WATER CONTROL MANUAL STATUS SHEET

FLATHEAD/KERR PROJECT

NUMBER	ITEM	PRIORITY	STATUS	PLANNED ACTION
				1/
I	INTRODUCTION	3	4	
II	DESCRIPTION	3	4	
III	HISTORY	3	4	
IV	WATERSHED CHARACTERISTICS	3	4	
V	DATA COLLECTION	2	4	
VI	HYDROLOGIC FORECASTS	2	4	
VII	WATER CONTROL PLAN	1	3	
VIII	EFFECT OF WATER CONTROL PLAN	2	4	
IX	WATER CONTROL MANAGEMENT	2	4	
	SUPPORTING INFORMATION--- PHOTOS, PERTINENT DATA, TABLES, CHARTS, PLATES, AND EXHIBITS	2	4	

STATUS CODES

1. APPROVED, UP-TO-DATE
2. APPROVED, NEEDS REVISION
3. PRELIMINARY/DRAFT
4. INCOMPLETE AND/OR OUTDATED

REMARKS

1/ NO ORGANIZED CHAPTERS OF THIS MANUAL EXIST. AVAILABLE DOCUMENTS ON FILE WHICH ARE ESSENTIAL TO THE WATER CONTROL PLAN WERE INCLUDED IN THE MAY 1985 SUBMITTAL. WORK ON THE WATER CONTROL MANUAL IS SCHEDULED TO BEGIN IN FY 1992.

KERR DAM / FLATHEAD LAKE

FLATHEAD RIVER, MONTANA

WATER CONTROL PLAN

U.S. ARMY ENGINEER DISTRICT, SEATTLE

CORPS OF ENGINEERS

SEATTLE, WASHINGTON

FEBRUARY 1985

KERR DAM AND LAKE 1/

1. Project Description

Stream:	Flathead River (R.M. 72.0)
Location:	Polson, Montana
Owner:	Montana Power Company
Authorized Purpose:	Power, Flood Control, Recreation
Type of Project:	Storage

2. Lake Elevation (ft)

Normal full pool	2,893.0
Normal minimum pool	2,883.0
Flood control 2/	
15 April	2,883.0
30 May 3/	2,890.0
15 June 4/	2,893.0

3. Discharge (cfs)

Minimum daily average	1,500 5/
Maximum	No Limit 6/

4. Powerhouse

Number of units	3
Nameplate capacity (3 units @ 56 MW)	168 MW
Overload capacity (3 units @ 60 MW)	180 MW
Hydraulic capacity	14,346 cfs

KERR DAM / FLATHEAD LAKE

Table of Contents

D R A F T

Article 21 of the license for the Kerr Project states:

"The operations of the Licensee, in so far as they affect the use, storage, and discharge from storage of the water of Flathead Lake, shall at all times be controlled by such reasonable rules and regulations as the Secretary of War may prescribe in the interests of navigation, and as the Federal Power Commission may prescribe in the interests of flood control and of the fullest practicable utilization of the waters of Flathead River and Clark Fork for power, irrigation and other beneficial public uses".

These rules and regulations for flood control operation of the project were issued by the Federal Power Commission in an order approving the amended agreement between the Corps of Engineers and Montana Power Company. The order approving the agreement states as follows:

"(1) The Licensee and the Corps of Engineers will cooperate in exchanging data and coordinating operations for flood control. (2) Conditions permitting, the lake will be drawn down to elevation 2883 feet, the minimum level under the license, by April 15th and will be raised to elevation 2890 feet by Memorial Day (May 30th) and to elevation 2893 feet, the maximum level under the license, by June 15th. (3) When the lake reaches elevation 2886 feet, in a moderate or major flood year, the Licensee will gradually open its spill-gates to maintain free flow and will not close the gates until after the danger of exceeding elevation 2893 feet has passed.

The amended agreement has been endorsed by both the Flathead Lakers, Inc., an association of lakeside residents who are interested in having the lake

5. Basis for Operating Limits

FERC license, Project No. 5, issued Feb 1966. Relicensing by FERC presently being processed.

6. Status - History

Project completed in 1938.

1/ Data provided from telephone conversation between Wayne Wagner, NPS, Corps of Engineers and Bill Pasco, Montana Power Company, of 11 March 1982.

2/ Memorandum of Agreement between the Corps of Engineers and Montana Power Company, amended Oct. 1965.

3/ If a moderate to major flood year is forecast by NPD when the lake reaches elevation 2,886 ft, the spillway gates will be opened to maintain free flow condition until the danger of exceedig elevation 2,893 ft has passed.

4/ The lake may be raised to reach elevation 2,893 ft. by 15 June if a flood potential does not exist in the river basin above the lake as determined by NPD.

5/ The settlement agreement arrived at during the relicensing procedure contains a provision that would increase the minimum daily release from 1,500 cfs to 3,200 cfs.

6/ Project operated so that maximum discharge limited by natural lake outlet restriction.

There are two gages generally referred to in public releases. The first is Flathead River at Columbia Falls, located on the right bank 200 feet south of the old steel bridge south of Columbia Falls on 3rd Avenue West. The second is Flathead Lake at Somers, located at the steamboat dock in the town of Somers.

3/3

level brought up to the maximum under license as soon in the recreation season as possible, and the Upper Flathead Valley Flood Control Association, an organization of farm owners at the upper end of the lake who are interested in having the lake level kept down to prevent innundation of their lands by late floods. At a conference held in Missoula, Montana, on September 28, 1965, attended by representatives of these two landowners' groups, the Licensee, the Corps of Engineers, and the Commission, various differences were settled, and the terms of the settlement were incorporated into the agreement by the amendment of October 15, 1965. . . ."

During the flood period, the Corps of Engineers responsibilities include deciding the amount of flood storage that should be provided and if and when the Kerr Project should go to free flow spillway discharge. The National Weather Service, through its regional River Forecast Center in Portland, Oregon , is responsible for the preparation and issuance of flood forecasts. Air temperature, precipitation, water content of snow, upstream river flow and other variables, together with the latest computer techniques are used to revise and update the forecasts. To improve forecast quality through an increased quantity of data has been estimated to cost more than the benefits to be received. However, efforts are currently under way to automatically transmit this data from remote gages to speed up data availability, and sometimes the quality, so that forecasts can be more readily updated. This will allow earlier public notification of a flood potential. This notification is made through press releases to newspapers and radio-tv stations serving the Flathead River Basin. In addition, weekly teletypes describing the operations of Hungry Horse and Flathead Lake are sent to Montana senators and representatives, newspapers, radio-tv stations, and to the international news services by the Corps of Engineers.

4/ 2/3

MEMORANDUM OF UNDERSTANDING

BETWEEN

THE MONTANA POWER COMPANY AND CORPS OF ENGINEERS, U. S. ARMY

RE: REGULATION OF FLATHEAD LAKE

This Memorandum of Understanding made this 31st day of May, 1962, by and between The Montana Power Company and the Division Engineer, North Pacific Division, Corps of Engineers, U. S. Army,

W I T N E S S E T H :

WHEREAS, The Montana Power Company (hereinafter called the "Company") is the licensee for the Kerr hydroelectric development located on the Flathead River approximately five miles below the outlet of Flathead Lake, Montana, which license is designated as Federal Power Commission Project No. 5, and

WHEREAS, the Company is authorized by said license to regulate the levels of Flathead Lake between elevations 2883 and 2893 feet, USGS datum and

WHEREAS, the United States Government maintains and operates the Hungry Horse project on the south fork of the Flathead River upstream from Flathead Lake, and

WHEREAS, the parties hereto desire to establish procedures and principles for the regulation of Flathead Lake in the interests of flood control downstream therefrom:

NOW, THEREFORE, the parties hereto agree as follows:

(a) The Company will withdraw storage from Flathead Lake so as to endeavor to reach a lake level at Polson, Montana of approximately 2883 feet on or about April 15. It is understood that in order to accomplish this the

#2 1/5

is tentatively accepted as a means of judging this criterion. After it has been tested against floods of varying degrees of severity, said chart may be adjusted.

During an actual flood, when the best engineering judgment indicates that said chart is incorrect, its use will be suspended and the regulation will proceed as agreed upon between the Company and the Corps of Engineers. When such suspension appears necessary and is imminent the Company will notify the North Pacific Division of the Corps of Engineers.

(e) The parties will cooperate in the exchange of data and in the regulation of Flathead Lake levels in the interest of flood control consistent with the requirements of Federal Power Commission license for Project No. 5.

The procedures and principles herein set forth shall be followed unless modified by mutual consent to meet changed conditions, until terminated by either party on one year's written notice to the other.

IN WITNESS WHEREOF, the parties hereto have executed this Memorandum of Understanding the day and year first above written.

CORPS OF ENGINEERS

By /S/ W. W. Lapsley
The Division Engineer
U. S. Army Division, North Pacific
Portland, Oregon

THE MONTANA POWER COMPANY

By /S/ Sam B. Chase
Vice President

#2 3/5

UNITED STATES OF AMERICA
FEDERAL POWER COMMISSION

Before Commissioners: David S. Black, Acting Chairman; L. J. O'Connor, Jr., Charles R. Ross, and Carl E. Bagge.

The Montana Power Company) Project No. 5

ORDER APPROVING AGREEMENT AND PRESCRIBING PRINCIPLES AND PROCEDURES FOR REGULATION OF FLATHEAD LAKE

(Issued February 24, 1966)

On May 31, 1962, The Montana Power Company, licensee for the Kerr hydroelectric development, Project No. 5, on the Flathead River in Montana, and the Corps of Engineers entered a memorandum of understanding which set forth principles and procedures for regulation of Flathead Lake, the storage reservoir of the Kerr development, in the interests of flood control. The agreement, as amended on October 15, 1965, was filed on October 19, 1965, for approval by the Commission under Article 21 of the Kerr license, providing:

> The operations of the Licensee, in so far as they affect the use, storage, and discharge from storage of the water of Flathead Lake, shall at all times be controlled by such reasonable rules and regulations . . . as the Federal Power Commission may prescribe in the interests of flood control and the fullest practicable utilization of the waters of Flathead River and Clark Fork for power, irrigation, and other beneficial uses.

The amended agreement provides in general that: (1) The Licensee and the Corps of Engineers will cooperate in exchanging data and coordinating operations for flood control. (2) Conditions permitting, the lake will be drawn down to elevation 2883 feet, the minimum level under the license, by April 15th and will be raised to elevation 2890 feet by Memorial Day (May 30th) and to elevation 2893 feet, the maximum level under license, by June 15th. (3) When the lake reaches elevation 2886 feet, in a moderate or major flood year, the Licensee will gradually open its spill-gates to maintain free flow and will not close the gates until after the danger of exceeding elevation 2893 feet has passed.

The amended agreement has been endorsed by both the Flathead Lakers, Inc., an association of lakeside residents who are interested in having the lake level brought up to the maximum under license as soon in the

DC 23

#3 ½

recreation season as possible, and the Upper Flathead Valley Flood Control Association, an organization of farm owners at the upper end of the lake who are interested in having the lake level kept down to prevent innundation of their lands by late floods. At a conference held in Missoula, Montana, on September 28, 1965, attended by representatives of these two landowners' groups, the licensee, the Corp of Engineers, and the Commission, various differences were settled, and the terms of the settlement were incorporated into the agreement by the amendment of October 15, 1965.

The Commission finds:

The memorandum of understanding of May 31, 1962, as amended October 15, 1965, between The Montana Power Company and the Corps of Engineers provides satisfactory principles and procedures for regulation of Flathead Lake in the interest of flood control, power, recreation, and other beneficial public uses.

The Commission orders:

Until further order of the Commission, the principles and procedures for regulation of Flathead Lake contained in the aforesaid memorandum of understanding are approved and are prescribed under Article 21 of the license for the Montana Power Company's Kerr development, Project No. 5.

By the Commission.

Joseph H. Gutride,
Secretary.

#3 2/2

releases from the Government's Hungry Horse storage reservoir will have to be coordinated and scheduled so as to reduce the inflow into Flathead Lake.

It is further understood that the natural channel restriction at the outlet of Flathead Lake, near Polson, Montana, reduces the flows at low lake levels. It is also understood that natural floods in the past, unaffected by any regulation, have exceeded an elevation of 2893 feet.

(b) As the inflow increases, the level of Flathead Lake rises naturally due to the channel restriction at the outlet of the lake and the lake level is not greatly affected by a regulation of the forebay elevation at Kerr Dam at 2882 feet or lower, so that maintaining this elevation or a lower elevation is acceptable for flood control needs. The Chart "Backwater Conditions Flathead Lake for Varied Flows and Stages at Kerr Dam," File No. CF-3-2.2-2.6 dated October 1961, attached hereto, supports this operating procedure.

(c) As inflows to Flathead Lake continue to increase, the lake level continues to rise and at about elevation 2886 the outlet capacity and head are adequate for full power generation; with a continuing rise in a moderate or major flood year the gates at Kerr Dam will gradually be opened so that free flow conditions may prevail. In years when a minor flood is forecast, the Company will operate the spill-gates in a manner it deems necessary to fill the lake to elevation 2893 by the end of the refill period .

(d) The spill-gates at Kerr Dam will not be closed until after the danger of exceeding elevation 2893 has passed. It is recognized that due to natural flows this elevation may be exceeded even with the spill-gates at Kerr Dam fully opened. The control of the spill-gates will be determined by estimates of the hydrologic situation as the season progresses, and a chart entitled "Curves of Remaining Potential for Peak Inflow to Flathead Lake, Montana," dated April 24, 1961, with supporting explanation attached hereto,

#2 2/5

AIR MAIL

NPDEN-WC

15 October 1965

Mr. George W. O'Connor
Vice President, Montana Power Company
Electric Building
Butte, Montana

MC

MLN/jas

Dear Mr. O'Connor:

The amendment to the Memorandum of Understanding between the Corps of Engineers and the Montana Power Company, dated May 31, 1962 as set forth in your letter of 1 October 1965 has been approved by our Office, Chief of Engineers.

Acceptance of this amendment is reflected by the signature of the Division Engineer, P. C. Hyzer, Brigadier General, United States Army.

It is our understanding that you will further process this amendment and the agreement by forwarding it to Mr. Donald Sander of the Federal Power Commission, Washington, D. C., for further action and probable issuance of a FPC Order in the relatively near future.

Sincerely yours,

Incl
as

ANDREW V. INGE
Colonel, Corps of Engineers
Deputy Division Engineer

AIR MAIL

#4 1/3

The MONTANA POWER COMPANY

GENERAL OFFICES
ELECTRIC BUILDING
BUTTE, MONTANA

October 1, 1965

Division Engineer
U. S. Army, North Pacific Division
Corps of Engineers
210 Custom House
Portland 9, Oregon

Re: Regulation of Flathead Lake

Dear Sir:

In accordance with the conclusions reached at the meeting in Missoula, Montana, September 28, 1965, of representatives of the Corps of Engineers, the Federal Power Commission, the Flathead Lake Citizens' Groups, and The Montana Power Company, it is proposed that the Memorandum of Understanding between the Corps of Engineers and The Montana Power Company, dated May 31, 1962, shall be amended by the insertion before the last paragraph thereof of a new section, as follows:

> "(f) The level of the Flathead Lake shall be raised to elevation 2890 feet by Memorial Day. The lake will then be raised as rapidly and early thereafter as possible to reach 2893 feet taking into account the flood potential still existing in the river basin above the lake as determined by the Corps of Army Engineers. Should the potential flood condition subside then the filling of the lake will be accelerated so that the lake reaches the 2893 foot level by June 15."

As so amended, the said agreement of May 31, 1962, will be submitted to the Federal Power Commission for approval and shall constitute the flood control requirements of Article 21 of the Federal Power Commission license for Project No. 5.

If the foregoing is in accordance with your understanding,

#4 2/3

will you please endorse your approval on the enclosed copy of this letter and return it to us.

Very truly yours,

THE MONTANA POWER COMPANY

By _____
Vice President

The foregoing is accepted and agreed to this _____ day of October, 1965.

CORPS OF ENGINEERS

By _____
The Division Engineer
U.S. Army, North Pacific Division

#4 3/3

Elevation Flathead Lake at Somers, Montana (Feet above M.S.L.)	Discharge Flathead River near Polson, Montana (Cu. Ft. per Second)
2884.0	8,000
84.5	9,800
85.0	11,800
85.5	13,800
86.0	16,100
86.5	18,400
87.0	20,800
87.5	23,300
88.0	26,000
88.5	28,700
89.0	31,600
89.5	34,500
90.0	37,400
90.5	40,500
91.0	43,600
91.5	46,700
92.0	49,900
92.5	53,100
93.0	56,500

Note: Information below lake elevation 2884.0 feet is not available.

(freeflow, prepared in 1966)

#5

D-816-
(June 1941)

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY (WATER RESOURCES BRANCH)

File No. Washington ..... Field .....

Capacity table for FLATHEAD LAKE Dated OCT. 12, 1943

Gage at ..... to ..... ; from ..... to .....

from ..... to ..... ; from ..... to .....

Gage height	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09	Differ-ence
Feet	Ac-ft	Ac-ft.	Ac-ft.	Ac-ft.	Ac-ft.	Ac-ft.	Ac-ft.	Ac-ft.	Ac-ft.	Ac-ft.	Ac-ft.
2882.0	454,900	456,074	457,248	458,422	459,596	460,770	461,944	463,118	464,292	465,466	11,740
.1	466,640	467,814	468,988	470,162	471,336	472,510	473,684	474,858	476,032	477,206	
.2	478,380	479,554	480,726	481,902	483,076	484,250	485,424	486,598	487,772	488,946	
.3	490,120	491,294	492,468	493,642	494,816	495,990	497,164	498,338	499,512	500,686	
.4	501,860	503,034	504,208	505,382	506,556	507,730	508,904	510,078	511,252	512,426	
.5	513,600	514,774	515,948	517,122	518,296	519,470	520,644	521,818	522,992	524,166	
.6	525,340	526,514	527,688	528,862	530,036	531,210	532,384	533,558	534,732	535,906	
.7	537,080	538,254	539,428	540,602	541,776	542,950	544,124	545,298	546,472	547,646	
.8	548,820	549,994	551,168	552,342	553,516	554,690	555,864	557,038	558,212	559,386	
.9	560,560	561,734	562,908	564,082	565,256	566,430	567,604	568,778	569,952	571,126	11,740
2883.0	572,300	573,484	574,668	575,852	577,036	578,220	579,404	580,588	581,772	582,956	11,840
.1	584,140	585,324	586,508	587,692	588,876	590,060	591,244	592,428	593,612	594,796	
.2	595,980	597,164	598,348	599,532	600,716	601,900	603,084	604,268	605,452	606,636	
.3	607,820	609,004	610,188	611,372	612,556	613,740	614,924	616,108	617,292	618,476	
.4	619,660	620,844	622,028	623,212	624,396	625,580	626,764	627,948	629,132	630,316	
.5	631,500	632,684	633,868	635,052	636,236	637,420	638,604	639,788	640,972	642,156	
.6	643,340	644,524	645,708	646,892	648,076	649,260	650,444	651,628	652,812	653,996	
.7	655,180	656,364	657,548	658,732	659,916	661,100	662,284	663,468	664,652	665,836	
.8	667,020	668,204	669,388	670,572	671,756	672,940	674,124	675,308	676,492	677,676	
.9	678,860	680,044	681,228	682,412	683,596	684,780	685,964	687,148	688,332	689,516	11,840
2884.0	690,700	691,894	693,088	694,282	695,476	696,670	697,864	699,058	700,252	701,446	11,930
.1	702,640	703,834	705,028	706,222	707,416	708,610	709,804	710,998	712,192	713,386	
.2	714,580	715,774	716,968	718,162	719,356	720,550	721,744	722,938	724,132	725,326	
.3	726,520	727,714	728,908	730,102	731,296	722,490	733,684	734,878	736,072	737,266	
.4	738,460	739,654	740,848	742,042	743,236	744,430	745,624	746,818	748,012	749,206	
.5	750,400	751,594	752,788	753,982	755,176	756,370	757,564	758,758	759,952	761,146	
.6	762,340	763,534	764,728	765,922	767,116	768,310	769,504	770,698	771,892	773,086	
.7	774,280	775,474	776,668	777,862	779,056	780,250	781,444	782,638	783,832	785,026	
.8	786,220	787,414	788,608	789,802	790,996	792,190	793,384	794,578	795,772	796,966	
.9	798,160	799,354	800,548	801,742	802,936	804,130	805,324	806,518	807,712	808,906	11,940

Computed by JCA 11/2/1950 Checked by RP 11/27/1950 Remarks

2878 ELEV = 0 AC-FT. 2880 ELEV. = 224,700

2879 " = 111,800 " " 2881 " = 338,900

#6

9 210-a (June 1948)

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY (WATER RESOURCES BRANCH)

File No. Washington ... Field ...

Capacity table for

FLATHEAD LAKE

Dated OCT. 12, 1943

a ... to ...; from ... to ...

from ... to ...; from ... to ...

Gage height	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09	Differences
Feet	Sq. ft.	Sq. ft.	Sq. ft.	Sq. ft.	Sq. ft.	Sq. ft.	Sq. ft.	Sq. ft.	Sq. ft.	Sq. ft.	Sq. ft.
2885.0	810,100	811,302	812,504	813,706	814,908	816,110	817,312	818,514	819,716	820,918	12,020
.1	822,120	823,322	824,524	825,726	826,928	828,130	829,332	830,534	831,736	832,938	
.2	834,140	835,342	836,544	837,746	838,948	840,150	841,352	842,554	843,756	844,958	
.3	846,160	847,362	848,564	849,766	850,968	852,170	853,372	854,574	855,776	856,978	
.4	858,180	859,382	860,584	861,786	862,988	864,190	865,392	866,594	867,796	868,998	
.5	870,200	871,402	872,604	873,806	875,008	876,210	877,412	878,614	879,816	881,018	
.6	882,220	883,422	884,624	885,826	887,028	888,230	889,432	890,634	891,836	893,038	
.7	894,240	895,442	896,644	897,846	899,048	900,250	901,452	902,654	903,856	905,058	
.8	906,260	907,462	908,664	909,866	911,068	912,270	913,472	914,674	915,876	917,078	
.9	918,280	919,482	920,684	921,886	923,088	924,290	925,492	926,694	927,896	929,098	12,020
2886.0	930,300	931,507	932,714	933,921	935,128	936,335	937,542	938,749	939,956	941,163	12,070
.1	942,370	943,577	944,784	945,991	947,198	948,405	949,612	950,819	952,026	953,233	
.2	954,440	955,647	956,854	958,061	959,268	960,475	961,682	962,889	964,096	965,303	
.3	966,510	967,717	968,924	970,131	971,338	972,545	973,752	974,959	976,166	977,373	
.4	978,580	979,787	980,994	982,201	983,408	984,615	985,822	987,029	988,236	989,443	
.5	990,650	991,857	993,064	994,271	995,478	996,685	997,892	999,099	1,000,306	1,001,513	
.6	1,002,720	1,003,927	1,005,134	1,006,341	1,007,548	1,008,755	1,009,962	1,011,169	1,012,376	1,013,583	
.7	1,014,790	1,015,997	1,017,204	1,018,411	1,019,618	1,020,825	1,022,032	1,023,239	1,024,446	1,025,652	
.8	1,026,860	1,028,067	1,029,274	1,030,481	1,031,688	1,032,895	1,034,102	1,035,309	1,036,516	1,037,723	
.9	1,038,930	1,040,137	1,041,344	1,042,551	1,043,758	1,044,965	1,046,172	1,047,379	1,048,586	1,049,793	12,070
2887.0	1,051,000	1,052,210	1,053,420	1,054,630	1,055,840	1,057,050	1,058,260	1,059,470	1,060,680	1,061,892	12,100
.1	1,063,100	1,064,310	1,065,520	1,066,730	1,067,940	1,069,150	1,070,360	1,071,570	1,072,780	1,073,990	
.2	1,075,200	1,076,410	1,077,620	1,078,830	1,080,040	1,081,250	1,082,460	1,083,670	1,084,880	1,086,090	
.3	1,087,300	1,088,510	1,089,720	1,090,930	1,092,140	1,093,350	1,094,560	1,095,770	1,096,980	1,098,190	
.4	1,099,400	1,100,610	1,101,820	1,103,030	1,104,240	1,105,450	1,106,660	1,107,870	1,109,080	1,110,290	
.5	1,111,500	1,112,710	1,113,920	1,115,130	1,116,340	1,117,550	1,118,760	1,119,970	1,121,180	1,122,390	
.6	1,123,600	1,124,810	1,126,020	1,127,230	1,128,440	1,129,650	1,130,860	1,132,070	1,133,280	1,134,490	
.7	1,135,700	1,136,910	1,138,120	1,139,330	1,140,540	1,141,750	1,142,960	1,144,170	1,145,380	1,146,590	
.8	1,147,800	1,149,010	1,150,220	1,151,430	1,152,640	1,153,850	1,155,060	1,156,270	1,157,480	1,158,690	
.9	1,159,900	1,161,110	1,162,320	1,163,530	1,164,740	1,165,950	1,167,160	1,168,370	1,169,580	1,170,790	12,100

Computed by JCA 11 : 2 1950, Checked by RP 11 27 1950 Remarks ...

Form 9-216-a (Oct. 1942)

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY (WATER RESOURCES BRANCH)

File No. | Washington | Field

Capacity table for FLATHEAD LAKE Dated OCT. 12, 1943

at ... to ...; from ... to ...

from ... to ...; from ... to ...

Gage height	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09	Difference
Feet	Sec.-ft.	Sec.-ft.	Sec.-ft.	Sec.-ft.	Sec.-ft.	Sec.-ft.	Sec.-ft.	Sec.-ft.	Sec.-ft.	Sec.-ft.	Sec.-ft.
2888.0	1,172,000	1,173,220	1,174,440	1,175,660	1,176,880	1,178,100	1,179,320	1,180,540	1,181,760	1,182,980	12,200
.1	1,184,200	1,185,420	1,186,640	1,187,860	1,189,080	1,190,300	1,191,520	1,192,740	1,193,960	1,195,180	
.2	1,196,400	1,197,620	1,198,840	1,200,060	1,201,280	1,202,500	1,203,720	1,204,940	1,206,160	1,207,380	
.3	1,208,600	1,209,820	1,211,040	1,212,260	1,213,480	1,214,700	1,215,920	1,217,140	1,218,360	1,219,580	
.4	1,220,800	1,222,020	1,223,240	1,224,460	1,225,680	1,226,900	1,228,120	1,229,340	1,230,560	1,231,780	
.5	1,233,000	1,234,220	1,235,440	1,236,660	1,237,880	1,239,100	1,240,320	1,241,540	1,242,760	1,243,980	
.6	1,245,200	1,246,420	1,247,640	1,248,860	1,250,080	1,251,300	1,252,520	1,253,740	1,254,960	1,256,180	
.7	1,257,400	1,258,620	1,259,840	1,261,060	1,262,280	1,263,500	1,264,720	1,265,940	1,267,160	1,268,380	
.8	1,269,600	1,270,820	1,272,040	1,273,260	1,274,480	1,275,700	1,276,920	1,278,140	1,279,360	1,280,580	
.9	1,281,800	1,283,020	1,284,240	1,285,460	1,286,680	1,287,900	1,289,120	1,290,340	1,291,560	1,292,780	12,200
2889.0	1,294,000	1,295,230	1,296,460	1,297,690	1,298,920	1,300,150	1,301,380	1,302,610	1,303,840	1,305,070	12,300
.1	1,306,300	1,307,530	1,308,760	1,309,990	1,311,220	1,312,450	1,313,680	1,314,910	1,316,140	1,317,370	
.2	1,318,600	1,319,830	1,321,060	1,322,290	1,323,520	1,324,750	1,325,980	1,327,210	1,328,440	1,329,670	
.3	1,330,900	1,332,130	1,333,360	1,334,590	1,335,820	1,337,050	1,338,280	1,339,510	1,340,740	1,341,970	
.4	1,343,200	1,344,430	1,345,660	1,346,890	1,348,120	1,349,350	1,350,580	1,351,810	1,353,040	1,354,270	
.5	1,355,500	1,356,730	1,357,960	1,359,190	1,360,420	1,361,650	1,362,880	1,364,110	1,365,340	1,366,570	
.6	1,367,800	1,369,030	1,370,260	1,371,490	1,372,720	1,373,950	1,375,180	1,376,410	1,377,640	1,378,870	
.7	1,380,100	1,381,330	1,382,560	1,383,790	1,385,020	1,386,250	1,387,480	1,388,710	1,389,940	1,391,170	
.8	1,392,400	1,393,630	1,394,860	1,396,090	1,397,320	1,398,550	1,399,780	1,401,010	1,402,240	1,403,470	
.9	1,404,700	1,405,930	1,407,160	1,408,390	1,409,620	1,410,850	1,412,080	1,413,310	1,414,540	1,415,770	12,300
2890.0	1,417,000	1,418,240	1,419,480	1,420,720	1,421,960	1,423,200	1,424,440	1,425,680	1,426,920	1,428,160	12,400
.1	1,429,400	1,430,640	1,431,880	1,433,120	1,434,360	1,435,600	1,436,840	1,438,080	1,439,320	1,440,560	
.2	1,441,800	1,443,040	1,444,280	1,445,520	1,446,760	1,448,000	1,449,240	1,450,480	1,451,720	1,452,960	
.3	1,454,200	1,455,440	1,456,680	1,457,920	1,459,160	1,460,400	1,461,640	1,462,880	1,464,120	1,465,360	
.4	1,466,600	1,467,840	1,469,080	1,470,320	1,471,560	1,472,800	1,474,040	1,475,280	1,476,520	1,477,760	
.5	1,479,000	1,480,240	1,481,480	1,482,720	1,483,960	1,485,200	1,486,440	1,487,680	1,488,920	1,490,160	
.6	1,491,400	1,492,640	1,493,880	1,495,120	1,496,360	1,497,600	1,498,840	1,500,080	1,501,320	1,502,560	
.7	1,503,800	1,505,040	1,506,280	1,507,520	1,508,760	1,510,000	1,511,240	1,512,480	1,513,720	1,514,960	
.8	1,516,200	1,517,440	1,518,680	1,519,920	1,521,160	1,522,400	1,523,640	1,524,880	1,526,120	1,527,360	
.9	1,528,600	1,529,840	1,531,080	1,532,320	1,533,560	1,534,800	1,536,040	1,537,280	1,538,520	1,539,760	12,400

Computed by JCA 11-2 1950; Checked by RP 11 28 1950 Remarks

P 210-6
(June 1939)

SHEET 4 OF 4

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY (WATER RESOURCES BRANCH)

File No. Washington
Field

Capacity table for

FLATHEAD LAKE

Dated OCT. 12, 1943

m ... to ...; from ... to ...

from ... to ...; from ... to ...

Gage height	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09	Difference
Feet	Sec-ft.	Sec-ft.	Sec-ft.	Sec-ft.	Sec-ft.	Sec-ft.	Sec-ft.	Sec-ft.	Sec-ft.	Sec-ft.	Sec-ft.
2891.0	1,541,000	1,542,240	1,543,480	1,544,720	1,545,960	1,547,200	1,548,440	1,549,680	1,550,920	1,552,160	124,00
.1	1,553,400	1,554,640	1,555,880	1,557,120	1,558,360	1,559,600	1,560,840	1,562,080	1,563,320	1,564,560	
.2	1,565,800	1,567,040	1,568,280	1,569,520	1,570,760	1,572,000	1,573,240	1,574,480	1,575,720	1,576,960	
.3	1,578,200	1,579,440	1,580,680	1,581,920	1,583,160	1,584,400	1,585,640	1,586,880	1,588,120	1,589,360	
.4	1,590,600	1,591,840	1,593,080	1,594,320	1,595,560	1,596,800	1,598,040	1,599,280	1,600,520	1,601,760	
.5	1,603,000	1,604,240	1,605,480	1,606,720	1,607,960	1,609,200	1,610,440	1,611,680	1,612,920	1,614,160	
.6	1,615,400	1,616,640	1,617,880	1,619,120	1,620,360	1,621,600	1,622,840	1,624,080	1,625,320	1,626,560	
.7	1,627,800	1,629,040	1,630,280	1,631,520	1,632,760	1,634,000	1,635,240	1,636,480	1,637,720	1,638,960	
.8	1,640,200	1,641,440	1,642,680	1,643,920	1,645,160	1,646,400	1,647,640	1,648,880	1,650,120	1,651,360	
.9	1,652,600	1,653,840	1,655,080	1,656,320	1,657,560	1,658,800	1,660,040	1,661,280	1,662,520	1,663,760	12,400
2892.0	1,665,000	1,666,260	1,667,520	1,668,780	1,670,040	1,671,300	1,672,560	1,673,820	1,675,080	1,676,340	12,600
.1	1,677,600	1,678,860	1,680,120	1,681,380	1,682,640	1,683,900	1,685,160	1,686,420	1,687,680	1,688,940	
.2	1,690,200	1,691,460	1,692,720	1,693,980	1,695,240	1,696,500	1,697,760	1,699,020	1,700,280	1,701,540	
.3	1,702,800	1,704,060	1,705,320	1,706,580	1,707,840	1,709,100	1,710,360	1,711,620	1,712,880	1,714,140	
.4	1,715,400	1,716,660	1,717,920	1,719,180	1,720,440	1,721,700	1,722,960	1,724,220	1,725,480	1,726,740	
.5	1,728,000	1,729,260	1,730,520	1,731,780	1,733,040	1,734,300	1,735,560	1,736,820	1,738,080	1,739,340	
.6	1,740,600	1,741,860	1,743,120	1,744,380	1,745,640	1,746,900	1,748,160	1,749,420	1,750,680	1,751,940	
.7	1,753,200	1,754,460	1,755,720	1,756,980	1,758,240	1,759,500	1,760,760	1,762,020	1,763,280	1,764,540	
.8	1,765,800	1,767,060	1,768,320	1,769,580	1,770,840	1,772,100	1,773,360	1,774,620	1,775,880	1,777,140	
.9	1,778,400	1,779,660	1,780,920	1,782,180	1,783,440	1,784,700	1,785,960	1,787,220	1,788,480	1,789,740	12,600
2893.0	1,791,000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	12,600
2894.0	1,917,000										12,800
2895.0	2,045,000										12,900
2896.0	2,174,000										130,000
2897.0	2,304,000										
2898.0	2,435,000										
2899.0	2,566,000										
2900.0	2,699,000										

Computed by JEA 11 2 1950; Checked by RP 11 28 1950 Remarks

AREAS MEASURED BY G. H. ELLIS, THE MONTANA POWER CO., IN 1937, AND REVIEWED BY FEDERAL POWER COMMISSION AND HELENA DISTRICT OF U.S.G.S. BASE TABLE PREPARED OCT. 12, 1943.

L#

PROJECT OPERATING LIMITS
KERR DAM

1. Project Description.

a. Stream: Flathead River (R.M. 72.0)
b. Location: Lake County, Montana
c. Owner: Montana Power Company
d. Authorized Purpose: Power, flood control, and recreation
e. Hydraulic Capacity: 14,346 c.f.s.
f. Nameplate Capacity: 168 MW
g. Date Completed: 1938

2. Operating Limits.

Type	Limit	Description/Source	Legal Basis
a. Lake Elevation (ft).			
Normal full pool elevation	2,893	Required for power generation and flood control.	FERC license, project No. 5
Normal minimum pool elevation	2,883		
Rule curve (flood control)			
15 April	2,883		Article No. 21, FERC license, project No. 5.
30 May[1/]	2,890		
15 June[2/]	2,893		FERC order issued 24 February 1966, project No. 5.[3/]
b. Discharge (c.f.s.).			
Minimum daily average	1,500	Established for recreation and fisheries.	Informal operating limit.
Maximum discharge	No limit[4/]		
c. Powerhouse.			
Number of generating units	3	Machinery designation (Plant Data Sheets, Power Planning Commission, December 1972).	FERC license, project No. 5.
Nameplate capacity (3 @ 56 MW)	168 MW		
Overload capacity (3 @ 60 MW)	180 MW		
Hydraulic capacity	14,346 c.f.s.[5/]		

1/If a moderate or major flood year is forecast by the Corps of Engineers when the lake reaches elevation 2,886 feet, the spillway gates will be opened to maintain free flow condition until the danger of exceeding elevation 2,893 feet has passed.
2/The lake will be raised as rapidly as possible to reach elevation 2,893 feet, taking into account the flood potential still existing in the river basin above the lake as determined by the Corps of Engineers.
3/Memorandum of Agreement between the Corps of Engineers and Montana Power Company, amended on 15 October 1965.
4/Project operated so that maximum discharge limited by natural lake outlet restriction.
5/Hydraulic capacity given for overload capacity of 180 MW.