943 inundated about 29,000 acres mostly agricultural land but some waste and including a considerable amount of urban and suburban property. A flood with peak discharge of 55,000 cubic feet per second would inundate about 58,400 acres including 1,780 acres of urban and suburban property. Although urban areas are inundated and there is considerable damage to highways, railroads and other utilities, the principal flood damage is agricultural. This consists of loss of crops, damage to farm lands and property in inundated areas and agricultural losses in irrigated areas outside the flood plain due to flood effects on irrigation works which render them incapable of use for the delivery of water. Taking into account the protection afforded by previously constructed levees, the diversion of water through the irrigation canals and the reduction of flood flows by Arrowrock and Anderson Ranch Reservoirs after construction of the latter is completed, the district engineer estimates the average annual direct and indirect flood damages in the basin at $593,660 assuming economic developments in the area as they existed in 1944.

8. Local interests desire construction of additional reservoirs to regulate flows in the interest of flood control and irrigation; additional channel improvement along the full length of the river in the alluvial plain section to accommodate larger discharges without damage to adjacent property; development of power for pumping irrigation water; and the control of silt by reservoirs and watershed improvements.

9. The district engineer finds that Arrowrock and Anderson Ranch Reservoirs cannot be augmented economically by additional channel and levee improvements to correct the flood damage problem. He presents a plan in the interest of flood control, irrigation and hydroelectric power development which provides for construction of Lucky Peak Reservoir on Boise River with dam site about 10 miles above Boise. The proposed dam is an earth fill structure 251 feet high above low water and would have above it a drainage area of 2,650 square miles which includes 430 square miles below Arrowrock Reservoir. Lucky Peak Reservoir would have 26,000 acre-feet of dead storage and 280,000 acre-feet of active storage and the improvement would include an access road to the reservoir and construction of an adjacent park for recreation. The plan also provides for construction of a hydroelectric power plant with 13,000 kilowatt capacity at

Arrowrock Dam and minor alterations in the drainage system at that dam; installation and operation of a network of climatological stations for forecasting seasonal runoff; and for operation as a system, in accordance with runoff forecasts, of the storage space in Anderson Ranch, Arrowrock and Lucky Peak Reservoirs in the combined interest of flood control, irrigation and power.

10. The district engineer finds that with this added reservoir and use of an adequate factor of safety in forecasting runoff, additional storage space in Anderson Ranch and Arrowrock Reservoirs can be used for flood control when needed without endangering the irrigation water supply and that additional water for irrigation would be made available thereby. He proposes to furnish this supplemental water to the irrigationists who use Arrowrock Reservoir water as a recompense for the proposed flood control use of that reservoir. Maintenance of the proposed dead storage in Lucky Peak Reservoir would reduce the pumping head for supplying certain irrigation water to the Mountain Home Area by about 80 feet. This reservoir by serving as a flow reregulator would remove the past objection to development of hydroelectric power at Arrowrock Dam. The district engineer estimates the average salable energy output of the proposed Arrowrock power plant at 38,150,000 kilowatt-hours annually. With the three reservoirs operated according to his plan and repetition of the flood cycle for the period 1865 to 1943, inclusive, he finds that in only 8 of the 79 years would the modified flood discharge at the Diversion Dam have exceeded 6,500 cubic feet per second, that the peak discharge of the maximum known flood, 50,000 cubic feet per second, would have been reduced to 28,000 cubic feet per second and that a design flood with peak flow of 55,000 cubic feet per second could be reduced to a peak of 40,000 cubic feet per second.

11. The first cost of the plan is estimated by the district engineer at $10,634,000 for Lucky Peak Reservoir including $50,000 for recreational facilities; $885,000 for the drainage changes, power plant and auxiliaries at Arrowrock Dam; and $25,000 for the hydrometeorological network; a total of $11,544,000. He estimates the annual cost of operation and maintenance for Lucky Peak Reservoir at $22,000, for the meteorological network at $3,000 and for the power plant at $10,000. The estimated annual cost for the complete plan is $507,630 of which $47,030 is for the power features and $460,600 for the remainder. Average annual tangible benefits as evaluated by the district engineer are as follows:

Reduction of flood losses	$426,870
Increased land use	17,940
Supplemental water for irrigation	11,500
Reduction of pumping lift for contemplated Mountain Home project	85,400
Recreation	2,000
Power value	89,200
Total	$632,910

This indicates a ratio of annual costs to benefits of 1.0 to 1.25 neglecting intangible benefits such as fish and wildlife values and prevention of probable loss of life in major floods.

12. The district engineer recommends that Lucky Peak Reservoir with gross capacity of 306,000 acre-feet to be used primarily for flood control be authorized for construction and operation by the War Department; that the described power plant at Arrowrock Dam be authorized for construction and operation by the Bureau of Reclamation, this facility to wait until justified by the demand for power; that the War Department be authorized to install and operate the flood forecasting network of climatological and hydrological stations; and that initiation of the proposed construction be conditioned upon obtaining satisfactory assurances from interested water users that, in consideration of the irrigation benefits to be derived from the additional storage in Lucky Peak Reservoir, they will agree to use of Anderson Ranch and Arrowrock Reservoirs for flood control as proposed in the present report of the district engineer.

13. The division engineer notes that without the power facilities, which as proposed by the district engineer would not be constructed until justified by the demand for power, and without the benefits for saving in pumping cost which are concerned with the contemplated but uncertain Mountain Home irrigation plan, the estimated annual costs would be $460,600 and the estimated annual benefits $458,310, an economic ratio of about 1 to 1. In his opinion the proposed plan is economically justified and he concurs in the recommendation of the district engineer.

14. Local interests were advised of the nature of the report of the division engineer and afforded an opportunity to present additional information to the Board. No communications have been received.

Views and Recommendations of the Board of Engineers for Rivers and Harbors.

15. The Board concurs in the findings of the reporting officers that further improvement of Boise River, Idaho, by construction of Lucky Peak Reservoir is economically advisable.

16. The plan of the district engineer contemplates joint use of the storage in Lucky Peak, Arrowrock and Anderson Ranch Reservoirs and his recommendation makes initiation of construction of Lucky Peak Reservoir contingent upon securing certain prior agreements from local interests. In the opinion of the Board, the plan should be flexible in regard to combined operation of the reservoirs in order that the use of storage may at all times conform to changing conditions and best serve the varying needs of the locality. It also believes that construction should not be delayed for the time required to secure the contemplated agreements. Accordingly,

the Board proposes that accomplishment of the plan be initiated by construction of Lucky Peak Reservoir, for operation as a flood control facility, by the War Department under the direction of the Secretary of War and supervision of the Chief of Engineers, with the understanding that complete or partial joint use of the storage in the three reservoirs may be undertaken at such time as may be mutually agreed upon by the Secretary of War, the Secretary of the Interior and local interests concerned with flood control and the use of irrigation water. By initial use of the storage in Lucky Peak Reservoir, and the 212,500 acre-feet of flood control storage in Anderson Ranch Reservoir, for flood control, all floods of the magnitude of those which have occurred in the 46-year period, 1898 to 1943, inclusive, except that of 1945, could be reduced to the bankfull discharge of 6,500 cubic feet per second or less passing Diversion Dam and a flood such as that of 1943 could be reduced from a natural peak discharge of 25,040 cubic feet per second to a controlled peak of about 9,000 cubic feet per second. Thus during the interim between completion of Lucky Peak Reservoir and accomplishment of arrangements for combined use of all three reservoirs a substantial degree of flood control would be obtained. The interim period, would be terminated upon the consummation by the Bureau of Reclamation of its plans for irrigation of the Mountain Home Area and the conclusion of satisfactory agreements for combined operation of the three reservoirs to secure the much greater multiple-purpose benefits.

17. Lucky Peak Reservoir as a purely flood control facility including the flood forecasting network of climatological and hydrological stations is estimated to cost $10,684,000 for construction and $25,000 annually for maintenance and operation. The Board is of the opinion that the reservoir should be authorized for construction at this time and for operation initially for flood control with the understanding that changes in the method of operation will be made in the future when the Secretary of War, upon the advice of the Chief of Engineers, finds that such changes are in the best interest of flood control, irrigation and power development, and that they are agreeable to the Secretary of the Interior and to local interests concerned with flood control and the use of irrigation water. The annual cost for the project is estimated as $460,600. Benefits during the interim period when the reservoir would be operated primarily for flood control, are estimated as $392,930 annually, of which $379,430 is for flood control, $11,500 for supplemental irrigation, and $2,000 for recreation. When operated in combination with the other reservoirs for multiple purposes the benefits would be increased to $543,700, of which $444,800 would be for flood control, $96,900 for irrigation, and $2,000 for recreation. With intangible benefits taken into account, the ratio of cost to benefits would be approximately 1 to 0.9 during the early stages of operation and 1 to 1.2 during the later period.

18. Accordingly, the Board recommends that Boise River, Idaho, be further improved by construction, operation and maintenance, by the War

824.02(Boise River, Idaho)
Subject: Boise River, Idaho.

Department under the direction of the Secretary of War and supervision of the Chief of Engineers, of Lucky Peak Reservoir with gross capacity of 306,000 acre-feet primarily for flood control, in accordance with the plans of the district engineer and the comments herein and with such changes as in the discretion of the Secretary of War and the Chief of Engineers may be advisable, at an estimated cost of $10,684,000 for construction and $25,000 annually for operation and maintenance.

For the Board:

R. C. Crawford,
Brigadier General,
Senior Member.

Incls:
Review of survey report, 1/2/46,
Record of hearing,
8 tracings and
Letter of transmittal, 1/29/46.

WAR DEPARTMENT
OFFICE OF THE CHIEF OF ENGINEERS
WASHINGTON

May 13, 1946

CE SPEWF

The Chairman
Committee on Flood Control
House of Representatives, U. S.
Washington, D. C.

My dear Mr. Chairman:

1. The Committee on Flood Control of the House of Representatives, by resolution adopted November 10, 1943, requested the Board of Engineers for Rivers and Harbors to review the report on the Boise River and tributaries in Idaho, published as House Document No. 957, Seventy-sixth Congress, Third Session, with a view to determining whether improvements for flood control on the Boise River and tributaries are advisable at this time. Under date of October 12, 1943, the Committee on Commerce of the United States Senate requested the Board of Engineers for Rivers and Harbors to review the report on the Boise River, Idaho, contained in House Document Numbered 957, Seventy-sixth Congress, with a view to determining whether or not additional improvements in the interest of flood control are advisable at the present time. I inclose the report of the Board in response thereto.

2. After full consideration of the reports secured from the district and division engineers, the Board recommends that Boise River, Idaho, be further improved by construction, operation and maintenance, by the War Department under the direction of the Secretary of War and supervision of the Chief of Engineers, of Lucky Peak Reservoir with gross capacity of 306,000 acre-feet primarily for flood control, in accordance with the plans of the district engineer and the comments herein and with such changes as in the discretion of the Secretary of War and the Chief of Engineers may be advisable, at an estimated cost of $10,684,000 for construction and $25,000 annually for operation and maintenance.

3. After due consideration of these reports, I concur in the views and recommendations of the Board.

Very truly yours,

R. A. Wheeler
Lieutenant General
Chief of Engineers

WAR DEPARTMENT
OFFICE OF THE CHIEF OF ENGINEERS
WASHINGTON

May 13, 1946

CE SPEWF

The Chairman
Committee on Commerce
United States Senate
Washington, D. C.

My dear Mr. Chairman:

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3. After due consideration of these reports, I concur in the views and recommendations of the Board.

Very truly yours,

R. A. Wheeler
Lieutenant General
Chief of Engineers

The Columbia River

Supplemental Reports on the Bitterroot Valley, Cambridge Bench, Canby, Council, Crooked River, The Dalles (West Unit), Hells Canyon, Mountain Home (Payette Unit), Upper Star Valley, and Vale (Bully Creek Extension) Projects

Volume 2

UNITED STATES DEPARTMENT OF THE INTERIOR

Oscar L. Chapman, Secretary

BUREAU OF RECLAMATION

Michael W. Straus, Commissioner

MARCH 1950

HOUSE DOCUMENT 473

81ST CONGRESS, 2D SESSION

Aff. of David A. Jarvis, Ex.C, Pg. 122

THIS *is Volume 2 of The Columbia River (H. Doc. 473), containing supplemental reports of the projects presented in coordinated form in Volume 1. Volume 1 contains the Departmental Report of February 8, 1947, final letters of transmittal, and comments of the affected States and of Federal agencies.*

Preface

By a letter dated February 3, 1950, the Secretary of the Interior presented to the President of the Senate and the Speaker of the House, pursuant to the Federal reclamation laws his report and findings on proposed water use and control projects for further development of the Pacific Northwest. The Secretary's report comprises the report of the Commissioner of Reclamation dated May 2, 1949, and related materials, together with the appropriate comments thereon as required by law, and the agreement between the Departments of the Interior and the Army dated April 11, 1949, all as modified in the light of the letter of February 1, 1950, from the Director of the Bureau of the Budget to the Secretary of the Interior. These documents are published as Volumes 1 and 2 of House Document 473, Eighty-first Congress, Second Session.

By another letter, also dated February 3, 1950, the Secretary of the Interior, with the approval of the President, recommended to the Congress the authorization of 13 reclamation projects and the establishment of the Columbia Basin Account.

The Secretary's final report and its directly associated documents are published as Volume 1.

In the hearings conducted by the Senate Committee on Interior and Insular Affairs with respect to the Secretary's recommendations, the supplemental reports on the following projects were used extensively: Cambridge Bench project (Idaho), Council project (Idaho), Hells Canyon project (Idaho-Oregon), Payette unit, Mountain Home project (Idaho), Bitterroot Valley project (Montana), Bully Creek extension, Vale project (Oregon), Canby project (Oregon), Crooked River project (Oregon), West unit, The Dalles project (Oregon), and Upper Star Valley project (Wyoming). These reports comprise Volume 2 of House Document 473. These reports, as modified by appendix B of Director Pace's letter of February 1, 1950 (contained in Vol. 1), describe in greater detail than in the substantiating materials of the regional director's report of June 28, 1946, the physical plans and the objectives intended to be achieved by the projects and the works proposed.

Supplemental project reports were not submitted for the previously authorized Mann Creek project in Idaho or the Missoula Valley, North Side unit project in Montana, as these are described in the regional director's report of June 28, 1946, Volume 1. Similarly, no separate report was submitted for the Modifications of the Outlet Works at Grand Coulee Dam to permit its more efficient use for flood control.

The substantiating materials and the supplementary project reports were prepared with the thought that authorizing legislation might give their recommendations the effect of law by the incorporation by reference of the recommendations in those reports. Except to the extent that those recommendations may be enacted by such special reference, or by incorporation into authorizing legislation, they will not apply.

Aff. of David A. Jarvis, Ex.C, Pg. 124

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Aff. of David A. Jarvis, Ex.C, Pg. 125

Payette Unit, Mountain Home Project, Idaho

"Development of the . . . project would provide the agricultural opportunities needed to permit normal expansion of the economy of southwestern Idaho. The demand for new farms in the area far exceeds the number that are currently available at prices within reach of most prospective new farmers. . . .

"The Payette unit would provide about 2,550 new full-time farms. The cost to new settlers of acquiring raw farm lands in the unit would be little or nothing inasmuch as more than half of the area is presently owned by the Federal Government. . . .

"The electric power which would be produced by the project is also urgently needed. The demand for electricity in southwestern Idaho is growing at a rate much faster than the increases in generating capacity by private or public organizations."

65135—50——15

Regional Director's Report

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

MAY 18, 1949.

To: The Commissioner, Bureau of Reclamation.
From: Regional Director, Region I, Boise, Idaho.
Subject: Supplemental Report on the Payette Unit, Mountain Home Project, Idaho.

1. Attached hereto is my report on the Payette unit of the Mountain Home project in southwestern Idaho. It is submitted as a supplement to my report entitled "Columbia River Basin—Comprehensive Plan of Water Resource Development," dated June 28, 1946.

2. The Payette unit of the Mountain Home project is the largest of the irrigation developments included in the group of projects named in paragraph 139b of the report on the Columbia River Basin and recommended therein for authorization. The report on the Payette unit of the Mountain Home project attached hereto provides information on the project additional to that incorporated in the Columbia River Basin Report and is submitted in support of the recommendation for authorization of the Payette unit. A synopsis of the plan for development of the Payette unit is presented in the first chapter of the attached report.

3. Development of the Payette unit would make possible the irrigation of 192,000 acres of high-quality land, now part of a sagebrush desert, and the installation of hydroelectric generating capacity aggregating 180,000 kilowatts in three power plants. No final plan has yet been devised for the irrigation of the remainder of the Mountain Home project, estimated to contain another 200,000 irrigable acres.

4. Somewhat more than 2,500 new irrigated farm units would be made available for settlement in the Payette unit. Over half of them would be on public domain and thus would be available, at little or no cost, for homestead entry. Under prevailing statutes, veterans of World War II would have preference in the homesteading of farm units on public domain. The heavy demand for new farms is evident in the receipt of an average of 25 applications, most of them from veterans, for every farm unit made available in southern Idaho by the Bureau of Reclamation since the end of World War II.

5. The power installations of the Payette unit, utilizing the water supplies developed for irrigation, would help to relieve an impending shortage of electricity in southern Idaho. This shortage is in prospect, unless additional generating facilities are provided, because power consumption is growing at a rate faster than the new generating capacity now being constructed. Revenues from sale of power produced on the Payette unit would repay a substantial portion of the project costs allocated to irrigation, in addition to all costs allocated to power.

6. Almost all of the water for irrigation would be supplied by transmountain diversions from the Payette River, from which the unit takes its name. The remainder would be supplied from the portion of the water resources of the Boise River not now utilized. The water-supply system includes, on the North Fork of the Payette River, the partly constructed Cascade Reservoir, authorized as a feature of the Boise project, which has capacity available for use on the Mountain Home project. Also included is the proposed Garden Valley Reservoir, to store water from the Middle and South Forks of the Payette River and to reregulate the power releases from Cascade Reservoir. Flows from the North Fork would be diverted via two tunnels and two power plants into Garden Valley Reservoir. The third power plant would be at Garden Valley Dam.

7. The Payette-Boise aqueduct is the key feature of the project plan. It would convey water from Garden Valley Reservoir, by means of the 30-mile Mores Creek tunnel, under the intervening divide, into Lucky Peak Reservoir on the Boise River. The latter reservoir is authorized for construction by the Corps of Engineers, Department of the Army, as a flood-control project.

8. The Hillcrest division, one of the two major divisions of the Payette unit, would be irrigated by diversion from Lucky Peak Reservoir. The other, the Long Tom division, would be served by diversions from the South Fork of the Boise, some distance upstream from Lucky Peak, through the Long Tom tunnel. The Boise River water diverted to the Long Tom division would be replaced for use on irrigated lands of the Boise Valley

by that imported through the Payette-Boise aqueduct.

9. The construction costs of the Payette unit are estimated at $253,234,000, based on current price levels (April 1949). The substantial increase in this estimate over those shown in my Columbia River Basin Report of June 28, 1946, and the Secretary's proposed report of February 8, 1947, is due primarily to the advances in general price and wage levels since the earlier estimates were made. Moreover, the more detailed investigations undertaken in connection with the attached report have revealed that the cost of the Payette-Boise aqueduct, the most expensive feature of the project, would be much higher than that previously anticipated. A slight increase in the installed power generating capacity planned also contributes to the present, higher estimated cost.

10. Annual costs, for operation, maintenance, and replacement, are estimated at $1,559,800 of which those chargeable to irrigation are $557,600, or $2.91 per acre.

11. Potential benefits from the development are evaluated at $17,865,000, including $14,441,000 attributable to irrigation, $3,307,000 to power, $26,000 to flood control, and $91,000 to the improvements in habitats for fish and wildlife. The total annual costs, including the annual equivalent of the construction costs and those for operation, maintenance, and replacements, would be $8,913,000. The ratio of benefits to cost thus would be 2 to 1.

12. Somewhat more than 98 percent ($249,118,000) of the construction costs of the Payette unit would be reimbursable; $199,705,000 has been allocated to irrigation and $49,413,000 to power. The remaining $4,116,000 has been allocated, on a nonreimbursable basis, to flood control ($940,000) and fish and wildlife ($3,176,000).

13. Repayment of 69 percent of the reimbursable costs of the Payette unit would be realized from payments by water users over the recommended 50-year repayment period and from power revenues over a 79-year payment period. The latter period would begin with the first generation of electricity and extend through the 50-year repayment period of the last irrigation block to be supplied with water. That block would receive water for the first time 19 years after the first power generation and would have a 10-year development period before the beginning of its repayment period.

14. Water users would pay annual water charges averaging $5.25 per acre, of which $2.91 would be required to meet annual costs for operation and maintenance and replacements. The remainder, $2.34, would be available to apply on the repayment of construction costs allocated to irrigation. Over the 50-year period, repayment by water users would aggregate $22,455,000 of the total irrigation cost of $199,705,000. The remainder, $177,250,000, would be returned from other sources.

15. Net power revenues over the 79-year period would aggregate $149,268,000. This would repay in full the $49,413,000 allocated to power, and also $99,855,000 of the cost allocated to irrigation, using for the latter purpose the interest component on the power investment during the pay-out period (31 years) for power costs. After deducting the repayment from water users and power revenues, the irrigation costs remaining to be returned through the basin-wide repayment plan recommended in the Columbia River Basin report would be $77,395,000.

16. The method of returning the reimbursable costs of the development, outlined above and described in detail in the underlying report, is consistent with the inclusion of the Payette unit, Mountain Home project, as one of the projects recommended for authorization in the Columbia River Basin report, to which the attached report is supplemental. It will be evident, however, that net power revenues from the Payette unit hydroelectric plants would be available to the Federal Treasury beyond the 79-year period on which the power-system financial studies in the attached supplemental report are based. With the reimbursable power costs repaid in full, the entire net annual operating revenues of the plants would be available to retire the remaining portion of the reimbursable irrigation costs. The additional annual production available to the power system of the area from the Payette unit plants would be 616,000,000 kilowatt-hours of firm energy, and 87,000,000 kilowatt-hours of secondary energy. Total annual costs for operation, maintenance, and replacement of the power facilities would be $998,200. The revenues from power likely would repay all of the reimbursable costs allocated to irrigation with the extension of the pay-out period, independent of the basin-wide repayment plan. With inclusion of the Payette unit in the basin-wide repayment plan, these revenues would be credits to the Columbia Basin account, proposed in the basin report for administration of that plan.

17. It is recommended that the attached report, being supplemental to the Columbia River Basin report, be submitted to the Congress for its use in considering the recommendation in the basin report that the Payette unit, Mountain Home project, be authorized for construction.

(Signed) R. J. NEWELL,
Regional Director.

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CHAPTER I

General Description

Nearly 200,000 acres of dry land in southwestern Idaho would be irrigated by the construction of the Payette unit of the Mountain Home project, proposed for authorization in the report by the Department of the Interior on comprehensive development of the Columbia River Basin. This acreage is much larger than that included in any of the other projects recommended for authorization in the basin report. The Mountain Home project, in fact, is one of the larger irrigation projects remaining for development in the Pacific Northwest.

At three points along the extensive water supply system designed for the irrigation of the Payette unit, hydroelectric power plants with an aggregate installed capacity of 180,000 kilowatts would be provided. The output of these plants is needed to alleviate prospective shortages of power in southern Idaho. Moreover, the revenues from the sale of electric energy produced by the plants would assist in the return of the construction costs allocated to irrigation, in addition to repaying all power costs.

Benefits to the Nation from development of the Payette unit of the Mountain Home project would exceed costs to the Nation in the ratio of 2 to 1.

Sixty-nine percent of the reimbursable costs would be repaid to the Federal Government from power revenues of the Payette unit plants and from water-charge payments by the end of the 50-year repayment period for the last irrigation block developed. The balance of the reimbursable costs would be returned through the basin-wide repayment plan proposed in the Departmental report on the Columbia River Basin.

THE PROJECT AREA

The Mountain Home project area is located on the Snake River plain, a lava plateau extending in a crescent shape almost all the way across southern Idaho. The project area is near the western end of the plain, occupying a broad plateau between the foothills of the central Idaho Rocky Mountains on the north and the canyon of the Snake River on the south. The northern tip of the project area adjoins the city of Boise. From Boise, it extends generally southeastward for 70 miles to the town of Glenns Ferry on the Snake River. The width of the project area averages about 25 miles. Elevations range from 3,400 feet above sea level in the eastern part, to 2,000 feet in the southwestern part.

The Payette unit, so named because the water supply for it would be made possible by utilizing the surplus flows of the Payette River, occupies somewhat less than one-half the total estimated irrigable acreage of the Mountain Home project. The factor limiting the size of the unit is the amount of water surplus to the needs of the Payette River Basin which can be made available from the Payette River, together with the small amount in excess of the needs of presently irrigated land of the Boise River Valley which can be provided from the Boise River water resources. The water supply system for the unit would extend into the mountains north of Boise for 65 miles, and would involve three trans-mountain diversions.

The lands of the Payette unit are contained in two major divisions, with an intervening area which is largely above the elevation of the other lands and which is not included in the irrigation plan. The Hillcrest division, embracing 46 percent of the unit, occupies a strip of land adjoining the eastern boundary of the presently irrigated lands of the Boise project and the canyon of the Snake River. It extends southward from Boise for 35 miles. The Hillcrest division lies entirely in Ada County. The Long Tom division, containing 54 percent of the Payette unit lands, occupies roughly the center of the Mountain Home project area. Hook-shaped, it also is about 35 miles long, from northwest to southeast. Most of the Long Tom division is in Elmore County; its western tip is in Ada County.

No final plan has been devised for the irrigation of the Mountain Home project lands not included in the Payette unit.

Climate

The climate of the Mountain Home project area is characterized by paucity of precipitation and a growing season of moderate length. As in other nearby areas of

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southern Idaho, the climate of the Mountain Home project area is conducive to successful agricultural development with irrigation.

Data for the town of Mountain Home, in the south central part of the area, may be considered as representative of conditions on the Long Tom division, while those for Kuna, a town on the Boise project close to the western edge of the Payette unit, approximate conditions on the Hillcrest division. At Mountain Home, the average annual rainfall is less than 10 inches. Only 1.87 inches is received during the growing season. At Kuna, the average annual precipitation is somewhat more than 10 inches, with 2.63 inches falling during the growing season. In either case, of course, precipitation is too low to permit crop production without irrigation.

The growing season—defined as the length of the period between killing frosts—averages 144 days at Kuna and 125 days at Mountain Home. Summer temperatures ordinarily are high, with cloudless days prevailing. As a rule, winter seasons are of moderate intensity. Data on the climate of a number of selected localities in the vicinity of the Mountain Home project are presented in table 1.

TABLE 1.—*Climatological data—selected locations in the Snake River Valley*

County	Station	Elevation	Length of record	Precipitation	Growing season [2]		
					Average beginning date	Average ending date	Average length in days
		Feet	*Years*	*Inches*			
Ada	Kuna	2,682	37	10.66	May 10	Oct. 1	144
	Boise [1]	2,858	79	13.10	Apr. 23	Oct. 17	177
	Meridian	2,607	34	11.69	May 3	Sept. 30	150
Canyon	Caldwell	2,372	40	10.14	May 7	Oct. 3	149
	Deer Flat	2,510	26	8.40			
Elmore	Mountain Home	3,142	39	9.99	May 16	Sept. 18	125
Gooding	Bliss	3,269	28	8.70	June 3	Sept. 24	113
	Gooding [3]	3,572		9.27	May 21	Sept. 21	123
Jerome	Jerome	3,774	28	8.34	May 8	Oct. 4	149
Minidoka	Rupert	4,204	38	10.00	May 17	Sept. 21	127
	Paul	4,200	9	10.34			

[1] Airport 4 miles south of Boise.
[2] Defined by dates of killing frost, as reported in Agricultural Yearbook Separate No. 1832 up to 1941.
[3] Airport 5½ miles southwest of Gooding.

Lands

The Mountain Home area, as previously indicated, is a broad lava plateau lying between foothills on the north and the deeply incised Snake River on the south. A chain of lava hills and rocky uplifts, trending in an east-west direction, rises above the general elevation of the plateau along its major axis. Aside from these uplands, which would not be irrigated, the area is fairly level and well adapted topographically to irrigation development.

Soils of the project area have been developed principally from loessal and old lake-bed materials. A few soils, however, have been developed from basaltic rock, while others stem from stream deposition. Soil depths range from a few inches to considerably more than 6 feet. In general, the deeper soils, which alone have been included in the Payette unit, are well suited to irrigation agriculture.

The lands selected for inclusion in the Payette unit are generally superior to the average Mountain Home lands. About 45 percent of the Payette unit area is rated class 1, the best recognized in the land classification survey of the project. Fifty-three percent is class 2. Only 2 percent is class 4P, which comprises the lowest quality lands recognized in the survey as arable.

Surface and Ground Waters

The project area is virtually devoid of perennial streams. The few creeks which emerge from the hills to the north do not run all of the year. The principal stream is Canyon Creek, which crosses the plateau just west of Mountain Home to discharge into the Snake River. The South Fork of the Boise River flows in a deep canyon, to the north of and roughly parallel to the project area, but separated from it by a high range of rough hills. The Snake River, which bounds the area on the southwest, carries a large sustained flow, but its bed is about 800 feet below the surface of the plateau.

Ground waters in large volume lie beneath the project area, but at considerable depths. Static water levels in existing wells scattered throughout the area range from 330 to nearly 500 feet below the ground surface.

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Population

The project area is very sparsely settled. Traversed by a succession of major routes of travel, the Mountain Home desert for decades has been an area across which emigrants and travelers, whether in covered wagons or streamlined trains, have hurried with the least possible delay. Settlement in the area has been severely restricted by lack of water. The few small settlements all are located along the arterial transportation routes, where one of the principal functions of the inhabitants is the provision of service for through railroad and automobile traffic.

In 1940, Elmore County, which has a population distribution typical of the project area, had 5,518 inhabitants, a density of only 1.8 persons per square mile. The rural farm population had a density of 0.6 person per square mile.

The only town of any size is Mountain Home, which has a population of about 1,200. It is the seat of Elmore County. The most populated rural area in the project is the small irrigated farming district adjacent to Mountain Home.

Irrigated areas which lie near the project both to the northwest and southeast are densely settled. The Boise Valley, which adjoins the project area on the northwest, contains nearly 100,000 irrigated acres, with somewhat more than 9,000 farms and several sizable towns. The city of Boise, capital of Idaho and seat of Ada County, which, as noted, is immediately adjacent to the northern tip of the project area, has a population estimated at about 50,000. Southwest of the project area, the highly successful and closely settled irrigation developments of the Upper Snake River Valley extend in an almost unbroken strip virtually all the way to the Wyoming border.

Land Use

The predominant present use of most of the project area is for seasonal grazing. For a few weeks each fall and spring, sufficient forage is available for this purpose. In addition, some winter grazing is afforded in part of the area. Bands of sheep trail back and forth over the plateau between summer grazing lands in the mountains to the north and winter quarters along the Snake River.

Only a few, relatively small, scattered tracts in the project area, aggregating less than 10,000 acres, are now irrigated. In most cases, water is available for these areas only in the early part of the summer. The largest cropped area is in the vicinity of the town of Mountain Home, where somewhat less than 5,000 acres are irrigated. Three small reservoirs, with a total capacity of 33,000 acre-feet, serve these lands. A large portion of the water supply is secured from a tributary to the South Fork of the Boise River. Water from this tributary is conveyed to the area by means of a 14-mile canal. The other scattered tracts receive water from the few creeks which flow onto the plateau.

Industry

The principal industry in southwest Idaho is agriculture. Most of the manufacturing establishments are devoted to the processing of food and other agricultural products. Wholesale and retail trade rank second to agriculture in importance. Other significant industries are lumbering, printing, and publishing. The project area proper has virtually no industrial development.

Transportation

Two arterial transportation routes cross the project area. The main line of the Union Pacific Railroad to the Pacific Northwest and United States Highway No. 30 bisect the area, running parallel to each other northwest-southeast. There are few secondary roads in the area and most of them are unimproved.

INVESTIGATIONS

Irrigation of the Mountain Home area was considered as early as 1893. In the first years following that date, a number of irrigation plans were studied by private organizations. The plans considered included the use of water of the Snake River, both by pumping and by gravity, and transmountain diversions from the Boise and Salmon river watersheds.

Report of 1944

Investigations subsequently were initiated by the Bureau of Reclamation. These investigations culminated in the issuance in 1944 of Project Planning Report No. 69-A, entitled, "Initial Unit, Mountain Home Project, Idaho." The plan for developing a water supply from the Payette River presented in that report was similar to that proposed in this report except for the location and character of the aqueduct for transporting such water into the Boise River Basin. The acreage proposed to be irrigated, however, was somewhat larger than that now contemplated. The gross crop income to be earned on the lands of the unit was estimated at $30 per acre annually and the ability of farmers to pay annual water charges was estimated at $4 per acre.

In accordance with provisions of the quadripartite agreement, the Corps of Engineers, the Department of Agriculture, and the Federal Power Commission were

consulted during the preparation of the report, and comments on it were solicited from those agencies.

The principal comment was received from the Department of Agriculture. The land use coordinator of that Department, by a letter of October 27, 1944, raised a number of basic objections to the report. The four major points made by the Coordinator were: (1) That a detailed land capability study ought to be made prior to authorization of the project, (2) that the ability of farmers to pay water charges as high as $4 per acre annually was questionable, (3) that adequate account had not been taken of problems such as domestic water supply, marketing, size of farm, land preparation, and the like, and (4) that, in general, insufficient attention had been given to the agricultural aspects of the project and that these aspects ought to be studied jointly by the Departments of Interior and Agriculture. He also noted that domestic water supplies probably would be difficult and costly to obtain.

Report of 1945

The Commissioner of Reclamation issued a report entitled "Payette Unit, Mountain Home Project, Idaho," Project Planning Report No. 1-5.5-5, on September 10, 1945. This report embodied the 1944 version and took into account the comments noted above on the earlier edition. The Commissioner took the position that the agricultural studies of the development recommended by the Department of Agriculture could appropriately be undertaken after authorization of the project.

The Secretary of the Interior adopted the Commissioner's report as his proposed report on November 20, 1945, and authorized its submission, at the cabinet level, to the Secretaries of War and Agriculture for comment. It was also submitted as the Secretary's proposed report to the Federal Power Commission and to the governors of the States in the Pacific Northwest.

All of the comments received in response to this submittal indicated general approval of the project, except that received from the Assistant Secretary of Agriculture. In a letter dated March 27, 1946, he disagreed with the Commissioner of Reclamation on the method proposed for solution of the agricultural problems associated with the project. He reiterated the stand taken in the letter of October 27, 1944, from the land use coordinator, noted above, that additional study of the agricultural aspects of the project was required.

The Commissioner, on May 16, 1946, again transmitted the report, together with the additional comments, to the Secretary of the Interior, with the recommendation that the project be authorized for construction. A few days later, on May 31, 1946, the report and comments were submitted by the Acting Secretary to the President, through the Bureau of the Budget, to determine the relationship of the proposed development to the program of the President prior to transmitting the report to the Congress for action.

The Budget Director, in his letter of August 14, 1946, indicated that authorization of the project, at least at that time, was not in accord with the program of the President. The reasons given for this determination were (1) that studies proposed by the Department of Agriculture should be accomplished prior to authorization, (2) that the proposal in the report that power rates should not be less than sufficient to return annually an amount equal only to 3 percent of the costs allocated to power is not consistent with good business practice and the reclamation law, as interpreted by the Budget Bureau, and (3) that the proposed improvements were of a marginal nature in any event, based on information presented in the report.

Current Investigation

The additional investigations leading to this report, emphasizing the agricultural aspects of the Payette unit, were initiated shortly following receipt of the Budget Director's objections to the preceding report. Intensive technical study was devoted to soils, land classification, land-use capabilities, domestic water problems, anticipated farm economy, and like subjects, all reported on subsequently in this document.

Preliminary results of these studies were presented at a meeting in Boise on November 26, 1946, of the Idaho State U. S. D. A. Council. The chairman of that council indicated his approval of the agricultural investigations made by the Bureau of Reclamation for the Payette unit by the following letter to the regional director of the Bureau at Boise:

UNITED STATES
DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

OFFICE OF STATE CONSERVATIONIST
BOISE, IDAHO

DECEMBER 5, 1946.

MR. R. J. NEWELL, *Director,*
Region I, Bureau of Reclamation,
Boise, Idaho.

DEAR MR. NEWELL: Reference is made to discussions participated in between Bureau of Reclamation representatives and members of the Idaho State U. S. D. A. Council, November 26, at which time data and information pertaining to the agricultural and economic feasibility of the proposed Mountain Home irrigation project (Payette unit) were presented by the Bureau.

PLEASE RETURN 730

UNITED STATES
DEPARTMENT OF THE INTERIOR
Harold L. Ickes, Secretary

BUREAU OF RECLAMATION
H. W. Bashore, Commissioner

INITIAL UNIT
MOUNTAIN HOME PROJECT
IDAHO

Project Planning Report No. 69-A

April
1944

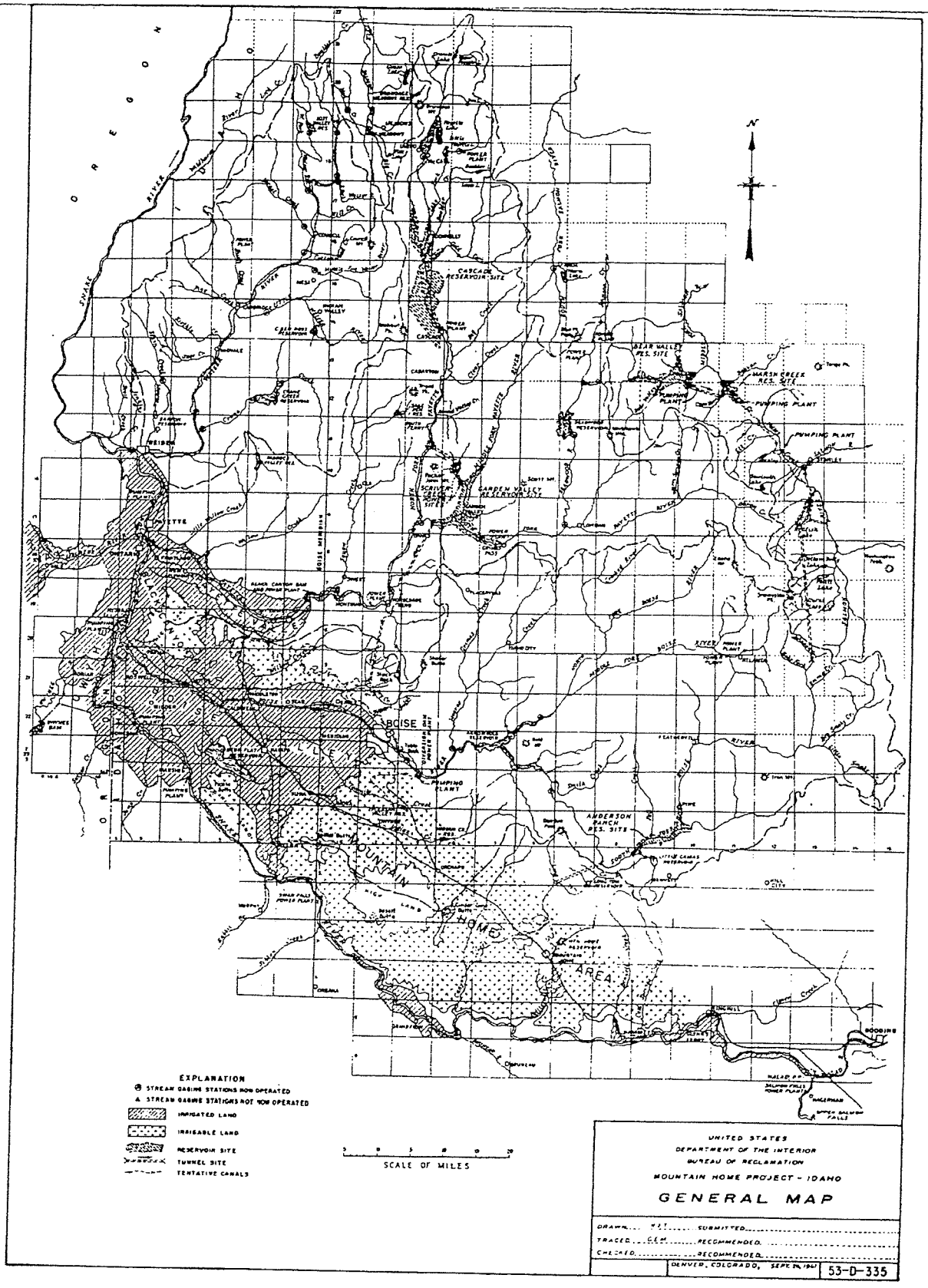

OREGON
CASCADE RESERVOIR SITE
BEAR VALLEY RES. SITE
MARSH CREEK RES. SITE
PUMPING PLANT
GARDEN VALLEY RESERVOIR SITE
SCRIVER CREEK RESERVOIR SITE
BOISE
PUMPING PLANT
ANDERSON RANCH RES. SITE
MOUNTAIN HOME AREA
EXPLANATION
STREAM GAGING STATIONS NOW OPERATED
STREAM GAGING STATIONS NOT NOW OPERATED
IRRIGATED LAND
IRRIGABLE LAND
RESERVOIR SITE
TUNNEL SITE
TENTATIVE CANALS
SCALE OF MILES
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
MOUNTAIN HOME PROJECT - IDAHO
GENERAL MAP
DRAWN... SUBMITTED...
TRACED... RECOMMENDED...
CHECKED... RECOMMENDED...
DENVER, COLORADO, SEPT. 1947
53-D-335

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- - -

SYNOPSIS

The Mountain Home Project, located in southwest Idaho about 40 miles southeast of Boise, will have an ultimate irrigated area of 400,000 acres. The initial project, contemplated for early development, involves the diversion of surplus water from the Payette River to irrigate 230,000 acres. Hydroelectric energy to be developed by the project would help meet growing power needs in southern Idaho and aid in financing project costs. Operation of project reservoirs would eliminate flood damages in the Payette Valley.

Southwestern Idaho is in need of new irrigation development to provide homes for ex-farmers who migrated to the area during the recent drouth years. Furthermore, there is the pressing problem of providing opportunities for settlement by returning war service men and for the thousands of war workers who have migrated to the Pacific Northwest, many of whom will wish to remain if opportunities for a livelihood are provided. Development of the initial Mountain Home Project, through irrigation, would provide some 3,000 farms for settlement. The expanded purchasing power of settlers thereon would cause increased activities in trade, transportation, and industry, particularly food and milk processing plants. A broadened tax basis thus provided would be of benefit to the Nation, the State, and the community.

The project area is now covered with sagebrush and has a limited value for grazing. Following irrigation development, an annual gross crop income of about $30 per acre would be realized. The gross crop value for the 230,000 acres in the project would total $6,900,000 annually.

In southern Idaho the existing power generating facilities and those now under construction are estimated to be inadequate to supply the normal power demands contemplated after 1948. There has been a steady growth in power uses and the undeveloped natural resources of the area are such that a future steady growth is assured. It is estimated that by 1968 the energy demand in southern Idaho will be 2,200 million kilowatt-hours, an increase of 1,500 million kilowatt-hours over present annual uses. The two Scriver Creek power plants and the Garden Valley power plant can supply approximately 700 million kilowatt-hours annually of the increased power demand.

Project works with estimated construction costs are as follows:

Cascade Reservoir (650,000 A.F. active capacity)	$ 3,270,000
Smiths Ferry diversion dam on North Fork Payette River	700,000
Smiths Ferry-Scriver Creek Tunnel (4.6 miles)	3,450,000
Scriver Creek power plants (2 plants with combined capacity 120,000 kw.)	6,790,000
Scriver Creek Reservoir and outlet tunnel (1.1 mi.)	2,300,000
Transmission lines and substations	5,588,000
Garden Valley Reservoir (1,250,000 A.F. active capacity) and power plant (45,000 kw.)	12,200,000
Payette-Boise Aqueduct (54 miles)	34,700,000
Diversion dam on South Fork Boise River and Long Tom tunnel (7.2 mi.)	14,600,000
Pumping plant (285 ft. lift) and canal from Boise River	3,150,000
Distribution system on project lands	9,200,000
Total	$95,948,000

The Payette Division of the Boise Project and the Lake Reservoir Company will also make use of Cascade Reservoir; hence, $1,255,000 of the cost of that feature is chargeable to projects other than Mountain Home. Of the remaining construction cost, $18,403,000, bearing interest at 3 percent, and $62,595,000, without interest (irrigation cost to be repaid from power revenues), would be allocated to power development; $12,880,000 allocated to irrigation; and $815,000 allocated to flood control.

With irrigation development, farmers in the area would be able to pay about $4 per acre annually for water. It is estimated that operation and maintenance costs of irrigation works would average $1.50 an acre and power charges for irrigation pumping $1.10, leaving an average of $1.40 per acre annually, or a total of $12,880,000 over a 40-year interest-free period, that the irrigators can repay of the construction cost. Power and irrigation developments should be made progressively, as the respective requirements increase. With commercial energy sold at an average rate of 4 mills per kilowatt-hour and irrigation pumping energy at 2 mills, power sales over a 62-year debt-retirement period would be adequate to pay operation and maintenance costs, etc., of the power system; interest at 3 percent on the interest bearing portion of the power investment; and repay the $80,998,000 allocated to power.

It is recommended that the Mountain Home project be constructed under the provisions of the Reclamation Project Act of 1939. Construction should be so planned that a 50,000-acre block of irrigable land may be opened at the earliest practicable date and to have the first unit of the Scriver Creek power development ready to begin generation in 1948.

INTRODUCTION

The Initial Unit of the Mountain Home Project, so named for the town of Mountain Home in southwest Idaho, about 40 miles southeast of Boise, is planned to irrigate 230,000 acres of fine arable land which is remotely situated from any large source of water supply. Water for the project would be supplied by diverting Boise River. To replace Boise River water now used for irrigation purposes, surplus water would be diverted from the Payette River to the Boise watershed. Operation of the proposed Cascade and Garden Valley Reservoirs in the Payette River watershed, and of the existing Arrowrock and Anderson Ranch Reservoirs in the Boise watershed, would provide an adequate water supply for project irrigation and would make possible the generation of large blocks of electric energy.

The project area for the most part comprises a sagebrush covered plain area of a plateau which averages 800 feet in elevation above the bed of Snake River. The area is now very sparsely settled and is devoted mostly to grazing.

There is a distinct need in this area for new developments to provide opportunity for settlement by returning service men and war workers in an area where they would be assured of an income worthy of their merit and efforts. Thousands of war workers have come to the Pacific Northwest, and many of these will wish to remain in the area if worth while occupations can be provided. These occupations can come from farming, and also from the hundreds of new jobs created in industry and trades which will follow project development. Furthermore, there is a constant need for additional farms arising from the natural increase in population of native Idahoans.

As early as 1893, the desirability of developing the Mountain Home area was recognized. Since that time various plans of bringing water to the area have been investigated by private agencies. Possibilities of the use of Snake River waters, both by pumping and by gravity, were investigated, as were the possibilities of transmountain diversion from the Boise and Salmon River watersheds. A brief investigation by the Bureau of Reclamation in 1923 indicates that diversion from Snake River is impracticable.

The present investigations recognize the impracticability of utilizing Snake River waters to develop Mountain Home lands, and contemplate instead the use of waters of the Boise, Payette, and Salmon Rivers not required for irrigation within their own watersheds. Surplus waters of the Payette and Salmon Rivers would be diverted to the Boise River watershed for rediversion, either directly or by exchange for an equivalent amount of Boise River water, to the Mountain Home area. Present investigations have not advanced to the point where it is known how much water may be diverted from the Salmon River watershed without

encroachment on existing or contemplated future developments in that basin. Consequently, this report covers only the initial or Payette Unit which will make possible the irrigation of 230,000 acres. An ultimate project area of about 400,000 acres is contemplated.

The possibility of developing power to meet growing commercial, domestic, and irrigation pumping demands, and to defray part of the cost of proposed irrigation developments with revenues from the sale of power, is shown to be desirable and practicable.

PROJECT AREA

All of the Mountain Home Project area lies on the north side of the Snake River between Glenns Ferry and Boise, in southwestern Idaho. It is bounded by the Boise Project on the northwest and the King Hill Project on the southeast. There are some 700,000 acres in the region with about 400,000 acres irrigable. Soil, topography and climatic conditions are well adapted to irrigated agriculture. The mean annual temperature is 49°F. and the mean annual precipitation is 10 inches. Observed extreme temperatures are 107°F. and -36°F. The average frost free period is 113 days, with the growing season considerably longer.

The area is well supplied with arterial transportation facilities, being crossed by the main line of the Oregon Short Line R. R., highway U. S. 30, and several state highways.

The principal town in the area and only one of any size is Mountain Home, the Elmore County Seat, which in 1940 had a population of 1,193.

Industry

The basic industry of all southwestern Idaho is agriculture, and is naturally dependent upon land and water resources for a stabilized economy. This section of the state must be an economic unit because of its distance from large urban centers outside of the area. The city of Boise and its environs, the largest urban center of the area, has a population of over 32,000, and is the largest city within a radius of 400 miles. Portland, Spokane and Salt Lake City, although constituting part of the market area, are outside the natural trading circle. Any influence leading to the economic development of southwestern Idaho will accrue to the benefit of the area as a whole.

Southwestern Idaho has never developed a large number of manufacturing establishments. By far the most important is the manufacturing of food and kindred products composed mostly of processed dairy products. Next in importance are lumbering, printing and publishing. Wholesale and retail trade ranks second in importance to agriculture as an economic pursuit.

Exhibit A.

MEMORANDUM OF AGREEMENT
BETWEEN
THE DEPARTMENT OF THE ARMY
AND
THE DEPARTMENT OF THE INTERIOR
FOR
FLOOD CONTROL OPERATION OF BOISE RIVER RESERVOIRS, IDAHO

THIS MEMORANDUM OF AGREEMENT entered into this 20th day of November, 1953, by and between the Department of the Army, represented by Robert T. Stevens, SECRETARY OF THE ARMY, and the Department of the Interior, represented by Fred G. Aandahl, Assistant SECRETARY OF THE INTERIOR,

W I T N E S S E T H

WHEREAS, the Department of the Army, through the Corps of Engineers, is engaged in constructing the Lucky Peak Dam and Reservoir on the Boise River in the State of Idaho, under authority of the Act of July 24, 1946 (60 Stat. 641), which authorized construction of Lucky Peak Reservoir substantially in accordance with the recommendations of the Chief of Engineers in his report of May 13, 1946; and

WHEREAS, said report concurred in the views and recommendations of the Board of Engineers for Rivers and Harbors that the Lucky Peak Reservoir be constructed with the understanding that complete or partial joint use of the storage in the three-reservoir system, viz., Lucky Peak, Arrowrock, and Anderson Ranch Reservoirs, may be undertaken at such time as may be mutually agreed upon by the Secretary

of War (now Secretary of the Army), the Secretary of the Interior, and local interests concerned with flood control and the use of irrigation water; and

WHEREAS, said report concurred in the views and recommendations of the Board of Engineers for Rivers and Harbors that Lucky Peak Reservoir be authorized for construction with the understanding that changes in the method of operation will be made in the future when the Secretary of War (now Secretary of the Army), upon the advice of the Chief of Engineers, finds that such changes are in the best interest of flood control, irrigation, and power development, and that they are agreeable to the Secretary of the Interior and to the local interests concerned with flood control and the use of irrigation water; and

WHEREAS, said act provides that Lucky Peak Dam and Reservoir "shall be operated in such manner as not materially to interfere with the operation of said Arrowrock Reservoir"; and

WHEREAS, the Department of the Interior, through the Bureau of Reclamation, acting under the Federal Reclamation Laws (these being the Act of June 17, 1902, 32 Stat. 388, and acts amendatory thereof or supplemental thereto), has constructed and is operating Arrowrock Dam and Reservoir on the Boise River and Anderson Ranch Dam and Reservoir on the south fork of the Boise River, both upstream from the Lucky Peak Dam; and

WHEREAS, there are storage rights in Arrowrock, Anderson Ranch, and Lake Lowell Reservoirs by virtue of appropriations under the laws of Idaho and contracts between the United States, represented by the Department of the Interior, and various water users' organizations serving lands in the Boise Valley, and there are other existing rights in and to the use of waters of the Boise River, both stored and natural flow, which waters are in part diverted and distributed through the transferred works of the Boise Project being operated and maintained by the Boise Project Board of Control and in part by means of other works being operated and maintained by other water users' organizations; and

WHEREAS, certain of the rights above described are adjudicated rights, which are exercised under the supervision of the State of Idaho, represented by the watermaster of District No. 12-A, Boise River; and

WHEREAS, to comply with the above-quoted Congressional declaration of operational policy in regard to Lucky Peak and Arrowrock Dams, and to achieve the greatest multiple-purpose use of the combined total usable flood control and irrigation storage of 983,000 acre-feet of water in all three reservoirs, a coordinated plan of operation is necessary for this reservoir system on the Boise River, a river totally within the State of Idaho, together with Diversion Dam, the New York Canal headworks, and Lake Lowell; and

WHEREAS, it is recognized that the successful operation of this coordinated irrigation and flood control plan will call for the cooperation and assumption of responsibilities by the two Departments and the water users having storage rights in the reservoir system, and that there is need for a policy of mutual coordination, information, and assistance in its performance;

NOW, THEREFORE, for and in consideration of the premises and certain benefits and advantages accruing hereunder to affected local interests, it is hereby agreed as follows:

1

The hydrologic situation is shown on Plate 1, attached hereto and made a part of this agreement, which depicts the general location of the Lucky Peak, Arrowrock, and Anderson Ranch Reservoirs, herein referred to collectively as the reservoir system, Diversion Dam, the New York Canal headworks, and Lake Lowell.

2

The plan of operation hereinafter set forth is limited to the flood control operation phase of the respective general operating plans of the parties hereto and shall be used during the period commencing with the actual operation of Lucky Peak Reservoir.

3

To attain the maximum benefits from the reservoir system, the total capacity of 1,084,000 acre-feet will be utilized as follows:

a. 983,000 acre-feet (418,000 acre-feet in Anderson Ranch, 285,000 acre-feet in Arrowrock Reservoir, and

4

280,000 acre-feet in Lucky Peak Reservoir) will be operated primarily in the interests of irrigation and flood control and secondarily in the interests of power, as governed by forecasts of runoff. The allocation of flood control space is shown on Plate 2.

b. 5,000 acre-feet in Anderson Ranch Reservoir will be used exclusively for power production.

c. 96,000 acre-feet (70,000 acre-feet in Anderson Ranch and 26,000 acre-feet in Lucky Peak Reservoirs) will be reserved for dead storage and allocated exclusively to the maintenance of minimum power head, maintenance of permanent pools for the preservation and propagation of fish and wildlife and for silt control.

The above-designated 983,000 acre-feet or any part thereof in storage at the end of each flood season will be primarily considered as available for irrigation except as such amount must be reduced by evacuation requirements for flood control.

4

No reregulation of storage or annual exchange of storage as provided in this plan shall, however, deprive any entity of water accruing to it under existing rights in Arrowrock, Anderson Ranch, and Lake Lowell Reservoirs.

5

The Chief of Engineers, the Commissioner of Reclamation, and the watermaster, having agreed upon acceptable methods of

forecasting seasonal volumes of runoff for the Boise River above Diversion Dam, will periodically during the period from January 1 to June 30 of each year, determine the volume of runoff that may be expected in the drainage area tributary to the Boise River above Diversion Dam. Any differences in forecasted amounts shall be reconciled to arrive at a common forecast within 48 hours after basic data for forecasts are available. To facilitate forecasting of runoff, mutually satisfactory arrangements will be made among the Chief of Engineers, the Commissioner of Reclamation, and the State of Idaho, after consultation with the interested water users' organizations, to expand the existing hydrologic network and to establish and operate continuously a system for the efficient assembly, analysis, and exchange of the basic data.

Beginning with the first year this plan is put into operation, the system will be operated, through close collaboration with all agencies concerned on the basis of periodic sequential forecasted runoffs made during each year, as nearly as practicable in accordance with the following particular terms and provisions:

a. The storage space to be allocated to flood control for each year is defined as follows:

It is the combined reservoir space which, using the governing forecast of flood runoff for the year, is required to control the forecasted flood volume,

from the time in that year that the natural flow as determined at Diversion Dam exceeds the allowable release through the succeeding July 31. The governing forecast of flood volume for each year is the forecast made as of the date the natural flow, as determined at Diversion Dam, first exceeds the allowable flow at that point and this date is usually about April 15. Allowable releases from the reservoir system during the period from the date of the governing forecast to the succeeding July 31 will be such that the flow in the river channel below Diversion Dam will not exceed 6,500 second-feet, in so far as this control can be accomplished with a total system capacity of 983,000 acre-feet together with the diversion to the New York Canal of an average of 1,365 second-feet during March and of 2,820 second-feet from April 1 through July 31, except that, due to decreased irrigation demand, diversions to the New York Canal may infrequently be reduced below the diversion figures indicated above. When the above decreased diversions are required, it may be necessary to increase flow in Boise River below Diversion Dam.

b. Attached hereto as Plate 2 is a scale figure depicting flood storage allocation parameters representing runoff volume anticipated at Diversion Dam between the

forecast date and July 31. These parameters were empirically derived from floods of record and are enveloping curves of the storage requirements for various volumes of total forecasted runoff from any given date to July 31. The total reservoir capacity required to control a flood to a discharge of 6,500 second-feet (or less) in the river channel past Diversion Dam is indicated by the ordinate of the parameter corresponding to the forecasted runoff on the date of the governing forecast.

c. During the period of each year from the date of the first forecast, about January 1, to the date that natural flow of Boise River at Diversion Dam first exceeds allowable releases, herein designated as the evacuation period, the reservoir system will be operated in such a manner that the reservoir levels on the date of the governing forecast as determined by the parameters on Plate 2, can be attained with the minimum practicable rates and fluctuations of discharge. The rate of discharge during the evacuation period will be determined as far as practicable in the following manner: The combined total reservoir space required on or about April 15 (approximate date of the governing forecast) will be estimated by use of the parameters

on Plate 2 and an April 15 forecast, which would be derived by deducting from the forecast made on any periodic forecast date probable average inflows, as determined from Plate 3, or measured inflow for the intervening period from the date of periodic forecasts to April 15. The required reservoir capacities thus estimated would comprise tentative allocations of flood control space at which to aim the evacuation procedure. The rate of discharge at Lucky Peak Reservoir then will be selected as that required to release the probable average inflow, as determined from Plate 3, or measured inflow for the period between the date of forecast and April 15, plus the evacuation necessary to attain the required total reservoir capacity indicated by the latest tentative allocation.

d. The evacuation of the active capacity in the reservoirs will be made in the following order: First, from Lucky Peak; second, from Arrowrock; and last, from Anderson Ranch. At least forty thousand (40,000) acre-feet of vacant space will be maintained in Lucky Peak Reservoir from November 1 to January 1 of every year, and from January 1 to May 24 of every year, except when forecasted amount of runoff between date of forecast

and July 31 is less than six hundred thousand (600,000) acre-feet and except that storage space in Anderson Ranch Reservoir may be considered partially to fulfill this requirement in Lucky Peak Reservoir to the extent of forty percent (40%). Power operation from Anderson Ranch storage will be so limited that, to the extent possible as to space allocated to flood control for any year, at least sixty percent (60%) thereof will be provided in Lucky Peak and Arrowrock Reservoirs. Filling of the three reservoirs will follow the reverse of the evacuation schedule to the extent that water is available at each of the respective sites. In the event Anderson Ranch or Arrowrock Reservoirs are not filled by reason of having evacuated water for flood control, storage in Lucky Peak will be considered as belonging to Arrowrock and Anderson Ranch storage rights to the extent of the space thus remaining unfilled at the end of the storage season but not to exceed the amount evacuated for flood control.

e. From the date of the governing forecast each year through July 31 of that year, herein designated as the filling period, the reservoir system will be operated in such a manner that the combined reservoir content, as determined from the parameter chart (Plate 2), will be

maintained except when irrigation requirements necessitate a drawdown below such total content, but will not be exceeded except when total storage above such content is required to limit the releases to allowable flows (as determined by downstream channel capacity and irrigation diversions) at Diversion Dam. However, when the forecasted runoff indicates extraordinary flood flows, requiring storage capacity for flood control in excess of the total active storage capacity of the reservoir system (983,000 acre-feet), temporary releases at Lucky Peak in excess of the allowable flows may be required but such releases will be made at a rate so as to minimize the peak rate of flow in the river channel below the Diversion Dam. The rate of such releases shall be specified by the Chief of Engineers after consultation with the Commissioner of Reclamation to the extent consistent with paragraph 6g herein.

f. Release of water for irrigation will be made from Lucky Peak Reservoir at such times and at such rates, pursuant to rights established under law, as requested by the owners thereof, or by officials or agencies authorized to make such requests. Flood control releases prescribed by the Chief of Engineers will be made in such a manner as to cause minimum practicable short-time

fluctuations in the flow of the Boise River below Lucky Peak Reservoir. Arrangements will be made to notify the State Watermaster, and other officials upon request, of contemplated significant changes in rate of release from Lucky Peak Reservoir.

g. The Chief of Engineers and the Commissioner of Reclamation may establish operating rules and regulations for the purpose of protecting from damage the dams and reservoirs being operated under their respective supervision but such rules and regulations shall, to the greatest extent practicable, avoid interference with the delivery of water accruing to rights established under law.

h. In order to enhance the recreational value of Lucky Peak Reservoir after recession of the flood each year, that reservoir will be filled, if not already full from flood water storage or natural flow, by transfer of water from Arrowrock storage, and will be held full through September 15 each year except when Arrowrock Reservoir has been drawn down to a level from which it can no longer supply the irrigation requirements prior to that date, in which case irrigation releases will be made as required from Lucky Peak storage. In no case will storage be released from Anderson Ranch

Reservoir for the purpose of holding Lucky Peak Reservoir full for recreational purposes.

7

If operating experience indicates the desirability therefor or if justified by future changes or improvements in the Boise River system, the Chief of Engineers and the Commissioner of Reclamation or their duly authorized representatives, after consultation with the Reclamation Engineer of the State of Idaho or his authorized representative, the Watermaster, Boise River, and the Project Manager, Boise Project Board of Control, may, within the general objectives of this agreement, modify from time to time the operating plan herein described with respect to allowable releases and the amount of space allocated each year to flood control on the basis of advanced forecasts of runoff. However, no modification which would affect in any substantial way any storage rights in the reservoir system and Lake Lowell, shall be made without the concurrence of all entities having rights in the reservoir system and Lake Lowell.

8

If and when a power plant is installed at Lucky Peak Dam, it shall be operated in a manner consistent with this operating plan and in subordination to any water rights validly established under law.

9

This memorandum of agreement shall become effective when it has been formally accepted by the water users having storage rights in the reservoir system and Lake Lowell and after a revised allocation report for the Boise Project, supplemental to the report and finding of June 25, 1940, by the Secretary of the Interior (H. Doc. No. 916, 76th Cong., 3d Sess.), reflecting the flood control benefits based on the operating plan herein set forth, has been transmitted to the Congress.

10

Except for the original execution thereof, this agreement shall be administered on behalf of the Department of the Army by the Chief of Engineers, representing the Corps of Engineers, and on behalf of the Department of the Interior by the Commissioner of Reclamation, representing the Bureau of Reclamation, or their duly authorized representatives.

IN WITNESS WHEREOF, this memorandum of agreement has been executed as of the date first above stated.

DEPARTMENT OF THE ARMY

By /s/ Robert T. Stevens
Secretary of the Army

DEPARTMENT OF THE INTERIOR

By /s/ Fred G. Aandahl
Assistant Secretary of the Interior

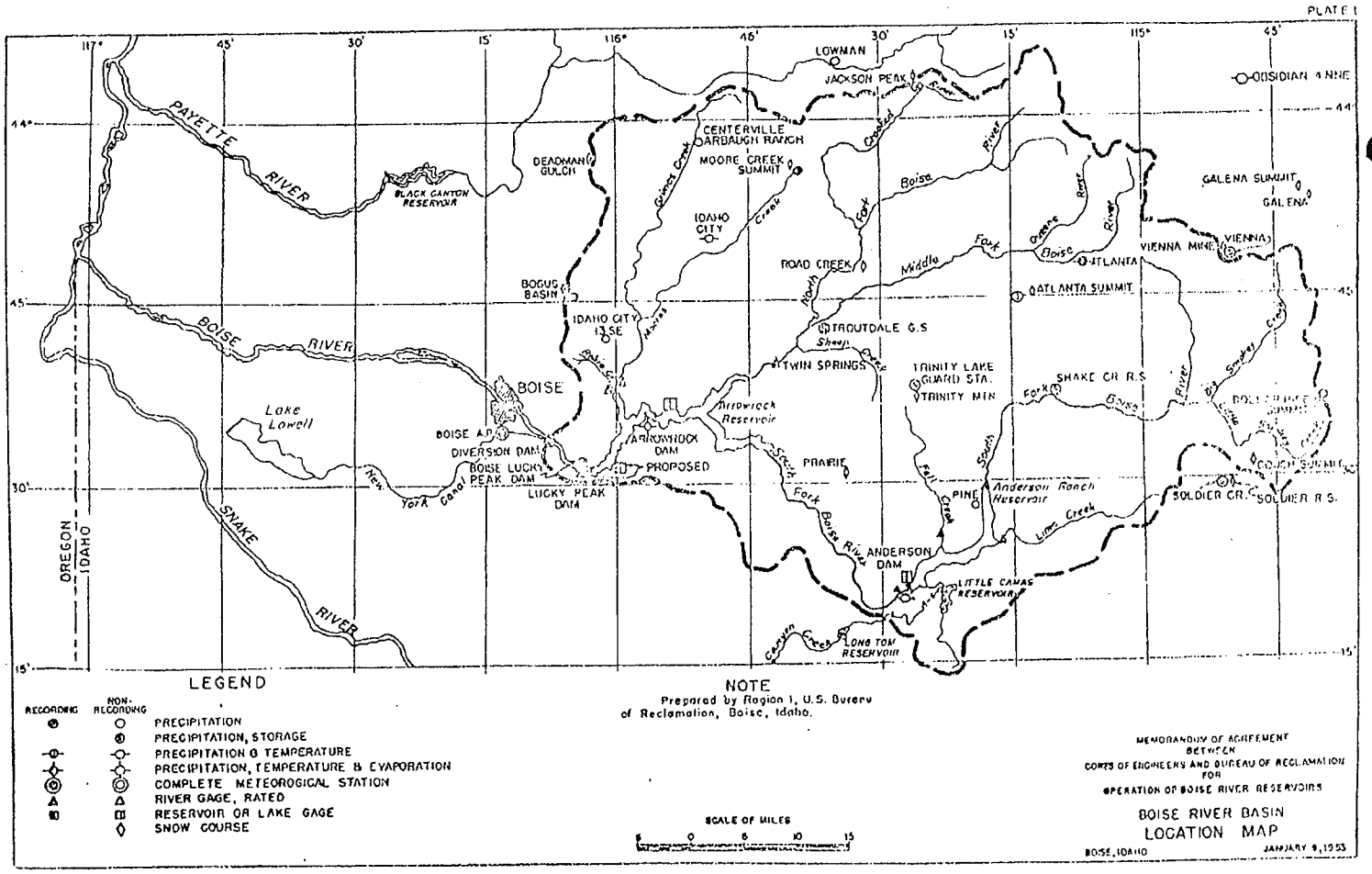
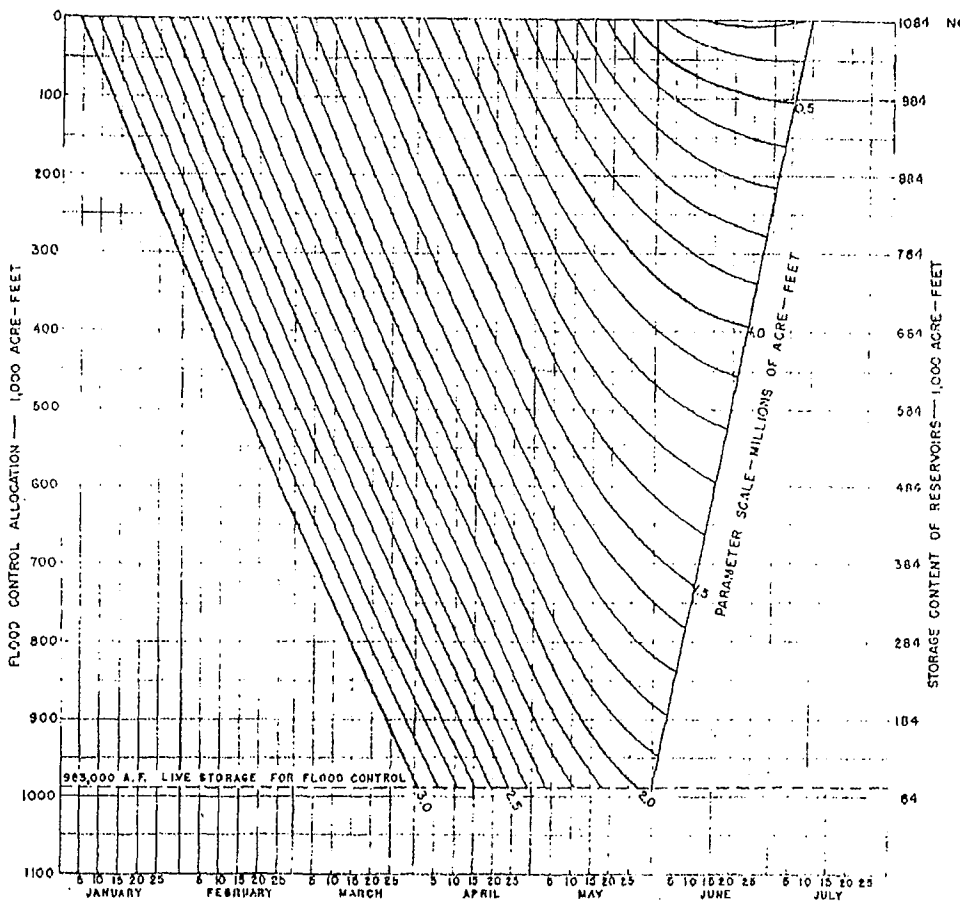

PLATE I
LOWMAN
JACKSON PEAK
OBSIDIAN MINE
CENTERVILLE
DARBAUGH RANCH
MOORE CREEK SUMMIT
DEADMAN GULCH
PAYETTE RIVER
BLACK CANYON RESERVOIR
IDAHO CITY
ROAD CREEK
BOGUS BASIN
GALENA SUMMIT
GALENA
VIENNA MINE
VIENNA
ATLANTA
ATLANTA SUMMIT
TROUTDALE G.S
TWIN SPRINGS
TRINITY LAKE GUARD STA.
TRINITY MTN
SHAKE CR R.S
BOISE RIVER
BOISE
Lake Lowell
BOISE A.D. DIVERSION DAM
BOISE LUCKY PEAK DAM
LUCKY PEAK DAM
ARROWROCK DAM
PROPOSED
Arrowrock Reservoir
PRAIRIE
PINE
Anderson Ranch Reservoir
ANDERSON DAM
LITTLE CAMAS RESERVOIR
LONG TOM RESERVOIR
SOLDIER CR.
SOLDIER R.S.
SNAKE RIVER
OREGON
IDAHO
117°
45'
30'
15'
116°
46'
30'
15'
115°
45'
44°
45'
30'
15'
LEGEND
RECORDING
NON-RECORDING
PRECIPITATION
PRECIPITATION, STORAGE
PRECIPITATION & TEMPERATURE
PRECIPITATION, TEMPERATURE & EVAPORATION
COMPLETE METEOROLOGICAL STATION
RIVER GAGE, RATED
RESERVOIR OR LAKE GAGE
SNOW COURSE
NOTE
Prepared by Region 1, U.S. Bureau of Reclamation, Boise, Idaho.
SCALE OF MILES
5 0 5 10 15
MEMORANDUM OF AGREEMENT
BETWEEN
CORPS OF ENGINEERS AND BUREAU OF RECLAMATION
FOR
OPERATION OF BOISE RIVER RESERVOIRS
BOISE RIVER BASIN
LOCATION MAP
BOISE, IDAHO
JANUARY 9, 1953

PLATE 2



NOTE: Parameters represent runoff volume anticipated at Diversion Dam between forecast date and July 31. Their spacing is based on following releases at Lucky Peak: January and February- 6,500 cfs, March- 7,865 cfs, April through July- 9,320 cfs.

To determine total vacant space required on any forecast date in all three reservoirs, select parameter corresponding to predicted runoff between that date and July 31 then read the ordinate of this parameter corresponding to forecast date. This ordinate is the total space required to control the predicted runoff at Diversion Dam.

The following allocation has been made of the acre feet of storage capacity available.

Reservoir	Flood Control	Dead	Total
Anderson Ranch	418,000	75,000*	493,000
Arrowrock	205,000	0	285,000
Lucky Peak	280,000	26,000	306,000
Total Space	963,000	101,000	1,064,000

* Additional drawdown of 5,000 acre feet may be made for power production.

At least sixty percent of this flood control space must be available in Lucky Peak and Arrowrock Reservoirs. Lucky Peak must contain a minimum of 20,000 acre feet of flood control space from November 1 to March 1 each year.

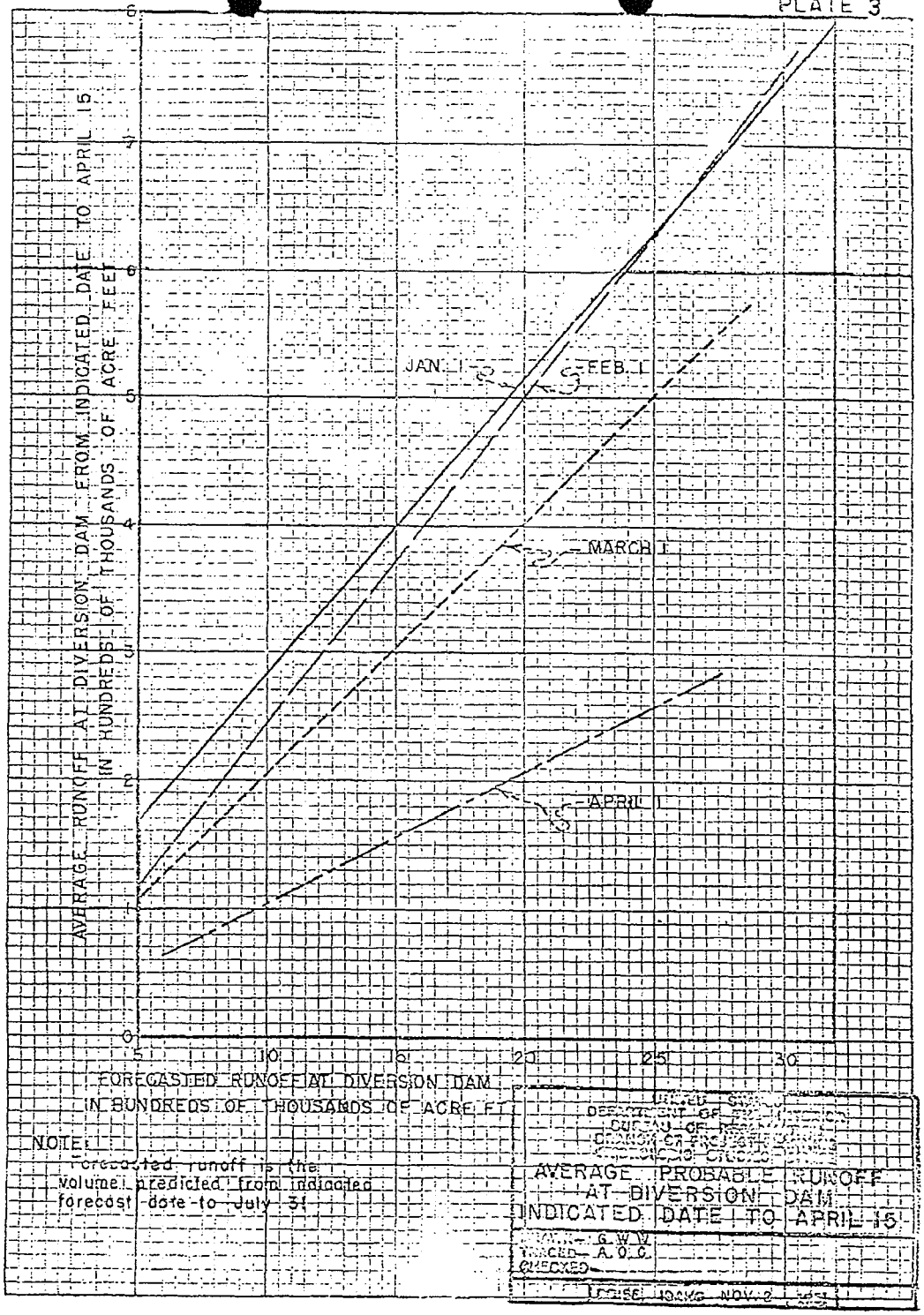
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
BRANCH OF PROJECT PLANNING
HYDROLOGIC STUDIES OFFICE

BOISE RIVER BASIN
FLOOD STORAGE ALLOCATION PARAMETERS
THREE RESERVOIR SYSTEM

DESIGNED R.W.H.
TRACED A.O.C.
CHECKED

BOISE, IDAHO 10-19, 1950

PLATE 3


AVERAGE RUNOFF AT DIVERSION DAM FROM INDICATED DATE TO APRIL 15
IN HUNDREDS OF THOUSANDS OF ACRE FEET
0
1
2
3
4
5
6
JAN. 1
FEB. 1
MARCH 1
APRIL 1
5
10
15
20
25
30
FORECASTED RUNOFF AT DIVERSION DAM
IN HUNDREDS OF THOUSANDS OF ACRE FT.
NOTE:
Forecasted runoff is the volume predicted from indicated forecast date to July 31
AVERAGE PROBABLE RUNOFF
AT DIVERSION DAM
INDICATED DATE TO APRIL 15
G.W.V.
A.D.C.
CHECKED
BOISE, IDAHO, NOV. 8

ISWS MOS 721 ACCN 34 PLOT 32

FISHERY IN RELATION TO LUCKY PEAK WATER RELEASE

MEETING - BOISE RIVER - CORPS OF ENGINEERS, SPORTSMEN, FISH & GAME

June 6, 1957

The meeting was called to order by Ross Leonard.

Introduction of Representatives

NAME	ORGANIZATION	ADDRESS
T. J. Jones, III	Idaho Fish & Game Dept	Attorney - Boise
F. E. Gaver	"	Hatchery Supt.
George F. Gould	Corps of Engineers	Walla Walla
E. C. Franzen	"	"
Myron E. Page, Jr. Col.	"	"
Melvin J. Ord	"	"
Oliver Johnson	"	North Pacific Div.
E. L. White	Bureau of Reclamation	Boise
Richard Lindgren	"	"
Wm. H. Tuller	"	"
James L. Knighton	Corps of Engineers	Lucky Peak
Edwin B. Karn	Water District 12 A	Boise
Mark R. Kulp	State Reclamation Engineer	"
Arthur Vant Hul	State Public Health Dept.	"
R. R. Edstrom	Corps of Engineers	Walla Walla
Earle L. Jester	Associated Press	Boise
Ross Leonard	Fish & Game Dept.	"
Gordon Whitaker	U. S. Bureau of Reclamation	"
Gilbert G. Stamm	"	"
Arthur S. Hale	U. S. Fish & Wildlife Service	"
Forrest Hauck	Fish & Game Dept.	"
Robert L. Hacker	U. S. Fish & Wildlife Service	Portland, Oregon
Kliess Brown	Fish & Game Dept.	Boise
Earl Coffey	Boise Chapter, I.O.A.	Boise
Forrest Sower	Boise Project Board of Control	Boise
E. G. Gulley	(Tax Payer - Fisherman)	
H. M. Wist	(Fisherman)	
James C. Simpson	Fish & Game Dept.	Boise
Bruce Bowler	Attorney	Boise

Director Ross Leonard opened discussion by reviewing the Boise River-Lucky Peak Reservoir fishery conditions and read the Commission resolution regarding the situation.

Forrest Hauck discussed the fishery problem in the Boise River.

During the spring of 1954, gates were first closed at Lucky Peak Dam. That fall a meeting was held to discuss fishery problems in relation to water cutoff, made necessary for emergency repairs.

MEAN MONTHLY DISCHARGE, BOISE RIVER AT BOISE, IDAHO
1950-57 From U.S.G.S. Records

Month	1950-1	1951-2	1952-3	1953-4	1954-5	1955-6	1956-7
October	506	251	204[c]	243	231	166	202
November	99.3[a]	111[b]	63[d]	91.4	13.9	13.9	16.2
December	187	1,208	112[e]	122	12.5	16.6	11.8
January	150	2,732	347	175	9.7	450[1]	8
February	567	2,849	378[f]	648	15.3	3,330[2]	112[3]
March	1,969	4,238	1,677	1,899	22.8	6,098	4,208[4]
April	5,330	6,255	1,371	2,755	100	4,954	
May	6,162	6,095	2,611	3,209	910	5,322	
June	3,254	2,931	6,123	2,002	1,367	3,629	
July	1,307	1,124	1,856	1,333	1,008	1,326	
August	895	831	910	863	962	986	
September	606	564	645	574	604	599	
Annual Mean	1,756	2,430	1,359	1,162	441	2,234	

a/ Below 100 for 14 days
b/ " " " 11 days
c/ 79-100 for 13 days
d/ Ranged from 30-94 (reg.)
e/ Below 100 for 4 days twice (reg.)
f/ Below 100 one day (reg.)

1/ Ranged from 10 to 1,080 (below 30 for 15 days
2/ " " 1,060 to 116 to 5,110
3/ " " 9 to 1,850
4/ " " 64 to 138 between 18-23

Aff. of David A. Jarvis, Ex.F, Pg. 162

Originally 60 days were planned for shut-off. It was during spring that water flow was below the recommended minimum of 80 cfs. For five months it was less than 23 cfs. and for 177 days it was less than the recommended minimum of 80 cfs. The wording of the agreement specified the Boise River between Lucky Peak and Diversion Dam.

In 1955-56, repair work at Lucky Peak brought a request for 45 days water shut-off. This shut-down extended over 75 days due to break in the New York Canal. During February, the minimum flow was below the 80 cfs. recommended minimum for 92 days. Again in 1956, the department was notified by phone that a water shut-off was necessary.

The Fish & Game Department is concerned with possible future effect if these shut-downs are to continue as an annual affair.

The Commission resolution followed the statement of plan regarding water use.

The department started planting of brown trout in 1950 to develop that fishery. The 80 cfs. was figured sufficient to allow survival of resident trout and to allow migration of steelhead.

Limitations in water temperatures were recognized in planning minimum flows. Brown trout were being caught from Boise to Eagle in 1953, an 11-pound brown being the largest taken. Brown were augmented with the planting of rainbow trout--legal size. Due to combination of factors, fish disappeared from the Ada County portion of the stream. Return flow downstream from Eagle is sufficient to maintain the fishery.

Chairman Leonard called for discussion of points covered. Arthur Van't Hul from the State Board of Health said that one-half part per million chlorine was maintained in sewage effluent for protection of people downstream. This can be cut down in low-water periods, but would not be done entirely due to public health reasons. He said they were not aware of potential damage to fishery of the chlorine in the water. The question was raised by H. T. Jones as to the distance between Diversion Dam and the point of sewage entrance. The answer was 12-15 miles. Mr. Leonard brought out that the economy of water was primary, but that plans should be coordinated to allow proper fishery management.

Colonel Page mentioned the first penstock closure and the meeting later to discuss minimum flows. Later they asked the Idaho State Rec. Engineer regarding what water should go down the river. They normally anticipate 5-7 days of water shut-off each year for inspection of the outlet works. It would be necessary to pump over the dam if the 80 cfs. are to be maintained. They do not feel that this is justified economically. Until it is specifically ordered, they will do nothing about it. He admitted that closures in 1955-57 were longer than necessary, but received no orders or demands otherwise, and that the original recommendations were not sufficient, especially during shut-down for overhaul. He said that the requirement was not firmed up originally and specified in the original design of the dam.

Mr. Franzen stated that they did not think the normal 5-7 days annual shut-down necessitated additional works to maintain 80 cfs. He brought out that delay in funds due to the Korean War necessitated this later shut-down for construction. The second closure was to place a steel lining on the gates. The third long shut-down was for the contractor to go back and replace seals in the outlet structure. He said that releases other than flood control is in response to order from the State of Idaho since water belongs to the state.

Attorney Bruce Bowler asked and Mr. Franzen answered that the 5-7 days have to be in a consecutive period. They may also close for 12 hours for moving the bulkhead on the six gates for repair. They have a manifold header which will handle up to 300 cfs. but it is necessary to close the main valve above which takes water off of the valve and all six gates.

Mr. Hauck brought out that drop in water flow in 1955 was from 201 to 64 cfs. in three days.

Mr. Leonard asked Mr. Karn for general overall water operating picture.

Mr. Karn said that there was no provision for storing water at Diversion and Barber dams due to a long period of proposed water shut-down.

They maintain water level in Lucky Peak for recreational purposes and they have to wait for runoff forecasts before planning water use for the year.

Mr. Karn noted there have been closures at Diversion Dam for Lake Lowell beginning in 1907-08. Ordinarily they didn't take Mores Creek water when Arrowrock was closed, except for a few times. In no case will water be taken from Anderson Ranch reservoir for Lucky Peak. There is always a possibility of closing for repairs. They can hold water at Diversion Dam for the 5-7 days. They don't consider water for fish at all because of the basic Idaho Law which doesn't include fish and fishing as a beneficial use. He mentioned that the other benefits to recreation were more than offsetting the loss in fishing. Also, when irrigation needs require, they will take all water necessary.

He also brought out that irrigation interests paid for no part of the construction of Lucky Peak Dam. He mentioned that the Mountain Home desert project will take all of the water. He said it would cost $250,000 to put in a pump to maintain the 80 cfs. and $200 a month power bill. They will do all they can to maintain fishery, but will guarantee nothing if water years are short, since farmers down the line would howl to the high heavens. He felt that the benefits of the dam and backwaters below compensate for the river loss.

Mr. Hauck brought out that the main criticism is from extreme fluctuation from 0 to 5,000-6,000 cfs. causing damage downstream.

Mr. Franzen mentioned three reasons for extreme fluctuation:

1. Building of bridge in Boise
2. Serious erosion around the city sewage plant--gravel bar and danger of damage to city of Boise.
3. Need for work on irrigation intakes by farmers downstream.

He also said that normally flows are fairly constant during flood water evacuation period. They had to catch up in anticipation of the wet period. Bruce Bowler, referring to Mr. Karn's statements, said that he felt from engineers' statements that they want to cooperate and that Mr. Karn doesn't.

Mr. Bowler said that the water from the drainage above is giving us our water. He said that the basic water rights actually are in question. He admitted that water in the drainage each year is beyond our control, and the possibility of a short water year is very remote because of the water storage development. He stated that the 80 cfs. minimum flow asked for is not out of line. He maintained that the fishery in the river does have a prior right and the sportsmen will seek to protect this right if necessary, through the courts, and that the fishery has a right prior to the preferential rights in the statute. Mr. Bowler said actual test is on the first determination of a real right. He said that they will

protect the prior water right of the fishery and that it is as much of a right as irrigation right. He called for cooperation in maintenance of fishery instead of going to court to establish the water right. The preference point is only in question when there is a simultaneous time of appropriation. We merely are going to insist on water necessary for the fishery--not the entire water supply. Water has been lost many times by default, but this one is not going to be lost in this manner. This is a problem that can well be solved and can be by cooperation between present users. So far as the water right is concerned, even the 5-7 days' closure is a violation of the right due to the fishery.

He said that he realizes that a practical method should be worked out, but that the rights of the people must be protected and they are entitled to that little bit of water to protect fishery.

The fish loss in irrigation ditches was mentioned and that if Mr. Bowler was correct, they would have to protect these fish. Mr. Bowler answered that the main channel was in question and not the ditches, also that screening laws were in effect.

Mr. Van't Hul mentioned a sewage disposal study they are going to conduct in relation to polution and felt that this will assist the fishery. He also asked Colonel Page what portion of the lake was apportioned to flood control, etc.

Mr. Ord of the corps said that if necessary Lucky Peak would be drawn down to 2,800 acres of feet, and that all three reservoirs would be operated together. The agreement is that if water is available, all three will be full about the first of July. If there is not enough water, they will hold flood storage in the reservoir. He brought out that releases should be tapered instead of rapid, sudden releases of water.

Mr. Karn said that they have received no report of damage subsequent to the 1955 meeting and asked for a statement of damages.

Mr. Leonard discussed fishing economy and related values.

Mr. Hauck pointed out that the lowering of waters in the Boise River did eliminate the fishery.

Bob Johnson said that in a pool below Barber dam he saw many fish and people were taking them out by the tub full.

Earl Coffey brought out that seagulls also take a lot of fish.

Mr. Leonard said that in emergencies it was advisable for people to take advantage of fish stranded in irrigation ditches, etc.

It was mentioned that plans on the Wood River Dam would allocate 2,000 acre feet to fishery use and maintenance.

Mr. Hauck brought out that the Fish & Wildlife Service was not aware of a report of the recreational hearing in Boise.

It was restated by Colonel Page that a 5-7 day shut-off would be normal except in emergency.

Mr. Franzen stated that other than flood control, they would release according to demands of water users. Mr. Leonard discussed the allocations of funds for fish maintenance in other projects on Snake River, and that the Boise River should have

the same type of planning and allocation of use. He also mentioned the Burns Creek allocation for fishery use.

The Yakima River and the work going on there to include the right of fishery maintenance was mentioned by Mr. Tuller. Mr. Hacker, U. S. Fish and Wildlife Service, said Lucky Peak comes under present laws and damages have not been offset, and also that boating and swimming do not offset fishery loss. Mr. Hauck brought out that the fishery in Lucky Peak reservoir does not equal fishery in the section of the river inundated.

Mr. Karn said there are no water rights except during the irrigation season.

Art Hale felt that the recommended 80 cfs. minimum flow was fair in consideration of the "cream" of the additional "free" water storage built up in Lucky Peak reservoir.

Bruce Bowler brought out that the constant flow from Mores Creek formerly maintained the fishery. Also that the question is on the entire fishery--not just trout, and that irrigators did not have the right to dry up a stream at any time. He stated also that Mr. Karn is incorrect in saying that there is no other water rights (Mr. Karn interjected "no water right of record"). Mr. Bowler appealed for a cooperative spirit to work out an agreeable plan of operation.

H. T. "Buck" Jones, Boise City Councilman, expressed thanks for the city of Boise in retarding river to take care of the gravel bar. He brought out that the effluent from Boise City sewage disposal is analyzed and that the only time it is a hazard is when Mr. Karn shuts down water to 30 cfs. or below.

Mr. Tuller discussed the repair of Diversion Dam in 1932 and from then on only 6-8 cfs. of water would leak through. No sewage disposal system at that time resulted in demands for water to flush out the river system.

Mr. Karn said that Mr. Kulp is responsible for water right allocation. Mr. Kulp said that if water right is recorded then the water master is bound to recognize water right. Fishery and sewage flushing rights not being decreed rights would be cut off first.

Perhaps going to the trouble of decreeing a right for fishery is the proper process brought out Mr. Bowler.

Mr. Kulp suggested we get together with water users to obtain a right to minimum flows in respect to water rights in Anderson Ranch and Arrowrock. He said that the water put into Lucky Peak is from water stored from rights in the other two dams. If there is any unappropriated water in Lucky Peak, they would be glad to release it for other demands.

Mr. Franzen thought that the proper course was for the state officials to get together to work out a proper use of the water unappropriated in Lucky Peak reservoir.

Mr. Bowler felt that excesses of water release would show that the 80 cfs. minimum flow could be worked out as a feasible plan.

Mr. Leonard pointed out that the meeting was to work out a feasible plan and not to give Mr. Karn a rough time. He called for another meeting to work out the plan.

Mr. Tuller mentioned the Guffey Dam and effect it would have on the situation.

The decision was made for Mr. Karn and Mr. Hauck to get together on a meeting to try and work out a suitable plan for maintenance of the fishery.

SCANLAN ENGINEERING

Groundwater and Environmental Engineering

February 25, 2004

Mike Creamer
Givens Pursley
P.O. Box 2720
Boise, ID 83701

Subject: Boise River Baseflow Data

Dear Mike:

Several years ago, I conducted an investigation of baseflow to the Boise River between Lucky Peak Dam and Boise. The investigation consisted of evaluating river gains during times of zero or near-zero discharge from Lucky Peak Dam. USGS gaging station data and a USGS Water Resource Investigation report were reviewed.

Gage Data

USGS gage data are available for stations at Lucky Peak Dam and the Capitol Boulevard Bridge.

I evaluated gage data for the 1955, 1956, 1958, 1959, and 1960 water years. No data are available for Lucky Peak Dam prior to its construction in 1954. The gage data for 1957, 1961, and 1962 were not available in the files at my office. I believe that zero discharges from Lucky Peak were infrequent after 1962 because the Idaho Department of Fish and Game obtained 50,000 acre feet of Lucky Peak storage in 1963 for water quality and fishery maintenance.

1955 Water Year. Zero discharge at Lucky Peak occurred from October 17, 1954 through February 18, 1955. During this period, flow at Capitol Boulevard declined from 98 cfs on October 20 to an average of 13.9 cfs for the month of November, 12.5 cfs for the month of December, 9.7 cfs for the month of January, and 8.4 cfs for the first 18 days of February. These data suggest a baseflow range of 8 to 14 cfs.

1956 Water Year. Lucky Peak discharge was 1 cfs from October 16 through January 16. The average gain appears to be about 12 cfs during November, December, and January.

1958 Water Year. Lucky Peak releases averaged 75 cfs in November 1957 and 62.5 cfs in December 1957. Average flows at Capitol Boulevard during these two months were 88.5 cfs and 75.2 cfs, suggesting average monthly gains of 13.5 cfs and 12.7 cfs.

1959 Water Year. Zero discharge occurred at Lucky Peak from December 2 through December 31, 1958, followed by 1 cfs discharge from January 1 through February 1, 1959. Flow declined to

600 East River Park Lane, Suite 105
Boise, Idaho 83706

Telephone (208) 463-4144
Facsimile (208) 463-4145

a minimum of 6.0 on December 21 and a minimum of 4.8 cfs on January 3. Average flow during January was 7.0 cfs. These data suggest a baseflow of 5 to 7 cfs.

1960 Water Year. Zero discharge did not occur during the 1960 water year. However, during the months of November and December, the release from Lucky Peak was held constant at 50 cfs. Mean flows for November and December at the Capitol Boulevard Bridge were 61.5 and 60.9 cfs, respectively. These data suggest an approximate 11 cfs gain during these months. Lucky Peak releases were reduced to 1 cfs for a week in January. At the end of this week, a measurement of 8 cfs was made at Capitol Boulevard Bridge, suggesting a 7 cfs gain.

USGS 1971 Study

The USGS (Thomas and Dion, 1974) evaluated stream gains during a period of 1.0 cfs Lucky Peak discharge in November 1971. They found a gain of 16.7 cfs between Lucky Peak Dam and Capitol Boulevard Bridge. The portion of gain from seeps or very short drains was 11.7 cfs, while the remaining 4 cfs came from major drainage channels. Approximately 4.0 cfs of this gain occurred between Broadway Avenue and Capitol Boulevard.

Average gain in the 10.1 mile reach above Broadway Avenue is 1.3 cfs per mile. The gain upstream from Olson City (near the present site of Warm Springs Golf Course) averaged 0.9 cfs per mile. In the 2.8 miles between Olson City and Broadway Bridge, the gain averaged 2.2 cfs per mile. The rate of gain downstream from Broadway Bridge increases significantly.

Conclusion

The data summarized above suggests that the Boise River above Broadway Avenue is a gaining stream during low flow periods. Base flow in early fall, a few weeks after the irrigation season, is in the range of 10 to 15 cfs. Baseflow appears to stabilize between 5 and 10 cfs after a few months of low flow. There is insufficient data to determine the effect of river stage on river gains.

I can furnish the data cited above on request. Please call me with any questions.

Sincerely,

Terry M. Scanlan, P.E., P.G.

1545 MSS 721 BOX 34 FILE 31

ADDRESS REPLY TO
THE DISTRICT ENGINEER
NOT TO INDIVIDUALS

CORPS OF ENGINEERS, U.S.ARMY
OFFICE OF THE DISTRICT ENGINEER
WALLA WALLA DISTRICT
BLDG. 602, CITY-COUNTY AIRPORT
WALLA WALLA, WASHINGTON

NPWGW

23 November 1954

Mr. M. B. Bowler
Idaho Wildlife Federation
McCarty Building
Boise, Idaho

Dear Mr. Bowler:

Transmitted herewith is a copy of the report on the proceedings of the 30 September meeting at Boise, concerning the closure of Boise River due to construction operations at Lucky Peak Dam.

The report has been revised in some minor respects, but remains essentially in accord with the draft copy originally furnished you. Final revision was deferred pending comments by some of the other participants.

Sincerely yours,

V. BALDWIN
EXECUTIVE ASSISTANT
FOR
A. E. MILLER
Colonel, Corps of Engineers
District Engineer

1 Incl:
rpt on 30 Sep meeting
at Boise

PROCEEDINGS OF MEETING CONCERNING PROPOSED CLOSURE OF BOISE RIVER FLOWS IN CONNECTION WITH CONSTRUCTION OF LUCKY PEAK DAM

1. The subject meeting was held at 1:15 p.m., 30 September, in the offices of the Idaho Department of Fish and Game, Boise, Idaho. In attendance were representatives of the Idaho Fish & Game Department, Idaho State Reclamation Engineer, Idaho State Department of Public Health, Corps of Engineers, U. S. Fish & Wildlife Service, Boise River Watermaster District 12A, Project Manager Boise River Board of Control and the Idaho Wildlife Federation. The individuals attending are shown on the attached list.

2. Mr. Franzen, Chief of Engineering Division, Walla Walla District, opened the meeting by explaining the need for closure of the river in connection with construction operations at Lucky Peak Dam. He stated that closure of the flow at the dam would be necessary for a period of 75 to 90 days beginning 15 October, and was occasioned by the necessity of completing the penstock portion of the outlet control tunnel. Various methods of maintaining flow in the river had been investigated, including the following:

a. Diversion by pipeline through the tunnel. - This method is impracticable because of interference with contractor's operations and, in view of the tight schedule under which the contractor is operating, would very likely extend the time required for completion as well as be a source of claim from the contractor which would be very costly to the Government.

b. Pumping over the dam. - This method, involving a pumping plant at pool level and a pipeline over the spillway, is physically feasible but costly. Preliminary estimates by the District indicated that the cost of pumping 20 c.f.s. over the dam would be approximately $75,000; an independent estimate by the Morrison-Knudsen Co. for pumping 100 c.f.s. over the dam amounted to $250,000.

c. As alternatives thereto, Mr. Franzen stated that the Boise River Water Users Board of Control and the Idaho Power Company had been contacted with regard to raising the flash boards at Diversion Dam and at Barber Dam prior to the closure and thereby maintaining pools for fish life which would also be sources of limited flow in the river during period of closure. He also stated that these problems had been discussed in 1951 not only with the Water Users Association, but also with the State Reclamation Engineer, Mr. Kulp, with a view to meeting all necessary requirements in connection with maintenance of flow in the river. The question had also been discussed at that time with Mr. Murray, then the Director of the Idaho Fish and Game Department.

3. Mr. Franzen further stated that investigations by his office indicated that complete closure of the river had been effected on

numerous occasions in the past, both at Arrowrock Dam and at Diversion Dam. He presented charts showing that during these closures the flow at Boise was in the neighborhood of 20 to 30 cubic feet per second and at Notus usually ranged from 650 to 800 c.f.s. The flow at Boise was evidently due in part to some leakage at Diversion Dam amounting to 8 or 10 c.f.s. augmented by groundwater inflow, and the flow at Notus was due almost entirely to larger inflow of groundwater below Boise. He further stated that it was the desire of the Corps of Engineers to cooperate with the State of Idaho and to do everything practicable and necessary to preserve fish life in the stream. However, the Corps did not feel warranted in expending major federal funds to provide pumping over the dam unless such measures were unquestionably shown to be necessary.

4. Mr. Leonard, Director of the Idaho Fish and Game Department stated that his responsibility and major concern was preservation of fish and wildlife in and along the river, and that he felt it necessary on behalf of the State of Idaho to be sure necessary measures to accomplish this end were taken. He stated that several plantings of trout had been made, both above and below Boise during the period of April-September 1954. His office was concerned particularly with the low flows that would exist above Boise affecting both fish and wild waterfowl, also with the effect of chlorinated effluent from the Boise sewage treatment plant below the city of Boise.

5. Mr. Clare, State Public Health Engineer of Idaho, stated that the chlorine residual in the plant effluent could be controlled, and if necessary this residual could be reduced to zero, thus eliminating this particular problem. He also emphasized the importance that assurance be provided for the prevention of creation of nuisances and possible destruction of aquatic life in Boise River. He stated the critical zone in this connection might be in stretches of the river below Middleton. 1/

1/ By a subsequent communication to the Corps of Engineers (letter of 28 October) Mr. Clare stated with reference to the meeting as follows:

"I specifically requested that the Corps maintain a check of stream conditions and provide for emergency release of water so that the flow of water in the Boise River would be increased if adverse conditions threatened or actually occurred. I further suggested that this emergency release of water might be provided by controlled releases from Diversion and Barber Dams until other arrangements for emergency release could be made, provided such release is necessary."

NOTE: It was the understanding of the Corps of Engineers representatives that the Idaho State Department of Fish and Game would maintain a check on conditions in the river as affecting fish and wildlife following the closure, and if seriously adverse conditions developed, would advise the Corps of Engineers immediately, upon which a joint investigation of the problem would be made and remedial measures considered, including those suggested by Mr. Clare. In the meantime the Corps would maintain a check on the streamflow conditions at critical points (see paragraph 9).

6. Statements were made by Messrs. Karn, Watermaster of District 12A; Sower, Project Manager, Boise Board of Control; and Humphrey, Deputy State Reclamation Engineer, supporting Mr. Franzen's statements that Boise River flows had been cut off on a number of occasions in the past in connection with Arrowrock Dam and irrigation diversion requirements for the Boise Water Users.

7. Mr. Bowler, representing the Idaho Wildlife Federation, stated that his organization was concerned with the major questions of law and policy that were involved; that he felt that the rights of the fish and wildlife interests should be given equal consideration with those of irrigation and other water users. This was a basic matter that should be solved equitably in the interests of all concerned.

8. Mr. Jewett of the U.S. Fish and Wildlife Service stated that some time ago his office made a study of the minimum water requirements in Boise River for fish and wildlife purposes and concluded that a minimum flow of 80 c.f.s. past Lucky Peak Dam was required.

9. After further discussions of the entire matter, it was agreed by all present that the Corps of Engineers should proceed with the plan outlined by Mr. Franzen. The State Department of Fish and Game would maintain close observation of conditions in the river as they affect fish and wildlife, and if serious adverse conditions appear to develop, would notify the Corps of Engineers who would then inspect the situation in the field and confer with the State as to what steps might be taken. The State Department of Health would maintain a check on the chlorine content of the effluent from the Boise sewage plant. The Corps of Engineers would make a periodic check on amount of streamflow at critical points. It was further agreed by Colonel Miller that if conditions were sufficiently serious to warrant such action, the Corps would be prepared to install necessary by-pass facilities to provide sufficient flow in the river; that this action would require approximately 30 days during which time releases of the water from pools at Diversion Dam and Barber Dam would be utilized to maintain adequate water in the river.

10. Corollary to the main question, discussion was held on the subject of maintenance of Lucky Peak pool for fish and recreational purposes and minimum releases from the dam for these purposes as part of the permanent operating plan for the project. Mr. Franzen stated in reply to questions that it was definitely planned that the pool would be maintained at or near maximum level during the summer recreational season and would not be drawn down until some time in September when necessary for irrigation purposes and/or flood control operations. This plan, he stated, could not be guaranteed to be effective every year inasmuch as the operating agreements with the Bureau of Reclamation and the Boise Water Users Association provided for additional draught from the reservoir during occasional years of critical low water flow. With regard to releases from the reservoir in the interest of downstream

fish life, he stated that this was primarily a matter for the State Reclamation Engineer inasmuch as the water was basically under the jurisdiction of the State. The Corps of Engineers are fully sympathetic with the purpose and would endeavor to work out a mutually agreeable plan for releasing surplus waters in this manner, although possibly not as much as the 80 c.f.s. recommended by Mr. Jewett. This matter will accordingly be given full joint study.

ATTENDANCE AT MEETING 30 SEPTEMBER 1954

Forest Sower	Project Manager, Board of Control	Boise, Idaho
Elmer N. Humphrey	State Reclamation	Boise, Idaho
Ross Leonard	Director, Fish & Game Dept.	Boise, Idaho
Robert L. Salter	Fish & Game Dept.	Boise, Idaho
W. M. Shaw	Fish & Game Dept.	Boise, Idaho
John W. Smith	Fish & Game Dept.	Boise, Idaho
T. D. Biladeau	Fish & Game Dept.	Boise, Idaho
W. J. Hilty	Fish & Game Dept.	Boise, Idaho
H. C. Clare	State Public Health Engineer, Idaho	(Statehouse) Boise, Idaho
Edwin B. Karn	Watermaster, District 12A	214 Broadway Boise, Idaho
Stanley G. Jewett, Jr.	U.S. Fish & Wildlife Service	Portland, Oregon
M. B. Bowler	Idaho Wildlife Federation	McCarty Bldg. Boise, Idaho
Col. A. H. Miller	Corps of Engineers	Walla Walla, Wash.
E. C. Franzen	Corps of Engineers	Walla Walla, Wash.
L. E. Rydell	Corps of Engineers	Walla Walla, Wash.
Oliver A. Lewis	Corps of Engineers	Walla Walla, Wash.
Walter J. Murphy	Resident Engineer, Lucky Peak	Lucky Peak Site

BEFORE THE DEPARTMENT OF RECLAMATION, STATE OF IDAHO

RECEIVED
JAN 24 1958
Department of Reclamation

IN THE MATTER OF APPLICATION NO. 35086 OF THE UNITED STATES OF AMERICA, ACTING THROUGH THE BUREAU OF RECLAMATION, FOR PERMIT TO APPROPRIATE AND STORE THE WATERS OF THE BOISE RIVER.

P R O T E S T

COMES NOW the State of Idaho on behalf of the Department of Fish and Game of the State of Idaho, and protests the granting of Application No. 35086, and respectfully represents that the address of the Department of Fish and Game of the State of Idaho is 518 Front Street, Boise, Idaho; and as grounds for such protest alleges as follows:

(1) That there is already pending before the Department of Reclamation of the State of Idaho Application No. 34892 to appropriate 100 cubic feet per second of the waters of the Boise River stored in Lucky Peak Reservoir, said waters being the same and identical waters sought to be appropriated by the applicant herein by Application No. 35086; and that because of this conflict, Application No. 34892 should be finally determined prior to the consideration of this Application No. 35086.

(2) That the Application No. 35086 shows in Section 19 thereof that the time required for complete application of water to proposed beneficial use is 15 years after the date set for the completion of the applicant's proposed diversion and pumping works, which is contrary to and not in accordance with the provisions of subsection 6 of Section 42-202, Idaho Code, which provides that the time required for the complete application of the water to the proposed use must be within six years after the date set for the completion of such works.

(3) That the Application No. 35086 in Section 2 thereof shows that the applicant seeks to store 307,000 acre feet of water per annum for purposes of irrigating approximately 14,400 acres of unirrigated lands for which no water has been previously appropriated, all of which is contrary to and not in accordance with the provisions of subsection 6 of Section 42-202, Idaho Code, which provides that for irrigation purposes, an applicant may not claim for storage more than 5 acre feet of water per acre of land to be irrigated.

(4) That the Application No. 35086 in Section 21 thereof shows that the applicant seeks to appropriate and store the said waters of the Boise River for purposes of entering into an "appropriate contract" whereby said waters will be immediately applied as "supplemental water" upon lands already irrigated by appropriated waters of the Boise River, that said "supplemental water" method of irrigation is not an application of the water to a beneficial use such as is contemplated by the statutes of the State of Idaho and by Article XV of the Constitution of the State of Idaho.

(5) That the Application No. 35086 in Section 21 thereof shows that the applicant seeks to appropriate and store the said waters of the Boise River for purposes of entering into an "exchange agreement" whereby the greatest portion of said waters would be "exchanged" for waters stored in Anderson Ranch Reservoir that will in turn be applied at some undetermined date in the future to lands of the "Mountain Home Project" that is not now under construction, nor proposed for construction at a determined future date, and for which construction funds have not been appropriated by the United States Congress; that the

appropriation of said waters for an uncommitted project is not an application of the water to a beneficial use, such as is contemplated by the statutes of the State of Idaho and by Article XV of the Constitution of the State of Idaho.

WHEREFORE, protestant prays that this matter be set down for hearing, after notice as provided by law, and that upon completion of said hearing, said application be dismissed and that the applicant take nothing thereby.

STATE OF IDAHO, DEPARTMENT OF FISH AND GAME OF THE STATE OF IDAHO

By _____
GRAYDON W. SMITH
Attorney General of Idaho

_____
T. J. JONES, III
Assistant Attorney General

ATTORNEYS FOR PROTESTANT
Residing at Boise, Idaho

STATE OF IDAHO,)
) ss.
County of Ada.)

ROSS LEONARD, being first duly sworn on oath, deposes and says:

That he is the Director of the Department of Fish and Game of the State of Idaho; that he has read the foregoing Protest, knows the contents thereof, and believes the facts therein stated to be true.

Ross Leonard

SUBSCRIBED AND SWORN to before me this 20th day of January, 1958.

Notary Public for Idaho
Residing at Boise, Idaho

(SEAL)

Service of the above and foregoing Protest is hereby acknowledged by receipt of a copy thereof this _____ day of January, 1958.

UNITED STATES OF AMERICA ACTING
THROUGH THE BUREAU OF RECLAMATION

By_____

R-1183

BEFORE THE DEPARTMENT OF RECLAMATION

STATE OF IDAHO,

Mark R. Kulp, State Engineer.

RECEIVED
JAN 23 1958
Department of Reclamation

In the Matter of Application No. R-35086 by the United States of America, acting through its Bureau of Reclamation, for a permit to appropriate and store public waters of the State of Idaho, in the channel of the Boise River, by the Lucky Peak Dam, under the provisions of Section 43-203, Idaho Code,

PROTEST

Comes now the Farmers' Co-Operative Ditch Company, Ltd., hereinafter designated as the protestant, and for grounds of protest, alleges:-

1.

That the protestant herein, the Farmers' Co-Operative Ditch Company, Ltd., is a mutual irrigation company, organized and existing under the laws of the State of Idaho, having its principal place of business at Parma, Canyon County, State of Idaho.

2.

That your protestant herein, now operates, and for more than the last fifty years has continuously operated a canal system, distributing the waters of Boise River upon approximately 15,500 acres of land, upon which there resides more than 300 farm-owners of the said canal company; that said lands are located on the northwesterly side of Boise River in Canyon County, Idaho.

3.

That heretofore, namely on January 18, 1906, there was allocated to this company for the use upon the said lands, by what is commonly designated as the "Stewart Decree", firm rights to the waters of Boise River, and its tributaries. This decree established in the protestant certain priority rights to said waters, and on the 14th day of February,

R-1183

1929, a certain proportion of the flood waters of the Boise River, were allocated and decreed to the lands of the protestant by what is commonly known as the "Bryan Decree". Operating under these two decrees, the waters of Boise River have been distributed to the protestant, continuously, for more than twenty-seven years.

4.

That on the 20th day of August, 1954, the applicant, the United States of America, acting by its Bureau of Reclamation, entered into a contract with the protestant, the Farmers' Co-Operative Ditch Company, Ltd., for the impounding of the natural run and the flood waters of Boise River belonging to this company in the Lucky Peak Dam, in the form of an exchange agreement, as to storage, which contract provides, among other things, as follows, to-wit:-

> "(e) This supplemental contract, notwithstanding any of the other provisions hereof, is executed on the express condition that no part of the regular and flood waters of Boise River, heretofore decreed and allocated to the Farmers' Co-Operative Ditch Company by the "Stewart" and "Bryan" decrees, shall at any time hereafter be withheld from this company and its stockholders"

5.

That your protestant herein expresses the fear that the impounding, by the applicant, and the storage of Boise River waters in the Lucky Peak Dam, for the purposes in its application set forth, will endanger the decreed rights of this company by diverting these waters to the Mountain Home Project, Hillcrest Project and a portion of the Boise Project, unless proper safeguards are imposed upon the applicant for the measurement and distribution of both the natural flow and flood waters of the Boise River, during the irrigation season.

6.

The protestant does not, however, oppose the impounding of waters in the said dam for beneficial purposes during the non-irrigation season,

so long as the rights of the protestant to those waters is not infringed upon.

7.

Your protestant further alleges that the primary purpose in the construction of the Lucky Peak Dam was for flood control, rather than for irrigation purposes; that if the said Dam is not used and operated for flood control, it imposes upon the protestant the danger of serious damage to the diversion works of the protestant, located as it is, near the headgate of the main canal of the company, located near Caldwell, Idaho.

WHEREFORE, Your protestant herein prays that the application by the petitioner be deferred until it shall file in the office of the Department of Reclamation-State of Idaho, detailed plans and specifications for the measurement and distribution of both the natural and flood waters of the Boise River in accordance with the decreed water rights of the protesting company.

By order of the Board of Directors of the Farmers' Co-Operative Ditch Company, Ltd.,

Dated and filed this 23rd day of January, 1958.

By Ernest Anderson
President and Manager.

Attest:

Agnes L. Anderson
Secretary.

Ernest Anderson
Attorney for Protestant
Residing at Parma, Idaho.

The application was presented to the State Reclamation Engineer on December 18, 1957, and such notice of application was duly made with the last date for protest to the State Reclamation Engineer being for January 27, 1958. Protests to this application were made by the Farmers' Co-Operative Ditch Co., Ltd. on January 23, 1958, and the Department of Fish and Game of the State of Idaho on January 24, 1958. These protests were timely made. Later additional protests were filed as follows: the Boise Valley Irrigation Ditch Co. on September 21, 1959; a joint protest of the New York Irrigation District, the Nampa & Meridian Irrigation District, the Boise-Kuna Irrigation District, the Wilder Irrigation District, and the Big Bend Irrigation District, on September 21, 1959; and the New Dry Creek Ditch Co. on November 2, 1959.

BEFORE THE DEPARTMENT OF RECLAMATION

STATE OF IDAHO,

George N. Carter, Engineer.

RECEIVED
JUL 9 1959
Department of Reclamation

In the Matter of the Application No. R-35086 by the United States of America, acting through its Bureau of Reclamation, for a permit to appropriate and store public waters of the State of Idaho, in the channel of the Boise River, by the Lucky Peak Dam, under the provisions of Section 43-203, Idaho Code.	)	PROTEST

COME NOW the New York Irrigation District, the Nampa and Meridian Irrigation District, the Boise-Kuna Irrigation District, the Wilder Irrigation District, and the Big Bend Irrigation District, hereinafter designated as protestants, and protest the above entitled application and for grounds of protest allege:

I

That these protestants are irrigation districts originating and existing under and by virtue of the laws of the State of Idaho, except that the Big Bend Irrigation District originated and exists under and by virtue of the laws of the State of Oregon.

That the address of the New York Irrigation District is Boise, Idaho; that the address of the Nampa and Meridian Irrigation District is Nampa, Idaho; that the address of the Boise-Kuna Irrigation District is Kuna, Idaho; that the address of the Wilder Irrigation District is Caldwell, ~~Wilder~~, Idaho; and that the address of the Big Bend Irrigation District is Route 3, Parma, Idaho.

II

That your protestants are engaged in the diversion and delivery of water for irrigation purposes to lands within the boundaries in their respective districts. That all of the irrigated lands within the boundaries of said districts are irrigated by means of water diverted from the Boise River, and that each of said districts are the owners of water rights in the waters of the Boise River or entitled to the beneficial use of such waters; that such water rights include natural stream flow rights, flood water and storage rights in Anderson Ranch Dam and Arrowrock Dam, and in some instances both natural stream flow rights and flood water rights in said Anderson Ranch Dam and Arrowrock Dam; that these protestants have diverted and delivered for irrigation upon lands within their boundaries the waters of the Boise River for a period in excess of twenty-five years.

III

That your protestants presently store or cause to be stored and divert or cause to be diverted the waters of the Boise River by means of a joint and co-ordinated plan of operations by the United States Bureau of Reclamation in the impounding of said waters in Anderson Ranch Dam and Arrowrock Dam and the impounding by the United States Army Corps. of Engineers of the waters of the Boise River in Lucky Peak Dam, and delivery of said waters to the diversion points in the channel of the Boise River of the irrigation works operated by these protestants; under which plan the impounding of the waters and the release of the same is in the best interest of

flood control of the Boise River and in the fulfillment of the needs of the irrigators in these protesting districts.

IV

That your protestants herein believe the impounding and the storage of Boise River waters in Lucky Peak Dam for the purpose of the above application and the use of said waters as set forth therein will endanger the water rights of these protestants by diverting said waters to the Mountain Home Project and the Hillcrest Project and certain areas in the Boise Project, and will disrupt and destroy the storage and the use of the waters of the Boise River under the co-ordinated plan now in effect between the Bureau of Reclamation, the United States Army Corps. of Engineers, and the Boise Project Board of Control, unless safeguards are made by the applicant in the impounding and the utilization of said waters in Anderson Ranch Dam, Arrowrock Dam and Lucky Peak Dam.

V

Your protestants further allege that the primary purpose in the construction of said Lucky Peak Dam was for flood control, and that if the use of said Dam is changed to irrigation purposes, said change in use will interfere with and impair the diversion and use of said waters of the Boise River now being made by your protestants and which have been made ever since the construction of said Luck Peak Dam.

WHEREFORE, your protestants pray that the application of the United States Bureau of Reclamation, above referred to, be deferred until it has filed in the office of the Department

of Reclamation in the State of Idaho, detailed plans for the proposed method of operation of Lucky Peak Dam for irrigation purposes; that a hearing be held upon said application; and that your protestants be permitted to appear at said hearing, and introduce evidence in support of this protest.

Dated and filed this ____ day of June, 1959.

New York Irrigation District

By Gayle Johnson

The Nampa and Meridian Irrigation District

By Robert P Brown

The Boise-Kuna Irrigation District

By C. D. Remmers.

The Wilder Irrigation District

By O W Burton

The Big Bend Irrigation District

By Joseph King

Chairmen of its Board of Directors.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
REGIONAL OFFICE, REGION 1
BOX 937, BOISE, IDAHO

IN REPLY
REFER TO: 150

APR 3 1963

State Reclamation Engineer
107 State House
Boise, Idaho

Dear Sir:

The application for reservoir permit filed by the United States of America covering the Lucky Peak Dam and Reservoir on the Boise River for irrigation purposes, has been before you since December 1957. After discussions with the parties who protested this filing, I believe that agreement has been reached as to a solution to these protests.

This solution involves confining the application of stored water to lands now entitled to receive water in the Boise Valley, leaving for further action any matter of application of Lucky Peak water to additional land until a later time. As no additional waters or lands are involved in making such a change in the wording of the application, it was thought that an amended application and a withdrawal of the protests would make it possible for you to issue the permit.

I am forwarding, therefore, for your consideration, an amended application for this filing with the belief that this amended application will meet with the approval of the irrigation protestants who have indicated objections to the original application. I am supplying a copy of this amended filing to the representatives of the protestants. It is our understanding that the protests now before you will be withdrawn in view of the amended application.

Very truly yours,

R. J. Nelson
Regional Director

Enclosure

Copy to: Ernest Anderson, Attorney, Parma, Idaho
Maurice H. Greene, Attorney, Boise, Idaho
Eugene H. Anderson, Attorney, Boise, Idaho
(with enclosure)

R-1183

STATE OF IDAHO

ROBERT E. SMYLIE
GOVERNOR

COMMISSION
GLENN STANGER IDAHO FALLS
R. J. HOLMES TWIN FALLS
ARLIE JOHNSON BOISE
WILLIAM B. DURBON MOSCOW
FRANK CULLEN COEUR D'ALENE

Fish and Game Department

JOHN R. WOODWORTH
DIRECTOR

518 FRONT STREET BOISE, IDAHO

February 27, 1964

Mr. Carl E. Tappan
State Reclamation Engineer
Department of Reclamation
107 Statehouse
Boise, Idaho

In re: THE MATTER OF APPLICATION NO. 35086 OF THE UNITED STATES OF AMERICA, ACTING THROUGH THE BUREAU OF RECLAMATION, FOR PERMIT TO APPROPRIATE AND STORE THE WATERS OF THE BOISE RIVER

Dear Mr. Tappan:

As you know, agreement has now been reached between the Idaho Fish and Game Department and the United States Department of the Interior, Bureau of Reclamation, regarding the above-mentioned application for storage permit and making available water from the yield of 50,000 acre-feet of storage capacity in Lucky Peak Reservoir for minimum wintertime releasing under the direction of the Idaho Fish and Game Department for maintaining minimum water flows in the Boise River below Boise Diversion Dam for the benefit of the fishery of said river.

In consideration of this agreement and upon the terms and conditions that the following quoted language will be incorporated as a limitation and condition on the storage permit to be issued to the United States Department of the Interior, Bureau of Reclamation, the Idaho Fish and Game Department herewith withdraws its protest against the above-mentioned application No. 35086.

Wildlife Needs Adequate Winter Living Quarters

D-1183

The language to be incorporated in the permit as a limitation and condition is:

> That the yield of water from 50,000 acre-feet of space be available for maintaining minimum wintertime flow in the Boise River below Boise Diversion Dam under a release pattern established from time to time by the Director of the Idaho Fish and Game Department.

Sincerely,

IDAHO FISH AND GAME DEPARTMENT

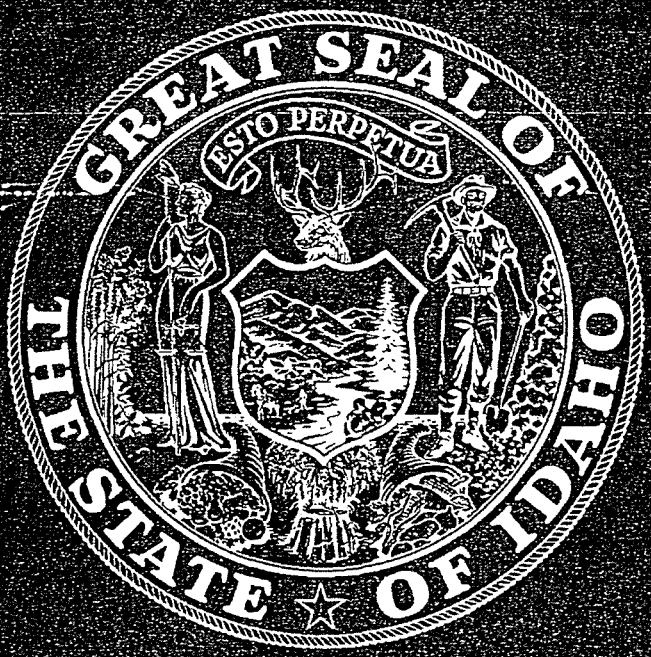
John R. Woodworth

John R. Woodworth
Director

cc: Mr. Harold T. Nelson, Regional Director
Bureau of Reclamation, Boise

p. 1183

Idaho State Water Plan



Adopted by the

Idaho Water Resource Board

January 19, 1982

STATE OF IDAHO

JOHN V. EVANS
Governor

"There shall be constituted a State Water Resource Agency composed as the Legislature may now or hereafter prescribe which shall have power to formulate and implement a state water plan for optimum development of water resources in the public interest . . ."

— Constitutional Amendment

State of Idaho

THE STATE WATER PLAN

Idaho Water Resource Board:

M. Reed Hansen
Chairman

James Shawver
Vice-Chairman

Donald R. Kramer
Secretary

Richard W. Wagner

Franklin Jones

Scott W. Reed

Herman J. McDevitt

Gene M. Gray

January 1982

A. KENNETH DUNN
DIRECTOR
IDAHO DEPARTMENT OF WATER RESOURCES
STATEHOUSE
BOISE, IDAHO 83720

Aff. of David A. Jarvis, Ex.M, Pg. 193

STATE OF IDAHO

IDAHO WATER RESOURCE BOARD

STATEHOUSE
BOISE, IDAHO 83720

January 19, 1982

To the Citizens of Idaho:

It is our pleasure to present to you The State Water Plan. Valuable time and effort has been expended by many citizens around the state in helping us develop this plan, and we gratefully acknowledge this assistance. We realize that the contents of this document may not meet the desires and expectations of every citizen, but we feel that it represents the best approach for the greatest number of Idahoans.

The success of this plan depends on how actively we all work toward its implementation. The Board looks forward to working closely with individual citizens, the legislature, and local, state and federal government to make these policies a reality.

The State Water Plan will serve Idaho only as long as it continues to reflect the needs of Idaho. The plan is subject to public and formal review at least once every five years, and this document is the result of the first formal review. We urge every citizen to monitor the plan as it is put to practical use and to suggest changes to the Board when necessary.

We seek the assistance and support of the people of Idaho so that together we may work toward providing for the future economic growth and protection of our natural resources that are so important to Idaho.

Sincerely,

M. Reed Hansen

M. REED HANSEN, Chairman
Idaho Water Resource Board

RESOLUTION TO ADOPT

January 19, 1982

The Idaho Water Resource Board is charged with the task of formulating water resource policy, and the State Water Plan has been published and distributed to the public, and public meetings and hearings have been held.

IT IS RESOLVED that the Idaho Water Resource Board hereby adopts the attached document as the State Water Plan to guide the future use and conservation of Idaho's water resources.

M. Reed Hansen, *Chairman*

James Shawver, *Vice-Chairman*

Franklin Jones

Donald R. Kramer, *Secretary*

Gene M. Gray

Richard W. Wagner

Scott W. Reed

Herman J. McDevitt

FOREWORD

The State Water Plan is the result of much thought, study and research by the Idaho Water Resource Board to fulfill the constitutional mandate "to formulate and implement a State Water Plan . . . ."

The State Water Plan is a guide to future water resource management in Idaho and results from a series of documents. In July 1972, the *Interim State Water Plan* was published. It catalogued the resources of the state and presented various alternatives for future water policy to the public. *The State Water Plan - Part One, The Objectives,* was published in June 1974 to guide the direction of later efforts to formulate the water plan. In December 1976, *The State Water Plan - Part Two* was adopted wherein several state water policies were advanced. This document is the result of the first formal review of the objectives and policies presented in parts one and two of the *State Water Plan* as previously adopted. It contains both the objectives and the policies and replaces the earlier two-part approach.

Water policy for the Snake River, Panhandle and Bear River basins is set forth within this document. *The State Water Plan* is a series of goals and recommendations to be used to guide Idaho's future water resource management. Some of these policies may pertain only to a single basin or be applicable to each basin.

Implementation of the *State Water Plan* will require changes in Idaho law and public attitudes. The Idaho Water Resource Board will work closely with the legislature to secure changes in the law where necessary. Public understanding and compromise will be required by all interests to assure the plan's full implementation. Unless the plan is implemented, there may not be sufficient water supplies left in many areas to maintain Idaho's quality of life. The Idaho Water Resource Board has found great support among the citizens of Idaho for a state water plan and is confident that it will be accepted as a process for continuing Idaho's economic growth while protecting a quality environment.

Because public priorities in economic and social conditions change, this plan will be reviewed and updated on a continuing basis, according to statute this review must take place at least once every five years. Future reviews will re-examine the need for water allocations, evaluate groundwater and water quality policies, and address other issues on the basis of opportunities to better use, protect and preserve the state's water resources for generations to come.

Former Members
Idaho Water Resource Board

Carl Tappen, Ex-officio member
Leonard E. Graham, Rigby
Evan M. Kackley, Wayan
George L. Crookham, Jr., Caldwell
Arlie L. Parkins, Marsing
LeRoy Stanger, Idaho Falls
Robert M. Bandy, Priest River
Edward Reichert, Filer
Charles J. Marshall, Jerome
Thomas Olmstead, Twin Falls
R. Keith Higginson, Boise, Ex-officio member
Ferris M. Kunz, Montpelier
John F. Streiff, Lewiston
George L. Yost, Emmett
Edwin C. Schlender, Malta
Joseph H. Nettleton, Murphy

Former Directors
Idaho Water Resource Board

Carl Tappen
Robert R. Lee
Wayne T. Haas
C. Stephen Allred

Former Directors
Idaho Department of Water Resources

R. Keith Higginson
C. Stephen Allred

Aff. of David A. Jarvis, Ex.M, Pg. 197

ACKNOWLEDGEMENTS

Formulation of *the State Water Plan* as adopted involved a great number of Idahoans from all walks of life. Citizen input was received through public opinion surveys, at information meetings, and public hearings. The contributions of the private sector as well as state, federal, and local agencies assured that a broad view of public interest will be considered in future water resource decisions. Without this citizen and agency response, a State Water Plan would not be possible.

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shoreline erosion. A continuing draft may be made until December for system power purposes if needed. Normally, the lake is at winter flood control level by December 1. Between then and spring, the lake is held at a nearly constant level. When springtime flood inflows occur, the spillway is opened allowing free flow. The lake then rises as it would without a dam. As the flood recedes, the lake is allowed to return to the normal summer level.

Priest Lake is controlled by a small dam originally constructed in 1950 and rebuilt in 1978. This structure is used during the summer to hold the lake at a nearly constant level about three feet above the natural lake summer level. Following the recreation season, the stored water is released for downstream power. The dam is operated by Washington Water Power Company under an agreement with the Idaho Department of Water Resources, owner of the dam.

The presence of an outlet control has produced a pronounced shift in outflows from July through November. The July and August outflows have been reduced by approximately 40 percent, and September outflows by about 30 percent. The October and November discharges have been increased by about 250 percent due to evacuation of storage. Discharges during the remainder of the year are relatively unaffected.

Lake Coeur d'Alene is controlled by Post Falls Dam on the Spokane River nine miles downstream from the lake outlet. Post Falls Dam is operated by Washington Water Power Company for power generation on site and at several other plants in Washington. The normal summer level of the lake is elevation 2128. Beginning in September, it is drafted three to five feet for power generation purposes. This lowering of the lake elevation also provides winter flood protection for lake shoreline properties and downstream points. Winter lake levels are quite variable as inflows fluctuate. Following spring runoff, lake levels decline to elevation 2128, the gates are closed and the dam is operated to hold the lake at that level through the summer.

Ground Water Trends

Since 1976, when the State Water Plan was adopted, ground water levels have shown a general decline throughout the state. Of the 359 wells monitored since 1976, 285 or 79 percent have shown an average decline in ground water levels of 7.54 feet. An average increase in ground water levels was indicated in 74 of the wells or 21 percent. The extremes range from an increase of 29.50 feet to a decline of 78.54 feet. Over 15,000 well logs have been filed with the Department of Water Resources in the period (see Table 4). During the same period, 4635 applications were filed to appropriate the ground waters of the state. Almost 7000 wells were drilled in the 1977-78 period apparently in response to the 1977 drought. Three times as many ground water applications were filed in 1977 than 1981.

Table 4. Numbers of Applications to Appropriate Ground Water and Well Logs Filed by Calendar Year.

Calendar Year	Ground Water Applications	Well Logs
1977	1,893	3,056
1978	663	3,764
1979	722	2,987
1980	697	2,911
1981	660	2,495
1982	4,635	15,213

Since 1976, a downward trend in the ground water levels of the Rathdrum Prairie and in the Lewiston basin has occurred while ground water levels rose slightly in the Moscow basin.

Ground water levels showed a slight downward trend in the upper Payette Valley and in the upper Weiser Valley while ground water levels rose significantly in the lower Weiser Valley. In the lower Payette Valley water levels varied only slightly.

In the Pahsimeroi Valley, moderate ground water level declines occurred while water levels rose in the Lemhi Valley and in the Salmon River Valley above Salmon, Idaho.

In central Idaho, ground water levels in Camas Creek and Silver Creek Valleys declined significantly with two wells lowering more than 30 feet. Several wells in these basins had slight to moderate increases; one well rose over 13 ft.

Declines in the ground water levels in the majority of wells on the Snake River plain range from slight to significant with a few scattered wells showing increases. The amount of decline varied with depth and location.

Ground water levels in the western Snake Plain declined slightly to significantly in areas including the Mountain Home plateau. The Cinder Cone Butte and Blue Gulch Critical Ground Water Areas are located in the Mountain Home area and Salmon Falls Creek area, respectively. Water levels in a few scattered wells rose somewhat in those areas.

Several ground water basins in southeastern Idaho flow south into Utah. Decline of the ground water levels in these basins was moderate to significant with a few wells also displaying slight to moderate increases.

Ground water levels in Raft River, Rock Creek, and Goose Creek all showed significant declines. Several of the wells had declines of more than 20 feet over the 5 year period. The Raft River, Artesian City, Cottonwood, and Oakley-Kenyon Critical Ground Water Areas are located in these drainages.

The general overall downward trend over the past five years is related to below normal precipitation the last five years and an increase in the amount of ground water being pumped.

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THE IDAHO STATE WATER PLAN

Article 15, Section 7, of Idaho's Constitution called for the formulation and implementation of a State Water Plan "for optimum development of water resources in the public interest." The state's water resources have been inventoried, problems identified, and the needs of a growing population, expanding agriculture, industrialization, and protection of the environment have been recognized and incorporated into a State Water Plan.

The State Water Plan coordinates the multiple uses of the state's water resources and considers all beneficial uses presently recognized under Idaho law. Based upon existing uses, it is a plan providing new opportunities, recognizing old and new values. This plan is based on inventories of Idaho's water supply, knowledge concerning present water use, public desires and information concerning future water needs. Idaho's water supplies are to be utilized to meet the economic and environmental needs of Idaho's citizens.

The State Water Plan is not meant to be a "fixed document" but a dynamic process which has as its purpose the protection of the quality of life enjoyed in Idaho. It includes an allocation of presently unused water for economic uses and industrial growth while at the same time providing a variety of programs to protect the natural environment. The plan does not propose specific projects but serves as a framework within which private enterprise and federal, state, and local entities can propose water resource projects.

Objectives

The State Water Plan is composed of Objectives and Policies.

The objectives are the state water planning criteria and are reviewed annually by the Water Resource Board. They are stated as follows:

1. **Beneficial and efficient water use:** The policy of the Idaho Water Resource Board is to follow a broader definition of the term "beneficial use of water" to include all water uses, both consumptive and nonconsumptive (for example, stream resource maintenance flows) and to seek implementation of those water resource projects and programs which provide for this definition through efficient water use practices.
2. **Electric energy:** The Idaho Water Resource Board adopts as a planning objective, a reduction in the reliance upon imported electric power. To achieve this objective, the state water resource policy is to promote and encourage those projects and programs which provide for the development of new electrical energy and more efficient use of existing energy sources.

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3. **Environmental quality:** The policy of the Idaho Water Resource Board is to maintain, and where possible enhance, environmental quality in Idaho.
4. **Erosion and sedimentation:** The policy of the Idaho Water Resource Board is to ensure that projects and programs adequately consider their effects with regard to the erosion and deposition of the soil.
5. **Fish and wildlife:** The policy of the Idaho Water Resource Board is to give equal consideration to the needs of fish and wildlife in any project or program designed to promote conservation, development, and optimum use of the state's water resources. The board recognizes that fish and wildlife are important elements of the state's economy and quality of life and will recommend stream maintenance flows in the basin reports.
6. **Fish-farming (aquaculture):** The policy of the Idaho Water Resource Board is to support continued growth of the aquaculture industry.
7. **Flood damage reduction:** The Idaho Water Resource Board adopts as a planning objective the preference of management over structural alternatives in reducing or preventing flooding damages.
8. **Food and fiber (agriculture):** The policy of the Idaho Water Resource Board is to seek an orderly growth of agricultural production in the state at a rate sufficient to maintain the state's current share of the national and international market.
9. **Indian lands and related water resources:** The Idaho Water Resource Board adopts as a planning objective the protection of the natural resources and community environment of Indian reservations in Idaho. To achieve this objective, the state water resource policy is to cooperate with the Indians and tribes to identify and inventory their resources as a first step toward formulation of a resource plan.
10. **Interbasin water transfer:** The Idaho Water Resource Board adopts as a planning objective opposition to interstate transfer and diversion of water from Idaho.
11. **Recreation:** The policy of the Idaho Water Resource Board is to support those projects and programs which are designed to protect and enhance recreational opportunities in Idaho.
12. **State-federal rights:** The policy of the Idaho Water Resource Board is to actively promote state control over the use and conservation of Idaho's water resources. As a positive means to help resolve the question of federal versus state jurisdiction of water uses, the Board supports the proposal for enactment of federal legislation which would require all federal rights and responsibilities to be clearly identified. This should be done in cooperation with state agencies and the effects clearly identified in the basin reports. Board-proposed projects and programs, and those brought to the Board for approval or concurrence, will be evaluated as to their effects on maintaining a strong position with regard to state control of all water uses.
13. **Wild and scenic rivers:** The policy of the Idaho Water Resource Board is to support the concept of designating selected Idaho river segments as "wild and scenic," through either federal or state programs, so that legal protection can be provided to insure that the rivers and their immediate environments are preserved for the benefit and enjoyment of present and future generations.

Will Reid, Dept. of Fish and Game, commented that 150 cfs has been identified as the practical streamflow maintenance for the Boise River from the Diversion Dam to Star diversion.

F. Dave Rydalch, Member, moved Board adoption that "streamflow maintenance from storage" is a water use in conformance with the State Water Plan and recommended director approval of the application for amendment. Robert M. Hammes, Member, seconded the motion.

Motion passed by voice vote: 8 Ayes, 0 Nays.

Gene M. Gray, Vice Chairman, moved the Board adopt a recommendation that the term of the Lucky Peak storage permit be thirty (30) years prior to review. James Shawver, Member, seconded the motion.

Motion passed by voice vote: 8 Ayes, 0 Nays.

Agenda Item No. 9. IWRB Financing Programs
a. Loan and Grant Applications
b. Bond and Inducement Resolutions
c. Boise Water Corporation Revenue Bond

a. Loan and Grant Applications. Fred Eisenbarth, department staff, advised the Board that Goose Creek Flood Control District #16 requested in a letter of December 5, 1984 the Board make a $164,000 loan to them from the Revolving Development Account for one year at nine percent interest to repair, maintain and enlarge the West Canal from Oakley Reservoir to Murtaugh Lake. The West Canal was constructed last spring to accommodate the high spring runoffs to avoid excessive flooding. The district was legally organized in August, 1984, but in accordance with Idaho law, the district is unable to levy a tax for operating money until next year. The flood control district is a legal entity and both the applicant and project do qualify for a Board loan as outlined in the rules and regulations of the Revolving Development Account.

Leland Baker, Chairman of the Goose Creek Flood Control District #16, informed the Board the district had the taxing authority, but timing was such that they could not get a tax levy on this year's tax bills.

J. D. Williams, Member, moved Board adoption of a resolution (ATTACHMENT 3) to make a $164,000 loan for one year at nine percent interest from the Revolving Development Account to Goose Creek Flood Control District #16 to be used for payment of costs associated with the repair and enlargement of the West Canal. Richard W. Wagner, Member, seconded the motion.

Motion passed by roll call vote: 8 Ayes, 0 Nays. Gray, Aye; Hammes, Aye; Jones, Aye; Kramer, Aye; Rydalch, Aye; Shawver, Aye; Wagner, Aye; and Williams, Aye.

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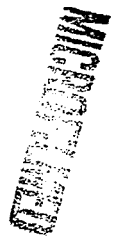
BOISE PROJECT

POWER and MODIFICATION STUDY

IDAHO-OREGON

Potential Solutions
to
Problems and Needs

Boise River Portion Only



For Agency Meeting
April 15, 1982

Bureau of Reclamation
Boise, Idaho

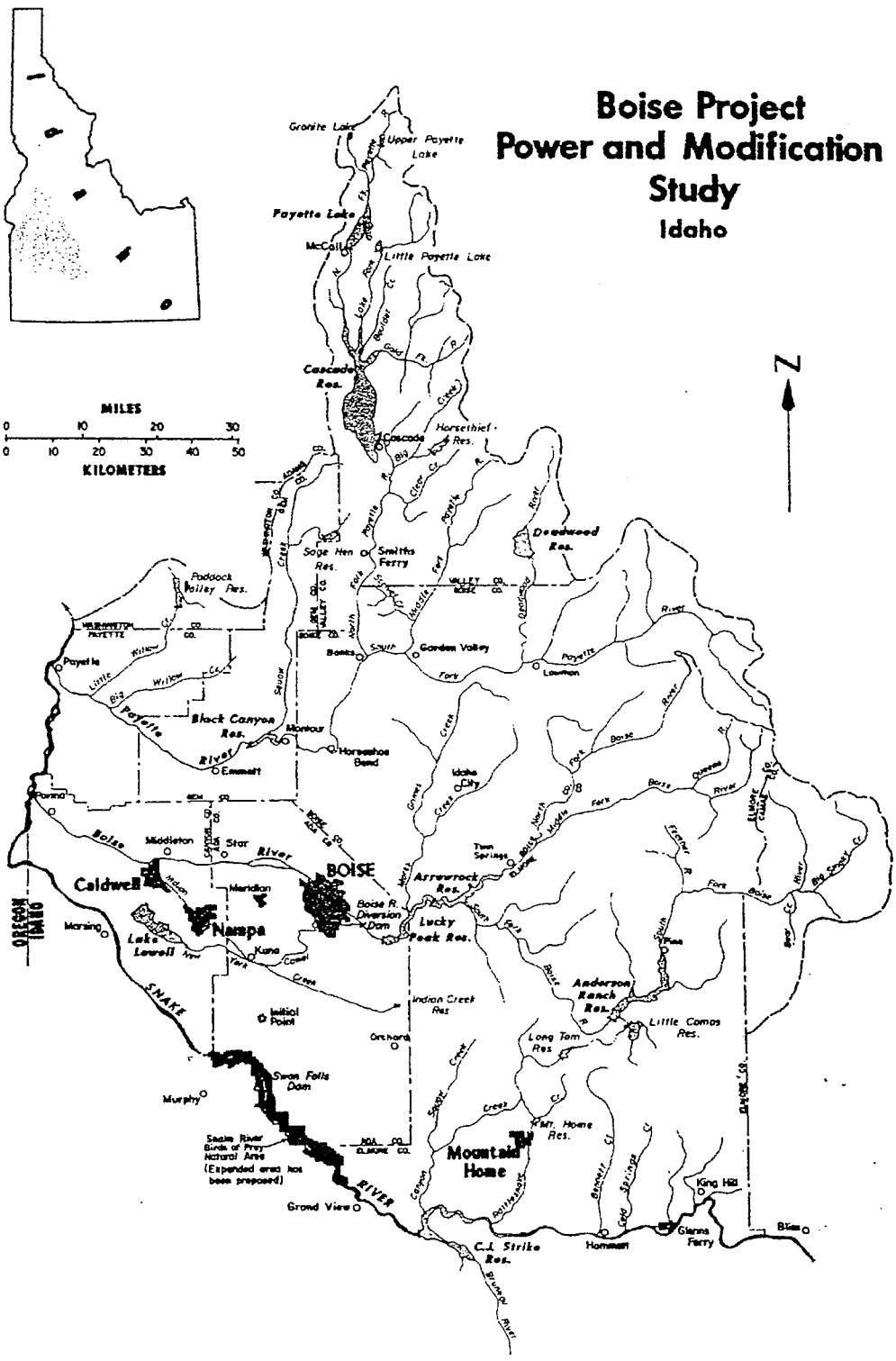
Water resource problems and needs were identified early in this study with the help of cooperating agencies and the public. Resources, problems and needs, and potential means of solving those problems were discussed in our Progress Report of October 1981.[1]

Preliminary studies have now been completed on most of the potential solutions to water resource problems in the Boise River basin (the Payette River basin studies are scheduled for completion at a later date).

This booklet summarizes the findings of the preliminary studies on:

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1/ For additional copies of the Progress Report, contact Study Coordinator Ron Golus, Bureau of Reclamation, Boise, phone (208) 334-1147 (FTS 554-1147).



October 1981

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PHOTOGRAPHIC COPY

ARROWROCK POWERPLANT

Studies to date show that a powerplant at Arrowrock Dam would be justified by benefits in excess of costs. The powerplant location and basic powerplant layout have been selected. Detailed geologic studies on the site are near completion.

Initial powerplant and reservoir operation studies have analyzed powerplants of several generating capacities, including 40 megawatts (40,000 kilowatts), 60 megawatts, and others. Detailed studies will be made on powerplants in the 50- to 80-megawatt range.

Several items must be considered in the construction of Arrowrock Powerplant. The lower tier of outlets is located at riverbed level. The gates on the outlets need replacing . If new gates were installed, the outlets could be used to help safely pass major floods. They could also eliminate the need to drain Arrowrock Reservoir to inspect the gates every few years, thus improving the reservoir fishery. Replacement of the gates in connection with powerplant construction is under study.

Access to the powerplant site on the left side of the river (looking downstream) is difficult. The existing bridge over the spillway is inadequate for powerplant construction activities. Alternative means of access are under study.

The rock bench where the powerplant would be built is under water when Lucky Peak Reservoir is full. Alternative means of dewatering the powerplant site during construction are under study. Alternatives include building a cofferdam at the site or limiting the filling of Lucky Peak Reservoir during part of the construction period.

Arrowrock Reservoir Road

The road skirting the north side of Arrowrock Reservoir is narrow and hazardous in places. The Forest Service, which manages the lands around the reservoir, is reluctant to upgrade recreational facilities at the reservoir unless the road is improved because the additional recreational traffic would make the road more hazardous.

Reclamation estimated the cost of upgrading the road, but the costs were found to exceed the benefits. Even so, the potential road improvement is still a consideration because it is needed. Justifying the improvement remains a problem.

Pumped-Storage Powerplant at Arrowrock

A pumped-storage hydropower project could be built at Arrowrock Dam. Water would be pumped from Lucky Peak Reservoir up to Arrowrock Reservoir at night or during other periods of low power demand. The water would then be released as needed through the Arrowrock Powerplant to generate high value power during periods of peak power demand.

A pump-back hydro development may be warranted in the future at Arrowrock. The potential will be evaluated during detailed planning on the proposed Arrowrock Powerplant to determine whether the plant should be designed to permit its future use as a pumped-storage installation.

There are two major obstacles to serious consideration of a pumped-storage development at Arrowrock in the near-term future. First, this general area has at least one other potential pumped-storage site with much more available head (elevation differential between the upper pool and the lower pool). Most importantly, a pumped-storage project needs plentiful power supplies for the off-peak pumping required. Southwest Idaho now has no such source of pumping power.

Additional Storage Possibilities

Additional storage capacity on the Boise River could be used to better meet water demands and provide flood control. There is a basic problem in justifying any new Boise River storage, however. In dry years, the existing reservoirs can store all or nearly all available runoff. Little or no storage yield could be credited to a new reservoir in a dry year or a series of dry years.

Three major storage possibilities remain in the basin.

1. Arrowrock Reservoir enlargement. Arrowrock Dam could be raised to provide new storage capacity. Because of the configuration of the damsite, raising the dam would be costly, however. A preliminary analysis will be made of the costs and benefits of enlarging the reservoir. It is unlikely that further studies will be warranted.

2. Lucky Peak Reservoir enlargement. The Corps of Engineers evaluated the potential for enlarging Lucky Peak Reservoir in a recent study. Based on that study and public and agency input, the Corps rejected the proposal.

3. Potential Twin Springs Reservoir. The Corps proposed the development of storage at the Twin Springs site a number of years ago. Storage at this site, which is on the Boise River just upstream from Arrowrock Reservoir, could create major power and other benefits, particularly when operated in coordination with Lucky Peak and Arrowrock Reservoirs. The Corps dropped the proposal because of opposition by the State of Idaho based on adverse effects on wildlife and other impacts. Reclamation made a brief reanalysis of the Twin Springs project during the current study. Although the dollar benefits of the project were found to slightly exceed its dollar costs, wildlife and other environmental losses would be substantial. As a result, Reclamation plans no further work on the Twin Springs project.

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BOISE R[redacted] RESERVOIR SYSTEM OPERATIONS

ALTERNATIVES STUDIED

A. Based on present reservoir operations
B. Increase Arrowrock Powerplant generation
C. Improve Boise River flows and Arrowrock minimum pool
D. Improve reservoir recreation
E. Improve flood control
F. Provide municipal and industrial water

RECOMMENDED OPERATION

The best features of the above alternatives and others studied will be combined and analyzed with the help of computer models. The goal is to develop an improved reservoir system operation to meet as many needs as possible while thoroughly protecting existing storage rights and uses.

EFFECTS OF ALTERNATIVES ON:

1--ARROWROCK POWER GENERATION

Alternatives include a 40 megawatt powerplant with existing reservoir water releases (top bar on chart). A 60 megawatt powerplant was assumed in the other alternatives, along with minor changes in the timing of water releases. In Alternative B, power generation would be further improved by assuming a minor reduction in Lucky Peak Reservoir's maximum water surface elevation in order to increase the head available for generation at Arrowrock Powerplant.

2--SYSTEM POWER GENERATION

The effects of the alternatives on the total power generation of the Boise River system are being studied. These studies assume the same Arrowrock Powerplants as in chart 1, as well as a 70 megawatt powerplant at Anderson Ranch (assumes installation of a third generating unit), the 5 megawatt powerplant now under study for Boise River Diversion Dam, and the planned 87.5 megawatt powerplant at Lucky Peak Dam.

3--BOISE RIVER FLOWS

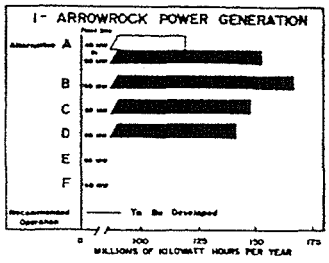
Two minimum flow levels are being studied for the Boise River below Boise River Diversion Dam. (a) An 80 cubic-foot-per-second flow is considered an absolute minimum to meet water quality and fish survival needs. That flow could be met in 46 of 50 years in each alternative. (b) A 150 cubic-foot-per-second flow was also evaluated. This is the stream resource maintenance flow recommended to insure a high quality stream and the maintenance of fish and other aquatic life.

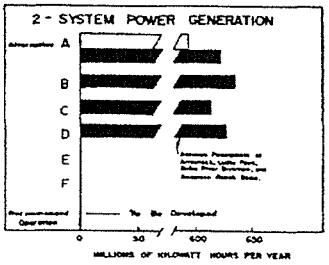
4--ARROWROCK MINIMUM POOL

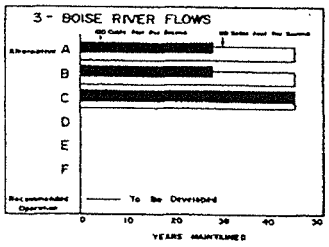
Arrowrock Reservoir now has no designated minimum pool although an attempt is made to maintain a minimum pool. Under this proposal, a minimum pool would be maintained if storage water were available in the reservoir system. No existing water rights would be affected. If a minimum pool of about 28,700 acre-feet (10 percent of total storage capacity) were maintained in Arrowrock, a good reservoir fishery should develop since trout in Arrowrock can use all three forks of the Boise River for spawning. The studies assume that the low-level outlets in Arrowrock Dam will be replaced, thus eliminating the need to drain the reservoir every few years.

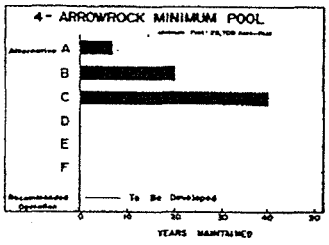
5--RESERVOIR RECREATION

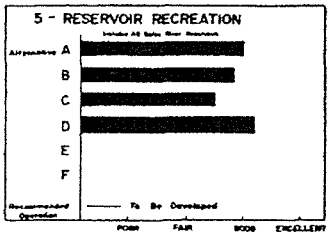
The Boise River reservoirs are already operated for recreation, with operations favoring Lucky Peak first, Anderson Ranch second, and Arrowrock last. If recreation season water levels are improved at one reservoir, the other reservoirs may be harmed when water supplies are limited. The potential for improving the operation of one or more of the reservoirs for recreation is still under study.











Lucky Peak Reservoir Uncontracted Space

The three Boise River reservoirs, Lucky Peak, Arrowrock, and Anderson Ranch, contain about 1.0 million acre-feet of active storage capacity. Nearly 90 percent of that space is under contract to specific water users or assigned to a specific use such as flood control. The remaining uncontracted space (116,250 acre-feet) is all located in Lucky Peak Reservoir.

The space is now operated for flood control and other joint uses that complement the flood control operation. In the alternative plans studied, the Lucky Peak uncontracted space was treated as joint-use space for flood control and for the particular function emphasized in each alternative. A number of other future uses have been suggested for portions of the uncontracted space, including irrigation (through the proposed water bank or other means), municipal and industrial water supplies for the Boise area, and others.

The water yield from the uncontracted space is a constraint on some new uses. Since this storage space is the last space to be filled in the Boise River system, little or no water is available for storage in a dry year. In a repetition of the actual precipitation and runoff over the 50-year study period (1928-1977), the 116,250 acre-feet of uncontracted space would yield about 30,000 acre-feet annually, based on a maximum water shortage of no more than 50 percent about once every 10 years.

Assured minimum flows are needed in the Boise River below Lucky Peak Dam. The congressional authorizations of the existing projects did not specifically provide for minimum flows, but the need for flows has become widely recognized.

Irrigation releases provide adequate streamflows during the irrigation season, about half the year. The Idaho Department of Fish and Game has 50,000 acre-feet of space in Lucky Peak Reservoir to meet minimum winter streamflow needs. The Department of Fish and Game is reluctant to release all its stored water in a given winter because of the risk that sometimes the space may not refill the next year.

It has therefore been suggested that the uncontracted reservoir space be used to provide a basic minimum flow, perhaps the 80 cubic-feet-per-second needed to meet minimum flow requirements for fish survival and for Boise's Lander Street sewage treatment plant. Studies indicate that the 80-cubic-foot-per-second flows could be provided in 46 years of the 50-year study period. If no other water were available during the 6-month nonirrigation season, a maximum of about 29,000 acre-feet would be required to maintain the 80 cubic-foot-per-second flows in dry years.

The possibility of coordinating the operation of the Idaho Department of Fish and Game's storage space and the uncontracted storage space to meet an absolute minimum 80 cubic-foot-per-second flow and a 150 cubic-foot-per-second stream resource maintenance flow whenever possible is being explored in this study. The stream resource maintenance flow is the total flow needed to maintain a viable stream and to protect fish and other aquatic life.

BOISE RIVER DIVERSION DAM POWERPLANT

A new powerplant at Boise River Diversion Dam is justified by benefits in excess of costs, based on preliminary studies. The generating capacity of the powerplant would be about 5 megawatts. Generation would average about 20 million kilowatt-hours per year. The existing powerplant would be removed from service.

The pool formed by the diversion dam has been suggested for use as a reregulating pool in order to permit power peaking releases from the proposed Lucky Peak Powerplant. This proposal was rejected because of the small size of the diversion pool (only about 1,000 acre-feet) and the excessive costs which would be involved in raising the height of the diversion dam and modifying the New York Canal headwaters at the dam.

The new powerplant would probably be a tube turbine buried in the dam's right abutment (looking downstream). A tube turbine is a horizontal turbine. It is less bulky than the traditional vertical turbine, and it is more efficient at low-head sites such as the Boise River Diversion Dam.

HISTORICAL PROPOSALS

Arrowrock and Boise River Diversion Dams are on the National Register of Historic Places. Public interpretive facilities are needed at both sites.

Historical and archeological evaluations will be made at any site to be affected by proposed developments. Adverse effects would be avoided wherever possible. Unavoidable adverse impacts would be mitigated.

Arrowrock Dam

Arrowrock Dam is a good subject for an interpretive exhibit because of its interesting construction history and engineering significance. When completed in 1915, Arrowrock Dam was the highest dam in the world. A scenic overlook could be developed along the existing road a short distance downstream from the dam. A small outdoor exhibit at that site would describe the construction of the dam and explain its importance to the area.

Boise River Diversion Dam

The Boise River Diversion Dam and the existing powerplant have potential as a major interpretive facility because of their unaltered condition and their significance to this part of Idaho. The powerplant is one of the oldest operating powerplants in the Northwest. Reclamation now has a limited interpretation program, but because of the safety hazards associated with the old equipment, visitor access to the powerplant must be restricted.

Since the existing powerplant would be taken out of service and all flows would be passed through a new powerplant, Reclamation could open the entire existing facility to the public and greatly expand the interpretive facilities. In addition, the contrast between modern design of the new power unit and the design of the existing unit could be used to illustrate the technical advances over the past 70 years.

Visitor Access to Diversion Dam

Improved visitor parking and passage across State Highway 21 are needed at Boise River Diversion Dam. Visitors to this historical site must now park on the side of the highway away from the river and cross the highway at an uncontrolled crossing. This situation will become more hazardous as visitation and traffic increase and as further improvements are made in the highway. Potential solutions to be studied include moving the parking lot to the river side of the road and improving the pedestrian crossing.

RECREATION

No recreational developments have been recommended to date. Studies of recreational potentials will continue where warranted.

Recreational Developments at Reservoirs

No recreational developments are proposed at project reservoirs at this time.

1. No improvements in recreation sites are planned at Arrowrock Reservoir because suitable sites are limited. Furthermore, the Forest Service, which manages the lands around the reservoir, does not support the development of new recreation facilities because the additional facilities would encourage more people to use the hazardous road along the reservoir.

2. No recreation development is recommended at the Boise River Diversion Dam pool because no suitable sites are available.

3. No new recreational development is proposed for Lake Lowell, the key feature of the Deer Flat National Wildlife Refuge. The U.S. Fish and Wildlife Service considers additional recreational facilities to be incompatible with the basic mission of the wildlife refuge.

Bicycle Paths

A bike path has been considered along the existing Penitentary Canal. It would extend downstream 2 miles from Boise River Diversion Dam, allowing bikers to avoid a dangerous section of State Highway 21. A non-Federal entity would probably have to share in the costs of building the path and assume the responsibility for maintaining the path. There is public support for developing the path, but no entity has stated a willingness to cost-share on it.

A second bike path extending from Boise along the New York Canal to Hubbard Reservoir near Kuna has been studied. The canal would have to be fenced. As in the case of the above bike path, no cost-sharing entity has been identified.

Although Reclamation has no authority to construct the paths at this time, other means of developing them will be explored if warranted by public interest. For example, the Idaho Department of Transportation has considered developing the Penitentary Canal bike path in the past, and the Idaho Department of Parks and Recreation has shown a recent interest in developing the path. If either of these agencies develops the Penitentary Canal bike path, Reclamation would make the Federal lands along the canal available for development if at all possible.

WATER QUALITY

Water quality problems were identified, and potential solutions to two problems were studied.

Reduce Sediment Reaching Boise River

Development of settling ponds in the Boise Valley would improve Boise River water quality by reducing the amount of sediment reaching the river from irrigation return flows. Settling ponds would be created by building small earth dams. Once a settling pond fills with silt, the area would probably be usable for farming. This gain in farmable land would provide an incentive for landowner participation.

Sites have been identified where ponds could be developed on a demonstration basis. Development could be a cooperative venture with the landowner, the Boise Project Board of Control, and Reclamation. If the demonstration ponds prove successful, landowners would likely develop additional ponds.

Improve Lake Lowell Water Quality

Several alternatives for improving water quality in Lake Lowell were studied, but none were found to be feasible at this time. Lake Lowell was developed by Reclamation. It is a large shallow irrigation reservoir located in the Deer Flat National Wildlife Refuge. Existing water quality problems include low dissolved oxygen concentrations and high phosphorus levels which increase the growth of algae. These problems restrict water sports and favor trash fish rather than game fish such as bass or crappie.

Possible solutions studied included diverting some inflows around the reservoir in new canals. The possible addition of chemicals to remove phosphorus from the water was also studied. Since the costs of each solution exceeded its benefits by a wide margin, no further studies are planned at this time.

FISH, WILDLIFE, AND ENVIRONMENTAL QUALITY

Proposals were studied for improving wildlife habitat to replace some of the habitat being lost to suburban development and other causes. Potential plan elements to enhance fishery resources and environmental quality were also evaluated.

Develop Wetland Tract at Lake Lowell

An 80-acre area at the upper end of Lake Lowell could be improved for waterfowl and other wildlife. This tract is located within the Deer Flat National Wildlife Refuge. The area is usually dry in the summer and fall and flooded by irrigation drainage water the rest of the year. Several small water control structures would be needed, and about 18 nesting islands would be constructed. Creating a permanent shallow wetland area at this site would provide quality habitat for ducks, geese, and other wetland wildlife.

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Develop Wildlife Tracts in Boise Project

Numerous isolated tracts of land in the Boise Valley have been identified as having good potential for development of improved wildlife habitat. Many of the tracts already provide some habitat, and improvements should be compatible with nearby farming operations.

A potential first phase development has been briefly evaluated. The development would consist of three tracts of land already owned by the Federal government. Improvement of these three tracts would provide wetlands and other habitat to increase goose and duck nesting and increase upland game populations. Benefits would result from hunting and other recreational use. The Idaho Department of Fish and Game would probably manage the tracts.

The second phase wildlife development would probably be much more costly because tracts would have to be purchased or easements would have to be obtained from willing landowners. About 25 isolated tracts with wildlife habitat potential have been identified. Cost-sharing would probably be required to acquire and develop some or all of these lands, and management would be by the Idaho Department of Fish and Game.

Improve Hubbard Reservoir

Hubbard Reservoir is an offstream irrigation reservoir near Kuna. The possibility of improving the reservoir and the shore area was studied. Potential improvements include developing a warm water game fishery, wildlife habitat areas, and picnic areas. Since the costs of the development would exceed its benefits by a wide margin, the potential project was dropped from further consideration.

Place Spawning Gravel in the Boise River

It was suggested that trout spawning could be improved in the Boise River by placing gravel in side channels. Suitable side channels are those that would not be dewatered during the spawning and rearing season and would not be subject to high flows that would wash out the gravels.

Non-Federal cost-sharing would be required on this project. Since the Idaho Department of Fish and Game could not state an interest in cost-sharing at this time, no further studies were made on this proposal.

Acquire Land Near Barber Dam

Barber Dam is located 2 miles downstream from Boise River Diverson Dam. The Barber pool area is recognized as important wildlife habitat. Several hundred acres are now in public ownership, and local attempts have been made to establish a park to protect this natural area.

The acquisition of three private parcels totaling 37 acres to further protect the area has been proposed. Since no dollar benefits have been identified, a decision will be needed on whether the nonmonetary environmental quality benefits are significant enough to justify the costs involved. An additional 3 to 4 acres of Reclamation lands are located near the upper end of the Barber pool. These lands could be included in any natural area that is established, whether or not the above land aquisition takes place.

OTHER HYDROPOWER

Potential pumped storage power projects were evaluated, and the potentials for low-head power development were deleted from this study.

In additon to the possibility for pumped storage hydropower at Arrowrock (discussed above), there are potentials for pumped storage projects at Anderson Ranch Reservoir and Lake Lowell. In a pumped storage project, water is pumped from a lower pool to the upper pool during periods of low power demand. The water is then released from the upper pool to generate power during periods of peak electrical demand.

At Anderson Ranch Reservoir, Little Camas Reservoir would serve as the upper reservoir. About 770 feet of head would be involved.

Much less head would be available at Lake Lowell; the Snake River would serve as the lower pool in this development. Either project would create some environmental problems.

Further studies are not warranted on these potential projects at this time because the large quanitities of relatively low-cost power needed for pumping are not now available and will not be available in the near term future.

A number of low-head hydropower sites were identified in the Boise Project system, including sites at existing canal drops and wasteways. The Boise Project Board of Control is now independently pursuing the development of all or nearly all of those sites through the Federal Energy Regulatory Commission process. The study of low-head hydro sites was therefore deleted from the current Reclamation investigation in order to avoid duplication of effort.

BOISE URBAN AREA WATER SUPPLY

Expanding suburban development around Boise is converting irrigated farmlands to residential lots. In many cases, the developers have not provided facilities to continue irrigation service. The irrigation water right still remains with the lands, but the homeowners cannot get the irrigation water, even though they must continue to pay annual water charges.

An estimated 6,500 acres in the Boise urbanized area still have water rights but cannot get irrigation water. A brief study was made of the potential for providing water to that acreage, mainly for lawn and garden irrigation. Water would be diverted from the New York Canal and other canals and delivered under pressure to individual lots. Pumping plants and a distribution system would be required.

Based on the preliminary study, the potential project appears economically feasible and environmentally acceptable. It is attractive because it appears that the cost to the landowners could be less than the cost of service from the Boise Water Corporation. It would provide the landowners with a surface water supply, and it would conserve the ground-water resource now used for municipal and industrial purposes in the Boise area.

A more detailed analysis of this proposal cannot be accomplished under the present study schedule. If there is enough support from the public and from the Boise Project Board of Control for a project to serve all or part of the area identified, detailed studies could be scheduled at a later date.

IRRIGATION SYSTEM IMPROVEMENTS FOR WATER SAVINGS

The Boise Project contains some high water-loss sections of canals and laterals that could be lined or put into pipe to reduce water losses. Preliminary studies indicate that these off-farm improvements could produce substantial water savings.

The water saved could be used for other purposes elsewhere in the system. The impacts of the water savings on ground-water recharge and reusable return flows would have to be carefully studied, however.

The distribution system improvements would be costly if considered only in relationship to the amount of water saved. However, improvements in key areas can be beneficial in distributing water efficiently and solving drainage problems. The Boise Project Board of Control is encouraged to continue and expand its program of system improvements. Further studies of system improvements by Reclamation do not appear warranted at this time.

BOISE RIVER FLOOD CONTROL

There continues to be strong public interest in reducing flood problems along the Boise River. Three partial solutions were considered: clearing trees and debris out of the river channel, reducing the problem sometimes created by irrigation diversion dams, and diverting some Boise River floodflows to the Snake River.

The second two possibilities were deleted from the study because they are not now within Reclamation's scope of responsibility. Irrigators should be encouraged to work with the Idaho Department of Water Resources and others to design diversion dams that minimize restrictions to streamflows and debris during floods and to remove temporary diversion dams when they are no longer needed.

The Corps of Engineers developed a proposal several years ago to divert Boise River floodflows through the existing canal system and to the Snake River through the Fargo Wasteway. Although that proposal was not implemented, the Board of Control is using the Fargo Wasteway to divert some floodflows. The Board of Control has partially rehabilitated the wasteway and is studying it as a potential site for a low-head hydro project. Reclamation therefore plans no studies on this item.

Removing fallen trees and debris from the Boise River channel would increase the carrying capacity of some reaches, particularly side channels where flows are now seriously restricted. Trees which have fallen or are about to fall into the river would be removed. The process should then be repeated every few years. Landowner cooperation to allow access for the work would be essential.

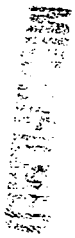
MILLENNIUM

The initial analysis indicates that the benefits of tree removal would exceed its costs. The trees to be removed would have to be carefully selected to avoid adverse effects on fish and wildlife. If there is public and agency support for this proposal, further studies by Reclamation may be warranted. The Corps of Engineers is now attempting to implement this proposal through its existing channel clearing authority. If it appears that approach will be successful, no further Reclamation studies will be made.

SAFETY FENCING OF CANALS

Canals and laterals in the Arrowrock Division of the Boise Project were considered for safety fencing if they were within a 1-mile radius of schools and parks. The Arrowrock Division includes the lands south of the Boise River. Possible locations for safety fencing were reviewed onsite, but it was found that either potentially hazardous canal reaches near schools and parks were already fenced or the waterways were safe enough that fencing is not needed. As a result of that review, no further studies are planned on safety fencing.

If hazardous canal reaches are identified in the future, determinations would be required on the extent of Federal involvement warranted, funding and cost-sharing requirements, and identification of a non-Federal entity to maintain the fence.



I N F O R M A T I O N U P D A T E

BOISE PROJECT POWER AND MODIFICATION STUDY

Bureau of Reclamation
Boise, Idaho
December 1983

This update on Reclamation's Boise Project Power and Modification Study covers the period from October 1982 to the present.

We have completed our analysis of the Boise River basin. The Regional Director's Report/Environmental compliance document is scheduled to be completed in 1984. This report will be distributed to the public after it is reviewed by Reclamation's offices in Denver and Washington, D.C.

The plan elements are those that came out of the agency and public "Workshop Recommendations," with the exception of potential wildlife developments near Kuna and Marsing which could not be included in the plan because their costs would exceed their benefits.

The plan elements are briefly described below.

Construct Arrowrock Dam Powerplant

A 60,000-kilowatt powerplant is being proposed for construction at Arrowrock Dam. The average annual generation of the powerplant would be 167,600,000 kilowatt-hours per year.

Construction measures related to the powerplant proposal would be:

a. The Arrowrock powerplant facility would be located on the basalt bench below the dam on the left side of the river (looking downstream). The powerplant structure, service yard, and switchyard would be located above the Lucky Peak Lake maximum water surface elevation of 3060 feet.

b. A cofferdam would be built around the Arrowrock Powerplant site for use during construction. The cellular cofferdam would accommodate a maximum tailwater elevation of 3050 feet. The cells would be constructed to elevation 3054 feet. The cofferdam would have two effects upon the Boise System operation. Lucky Peak Lake would be filled to elevation 3050 feet instead of 3055 feet, and the flood control operation would be modified although the powerplant site could be flooded if it was deemed to be necessary.

c. The existing access road from Arrowrock Dam to the powerplant site would be realined and widened.

Aff. of David A. Jarvis, Ex.P, Pg. 221

d. The county road that presently is the access road to Arrowrock Dam from Lucky Peak Lake would also be the construction access road. The road from Spring Shores Marina to Arrowrock Dam would be upgraded to meet current standards for county secondary highways. A portion of the road near Deer Creek, just downstream from Arrowrock Dam would require major realinement and improvement. The road improvement would begin where the existing county road pavement terminates at the Ada-Boise County line, and would end at the cattle guard located about 0.2 mile up the reservoir from the Arrowrock Dam spillway inlet. The narrow road along the spillway would be widened.

The existing Arrowrock Dam spillway bridge is inadequate to support construction traffic and a new bridge would be constructed.

e. An Arrowrock Dam overlook and interpretive facility would be developed along the road at the point downstream from Deer Creek.

Construct Boise River Diversion Dam Powerplant

A 5,000-kilowatt tubular-type powerplant would be constructed at Boise River Diversion Dam. The power facility would be located in the right abutment of the dam. It would replace the old existing power facility. The switchyard would be located across State Highway 21 next to the present parking area. The average annual generation of the powerplant would be 19,900,000 kilowatt-hours per year.

The following historical facilities would be proposed for development since the existing Boise River Diversion Dam Powerplant is among the oldest in the Northwest.

a. A stairway would be added in the present power facility to provide safe public access to the lower level of the facility where the machine shop, turbines, work benches, and some control mechanisms are located. An elevator would be installed to provide public access, including handicapped, to the lower powerplant level.

b. One of the turbines and the existing machine shop would be displayed.

c. The photo history of the project would be exhibited in the powerplant.

Wildlife Improvements

The 80-acre Leavitt Tract, which is located within the Deer Flat National Wildlife Refuge would be developed as a wetland for waterfowl.

Cloverdale Pond, which is located 1 mile east of South Cloverdale Road and 3 miles south of the Kuna-Mora road, would be improved for fish and wildlife.

Boise Reservoir Systems Operation

The proposed operation is essentially the "Workshop Recommended Operation" with revisions to the Lucky Peak Lake noncontracted space refill priority to accommodate improvements to the system flood control operation.

The objective in analyzing hydropower was to consider the existing and potential Anderson Ranch, Arrowrock, Lucky Peak, and Boise River Diversion Dam powerplants as part of a system and to maximize the total system hydropower resource and not consider each powerplant separately. The improvement of total system hydropower could be accomplished as part of an operation that considers and makes improvements in the operation for other multipurpose functions such as fish, flood control, reservoir recreation, and Boise River water quality.

The Boise Reservoir System will be operated primarily to meet the irrigation contractual obligations and flood control, and secondarily for other functions.

The system operation recommendations are listed below.

Lucky Peak Lake Noncontracted Space Assignments[1/]

The active storage capacity of Lucky Peak Lake is 278,200 acre-feet of which 116,250 acre-feet has not been placed under contract.

The 116,250 acre-feet of noncontracted space will have the following space assignments.

a. Continue the present practice of utilizing the Lucky Peak Lake space between elevations 3055 and 3060 feet (13,950 acre-feet noncontracted space) as exclusive flood control space, for short-term use only when that surcharge storage can prevent or reduce downstream flood damages.

b. Commit the remainder of the Lucky Peak Lake noncontracted space (102,300 acre-feet) to streamflow maintenance and municipal and industrial use by the Boise Water Corporation for its existing collector sites near the Boise River by the Warm Springs Golf Course and Veterans Park.

1/ The first 42,300 acre-feet of the 102,300 acre-feet of noncontracted space would accrue with storage water equally with the irrigators existing 111,950 acre-feet of space and Idaho Department of Fish and Game's existing 50,000 acre-feet of space. The remaining 60,000 acre-feet of noncontracted space would accrue with water last. The reason for operating this way is to benefit the system flood control operation.

If the water supply that accumulates in the space is not completely used for streamflow maintenance and municipal and industrial uses during 1 year, it would be carried over to the next year as streamflow maintenance and municipal and industrial water.

Improved Boise River Flows

The flow maintenance space of 102,300 acre-feet would be used to maintain an 80-ft^3/s minimum Lucky Peak Lake release to the Boise River, and the Idaho Department of Fish and Game would use its existing space (50,000 acre-feet) to provide an additional 70 ft^3/s, producing the total desired minimum flow to 150 ft^3/s. If the full 150 ft^3/s Lucky Peak Lake flow release could not be maintained, the 80 ft^3/s flow release would be provided whenever water is available. If water supplies were not available in the noncontracted space to make the 80 ft^3/s river release, the Fish and Game space water supplies could be used to maintain all or part of the 80 ft^3/s river release. If adequate water supplies were available, the Department of Fish and Game would have the option of using its water to meet other fish flow needs, such as the 225 ft^3/s flow release needed during October and November for brown trout spawning.

The most noteworthy improvement in Boise River streamflow maintenance is the designating of 102,300 acre-feet of Lucky Peak Lake noncontracted space for streamflow maintenance. Since the early 1970's water has been released from the noncontracted space to benefit streamflow maintenance as part of the system flood control operation. There were no guarantees under the past operation that water would be available for streamflow maintenance from the noncontracted space.

Boise River Minimum Streamflows--Proposed Operation

150 ft^3/s Stream Resource Maintenance Flow	80 ft^3/s Minimum Flow	90 ft^3/s Flow Past[3/] the Landers Street Sewage Treatment Plant
42 out of 50 years[1/]	48 out of 50 years[2/]	48 out of 50 years[2/]

1/ If the present operation were to continue into the future without making any of the recommended operation changes, 39 out of 50 years would be the accomplishment.

2/ Same explanation of footnote 1/ above with the accomplishment being 42 out of 50 years. Recommended operation accomplishment is significant improvement because 6 more years of flows below 80 ft^3/s would have negative impact upon river fish resources and water quality.

3/ Boise River flows, near where the Landers Street Sewage Treatment Plant discharges effluent into the river, are within water quality standards if the riverflow near the discharge point is 90 ft^3/s or greater.

Arrowrock Reservoir Minimum Pool

Whenever possible, maintain a minimum pool in Arrowrock Reservoir of about 28,700 acre-feet (10 percent of reservoir total volume) to preserve the resident trout fishery resource. This constraint has a high priority and should be violated only in case of a drought, unusual maintenance needs, or in anticipation of extremely large flood events requiring drafting to provide space to control the flood.

Reservoir Minimum Pools--Proposed Operation

Anderson Ranch 49,300 acre-ft	Arrowrock 28,700 acre-ft	Lucky Peak 28,000 ft
50 out of 50 years	43 out of 50 years[1/]	50 out of 50 years

1/ This compares to about 15 out of 50 years under the past operation.

Lucky Peak Lake Recreation Water Levels

When flood control constraints and other factors permit, Lucky Peak Lake will be filled to water-surface elevation 3032 feet as early in the spring as practical. This would benefit the boating public by improving access to launch ramps, the floating facilities at Spring Shores marina, and other recreation facilities.

Lucky Peak Lake Filled to Elevation 3032 Feet--Proposed Operation

Item	May	June	July	August	September
	-percent of years[1/]				
Recommended operation	40	96	96	90	58
If past operation were to continue without recommended changes	26	78	94	84	44

1/ The percentage represents the first of each month over the 50-year historical (1927-1977) period of analysis.

Improved System Flood Control

The new flood control rule curves developed by the Corps of Engineers for the revised Boise River System regulation manual will be made part of the operation. They improve the flood control operation by making more space available in the reservoirs to contain the runoff in wet years. The use of these curves will slightly increase the risk that all the reservoir space may not fill, especially the last 60,000 acre-feet of Lucky Peak Lake noncontracted space, which is to have a last fill priority.

South Fork of the Boise River Operation

The Anderson Ranch Third Generating Unit Addition feasibility study recommendations for the operation of the dam, powerplant, and South Fork of the Boise River below the dam will be in effect. One of the recommendations is the maintenance of minimum flow releases from Anderson Ranch Reservoir of 300 ft^3/s from April 1 through September 15 whenever water is available. This will benefit rainbow trout and other stream life.

Arrowrock Proposed Power Operation

If a powerplant is constructed at Arrowrock Dam, the Arrowrock Reservoir release pattern to Lucky Peak Lake would be modified to accommodate hydropower production. The weekly volume of water released into Lucky Peak Lake would be about the same as the present operation, but it would be released through the powerplant during the daytime high energy demand period.

Arrowrock Powerplant electrical generation can be improved by slightly altering the summer time reservoir drafting practice. When the Boise Reservoir System goes on "storage control" (outflow of Lucky Peak Lake exceeds Boise River natural flows), an initial draft of storage from Lucky Peak Lake to elevation 3050 feet (5 feet below the present summer pool level) should be accomplished prior to beginning the present practice of drafting Arrowrock Reservoir to meet irrigation demands. This 3050-foot water surface elevation in Lucky Peak Lake should then be maintained for the remainder of the summer until further drafting of Lucky Peak Lake is required to meet irrigation or other needs.

This 5-foot reduction in the Lucky Peak Lake water surface elevation (3055 to 3050 feet) during the summer months would be essential in order to maximize the system hydropower potential (Anderson Ranch and the potential Arrowrock, Lucky Peak, and Boise River Diversion Dam powerplants) for an operation that would enhance the Arrowrock Reservoir fish resources, flood control, Boise River minimum streamflows, and reservoir recreation.

System Generation--Proposed Operation
Average Annual Energy
(Million kWh/year)

Total	Anderson Ranch 1/ *70 MW*	Arrowrock 2/ *60 MW*	Lucky Peak 2/ *87.5 MW*	Boise River Diversion Dam 2/ *5 MW*
644.2	173.8	167.6	282.9	19.9

1/ The 70-MW potential includes 40 MW existing power plant generation plus a potential third 30-MW generating unit.
2/ Potential powerplant sizes as shown

The 5-foot reduction in Lucky Peak Lake water-surface elevation would require that the following recreation mitigation measures be accomplished at the lake as a part of the cost of the power project.

(1) The existing floating boat docks, which presently are made up of two or more attached sections, would be extended in most instances by adding one, two, or more sections

(2) The Chimney Rock recreation area beach and underwater slope would have to be reshaped to accommodate boats.

(3) The Robie Creek recreation complex wading and swimming beach area would require reshaping so that the existing uses can be maintained.

(4) An effective communication procedure would be established between the Spring Shores Marina operation and Reclamtion Boise Project Superintendent to accommodate the operation of the marina boat docks.

Other Related Items

A. Boise Water Corporation Municipal and Industrial Water Supplies

The Boise Water Corporation's existing Warm Springs Golf Course and Veterans Park water collector facilities, both located near the Boise River, collect about 5,000 acre-feet of water annually for distribution to domestic and industrial uses by the corporation. The water corporation and Reclamation have entered into contractual negotiations for the annual use of Boise River storage supplies by the corporation.

Before Reclamation can contract on a long-term basis with the Boise Water Corporation for Boise River System noncontracted space storage water supplies for its collector systems near the river at Warm Springs Golf

Course and Veterans Park, National Environmental Policy Act compliance (NEPA) must be accomplished. Reclamation will accomplish necessary NEPA compliance through the Boise Project Power and Modification Study effort.

Because a period of time will pass before a long-term storage contract can be finalized, a 2-year temporary contract for the purchase of 5,000 acre-feet of water has been sent to the Boise Water Corporation for its consideration.

B. Installation of High-pressure Valves on Arrowrock Dam Sluiceways

Presently a Boise Reservoir System operation constraint exists in conveying water from Arrowrock Reservoir to Lucky Peak Lake because of lack of sufficient capacity in existing Arrowrock Dam valves.

During the 1982 and 1983 flood control seasons predicted high water runoff forecasts resulted in releasing large quantities of reservoir storage water to make space in the reservoirs to store the anticipated flood runoff. Because the existing Arrowrock Dam valves are capable of releasing only a limited amount of water into Lucky Peak Lake, more water had to be released from Lucky Peak Lake than Arrowrock Reservoir could discharge into the lake. This resulted in reducing the capacity and lowering the elevation of Lucky Peak Lake to the detriment of reservoir boating.

To improve the flood control operation and Lucky Peak Lake recreation, Reclamation proposes to install high-pressure valves in Arrowrock Dam's five existing sluiceways. If the valves are installed, about 5,000 ft^3/s of additional water could be moved through them, providing for a more flexible Boise Systems operation.

It is possible that funds could be available to initiate work on the high-pressure value installation as early as 1985.

C. Irrigation Request for Lucky Peak Lake Noncontracted Water Supplies

Reclamation met with the Dry Lake irrigation group on May 9, 1983, and discussed its request for Lucky Peak Lake noncontracted space water supplies. This group of irrigators are engaged in forming activities that involve the irrigation of 20,000 to 25,000 acres of land which extends from near Lake Lowell south to the Snake River. Their present water supply is derived from ground-water wells and large pumping stations that lift water from the Snake River. They are interested in Bosie River water because it may be less expensive for irrigation than their ground water and Snake River supplies. The irrigators were provided with water supply information that they had requested at the September 1982 meeting. The availability of Lucky Peak Lake water supplies for irrigation use was discussed. The probable need for New York and Mora Canal rehabilitation and improvement in order to make use of the Lucky Peak Lake water was also discussed.

The Dry Lake irrigators have not contacted the Boise Project Board of Control or taken other action to pursue the implementation of their proposal. Since the Dry Lake irrigators have not taken further action, the workshop recommendation to request the Idaho Department of Water Resources to finalize the Lucky Peak Lake storage permit for streamflow maintenance and municipal and industrial uses has been adopted.

Information

Payette River Basin Studies

Reclamation has progressed on the preliminary studies of the Payette River basin. Several Payette River and Reservoir System operational alternatives are being analyzed.

Reclamation will be completing the preliminary study work in December and scheduling three public information meetings during the early part of 1984. The meetings will be publicized as soon as times and locations are scheduled.

* * * * * *

If you have any questions or desire additional information, please contact Ron Golus, Bureau of Reclamation, Boise Project Power and Modification Study Coordinator, phone (208) 334-1147 (FTS 554-1147).

STATE OF IDAHO
OFFICE OF THE GOVERNOR
BOISE

CECIL D. ANDRUS
GOVERNOR

July 15, 1976

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Wesley E. Peel, Major General USA
Division Engineer
Department of the Army
North Pacific Division, Corps of Engineers
210 Custom House
Portland, Oregon 97209

Dear General Peel:

It is our understanding that funding may be made available for installation of a second outlet for Lucky Peak Dam and Reservoir on the Boise River near Boise. The State of Idaho urges the Corps to vigorously seek these funds and to undertake the installation of the second outlet as soon as practicable. The second outlet project, along with the installation of a hydropower facility at Lucky Peak, is considered to be among the most important prospective public works projects in the State.

The advantages of the second outlet are considered significant for the Boise area and the State and include:

1. The elimination of the "no-flow: condition which occurs during the annual maintenance period on the present single outlet and results in degradation of the downstream fishery and stream ecology.

2. Enhancement of the prospects for continuously meeting the minimum (interim) stream resource maintenance flow of 240 CFS for the lower Boise River given in the draft State Water Plan (March, 1976).

3. Support of the objectives of the "areawide 208" planning program presently underway in the Ada and Canyon County areas.

4. Enhancement of the prospect of achieving and maintaining the State water quality standards on the lower Boise River.

You will note by the enclosed letter from the City of Boise to the Idaho Congressional Delegation that the City of Boise is also keenly interested in seeing this project funded.

Please advise me if additional information is required and of your disposition of this matter.

Sincerely,

Cecil D. Andrus

CECIL D. ANDRUS
GOVERNOR

jb

Attachment

cc: Senator Frank Church
Senator James McClure
Congressman George Hansen
Congressman Steven D. Symms
Mayor Dick Eardley, Boise
Mayor Ernest E. Starr, Nampa
Mayor Don M. Storey, Meridian
Mayor Robert E. Pasley, Caldwell
Milton G. Klein, H&W Dir.
R. Keith Higginson, Water Resources Dir.
Joseph P. Greenley, Fish & Game Dir.
Donald P. DuBois, Regional Admin., EPA
Bob Minter, 208 Project Dir., A/CAWTMC
Dr. Lee Stokes, H&W
Colonel Conover, Walla Walla Dist., COE

CITY OF TREES

RICHARD R. EARDLEY
MAYOR

JUL 07 1976
Public Works Department
Boise City, Idaho

Jim Kennedy
Dept Health & Welfare

BOISE CITY, IDAHO

COUNCIL MEMBERS
RALPH J. McADAMS, PRESIDENT
MARJORIE J. EWING, PRES. PRO-TEM
FRED L. KOPKE
BERNE K. JENSEN
JOY BUERSMEYER
CORKI ONWEILER

July 2, 1976

Senator Church & McClure
Representative Hansen & Symms

Re: Funding for Work at Lucky Peak Dam

The purpose of this letter is to request your support for legislation supporting the Corps of Engineers' request for $200,000 to construct an additional outlet at Lucky Peak Dam. Please do what you can to have this amount included in the Fiscal Year 77 appropriations for the U. S. Army Corps of Engineers.

The installation of an additional outlet is of extreme importance to the Boise Metropolitan Area and to the quality of the Boise River from Lucky Peak Dam to the Snake River. When Lucky Peak Dam was built it was built with only one outlet, and this outlet needs to be closed annually for maintenance. An additional outlet is needed to allow a minimum amount to flow in the Boise River at all times.

Without this additional outlet, the Boise River is virtually dry at our sewage treatment plant when maintenance operations are necessary at Luck Peak Dam. The U. S. Environmental Protection Agency is expecting to go to an extremely high level of treatment at our two city treatment plants in order to provide adequate protection to the environment.

Not having a minimum of water in the river is not only a problem for the City but for the U. S. Fish and Wildlife Service and the Idaho Fish and Game Department.

Although a detailed estimate has not been made as to the actual cost to the City of Boise to not have this outlet, figures range from $10 to $15 million, and probably more.

At this time, we feel that we are caught between two federal agencies; the Environmental Protection Agency telling us that if we don't get more

water we will have to go to an extremely high level of treatment, and the U. S. Army Corps of Engineers having constructed a dam that today would not be considered environmentally acceptable if an environmental impact statement were to be written.

Thank you for your consideration in this matter.

Sincerely yours,

Dick Eardley
MAYOR

dfs

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

New York Irrigation District	)	Project No. 2832
Nampa - Meridian Irrigation District	)	
Boise - Kuna Irrigation District	)	
Wilder Irrigation District	)	
Big Bend Irrigation District	)	

ORDER ISSUING LICENSE (MAJOR)
(Issued June 10, 1980)

On January 26, 1979, Boise Project Board of Control (Applicant) 1/ filed an application for a major license under Part I of the Feder Power Act (Act) for the proposed Lucky Peak Power Plant Project No. 2832. 2/ The project would be located at and develop the water power potential of the United States Army Corps of Engineers (Corps) Lucky Peak Dam, located on the Boise River in Ada County, Idaho, and would affect lands of the United States under the Corps' administration.

Notice of the application has been published in accordance with the Act. A protest was filed by the Idaho Department of Parks and Recreation on July 26, 1979, concerning the Applicant's failure to propose any recreational development.

PROJECT DESCRIPTION

The Lucky Peak Power Plant Project would be located at the downstream toe of the Corps' Lucky Peak Dam. 3/ The project would

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1/ Boise Project Board of Control was formed by five member districts, to wit: New York Irrigation District, Nampa - Meridian Irrigation District, Boise - Kuna Irrigation District, Wilder Irrigation District, and Big Bend Irrigation District. By letter filed July 3, 1979, Boise Project Board of Control requested that the above named districts be designated, collectively, as the Applicant.

2/ Authority to act on this matter is delegated to the Director, Office of Electric Power Regulation, under Section 375.308 of th Commission's regulations, 45 Fed. Reg. 21216 (1980), amending 44 Fed. Reg. 46449 (1979) and 18 C.F.R. 3.5(g) (1979).

3/ The Lucky Peak Dam, completed by the Corps in 1955, is a rolled-earth and gravel-filled structure 340 feet high and 1,700 feet long. The dam was constructed to provide irrigation and flood control. It impounds a reservoir with a usable storage capacity of about 278,200 acre-feet.

consist of: a concrete intake structure; a 1,050-foot long, 21-foot diameter, concrete and steel lined tunnel serving an outdoor-type powerhouse containing 4 generating units with a total rated capacity of 87.48 MW. The project is more fully described in ordering paragraph (B) below.

SAFETY OF STRUCTURES

The Corps stated in its comments that the Applicant's plan to construct - by blasting - a separate tunnel adjacent to the Corps' existing tunnel could jeopardize the structural integrity of the existing tunnel. The Corps, however, did not recommend an alternative scheme. Article 37 of the license requires the approval of the Corps for those project facilities that would affect the Lucky Peak Dam. Article 40 of the license also requires that a copy of the final plans and specifications be filed with the Commission's Regional Engineer in San Francisco, California, before construction commences. Should any changes in the final plans or specifications be necessary to insure the safety and adequacy of the project, the Director, Office of Electric Power Regulation, may require those changes. The Commission's staff has examined the preliminary plans for the powerhouse and intake structures. The intake structure was found to be safe under normal maximum reservoir level and earthquake loads. The powerhouse structure was found to be safe under maximum hydrostatic loading.

The safety and adequacy of the Lucky Peak Dam are the responsibility of the Corps.

ECONOMIC ANALYSIS

The Applicant, by letter dated April 4, 1980, furnished a copy of a Memorandum of Understanding with Idaho Power Company (IPC). This memorandum sets forth the preliminary agreement for the purchase of power by IPC. IPC will purchase all the project generation that is in excess of the Applicant's pumping requirements at Lake Lowell or the energy required for 1,000 hp of pumping, whichever is less. The price of the purchased power shall include:

(a) the amount required to pay the Annual Debt Service which includes the total amount of interest on the outstanding bonds, the annual amount of Trustee's fees, and the annual annuity factor;

(b) the amount required to be deposited in the Maintenance Reserve account;

(c) any taxes or FERC charges levied against the project; and

(d) an amount equal to not less than 2.0 mills per kilowatt hour for each kilowatt of project generation in each calendar year.

In addition, IPC will construct the transmission lines from the point of delivery, the high voltage bus, to interconnect with IPC's existing distribution system. Based on the Memorandum of Understar between IPC and the Applicant, and staff's analysis, the project is economically feasible.

TRANSMISSION FACILITIES AND USE OF PROJECT POWER

There would be no transmission facilities included under this license. An application was submitted on March 26, 1980, by IPC for the Lucky Peak Transmission Line Project No. 3104.

The power to be generated by the project would be used for irrigation purposes of the member districts. Surplus power would be sold to IPC for use in its service area. The City of Boise, Idaho urged that it be given preferential rates for additional energy demands required for upgrading the quality of wastewater discharged from its sewage treatment facilities into the Boise River. There is no express authorization in the Act for the Commission to require preferential rates for municipal purposes as a license condition and the City of Boise has offered no explanatic nor is it apparent, why the imposition of such a license condition requiring preferential treatment would be warranted under Section 10(g) of the Act. The imposition of such a requirement would not, under the circumstances, be appropriate.

WATER QUALITY AND MINIMUM FLOWS

Applicant has obtained a state water quality certificate for the Lucky Peak Project, in accordance with Section 401 of the Federal Water Pollution Control Act Amendment of 1972.

The City of Boise (City) and the U. S. Environmental Protection Agency recommended that a continuous minimum flow of 160 cubic feet per second be maintained to protect water quality standards and quality of fishing in the Boise River during the non-irrigatio season. Applicant has agreed to release a continuous minimum flow of 160 cfs except during critical drought years as determined by State and Federal agencies responsible for water management of the Boise River. Article 35 requires the minimum flow. During critical drought years the Applicant may request of the Commission a temporary waiver of the minimum flow requirement.

RECREATION

Existing public recreation sites near the Lucky Peak Project area include: Discovery Picnic Area, owned and operated by Idaho Depart ment of Parks and Recreation (IDPR); Observation Point (Overlook),

developed and maintained by the Corps; and Sandy Point Beach, leased from the Corps and operated by IDPR. Additionally, there are eleven developed sites and nine potential sites in the area.

Exhibit R of the subject application describes project facilities and water releases and references Exhibit W, which describes existing recreation facilities near the Lucky Peak Reservoir. No new recreational development was proposed by the Applicant.

Applicant indicated that in an effort to improve reservoir recreati it would propose a revised operating plan to the agencies involved in regulating the river when the project begins operation. This plan would allow the reservoir to be maintained at a fairly stable level all year.

IDPR found the Exhibit R filed to be totally inadequate considering the recreation opportunity that exists at the Lucky Peak site. IDPR, emphasizing licensee's responsibility to make provisions for adequate public access to project facilities and waters, discussed the desirability of developing trails for bicycling and jogging along the irrigation canals. The U. S. Department of the Interior (Interior) commented that there is a need for additional recreationa facility development at the project. Noting the proximity of the project to Boise, Interior explained that the highest visitor attendance for all recreation areas in the State of Idaho occurred at Lucky Peak in 1977. Interior suggested that a bicycle trail extending from Barber Park (located approximately 5 miles downstream from the project) to the Water and Power Resources Service (WPRS) Diversion Dam (located approximately 3 miles downstream from the project) would be an appropriate recreational development for the project. Interior recommended that the Applicant be directed to develop, in coordination with IDPR and the concerned Federal agencies, a definitive proposal for meeting recreation needs at the project.

In response to Interior's comments, Appplicant stated that its member "irrigation districts do not feel that they sould be burdened with such [recreational development] costs and indeed, are prohibitec by state law, from expending funds on other than the purpose for which they were chartered which is to provide irrigation water for the dry lands of southern Idaho".

Applicant's Exhibit C does reflect its authority under the Idaho Code and Oregon Revised Statutes to generate and sell hydroelectric power. Applicant's comments, however, raise some questions regarding its ability or willingness to comply with conditions the Commission may impose in the interests of comprehensive development pursuant to Section 10(a) of the Federal Power Act [16 U.S.C. §803(a)]. The imposition of such conditions addressing matters other than hydroelectric power generation is not optional. Section 10(a) requires that any license issued be on the condition that the project shall be "best adapted to a comprehensive plan for improving

or developing a waterway... for the improvement and utilization of water power development, and for other beneficial public uses, including recreational purposes; and if necessary in order to secure such plan the Commission shall have authority to require the modification of any project and of the plans and specifications of the project works before approval".

In light of the agency comments received, Applicant will be directed to conduct a study, in consultation with appropriate agencies, to determine the need for recreational development in the vicinity of the project and shall prepare a plan for developing recreation facilities that, based on the study completed, would be appropriately related to its hydropower development. This does not constitute prejudgment in advance of the required study what, if any, recreational development the licensee must undertake incident to the development of power at the Lucky Peak Project. It must, however, be made clear at this time that by retrofitting hydroelectric facilities to an existing dam, a licensee is not relieved of its recreational development responsibilities as a licensee under the Federal Power Act. It should also be noted that recreation facilities that are clearly related to the Federal development are the responsibility of the Corps.

The Exhibit R does not provide for the development of any recreational facilities at the project and therefore is not approved. Article 34 directs the filing of plans for developing any recreational facilities required as a result of the Licensee's study in consultatic with appropriate agencies.

CULTURAL RESOURCES

The foundation of the home of Mary Hallock Foote, a novelist, is approximately 1,080 feet south of the project. This site has been nominated for inclusion in the National Register of Historic Places. Also, Bannock and Shoshone Tribes' artifacts have been salvaged from an archeological site near Lydle Gulch. The gulch extends southward from the river valley below the Lucky Peak Dam. The artifacts are being analyzed at the University of Idaho. Lydle Gulch is eligible for inclusion in the National Register of Historic Places. The State Historic Preservation Officer (SHPO) advised that the proposed project will have no effect on archeological or historic properties in the area that are eligible for inclusion in the National Register.

Interior recommended that Applicant be required to keep the SHPO informed of all excavations and construction activities at the project site. Interior also recommended that the Applicant contact the State Office of Archeology and Historic Preservation for consideration of any archeological salvage program should artifactual material be found during construction.

Article 33 details procedures to protect any cultural resources that may be affected by the project.

FISH AND WILDLIFE RESOURCES

The Idaho Department of Fish and Game (DFG) annually plants rainbow trout, kokanee, and smallmouth bass in the Lucky Peak Reservoir. Dolly Varden is native to the Boise River, and is found both in the reservoir and below it. A rainbow and brown trout fishery is located below the WPRS's Diversion Dam downstream. Under current procedures, 50,000 acre-feet of storage capacity in Lucky Peak Reservoir is used for flow maintenance below Lucky Peak Dam. Releases are made in accordance with schedules provided by DFG.

Exhibit S, filed as part of the application, describes the fishery and wildlife resources of the project and measures designed to conserve and enhance these resources. DFG, in commenting on the application, stated that the Applicant's plan, described in Exhibit S, "should result in no long-term adverse impact on the Boise River or the fish and wildlife resources of the Boise River drainage". Exhibit S is approved and made part of this license.

OTHER ENVIRONMENTAL CONCERNS

Noise and human activities occuring during construction would have adverse, but temporary, effects on wildlife that inhabit or frequent the area. Additional traffic, noise, and dust would hamper recreation activities in the Sandy Point area. The swimming beach at Sandy Point might be closed for a short time during excavation for the powerhouse.

The adverse effects of construction upon recreation and environmental resources would be temporary and the operation and maintenance of the project would have minimal adverse environmental impacts.

Based upon the record, including agency comments and staff's independent analysis, it is concluded that issuance of a license for this project would not constitute a major Federal action significantly affecting the quality of the human environment; therefore, the preparation of an environmental impact statement is not required.

OTHER EXHIBITS

Applicant's Exhibits J, K, L, and M are approved to the extent that they generally show and describe the project. Article 43 requir filing, within one year of completion of project construction, "as-built" Exhibits A, F, and G (these exhibits replace Exhibits J, K, L, and M) to show and describe the project as finally constructed and located.

COMPREHENSIVE DEVELOPMENT

Two reservoirs located upstream of Lucky Peak Dam, Arrowrock and Anderson Ranch, are operated by WPRS. The Arrowrock Reservoir, 10 miles upstream of Lucky Peak on the Boise River, has a storage capacity of 285,000 acre-feet entirely allocated to irrigation

purposes. There are no power generating facilities at this site. The Anderson Ranch Reservoir, located on the South Fork Boise River, which flows into Arrowrock Reservoir, has a storage capacity of 423,000 acre-feet allocated to flood control and irrigation purposes. WPRS operates a 27 MW Power Plant at this site.

Flow releases from Lucky Peak, Arrowrock, and Anderson Ranch are made in accordance with a coordinated operation plan as directed jointly by the Corps, WPRS, and the member irrigation districts.

The Lucky Peak Power Plant Project would develop the head created by the Lucky Peak Dam and use flows released from the reservoir for irrigation which are not now being used to generate power. It would use a non-polluting, reusable resource to produce annually an average of 282 million kWh of electric energy, saving the equivalent of approximately 463,000 barrels of oil or 131,000 tons of coal per year.

It is concluded that the proposed project is compatible with the water resource projects in the region, and under the terms of this license, is best adapted to the comprehensive development of the Boise River.

ANNUAL CHARGES

Section 10(e) of the Act, 16 U.S.C. Section 803(e) requires the Commission to fix a reasonable annual charge to be paid to the United States for the use of a government dam. The method used historically to arrive at a charge has been the "sharing of the net benefit method". The Applicant and Idaho Power Company have entered into a memorandum of understanding for the purchase of the project's power output. Under the terms of that agreement, submitted by letter dated April 4, 1980, Idaho Power Company agreed to pay projects costs, including operation and maintenance costs and government dam use charges assessed in this license. In addition, the Company agreed to pay the Applicant benefits of at least 2 mills per kWh, subject to certain adjustments based on future Idaho Power Company steam plant construction and fuel costs and charges in operation and maintenance costs of the Lucky Peak Project. Based on the concept that the Applicant and the United States should equally share the benefits derived from power developments using government dams, the benefits to the United States would be the same as those described above that would accrue to the Applicant. Therefore, the annual charge for use of the Corps' Lucky Peak Dam would be $564,000. The Commission's staff is currently reassessing the subject of annual charges for use of government dams for the purpose of making recommendation to the Commission. Therefore, a final determination of the charge for the use of the Lucky Peak Dam will be reserved. Article 41 provides for subsequent determination of that charge, which will be not more than $564,000.

It is ordered that:

(A) This license is issued under Part I of the Federal Power Act (Act) to New York Irrigation District of Boise, Idaho; Nampa - Meridian Irrigation District of Nampa, Idaho; Boise - Kuna Irrigation District of Kuna, Idaho; Wilder Irrigation District of Coldwell, Idaho ; and Big Bend Irrigation District of Nyssa, Oregon, for a fifty-year period effective the first day of the month in which this license is issued, for the construction, operation, and maintenance of the Lucky Peak Power Plant Project No. 2832, located on the Boise River in Ada County, Idaho and utilizing the Lucky Peak Dam of the United States and appurtenant lands administered by the U. S. Army Corps of Engineers. This license is subject to the terms and conditions of the Act, which is incorporated by reference as part of this license, and subject to the regulations the Commission issues under the provisions of the Act.

(B) Project No. 2832 consists of:

(1) all lands, to the extent of the Licensee's interests in those lands, constituting the project area and enclosed by the project boundary, the project areas and boundary being shown and described by certain exhibits which form part of the application for license and which are designated and described as:

Exhibit	FERC No. 2832-	Titled
J	2	Location Map
K	3	Site Plan

(2) Project works consisting of (1) a concrete intake structure; (2) a 1,050-foot long, 21-foot diameter concrete and steel lined tunnel; (3) an outdoor-type powerhouse containing three Francis turbines, directly connected to three generators each rated at 27.54 MW and one Francis turbine directly connected to a generator rated at 4.86 MW; (4) step up transformers; (5) 13.8/138 kV generator leads; and (6) appurtenant facilities.

The location, nature, and character of these project works are more specifically shown and described by the exhibits cited above and by certain other exhibits which also form part of the application for license and which are designated and described as:

Exhibit	FERC No. 2832-	Titled
L-1	4	Intake, Tunnel, and Powerhouse - Plan, Cross Sections and Details
L-2	5	Powerhouse - Plans and Sections

Exhibit M containing general specifications of mechanical, electrica and transmission equipment and consisting of 3 pages filed on January 26, 1979.

Exhibit S consisting of 31 pages filed January 26, 1979.

(3) All of the structures, fixtures, equipment, or facilities used or useful in the operation or maintenance of the project and located within the project boundary, all portable property that may be employed in connection with the project, whether located within or outside the project boundary, as approved by the Commission, and all riparian or other rights necessary or appropriate in the operation or maintenance of the project.

(C) Exhibits J, K, L, and M designated in ordering paragraph (B) above, are approved and made a part of the license only to the extent that they show the basic location and layout of the project and its works and generally describe its mechanical and electrical equipment and appurtenances. Exhibit S, designated in ordering paragraph (B) above, is approved and made a part of the license.

(D) This license is also subject to the terms and conditions designated Articles 1 through 32 in Form L-2 (revised October 1975), entitled "Terms and Conditions of License for Unconstructed Major Project Affecting Lands of the United States," attached to and made a part of this license. This license is also subject to the following special conditions set forth as additional articles:

Article 33. Prior to the commencement of any construction or development of any project works or other facilities at the project, the Licensee shall consult and cooperate with the State Historic Preservation Officer (SHPO) to determine the need for, and extent of, any archeological or historic resource surveys and any mitigative measures that may be necessary. The Licensee shall provide funds in a reasonable amount for such activity. If any previously unrecorded archeological or historic sites are discovered during the course of construction, construction activity in the vicinity shall be halted, a qualified archeologist shall be consulted to determine the significance of the sites, and the Licensee shall consult with the SHPO to develop a mitigation plan for the protection of significant archeological or historic resources. If the Licensee and the SHPO cannot agree on the amount of money to be expended on archeological or historic work related to the project, the Commission reserves the right to require the Licensee to conduct, at its own expense, any such work found necessary.

Article 34. Licensee shall, in consultation with the Idaho Department of Parks and Recreation, the U. S. Army Corps of Engineers and the Heritage Conservation and Recreation Service of the U. S. Department of the Interior, conduct a study to determine the need for recreational development in the vicinity of its hydroelectric

project, and shall prepare a plan to provide for any recreational facilities by the Licensee. The Licensee shall, within one year from the date of issuance of this license, file with the Commission a report on the study, and for approval, its plan for developing any recreational facilities associated with Project No. 2832.

Article 35. Licensee shall discharge from the project a continuous minimum flow of 160 cubic feet per second. This flow may be modified temporarily if required by operating emergencies beyond the control of the Licensee, and for short periods for fishery management purposes upon mutual agreement between the Licensee and the Idaho Department of Fish and Game.

Article 36. The Licensee shall, to the satisfaction of the Commission's authorized representative, install and operate any signs, lights, sirens, barriers or other safety devices that may reasonably be needed to warn the public of fluctuations in flow from the project and to protect the public in its recreational use of project lands and waters.

Article 37. The design and construction of all facilities that will be an integral part of the Lucky Peak Dam shall be done in consultation with and subject to the review and approval of the U. S. Army Corps of Engineers, Walla Walla District, Walla Walla, Washington. If, within one year from the date of issuance of this license, the Licensee and the Corps have not been able to agree on the design and construction of the above facilities, then no later than that date the Licensee shall file, with a copy to the Corps, a request for resolution by the Director, Office of Electric Power Regulation, of the terms remaining in dispute. The request must include all the terms on which there is agreement and specify each term proposed by the Corps with which the Licensee disagrees, the Licensee's counter-proposal, if any, and the reason for disagreement with that term.

Article 38. The Licensee shall have no claim under this license against the United States arising from the effect of any changes made in the pool levels of the Lucky Peak Reservoir.

Article 39. The Licensee shall commence construction of the project works within two years from the effective date of this license and in good faith and with due diligence shall prosecute and complete construction of the project works within four years from the effective date of this license.

Article 40. The Licensee shall file with the Commission's Regional Engineer in San Francisco, California, and the Director, Office of Electric Power Regulation, one copy each of the contract drawings and specifications prior to the start of construction. The Director, Office of Electric Power Regulation, may require changes in the plans and specifications to ensure a safe and adequate project.

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

New York Irrigation District
Nampa-Meridian Irrigation District
Boise-Kuna Irrigation District
Wilder Irrigation District
Big Bend Irrigation District

Project No. 2832-010

ORDER SETTING MINIMUM FLOWS

(Issued April 7, 1987)

On October 1, 1986, the New York Irrigation District, the Nampa-Meridian Irrigation District, the Boise-Kuna Irrigation District, the Wilder Irrigation District, and the Big Bend Irrigation District (licensees) filed a minimum flow recommendation to protect fish and wildlife resources inhabiting the Boise River downstream of the Lucky Peak Power Plant Project during the non-irrigation season (about October 15 through April 1). This recommendation is required by article 35 of the license amended on October 9, 1980.

Article 35 requires the licensees to consult with the Water and Power Resources Service (now the Bureau of Land Management) of the Department of the Interior, the Corps of Engineers, the Idaho Department of Water Resources, and the Idaho Department of Fish and Game to determine the feasibility of releasing a continuous minimum flow of 160 cubic feet per second (cfs) from the Lucky Peak Dam during the non-irrigation season.

The licensees and the agencies have determined that a 150-cfs flow could be released from the Lucky Peak Dam without adversely affecting the flood control purposes for which the Lucky Peak Dam was built, or the fish and wildlife resources that inhabit the project area.

It is concluded that a 150-cfs flow release would adequately protect the fish and wildlife resources downstream of the power project throughout the non-irrigation season.

The Director orders:

(A) Article 35 of the license issued on June 10, 1980, as amended on October 9, 1980, is superseded by the following:

Article 35. The licensees shall discharge from the Lucky Peak Dam a continuous minimum flow of 150 cubic feet per second, during the non-irrigation season, which occurs from October 15 through April 1. This flow is needed to protect and enhance the fish and wildlife resources in the Boise River downstream of the Lucky Peak Power Plant. This flow may be temporarily modified by operating emergencies beyond the control of the licensees, and for short periods of time upon mutual agreement among the licensees and the Bureau of Land Management, the Corps of Engineers, the Idaho Department of Water Resources, and the Idaho Department of Fish and Game.

(B) This order is issued under the authority delegated to the Director and is final unless appealed to the Commission under Rule 1902 within 30 days from the date of this order.

Edward A. Abrams for
William C. Wakefield II
Acting Director, Division
of Project Management

2832

Aff. of David A. Jarvis, Ex. T, Pg. 244

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

New York Irrigation District
Nampa-Meridian Irrigation District
Boise-Kuna Irrigation District
Wilder Irrigation District
Big Bend Irrigation District

Project No. 2832-010

ORDER SUPERSEDING THE AMENDMENT TO ARTICLE 35

(May 6, 1987)

On April 7, 1987, the Director, Office of Hydropower Licensing (Director), issued an order amending article 35 to require the New York Irrigation District, the Nampa-Meridian Irrigation District, the Boise-Kuna Irrigation District, the Wilder Irrigation District, and the Big Bend Irrigation District (licensees) to maintain a 150-cubic-foot-per-second (cfs) minimum flow release at the Lucky Peak Power Project during the non-irrigation season (October 15 through April 1). This minimum flow requirement was established to protect the fish and wildlife resources inhabiting the Boise River downstream of the Lucky Peak Dam. The dam is administered by the Department of the Army, Corps of Engineers, Walla Walla District (Corps), and operated by the Corps in conjunction with the Bureau of Reclamation (BR).

During the 30-day appeal period, the licensees, the Corps, and the BR informed the Director that the licensees have a contract with the BR for use of stored water for irrigation purposes; however, the licensees have no rights to stored water for maintaining the 150-cfs minimum flow release needed to protect and enhance fish and wildlife resources during the non-irrigation season. The licensees informed the Director that the Corps maintains this minimum flow by releasing water stored in the reservoir that is allocated to the BR and IDFG. Because this minimum flow release protects and enhances the fish and wildlife resources downstream of the dam, the licensees should be relieved of the requirements stated in article 35, as amended on April 7, 1987. The licensees should, however, cooperate fully with the Corps and consult with the BR and IDFG to ensure that operation of the Lucky Peak Power Project does not adversely affect the maintenance of the minimum flow releases needed to protect the fish and wildlife resources inhabiting the Boise River downstream of the project.

The Director orders:

(A) Article 35 of the order issued on April 7, 1987, is superseded by the following:

Article 35. The licensees shall cooperate with the Department of the Army, Corps of Engineers, Walla Walla District (Corps) and consult with the Bureau of Reclamation and the Idaho Department of Fish and Game regarding the operation of the Lucky Peak Power Project. The cooperation and consultation are needed to ensure that operation of the hydroelectric facility is within the guidelines the Corps has established for the operation of the Lucky Peak Dam, and to ensure that operation of the generation facility does not adversely affect the minimum flows being released for the protection and enhancement of fish and wildlife resources inhabiting the Boise River downstream of the Lucky Peak Dam.

(B) This order is issued under the authority delegated to the Director and is final unless appealed to the Commission under Rule 1902 within 30 days from the date of this order.

William C. Wakefield II
Acting Director, Division
of Project Management

2832

Aff. of David A. Jarvis, Ex.U, Pg. 245

RECEIVED
JUL 19 1982
Department of Water Resources

United States Department of the Interior

BUREAU OF RECLAMATION
PACIFIC NORTHWEST REGION
FEDERAL BUILDING & U.S. COURTHOUSE
BOX 043 - 550 WEST FORT STREET
BOISE, IDAHO 83724 - 0430

IN REPLY REFER TO: PN 704
500.2

JUL 16 1982

Mr. A. Kenneth Dunn, Director
Idaho Department of Water Resources
450 West State Street
Boise, Idaho 83702

Dear Mr. Dunn:

The Bureau of Reclamation conducted a Boise Project Power and Modification Study workshop in the Federal Building in Boise, Idaho, on June 24, 1982, with the purpose being the development of a "workshop recommended plan" for the Boise basin portion of the study.

Enclosed for your information are copies of the Workshop Recommended Plan (Enclosure A), Proposed Boise River System Operation Changes, including Workshop Stipulations and Actions to be Taken (Enclosure B), and a listing of workshop participants (Enclosure C).

We intend to prepare designs and estimates for a 60,000-kilowatt power facility at Arrowrock Dam and complete detailed studies for the Boise basin portion of the study. We will also intensify our Payette basin study analysis.

We appreciate the interest you have taken in the study and public involvement activities and your participation in the workshop.

If you have any questions, please direct them to Ron Golus, Boise Project Power and Modification Study Coordinator.

Sincerely yours,

Robert J. Riley

Acting Regional Planning Officer

Enclosures

cc: Norman Young, Idaho Department of Water Resources, 450 West State Street, Boise, Idaho 83702
(w/enclosures)

CERTIFIED COPY

Enclosure A

BOISE PROJECT POWER AND MODIFICATION STUDY
BUREAU OF RECLAMATION

WORKSHOP RECOMMENDED PLAN

The workshop was held in the Boise Federal Building on Thursday, June 24, 1982.

The workshop recommended plan for the Boise basin portion of the study is as follows:

1. Lucky Peak noncontracted space be assigned to (a) maintain Boise River minimum streamflows and (b) municipal and industrial use by the Boise Water Corporation by its three collectors adjacent to the Boise River in the vicinity of Warm Springs Golf Course and another collector adjacent to the river in the vicinity of Veterans State Park. The three collectors near the Warm Springs Golf Course have been operated under a state ground water permit since 1952. The other collector is not yet in operation.

2. Maintain an Arrowrock Reservoir minimum pool of 28,700 acre-feet for fish as long as the Boise system irrigation and flood control constraints are met.

3. Lucky Peak Reservoir Recreation

a. Try to fill reservoir to elevation 3032 feet as early as possible during spring to improve boating season. (Full reservoir pool is at elevation 3055 feet.)

b. Try to maintain a nonfluctuating reservoir pool during the summer recreation season.

c. Any opportunities to vary the operation of Lucky Peak Reservoir in August, such as the starting of a gradual drawdown of Lucky Peak Reservoir sometime in August for purposes of extending the maintenance of a near full reservoir prior to significantly reducing reservoir volume due to mandatory irrigation releases, should be agreed upon through annual Idaho Boaters Association discussion with the Bureau of Reclamation Central Snake Projects Office in Boise.

4. Boise System Hydropower

If an Arrowrock powerplant is constructed, a 5-foot change in Lucky Peak Reservoir maximum full pool elevation from 3055 feet to 3050 feet during the

---

1/ A contract for purchase of the water supply by Boise Water Corporation would have to be consummated before the beneficial use of noncontracted space for municipal and industrial purposes can be satisfied.

summer months to increase Boise system hydropower production was generally acceptable to workshop participants. Further study is required to determine whether more or less drawdown would be acceptable.

5. Improve Boise system flood control operation by rehabilitating and/or replacing Arrowrock Dam valves and/or sluice gates. This would permit moving more water from Arrowrock to Lucky Peak during the period before Arrowrock fills and spills.

6. Construct a powerplant at Boise Diversion Dam to replace existing power facility.

7. Arrowrock and Boise Diversion Dam historical opportunities should be pursued.

8. Boise Project, Arrowrock Division Wildlife Opportunities

a. The 80-acre Leavitt Tract near Lake Lowell should be improved for wildlife habitat. The tract is located within the Deer Flat National Wildlife Refuge. At the east end of Lake Lowell there is an 80-acre seasonally flooded area of public land called the Leavitt Tract, which is usually dry during the nonirrigation season. This tract could be significantly improved for water fowl and other wetland wildlife by the installation of several small water control structures in dikes presently surrounding a portion of the tract. Installation of these control structures would allow the establishment of a permanent shallow marsh on the tract.

b. The potential wildlife developments related to the Cloverdale Pond and areas near Kuna and Marsing should be pursued.

Development of the Cloverdale Pond would be directed at preserving and improving upland habitat used by raptors, and consideration would be given to the establishment of a warm-water fishery.

Development of the two other tracts would be directed at improving wetland and upland wildlife resources.

9. No consensus was reached on the proposal to maintain a 6,500 ft^3/s channel in the lower Boise River to safely pass releases from Lucky Peak Reservoir.

The proposal was a cooperative approach to removing some fallen trees, selectively cutting down a limited number of trees that are about ready to fall in the river, and clearing some brush where necessary. The trees and other obstructions to be removed would be selected in cooperation with the Idaho Department of Fish and Game and others. The river section under consideration was from near Eagle Island to the interstate bridge that crosses the river near Caldwell.

No channel dredging or diking was proposed--just enough selective cleanup of trees and debris to maintain a 6,500 ft^3/s river channel capacity.

Enclosure B

BOISE PROJECT POWER AND MODIFICATION STUDY
BUREAU OF RECLAMATION

PROPOSED BOISE RIVER SYSTEM OPERATION CHANGES, INCLUDING WORKSHOP STIPULATIONS AND ACTIONS TO BE TAKEN

1A. Boise River minimum streamflows would be met from water released from Lucky Peak Reservoir noncontracted space. This use of the water that accumulates in the Lucky Peak noncontracted space would be a beneficial use.

The Standard Operating Procedures (S.O.P.) for the Boise River system would include language stating that an 80 ft^3/s minimum streamflow release would be maintained by releasing water to the river from the Lucky Peak noncontracted space.

The Idaho Department of Fish and Game would have to use the water that accumulates in its existing 50,000 acre-feet of Lucky Peak Reservoir space to meet the 150 ft^3/s stream resource maintenance flow (S.R.M.F.) fish requirements. That means a 70 ft^3/s release would have to be made from the Fish and Game space. The 80 ft^3/s release from the noncontracted space plus the 70 ft^3/s Fish and Game space water release equals the 150 ft^3/s S.R.M.F. release. The Idaho Department of Fish and Game would have the option to use the water that accumulates in its 50,000 acre-feet space to meet other fish flow needs, such as the 225 ft^3/s flow release needed during October and November for brown trout spawning flows.

1B. Boise Water Corporation municipal and industrial water supplies obtained from surface water supplies through its three collectors near the Warm Springs Golf Course and one collector near Veterans Park would be met from Boise system flow releases attributed to the Lucky Peak noncontracted space. This would be a beneficial use of storage water supplies.

The Boise Water Corporation has requested a Boise system flow of 25 ft^3/s based upon an average for a 24-hour period which does not take into account the instantaneous peaking requirements which would occur throughout the day.

Workshop stipulations

(1) Workshop participants approved of the Boise Water Corporation contracting for a water supply for its four collectors and tying it to the Lucky Peak Reservoir noncontracted space.

The Boise Water Corporation should explore alternative means of obtaining water supplies to meet its increasing future water needs other than the noncontracted space.

(2) A Lucky Peak Reservoir winter minimum flow release of 80 ft^3/s may be all that can be maintained in the Boise River during a dry or water-short period.

MICROFILMED

It may be necessary to protect the minimum river flow from being depleted by the collectors during a water-short period by including a clause providing for an interruptable supply in any contract that would be negotiated with Boise Water Corporation.

Actions to be taken

The Bureau of Reclamation would begin the process of obtaining a Lucky Peak Reservoir final state storage permit.

The Bureau would send a letter to the Idaho Department of Water Resources requesting that the Lucky Peak noncontracted space water supply be assigned to maintaining minimum Boise River streamflows and Boise Water Corporation municipal and industrial water supplies for their two previously constructed collector sites.

The designation of Lucky Peak Reservoir noncontracted space as a beneficial use for the Boise Water Corporation municipal and industrial use is dependent upon the water corporation being successful in contracting for the water.

The Lucky Peak noncontracted space would still be jointly used for system flood control purposes.

2. The Arrowrock Reservoir minimum pool requirement for fish of 28,700 acre-feet would be maintained in most years.

Workshop stipulations

The Arrowrock Reservoir minimum pool requirement of 28,700 acre-feet can be violated if the water has to be used to meet contractual irrigation demands or flood control space requirements.

Actions to be taken

The recommendation will be discussed with the Bureau and Corps Boise River system operators for purposes of incorporating it into the Boise System operation SOP as an operation objective.

3. The Lucky Peak Reservoir recreation recommendations to

(a) try to fill reservoir to elevation 3032 feet as early as possible during spring to improve boating season, and

(b) try to maintain a nonfluctuating reservoir pool during the summer recreation season would be accomplished whenever possible.

Any opportunities to vary the operation of Lucky Peak Reservoir during the latter part of the summer should be agreed upon through annual (or more frequent) Idaho Boaters Association discussions with the Bureau Central Snake Projects Office.

Workshop stipulations

The Boise system operation near the end of the summer boating season should be discussed with the boaters to determine how to best meet all needs.

Actions to be taken

These recommendations will be disucssed with the Boise River reservoir system operators for purposes of incorporating them into the system operation.

4. Boise system hydropower production can be enhanced by dropping Lucky Peak Reservoir maximum water surface 5 feet (3055 to 3050 feet) during the summer recreation season.

Workshop stipulation

Further studies may show that more or less drawdown can be acceptable.

Any impacts to reservoir recreation resulting from a drawdown in Lucky Peak Reservoir should be mitigated.

The drawdown impact upon Robie Creek recreation site is an important consideration. More data are needed on effect of drawdown at Robie Creek and possibly other key recreation sites.

Actions to be taken

Arrowrock hydropower construction could be implemented through the Boise Project Power and Modification Study feasibility process which would require congressional authorization, or by the Boise Project Board of Control through the Federal Energy Regulatory Commission (FERC) process.

5. Boise System Flood Control Operation

The present system operation for vacant flood control storage space is about 60 percent in lower reservoirs (Lucky Peak and Arrowrock) and 40 percent in Anderson Ranch."

The revised storage regulation manual that is nearing final approval is proposing variable vacant space assignment, depending upon date and volume forecast.

Actions to be taken

The review process of the revised regulation manual has to be completed with Pacific Northwest Division General, Corps of Engineers, and Pacific Northwest Regional Director of Bureau of Reclamation providing signatory approval.

6. The Boise system flood control operation could be improved by replacing and/or rehabilitating the Arrowrock Dam valves and/or sluice gates. Operational flexibility would be enhanced and Lucky Peak boating may benefit.

Actions to be taken

The Bureau would include this recommendation in the Boise Project Power and Modification Feasibility Study. Other possible avenues would be explored to try and improve Arrowrock Dam valves and/or sluice gates.

7. No consensus was reached on the selective clearing of shrubs and trees from the Boise River channel from near Eagle Island to the Caldwell interstate river crossing bridge to maintain a 6,500 ft^3/s channel capacity.

Workshop stipulations

(1) It was suggested that a comprehensive plan be developed with one aspect being Boise River channel maintenance. One entity would manage the study with involvement from other entities.

(2) The proposal to clear a section of the river channel or side channels of some of the debris and a limited number of trees to maintain a 6,500 ft^3/s channel capacity might gain some acceptance if a site-by-site proposal were developed and presented in detail to the interested parties.

Actions to be taken

The Boise Project Power and Modification Study would not recommend implementation of the proposal.

Enclosure C

List of Workshop Participants--June 24, 1982

Al-Greene, Frank	Idaho Public Utilities Commission
Brown, Robert	Bureau of Reclamation
Brownell, Dave	Corps of Engineers
Brush, Harold	Bureau of Reclamation
Burrows, Erv	U.S. Forest Service
Crase, Fred	Bureau of Reclamation
Doty, Jim	Bureau of Reclamation
Eggleston, Jerry	CH2M Hill, representing City of Boise
Ellsworth, Carl	City of Boise
Entwistle, Bob	U.S. Forest Service
Golus, Ron	Bureau of Reclamation
Griswold, Ed	Bureau of Reclamation
Haumann, Richard	Nampa and Meridian Irrigation District
Hayes, Marjorie	Boise River Watch
Kelley, Fenton	Boise Valley Fly Fishermen
King, Pam	Idaho Boaters Association
Lyle, Irma	Bureau of Reclamation
Masarik, Mark	Environmental Protection Agency
Minter, Robert	Ada County
Padour, Carl	Boise Project
Paulson, Jim	Idaho Department of Parks and Recreation
Ray, Walt	U.S. Fish and Wildlife Service
Reese, Dave	Corps of Engineers
Reid, Will	Idaho Department of Fish and Game
Reiners, Al	Bureau of Reclamation
Ries, Norbert	Bureau of Reclamation
Schmitt, Ed	Nampa-Meridian Irrigation District
Stillings, Fred	Bureau of Reclamation
Stoors, Gerald	Lucky Peak Spring Shores Marina
Sutherland, Roy	Idaho Boaters Association
Van Curen, Royse	Project Manager, Boise Project Board of Control
Walker, Robert	Boise Water Corporation
Williams, Everett	Bureau of Reclamation
Young, Norman	Idaho Department of Water Resources

Agenda Item No. 8. Review of Application for Amendment of Permit No. 63-3618, Lucky Peak Reservoir - USBR

Wayne T. Haas, Administrator, Resources Analysis Division, reported that the U.S. Bureau of Reclamation (BoR) submitted on March 15, 1984 an application for amendment of permit for storage at Lucky Peak Reservoir. No protests were received on the amendment. In accordance with Section 42-1737, Idaho Code, the amendment is being submitted to the Board for approval or disapproval. The amendment proposes to maintain the 50,000 af streamflow, change the 28,800 af dead storage to storage for recreation, and change the 228,200 af for irrigation to 102,300 af streamflow maintenance and 111,950 af for irrigation (allowing 13,950 af flood control). Two issues the Board may wish to consider are: "Is streamflow maintenance from storage in conformance with the State Water Plan?" and "Should the duration of the water right be conditioned?". In regard to the first issue, Lucky Peak Reservoir is not a natural body of water and the stored quantities are not subject to the provisions of Chapter 15, Idaho Code. Most water rights in Idaho require diversion and beneficial use. The dam is considered to be the diversion for a storage water right, and if the streamflow maintenance uses can be considered to be beneficial, a valid water right can be constituted. Historically the BoR has not allowed the 102,300 acre feet of storage to be contracted except on a limited basis. On the issue of conditioning a water right, the Board may wish to consider the increased competition between the various uses of the limited water supplies in Idaho and the notion that "higher and better use" now may be viewed differently in the future.

Ron Golus, Bureau of Reclamation, discussed the development of the recommendations for the noncontracted space in Lucky Peak Reservoir. On March 20, 1964 a storage permit was granted to the BoR with a stipulation that beneficial use of water storage be made on or before March 20, 1975. In 1975, no designation use had been made for 116,250 af of noncontracted space. At that time, the directors of Idaho Dept. of Water Resources and Bureau of Reclamation met to discuss the potential uses of stored water. The permit issued stated that the water from Lucky Peak storage would be used as supplemental supply for irrigated lands in the Boise River valley, but the existing Boise River valley irrigation entities could not prove beneficial use for supplemental water from the uncontracted space. It was also agreed that using noncontracted storage space for maintaining flows in the Boise River to dilute the city of Boise's Lander Street sewage discharge into the river was not a beneficial use. Two studies were recommended: (1) review ways to improve the flood control and maintain streamflow operation of the river, and (2) review the possibility of irrigating parts of the Mountain Home and Bruneau plateaus. The studies were accomplished through the Boise Project Power Modification Study and the Corps/BoR Regulation Manual Study for the Boise River System. Upon completion of the studies, agency meetings from the federal, state, county and city were held to receive input and a public meeting and workshop were held to inform the public and receive comments. The recommended plan agreed upon was for the Lucky Peak Lake noncontracted space to be used for the Boise River streamflow maintenance jointly with the authorized flood control use.

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Will Reid, Dept. of Fish and Game, commented that 150 cfs has been identified as the practical streamflow maintenance for the Boise River from the Diversion Dam to Star diversion.

F. Dave Rydalch, Member, moved Board adoption that "streamflow maintenance from storage" is a water use in conformance with the State Water Plan and recommended director approval of the application for amendment. Robert M. Hammes, Member, seconded the motion.

Motion passed by voice vote: 8 Ayes, 0 Nays.

Gene M. Gray, Vice Chairman, moved the Board adopt a recommendation that the term of the Lucky Peak storage permit be thirty (30) years prior to review. James Shawver, Member, seconded the motion.

Motion passed by voice vote: 8 Ayes, 0 Nays.

Agenda Item No. 9. IWRB Financing Programs
a. Loan and Grant Applications
b. Bond and Inducement Resolutions
c. Boise Water Corporation Revenue Bond

a. Loan and Grant Applications. Fred Eisenbarth, department staff, advised the Board that Goose Creek Flood Control District #16 requested in a letter of December 5, 1984 the Board make a $164,000 loan to them from the Revolving Development Account for one year at nine percent interest to repair, maintain and enlarge the West Canal from Oakley Reservoir to Murtaugh Lake. The West Canal was constructed last spring to accommodate the high spring runoffs to avoid excessive flooding. The district was legally organized in August, 1984, but in accordance with Idaho law, the district is unable to levy a tax for operating money until next year. The flood control district is a legal entity and both the applicant and project do qualify for a Board loan as outlined in the rules and regulations of the Revolving Development Account.

Leland Baker, Chairman of the Goose Creek Flood Control District #16, informed the Board the district had the taxing authority, but timing was such that they could not get a tax levy on this year's tax bills.

J. D. Williams, Member, moved Board adoption of a resolution (ATTACHMENT 3) to make a $164,000 loan for one year at nine percent interest from the Revolving Development Account to Goose Creek Flood Control District #16 to be used for payment of costs associated with the repair and enlargement of the West Canal. Richard W. Wagner, Member, seconded the motion.

Motion passed by roll call vote: 8 Ayes, 0 Nays. Gray, Aye; Hammes, Aye; Jones, Aye; Kramer, Aye; Rydalch, Aye; Shawver, Aye; Wagner, Aye; and Williams, Aye.

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Form 211
5/78

Ident. No. _____

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES

APPLICATION FOR AMENDMENT OF A PERMIT

To change the point of diversion and/or the place of use APPROVED

The United States of America acting through the
Regional Director, Pacific Northwest Region,
Comes now Bureau of Reclamation

of (address) Box 043-550 West Fort Street, Boise, Idaho 83724, and represents to the Director of the Idaho Department of Water Resources:

That he is the owner and holder of Permit to Appropriate the Public Waters of the State of Idaho No. 63-3618/R-1183, and requests that the permit ~~and permit map~~ be changed as follows:

1. Point of diversion: SE ¼ NE ¼, Section 11, Township 2N, Range 3E, B.M., County of Ada. Other points of diversion: _____

2. Period and nature of use: (irrigation, domestic, stockwatering, industrial, etc.)

Amount 111,950 (cfs or acre feet per annum)	for storage for* irrigation purposes	from January 1	to December 31* (both dates inclusive)
Amount 152,300 (cfs or acre feet per annum)	for storage for streamflow maintenance* purposes	from Jan. 1	to Dec. 31 (both dates inclusive)
152,300	streamflow maintenance from storage	Jan. 1	to Dec. 31*
Amount ~~13,950~~ (cfs or acre feet per annum)	for ~~Flood Control~~ purposes	from ~~Jan. 1~~	to ~~Dec. 31~~ (both dates inclusive)
Amount 28,800 (cfs or acre feet per annum)	for Storage for recreation* ~~Dead Storage~~ purposes	from Jan. 1	to Dec. 31 (both dates inclusive)
111,950	irrigation from storage	March 15	November 15*

*per letter dated 5/15/1984 - DRT

3. Place of use or land to be irrigated:

TWP	RGE	SEC	NE¼				NW¼				SW¼				SE¼				TOTALS
			NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	
							BOISE FEDERAL RECLAMATION PROJECT LANDS												

Total number of acres to be irrigated = _____

4. a. Who owns the property at the point of diversion? United States of America

b. Who owns the land to be irrigated or the place of use? Various landowners

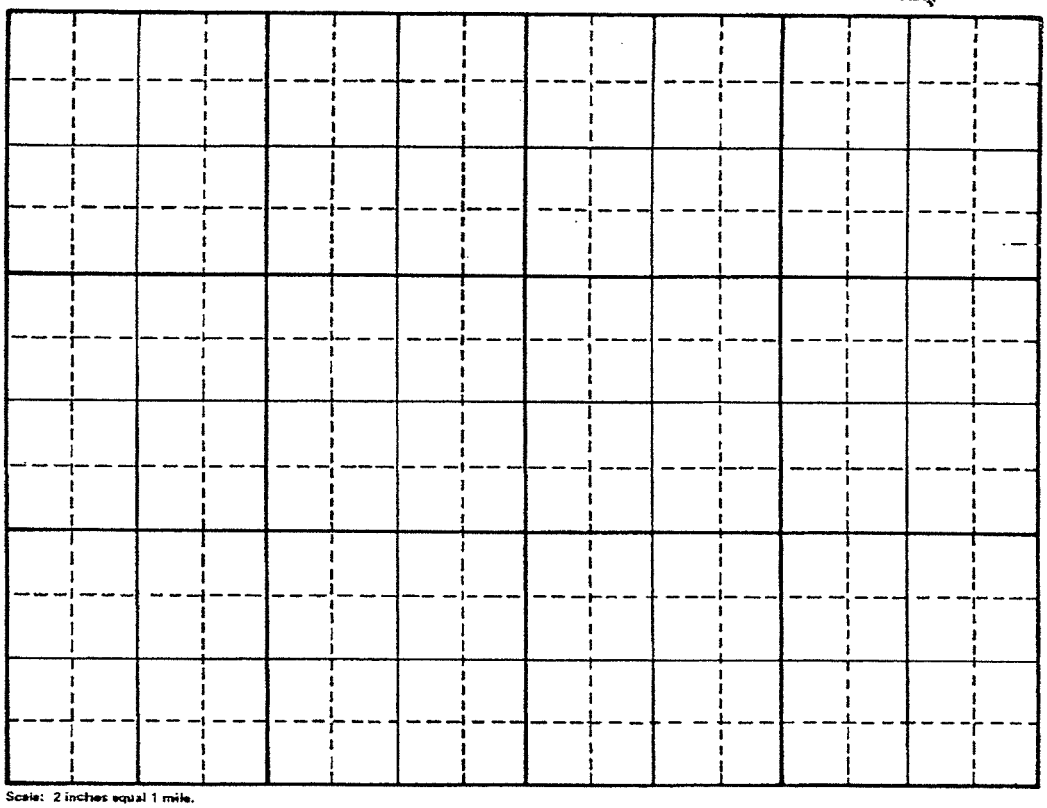
c. If the property is owned by a person other than the applicant, describe the arrangement enabling the applicant to make this filing: Federal Reclamation Project contracts with various water user organizations.

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Complete the following map by showing land and point of diversion as proposed by this amendment.

Show 40-acre subdivisions, townships, ranges and ditches.

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Scale: 2 inches equal 1 mile.

That no one will be injured by such change, and that such change will be made at permit holder's own risk.

Signed at Boise, Idaho, this 9th day of March, 19 84.

John W. Kays, Jr.
(Signature)

FOR DEPARTMENT USE ONLY

Preliminary check by _____ Fee = $20.00 # 32570 Receipted by JP Date 3/15/84

Publication prepared by JP Date 3/29/84 Published in Idaho Statesman

Publication dates 4/5 & 4/12/84

ACTION OF THE DIRECTOR, DEPARTMENT OF WATER RESOURCES

I, _____, Director of the Department of Water Resources hereby APPROVE the above Application for Amendment of Permit No. R-1183 (63-3618) provided the following condition are met:

1. The allocation of 152,300 acre feet of storage space for stream flow maintenance includes 50,000 acre feet allocated for same purpose under the original permit.

Witness my hand this 14th day of February, 1985.

R. Gluw Saxton

MEMORANDUM OF UNDERSTANDING
for
CONFIRMATION, RATIFICATION, AND ADOPTION OF
WATER CONTROL MANUAL
BOISE RIVER RESERVOIRS, BOISE RIVER, IDAHO

This Memorandum of Understanding is made and entered into by and between the Department of Army represented by the Division Engineer, Corps of Engineers, the authorized representative of the Chief of Engineers, hereinafter referred to as Corps, and the Department of Interior represented by the Regional Director, Pacific Northwest Region, Bureau of Reclamation, the authorized representative of the Secretary of Interior, hereinafter referred to as Bureau.

WITNESSETH

WHEREAS, the Boise River reservoirs (Anderson Ranch, Arrowrock, and Lucky Peak) have been regulated in accordance with a general operating plan and procedures developed by the parties pursuant to Article 6 of Memorandum of Agreement for Flood Control Operation of Boise River Reservoirs, dated 20 November 1953; and

WHEREAS, Article 7 of said Memorandum of Agreement provides that the operating plan and procedures may be changed or modified if operating experience indicates the desirability therefor, and future changes and improvements in the Boise River system are justified within the general objectives of the Agreement; and

WHEREAS, Department of the Army Engineer Regulation (ER) 1110-2-240, Engineering and Design, Water Control Management, 8 October 1982, and Engineer Technical Letter (ETL) 1110-2-251, Engineering and Design, Preparation of Water Control Manuals, 14 March 1980, prescribe that water control plans for such Federal projects be continually reviewed and adjusted to ensure that the best use is made of available water resources; and

WHEREAS, the Bureau and Corps, after consultation with the State of Idaho, Boise River Watermaster, and Project Manager of the Boise Project Board of Control, have agreed based on past operating experiences that revision of the operating plan and procedures is needed to reflect current conditions, needs, and technology and have worked jointly to develop a Water Control Manual; and

WHEREAS, a final revision of the Water Control Manual has now been completed, reviewed, and approved by the Bureau, Corps, and State of Idaho.

NOW THEREFORE, the parties hereby confirm, ratify, and adopt Water Control Manual dated April 1985 as an integral part of "Memorandum of Agreement for Flood Control Operation of Boise River Reservoirs," dated 20 November 1953, and further agree that:

a. The Water Control Manual shall constitute the current operating plan and procedures until further changed or modified by the parties in accordance with Article 7 of the Memorandum of Agreement and paragraph e. hereof.

b. The Bureau, as project owner, shall be responsible for the operation and maintenance of the Anderson Ranch and Arrowrock Dams and related facilities subject to the reservoir regulation objectives established by the Water Control Manual in paragraph a.

c. The Corps, as project owner, shall be responsible for the operation and maintenance of the Lucky Peak Dam and related facilities subject to the regulation objectives established by the Water Control Manual in paragraph a.

d. The Bureau and the Corps shall regulate Anderson Ranch, Arrowrock, and Lucky Peak Dams jointly as a system in accordance with regulation criteria and procedures within the Water Control Manual for Boise River reservoirs.

e. Portions of the Water Control Manual for Boise River reservoirs may be updated from time to time as conditions warrant. Any portion of this manual which is revised shall be labeled as revised and shall show the date of revision. Either party may propose revisions to the Water Control Manual, but such proposed revision shall not be adopted or become final until approved by the other party. The requirement for consultation with other parties as set out in Article 7 of Memorandum of Agreement dated 20 November 1953 will likewise apply to future revisions of the Water Control Manual; however, no formal document will be necessary other than the necessary approvals contained in this subparagraph to effect any such duly approved revision.

f. All terms and provisions of Memorandum of Agreement dated 20 November 1953 not inconsistent with this Memorandum of Understanding and the Water Control Manual shall remain in full force and effect.

THIS AGREEMENT shall become effective on the date of the last-dated signature hereto.

L. W. Lloyd
Regional Director
Pacific Northwest Region
Bureau of Reclamation
Authorized Representative of
the Secretary of Interior

DATE 9/25/85

George R. Robertson
Brigadier General, Corps of Engineers
Division Engineer
North Pacific Division
Authorized Representative of
the Chief of Engineers

DATE 21 JUN 85



US Army Corps
of Engineers
Walla Walla District

Water Control Manual for Boise River Reservoirs

Boise River, Idaho

WATER CONTROL MANUAL

FOR

BOISE RIVER RESERVOIRS

APRIL 1985

U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT

Aff. of David A. Jarvis, Ex.Z, Pg. 262

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2-04. Lucky Peak.

a. Location. Lucky Peak Dam is located approximately 64 river miles above the mouth of the Boise River and is approximately 12 river miles below Arrowrock Dam. The following tabulation outlines the location of the dam.

Lucky Peak Dam

Stream: Boise River.
River Mile: 63.8.
Drainage Basin: Boise River.
State: Idaho.
County: Ada.
Location from nearby community:1/
9 miles southeast of Boise.

1/ Approximate road mileage.

b. Project Purposes. Lucky Peak is a multipurpose project which controls water from the 470-square-mile drainage basin above Lucky Peak Dam and below Arrowrock Dam. The project also reregulates releases from Arrowrock Dam and provides flood control, irrigation water, recreation, and fish and wildlife water. Refer to Section VII - WATER CONTROL PLAN for the system use priorities and regulation plans.

c. Physical Components. The following paragraphs discuss in general terms the physical components of the Lucky Peak project (both structural and the reservoir). More detailed information on these items is available in the Operation and Maintenance Manual - Lucky Peak Project, U. S. Army Engineer District, Walla Walla, 1959. Plate 2-11 shows the general plan and sections for Lucky Peak Dam.

(1) Dam. Lucky Peak Dam is a rolled earth and gravel embankment with a central impervious core extending from the base to the top of the dam. The dam has a structural height of 340 feet, a hydraulic height of 238 feet, and a crest length of 1,700 feet. The crest of the dam is at elevation 3078 and has a width of 30 feet which provides an area for a roadway across the dam. Base width of the dam is 1,350 feet. The upstream face of the dam is on a 1V on 2.25H slope from the crest elevation 3078 down to elevation 3008, a 1V on 2.75H slope down to elevation 2928, and a slope of 1V on 3.25H down to elevation 2850. The downstream face is on a 1V on 1.50H slope from the crest down to elevation 3066, a 1V on

Aff. of David A. Jarvis, Ex.Z, Pg. 270

will be drafted from Arrowrock to enhance the Lucky Peak recreational opportunities. Plates 7-7, 7-8, and 7-9 show past reservoir storages for Anderson Ranch, Arrowrock, and Lucky Peak.

Management of the Lucky Peak recreational pool is the responsibility of the Corps of Engineers, but filling the pool and then maintaining it is a cooperative regulation effort between the Corps of Engineers and the Bureau of Reclamation. After flood control season, the Central Snake Projects Superintendent and his staff will schedule Arrowrock releases such that the Lucky Peak recreational pool will remain near constant until Arrowrock storage is nearly depleted and downstream irrigation demand must be met with Lucky Peak storage. Lucky Peak releases after flood control season are scheduled according to the procedure in paragraph 7-06.g. of the Irrigation Plan.

Management of the Anderson Ranch and Arrowrock recreational pools is the responsibility of the Bureau of Reclamation. As previously discussed, recreational opportunities at Arrowrock are quite limited, but it is desirable to enhance the Anderson Ranch recreational opportunities as much as practical. No water control coordination between the regulating agencies is required for recreation at Anderson Ranch or Arrowrock.

7-10. Fish and Wildlife Plan. It is desirable to enhance fish and wildlife resources within the three reservoirs, in the Boise River, and adjacent areas as much as is practical. In order to accomplish this goal, specific policies and practices have been established. Lucky Peak Lake contains a minimum conservation pool of 28,767 acre-feet of storage (elevation 2824 to 2905). Anderson Ranch Reservoir contains a minimum conservation pool of 41,000 acre-feet of storage (elevation 3992 to 4039.6). At Arrowrock Reservoir it is desirable to maintain 28,700 acre-feet of storage (elevation 2974 to 3078.32) as a conservation pool. Occasionally it may be necessary (because of inspections, maintenance, or flood control) to evacuate some or all of this Arrowrock storage, but this should be avoided whenever possible.

In addition to conservation pools at each reservoir, there are provisions for minimum fish flows below Lucky Peak and Anderson Ranch dams. Lucky Peak Lake has a 50,000-acre-foot space allocation for the Idaho Fish and Game Department as required by the current Lucky Peak storage permit. This allocation is a primary use within Lucky Peak and is equal to flood control and irrigation. The purpose of this space allocation is to provide minimum fish and wildlife streamflows below Lucky

Peak Dam during the nonirrigation season. The 50,000 acre-feet of stored water is sufficient to provide a continuous flow of 137 cfs over a 182-day period from 16 October to 14 April, or a continuous flow of 160 cfs for a 156-day period. The actual release pattern is to be established by the * Director of the Idaho Fish and Game Department; however, since an additional 102,300 acre-feet of space in Lucky Peak is used for stream maintenance flows along with the Idaho Department of Fish and Game space, the release from the Fish and Game space could vary from a minimum of about 70 cfs to larger releases. *

At Anderson Ranch, the Bureau of Reclamation has a verbal agreement with the Idaho Fish and Game Department to maintain minimum releases from Anderson Ranch Dam of 300 cfs during the nonirrigation season and 600 cfs during the irrigation season. The maximum flow release during the irrigation season is about 1,600 cfs. This verbal agreement is contingent upon having ample storage water and favorable forecasts to indicate that it is practical to make these minimum releases. It is also desirable at Anderson Ranch to avoid, if possible, making large spring releases which would disturb downstream spawning beds.

7-11. Minimum Streamflow Maintenance. A continuous flow of 80 cfs as a * minimum below Diversion Dam will be provided from the 102,300 acre-foot streamflow maintenance space in Lucky Peak for the purpose of flow maintenance. This 80-cfs minimum requirement will not be violated unless required maintenance within the Lucky Peak outlet tunnel makes it temporarily impractical to do so. As specified within paragraph 7-10., a continuous minimum of 70 cfs will also be released from the 50,000-acre-foot Idaho Fish and Game Department allocation during the nonirrigation season (if stored water is available). Thus, the normal total nonirrigation season minimum streamflow below Diversion Dam will generally be 150 cfs. This normal minimum can be larger than 150 cfs if the Director of Idaho Fish and Game Department specifies a release larger than 70 cfs from the 50,000-acre-foot allocation. If water is not available in Lucky Peak Lake's 102,300-acre-foot streamflow maintenance space to maintain an 80-cfs flow release to the Boise River, the 80-cfs flow * release would be made from the Idaho Department of Fish and Game space, if water is available.

There is no minimum release requirement for Arrowrock. A minimum release is not necessary since there is no channel reach between Arrowrock Dam and Lucky Peak Reservoir.

Aff. of David A. Jarvis, Ex.Z, Pg. 272

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Western Regional Office

Peter J. Boyd
Scott L. Campbell
ELAM, BURKE AND BOYD
1010 First Interstate Building
P.O. Box 1559
Boise, Idaho 83701
(208) 343-5454

Attorneys for Protestants

BEFORE THE DEPARTMENT OF WATER RESOURCES

STATE OF IDAHO

IN THE MATTER OF THE APPLICATION FOR AMENDMENT OF PERMIT NO. 63-3618, IN THE NAME OF THE UNITED STATES BUREAU OF RECLAMATION	)	PROTEST

COMES NOW, Settlers Irrigation District and Pioneer Irrigation District, by and through their counsel, Scott L. Campbell, and hereby protest the Application for Amendment of Permit No. 63-3618, heretofore filed by the United States Bureau of Reclamation to change the nature of use of 44,700 acre-feet of stored water in Lucky Peak Reservoir.

Each of the protestants herein possess water storage rights in Lucky Peak Reservoir, pursuant to contracts with the United States Department of the Interior, Bureau of Reclamation.

Settlers Irrigation District, Pioneer Irrigation District, and Farmers Union Ditch Company possess natural flow-of-the-river water rights in the Boise River, pursuant to Farmers Co-op v. Riverside Irrigation District, 14 Idaho 450 (1908), which decision is commonly referred to as the Stewart Decree.

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Protestants believe that the terms of the proposed Amendment of Permit No. 63-3618 may adversely affect the water storage rights of the protestants in Lucky Peak Reservoir.

Protestants further believe that the reasons for the proposed change, as stated in the Application for Amendment of Permit No. 63-3618, which is to "provide a water supply to the users of the Boise Board of Control to offset shortages due to evacuation of Lucky Peak Reservoir during power plant construction," is an improper basis for granting such a change in the nature of use of the water.

Protestants also believe that the modification of the nature of use of 44,700 acre-feet of stored water from streamflow maintenance purposes to irrigation purposes in order to supply water to the users of the Boise Board of Control and not to the protestants or other similarly situated water users constitutes an unjust, preferential treatment of one group of water users to the detriment of the protestants and other similarly situated users of Boise River water.

In this regard, protestants assert that if the 44,700 acre-feet of streamflow maintenance water is changed to irrigation use for the Boise Project Board of Control, a like amount should be changed to irrigation use and be made available to protestants and other similarly situated water users who may desire to contract with the United States Bureau of Reclamation for such additional water during the 1987 irrigation season. This is

MAR 10 1988

particularly significant in view of the below normal precipitation accumulations in the Boise River drainage during the period of October 1986 through April 1987.

Protestants respectfully request that a hearing be scheduled before the Department of Water Resources to consider these and other objections to the Application for Amendment of Permit No. 63-3618.

DATED This 6th day of April, 1987.

ELAM, BURKE & BOYD

By Scott L. Campbell
Scott L. Campbell, of the Firm
Attorneys for Protesters

CERTIFICATE OF MAILING

I HEREBY CERTIFY That on this 6th day of April, 1987, I caused a true and correct copy of the above and foregoing instrument to be mailed, postage prepaid, to:

John W. Keys, III
Regional Director
Pacific Northwest Region
Bureau of Reclamation
Box 043, 550 W. Fort St.
Boise, ID 83724

Scott L. Campbell

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Department of Water Resources
Western Regional Office

Peter J. Boyd
Scott L. Campbell
ELAM, BURKE AND BOYD
1010 First Interstate Building
P.O. Box 1559
Boise, Idaho 83701
(208) 343-5454

Attorneys for Petitioners

BEFORE THE DEPARTMENT OF WATER RESOURCES

STATE OF IDAHO

IN THE MATTER OF THE APPLICATION FOR AMENDMENT OF PERMIT NO. 63-3618, IN THE NAME OF THE UNITED STATES BUREAU OF RECLAMATION	)	PETITION FOR LEAVE TO INTERVENE

COMES NOW, Middleton Mill Ditch Company, Middleton Irrigation Association, Inc., Thurman Mill Ditch Company, Haas Ditch Company, and Franklin Ditch Company, by and through their counsel, the firm of Elam, Burke and Boyd, and hereby petition the Idaho Department of Water Resources for leave to intervene in the above-captioned proceeding.

The name and address of each petitioner is set forth below:

Middleton Mill Ditch Company
c/o Floyd Whitely
Route 1, Box 384
Middleton, ID 83644

Middleton Irrigation Association, Inc.
c/o Sam Rosti
Route 1, Box 30
Star, ID 83669

Thurman Mill Ditch Company
c/o Bob Carrico
Route 4, Joplin Road
Boise, ID 83714

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Haas Ditch Company
c/o Raymond Abbott
Route 3
Parma, ID 83660

Franklin Ditch Company
c/o Wayne Bishop
Route 3
Caldwell, ID 83605

The petitioners possess irrigation water storage rights in Lucky Peak Reservoir, pursuant to contracts with the U.S. Department of the Interior, Bureau of Reclamation, or natural flow-of-the-river water rights in the Boise River pursuant to court decree, or both in some cases.

Petitioners believe that the terms of the proposed amendment of Permit No. 63-3618 may adversely effect the water storage rights of the petitioners in Lucky Peak Reservoir.

Petitioners also believe that the reasons for the proposed change, as stated in the Application for Amendment of Permit No. 63-3618, which is to "provide a water supply to the users of the Boise Board of Control to offset shortages due to evacuation of Lucky Peak Reservoir during power plant construction," is an improper basis for granting such a change in the nature of use of the water.

Petitioners further believe that the modification of the nature of use of 44,700 acre-feet of stored water from stream-flow maintenance purposes to irrigation purposes in order to supply water to the water users of the Boise Board of Control and not to the petitioners constitutes an unjust, preferential

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treatment of one group of water users to the detriment of the petitioners.

Petitioners assert that if the 44,700 acre-feet of stream-flow maintenance water is changed to irrigation use for the benefit of the Boise Project Board of Control water users, a like amount should be changed to irrigation use and be made available to petitioners for additional water during the 1987 irrigation season. This is particularly important in view of the below normal precipitation accumulations in the Boise River drainage during the period of October 1986 through April 1987.

Petitioners further assert that they are required to pay a water charge for stored water provided to them for irrigation purposes out of Lucky Peak Reservoir, pursuant to their irrigation storage contracts with the U.S. Bureau of Reclamation. The water storage charge for the 1987 irrigation season has been established at $3.10 per acre-foot. Petitioners, therefore, believe it is not in the public interest to permit the U.S. Bureau of Reclamation to change 44,700 acre-feet of stream-flow maintenance water in Lucky Peak Reservoir and deliver it to the Boise Project Board of Control irrigation districts at no monetary cost, while the Bureau of Reclamation charges the petitioners for irrigation water from Lucky Peak Reservoir.

Petitioners also assert that due to the drought conditions in the Boise River Basin and the Treasure Valley during this irrigation season, the petitioners have an extreme need for supplemental irrigation water supplies in order to irrigate the agricultural

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lands supplied by the petitioners' delivery systems. If supplemental water supplies are not made available, substantial economic harm will be suffered by the landowners and shareholders in the petitioners' service area.

If the Petition for Leave to Intervene is granted, the petitioners will present testimony relative to the issues set forth above. This testimony will be provided by members of the boards of directors of the petitioners and possibly from individuals landholders in the petitioners' service area.

This petition is filed pursuant to Rule 6,2. of the Rules and Regulations of Practice and Procedure Before the Department of Water Resouces, State of Idaho.

Petitioners were not provided with notice of this proceeding from the Department of Water Resources, State of Idaho, and this petition is filed more than five days prior to the date set for hearing in this matter. Rule 6,3., Rules and Regulations of Practice and Procedure Before the Department of Water Resources, State of Idaho.

DATED This 8th day of May, 1987.

ELAM, BURKE & BOYD

By Scott L. Campbell
Scott L. Campbell, Of the Firm
Attorneys for Petitioners

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CERTIFICATE OF HAND DELIVERY

I HEREBY CERTIFY That on this 8th day of May, 1987, I caused a true and correct copy of the above and foregoing instrument to be hand delivered to:

John W. Keys, III
Regional Director
Pacific Northwest Region
Bureau of Reclamation
Box 043, 550 W. Fort Street
Boise, ID 83724

John J. Hockberger, Jr.
Office of the Field Solicitor
Pacific Northwest Region
Bureau of Reclamation
Box 043, 550 W. Fort Street
Boise, ID 83724

Scott L. Campbell

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Form 211
5/78

Ident. No. _____

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES APPROVED

APPLICATION FOR AMENDMENT OF A PERMIT

To change the point of diversion and/or the place of use.

Comes now The United States of America acting through the Regional Director, Pacific Northwest Region, Bureau of Reclamation

of (address) Box 043-550 West Fort Street, Boise, ID 83724, and represents to the Director of the Idaho Department of Water Resources:

That he is the owner and holder of Permit to Appropriate the Public Waters of the State of Idaho No. R-1183/63-3618, and requests that the permit and permit map be changed as follows:

1. Point of diversion: SE ¼ NE ¼, Section 11, Township 2N, Range 3E, B.M., County of Ada. Other points of diversion: Secondary diversions from the Boise River at various points downstream from Lucky Peak Reservoir.

2. Period and nature of use: (irrigation, domestic, stockwatering, industrial, etc.)

Amount (acre-feet)	Use	Period: From	To
111,950	Storage for Irrigation	Jan. 1	Dec. 31
111,950	Irrigation from Storage	Mar. 15	Nov. 15
152,300	Storage for Streamflow Maintenance	Jan. 1	Dec. 31
152,300	Streamflow Maintenance from Storage	Jan. 1	Dec. 31
28,800	Storage for Recreation	Jan. 1	Dec. 31

Total of 293,050 acre feet

TWP	RGE	SEC	NE¼				NW¼				SW¼				SE¼				TOTALS
			NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	

Supplemental irrigation of cultivated lands of the Boise Federal Reclamation Project Ada and Canyon counties.
Streamflow maintenance in the channel of the Boise River below Lucky Peak Reservoir. Lucky Peak Reservoir storage pool maintenance for Recreation.

Total number of acres to be irrigated = 164,920

4. a. Who owns the property at the point of diversion? United States of America

   b. Who owns the land to be irrigated or the place of use? Various Water Users

   c. If the property is owned by a person other than the applicant, describe the arrangement enabling the applicant to make this filing: Administrator of Federal Reclamation Project.

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Complete the following map by showing land and point of diversion as proposed by this amendment. Show 40-acre subdivisions, townships, ranges and ditches.

DESCRIPTION OF RIGHT OR PORTION THEREOF, AFTER THE REQUESTED CHANGE

1. General information

a. The amount of water for which the purpose of use may be modified is 44,700 acre-feet.

b. Storage water is to be released from Lucky Peak Reservoir.

c. The reasons for the proposed changes is to provide a water supply to the users of the Boise Board of Control to offset shortages due to evacuation of Lucky Peak Reservoir during power plant construction.

2. Change

a. This amendment is not intended to permanently alter the distribution of uses for storage waters in Lucky Peak Reservoir. Instead, this amendment will authorize, (1) use of up to 44,700 acre-feet of streamflow maintenance water for irrigation of Boise Project Board of Control (BPBOC lands in the 1987 season; and (2) use of up to 57,600 acre-feet of BPBOC irrigation storage to guarantee streamflow maintenance capacity through April 15, 1990.

6. This amendment is intended to be subject to the agreements and stipulations outlined in (1) the contract letter to Mr. Carl Padour, Manager of the Boise Project Board of Control from Mr. Neil Stessman, Project Superintendent of the U.S. Bureau of Reclamation Central Snake Projects Office dated June 26, 1986, and (2) the cover letter submitted with this application.

Scale: 2 inches equal 1 mile.

That no one will be injured by such change, and that such change will be made at permit holder's own risk.

Signed at _____, this 11th day of May, 1987.

John W. Keys III
(Signature)
REGIONAL DIRECTOR

FOR DEPARTMENT USE ONLY.

VOUCHER CONTRACT NO. 7-07-10-W0032

Preliminary check by jp Fee = $20.00 Receipted by jp Date 5/19/87 #44851

Publication prepared by jp Date 3/12/87 Published in The Idaho Statesman

Publication dates 3/19 & 3/26/87

ACTION OF THE DIRECTOR, DEPARTMENT OF WATER RESOURCES

I, A. Kenneth Dunn, Director of the Department of Water Resources hereby APPROVE this amendment subject to the conditions of the Memorandum Decision and Order dated May 20, 1987.

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Witness my hand this 20th day of May, 1987.

A. Kenneth Dunn
Director

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BEFORE THE DEPARTMENT OF WATER RESOURCES

STATE OF IDAHO

IN THE MATTER OF THE APPLICATION FOR AMENDMENT OF PERMIT NO. 63-3618 IN THE NAME OF THE UNITED STATES BUREAU OF RECLAMATION	STIPULATION FOR WITHDRAWAL OF PROTEST

COME NOW the applicant, BUREAU OF RECLAMATION (hereinafter the "Bureau"); the protestants, SETTLERS IRRIGATION DISTRICT and PIONEER IRRIGATION DISTRICT; the intervenors, BOISE-KUNA IRRIGATION DISTRICT, NEW YORK IRRIGATION DISTRICT, NAMPA & MERIDIAN IRRIGATION DISTRICT, WILDER IRRIGATION DISTRICT, BIG BEND IRRIGATION DISTRICT, and BOISE PROJECT BOARD OF CONTROL, and the intervenors, MIDDLETON IRRIGATION ASSOCIATION, INC., THURMAN MILL DITCH COMPANY, HAAS DITCH COMPANY, and FRANKLIN DITCH COMPANY, by and through their respective attorneys of record, to stipulate and agree as follows:

1. The Settlers Irrigation District and Pioneer Irrigation District hereby withdraw their protest against the above-captioned application by the Bureau of Reclamation.

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2. The intervenors--Boise-Kuna Irrigation District, New York Irrigation District, Nampa & Meridian Irrigation District, Wilder Irrigation District, Big Bend Irrigation District, and Boise Project Board of Control--hereby withdraw their petition to intervene.

3. The intervenors--Middleton Mill Ditch Company, Middleton Irrigation Association, Inc., Thurman Mill Ditch Company, Haas Ditch Company and Franklin Ditch Company--hereby withdraw their petition for leave to intervene.

4. The Bureau will confer with the Idaho Department of Fish and Game to determine the availability of additional streamflow maintenance water for irrigation in 1987. The Idaho Department of Fish and Game may exclude water dedicated to its maintenance of streamflows from inclusion in further amendment of the Bureau's Lucky Peak Reservoir storage permit. The Bureau will then apply as soon as possible to the Idaho Department of Water Resources to amend its Lucky Peak Reservoir storage permit to authorize use of additional streamflow maintenance water for irrigation purposes in 1987 by entities with storage rights in the Boise River system. The class of eligible entities would include, but not be limited to the Settlers Irrigation District, Pioneer Irrigation District, Middleton Mill Ditch Company, Middleton Irrigation Association, Inc., Thurman Mill Ditch Company, Boise-Kuna Irrigation District, New York Irrigation

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District, Nampa & Meridian Irrigation District, Wilder Irrigation District, and Big Bend Irrigation District.

5. The Bureau will notify all storage right holding entities of the application to the Idaho Department of Water Resources and invite them to submit their cases for receiving any water made available. If requests for supplemental water exceed the available supply, the Bureau will initiate a public process for deciding on a fair allocation. Input on appropriate criteria for deciding from among interested entities will be solicited from the entities themselves and other interested parties. The ultimate decision on which entities the Bureau contracts with and the amounts to be made available to them will be left to the Bureau's informed discretion.

6. At the present time the Bureau cannot quantify the total amount of water that may be available or the proportionate share that any interested entity might receive. The terms of any contract are also uncertain at this time. Compensation for water allocated, in the form of money or an exchange of water, will likely be a requirement.

7. The undersigned applicant, protestants, and intervenors agree to cooperate in carrying out the terms of this stipulation and to the filing of this stipulation with the Idaho Department of Water Resources in the currently pending proceedings involving the application for amendment of the subject permit.

FILED
MAR 10 1988

Dated this 14 th day of May, 1987.

Applicant BUREAU OF RECLAMATION

By: John W. Keys, III

John W. Keys, III.
Regional Director
Pacific Northwest Region
Bureau of Reclamation
U. S. Department of the Interior

Approved as to Form: John J. Hockberger Jr.

John J. Hockberger, Jr., Attorney
Boise Field Office
Pacific Northwest Region
Office of the Solicitor
U.S. Department of the Interior

Dated this 14th day of May, 1987.

Protestants SETTLERS IRRIGATION DISTRICT and PIONEER IRRIGATION DISTRICT; Intervenors MIDDLETON MILL DITCH COMPANY, MIDDLETON IRRIGATION ASSOCIATION, INC., THURMAN MILL DITCH COMPANY, HAAS DITCH COMPANY, and FRANKLIN DITCH COMPANY

By: Scott L. Campbell

Scott L. Campbell of the firm
ELAM, BURKE & BOYD

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Dated this 14th day of May, 1987.

Intervenor BOISE-KUNA IRRIGATION DISTRICT

By: Randall C. Fredricks
Randall C. Fredricks of the firm
CLEMONS, COSHO & HUMPHREY

Dated this 14th day of May, 1987.

Intervenors NEW YORK IRRIGATION DISTRICT and BOISE PROJECT BOARD OF CONTROL

By: Raymond D. Givens
Raymond D. Givens of the firm
GIVENS, McDEVITT, PURSLEY,
WEBB & BUSER

Dated this 14th day of May, 1987.

Intervenor NAMPA & MERIDIAN IRRIGATION DISTRICT

By: W F Ringert
William F. Ringert of the firm
RINGERT, CLARK, HERRINGTON, REID,
CHRISTIANSEN & KAUFMAN

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Dated this 14th day of May, 1987.

Intervenor WILDER IRRIGATION DISTRICT

By: Don Olowinski
Don Olowinski of the firm
HAWLEY, TROXELL, ENNIS & HAWLEY

Dated this 14 day of May, 1987.

Intervenor BIG BEND IRRIGATION DISTRICT

By: Larry Sullivan
Larry Sullivan, Attorney at Law

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APPLICATION FOR PERMIT

63-3618.

To Construct a Reservoir and Appropriate and Store
The Public Waters of the State of Idaho

Application No. R 35086
Permit No. R 1183

1. Name of Applicant: United States of America, acting through the Regional Director, Region 1, Bureau of Reclamation
Post office address: P.O.Box 937 Boise State Idaho
and for the benefit of the users of Boise River water.

I. If applicant is a corporation, give:

(a) Date and place of incorporation:

(b) Amount of Capital Stock: $

(c) Amount paid in: $

(d) Names and addresses of directors:

II. The financial resources of the corporation are:

(a) Cash on hand: $

(b) Treasury Stock: $

(c) Bonds to be issued: $

(d) Other resources:

2. Quantity of water to be stored: 307,000 acre feet per annum.

3. Source of water supply is Boise (River) a tributary of Snake River.

4. The outlet of the proposed reservoir is located S6°20'W 2300 feet, distant from the (bearing) NE corner of Section 11, Township 2 N., Range 3 E., B.M. and is in the SE ¼ of NE ¼ of Section 11, Township 2 N., Range 3 E., B.M. County of Ada
intake tower to the

5. Fill out either (a) or (b).

(a) The reservoir is located in the channel of Boise (Creek) (River).

(b) The reservoir is to be filled through a feeder canal, the point of diversion for which is located feet distant from the corner of Section, Township, Range, B.M., and is in the (bearing) ¼ of ¼ of Section, Township, Range, B.M.; width at bottom feet, width at top feet, depth of water feet; average grade per mile feet; Capacity cubic feet per second

6. (a) The area of the high water line of the reservoir is 2,850 acres.

(b) The reservoir capacity is 307,000 (total capacity); 278,200 (usable storage) acre feet.

7. Height of reservoir dam 340 feet, length of crest 1,700 feet, length at bottom variable feet, size of outlet 23 feet inside diameter. The dam is to be constructed of materials as follows:
the existing Lucky Peak Dam and is
Rolled earth and gravel fill.
(If height will exceed 10 feet, plans must be approved by Department of Reclamation, before beginning construction.)

8. (a) Will water stored in reservoir be diverted to canal or aqueduct, thence to land to be irrigated without commingling with natural flow of Boise (River)? No

(b) Water stored in reservoir will be carried in the channel of Boise (Creek) (River) a distance of 2 miles to point of diversion located at the existing Boise Diversion Dam S11°45' E (bearing) 356 feet, distant from the E¼ corner of Section 4 Township 2 N., Range 3E., B.M., and Lot 9 of Section 3 Township 2 N., Range 3 E., B.M., and to other points of diversion in the Boise River downstream therefrom.

9. (a) Area of watershed above dam site 2,650 square miles.

(b) Estimated maximum flow of stream (unregulated natural flow) 35,000 to 40,000 cubic feet per second.

10. Water is to be used for irrigation purposes.

11. If for mining, milling, power or manufacturing purposes give:

(a) Point of use of water feet, distant from Corner of Section, Township, Range (bearing), B.M., and is in the ¼ of ¼ of Section, Township, Range, B.M.

(b) Amount of power generated: H.P., under feet head.

(c) Water is to be returned to (Creek) (River) (Spring) at a point feet distant from the corner of Section, Township, Range (bearing), B.M. in the ¼ of ¼ of Section, Township, Range, B.M.

12. Water stored in accordance with this Permit will be carried to place of use through a canal heretofore constructed/enlarged or enlarged, as described in Permit No. 4800 & 16098, which is hereby referred to and made a part hereof., and other existing canals diverting from the Boise River.

13. Kind of diversion works: Rubble concrete weir dam (Dam, canal, flume, pipe, etc.)

14. Height of diversion dam: 52 feet, length at top 500 feet, length at bottom 400 feet. The dam is constructed of materials as follows: Rubble concrete. Diversion will be through the existing New York Canal and other canals diverting from the Boise River.
(If height will exceed 10 feet, plans must be approved by Department of Reclamation, before beginning construction.)

15. Size of headgate: New York Canal - 8 gs each, 5' x 9' ~~feet, diameter~~ feet.

16. Diversion Canal: Width at bottom 40 feet, width at water line 67 feet, depth of water 9 feet, Dimensions of Flume

Diameter of Pipe inches; Length of Conduit miles. Average grade per mile feet.

17. Estimated Cost of Works: Storage Works: $ Constructed Diversion Works: $ Constructed

18. Time required for completion of work 5 years.

19. Time required for complete application of water to proposed beneficial use is 6 years.

20. The land to be irrigated is described in the following tabulation:

(Give Irrigable acreage in each 40-acre subdivision.)

Twp.	Range	Sec.	NE¼				NW¼				SW¼				SE¼				Totals
			NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	
			Lucky Peak stored waters will be utilized in the Boise Valley on presently irrigated lands for supplemental irrigation water.																

Total Number of Acres to Be Irrigated

21. Existing rights and/or valid permits appurtenant to lands described above are Water License No. R-698, No. R-652, No. 430, No. 7180, No. 4800, No. 16098, and the rights described in the Bryan and Stewart decrees.

~~Remarks:~~ Remarks: The water to be stored under this permit will be used to supplement lands having existing water rights in the Boise Valley who desire to contract therefor.

REMARKS: This permit is issued on condition - "That the yield of water from 50,000 acre feet of space be available for maintaining minmum winter time flow in the Boise River below Boise Diversion Dam under a release pattern established from time to time by the Director of the Idaho Fish and Game Department.

BE IT KNOWN That the undersigned hereby makes application for permit to construct a reservoir and appropriate and store the public waters of Idaho as herein set forth, and that the enclosed map is hereby made a part of this application.

UNITED STATES OF AMERICA, *Applicant.*

By s/ M. B. Austin, *Agent.*
Acting Regional Director

Date of first receipt at Department of Reclamation: 8:00 A.M. April 12, 1963

Returned to applicant for correction:

Corrected application received:

APPROVAL OF STATE RECLAMATION ENGINEER

The number of this permit is R 1183

Recorded in book R 5, page 1183. Approved March 20, 1964

This is to certify that I have examined the within application for a permit to construct a reservoir and appropriate and store the public waters of the State of Idaho, and hereby approve the same, subject to the following limitations and conditions:

Bond in the sum of $, to be filed on or before

Work to begin on or before May 20, 1964 and to continue diligently and uninterruptedly to completion, unless temporarily interrupted by circumstances over which the permit holder has no control.

One-fifth of the work above specified to be completed on or before September 20, 1966

The whole of said work to be completed on or before March 20, 1969

Beneficial use of water stored in accordance herewith, to be made on or before March 20, 1975

Witness my hand this 20th day of March, 19 64

s/ CARL E. TAPPAN
State Reclamation Engineer.

IN TESTIMONY WHEREOF, We, ROBERT E. SMYLIE, Governor of the State of Idaho, and ARNOLD WILLIAMS, Secretary of State of the State of Idaho, have caused this instrument to be executed in the name of the State of Idaho, and caused the Great Seal of the State of Idaho to be hereunto affixed, this 20th day of March, 19 64

COUNTERSIGNED

STATE OF IDAHO

By s/ ARNOLD WILLIAMS
Secretary of State.

By s/ ROBERT E. SMYLIE
Governor.

BEFORE THE DIRECTOR OF THE DEPARTMENT OF WATER RESOURCES
STATE OF IDAHO

IN THE MATTER OF APPLICATION FOR THE AMENDMENT OF PERMIT NO. 63-3618 IN THE NAME OF THE UNITED STATES OF AMERICA, BUREAU OF RECLAMATION	MEMORANDUM DECISION AND ORDER GRANTING AMENDMENT TO PERMIT DATED JUNE 5, 1987

This Memorandum Decision and Order is prepared in compliance with a stipulation resolving protests to a previous application for amendment filed for Permit No. 63-3618.

The Director, based upon his understanding of the law and the information contained in the records of the Department finds, concludes, and orders as follows:

FINDINGS OF FACT

1. Permit No. 63-3618 was amended on February 14, 1985, to change 102,300 acre feet of storage space from irrigation to streamflow maintenance purpose.

2. The applicant proposes in this application for amendment to change the allocation of 25,905 acre feet of storage space in Lucky Peak Reservoir from streamflow maintenance purpose to irrigation purpose.

3. The application was filed by the applicant pursuant to a stipulation between the Bureau of Reclamation (hereafter referred to as "Bureau"), the Boise Project Board of Control, and other irrigation organizations (hereafter referred to as "parties"). The stipulation implicitly incorporates into its text a previous agreement between the Bureau of Reclamation and the Boise Project Board of Control. The contract states that streamflow

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maintenance water will be made available to provide irrigation carry over for the 1988 season. That contract also requires the repayment of the water used for irrigation.

4. Permit No. 63-3618 was amended on May 20, 1987, to temporarily change 44,700 acre feet of storage space in Lucky Peak Reservoir from streamflow maintenance purpose to irrigation purpose.

5. The Department imposed the following conditions to the May 20, 1987 amendment:

2. The 44,700 acre feet must be allocated based on need to those who do not have an adequate water supply from other sources including hold over storage from prior years.

3. Spaceholders who have sold, rented, bartered, or otherwise conveyed water since last irrigation season shall not be eligible to utilize reallocated water.

4. The allocation change approved by this order shall revert to streamflow maintenance after the 1987 irrigation season.

6. In reviewing this Application for Amendment, Dave Tuthill of the Department of Water Resources, asked Carl Padour, Manager, Boise Project Board of Control, about compliance with condition 2, requiring specific distribution to users on the basis of need, and condition 3, requiring denial of use to those who had sold, rented, bartered, or otherwise conveyed water during the last year.

7. Mr. Padour stated that no water had been sold or conveyed from one district (party) to another. He also stated that the districts (parties) had resolved that each needed the water equally, and that the water should be prorated to the

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districts (parties) based on the respective acreage irrigated. The users did not pay additional excess storage costs for the water delivered to them.

8. The Department informed the Bureau that the previous scheme for distribution did not address the needs of individual users, and that prior to approving the change for an additional 25,905 acre feet from streamflow maintenance to irrigation, the Bureau must propose a plan for allocation of the stored water on the basis of need.

9. The Bureau represented to the Department during a meeting on August 4, 1987, that, before any water will be delivered under the present amendment, a party needing additional storage must identify and be willing to pay for the portion of the 25,905 acre feet that is needed to complete the irrigation season.

10. The Bureau also stated that after quantification of water needed by the parties, requests may exceed 25,905 acre feet.

11. Should requests exceed 25,905 acre feet, storage available to each party will be determined by means of a plan of distribution to be prepared by the Bureau. A party must contract with the Bureau for the entire quantity requested, up to the amount available to that party.

12. Parties requesting additional storage will pay operation and maintenance costs for the entire amount of water contracted for whether the water is diverted or not.

13. The proposed amendment will reduce the amount of storage

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remaining in the reservoir at the end of the irrigation season which will cause a decrease in the lake level.

14. The applicant will still be able to release a minimum flow of 80 cubic feet per second in the Boise River which when combined with storage available to the Idaho Department of Fish and Game will provide that a 150 cubic feet per second flow rate will be maintained during the non-irrigation season of 1987-1988.

15. The provisions in the June 26, 1986, contract between the applicant and the Boise Project Board of Control providing for repayment of water temporarily allocated to irrigation under the prior amendment approved May 20, 1987, will allow the minimum stream flow to be maintained during the 1988-1989 non-irrigation season.

CONCLUSIONS OF LAW

1. The issues to be considered in this application for amendment are similar to the issues raised in the previous amendment approved by the Department on May 20, 1987.

2. The Bureau has provided an acceptable plan for supplying water on the basis of need. The plan requires that the parties requesting water must pay an additional fee for excess stored water for all the water for which the parties contract. Payment for all contracted water rather than payment for only the water used will force the parties to more carefully assess their individual needs.

3. The Bureau must propose a plan of allocation for the 25,905 acre feet between the parties should requests exceed the volume available under the Bureau's application for amendment

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MAR 10 1988

which the plan must be approved by the department.

4. To avoid an unnecessary adverse impact on the lake levels and interference with the local public interest, the 25,905 acre feet of water must be used only on land that does not have an adequate water supply from other sources including hold over storage from prior years.

5. This change in allocation from streamflow maintenance to irrigation shall only occur during the 1987 irrigation season and following the irrigation season the 25,905 acre feet of storage shall revert to streamflow maintenance.

ORDER

Therefore the amendment filed on June 5, 1987 on Permit No. 63-3618 is hereby APPROVED with the following conditions:

1. The 25,905 acre feet must be allocated based on need to those who do not have an adequate water supply from other sources including hold over storage from prior years.

2. To insure that condition No. 2 is complied with, the Bureau required by letter request dated July 2, 1987, that the parties desiring water to request in writing and be willing to pay for the additional storage needed and justification for the request.

3. If written requests exceed 25,905 acre feet, the Bureau shall submit a plan to the Department for allocation of the limited storage to the parties. The Department reserves the right to approve or disapprove the plan. The criteria for approval or disapproval is whether the plan proposes allocation on the basis of need.

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4. After the plan is accepted by the Department, the parties must pay operation and maintenance costs for all the water contracted for.

5. Spaceholders who have sold, rented, bartered, or otherwise conveyed water since last irrigation season shall not be eligible to utilize reallocated water.

6. The allocation change approved by this order shall revert to streamflow maintenance after the 1987 irrigation season.

Signed this 13TH day of August, 1987.

NORMAN C. YOUNG, Director
Department of Water Resources

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CERTIFICATE OF MAILING

I hereby certify that on the 19th day of August, 1987, I mailed a true and copy of the Memorandum Decision and Order Granting Amendment to Permit by U.S. mail, postage prepaid to: Bureau of Reclamation, 214 Broadway Avenue, Boise, ID 83702.

Jane L. Fox

JANE L. FOX, Receptionist

FILED

MAR 10 1988

Form 211
2/80

Ident. No. 63-3618

STATE OF IDAHO

APPROVED
RECEIVED
JUL 11 1990
Department of Water Resources
Western Regional Office

APPLICATION FOR AMENDMENT OF A PERMIT

To change the point of diversion and/or the place of use.

The United States of America acting through the Project Superintendent, Central Snake Project Office, Bureau of Reclamation Phone 334-1460

Comes now _____

of (address) 214 Broadway, Boise, Idaho 83702 , and represents to the

Director of the Idaho Department of Water Resources:

That he is the owner and delegated holder of Permit to Appropriate the Public Waters of the State of Idaho No. R-1183/63-3618 , and requests that the permit and permit map be changed as follows:

1. Point of diversion: SE ¼ NE ¼, Section 11 , Township 2N , Range 3E , B.M., County of Ada . Other points of diversion: Secondary diversions from the Boise River at various points downstream from Lucky Peak Reservoir.

2. Period and nature of use: (irrigation, domestic, stockwatering, industrial, etc.)

Amount 111,950 (cfs or acre feet per annum) for Storage for irrigation purposes from Jan. 1 to Dec. 31 (both dates inclusive)

Amount 111,950 (cfs or acre feet per annum) for Irrigation from storage purposes from Mar. 15 to Nov. 15 (both dates inclusive)

Amount 152,300 (cfs or acre feet per annum) for Storage for streamflow maintenance purposes from Jan. 1 to Dec. 31 (both dates inclusive)

Amount 152,300 (cfs or acre feet per annum) for Streamflow maintenance from storage purposes from Jan. 1 to Dec. 31 (both dates inclusive)

Amount 28,800 (cfs or acre feet per annum) for Storage for recreation purposes from Jan. 1 to Dec. 31 (both dates inclusive

3. Place of use or land to be irrigated: TOTAL OF 293,050 Acre feet

TWP	RGE	SEC	NE¼				NW¼				SW¼				SE¼				TOTALS
			NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	
Supplemental irrigation of cultivated lands of the Boise Federal Reclamation Project Ada and Canyon counties.																			
Streamflow maintenance in the channel of the Boise River below Lucky Peak Reservoir. Lucky Peak Reservoir storage pool maintenance for Recreation																			

Total number of acres to be irrigated = 277,000

4. a. Who owns the property at the point of diversion? United States of America

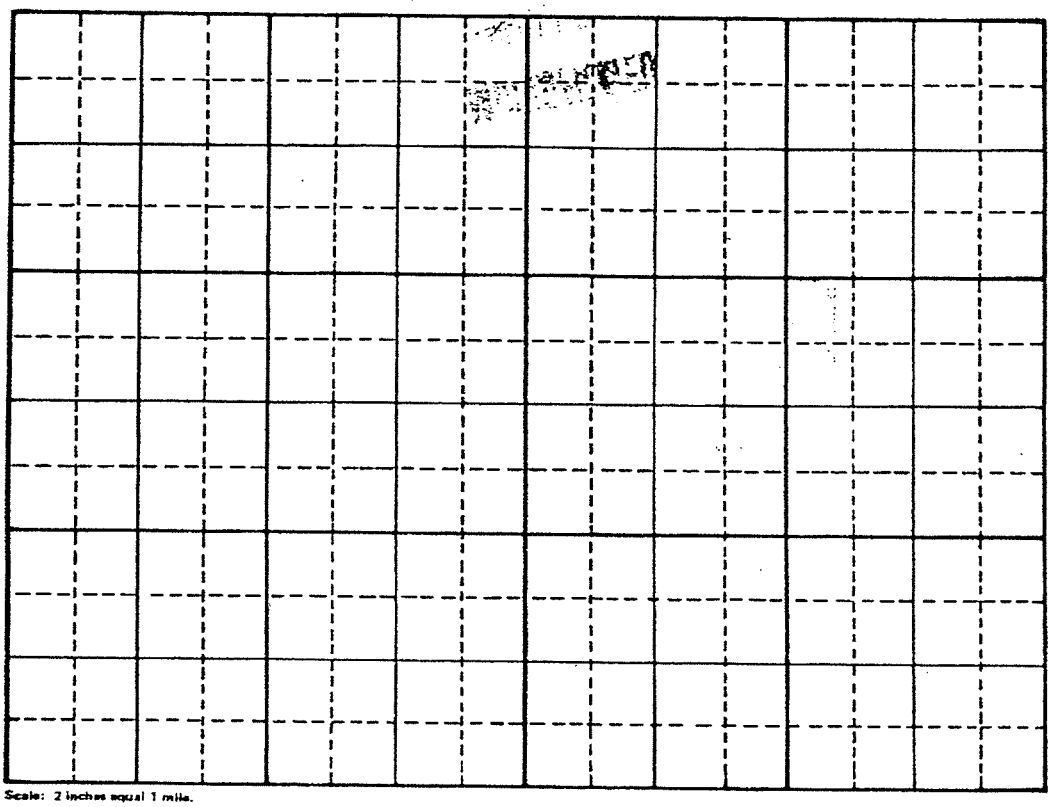
b. Who owns the land to be irrigated or the place of use? Various Water Users

c. If the property is owned by a person other than the applicant, describe the arrangement enabling the applicant to make this filing: Administrator of Federal Reclamation Project.

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Complete the following map by showing land and point of diversion as proposed by this amendment.

Show 40-acre subdivisions, townships, ranges and ditches.



Scale: 2 inches equal 1 mile.

That no one will be injured by such change, and that such change will be made at permit holder's own risk.

Signed at Boise, Id, this 11 day of July, 1990.

(Signature)

Project Superintendent

FOR DEPARTMENT USE ONLY

Preliminary check by DET Fee = $20.00 W01633 Receipted by KH Date 8/13/90

Publication prepared by DET Date 7/11/90 Published in Press-Tribune on 7/19 & 7/26/90

Publication dates 7/19/90 & 7/26/90 ID Statesman on 7/18 & 7/25/90

ACTION OF THE DEPARTMENT OF WATER RESOURCES

I, L. GLEN SAXTON, of the Department of Water Resources hereby approves the Application for Amendment of Permit No. 63-[illegible]. See attached sheet for the conditions of approval.

MICROFILMED

DEC 11 1990

Witness my hand this 14th day of November, 1990.

L. Glen Saxton

Chief, Water Alloc. Bureau

MEMORANDUM

TO: File

FROM: Steve Lester

DATE: February 19, 2002

RE: Beneficial Use Examination for Permit No. 63-3618

An in-office exam was conducted in late 1993 for the Lucky Peak permit. The exam report was based on IDWR file information explained in this memorandum.

Several amendments were approved through the early 1990s. The database reflects the current state of the permit. Proof of beneficial use was filed in 1986 with Ed Thomas (now retired) listed as the exam contact person. Phil Graf replaced Mr. Thomas as noted in Attachment A. Gail McGarry and/or Ruth Page are current contacts per Attachment B. Proper contact was established with the permit holder to complete the exam report.

Overlap

The permit was claimed in the SRBA under the same water right number. The claim listed the same total amount of water but stated somewhat different individual storage uses than the permit. The adjudication claim noted 224,886 irrigated acres served by the right. Competing adjudication claims for this right include 63-3618A by Pioneer Irrigation District and 63-3618B by Settlers Irrigation District.

BOR claimed right 63-5263 for 17,000 af "bank storage" at Lucky Peak. The claim lists irrigation storage components but alleges to increase storage capacity at the reservoir to 324,000 af.

Permits 63-9019 and 63-11069 use reservoir water to generate power at Lucky Peak. Power is produced as storage water is released for other uses authorized by permit 63-3618.

Overlapping rights/claims do not present licensing problems in 63-3618. Questions about bank storage and maximum acres irrigated with reservoir water can be addressed in the SRBA.

Point of diversion and storage capacity

Dam Safety file D63-3618 contains sufficient information to document the storage dam at Lucky Peak. Attachment C summarizes dam safety data. Lucky Peak is a 240' earthen structure with a 2,340' crest. The dam can impound 307,000 af (Attachments C and D; see 1981 BOR memo at end of D). Reservoir water is released to the Boise River as needed. Irrigation storage water is withdrawn from the river at numerous diversions for distribution throughout the Boise Project. These withdrawals remain under watermaster control. Fish habitat (aka streamflow maintenance) releases serve the river channel from the dam to the mouth of the river. The reservoir holds about 28,800 af as inactive storage ("dead pool") according to the 1981 BOR memo in Attachment D.

The point of diversion includes the dam crest within three tracts. Government lots are difficult to precisely define as noted by comparing the 1934 government lot plat to the current river/reservoir configuration. It is probably best not to list government lots for this reason.

Beneficial use rules and acreage determination

Beneficial Use Examination Rule 1 allows deviations from beneficial use standards to meet licensing requirements. Rule 35 requires an accurate determination of the irrigated acres for a project exceeding 25,000 acres. A specific P/U land list is not required in these large irrigation cases.

The permit does not appear to be limited to a discreet number of acres although conflicting limits are suggested by the file history. Consider the following factors:

- Original application for permit and 1964 permit approval did not list acres.
- 1985 amendment did not define acres.
- 1987 amendment noted 164, 920 acres.
- 1989 adjudication claim listed 224,886 acres (see claim remarks).
- 1990 amendment listed 277,000 acres.
- Amendment approvals did not limit the number of acres. Conditions of approval in the amendments did not address acreage limits.
- A 1994 meeting between BOR, IDFG, the Boise River Watermaster and IDWR noted 277,000 acres in the project but 224,886 acres served by contract (see meeting notes from 1-5-94 in Attachment D).
- Attachment B (October 2001) describes supplemental use for up to 324,300 acres.

- The number of acres is not limited by current permit information.

- Acreage limits for Arrowrock and Anderson Ranch Reservoirs (63-303, 63-3613 and 63-3614) remain undefined or not necessarily accurately determined.

I asked Adjudication, Allocation and Technical Services Bureau Chiefs about accurate acreage data available for the Boise Project. Dave Tuthill mentioned shape files have been created for Boise Project delivery organizations but total acres have not been quantified yet. Acres should be tallied next year to prepare the Director's Report for the area below Lucky Peak. Glen Saxton doubted Allocation had such a record. Bob Sutter for Paul Castelin recalled irrigation exceeding 275,000 acres per BOR data. An accurate determination of acres cannot be fully documented at this time but the file history suggests a maximum of 277,000 to 324,300 acres served by the Boise Project.

It is difficult to find merit in delaying the license until SRBA acreage calculations have been completed. A license could be issued without an acre limit or could be issued with some limit. Although a limit based on accurate data cannot be determined yet, the most flexible limit based on unverified data is BOR's 324,300 acres within the Boise Project. An incorrect acre limitation could be revised by a future transfer to expand storage water to more acres (specifically approvable in I. C. § 42-222).

A license without an acre limit would be most consistent with the permit and can be accommodated within Beneficial Use Rule 1. Allow the SRBA to determine the acre limit if necessary. Additionally, a transfer could be processed to define an acre limitation for the license during SRBA review or after a partial decree is issued.

Lucky Peak storage water is used as needed. Contracts and watermaster control provide reasonable methods to control water used under this permit, regardless of the number of acres eligible to receive storage water.

Water use

The Boise River system produces about two million af in an average year. Lucky Peak is the most downstream of three major storage facilities and provides the most expensive storage water for the users. These factors result in Lucky Peak water being used last and/or held for carry over in at least some circumstances. [1]

Lucky Peak can store 307,000 af if conditions allow. Weather, carry over from prior years, flood control requirements, water demand and other variables are involved. The storage portion of the reservoir permit does not present licensing complications.

[1] Personal communication from Watermaster Lee Sisco, February 19, 2002.

What about use from storage? Is it necessary to measure actual use of storage water to issue a license? Is it even possible to make this determination? Management of and accounting for the Boise River storage system is complex. It would be a painstaking and perhaps even futile exercise to comb through all the watermaster records to determine if the permitted uses from storage had occurred in the last few decades (the records do not clearly state such information and are complicated by numerous factors, such as carry over, found in complex storage scenarios). It is possible that the maximum use from storage has not been needed.

We know water is released from storage for irrigation and fish habitat uses dictated by a complex array of factors. Fish habitat use occurs at the reservoir and in the river below Lucky Peak. Irrigation takes place within the Boise Project. Failure to release water from storage should not diminish the permit in the context of overall river management. Instead, rely on BOR information to understand distribution of Lucky Peak storage water. BOR provided Attachment E in 1994, and the attachment offers the best available guide to understanding use of the storage water.

Some of the information in Attachment E is confusing but a careful reading suggests four uses of Lucky Peak storage. Disregard the "bank storage" water for now because it exceeds the permit (recall 63-5263 covers bank storage). Flood control cannot be recognized as a beneficial use unless IDWR's standard has changed. [2]

Three uses of the storage water can be licensed as follows based on the ability to store water and release water from storage as conditions and BOR contracts warrant:

- 111,950 af contracted for irrigation use.
- 152,300 af of contracted and uncontracted water for fish habitat use ("streamflow maintenance"), which includes 50,000 af contracted to IDFG for winter flow releases.
- 28,800 af for recreation storage (unlike the previous two uses, does not include use from storage), which is the inactive storage in Lucky Peak.

The three storage uses total 293,050 af, which is 13,950 af short of the reservoir capacity of 307,000 af. The "missing" 13,950 af represent the previously mentioned flood control parameter. The following recommendations are consistent with the flexibility noted in Beneficial Use Rule 1.

[2] IDWR letter to BOR dated May 15, 1984 in reference to an amendment application that listed 13,950 af for flood control. IDWR suggested this use be listed in the permit remarks.

Recommendations

The license should be issued as follows with standard conditions and some clarifications.

Storage Use/Amount/Period	Use *from* Storage/Amount/Period
Irrigation / 111,950 afa / all year	Irrigation / 111,950 afa / March 1-Nov. 15
Fish habitat / 152,300 afa / all year	Fish habitat / 152,300 afa / all year
Recreation / 28,800 afa / all year	(no recreation from storage) [3]
Total storage 293,050 afa	Total from storage 264,250 afa.

Total amount of water in this right is limited to 307,000 acre feet per year.

Place of use for irrigation is the service area of the Boise Project.

Place of use for fish habitat ("streamflow maintenance") includes Lucky Peak Reservoir and the Boise River channel from Lucky Peak Dam to the confluence with the Snake River. Water for fish habitat use includes 50,000 acre feet contracted to the Idaho Department of Fish & Game. "Natural flow within this reach in excess of the stored water released under this right is subject to appropriation." [4]

Place of use for recreation is Lucky Peak Reservoir.

Use of water under this right is subject to contracts administered by the right holder.

Use of water under this right is subject to control of the Boise River Watermaster.

Flood control can include 13,950 acre feet of Lucky Peak Reservoir water.

---

[3] It is conceivable although improbable to totally empty the reservoir and achieve "recreation from storage" use. This suggests a possible adjustment to the license recommendation.

[4] Quote from item #1 in DRT's memo of March 21, 1994. See Page 1 of Attachment D.

State of Idaho
Department of Water Resources

Water Right License

WATER RIGHT NO. 63-03618

Priority: April 12,1963

Maximum Volume Annually Diverted to Storage And Released from Storage: 293,050.0 AF

It is hereby certified that US DEPT OF INTERIOR
BUREAU OF RECLAMATION
PN REGIONAL OFFICE
1150 N CURTIS RD SUITE 100
BOISE ID 83706-1234 has complied with the terms and conditions of the permit, issued pursuant to Application for Permit dated April 12,1963; and has submitted Proof of Beneficial Use on September 22, 1986. An examination indicates that the works have a capacity to divert 307,000 af of water to storage from:

SOURCE
BOISE RIVER **Tributary:** SNAKE RIVER

and a water right has been established as follows:

BENEFICIAL USE	PERIOD OF USE	ANNUAL DIVERSION VOLUME
IRRIGATION FROM STORAGE	03/01 to 11/15	111,950.0 AF
IRRIGATION STORAGE	01/01 to 12/31	111,950.0 AF
RECREATION STORAGE (INACTIVE STORAGE)	01/01 to 12/31	28,800.0 AF
STREAMFLOW MAINTENANCE STORAGE	01/01 to 12/31	152,300.0 AF
STREAMFLOW MAINTENANCE FROM STORAGE	01/01 to 12/31	152,300.0 AF

LOCATION OF POINT OF DIVERSION:
BOISE RIVER L7 SE¼NE¼ Sec. 11, Twp 2N, Rge 3E, B.M., ADA County

PLACE OF USE:
IRRIGATION FROM STORAGE – LANDS IRRIGATED IN THE BOISE VALLEY IN ADA, CANYON, PAYETTE, AND GEM COUNTIES, IDAHO; MALHEUR COUNTY, OREGON; AND THE FOLLOWING TRACTS IN ADA, BOISE AND ELMORE COUNTIES, IDAHO:

Twp	Rge	Sec	NE				NW				SW				SE			
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE
02N	03E	11	X L4												X			
02N	03E	12						X L2					X					
02N	04E	4											X					
02N	04E	5		X L2	X L8				X L6						X	X	X	X
02N	04E	6			X						X		X L8	X L9	X L6	X		X L11
02N	04E	7		X	X		X L1			X	X	X L4				X		
03N	04E	5				X												
03N	04E	11				X									X L1			
03N	04E	12							X			X L1						
03N	04E	22					X L3		X	X								
03N	04E	32		X L1	X											X L5	X L10	

State of Idaho
Department of Water Resources

Water Right License

WATER RIGHT NO. 63-03618

PLACE OF USE CONTINUED:

IRRIGATION STORAGE, STREAMFLOW MAINTENANCE STORAGE, AND RECREATION STORAGE – LUCKY PEAK RESERVOIR.

STREAMFLOW MAINTENANCE FROM STORAGE -- WITHIN THE CHANNEL OF THE BOISE RIVER FROM LUCKY PEAK DAM DOWNSTREAM TO THE CONFLUENCE WITH THE SNAKE RIVER.

CONDITIONS OF APPROVAL

1. Use of water under this water right will be regulated by the watermaster of State Water District No. 63 or its successor.
2. The Bureau of Reclamation and Idaho Department of Fish and Game shall provide joint written instructions to the Department, for conveyance to the watermaster, regarding release of the Lucky Peak streamflow maintenance storage water.
3. The reservoir storage capacity is 293,050 acre feet when filled to elevation 3055.0 and measured at the upstream face of the dam.
4. Lucky Peak Reservoir has 13,950 acre feet of capacity for flood control purposes in addition to the volume of water authorized for storage under this right.
5. Recreation storage (inactive storage) shall not be released from storage for a beneficial use.
6. The storage of water under this right is contingent upon continued certification by the Department of Water Resources under the dam safety provisions of the Idaho Code authorizing storage.

This license is issued pursuant to the provisions of Section 42-219, Idaho Code. The water right confirmed by this license is subject to all prior water rights and shall be used in accordance with Idaho law and applicable rules of the Department of Water Resources.

Signed and sealed this 27th day of SEPTEMBER, 2002.

Acting for KARL J. DREHER
Director

STATE OF IDAHO)
)ss.
COUNTY OF ADA)

Debbie Walsh, being duly sworn, deposes and says: That she is the Principal Clerk of The Idaho Statesman, a daily newspaper printed and published at Boise, Ada County, State of Idaho, and having a general circulation therein and which said newspaper has been continuously and uninterruptedly published in said County during a period of twelve consecutive months prior to the first publication of the notice, a copy of which is attached hereto; that said notice was published in the regular edition of The Idaho Statesman for

two insertions, beginning with the

issue of April 5, 1984, and ending with the

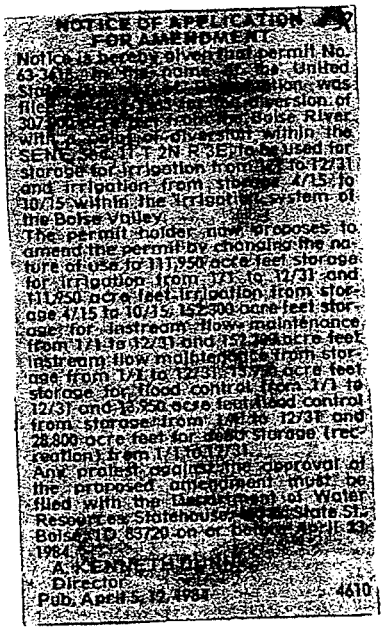
issue of April 12, 1984.

Debbie Walsh

Subscribed and sworn to before me this 12th

day of April, 1984.

Notary Public for Idaho, Residing at Boise, Idaho



NOTICE OF APPLICATION FOR AMENDMENT

Notice is hereby given that permit No. 43-[illegible] in the name of the United States [illegible] application was filed [illegible] diversion of 30[illegible] from the Snake River with the point of diversion within the SENE Sec. 11, T 2N R 3E to be used for storage for irrigation from 12/1 to 12/31 and irrigation from storage 4/15 to 10/15 within the irrigation system of the Boise Valley.

The permit holder now proposes to amend the permit by changing the nature of use to 111,950 acre feet storage for irrigation from 12/1 to 12/31 and 111,950 acre feet irrigation from storage 4/15 to 10/15; 152,300 acre feet storage for instream flow maintenance from 1/1 to 12/31 and 152,300 acre feet instream flow maintenance from storage from 1/1 to 12/31; [illegible] acre feet storage for flood control from 1/1 to 12/31 and 18,950 acre feet flood control from storage from 1/1 to 12/31 and 28,800 acre feet for water storage (recreation) from 1/1 to 12/31.

Any protest against the approval of the proposed amendment must be filed with the Department of Water Resources, Statehouse, Boise, ID 83720 on or before April 23, 1984.

A. KENT FOSTER
Director

Pub. April 5, 12, 1984 4610

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RECEIVED
JAN 30 2003
Department of Water Resources

IN THE DISTRICT COURT OF THE FIFTH JUDICIAL DISTRICT OF THE

STATE OF IDAHO, IN AND FOR THE COUNTY OF TWIN FALLS

In Re SRBA	)	Subcase No. 63-3618
	)	
Case No. 39576	)	
	)	**STANDARD FORM 1**
	)	**OBJECTION**
	)	
_____	)	

NAME AND ADDRESS OF PERSON OBJECTING

Name: Nampa & Meridian Irrigation District
Address: 1503 First Street South
Nampa, ID 83651
Daytime Phone:(208) 466-7861

Name & Address of Attorney:

Daniel V. Steenson
S. Bryce Farris
Ringert Clark, Chartered
P.O. Box 2773
Boise, ID 83701
(208) 342-4591

CLAIMANT OF WATER RIGHT AS LISTED IN DIRECTORS'S REPORT

Name: United States of America Acting Through
Regional Director PN Region
Bureau of Reclamation
Address: 1150 N. Curtis Rd., Suite 100
Boise, ID 83706-1234

COPY

I object to the following elements as recommended in the Director's Report.

1. X **Name and Address**
   Should be: See Attachment A.

2. **Source**
   Should be:

3. X **Quantity**
   Should be: See Attachment A.

4. **Priority Date**
   Should be:

5. **Point(s) of Diversion**
   Should be:

6. X **Instream Flow Description**
   Should be: See Attachment A.

7. X **Purpose(s) of Use**
   Should be: See Attachment A.

8. **Period of Year**
   Should be:

9. X **Place of Use**
   Should be: See Attachment A.

10. **I object because:**

    This water right should not exist.

    This water right was not recommended, but should be recommended with the elements as described above.

REASONS SUPPORTING OBJECTION(S):
See Attachment A.

VERIFICATION

State of Idaho)
) ss.
County of Ada)

S. Bryce Farris, duly sworn, upon oath, deposes and says:

That I am the party/claimant filing this objection, as defined by I. C. §§ 42-1401A (1) and (6) or that I am the attorney for the party/claimant objecting and that I have read this objection, know its contents and believe that the statements are true to the best of my knowledge.

(Attorney signing in representative capacity)

Subscribed and sworn to before me on: 1/29/03

Notary Public for State of Idaho
Residing at: Boise, Idaho
My Commission Expires: 2/20/08

KATIE R. MOSER NOTARY PUBLIC STATE OF IDAHO

CERTIFICATE OF MAILING

I certify that on January 27th, 2003, I mailed the original and copies of this objection, including all attachments, to the following persons:

1. Original to:

   Clerk of the District Court
   Snake River Basin Adjudication
   253 Third Avenue North
   PO Box 2707
   Twin Falls, ID 83303-2707

2. One copy to the Claimant of the water right at the following address:

   United States of America Acting Through
   Regional Director PN Region
   Bureau of Reclamation
   1150 N. Curtis Rd., Suite 100
   Boise, ID 83706-1234

3. Copies to:

   IDWR Document Depository
   PO Box 83720
   Boise, ID 83720-0098

   Chief, Natural Resources Division
   Office of the Attorney General
   State of Idaho
   PO Box 44449
   Boise, ID 83711-4449

   United States Department of Justice
   Environment and Natural Resource Division
   550 West Fort Street, MSC 033
   Boise, ID 83724

Signature of Objector or attorney
mailing on Objector's behalf

ATTACHMENT A
63-3618

1. Ownership, Quantity, Place of Use. The Idaho Department of Water Resources (IDWR) has recommended this right in the name of the United States Department of Interior, Bureau of Reclamation (Reclamation). However, Nampa & Meridian Irrigation District (NMID) is the owner of 35,000 acre feet of this water right based upon the fact that this portion of the right was perfected by beneficial use on lands within NMID's boundaries, and is therefore appurtenant to those lands. NMID's position is in accordance with Idaho Law, the Reclamation Act of 1902, 43 U.S.C. § 372, and is supported by case law holding that a water right developed under the Reclamation Act is appurtenant to the land, and the landowners are the owners of the water right. *Ickes v. Fox*, 300 U.S. 82 (1937). Consistent with these authorities, NMID has filed SRBA Claim no. 63-3618J seeking a decree of 35,000 acre feet of this water right in NMID's name, appurtenant to lands within NMID's boundaries. Issuance of such a decree to NMID will require that 35,000 acre feet not be included in the decree for Water Right Number 63-3618.

In the alternative, at a minimum under these authorities, NMID is the beneficial owner of the water right and Reclamation holds only nominal legal title. If the court decrees the water right to Reclamation in this manner the decree must state that Reclamation holds legal title in name only, and NMID is the beneficial owner of 35,000 acre feet, appurtenant to lands within NMID's boundaries.

2. Purpose of Use.

(a) The purposes for which Lucky Peak Dam and Reservoir were constructed are irrigation and flood control. These are the only allowable uses of the dam and reservoir under the statutes authorizing the construction of the dam and reservoir. Therefore, Reclamation has no authority to seek or claim water right uses other than irrigation and flood control.

(b) If the right is decreed, the claimed purpose for use for streamflow maintenance storage or streamflow maintenance from storage should not be decreed. Those uses are not beneficial uses of water under Idaho law, particularly if held by any individual or entity other than the Idaho Water Resources Board. Those quantities should be decreed for irrigation purposes, as reflected in the water permit before IDWR erroneously approved the amendment of the permit.

(c) In order to properly define and administer this water right, there must be: a remark which provides that any change to the elements of this water right requires a transfer pursuant to Idaho law; a remark which requires NMID's approval of any change to NMID's portion of this right (35,000 acre feet); and a remark which requires that uncontracted space be made available for irrigation use.

RECEIVED
JAN 3 1 2003
Department of Water Resources

IN THE DISTRICT COURT OF THE FIFTH JUDICIAL DISTRICT OF THE STATE OF IDAHO, IN AND FOR THE COUNTY OF TWIN FALLS

In Re SRBA)
)
Case No. 39576)
)
)
)

A. **Subcase** 63-03618
(Insert water right number)

STANDARD FORM 1 OBJECTION

AMENDED

Please fill in the following information:

B. **NAME AND ADDRESS OF PERSON OBJECTING**

Name: Settlers Irrigation District

Address: P.O. Box 7571
Boise, ID 83707

Daytime Phone: 208-344-2471

Name & Address of Attorney, if any:
Scott Campbell & Angela Schaer Kaufmann
Moffatt Thomas Barrett Rock & Fields Chtd.
P.O. Box 829, Boise, ID 83701-0829

C. **CLAIMANT OF WATER RIGHT AS LISTED IN DIRECTOR'S REPORT**

Name: Settlers Irrigation District

Address: P.O. Box 7571
Boise, ID 83707

D. I object to the following elements as recommended in the Director's Report. (Please check the appropriate box(es)).

1. ☒ **Name and Address**
   Should be: See Attachment A

2. ☐ **Source**
   Should be: _____

3. ☒ **Quantity**
   Should be: See Attachment A

4. ☐ **Priority Date**
   Should be: _____

5. ☐ **Point(s) of Diversion**
   Should be: _____

6. ☐ **Instream Flow Description**
   Should be: _____

7. ☒ **Purpose(s) of Use**
   Should be: See Attachment A

8. ☐ **Period of Year**
   Should be: _____

9. ☒ **Place of Use**
   Should be: See Attachment A

11. **I object because:**

☐ This water right should not exist.

☐ This water right was not recommended, but should be recommended with the elements described above.

E. REASONS SUPPORTING OBJECTION(S): See Attachment A

E

VERIFICATION (Must be Completed)

State of Idaho)
)ss.
County of Ada)

Angela Schaer Kaufmann, duly sworn, upon oath, deposes and says:
(Name of person filing objection)

That I am the party/claimant filing this objection, as defined by I.C. §§ 42-1401A(1) and (6) or that I am the attorney for the party/claimant objecting and that I have read this objection, know its contents and believe that the statements are true to the best of my knowledge.

(Signature of person filing objection)

Angela Schaer Kaufmann
(Attorney signing in representative capacity)

Subscribed and sworn to before me on: January 30, 2003

DEBORAH L. LONG NOTARY PUBLIC STATE OF IDAHO

Notary Public for Idaho
Residing at: Boise, Idaho
My Commission Expires: 10/10/07

INSTRUCTIONS FOR MAILING

You must mail the objection, to the Clerk of the Court. **FAX filings will not be accepted**. You must also send a copy to all the parties listed below in the Certificate of Mailing.

CERTIFICATE OF MAILING

I certify that on January 30, 2003, I mailed the original and copies of this objection, including all attachments, to the following persons:

1. Original to:

   Clerk of the District Court
   Snake River Basin Adjudication
   253 Third Avenue North
   PO Box 2707
   Twin Falls, ID 83303-2707

2. One copy to the claimant of the water right at the following address:

   Name: Settlers Irrigation District
   Address: P.O. Box 7571
   Boise, ID 83707

3. Copies to:

   IDWR Document Depository
   PO Box 83720
   Boise, ID 83720-0098

   Chief, Natural Resources Division
   Office of the Attorney General
   State of Idaho
   PO Box 44449
   Boise, ID 83711-4449

   United States Department of Justice
   Environment and Natural Resource Division
   550 West Fort Street, MSC 033
   Boise, ID 83724

Angela Schaer Kaufmann

Signature of Objector or attorney mailing on Objector's behalf

ATTACHMENT A
63-3618

Settlers Irrigation District ("Settlers") has a contract with the Bureau of Reclamation for irrigation storage water from Lucky Peak Reservoir. Settlers has a right to use 10,000 acre feet of water from Lucky Peak Reservoir to irrigate 12,322 acres owned by landholders within Settlers's service area. The Idaho Department of Water Resources has recommended that Settlers' water right claim for that amount of water, 63-3618B, be disallowed.

Settlers has filed or will file an objection to that recommendation, and further objects to the recommendation for SRBA Claim Number 63-3618, because the Idaho Department of Water Resources has indicated that claim number 63-3618B has been recommended as 63-3618. Settlers asserts an ownership interest in 63-03618 to the extent that water right, as recommended, includes 63-3618B. This ownership interest is a full ownership interest, in accordance with Idaho law, the Reclamation Act of 1902, 43 U.S.C. § 372, and the United States Supreme Court decision in *Ickes v. Fox*, 300 U.S. 82, 57 S.Ct. 412, 416-17 (1937). In the alternative, Settlers asserts a beneficial ownership interest, with the United States holding only nominal legal title.

If the right is decreed, the claimed purposes of use for streamflow maintenance storage or streamflow maintenance from storage should not be decreed. Those uses are not beneficial uses of water under Idaho law, particularly if held by any individual or entity other than the Idaho Water Resource Board. Those quantities should be decreed for irrigation purposes, as reflected in the water permit before the Idaho Department of Water Resources erroneously approved the amendment of the permit.

Moreover, allowing wintertime releases and releases for fish and game purposes is contrary to the purposes for which Lucky Peak Dam and Reservoir were constructed. The only allowable uses under the pertinent authorizations are irrigation and flood control.

Relatedly, the claimed purpose of use for recreation storage (inactive storage) is subordinate and subject to use of water for irrigation purposes. If this water right is decreed, it should contain a remark that "the quantity of water decreed for recreation storage shall be subordinate and subject to the use of water for irrigation purposes."

In order to properly define and administer this right, at a minimum, a remark should be included which provides that any change to any element of this right must be undertaken in accordance with the transfer proceedings of Idaho law, with the approval of Settlers Irrigation District as to that portion owned by the District, and with a remark that uncontracted space be made available for irrigation.

RECEIVED
JAN 3 1 2003
Department of Water Resources

IN THE DISTRICT COURT OF THE FIFTH JUDICIAL DISTRICT OF THE STATE OF IDAHO, IN AND FOR THE COUNTY OF TWIN FALLS

In Re SRBA)
)
Case No. 39576)
)
)
)

A. Subcase 63-03618
(Insert water right number)

STANDARD FORM 1 OBJECTION

AMENDED

Please fill in the following information:

B. **NAME AND ADDRESS OF PERSON OBJECTING**

Name: Pioneer Irrigation District

Address: P.O. Box 426

Caldwell, ID 83606

Daytime Phone: 208-459-3617

Name & Address of Attorney, if any:

Scott Campbell & Angela Schaer Kaufmann

Moffatt Thomas Barrett Rock & Fields Chtd.

P.O. Box 829, Boise, ID 83701-0829

C. **CLAIMANT OF WATER RIGHT AS LISTED IN DIRECTOR'S REPORT**

Name: Pioneer Irrigation District

Address: P.O. Box 426

Caldwell, ID 83606

D. I object to the following elements as recommended in the Director's Report. (Please check the appropriate box(es)).

1. [x] **Name and Address**
   Should be: See Attachment A

2. [ ] **Source**
   Should be: _____

3. [x] **Quantity**
   Should be: See Attachment A

4. [ ] **Priority Date**
   Should be: _____

5. [ ] **Point(s) of Diversion**
   Should be: _____

6. [ ] **Instream Flow Description**
   Should be: _____

7. [x] **Purpose(s) of Use**
   Should be: See Attachment A

8. [ ] **Period of Year**
   Should be: _____

9. [x] **Place of Use**
   Should be: See Attachment A

11. **I object because:**

[ ] This water right should not exist.

[ ] This water right was not recommended, but should be recommended with the elements described above.

E. **REASONS SUPPORTING OBJECTION(S):** See Attachment A

F. **VERIFICATION** (Must be Completed)

State of Idaho)
)ss.
County of Ada)

Angela Schaer Kaufmann, duly sworn, upon oath, deposes and says:
(Name of person filing objection)

That I am the party/claimant filing this objection, as defined by I.C. §§ 42-1401A(1) and (6) or that I am the attorney for the party/claimant objecting and that I have read this objection, know its contents and believe that the statements are true to the best of my knowledge.

(Signature of person filing objection)

Angela Schaer Kaufmann
(Attorney signing in representative capacity)

Subscribed and sworn to before me on: January 30, 2003

Deborah L. Long
Notary Public for Idaho
Residing at: Boise, Idaho
My Commission Expires: 10/10/07

DEBORAH L. LONG NOTARY PUBLIC STATE OF IDAHO

INSTRUCTIONS FOR MAILING

You must mail the objection, to the Clerk of the Court. **FAX filings will not be accepted.** You must also send a copy to all the parties listed below in the Certificate of Mailing.

CERTIFICATE OF MAILING

I certify that on January 30 , 2003 , I mailed the original and copies of this objection, including all attachments, to the following persons:

1. Original to:

   Clerk of the District Court
   Snake River Basin Adjudication
   253 Third Avenue North
   PO Box 2707
   Twin Falls, ID 83303-2707

2. One copy to the claimant of the water right at the following address:

   Name: Pioneer Irrigation District
   Address: P.O. Box 426
   Caldwell, ID 83606

3. Copies to:

   IDWR Document Depository
   PO Box 83720
   Boise, ID 83720-0098

   Chief, Natural Resources Division
   Office of the Attorney General
   State of Idaho
   PO Box 44449
   Boise, ID 83711-4449

   United States Department of Justice
   Environment and Natural Resource Division
   550 West Fort Street, MSC 033
   Boise, ID 83724

Angela Schaer Kaufmann

Signature of Objector or attorney mailing on Objector's behalf

ATTACHMENT A
63-03618

Pioneer Irrigation District ("Pioneer") has a contract with the Bureau of Reclamation for irrigation storage water from Lucky Peak Reservoir. Pioneer has a right to use 16000 acre feet of water from Lucky Peak Reservoir to irrigate 35350.5 acres owned by landholders within Pioneer's service area. The Idaho Department of Water Resources has recommended that Pioneer' water right claim for that amount of water, 63-3618A, be disallowed.

Pioneer has filed or will file an objection to that recommendation, and further objects to the recommendation for SRBA Claim Number 63-3618, because the Idaho Department of Water Resources has indicated that claim number 63-3618A has been recommended as 63-3618. Pioneer asserts an ownership interest in 63-03618 to the extent that water right, as recommended, includes 63-3618A. This ownership interest is a full ownership interest, in accordance with Idaho law, the Reclamation Act of 1902, 43 U.S.C. § 372, and the United States Supreme Court decision in *Ickes v. Fox*, 300 U.S. 82, 57 S.Ct. 412, 416-17 (1937). In the alternative, Pioneer asserts a beneficial ownership interest, with the United States holding only nominal legal title.

If the right is decreed, the claimed purposes of use for streamflow maintenance storage or streamflow maintenance from storage should not be decreed. Those uses are not beneficial uses of water under Idaho law, particularly if held by any individual or entity other than the Idaho Water Resource Board. Those quantities should be decreed for irrigation purposes, as reflected in the water permit before the Idaho Department of Water Resources erroneously approved the amendment of the permit.

Moreover, allowing wintertime releases and releases for fish and game purposes is contrary to the purposes for which Lucky Peak Dam and Reservoir were constructed. The only allowable uses under the pertinent authorizations are irrigation and flood control.

Relatedly, the claimed purpose of use for recreation storage (inactive storage) is subordinate and subject to use of water for irrigation purposes. If this water right is decreed, it should contain a remark that "the quantity of water decreed for recreation storage shall be subordinate and subject to the use of water for irrigation purposes."

In order to properly define and administer this right, at a minimum, a remark should be included which provides that any change to any element of this right must be undertaken in accordance with the transfer proceedings of Idaho law, with the approval of Pioneer Irrigation District as to that portion owned by the District, and with a remark that uncontracted space be made available for irrigation.

State of Idaho

Department of Water Resources

WATER RIGHT LICENSE

License of Water Right No. 31-7301 Priority June 2, 1978 Amount 8.78 cfs

THIS IS TO CERTIFY, that U.S. Dept. of Interior, Fish and Wildlife Services

of Portland, Oregon has complied with the terms and conditions of Permit

No. 31-7301 issued pursuant to Application for Permit dated June 2, 1978

and has submitted proof to the Department of Water Resources on January 27, 1981

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 8.78 cfs of water from a groundwater 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
Wildlife	from March 1 to November 1	at 8.78 cfs	and 4310.0 acre feet
	from to	at cfs	and
	from to	at cfs	and

(both dates inclusive)

Subject, however, to the condition that no more than 8.78 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 by for the purpose aforementioned and is limited to the amount which can actually be beneficially used and shall not exceed 4310.0 acre feet per year, said waters to be diverted within the NE¼SW¼, Section 5, Twp. 7N, Rge. 36E in the County of Jefferson.

Description and location of place of use:

Twp.	Range	Sec.	NE¼				NW¼				SW¼				SE¼				Totals
			NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	
						WITHIN THE CANAS NATIONAL WILDLIFE REFUGE													

Total number of acres irrigated

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. The right may be forfeited by five years of nonuse.

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

Witness the seal and signature of the Director, affixed at Boise, Idaho, this 20TH day of SEPTEMBER, 1983.

For the Director

State of Idaho

Department of Water Resources

WATER RIGHT LICENSE

License of Water Right No. 43-7007 Priority Dec. 24, 1968 Amount 0.50 cfs

THIS IS TO CERTIFY, that the U.S. Bureau of Sports Fisheries & Wildlife

of Portland, Oregon, has complied with the terms and conditions of Permit No. 43-7007 issued pursuant to Application for Permit dated December 24, 1968, and has submitted proof to the Department of Water Resources on March 13, 1974, 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 0.50 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
Stockwater and Wildlife	from April 1	to Sept. 30	at 0.50 cfs	and	4.0 acre feet
	from	to	at cfs	and	
	from	to	at cfs	and	

(both dates inclusive)

Subject, however, to the condition that no more than 0.50 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 4.0 acre feet per year, said waters to be diverted within the SW¼SW¼ of Sec. 11, Twp. 9 S, Rge. 26 E, B.M. in the County of Cassia.

Description and location of place of use:

Twp.	Range	Sec.	NE¼				NW¼				SW¼				SE¼				Totals
			NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	
9S	26E	11											X						

Total number of acres irrigated _____

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 26 day of March, 19 75.

Director

State of Idaho
Department of Water Administration

LICENSE OF WATER RIGHT

License of Water Right No. 98-7003 Priority Dec. 4, 1967 Amount 1.0 cfs

THIS IS TO CERTIFY, that the U.S. Bureau of Sport Fisheries & Wildlife of Portland, Oregon, has complied with the terms and conditions of Permit No. 98-7003 issued pursuant to Application for Permit dated December 4, 1967, and has submitted proof to the Department of Water Administration on June 1, 1970, that he has applied water to a beneficial use; an examination by the Deparument indicates that the works have a capacity of 1.0 cfs, and that the water has in fact been applied to a beneficial use; a right to the use of water from Cascade Creek tributary of Myrtle Creek, is hereby confirmed in the following amounts:

Amount 1.0 cfs for Irrigation from April 1 to Nov. 30 (both dates inclusive)
Amount 1.0 cfs for Stockwater from Jan. 1 to Dec. 31 (both dates inclusive)
Amount 1.0 cfs for Wildlife from Jan. 1 to Dec. 31 (both dates inclusive)

Subject, however, to the condition that no more than 1.0 cfs of water be diverted at any one time, said waters to be diverted within the NW¼NW¼ Sec. 13, Twp. 62 N, Rge. 1 W, B.M. in the county of Boundary; and that the amount of water so diverted and to which such right is entitled and confirmed is for the purposes aforesaid and is limited to the amount which can actually be beneficially used and shall not exceed 162 acre feet per year or 3.0 acre feet per acre. for irrigation use and 1 acre feet per year for stockwater & wildlife use with the total amount not to exceed 163 acre feet per year.

Description and location of place of use:

TWP.	RANGE	SEC.	NE¼				NW¼				SW¼				SE¼				TOTALS
			NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	
62 N	1W	12									10	10	30						50
		13						4											4
(Stockwater & Wildlife use)																			
62 N	1W	12									x	x	x						
		13						x											

Total number of acres irrigated 54

A measuring device of a type approved by this Department shall be permanently maintained as part of the diverting works.

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 10 day of September, 19 73.

Director

98 7003

State of Idaho
Department of Water Administration

LICENSE OF WATER RIGHT

License of Water Right No. 98-7004 Priority Dec. 4, 1967 Amount 2.20 cfs

THIS IS TO CERTIFY, that the U.S. Bureau of Sport Fisheries & Wildlife of Portland, Oregon, has complied with the terms and conditions of Permit No. 98-7004 issued pursuant to Application for Permit dated December 4, 1967, and has submitted proof to the Department of Water Administration on June 1, 1970, that he has applied water to a beneficial use; an examination by the Department indicates that the works have a capacity of 2.20 cfs, and that the water has in fact been applied to a beneficial use; a right to the use of water from Deep Creek tributary of the Kootenai River, is hereby confirmed in the following amounts:

Amount 2.20 cfs for Irrigation from April 1 to Nov. 30 (both dates inclusive)
Amount 2.20 cfs for Stockwater from Jan. 1 to Dec. 31 (both dates inclusive)
Amount 2.20 cfs for Wildlife from Jan. 1 to Dec. 31 (both dates inclusive)

Subject, however, to the condition that no more than 2.20 cfs of water be diverted at any one time, said waters to be diverted within the NE¼NE¼ Sec. 36, Twp. 62 N, Rge. 1 W, B.M. in the county of Boundary; and that the amount of water so diverted and to which such right is entitled and confirmed is for the purposes aforesaid and is limited to the amount which can actually be beneficially used and shall not exceed 828 acre feet per year or 3.0 acre feet per acre for irrigation use and 2 acre feet per year for stockwater & wildlife use with the total amount not to exceed 830 acre feet per year.

Description and location of place of use:

TWP.	RANGE	SEC.	NE¼				NW¼				SW¼				SE¼				TOTALS
			NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	
62N	1W	25	20	38	39	14	11			2	1				25	39	30	22	241
		36	11	24															35
(Stockwater & Wildlife use)																			
62N	1W	25		x	x		x			x									
		36		x															

Total number of acres irrigated 276

A measuring device of a type approved by this Department shall be permanently maintained as part of the diverting works.

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 10 day of September, 19 73.

Director

98 7004

State of Idaho

Department of Water Resources

WATER RIGHT LICENSE

License of Water Right No. 98-7366 Priority March 9, 1981 Amount 2.29 cfs

THIS IS TO CERTIFY, that U.S. Dept. of Interior, Fish and Wildlife Service of Portland, OR, has complied with the terms and conditions of Permit No. 98-7366 issued pursuant to Application for Permit dated March 9. 1881, and has submitted proof to the Department of Water Resources on Sentember 24, 1982, 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 6.99 cfs of water from Kootenai River, tributary to Snake River, 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
Wildlife	from January 1 to December 31	2.29 cfs and	1657.9 Acre Feet
	from	cfs and	
	from	cfs and	

(Insert dates inclusive)

Subject, however, to the condition that no more than 2.29 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 1657.9 acre feet per year, said waters to be diverted within the SE¼NW¼, Section 18, Twp. 62 N, Rge. 1E in the County of Boundary

Description and location of place of use:

Twp.	Range	Sec.	NE¼				NW¼				SW¼				SE¼				Totals
			NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	
62N	1E	7																	
		18						X	X			X							
62N	1W	12													X				
		13	X	X	X	X													

Total number of acres irrigated _____

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, and is subject to all prior water rights, as provided by the laws of Idaho.

Witness the seal and signature of the Director, affixed at Boise, Idaho, this 20TH day of SEPTEMBER, 19 83.

Acting for the Director Norman C Young

APPLICATION FOR PERMIT 63-3614

To Construct a Reservoir and Appropriate and Store
The Public Waters of the State of Idaho

Application No. R 35086
Permit No. R 1183

1. Name of Applicant: United States of America, acting through the Regional Director, Region 1, Bureau of Reclamation
Post office address: P.O.Box 937 Boise State Idaho
and for the benefit of the users of Boise River water.

I. If applicant is a corporation, give:

(a) Date and place of incorporation:

(b) Amount of Capital Stock: $

(c) Amount paid in: $

(d) Names and addresses of directors:

II. The financial resources of the corporation are:

(a) Cash on hand: $

(b) Treasury Stock: $

(c) Bonds to be issued: $

(d) Other resources:

2. Quantity of water to be stored: 307,000 acre feet per annum.

3. Source of water supply is Boise (River) (Spring), a tributary of Snake River.

4. The outlet of the proposed reservoir is located S6°20'W 2300 feet, distant from the (bearing) NE corner of Section 11, Township 2 N., Range 3 E., B.M. and is in the SE ¼ of NE ¼ of Section 11, Township 2 N., Range 3 E., B.M. County of Ada
intake tower to the

5. Fill out either (a) or (b).

(a) The reservoir is located in the channel of Boise (Creek) (River).

(b) The reservoir is to be filled through a feeder canal, the point of diversion for which is located feet distant from the corner of Section, Township, Range, B.M., and is in the (bearing) ¼ of ¼ of Section, Township, Range, B.M.; width at bottom feet, width at top feet, depth of water feet; average grade per mile feet; Capacity cubic feet per second

6. (a) The area of the high water line of the reservoir is 2,850 acres.

(b) The reservoir capacity is 307,000 (total capacity); 278,200 (usable storage) acre feet.

7. Height of reservoir dam 340 feet, length at top of crest 1,700 feet, length at bottom variable feet, size of outlet 23 feet inside diameter. The dam is to be constructed of materials as follows: the existing Lucky Peak Dam and is Rolled earth and gravel fill.
(If height will exceed 10 feet, plans must be approved by Department of Reclamation, before beginning construction.)

8. (a) Will water stored in reservoir be diverted to canal or aqueduct, thence to land to be irrigated without commingling with natural flow of Boise (River)? No

(b) Water stored in reservoir will be carried in the channel of Boise (Creek) (River) a distance of 2 miles to point of diversion located at the existing Boise Diversion Dam S41°45' E (bearing) 356 feet, distant from the E½ corner of Section 4, Township 2 N., Range 3E., B.M., and Lot 9 of Section 3, Township 2 N., Range 3 E., B.M., and to other points of diversion in the Boise River downstream therefrom.

9. (a) Area of watershed above dam site 2,650 square miles.

(b) Estimated maximum flow of stream (unregulated natural flow) 35,000 to 40,000 cubic feet per second.

10. Water is to be used for irrigation purposes.

11. If for mining, milling, power or manufacturing purposes give:

(a) Point of use of water feet, distant from (bearing) Corner of Section, Township, Range, B.M., and is in the ¼ of ¼ of Section, Township, Range, B.M.

(b) Amount of power generated: H.P., under feet head.

(c) Water is to be returned to (Creek) (River) (Spring) at a point feet distant from the (bearing) corner of Section, Township, Range, B.M. in the ¼ of ¼ of Section, Township, Range, B.M.

12. Water stored in accordance with this Permit will be carried to place of use through a canal heretofore constructed or enlarged, as described in Permit No. 1600 & 1603 which is are hereby referred to and made a part hereof, and other existing canals diverting from the Boise River.

13. Kind of diversion works: Rubble concrete weir dam (Dam, canal, flume, pipe, etc.)

14. Height of diversion dam: 52 feet, length at top 500 feet, length at bottom 400 feet. The dam is constructed of materials as follows: Rubble concrete. Diversion will be through the existing New York Canal and canals diverting from the Boise River.
(If height will exceed 10 feet, plans must be approved by Department of Reclamation, before beginning construction.)

New York Canal - 8 [illegible]s each, 5' x 9'

5. Size of headgate: [illegible]

6. Diversion Canal: Width at bottom 40 feet, width at water line 67 feet, depth of water 9 feet, Dimensions of Flume

Diameter of Pipe inches; Length of Conduit miles. Average grade per mile feet.

7. Estimated Cost of Works: Storage Works: $ Constructed Diversion Works: $ Constructed

8. Time required for completion of work 5 years.

9. Time required for complete application of water to proposed beneficial use is 6 years.

10. The land to be irrigated is described in the following tabulation:

(Give Irrigable acreage in each 40-acre subdivision.)

Twp.	Range	Sec.	NE¼				NW¼				SW¼				SE¼				Totals
			NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	NE¼	NW¼	SW¼	SE¼	
			Lucky Peak stored waters will be utilized in the Boise Valley on presently irrigated lands for supplemental irrigation water.																

Total Number of Acres to Be Irrigated

1. Existing rights and/or valid permits appurtenant to lands described above are Water License No. R-698, No. R-652, No. 430, No. 7180, No. 4800, No. 16098, and the rights described in the Bryan and Stewart decrees.

Remarks: The water to be stored under this permit will be used to supplement lands having existing water rights in the Boise Valley who desire to contract therefor.

REMARKS: This permit is issued on condition - "That the yield of water from 50,000 acre feet of space be available for maintaining minmum winter time flow in the Boise River below Boise Diversion Dam under a release pattern established from time to time by the Director of the Idaho Fish and Game Department.

BE IT KNOWN That the undersigned hereby makes application for permit to construct a reservoir and appropriate and store the public waters of Idaho as herein set forth, and that the enclosed map is hereby made a part of this application.

UNITED STATES OF AMERICA, Applicant.

By s/ M. B. Austin, Agent.
Acting Regional Director

Date of first receipt at Department of Reclamation: 8:00 A.M. April 12, 1963

Returned to applicant for correction:

Corrected application received:

APPROVAL OF STATE RECLAMATION ENGINEER

The number of this permit is R 1183

Recorded in book R 5, page 1183. Approved March 20, 1964

This is to certify that I have examined the within application for a permit to construct a reservoir and appropriate and store the public waters of the State of Idaho, and hereby approve the same, subject to the following limitations and conditions:

Bond in the sum of $, to be filed on or before

Work to begin on or before May 20, 1964 and to continue diligently and uninterruptedly to completion, unless temporarily interrupted by circumstances over which the permit holder has no control.

One-fifth of the work above specified to be completed on or before September 20, 1966

The whole of said work to be completed on or before March 20, 1969

Beneficial use of water stored in accordance herewith, to be made on or before March 20, 1975

Witness my hand this 20th day of March, 19 64

s/ CARL E. TAPPAN
State Reclamation Engineer

IN TESTIMONY WHEREOF, We, ROBERT E. SMYLIE, Governor of the State of Idaho, and ARNOLD WILLIAMS, Secretary of State of the State of Idaho, have caused this instrument to be executed in the name of the State of Idaho, and caused the Great Seal of the State of Idaho to be hereunto affixed, this 20th day of March, 19 64

COUNTERSIGNED

By s/ ARNOLD WILLIAMS
Secretary of State.

STATE OF IDAHO
By s/ ROBERT E. SMYLIE
Governor.

(SEAL)

State of Idaho
DEPARTMENT OF WATER RESOURCES
Western Region, 2735 Airport Way, Boise, Idaho 83705-5082 - (208) 334-2190
FAX (208) 334-2348

CECIL D. ANDRUS
GOVERNOR

R. KEITH HIGGINSON
DIRECTOR

January 21, 1994

Distribution: See Below

RE: Conveyance of Boise River Maintenance Storage Flows Through the Boise River

Dear Interested Party:

During the past several months the issue of river maintenance flows in the Boise River has been a topic of discussion at meetings of the Idaho Water Resource Board. One outcome of the discussion was the identification of a need to clarify the mechanism for conveying river maintenance stored flows through the Boise River. On January 5, 1994, this office conducted a meeting to discuss this matter with representatives from the Idaho Department of Fish and Game (IDFG) (Cindy Robertson and Steve Goddard), the U.S. Bureau of Reclamation (BOR) (Jerry Gregg, Lori Postlethwait and Rick Wells), Water District 63 (Lee Sisco), and IDWR (Frank Sherman, John Beal, Steve Lester and Dave Tuthill). The purposes of this letter are to document the results of the meeting, propose a solution for clarifying this issue, and provide an opportunity for review of the issue by legal staffs representing each of the impacted entities.

The January 5, 1994 meeting consisted of discussions regarding the Lucky Peak Reservoir water right, river maintenance storage release agreements, and statutory provisions regarding delivery of storage water. The results of these discussions are as follows:

Water Right

Water Right No. 63-03618 is a water right permit for storage in Lucky Peak Reservoir. The permit was originally issued with a remark which serves as a condition of approval as follows:

> This permit is issued on condition -- "That the yield of water from 50,000 acre-feet of space be available for maintaining minimum winter time flow in the Boise River below Boise Diversion Dam under a release pattern established from time to time by the Director of the Idaho Fish and Game Department."

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This permit was amended in 1985 to add 102,300 of dedicated storage for stream flow maintenance purposes, so the amount of water for stream flow maintenance purposes totals 152,300 acre-feet. Proof of Beneficial Use was submitted for the permit on September 22, 1986, and since that date the permit has been amended to temporarily adjust the storage amounts in Lucky Peak Reservoir available for streamflow maintenance and irrigation while the total storage amount has not changed. The beneficial use field examination for the permit was conducted on October 27, 1993. Accordingly, the Western Regional Office staff are presently preparing recommendations for licensing of the permit. This process provides an opportunity to include conditions of approval that direct the use of water stored under this water right.

In general, each water right in Idaho must consist of two factors -- diversion and beneficial use. Therefore, in this situation Lucky Peak Dam provides the diversion works and the beneficial use is streamflow maintenance throughout the Boise River channel. This situation is different from the instream flow water rights described in Chapter 15, Title 42, Idaho Code. Instream flow water rights described in this chapter have no diversion and thus can be initiated only by the Idaho Water Resource Board filing an appropriation of water. Thus, the storage and release process conducted with Lucky Peak storage represents a streamflow maintenance water right that can be held by an entity other than the Board, in this case BOR.

Storage Releases

The only known written guidance regarding release of the streamflow maintenance water is a BOR memorandum dated March 8, 1981 from the Regional Planning Officer to the Project Superintendent of the Central Snake Planning Office. This memorandum includes the following guidance:

> The flow maintenance space of 102,300 acre-feet would be used to maintain an 80 cfs minimum Lucky Peak Lake release to the Boise River, and the Idaho Department of Fish and Game would use its existing space (50,000 acre-feet) to provide an additional 70 cfs, producing the total desired minimum flow of 150 cfs. If the full 150 cfs of Lucky Peak Lake flow release could not be maintained, the 80 cfs flow release would be provided whenever water is available. If water supplies were not available in the uncontracted space to make the 80 cfs river release, the Department of

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> Fish and Game could choose to use its water supplies to maintain all or a part of the 80 cfs river release. If adequate water supplies were available, the Department of Fish and Game would have the option of using its water to meet other fish flow needs, such as the 225 cfs flow release needed during October and November for brown trout spawning.

Participants at the meeting indicated that during the fall of each year, representatives from IDFG and BOR meet to plan Lucky Peak storage releases for the upcoming winter months based on availability of water supplies. These requirements are communicated to the Boise River watermaster.

Statutory Provisions

Chapter 8, Title 42, Idaho Code, is entitled "Distribution of Stored Water." Section 42-801 provides for conveyance of stored water and indicates that the owner of the reservoir shall in writing notify the Department of Water Resources regarding the dates and amounts of release of stored water and the purpose of the use. The Department is to convey these written instructions to the Watermaster. Section 42-802 provides protection of the stored water for the uses to which it is supposed to be placed.

Conclusions

Based on this information, the meeting participants drew the following conclusion:

1. A condition should be added to Water Right No. 63-03618 as it is licensed, clarifying the place of use of the streamflow maintenance water to be within the channel of the Boise River from Lucky Peak downstream to the mouth.

A second conclusion, resulting from discussion following the meeting, is as follows:

2. Pursuant to Section 42-801, Idaho Code, the BOR and IDFG should provide written instructions to the Department for conveyance to the Watermaster regarding delivery of the Lucky Peak streamflow maintenance storage water.

Summary

The recipients of this letter are invited to review the information provided herein and to respond with any concerns or objections no later than Friday, February 11, 1994.

Sincerely,

David R. Tuthill, Jr., P.E.
Manager, Western Regional Office

Distribution: IDFG (Cindy Robertson and Steve Goddard)
U.S. Bureau of Reclamation (Jerry Gregg, Lori Postlethwait and Rick Wells)
Water District 63 (Lee Sisco)
IDWR (Frank Sherman, John Beal, Steve Lester, Phil Rassier, Norm Young, Wayne Haas, Keith Higginson)

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