

REPORT OF COMMISSION TO INVESTIGATE IRRIGATION
PROJECTS ON INDIAN LANDS.

L E T T E R

FROM

THE SECRETARY OF THE INTERIOR,

TRANSMITTING

COPY OF REPORT OF A COMMISSION APPOINTED BY THE COMMISSIONER OF INDIAN AFFAIRS TO INVESTIGATE IRRIGATION PROJECTS ON INDIAN LANDS IN THE THREE NORTHERN DISTRICTS.

DECEMBER 8, 1914.—Referred to the Committee on Indian Affairs and ordered to be printed with illustrations.

DEPARTMENT OF THE INTERIOR,
Washington, December 7, 1914.

SIR: The Indian appropriation act of August 1, 1914 (Public, 160), provides that there shall be submitted to Congress on the first Monday in December, 1914, as to the Blackfeet, Flathead, and Fort Peck reclamation projects, a report showing the status of the water rights of the Indians and the method of financing said projects, together with such other information as the Secretary of the Interior may deem necessary for a full and complete understanding of all the facts and conditions in connection therewith.

In compliance with this provision, I have the honor to transmit herewith copy of a report made by a commission appointed by Commissioner Sells. The commission consisted of the superintendents of the reservations named and the superintendents of irrigation in charge of the three northern districts. The superintendents of the reservations were by reason of their positions thoroughly familiar with the conditions of the Indians and the interests adverse to them, while the superintendents of irrigation, who are skilled irrigation engineers, were in a position to judge of the general and technical aspects of the situation. Their report shows the details of the work, what has been done to protect the water rights of the Indians, general information as to the conditions on each of the three projects, and the difficulties to be met in solving the problems.

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The projects are financed under the present plan by appropriations from the Public Treasury heretofore carried in the Indian bill. The work is being conducted by the Reclamation Service with the expenditure of reclamation funds. Its cost is reimbursed to that service on accounts stated monthly for actual cost of work performed, including charges for use of equipment, use of Government animals, and other items.

Section 14 of the act of April 23, 1904 (33 Stat. L., 302-305), provides for the disposition of moneys received from the sale of land within the Flathead Indian Reservation, upon the survey and allotment thereof, as follows:

One-half shall be expended from time to time by the Secretary of the Interior as he may deem advisable for the benefit of the said Indians and such persons having tribal rights on the reservation, including the Lower Pend d'Oreille or Kalispel thereon at the time that this act shall take effect, in the construction of irrigation ditches, the purchase of stock cattle, farming implements, or other necessary articles to aid the Indians in farming and stock raising, and in the education and civilization of said Indians, and the remaining half to be paid to the said Indians and such persons having tribal rights on the reservation, including the Lower Pend d'Oreille or Kalispel thereon at the date of the proclamation provided for in section nine hereof, or expended on their account, as they may elect.

This section is amended by the act of May 29, 1908 (35 Stat. L., 444), so as to provide for the disposition of the proceeds of said sale as follows:

So much thereof as the Secretary of the Interior may deem advisable in the construction of irrigation systems, for the irrigation of the irrigable lands embraced within the limits of said reservation, one half of the money remaining after the construction of said irrigation systems to be expended by the Secretary of the Interior as he may deem advisable for the benefit of such Indians in the purchase of live stock, farming implements, or the necessary articles to aid such Indians in farming and stock raising and in the education and civilization of said Indians, and the remaining half of said money to be paid to said Indians and persons holding tribal rights on said reservation, semiannually as the same may become available, share and share alike: *Provided*, That the Secretary of the Interior may withhold from any Indian a sufficient amount of his pro rata share to pay any charge assessed against land held in trust for him for operation and maintenance of irrigation systems.

The first appropriation of public funds for the construction of irrigation systems on the Flathead Reservation appears in the act of April 30, 1908 (35 Stat. L., 83), and contemplates more extensive irrigation systems than those authorized in the act of April 23, 1904 (supra), and appropriates \$50,000 for preliminary surveys, plans, and estimates for irrigating systems to irrigate the allotted lands of the Indians and the unallotted irrigable lands to be disposed of, the cost of said entire work to be reimbursed from the proceeds of the sale of land within said reservation. The extent of the systems is greatly enlarged, but the cost of the systems for the surplus unallotted irrigable lands is required to be reimbursed from Indian money to be derived from the sale of unallotted land at an appraised valuation which did not include the natural enhancement in value which would accrue by reason of the construction of the irrigation system.

Provisions to the same general effect are found in laws relating to the Blackfeet Reservation, the first of which is the act of March 1, 1907 (34 Stat. L., 1035), which provides that the cost of said entire system shall be reimbursed from the proceeds of sale of lands within the reservation and further that when the Indians have become self-supporting, to the annual operating charge shall be added an amount

sufficient to pay back into the Treasury the cost of the work done in their behalf within 30 years, apportioned upon the lands irrigated, suitable deduction being made for the amount received from the disposal of the lands as aforesaid; and the act of May 30, 1908 (35 Stat. L., 558), relating to the Fort Peck Reservation, which provides that the sum of \$200,000 therein appropriated and any and all sums thereafter appropriated to pay the costs of certain examinations and irrigation systems shall be reimbursed from the proceeds of the sales of lands within the reservation; but does not provide for an apportionment of such costs to the land benefited.

In the case of each of these projects all of the appropriations are required to be reimbursed to the United States from the proceeds of the sale of tribal property, and the injustice of this arrangement will readily appear. It is provided by law in each of these cases that the entryman shall pay the charges apportioned against the tract entered, with certain penalties for failure to make the payments when due, and it would appear therefore that every entry was made subject to this obligation to pay the charges.

In the case of the Flathead and Fort Peck projects it is provided that—

When the payments required by this act have been made for the major part of the unallotted lands irrigable under any system, and subject to charges for construction thereof, the management and operation of such irrigation works shall pass to the owners of the lands irrigated thereby, to be maintained at their expense, under such form of organization and under such rules and regulations as may be acceptable to the Secretary of the Interior.

On the Flathead Reservation, out of a total area of 152,000 acres of irrigable land, 50,000 acres have been opened to entry, of which 48,000 acres have been entered, and an area of 5,000 acres is State land.

On the Fort Peck Reservation, of a total irrigable area of 124,643 acres, approximately 37,000 acres is not included in the allotments, and not exceeding this area of unallotted land will be subject to the charges for construction of the system.

Under the proviso quoted, it would appear that when the payments of such charges have been made for the major part of the unallotted lands irrigable under the systems, in the case of the Flathead Reservation an area slightly in excess of 27,500 acres and in that of the Fort Peck Reservation slightly in excess of 18,500 acres, the management and operation of the irrigation works shall pass to the owners of the land irrigated thereby. It will thus appear that the proposed arrangement might work a great disadvantage to the interests of the allottees whose allotments include an area on the Blackfeet Reservation nearly four times that of the surplus unallotted land, and on the Flathead Reservation an area nearly double that of the surplus unallotted land.

It is believed that the best interests of the Indians require that this part of the laws be repealed in order that the irrigation systems may not pass beyond control of the department until the Indians are able to look after their own interests, and in any event before the expiration of the trust period on their allotments.

There is an apparent inconsistency in the laws relating to these two projects, which requires that the entire cost shall be reimbursed to the United States from the tribal funds and yet include a provision

that the land irrigable under the system which has been allotted to Indians shall be deemed to have a right to so much water as may be required to irrigate such land without cost to the Indians for the construction of such irrigation systems.

The acts further provide that the purchaser of any Indian allotment purchased prior to the expiration of the trust period thereon shall be exempt from that part of the charge for the construction of such irrigation system incurred up to the time of such purchase. It is presumed that the charge referred to has reference to an announcement of the charges in a manner similar to that authorized by law for reclamation projects constructed under the provisions of the national reclamation act, but no provision for the announcement of charges appears to have been made in existing law relating to these irrigation projects.

As will appear from the report of the commission the irrigation systems approved will irrigate not only Indian land, but in each case a very extensive acreage of land to be used by white people. The financing arrangements contemplate that after the systems have been constructed and the Indian tribal funds used to repay the congressional appropriations, the white landowner will pay in not to exceed 15 annual installments the proportionate charge for irrigation of his land. This arrangement is wholly unfair, and operates to retard the Indians in every way. Besides, it unjustly hypothecates all of the tribal funds for work benefiting only part of the Indians and for work on the surplus unallotted irrigable lands.

It is believed that the only proper way to finance these projects, in view of the existing conditions, is to provide sufficient sums for satisfactory progress and to release the tribal funds from the obligation of reimbursement, and require that the cost of the work shall be assessed against the land benefited and repaid by the owners of the land. This subject received extended consideration both by the Senate and House of Representatives when the last appropriation bill was under consideration, and as a result Congress required this special report. It is clear that objection arises to the present financial arrangement, from whatever point considered, and it is believed that the reimbursement of appropriations for the work could well be required from the owners of these lands similarly to the requirement of return by settlers on lands entered under the reclamation act of the costs of irrigation work constructed thereunder.

Accordingly there has been prepared and will be submitted to Congress draft of proposed legislation which it is believed will meet the requirements of the situation.

Respectfully,

FRANKLIN K. LANE.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

UNITED STATES INDIAN SERVICE,
FLATHEAD AGENCY,
Jocko, Mont., September 4, 1914.

COMMISSIONER OF INDIAN AFFAIRS,
Washington, D. C.

SIR: In compliance with instructions contained in your letter of July 13, 1914, the commission appointed by you to report upon the present condition and future policy to be followed in reference to the irrigation projects on the Fort Peck, Blackfeet, and Flathead Reservations, met at Poplar, Mont., on August 10, 1914.

The members of this commission are all men who have been connected with the Indian Service as superintendents of Indian reservations and engineers on irrigation construction work for a number of years, and from daily contact with Indians are in a position to supply first-hand information from personal experience, especially in reference to Indian character, habits, and peculiarities. Several days were occupied in going over the various irrigation units of the Fort Peck Project, including those constructed, partly constructed, and proposed.

The commission met with about 30 Fort Peck Indians, who can hardly be considered fair representatives of the tribe. We listened to what they had to say and obtained their views in regard to the benefits derived from irrigation, the value of lands irrigated, and those dry-farmed, etc.

Some of these Indians objected to initiating construction on new units until it has been demonstrated that those constructed or in course of construction are successful.

Practically all the Indians who spoke stated that irrigation would increase crop yields and enhance the value of their lands, and some stated that in their opinion the land would permit a charge of from \$30 to \$35 per acre for irrigation construction.

Their principal objection to the present policy was that it hypothecated the proceeds from the sale of surplus land in the construction of irrigation units and leaves no funds with which to meet the necessary expenses incidental to beginning farm operations on a self-supporting basis.

Another objection stated was that the Indian funds being expended as under the present policy leaves nothing available for the support of the old and sick, who will probably never receive any benefits from money which they feel should be available when needed. This objection can not be given much weight inasmuch as provision is now made for the support of the old and indigent members of the tribe.

The following gives a brief description of the various units, showing the present condition, areas allotted and unallotted under each unit, cost to date, cost to complete, water supply, and other engineering data. All engineering data herein presented were obtained from the Reclamation Service records.

The Fort Peck Indian Reservation lies along the Missouri River in northeastern Montana in Valley and Sheridan Counties. The elevation of the irrigable area ranges from 1,900 to 2,100 feet above sea level. The temperature ranges from -40° to $+100^{\circ}$. The average rainfall on the irrigable area for the past 17 years is 14.28 inches.

The minimum is 9.82 inches and the maximum 25.35 inches. It might be stated here that the maximum as given is the only year in the 17 years in which records were kept that the rainfall exceeded 17.87 inches. The mean annual rainfall during the growing season for the above period of 17 years is as follows:

April.....	0.98
May.....	2.01
June.....	3.04
July.....	1.59
August.....	1.30

The irrigation season covers the period from April 1 to August 15, or 137 days.

The duty of water is estimated by the Reclamation Service to be between 1 and 2 acre-feet per season.

The major part of the soil on the irrigable area consists of heavy clay and loam.

The principal products are hay, grain, and vegetables and the principal markets are local.

Land values vary from \$10 to \$15 per acre for dry farm lands and from \$50 to \$75 per acre for improved irrigated land. The above prices are those prevailing on lands adjoining the reservation.

The units of this project as proposed by the Reclamation Service are as follows:

1. Big Porcupine unit.
2. Little Porcupine unit.
3. Poplar River unit.
4. Big Muddy unit.
5. Missouri River gravity unit.
6. Galpin Bottom pumping unit.
7. Milk River pumping unit.

BIG PORCUPINE UNIT.

This unit lies in the southwest corner of the reservation. The water for irrigation is to be taken from the Big Porcupine Creek. The average annual run-off of this stream for the past four years (1909 to 1913), inclusive, being 17,200 acre-feet.

This unit is now under construction, the main canal being practically completed with the exception of the structures and diversion dam, none of which have been built. The lateral system is now being constructed. The first part of this unit contemplates the irrigation of 4,120 acres of allotted land and 1,980 acres of unallotted land. An inexpensive diversion dam will be required to divert water into the canal. The canal has a bottom width of 9 feet, water depth of 3 feet, side slopes 2:1 and a 1½-foot freeboard. The grade of the canal is 0.0005 or 2.6 feet per mile. The capacity of the canal is 104 cubic feet per second.

The second part of this unit on which no construction work has been done, contemplates the irrigation of 2,230 acres of allotted land and 630 acres of unallotted land.

To make this a thoroughly practicable irrigation scheme, storage of flood waters is necessary. There is a feasible site for a storage of 9,600 acre-feet but the cost of construction will be high.

The total expenditure to June 30, 1914, on the Big Porcupine unit was \$43,000. The estimated cost for completion of the first part of this system is \$135,000. The estimated cost to extend the lateral system to cover the second part of the unit is \$30,000. The estimated cost of a 9,600 acre-feet storage reservoir is \$203,000. Total estimated cost of completed unit \$368,000, or \$40 per acre.

LITTLE PORCUPINE UNIT.

The water for this unit is diverted from the Little Porcupine Creek through a feed canal 7,000 feet in length having a capacity of from 250 to 300 cubic feet per second. This feed canal supplies water to a storage reservoir having a capacity of 3,900 acre-feet. The distribution system from the storage reservoir will irrigate 2,400 acres of allotted or unallotted land. The main lateral leading from the reservoir has a capacity of 35 cubic feet per second. This entire system is now completed, and a few of the allottees irrigated their land this season. There are 23 miles of canals and laterals in this unit. The total cost of the unit to June 30, 1914, was \$52,600, or a unit cost of \$22 per acre.

The minimum run-off recorded for Little Porcupine Creek is 3,300 acre-feet, and occurred during what is considered an exceptionally dry year. The maximum run-off as recorded was 16,000 acre-feet.

POPLAR RIVER UNIT.

This unit contemplates the irrigation of 28,000 acres of land, of which 11,000 acres are allotted to Indians.

The average annual run-off from this basin for the past four years was 69,600 acre-feet from the 3,000 square miles of watershed.

The maximum run-off recorded was 153,000 acre-feet, which is abnormal. The minimum was 43,000 acre-feet, during the irrigation period of a dry year.

The minimum discharge during the irrigation season in what is termed the driest year since records have been kept was 18 cubic feet per second, at times, during the months of June, July, and August, when a maximum irrigating head is necessary to save crops.

We understand that about 19 years ago there was an abnormally dry year, and at this time the river was entirely dry in the month of June.

The low-water supply, as shown above, will probably irrigate all the land the Indians will place under cultivation during the next year or two, giving ample time for the completion of the reservoir if funds are available. However, storage will be necessary to make this an entirely successful unit.

A storage reservoir is proposed, at an estimated cost of \$460,000. This proposed reservoir has a capacity of 31,000 acre-feet and will supply water for three canals—canals A and B on the west side of Poplar River and canal C on the east side.

Canal A.—No construction work has been done on canal A, the estimated cost of which is \$112,000. When completed, this canal will irrigate 10,200 acres, of which 580 acres are now allotted, the remainder being unallotted Indian land.

A permanent water supply will necessitate the construction of the storage reservoir proposed by the Reclamation Service.

Canal B.—This canal diverts water from the Poplar River by means of a diversion dam 300 feet in length. The canal has a capacity of 73 cubic feet per second and is 12 miles long. The bottom width of the canal is 8 feet; water depth, 3.5 feet, with a 1½-foot freeboard. This canal, laterals, and structures are now completed and will irrigate 5,860 acres, of which 2,560 acres are allotted to Indians. The total expenditure to June 30, 1914, on canal B was \$81,000, or a unit cost of about \$14 per acre without storage.

In addition to the above, it is contemplated to supply water to the old agency ditch from canal B, and the cost of this additional work is estimated at about \$6,000.

As stated under the general head "Poplar River unit," there will be times of shortage in the water supply unless the storage reservoir is constructed.

Canal C.—The head gate for canal C is located on the east side of Poplar River, about 2 miles below the diversion for canal B.

No diversion dam is necessary, the floor of the canal head gate being 3.5 feet below low-water mark in the river. Canal C has a bottom width of 8.5 feet, with a water depth of 4 feet. The grade of the canal is 0.0002, or a fall of 1 foot per mile. The capacity is 100 cubic feet per second. It will irrigate 8,730 acres, of which 5,330 acres are allotted. The main canal is completed, the lateral system 98 per cent completed, and the structures 50 per cent completed.

The expenditures to June 30, 1914, on canal C were \$163,000 and it is estimated that \$15,000 will be necessary to complete this portion of the Poplar River unit. The unit acreage cost will be approximately \$20.50 without storage.

The construction of the storage reservoir is considered necessary to secure a permanent water supply.

MISSOURI RIVER GRAVITY UNIT.

This is by far the largest proposed project on the Fort Peck Reservation and was the first one contemplated by the Reclamation Service.

No construction work has been done, but the entire unit has been surveyed and topographically mapped.

The proposed canal will be 110 miles long and have a capacity of 630 cubic feet per second.

The estimated cost of the entire system is \$2,695,000.

No diversion dam or storage will be required.

There will be approximately 8,500,000 cubic yards of excavation required in the construction of the main canal and lateral system.

The Missouri River carries quite a large percentage of silt and this question enters to a large extent in the plans contemplated by the Reclamation Service. We understand the present design provides sluiceways at suitable points along the upper portion of the canal, by means of which it is intended to flush back into the Missouri River the greater portion of the deposit, which is much more pronounced near the head of a canal than elsewhere on the system.

Under the proposed system there are 37,923 acres of allotted land, 15,400 acres of unallotted Indian land, and 15,960 acres of allotted timberland.

The estimated acreage cost as above outlined, without including the allotted timberland is approximately \$50. The irrigation of the land now classed as timberland will reduce this cost to about \$40 per acre. It will probably not be necessary to provide for the irrigation of all these timber allotments for many years.

The Missouri River gravity unit, unlike the other units of this project, has an abundant supply of water and from the water-right standpoint it is not deemed necessary by this commission that immediate steps be taken toward its construction.

The Reclamation Service filed a notice of appropriation of 1,000 cubic feet per second on October 17, 1913. In order to protect the water right under this filing it will be necessary to begin construction within three years from that date.

However, when we consider the fact that 62½ per cent of the total number of Indian allotments are under this unit and also that a great many of the Indians who have allotments under other units now live on the lands covered by this unit, it being considered a more desirable location on account of its proximity to the railroad and the timber along the Missouri River, it is our opinion that it will be only a short time before it will be necessary to construct this system.

At the present time a large number of the Indians are attempting to raise crops by dry farming, but according to their own statements they not only can raise double the crops with irrigation but are sure of a crop every year. Under the present conditions they average about one crop in three years and that one crop is considerably less than it would be with an efficient irrigation system.

BIG MUDDY UNIT.

Big Muddy Creek forms the east boundary of the Fork Peck Reservation, and the Big Muddy unit is proposed to irrigate the land along the west side of the creek with water diverted from the channel of this stream.

The mean run-off as obtained from incomplete Geological Survey records during the period from 1909 to 1913 was 22,300 acre-feet.

The record per month, in acre-feet, during the irrigation season of 1910 is as follows:

April.....	2,790
May.....	227
June.....	583
July.....	147
August.....	33

The maximum flow recorded for this stream is 1,100 cubic feet per second and the minimum flow is 0.

Storage will be necessary. Two feasible sites have been surveyed, one on Smoke Creek having a capacity of 5,000 acre-feet and an estimated cost of \$87,600 and the other on Wolf Creek with a capacity of 4,500 acre-feet and an estimated cost of \$146,000.

This unit will irrigate 16,000 acres of land of which 13,300 acres are allotted.

No construction work has been done on this unit.

The estimated cost of the canal and lateral system is \$325,000. The total estimated cost of the system complete with two storage reservoirs is \$558,600, or an acreage cost of approximately \$35.

The Reclamation Service has filed notices of appropriation on Big Muddy and tributaries amounting to 6,250 cubic feet per second dated November 14 and 15, 1913. For the reason that this is a boundary stream and subject to appropriation by white settlers on the east side of the creek who have already filed notices of appropriation covering many times the flow of the stream, it is deemed imperative that construction work be started on this project before November 14, 1916, in order to protect the Indian title to this water.

The Galpin Bottom pumping unit and the Milk River pumping unit are two pumping projects on which no construction work has been done and which need not be considered at this time.

WATER RIGHTS.

Section 4846 of the Montana Civil Code provides as follows:

Appropriation by the United States.—That the Government of the United States may, by and through the Secretary of the Interior, or any person by him duly authorized to act in that behalf, appropriate the water of streams or lakes within the State of Montana in the same manner and subject to the general conditions applicable to the appropriation of the waters of the State by private individuals: *Provided*, Such appropriations shall be held valid for the period of three years after the filing of the notice of appropriation thereof in the office of the county clerk and recorder of the appropriate county, but such appropriation shall be null and void after the period of three years unless prior to the expiration of such period the work of constructing the canal or ditch by which the same is to be diverted shall have been commenced: *And be it further provided*, That if at any time prior to the expiration of the aforesaid period of three years the Secretary of the Interior, or a person by him duly authorized to act in the premises, files a notice with the county clerk and recorder in the county in which the original appropriation notice was filed, announcing an abandonment by the Government of the United States of the irrigation project for which the water was appropriated, then and in that event the appropriation shall become null and void. (Act approved Feb. 27, 1905.)

The law applying to the appropriation by a private citizen differs from the above as shown in section 4847 of the same code:

Notice of appropriation.—Any person hereafter desiring to appropriate water must post a notice in writing in a conspicuous place at the point of intended diversion, stating therein: 1, The number of inches claimed, measured as hereinafter provided; 2, the purpose for which it is claimed and place of intended use; 3, the means of diversion, with size of flume, ditch, pipe, or aqueduct by which he intends to divert it; 4, the date of appropriation; 5, the name of the appropriator. Within 20 days after the date of appropriation the appropriator shall file with the county clerk of the county in which such appropriation is made a notice of appropriation, which, in addition to the facts required to be stated in the posted notice, as hereinafter prescribed, shall contain the name of the stream from which the diversion is made, if such stream have a name, and if it have not, such a description of the stream as will identify it, and an accurate description of the point of diversion on such stream, with reference to some natural object or permanent monument. The notice shall be verified by the affidavit of the appropriator, or some one in his behalf, which affidavit must state that the matters and facts contained in the notice are true.

Section 4848 of the same code relative to beginning work to perfect the appropriation.

Diligence in appropriating.—Within 40 days after posting such notice the appropriator must proceed to prosecute the excavation or construction of the work by which the water appropriated is to be diverted, and must prosecute the same with reasonable diligence to completion.

Section 4849.

Effect of failure.—A failure to comply with the provisions of this title deprives the appropriator of the right to the use of water as against a subsequent claimant who complies therewith, but by complying with the provisions of this title the right to the use of the water shall relate back to the date of posting the notice.

Under section 4846 of the Montana Civil Code given above the Reclamation Service, under authority of the Secretary of the Interior, has made the following appropriation, and the filings have been recorded as provided in the law.

Filings on Big Muddy Creek:

	Cubic feet per second.
Nov. 15, 1913.....	1,000
Nov. 15, 1913.....	750
Nov. 14, 1913.....	750
Nov. 14, 1913.....	750
Smoke Creek (a branch of Big Muddy), Nov. 14, 1913.....	1,000
Wolf Creek (a branch of Big Muddy), Nov. 15, 1913.....	2,000

On Poplar River, which rises north of the Fort Peck Reservation, the following notices of appropriation were filed:

	Cubic feet per second.
Oct. 30, 1913.....	350
Oct. 22, 1913.....	700
Oct. 22, 1913.....	1,000
Oct. 22, 1913.....	5,000

A filing on 500 cubic feet per second of the Little Porcupine was made on October 31, 1913. This project is now completed and title perfected as far as construction proof. The final proof by beneficial use, however, rests with the Government and the allottees.

A filing of 500 cubic feet per second was made on the Big Porcupine Creek on October 13, 1913. This project is under construction and construction proof is now being made.

A filing was made on Little Wolf Creek, a small stream west of Poplar River, for 250 cubic feet per second on November 20, 1913.

On the Missouri River a water filing was made on 1,000 cubic feet per second for the Missouri River gravity unit under date of October 17, 1913.

Until the water question gets into the courts it will not be definitely known whether or not the decision in the case of *Winters v. United States* will apply to the streams of this reservation.

The Little Porcupine and Little Wolf Creeks are the only streams entirely within the boundary of the reservation, the other streams, with the exception of the Missouri River, having their sources north of the reservation, and are subject to appropriation by settlers.

The Big Porcupine and the Big Muddy Creeks are boundary streams, the first on the west and second on the east side of the reservation. These streams have been overappropriated by the white owners living on adjoining land.

While many appropriators have undoubtedly lost their rights by failure of construction proof, it is quite possible that they may reapropriate and acquire prior rights if the Government does not perfect its right under the filings made by the Reclamation Service.

Now that this reservation is open for settlement those settlers taking land may appropriate and beneficially use the water of these streams and their various branches and finally acquire a water right to the detriment of the Indians.

COMMENTS ON COMPLETED WORK.

The commission visited the units completed and those under construction. The location work was all done along economical lines and the canals and structures designed in accordance with approved

engineering principles. The excavation work was all done by Indian labor and was done in a satisfactory manner. The cost of the work to June 30, 1914, including all surveys, preliminary plans and estimates, construction work, and all overhead charges, including Washington and Chicago office as well as the supervising engineer's office charge, was \$396,610.69.

The total expenditures during the fiscal year ending June 30, 1914, were \$114,112.25, which was subdivided as follows:

Project overhead charge	\$9,294.04
Washington office charge	2,307.61
Supervising engineer's office charge	1,666.37
Chicago office charge	342.57
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Total overhead charge	\$13,610.59
Construction and other charges	100,501.66

The percentage of all overhead charges to total expenditure is 11.9 per cent. The project overhead charge is 8.15 per cent of the total expenditure.

It should be noted that of the Chicago office charge of \$342.57 about 90 per cent was due to the purchase of supplies for the mercantile store, which is self-supporting and to date has an accumulated profit of \$9,705.28.

There are 17,270 acres of irrigable allotments under the various units that are completed and in course of construction. Of this acreage there were about 765 acres irrigated in 1913 by Indian allottees.

We also find the irrigable area not allotted under different units now under construction to be 19,130 acres.

The work of construction begun by the Reclamation Service on this reservation should be completed at the earliest possible date in order that the allottees may be enabled to derive some income from their irrigable lands and also to save the water rights by construction work and beneficial use.

In addition to completing the units under construction we respectfully recommend that work be initiated on the Big Muddy unit at once in order to save for the Indian land the use of the water of Big Muddy Creek, which, in our opinion, is in very serious danger of being lost to the Indians.

The Indians should be encouraged by being furnished farming equipment and competent instructors. Also they should be required to move to and live on their allotments wherever practicable. The superintendent should be firmly supported by the department in his endeavors to compel able-bodied Indians who have equipment to cultivate their land or to become engaged in some useful occupation, in order to conserve the interest of thousands of dollars invested in their behalf.

Of the irrigable allotments on the Fork Peck Reservation, 62½ per cent are under the proposed Missouri River gravity canal and 325 irrigable allotments under the proposed Big Muddy unit, which is in the extreme eastern part of the reservation, the Big Muddy Creek being the eastern boundary. The land just off the reservation adjacent to the Missouri River and Big Muddy Creek has been settled by homesteaders, and it is therefore imperative that at the proper time steps be taken to protect the water rights of the Indians under

these two proposed units. It is understood that the Reclamation Service has filed on the water in the Big Muddy, but unless work of construction is begun within three years from the date of filing the water right of the Indians will be lost. The settlers east of the reservation along the Big Muddy Creek have posted notices of the appropriation of the water in said stream but as yet have not perfected their title. They are given but 40 days under the Montana State law to begin work of construction in order to retain their water right.

It is a known fact that it requires a capital of from \$1,500 to \$2,000 for a homesteader to successfully begin operations on land in this western country. An Indian who has had practically no experience can not be expected to farm his land without either capital, implements, or competent instruction.

In order that the Indians may establish themselves on their irrigable allotments it will be necessary that they be properly equipped for farming. It is our opinion that a portion of the funds derived from the sale of surplus land should be made available for the purchase of such stock, equipment, etc., as is needed. Also it is our opinion that in order to effect the sale of this surplus land it will be necessary to have the present homestead laws, in so far as they apply to nonirrigable Indian land opened to entry on this reservation, so amended as to eliminate the requirements as to residence and to allow a filing to be made on 320 acres instead of 160 acres as now provided by law. Otherwise the lands opened to settlement on the Fort Peck reservation will not be filed on by homesteaders, and as a result there will not be enough money derived from the sale of the surplus lands to pay for the work that is now in course of construction. Neither will any funds be available with which to equip the Indians for their work.

Aside from furnishing proper implements, seeds, etc., it is absolutely necessary that the superintendent be given competent farmers who have had experience in irrigation and who are competent instructors in methods of farming irrigable lands.

A reimbursable appropriation of at least \$100,000 should be made available at an early date in order that the Indians may be equipped for this work as soon as water can be had for irrigating their allotments.

CONCLUSION AND RECOMMENDATIONS.

That the Big Porcupine unit, also the A, B, and C canals of the Poplar River unit, be completed at the earliest moment possible. Also that sufficient work be done on the Big Muddy unit to insure the holding of the water rights against adverse filings by settlers residing on the other side of the stream.

Also we recommend that \$100,000 be made immediately available as a reimbursable fund to provide seed, stock, and farming equipment that these allottees may have an opportunity to successfully undertake farming operations.

BLACKFEET IRRIGATION PROJECT.

The commission arrived at Browning on August 19 and proceeded to go over and view the work done and proposed by the Reclamation Service.

The trip of inspection over the Blackfeet Reservation covered a period of four days by automobile.

After viewing the work done and proposed to be done by the Reclamation Service on this reservation, the commission made a trip over the northern part of the reserve through some of the best of the grazing land, both allotted and unallotted, with the idea of being able to report intelligently on the condition of the grazing land. Before going any further into detail we wish to give the office an idea as to the location of the Blackfeet Reservation.

The Blackfeet Irrigation Project is located on the Blackfeet Indian Reservation in Teton County, Mont. This reservation is situated in the northwestern portion of the State and extends from the eastern slope of the Rocky Mountains on the west for 50 miles to the east, and from the Canadian border on the north for 50 miles to the south.

The western end of the reservation is very mountainous and joins the Glacier National Park. Going east from these mountains the reservation flattens into an open rolling country, which is traversed by numerous streams having their origin in the snow and glaciers of the mountains. From these streams it is planned to irrigate the adjacent land. The mean annual run-off of the various streams is given below:

	Acres.
Cut Bank Creek at Cut Bank, 971 square miles drainage, 1905-1913.	179,500
Two Medicine River at Family, 368 square miles drainage, 1907-1913.	343,000
Badger Creek, near Family, 224 square miles drainage, 1907-1913.	179,000
Birch Creek, near Dupuyer, 155 square miles drainage, 1907-1913.	115,700

The elevation of the lands to be irrigated is between 3,500 and 4,000, and it slopes to the south and east. The temperature ranges from -44° to 100° . The mean rainfall on the irrigable area is about 12.8". The mean average rainfall in inches for the period from 1909 to date on the irrigable area during the irrigation season is as follows:

April.	0.74
May.	1.53
June.	2.59
July.	1.45
August. ....	.80
September.	1.52

The most of the water for irrigation is used during a period of 90 days, from May 1 to August 1. The duty of water is estimated to be about 2 acre-feet measured at the land.

The soil of the irrigable area ranges from a rich sandy loam to a heavy clay, and in some instances contains considerable sand and gravel. The main product of the reservation will be hay, and some grain and vegetables. The products will be disposed of in the local market. The Great Northern Railway traverses the irrigable portion of the reservation.

The following information was obtained from the Reclamation Service records at the Browning office.

The project is composed of the following units:

Cutbank Creek:	
North canal.	
South canal.	
Carlow Flat.	
Two Medicine:	
Seville.	
South branch canal.	

Badger Creek:
Piegan canal.
Fisher Flat.
Birch Creek.

CUT BANK UNIT.

No construction work has been done on any of the Cut Bank unit. The north canal of this unit covers 9,000 acres of unallotted land within the reservation, and the estimated cost is \$20 per acre. This proposed canal also covers 11,000 acres of land outside the reservation boundary.

The proposed south canal covers 18,000 acres, of which 2,100 acres are allotted. The estimated cost of this work is \$20 per acre. To make the Cutbank unit a success, storage will be necessary. It is proposed to divert water from the south canal to the proposed Guardipee Reservoir site where there is a feasible storage for 37,000 acre-feet. From this reservoir a canal can be built to cover the Carlow Flats, and this canal can be emptied into Cutbank Creek above the headworks of the proposed Cutbank north canal.

The mean annual run-off of Cutbank Creek from 1905-1913 was 179,500 acre-feet. The drainage area is 971 square miles. The Reclamation Service has recorded filings for 1,000 cubic feet per second. Date of filing is May 7, 1910. New filings are to be made prior to the opening of the reservation in order to protect the Indian water rights.

Cutbank Creek is a boundary stream and numerous filings have been made by settlers outside the reservation boundary.

TWO MEDICINE UNIT.

This system as originally designed was intended to supply 29,000 acres, 24,600 acres of which are allotted to Indians.

As at present constructed, however, it would be impossible for the main canal to properly supply water to more than about 6,000 acres.

The lateral system has been constructed sufficiently large to supply the entire area, but turnouts and small laterals have been built only to each 40-acre tract of allotted land. One hundred and thirty miles of laterals are constructed. All structures in the lateral system are of timber and will probably have to be replaced within 10 years.

The carrying capacity of the main canal at present is 100 second-feet, and as much of the canal section is in gravel and sandstone the loss from seepage will be very great. After having water in the canal only a few months there are a great many places where the seepage water has appeared below the canal to such an extent that drainage will be necessary at once to save the bottom land along the stream below the canal.

Practically all the upper portion of the canal was very heavy hillside work and through very porous material.

The head gate is constructed sufficiently large to supply 350 second-feet and it is proposed to enlarge the main canal to this capacity at some future time. This enlargement will probably have to be done with steam shovels and will be expensive.

The head gate and crossing under the Great Northern Railroad are of reinforced concrete. All other structures are of timber and

constructed to present canal capacity only. It is estimated that an expenditure of \$75,000 will be required to complete the Two Medicine canal system to full capacity.

The mean annual run-off of Two Medicine River from 1907 to 1913 was 343,000 acre-feet. The maximum and minimum discharges recorded during the irrigation season over a period of seven years were 7,500 second-feet maximum and 50 second-feet minimum. From the available hydrographic data it was apparent that storage was necessary.

A storage reservoir has been completed at the Lower Two Medicine Lake, about 4 miles from Glacier Park Station on the Great Northern Railroad. This storage is completed to first development and will store 13,000 acre-feet. By the addition of automatic shutters the surface of the lake can be raised 4 feet, giving an additional storage of 3,000 acre-feet.

The outlet and spillway portion of the dam is constructed of reinforced concrete. The remainder of the dam is constructed of earth with a heavy layer of hand-laid riprap on the face. The total cost of this storage was \$134,849.95. The general expense charged to this storage amounted to 19.6 per cent of the total. This general expense is distributed as follows:

	Total cost.	Per cent of cost.
Administration	\$14,304.35	13.2
Engineering.....	1,870.91	1.7
Supervision.....	2,483.70	2.3
Timekeeping.....	1,153.22	1.0
Camp expense.....	5,338.12	4.9
Depreciation, general.....	317.31	.3
Travel.....	827.69	.7
Cleaning up after construction.....	16.00	.01
Unused lumber.....	125.91	.1
	26,437.21	24.2

Total cost of dam, \$134,849.95.

Percentage of general expense is based on actual cost of construction work, which is \$108,412.74.

The total cost on the Two Medicine unit, including storage reservoir, is \$528,892.46.

In addition to the work completed or under construction, there is another proposed storage at Spring Lake for the South Branch Canal. This system will have to be supplied through the Two Medicine main canal. The capacity of this proposed reservoir is 30,000 acre-feet at an estimated cost of \$125,000. The South Branch Canal will be approximately 15 miles long and will irrigate 15,000 acres, of which 500 acres are allotted. The estimated cost of this system is \$20 per acre, including storage.

Another canal known as "lateral K," to irrigate 4,000 acres, of which 1,000 acres are allotted, was proposed, but if these allottees agree to accept allotments under other systems the present plan is to abandon this lateral.

About 12 allottees used water from the Two Medicine system during the season of 1914.

The total estimated cost of the complete unit as originally planned is \$760,000 for 48,000 acres, or approximately \$16 per acre. The total expenditure to date is \$528,892.46.

If no funds are made available for further work the present condition of the system will deliver water for only about 6,000 acres. This would make the unit cost for the area amount to \$88 per acre for the acreage for which the canal as at present constructed will supply water.

The distribution system has practically all been completed with the exception of turnouts and some small laterals, to cover 29,000 acres in the Seville Flat. However, the main canal must be enlarged before an ample supply of water can be delivered to the entire area in this flat.

The Badger division consists of the Piegan Flat and Fisher Flat units.

The Piegan Flat main canal diverts from Badger Creek and has a capacity of 45 second-feet. It is about 9 miles in length. The canal is located in very coarse gravelly material. It is designed to serve 3,000 acres, about 2,000 acres of which are allotted. Seventeen miles of V-shaped laterals have been constructed. Turnouts are constructed for that area which is allotted only. The soil of this tract is rather low grade, being mostly rocky and coarse gravel.

All the structures of this unit are constructed of reinforced concrete and concrete pipe. No storage is planned for this unit. The mean minimum discharge of Badger Creek from which the supply is obtained is about 125 second-feet, which is in excess of the capacity of the canal. The mean run-off of the creek from 1907 to date is 179,000 acre-feet.

The total cost of this unit is \$21,570.87, or \$7 per acre.

No land has been irrigated under this unit.

BADGER-FISHER UNIT.

This system, to irrigate what is known as the "Fisher Flats," requires the diversion and storage of Badger Creek water in the Four Horns Reservoir. The water from the outlet of the Four Horns Reservoir will follow a coulee a distance of 4 miles, thence emptying into Blacktail Creek just above the diversion of the Fisher Canal.

The diversion canal from Badger Creek to the Four Horns Reservoir has been completed to first development with the exception of the crossing at Whitetail Creek. This crossing will be a 62-inch wood stave pressure pipe 1,050 feet in length. The estimated cost of this structure is \$8,000.

The headgate is of reinforced concrete and was constructed to final capacity. The canal has been excavated to carry 100 second-feet, the final capacity is to be 165 second-feet.

This canal will enable the Badger Creek water to be carried directly through the Four Horns Reservoir and Blacktail Creek to the Fisher Canal.

To supply immediate needs the outlet from the Four Horns Reservoir will be excavated to drain the reservoir. This will require an outlet gate to withstand a head of 12 feet. The reservoir at this elevation will store 4,000 acre-feet and the cost of this work is estimated at \$12,000. Before any use can be made of the Fisher Canal it will be

necessary to excavate the outlet to Four Horns Reservoir, and with this 4,000 acre-feet storage and such additional water as can be taken from Badger Creek about 8,000 acres in the Fisher Flats can be irrigated.

The Fisher Canal is 30 miles long. The capacity as at present constructed is 220 second-feet and the proposed final capacity is to be 370 second-feet. There are 104 miles of laterals and sublaterals partially completed at the present time.

It is proposed to irrigate 30,000 acres of land, of which 16,000 acres are allotted. About \$40,000 will be required to complete construction to irrigate the allotted land so far as the present construction will permit. When completed the system will require additional storage, and to supply this the capacity of the Four Horns Reservoir can be increased to 30,000 acre-feet.

All structures in the Badger-Fisher unit as at present constructed are of reinforced concrete and steel. The total estimated cost is \$568,000.

The total cost to July 31, 1914, of this unit was \$307,684.32. Water supply data for Badger Creek is given under description of Piegan unit.

With the present available funds it will be possible to complete enough of the system to insure a supply of water sufficient for approximately 8,000 acres. If no further work is authorized the unit cost on the land that can be supplied will be approximately \$38 per acre. If the entire unit can be completed at the estimated cost of \$568,000 the unit cost will be approximately \$19 per acre.

BIRCH CREEK UNIT.

The proposed Birch Creek Canal is designed to irrigate 3,500 acres, 1,760 acres of which are allotted as irrigable and 1,700 acres allotted as grazing land. Canals constructed by the Indian Department years ago cover a part of the irrigable allotments.

The capacity of the proposed canal to cover the entire area is 45 second-feet.

Water rights decreed by the courts allow 41 $\frac{3}{4}$ second-feet of the flow of Birch Creek for the irrigation of Indian lands. Practically all the remainder of the flow of Birch Creek is claimed by the Conrad-Valier Ditch Co. on the south side of the creek.

No construction work has been done on the Birch Creek unit, and very little of the land under the old Indian ditch is being irrigated.

Summary of expenditure to July 31, 1914, on entire Blackfoot project is \$900,552.26. Of this amount \$110,144.11 is carried under the head of general expense, subdivided as follows:

Salaries:	
Engineering.....	\$17,337.53
Clerical.....	29,398.42
Leave, annual and sick.....	3,099.16
Travel.....	5,670.43
Stationery.....	3,309.09
Livery.....	3,852.90
Telephones.....	655.94
Office supplies and expense.....	2,615.64
Settlement.....	9.50
Photography.....	1,020.90

Furniture and fixtures.....	\$886. 93
Camp maintenance.....	8, 727. 71
Proportion Chicago office expense.....	1, 828. 59
Directors' office expense.....	16, 088. 35
Expert engineering.....	331. 31
Supervising engineer's office expense.....	13, 845. 70
Injuries under act May 30, 1908.....	1, 466. 01
Total.....	110, 144. 11

Per cent of total cost of project to date, 0.12230.

The Reclamation Service plan for the expenditure of the present appropriation of \$50,000 is as follows:

Excavation of Four Horns Outlet and construction of temporary outlet gate for storage of 4,000 acre-feet.....	\$12, 000
Whitetail inverted siphon on Four Horns supply canal.....	8, 000
2 large chutes and 40 turnouts on Fisher Flat system.....	10, 000
20 miles of small laterals on Fisher Flat system.....	1. 600
25,000 cubic yards of excavation in larger laterals on Fisher Flat system....	5, 000

With the balance it is proposed to construct farm turnouts and a drainage system for draining two lakes in the Fisher Flats. This drainage work will require the excavation of about 35,000 cubic yards of earth.

The proposed expenditure of the present appropriation of \$50,000 as outlined above is, in our judgment, the most feasible method of expending the money available. Upon the completion of the work as outlined above it will be possible to irrigate about 16,000 acres, or approximately one-third of the allotted irrigable land.

It is estimated that \$370,000 will be required to complete the system now partially constructed to such an extent that practically all of the irrigable allotments can be supplied with water.

The estimated cost of the entire Blackfeet project as outlined by the Reclamation Service is approximately \$2,123,000.

WATER RIGHTS.

Under the Birch Creek decree we are safe as far as appropriation is concerned, but beneficial use should be made in order to perfect title.

Under Two Medicine sufficient work has been done to hold the appropriation for a year or two, but in order to make final proof the Spring Lake and Four Horns reservoirs should be completed.

No work as yet has been done on the Cut Bank system. This stream is a boundary stream for nearly 15 miles, and many filings have been made. It will therefore be necessary to initiate work on this system if the appropriation is to be saved for the land in this unit.

In the past all filings of notice of appropriation of water for the benefit of Indian lands have been made by the supervising engineer of the United States Reclamation Service. According to the understanding of this commission the act of 1907 states specifically that filings must be made by the Commissioner of Indian Affairs.

We would recommend that in the future all filings of notice of appropriation of water for Indian lands be made in strict conformity with the act of 1907. Also that all filings that have lapsed from lack of construction proof be immediately refiled in accordance with the above statements.

We found enrolled on this reservation, according to the census of June, 1914, 2,642 Indians; this of course includes full bloods and mixed bloods. These Indians live almost entirely on their grazing allotments and along the streams and lakes. They are natural herdsmen, and some of them are now owners of many horses and cattle. Nature has endowed their environments for stock purposes with an abundance of water, grass, and natural protection against winters, as the reservation is broken and affords good winter range for stock.

As this board has been instructed to report upon the future policy for the prosperity, welfare, and happiness of these people, as well as conserving the vast amount of money that has been and will be expended for irrigation purposes here, we believe it is our duty not only to report on the irrigation but also upon the general conditions and industries of these people. It appears that there are about 123,000 acres of irrigable land on the reservation, 78,000 acres of which are unallotted. The larger part of the land that is subject to irrigation lies east of the meridian between ranges 7 and 8 and is in the district that these people propose to have opened to settlement, thus retaining the best part of their grazing land in order that they may pursue the only industry that they know and the principal industry that is now practiced by those in this section of the country, namely, the stock industry. We have before us Senate bill 5484, which provides for the opening to homestead entry of the land above mentioned, east of the meridian between ranges 7 and 8, and have made a careful examination of this bill and, in our opinion, we believe it to be for the best interest of the Indians that said bill should be enacted into law.

The act of March 1, 1907, which provides for the survey, allotting appraisement and opening to settlement of the surplus lands of the Blackfeet Reservation would be, in our opinion, a detriment to these people, inasmuch as this would destroy the opportunity for grazing tribal herds.

Lands lying south and east of the project adjacent to the boundary line of this reservation that have been homesteaded and plowed have in many instances been deserted, giving place to obnoxious weeds which have taken the place of the native grass, much to the detriment of range conditions.

We earnestly urge the passage of Senate bill 5484, as introduced by Senator T. J. Walsh, of Montana, or a similar bill which will amend the act of March 1, 1907, which originally provided for the opening of the surplus lands of the Blackfeet Reservation to settlement. However, to make this opening a success it is deemed advisable to eliminate the residence clause of the present homestead laws as applicable to the opening of lands on the Blackfeet Indian Reservation.

The members of this commission realize that the Blackfeet Reservation has been in the past wholly a stock-raising country and probably the greater portion should remain the same in the future.

We believe that it is highly essential that the Indian retain possession of his irrigable land and be permitted to lease if he so desires in order that the water right to the land may be perfected by beneficial use.

We do not believe that this locality will at any time in the near future become an entirely successful country for diversified farming,

either dry land or irrigated, but it is our opinion that in any ordinary season a fairly good crop of hay may be grown on the irrigable land covered by the constructed and proposed irrigation systems.

We realize that the bill providing for the opening of the surplus land of this reservation to settlement also provides that the money spent by the Reclamation Service on the reservation shall be reimbursed from the proceeds of the sale of the said lands. This commission approves the provisions in the act of August 1, 1914, in which the construction charges for irrigation works be apportioned among those benefited, this to apply to allottees as well as to entrymen.

After this land shall have been opened to settlement, that is, the land east of the line between ranges 7 and 8, there will yet remain enough grazing land to care for at least 35,000 head of cattle, and it is recommended that steps be taken to purchase cattle for these Indians.

Of the lands under the Blackfeet project 78,000 acres are unallotted land and 45,000 acres are allotted.

The construction charges should constitute a lien on the land benefited and not hypothecate the tribal funds, and appropriations should be made accordingly.

This will leave the tribal funds available for the purchase of farming equipment and cattle as well as for the relief of old and indigent Indians.

If the land on the east side of the reservation is thrown open to entry as provided in the proposed amendment to bill S. 5484, 63d Congress, 2d session, this surplus irrigable land will be taken up by homesteaders. For this reason the future annual appropriation should be sufficient to protect all water appropriations by diligently prosecuting construction work so that beneficial use can be made on all irrigable land on this reservation.

This is an extremely important matter and should be borne in mind when estimates for future appropriation are being prepared for Congress.

FLATHEAD IRRIGATION PROJECT.

After completing the inspection work on the Blackfeet Reservation the members of the commission proceeded to the Flathead Reservation by way of Kalispell and Flathead Lake, arriving at Polson, Mont., on August 27.

The Flathead Indian Reservation is an agricultural country, located on the western slope of the Rocky Mountains in the west central part of the State of Montana, in Flathead, Missoula, and Sanders Counties.

Ranges of mountains on the east and west sides of the reservation are covered with valuable timber, and between these ranges lie the valleys and low table lands suitable for both agriculture and grazing. These lands are fertile and adapted to the raising of small grain, fruit, timothy, alfalfa, and clover.

Five days were occupied in traveling over the reservation by automobile and inspecting the various irrigation divisions.

Each of the various canal systems, constructed and proposed, as well as the most important of the storage reservoirs, was visited.

A very thorough study of farming conditions, both dry land and irrigated, was made and all possible data along these lines were obtained by the members of the commission.

The Flathead irrigation project is scattered over a wide territory and is very peculiar in that the greater part of it is connected.

A large tract of land in what is known as the Mission Valley, lying between the Jocko-Mission watershed and the ridge south of Polson, has a very limited water supply in the northern portion. There are several streams in the northern portion having quite large run-offs and feasible storage reservoir sites. Also there are some rather extensive reservoir sites in the northern portion of this tract. The proposed system when completed will consist of a series of storage reservoirs, some on the streams having large run-offs and the others in the northern portion of the tract where no local water supply is available.

Therefore a feeder canal will extend from the Jocko River to St. Mary Lake storage, and from the outlet channel from St. Mary Lake another feeder canal runs northward to the crest of the ridge just south of Flathead Lake. This canal is now constructed from Post Creek, which is the natural outlet channel of McDonalds Lake to the Pablo Reservoir.

The object of this large feeder canal is primarily to furnish water to the storage reservoir in the northern portion of this tract of land, but it will also be used to furnish water to numerous tracts of land lying adjacent to the feeder canal and above the canals leading from the storage reservoirs.

From the storages known as Kicking Horse, Nine Pipe, and the Pablo Reservoirs an intricate distribution system spreads the water to the farm units and allotments.

The systems in the Mission Valley have been divided into several divisions by the Reclamation Service, viz: Mission, Post, Crow, and Pablo. The Polson division is partly in the Mission Valley, but the greater portion is on the land sloping toward Flathead Lake.

The other divisions in the project are the Jocko, Camas, and Big Arm. The Polson and Big Arm divisions are proposed pumping units.

The total area included in the reservation was originally 1,300,000 acres. Of this amount 152,000 acres have been classed as irrigable by the Reclamation Service. The acreage is subdivided as follows: 97,000 acres allotted Indian land, 48,000 acres entered by homesteaders, 2,000 acres open to the entry, and 5,000 acres State land.

The Flathead River flows in a general southwesterly direction through the reservation. The average annual run-off of this river at Polson, Mont., where the river leaves Flathead Lake, was from 1908 to 1912, inclusive, 8,293,000 acre-feet. None of this water can be used for irrigation except by pumping. The sources of water supply for the completed and proposed irrigation divisions are the Flathead River and its tributaries, the most important of which are the Jocko and Little Bitter Root Rivers and Mud, Crow, Post, Mission, Dry, Finley, Agency, Big Knife, and Valley Creeks, and a large number of smaller creeks.

The length of irrigation season is from May 1 to September 30 or 153 days. The duty of water has been estimated at 1.5 acre-feet per acre. The average elevation of the irrigable area is 3,000 feet above sea level. The range of temperature on irrigable area is from

-30° to 96°. The average annual rainfall at St. Ignatius, Mont., is 16.24 inches and this is probably much larger than the rainfall on the greater portion of the irrigable area, especially on those divisions at a distance from the mountains. The character of soil on the irrigable area varies from light sandy loam to heavy clay.

On the western side of the reservation adjacent to the mountains much of the land is being dry farmed successfully. The lands lying along the Flathead River and that west of the river has an insufficient rainfall and dry farming has not proven successful.

In the opinion of this commission no diversified farming without irrigation can be successful.

While fairly good grain crops are now being raised by dry-farming methods east and south of the Flathead River it is probable that the crop yield could be doubled by the application of water and in consequence the value of the lands would greatly increase.

The irrigation scheme divides the land east of the Flathead River into various units, but nearly all of these will be connected inasmuch as it is contemplated to carry surplus waters from one stream to another in order to reach suitable storages. None of the storage supply canals at present constructed will be utilized wholly as carrying canals. Numerous turnouts will be installed to irrigate land directly under the canals. During the season of 1914 a total of 6,505 acres was irrigated from completed canals. All engineering data presented in this report were obtained from the records of the Reclamation Service.

POLSON DIVISION.

The Polson division contemplates the irrigation of 6,000 acres of land in the neighborhood of the town of Polson which is located at the outlet of Flathead Lake.

This division was designed as a pumping system from power developed at the Newell power plant.

This land lies on each side of the Flathead River and slopes toward Flathead Lake.

The area proposed to be irrigated consists of 5,500 acres of allotted land and 500 acres of farm units.

Two small storages are included in the plans.

Some construction work has been done on the left bank of the Flathead River and this canal can now be supplied by dropping water over the divide from Pablo feeder canal.

The present undeveloped condition of the greater portion of the land under the Pablo division permits the use of a portion of the supply for the irrigation of the lands bordering Flathead Lake and adjacent to the town of Polson. It is probable that this gravity supply will be ample for several years and will permit of the development of this land prior to the completion of the proposed power development.

The land under this system is very productive when irrigated and its close proximity to the town, with its shipping facilities, makes this unit a valuable one. At the close of the fiscal year 1914 there were 1,200 acres under completed works, and of this amount 56 acres were irrigated during the season of 1914.

The total expenditure to July 31, 1914, was \$14,823.79. The estimated cost of the completed unit is \$463,232.80, or \$77 per acre.

CROW DIVISION.

The Crow division comprises a body of land between Crow and Mud Creeks and a narrow strip of land east of Crow Creek that is above the feeder canal for the Kicking Horse Reservoir. This proposed division will receive its water supply from the feeder canal running from Post Creek to Pablo Reservoir and also from the storage supply of the Pablo Reservoir.

There are 14,000 acres in this division, of which 13,000 acres are allotted land and 1,000 acres in farm units.

The natural flow of the streams diverted into the Pablo feeder canal will supply a sufficient quantity of water for the early portion of the irrigation season. The proposed storage at McDonalds Lake will furnish water during the latter part of the season for the upper portion of this division and the Pablo storage will take care of the lower portion.

Practically the entire area covered by this system is excellent farming land, much of which is now being dry farmed with fair success during the more favorable seasons.

No construction work has been done. The estimated cost of this division is \$133,000.

PABLO DIVISION.

The Pablo division is intended to supply water for the large territory included between Mud Creek and the Flathead River as far north as the ridge bordering the southern end of Flathead Lake. The approximate area included in this tract is 40,000 acres. This acreage is one half allotments and the other half farm units.

The water for this division is supplied by the Pablo feeder canal, which carries water from Post, Crow, Mud, and numerous smaller streams running westward from the Rocky Mountain Divide. There is also a possible diversion of a number of small streams running into the east side of Flathead Lake to add to the Pablo Reservoir supply. This feeder canal as at present constructed extends to Post Creek, which is the natural outlet of McDonalds Lake. It is proposed to extend this large feeder canal to intercept the outlet of St. Marys Lake.

The combined low-water flow of all the streams intercepted by the Pablo feeder canal is insufficient for the needs of the completed division. There are several storages available above the feeder canal, the most important of which are McDonalds Lake Reservoir site, Mission Reservoir site, McConnell Reservoir site, and St. Marys Reservoir site. Of these possible sites the McDonalds Lake and St. Marys Lake are the largest and probably the most economical for immediate construction. When the entire chain of feeder canal and storages is completed the construction of a feeder canal from the North Fork of the Jocko River, and other branches, if found necessary, will be an important factor in supplying St. Marys Lake Reservoir and the Pablo feeder canal to full capacity.

In this connection it must also be remembered that the Pablo feeder canal will be required to carry the water to be stored in numerous other reservoirs for other divisions on the project.

At the end of the fiscal year 1914 the Pablo division was completed to cover 8,000 acres. The total cost to July 31, 1914, was \$522,958.38.

The estimated cost of the completed division is \$1,590,309.69, or approximately \$40 per acre.

MISSION DIVISION.

The Mission division covers the land below the proposed feeder canal along the foot of the mountains and between Post Creek on the north and the ridge between the Mission and Jocko Valleys on the south.

Water will be supplied to the land by several canals taken from Mission and Dry Creeks, but the low-water flow must be supplemented by storage waters from Mission, McConnell, or St. Mary Reservoir.

The total run-off of these streams is more than will ever be needed for this division, although the low-water flow is insufficient and storage must be resorted to. Also, the surplus run-off will be needed farther north, and must be stored in Kicking Horse, Nine Pipe, and Pablo Reservoirs.

There is a proposed canal from Mission Creek which will divert water about 3 miles north of the northwest corner of the National Bison Reserve.

This canal will cover approximately 510 acres along the left bank of the Flathead River, just above the town of Dixon.

The estimated cost of this canal is \$15,000. The proposed canal will cover some land inside the Bison Reserve, and will also cover the land on which is now located the new agency.

The land under this proposed ditch is all allotted, and in its present condition, without irrigation, is of very little value.

Aside from the needs of the Indian allottees, it is essential that irrigation water be supplied to the lands reserved for agency use.

We recommend that steps be taken toward the construction of the system at an early date.

The total acreage included under the Mission division is 23,000 acres, of which 21,500 acres are allotted and 1,500 acres farm units.

The irrigable area under completed works June 30, 1914, was 6,000 acres.

The total cost to July 31, 1914, was \$23,268.61.

The estimated cost of completed division is \$484,100.75, or \$21 per acre.

The division is 4.8 per cent completed.

The land under this system is very fertile, and with irrigation produces excellent crops.

During the season of 1914, 915 acres were irrigated by Indians, 22 by lessees, and 225 acres by white owners or leased from whites.

POST DIVISION.

The Post division consists of that district lying between Post and Crow Creeks and the Flathead River. It contains 30,000 acres of irrigable land, of which 17,500 acres are allotted to Indians.

The water supply for this division is obtained mainly from Post Creek, with an additional amount obtained from surplus waters not needed in the Mission division. The mean annual run-off of Post Creek is about 75,000 acre-feet. Of this amount it is contemplated to store 24,500 acre-feet in Nine Pipe and Kicking Horse Reservoirs. These reservoirs are situated in the eastern end of the division, and from them canals and laterals have been run to deliver water to the land to the west and south. In addition to the above, a canal has been constructed which takes out of Crow Creek and waters the land adjacent to the Flathead River. The water for this is obtained partly from the natural flow of Crow Creek, and later, when needed, from the Lower Crow Creek Reservoir, which has not yet been constructed.

Canals and laterals have been built to cover 21,700 acres of land. There are now irrigated 149 acres by Indians, 3 acres by lessees, and 2,066 acres by whites.

The estimated cost of this division is \$986,971.52, or a unit cost of \$33 per acre. The division is now 33.8 per cent completed.

The division contains 27.35 miles of main canals and 104.11 miles of laterals.

JOCKO DIVISION.

The Jocko division lies in the southern part of the Flathead Reservation, in the vicinity of Schley, Arlee, and Flathead. The water supply is derived from the Jocko River and its tributaries. The water supply of these streams is sufficient for all the irrigable land under them, leaving sufficient inflow below the points of diversion, together with the return flow, to supply the land below along the Flathead River in the vicinity of Dixon.

The North Canal diverts water from the Jocko River above the mouth of Big Knife Creek. This canal will irrigate 6,000 acres. The capacity at the head is 130 cubic feet per second. This was made so that water could be carried across the Jocko River in the vicinity of the Jocko Agency as soon as the old water rights are settled and the Indians brought under the new system. The canal capacity for the 6,000 acres, however, is only 90 cubic feet per second. The south side of the valley will be irrigated largely from Finley and Big Knife Creeks. The incomplete records of the mean annual run-off from these streams for the years from 1909 to 1913 was 14,509 and 7,107, respectively, a total of 21,616 acre-feet. This amount has proven to be insufficient for the land on the south side of the river and the supply must be supplemented by fluming 40 cubic feet per second from the North Canal across the Jocko River, as stated above.

Revais Creek will also supply water for some bench land along the Flathead River west of Dixon. No work has been done, however, on this part of the division.

This division is 63 per cent completed and could irrigate 8,500 acres during the season of 1914. However, only 2,744 acres were irrigated, divided as follows: Farmed by Indians, 1,414 acres; farmed by lessees of Indian land, 1,150 acres; lands owned by whites, 180 acres.

The total expenditures to July 31, 1914 were \$105,558.76. Total estimated cost of completed division is \$167,480.75, or an estimated cost of \$10.50 per acre.

BIG ARM DIVISION.

This division lies along the western shore of Flathead Lake and contains 3,000 acres of land, 2,000 acres of which are allotted to Indians. The water for this land is to be pumped from Flathead Lake by means of electric power transmitted from the proposed power development on the Flathead River near Newell Tunnel a distance of 8 miles.

Nothing had been spent on this project up to July 31, 1914. The estimated cost of this division is \$78,000, or \$26 per acre.

This is very desirable land for fruit on account of the climate being tempered by the proximity of Flathead Lake.

CAMAS DIVISION.

The Camas division lies in the western part of the Flathead Reservation along the Little Bitter Root River and Sullivan Creek. The total irrigable area in this division is 20,000 acres, of which 2,000 acres are allotted.

The general plan of this unit is to store water in Little Bitter Root Lake and Hubbart Reservoirs, both off the reservation. However, all rights have not as yet been secured from corporations holding these lands. Additional storage may be provided in Big Draw and Dry Forks Reservoirs, both on tributaries of the Little Bitter Root River.

The annual run-off from the Little Bitter Root near Marion, Mont., beginning April and ending in December, varies from 6,640 acre-feet in 1910 to 3,515 acre-feet in 1913. It, however, usually goes dry in August and would supply very little water during irrigation season without storage. Storage at Little Bitter Root Lake would be very cheap if the right of way is secured, as the proposed dam will be 10 feet high, built of earth, a total yardage of 4,000 cubic yards, and when completed would store 6,000 acre-feet, probably the entire flow of the river at that point. This, in addition to the natural flow, could not be depended upon to irrigate more than 3,000 to 4,000 acres of land unless supplemented by additional storage at the Hubbart Reservoir site.

The mean annual run-off of the Little Bitter Root at Hubbart for months ranging from April to December from 1909 to 1913 is 18,590 acre-feet. During some of the years, however, the records were kept for a period of only seven months.

The minimum annual run-off was 13,332 acre-feet and the minimum flow only 7 cubic feet per second. The natural flow of the stream at this point could not be depended upon to irrigate more than 1,000 acres after July 1.

This reservoir could be constructed with a capacity of 20,000 acre-feet, but with the cheaper storage in the Bitter Root Lake mentioned above it is doubtful if it will be necessary to construct the canal to its fullest capacity unless the lake above mentioned can not be secured for reservoir purposes. There are two other reservoir sites on the tributaries of Little Bitter Root River. The Big Draw Reservoir on

Sullivan Creek, with a capacity of 9,330 acre-feet, covering an area of 901 acres, with a proposed earth dam 35 feet in height. This reservoir would irrigate 1,000 acres not feasible to irrigate from the Little Bitter Root River direct, besides furnishing water for bottom land along the Little Bitter Root River.

The canal to irrigate the greater part of this area would divert water from the Little Bitter Root River about 3 miles south of the north boundary of the reservation in order to cover the high bench land along the river.

It may be possible to irrigate some land in the vicinity of Camas Prairie by storing water in Dog Lake or in a marsh east of Dog Lake. Very little investigation has been made of this water supply. It is doubtful if more water can be developed at this point than will be required for the Indian allotments. The land in this division is badly in need of water and little can be accomplished by dry-farming methods.

The estimated cost of this division when completed is \$677,000, or \$33.85 per acre.

RESERVOIRS, FLATHEAD IRRIGATION PROJECT.

The following is a brief description of the storage reservoirs under construction and proposed:

Big Draw Reservoir.—This proposed reservoir is located on Sullivan Creek and is to be used to supply water for the Camas division. The dam is to be of the earth type and 35 feet in height, with a total length of 3,600 feet, unless it is found that the run-off from the watershed is insufficient to fill a reservoir of that capacity.

The total capacity of this reservoir will be 9,330 acre-feet, the estimated cost being \$95,000, or a little more than \$10 per acre-foot.

Dog Lake Reservoir.—It is thought possible that this lake may be used to store water and divert it onto the land in Camas Valley. It is also possible by constructing two small dams at a marsh east of Dog Lake to store water for irrigation. The amount of water is limited, and it is doubtful whether there will be more than enough water for the allotted lands. The capacity of the Dog Lake Reservoir, with a loose rock and earth dam 35 feet in height and 2,250 feet in length, will be 3,200 acre-feet, at an estimated cost of \$66,800, or about \$20 per acre-foot. Very little investigation work has been done on this proposed reservoir.

Dry Fork Reservoir.—The purpose of this proposed reservoir is to conserve the surplus waters of the Little Bitter Root River and serve the lowlands near Camas Hot Springs. The estimated cost of this reservoir is \$52,000. With an earth dam 33 feet in height it will have a capacity of 1,918 acre-feet, or a unit cost of a little more than \$26 per acre-foot.

Hubbart Reservoir.—The location of this reservoir site is on the Little Bitter Root River about 1 mile north of the reservation. This reservoir should be constructed after the Little Bitter Root Lake described below is completed. It can be developed to any extent, but it is doubtful if it will be necessary to construct it to a capacity of more than 20,000 acre-feet. This will require a dam of loose rock and earth 118 feet high, the estimated cost being \$167,000, or about

\$8 per acre-foot. The right of way for this reservoir has not as yet been acquired by the Government.

Little Bitter Root Lake.—This proposed reservoir site lies several miles north of the reservation on the Little Bitter Root River near the vicinity of Marion. This lake, with a dam 300 feet long and 10 feet in height, will store 6,000 acre-feet at an estimated cost of \$6,000, or \$1 per acre-foot.

Kicking Horse Reservoir.—Kicking Horse Reservoir is located on the prairie about 4 miles south of Ronan and will be supplied with water from Post Creek and will be used in supplying water to the Post division. The capacity of this reservoir, with an earth dam 31 feet high, will be 6,800 acre-feet, at an estimated cost of \$160,000, or about \$23 per acre-foot.

Nine Pipe Reservoir.—This reservoir, like Kicking Horse Reservoir, is located on the prairie and is supplied with water from Post Creek through a feeder canal. When this reservoir is completed with an earth dam 38 feet in height it will have a storage capacity of 15,100 acre-feet. Its present capacity is 5,000 acre-feet, and \$51,641.41 have been expended. The total cost of this reservoir when completed will be \$131,609.62. This reservoir will supply water for the Post division.

Pablo Reservoir.—This reservoir is located on the prairie south of Polson. The ultimate capacity with an earth dam 46 feet in height will be 29,600 acre-feet. The present capacity is 5,000 acre feet, at a cost of \$185,583.82. The total estimated cost is \$746,888.53. It can be supplied with water from the feeder canal and by pumping when necessary from Flathead River.

Lower Crow Creek Reservoir.—This proposed reservoir will be located on Crow Creek and will store the early run-off from this stream and surplus waters from the Mission and will furnish water to the Post division.

The capacity of this reservoir will be 9,485 acre-feet with an earth dam 92 feet in height. The estimated cost of this storage is \$126,000 or about \$14 per acre-foot.

McConnell Reservoir.—This reservoir will be filled from Dry Creek below St. Mary Lake in high water.

This is not a very satisfactory site.

With a dam 45 feet high it will have a capacity of 2,000 acre-feet at an estimated cost of \$39,425.43 or a unit cost of about \$19.50 per acre-foot.

McDonald Lake.—This is a natural lake on Post Creek and by constructing a dam of loose rock and earth 57 feet high it will store 10,200 acre-feet at an estimated cost of \$192,000 or an estimated cost of \$19 per acre-foot.

Mission Reservoir.—This site is on the head of Mission Creek and will act as an equalizer between Nine Pipe and Kicking Horse Reservoirs and supply water to the Mission division. The capacity of this reservoir with a dam 80 feet high will be 8,300 acre-feet at an estimated cost of \$230,339.71 or a unit cost of about \$29 per acre-foot.

Polson Reservoir.—This reservoir site is located about 1½ miles southwest of the town of Polson. The supply of water can be furnished to this reservoir temporarily from the feeder canal, but ultimately by pumping from the Flathead River. It will supply water to the land about Polson now irrigated from a branch of the main feeder canal.

This reservoir will have a capacity of 1,700 acre-feet with a dam 85 feet high. The estimated cost will be \$68,000 or \$40 per acre-foot.

St. Mary Lake.—This is the most feasible of all the proposed reservoirs. It is a natural lake near the head of Dry Creek. It will be tapped by a tunnel 60 feet below the present water surface and with a dam 58 feet high will store 25,000 acre-feet. A feeder canal can be constructed from one or more of the forks of Joeko River to not only supply this reservoir in part, but will pass water through it into the main feeder canal. The estimated cost of this reservoir is \$209,000 or a unit cost of \$8 per acre-foot.

Twin Reservoir.—Twin Reservoir site is located about 5 miles southeast of the town of Polson and will be filled from the feeder canal; by cutting through a divide it will supply water to the Polson division.

This is a small reservoir and with a dam 30 feet high will store 937 acre-feet. The estimated cost is \$18,400, or a little more than \$19 per acre-foot.

In our opinion the St. Mary Reservoir should be the next storage reservoir developed inasmuch as it is the cheapest storage in point of cost per acre-foot, and also will better serve the needs of the project for the immediate future.

Reservoirs, Flathead project, Mont.

Reservoir.	Capacity.	Present capacity.	Estimated cost.	Cost to July 31, 1914.
Big Draw.....	9,330	.....	\$25,000.00	.....
Dog Lake.....	32,000	.....	66,800.00	.....
Dry Fork.....	1,918	.....	52,000.00	.....
Flathead Lake.....	1,800,000	.....	¹ 640,733.43	.....
Hubbart.....	20,000	.....	167,000.00	.....
Kickinghorse.....	6,800	.....	160,000.00	.....
Little Bitter Root Lake.....	6,000	.....	6,000.00	.....
Lower Crow Creek.....	9,485	.....	126,000.00	.....
McConnell.....	2,000	.....	39,425.43	.....
McDonald Lake.....	10,600	.....	192,000.00	.....
Mission.....	8,300	.....	230,339.71	.....
Ninepipe.....	15,100	5,000	131,609.62	\$51,641.41
Pablo.....	29,600	5,000	746,888.53	185,583.82
Polson.....	1,700	.....	68,000.00	.....
St. Mary Lake.....	25,000	.....	209,000.00	.....
Twin.....	937	.....	18,400.00	.....

¹ Includes power plant for 6,000 horsepower and pumps for using same.

Capacities shown in acre-feet.

WATER RIGHTS.

Like the Fort Peck and Blackfeet Reservations filings have been made by the Reclamation Service in behalf of the Secretary of Interior on all streams thought necessary for the construction of the entire project. On only a few streams, however, has sufficient work been done to protect the appropriation toward perfecting title. Many of the streams have been refiled on, but owing to the fact that the Montana laws require that construction work begin before the expiration of three years it will soon be necessary to refile. This method of refileing, however, is not satisfactory, as subsequent appropriators may acquire title in the meantime. Filings unless followed by construction are of little value.

It is the opinion of this commission that sufficient funds should immediately be made available so that construction proof may be

made on all streams necessary for the ultimate development of this project, and in such amounts as to insure economic construction, and the title be perfected by beneficial use.

Under date of June 27, 1912, the Acting Commissioner of Indian Affairs advised the superintendent of the Flathead Reservation that the Secretary of the Interior approved the recommendation that a committee be appointed, which should include the superintendent of the Flathead Reservation, the engineer engaged in the reclamation work, and an Indian to be selected by the Flathead Tribe, for the purpose of determining the lands affected by appropriation of water and that all lands so irrigated should be determined and have a paid-up water right.

A council of Indians was called and Alphonse Clairmont was unanimously elected as the Indian member of the commission. Fred C. Morgan, superintendent of the Flathead Reservation, and E. F. Tabor, project engineer, were the other members of the commission. Later, on account of other work requiring Mr. Tabor's attention, he was replaced by Mr. Foster Towle, an assistant engineer. The commission met on September 9, 1913, at the Flathead Agency. After going over the irrigated lands and making a thorough examination of the canals and ditches, they decided—

That beneficial use shall be the measure and limit of the right to irrigation water and the capacity of all ditches as now constructed shall limit the water rights of appropriator or appropriators using ditches; that from a general consideration of the facts it has been determined that many of the appropriators have not sufficient water diverted and appropriated to irrigate all their lands and it will be necessary for them, when practicable, to obtain irrigation water from the system constructed by the United States for the purpose of irrigating portions of their allotments; that in the event water is obtained from the Government-constructed irrigation system, or an exchange is made for the water rights found to be vested for a water right from the Government-constructed irrigation system, all land covered by such change will be charged with the payment of its proportion of the annual operation, maintenance, and betterment charges as fixed by the Secretary of the Interior.

The committee made findings on each of the following:

1. Name of appropriator.
2. Number and description of allotment.
3. Date of appropriation.
4. Location of point of diversion.
5. Area of land irrigated and exact location.
6. Paid-up water rights on the Government-constructed system for definite number of acres; or
7. Partially paid-up water right to the extent of a definite per cent of the cost per acre for a water right under Government-constructed system.

Under date of January 15, 1914, the commission submitted its report in two volumes, one containing the testimony taken, the other the findings of the committee as to rights of individual allottees, together with maps.

Relative to a ditch constructed by the Government in 1893 and other ditches constructed at Government expense prior to the work done by the Reclamation Service the conclusions are as follows:

It is also determined that a claim for water rights in the new system based upon use from the old Government ditches will fail for lack of ownership in the ditch, through which such claims would have to be established; and it is therefore concluded that if all the water rights properly claimed through ditches privately constructed be protected, equity will be done.

In other words, the committee concluded that those Indians who irrigated their lands through ditches constructed at their own expense have a paid-up water right to that part of their various allot-

ments shown by the testimony and maps to have been irrigated, and that these Indians irrigating from these canals constructed at the expense of the Government prior to that work being done by the Reclamation Service are not entitled to a paid-up water right under those ditches that will eventually be irrigated under the new and more comprehensive system now being constructed.

This commission agrees with the findings and conclusions of the committee as given above and recommends that they be approved at an early date so that the construction work may be completed on this division.

We further recommend that, if necessary, the Indians irrigating land from the old ditches be requested to change to the new system and to abandon their old ditches, except as they may be needed in connection with irrigating lands under the system. The testimony and hearings have been completed on all divisions, but owing to the time required to make necessary surveys only the report on the Jocko division has been submitted, and it is respectfully recommended that the commission appointed by office letter of June 27, 1912, be instructed to continue the investigation and report on all unfinished work in the same manner in which the Jocko division was handled.

POWER DEVELOPMENT.

The power possibilities on the Flathead River from Flathead Lake to Dixon are very great, ranging from 43,000 to 100,000 horsepower at the Newell Dam site, depending on the height to which the lake is raised, or if all the power be developed between the lake and Dixon it may be increased to 180,000 horsepower. Even this could be increased to 260,000 horsepower by raising the lake an additional 10 feet. It is doubtful, however, if the water supply could always be sufficient to fill the lake to this height.

The general plan for utilizing this power has been tentatively adopted as follows: The river has a rapid fall at the Newell Dam site, falling 55 feet in 2,800 feet. A tunnel 1,700 feet in length has been constructed from the upper to the lower point, with the exception of a few feet at the upper end which, with a small diversion dam, will develop a head of 69 feet. The tunnel is about 11 by 11 feet, through solid rock and unlined. The development of the 69-foot head will furnish 6,000 horsepower, or sufficient for furnishing the present need for pumping purposes.

The work now done will work into the scheme of greatest power development. The power developed can be utilized in filling Polson and Pablo Reservoirs if the streams emptying into the feeder canal fail to supply sufficient water for irrigation purposes. It will also furnish the power for pumping in the Big Arm division and the land adjacent to the lake on both sides of the Flathead River in the vicinity of Polson.

The expenditures on this development to July 31, 1914, were \$95,733.43. The estimated cost of the entire development of the first 6,000 horsepower contemplated is \$640,733.43.

The water power of this stream is a necessary problem for future development.

It is important that sufficient development be carried on and the rights of the Indians to this power protected by construction work, or in some other manner.

This commission has not gone into the matter of future development of this water power, except as it concerns irrigation, but invites your attention to the possibilities of outside parties acquiring title to land adjacent to the Flathead River and developing power to the detriment of the Indians.

This commission understands that outside parties have already made filings on the Flathead River for power purposes. Relative to this matter refer to Supt. Morgan's letter dated June 8, 1914, addressed to the Indian Office.

The value of the power propositions in Flathead River, which are estimated at over \$1,000,000, the expense already incurred in building a tunnel, and the necessity of developing power for pumping water onto Indian lands make it of the utmost importance that steps be immediately taken to diligently prosecute the work in connection with power development to the end that the attempts of speculators may be frustrated and the rights of the Flathead Indians and the public be protected.

Proposed expenditure of the \$200,000 now available for construction.

Completion of structures on canals under contract with Wilson Bros.	\$70,000
Additional small structures for existing canals.....	7,000
Operating road on Pablo feeder canal.....	2,500
Excavation of canals for about 7,000 acres of land, Pablo division, canal location completed.....	25,000
Structures for last-named canals.....	42,000
Canals and structures to be located immediately for about 1,500 acres additional land in Pablo division east of Horte.....	13,500
Survey and design.....	18,000
Operation and maintenance.....	20,000
Stream gauging.....	2,000
Total.....	200,000

Summary of expenditures on the Flathead Reservation to July 31, 1914, Flathead project, Mont.

AREA AND ESTIMATED COST.

Division or feature.	Irrigable area total project.	Irrigable area under completed works, June, 1914.	Irrigable area in allotments.	Irrigable area farm units.	Cost to July 31, 1914.	Estimated total cost.	Per cent completed July 31, 1914.
Camas.....	20,000		2,000	18,000	\$113.67	\$677,000.00	0.016
Big Arm.....	3,000		2,000	1,000		78,000.00	
Polson.....	6,000	1,200	5,500	500	14,823.79	463,232.80	3.2
Pablo.....	40,000	8,000	20,000	20,000	522,953.38	1,590,309.69	31.7
Crow.....	14,000		13,000	1,000		133,000.00	
Post.....	30,000	21,700	17,500	12,500	333,934.69	986,971.52	33.8
Mission.....	23,000	6,000	21,500	1,500	23,268.61	484,100.75	4.8
Jocko.....	16,000	8,500	15,500	500	105,558.76	167,480.75	63.0
St. Mary storage.....					15,162.92	352,173.85	
Drainage.....						300,000.00	
Power development.....					95,733.43	640,733.43	
Telephone system.....					8,872.46	27,004.75	
Buildings and grounds.....					31,499.66	86,406.94	
Stream gaging.....					11,079.77	19,072.83	
Survey and design.....					199,847.74	600,000.00	
Total.....	152,000	48,400	97,000	55,000	1,362,853.88	6,605,486.81	20.6
Operation and maintenance.....					44,733.95		
Grand Total.....					1,407,587.83		

The general expense item to June 30, 1914, was:

Flathead project, Mont.

Washington office.....	\$21,291.80
Chicago office.....	2,345.10
Expert engineering.....	1,231.19
Supervising engineer's office.....	24,399.46
Injuries under act May 30, 1908.....	2,275.77
Local office.....	116,637.11

168,170.43

Length of canals.

Division.	Capacity 800 to 301 second- feet.	Capacity 300 to 50 second- feet.	Capacity less than 50 second- feet.
	<i>Miles.</i>	<i>Miles.</i>	<i>Miles.</i>
Post.....	2.74	24.61	104.11
Jocko.....		4.54	71.35
Polsom.....			7.97
Pablo.....	8.04	36.53	46.09
Mission.....		6.93	18.43
Total.....	10.78	72.61	247.95

Inasmuch as there has at times been a question raised as to the interpretation of the act of May 29, 1908 (35 Stat. L., 444-450, par. 6, sec. 9), regarding the payment of construction charges for irrigation work on Flathead lands for which Indians have received patent in fee, we respectfully recommend that this matter be thoroughly reviewed, and if it is possible to do so to have legislation enacted similar to the ruling contained in Indian Office letter addressed to the superintendent of the Flathead Indian School, under date of March 3, 1911. This would eliminate the possibility of further misunderstanding.

The following is a copy of paragraph 6, section 9, 35 Statutes at Large, pages 444-450:

The land irrigable under the systems herein provided, which has been allotted to Indians in severalty shall be deemed to have a right to so much water as may be required to irrigate such lands without cost to the Indians for construction of such irrigation systems. The purchaser of any Indian allotment, purchased prior to the expiration of the trust period thereon, shall be exempt from any and all charge for construction of the irrigation system incurred up to the time of such purchase. All lands allotted to Indians shall bear their pro rata share of the cost of the operation and maintenance of the system under which they lie.

The question has been raised by various persons as to the possibilities of irrigating the Indian allotments directly from the various streams without storage. It should be stated that the allotments were made some time before irrigation plans were formed and are not all located favorably for irrigation direct from the streams.

In order to show just what might have been done the mean discharge of the various streams, taken from a record of several years, is given herewith. The fact that the streams have their origin in the forest-covered mountains makes the run-off come during the summer months when most needed.

Stream.	June.	July.	August.
	<i>Acre-feet.</i>	<i>Acre-feet.</i>	<i>Acre-feet.</i>
Jocko River.....	25,075	24,625	15,205
Mission Creek.....	19,330	11,603	4,841
Post Creek.....	14,520	11,457	5,255
Mud Creek.....	877	953	583
Crow Creek.....	18,700	6,800	2,500
Total (without Jocko River).....	53,427	30,813	13,179

The heaviest irrigation on this reservation occurs during July. About 70 per cent of the season's water is applied between July 10 and August 10. The discharge of the streams is here given in second-feet on those dates, and is a mean obtained from records extending over several years.

Stream.	July 10.	Aug. 10.	Mean.
	<i>Cu. ft. per sec.</i>	<i>Cu. ft. per sec.</i>	<i>Cu. ft. per sec.</i>
Jocko River.....	520	260	390
Post Creek.....	230	83	155
Mud Creek.....	24	12	18
Crow Creek.....	187	48	117
Mission Creek.....	245	85	165
Total (without Jocko River).....	686	223	455

The Jocko River will easily care for all the irrigable land under this system, as there is a surplus of water. The acreage which can be served is 15,500.

Assuming that all the water of the various streams can be used and that 70 per cent is needed between July 10 and August 10, these streams could supply a total of 39,000 acre-feet. Assuming a duty of 2 acre-feet, this would supply water for 19,000 acres.

In addition to the above-named streams there is water enough available in Little Bitter Root River to care for about 1,500 acres.

This gives a total acreage which can be supplied with water without storage of 26,000, as follows:

Jocko River.....	15,500
Various streams.....	19,000
Little Bitter Root River.....	1,500
Total.....	36,000

This is but a small percentage of the total allotted land.

As has been previously stated, there are under this project 97,000 acres of allotted land, and 55,000 acres of land other than Indian, namely, homestead land, State land, and vacant land. It is the opinion of this board that, in working out the plan of properly distributing the waters having their sources in the tribal timberlands, the building of a comprehensive system sufficient in size to convey water to the homestead, as well as the Indian land, the most economic plan was followed to control the water supply; also to properly protect the Indians' water rights. The building of a system to have conveyed water to the Indians' lands only would eventually have been fraught with many complications, and the Indians would beyond doubt, sooner or later, have lost valuable water rights by homesteaders, not under the system, filing on and making a beneficial

use of the water. The understanding of the homesteader that water would eventually be delivered to his land (however, no definite promise was made on the part of the United States as to date of delivery) enabled the United States, as agent for the Flathead Tribe, to dispose of practically all their surplus lands at the appraised value.

The Indians and whites under the various divisions on this reservation are demanding continually that irrigation water be furnished for the allotments and homesteads taken as irrigable land at the earliest possible date, as well as to be informed of the estimated costs. Under the present method of financing this project, it is absolutely impossible to accurately estimate the cost, as it depends to a large extent on the rate of progress of the work, which progress is entirely governed by the annual appropriation. For example, if the annual appropriation be limited to \$100,000 for this project, it will take about 50 years to complete it, and in the meantime many of the Indians and homesteaders will be left in a destitute condition, while on the other hand if \$500,000 are made available each year for construction purposes, the work can be completed within a period of 10 years. It can readily be seen that the work extended over a period of 50 years will probably cost 50 per cent more than if completed within a period of 10 years.

It is also our opinion that no injustice has been done the Indians on the Flathead Reservation in regard to irrigation matters except the hypothecating of their tribal assets for the payment of the system instead of attaching the cost of the system to the tracts of land irrigated, nor will an injustice be done provided future appropriations are of sufficient magnitude to permit of early completion of the irrigation systems.

The removal of the objectionable feature as stated above will give an opportunity to assist the Indian by using a part of the tribal funds to start him in farming operations, and thereby enable him to make a beneficial use of the waters delivered to his land.

This reservation was opened May 2, 1910, to homestead entry, and in some parts of the reservation, principally that part known as Camas Prairie and Little Bitter Root Valleys, is settled by homesteaders save a very few Indian allotments. We are of the opinion that the various units which are to furnish water to the parts of the reservation allotted to Indians should be pushed to completion as early as possible in order to protect the Indians' water rights and to encourage him in farming, but we do not favor the construction of ditches to cover Camas Prairie or the Little Bitter Root Valleys, where the white man has practically all the land, unless the act of Congress approved April 23, 1904, can be so amended as to provide that the cost of said construction be attached to each tract of land irrigated therefrom and the tribal assets not held for payment.

We find that these Indians are beginning to see that, owing to the change of conditions by the opening of their reservation to white settlement, the raising of stock is no longer a profitable industry, but that they must depend upon their farming operations for a livelihood, and we believe the time is here when they should be encouraged and assisted, both by furnishing them water as soon as possible and by devising some means whereby they can be supplied with proper equipment for farming.

We find that there are 218,000 acres of timberland on the Flathead Reservation, 18,000 acres of which have been allotted to Indians and approximately 5,000 acres reserved for the use and benefit of the tribe. There should be further reserved for the benefit of the tribe 5,000 acres more, making a timber reserve on this reservation of 10,000 acres for the exclusive use of the Indians. This would leave 190,000 acres remaining of timberlands.

The act of 1912, which provides for the disposition of the surplus land on opened reservations, reads as follows:

That the Secretary of the Interior be, and he is hereby, authorized to cause to be classified or reclassified and appraised or reappraised, in such manner as he may deem advisable, the unallotted or otherwise unreserved lands within any Indian reservation opened to settlement and entry, but not classified and appraised in the manner provided for in the act or acts opening such reservations to settlement and entry, or where the existing classification or appraisement is, in the opinion of the Secretary of the Interior, erroneous.

It is the opinion of this commission that this act is an injustice and detrimental to the welfare of this tribe of Indians and is not conducive to good administration, and should be repealed for the following reasons:

Practically all the timber on this reservation is on the sides of the mountains which form watersheds and in which mountains are the sources of the streams from which water is secured for irrigation. If these timberlands are opened to entry these watersheds would no doubt soon be divested of their timber, thus permitting the run-off from the various streams which furnish water for irrigation to occur earlier each year than it otherwise would, and making additional storage necessary at a great expense in order to supplement the flow during the latter part of the irrigation season, and in view of this fact we believe and recommend that the surplus timberlands together with the timber on said lands on the Flathead Reservation not otherwise reserved or allotted be purchased and acquired by the United States at the original appraised value of the timber, the same having been appraised, plus the value of the land to be appraised by a competent commission of three appraisers to be appointed by the President, and that said timberland be placed under the supervision of the National Forestry Service and be made a part of the national forest reserve, thus preserving the water supply for irrigation.

By the purchase of the surplus timberlands on this reservation by the United States and causing it to become a part of the National forest the Indian property adjacent thereto will not be so greatly endangered, by reason of the fact that the Forestry Service is equipped for the protection of the forests against fire.

It might be well to say that we do not believe such a step would meet the approval of the unscrupulous speculators, and those who think the Indian should apologize for being here, and who spend their time trying to foil the plans of the superintendent in his efforts to better the condition of this tribe, therefore we believe it detrimental to good administration to add to the many duties of the superintendent that of acting in the capacity of appraiser of these lands to be sold.

A further reason why this act should, in the opinion of this commission, be repealed is because of the fact that it affords the home-

steadier, not only prior to filing but even after he has filed and proven up and paid for a tract of land, an opportunity to make application for reappraisal of the land, and in some cases they have availed themselves of said opportunity to the detriment of the best interest of the tribe, and in an effort to protect the Indians' interests the field officials incur the enmity of the so-called "wolves" who live by preying upon the Indians.

It has come to our notice that a great deal of annoyance has been caused some of the field employees of the Indian Service on many reservations by reason of the fact that copies of reports and other correspondence have been obtained by parties in opposition to Indian Office policies.

In our opinion it is not in the interest of good administration to allow these reports and other correspondence of a more or less confidential nature relative to matters pertaining to both whites and Indians to fall into the hands of persons who may use them to the detriment of those called upon to make such reports.

SPECIAL RECOMMENDATIONS.

1. We respectfully recommend that the irrigation units on the Fort Peck Reservation now under construction and also the proposed Big Muddy unit be completed at the earliest possible date; that the cost of all irrigation work be chargeable to the lands benefited, both allotted and unallotted, and not be held as a charge against the tribal funds, or in any other way hypothecate the tribal interests.

2. Inasmuch as 62½ per cent of the Indian allotments are under the Missouri River gravity system, which we consider feasible and the most valuable unit on the Fort Peck project, we recommend that this feature of the Fort Peck irrigation scheme should not be lost sight of. While we do not feel justified in recommending immediate construction of this unit, we are unanimous in stating that this construction will be a necessity in the near future, and we believe that within a very short period of time the Fort Peck Indian will come to a full realization of the immense value of irrigation and will willingly consent to and demand the construction of the Missouri River gravity unit.

3. As the act of March 1, 1907, requires that water filings for Indian lands on Blackfeet Reservation be made by the Commissioner of Indian Affairs, it is recommended that filings be made in conformity with said act.

4. As we believe Senate bill 5484, regarding the opening of a portion of the Blackfeet Indian Reservation, as introduced by Senator Walsh, of Montana, to be for the best interest of both entrymen and Indians, we recommend passage of same.

5. In order that the Blackfeet Indian's water rights may be perfected by beneficial use, we believe that he should retain his irrigable land and be permitted to lease it for cultivation, and the same is hereby recommended.

6. It is our opinion that the tribal funds should not be hypothecated to pay the construction charges to irrigate lands on the Blackfeet Reservation, but that these charges should constitute a lien on the lands benefited and their tribal funds expended for cattle to graze on their nonirrigable lands.

7. We recommend that sufficient funds be appropriated annually to permit of the early completion of the irrigation systems on the Blackfeet Reservation. This will not only tend to safeguard the water rights but will materially reduce final unit costs.

8. We recommend the act of 1912 which relates to the classification and reclassification and appraisal and reappraisal of the timber lands on the Flathead Reservation be repealed as this act, in our opinion, encourages entrymen to make application for the reappraisal of lands even after filing and making final proof, and in addition to this it will eventually mean the destruction of the timber which makes the mountains so valuable as watersheds and eliminates the necessity for additional storage of water for irrigation.

We do not believe the proposed amendment to section 11 of the act of March 3, 1909, which provides for the opening to entry the timber lands on the Flathead Reservation, should be enacted into law. Such a law would mean that the homesteader could divest the land of its valuable timber after filing and making his second payment with the results as stated above.

We earnestly recommend as being for the best interest of the Indians and in the interest of good administration that the United States purchase the timber lands on the Flathead Reservation not otherwise allotted or reserved and that the same be made a part of the national forest under the supervision of the national Forestry Service. By so doing the timber will be cut under proper supervision and the watersheds will be preserved, and the run-off of the streams having their sources in the mountains will not occur so early each year as to make necessary the providing for additional storage for irrigation and the Indian property adjacent to the forests will be more amply protected from destruction by fire, because of the fact that the Forestry Service is better equipped for this purpose.

GENERAL RECOMMENDATIONS.

1. We respectfully recommend that inasmuch as the Commissioner of Indian Affairs is held by the Secretary of the Interior directly responsible for the expenditure of all funds for the benefit of Indians on Indian Reservations, in the future no work be initiated, no plans prepared, or any funds chargeable to Indian work be expended by the Reclamation Service except with the approval of the Commissioner of Indian Affairs.

2. We respectfully recommend that the acts providing for the opening of the Fort Peck, Blackfeet, and Flathead Indian Reservations, and for the construction of irrigation systems thereon, be so amended as to attach the cost of said construction to the lands irrigated under the systems, using, however, in the discretion of the Secretary of the Interior, the share of the tribal fund of the individual allottee whose land is benefitted thereby, remaining after purchasing seeds, stock, and farm equipment, to defray, if necessary, his share of the cost of construction.

3. We recommend that future appropriations for irrigation work on the projects on these three Indian reservations be made by direct appropriation of any funds available in the Treasury of the United States, and such funds be made reimbursable, and the repayment of same to

be held as a lien against the lands benefited, both those held by allottees and entrymen, and not hypothecate the tribal funds.

4. We also recommend that the annual appropriation for the completion of the irrigation projects on the Fort Peck, Blackfeet, and Flathead Reservations be of sufficient magnitude to insure the early completion of said projects.

Delay in securing large annual appropriations for each of these projects will not only jeopardize the water rights for these lands but will very appreciably increase the unit costs per acre.

Respectfully submitted.

C. B. LOHMILLER,
Superintendent Fort Peck Reservation.

ARTHUR E. McFATRIDGE,
Superintendent Blackfeet Reservation.

FRED C. MORGAN,
Superintendent Flathead Reservation.

W. S. HANNA,
Superintendent of Irrigation, Chairman.

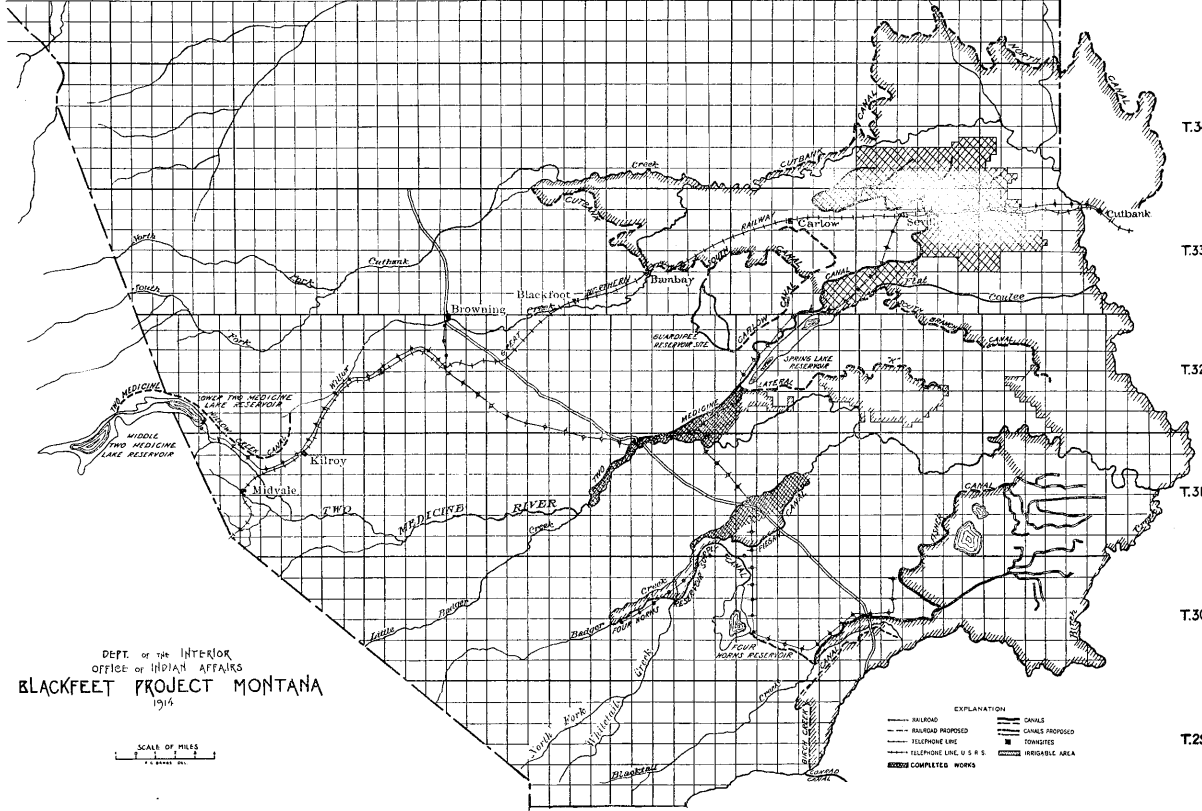
L. M. HOLT,
Superintendent of Irrigation.

HENRY W. DIETZ,
Superintendent of Irrigation.

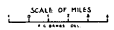


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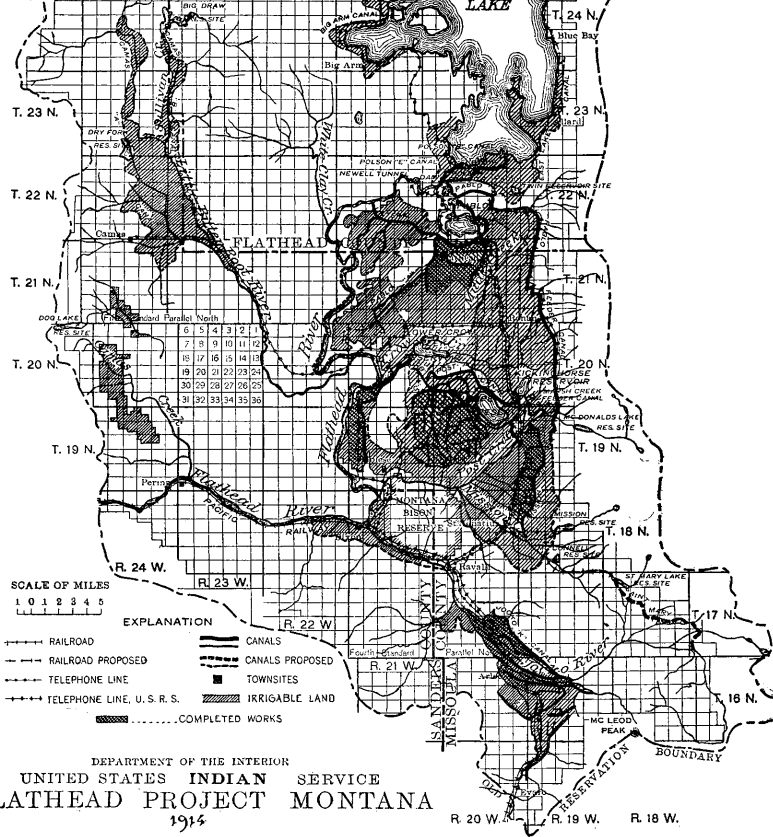


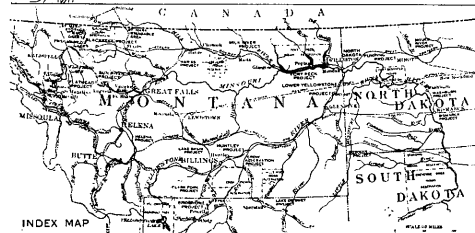
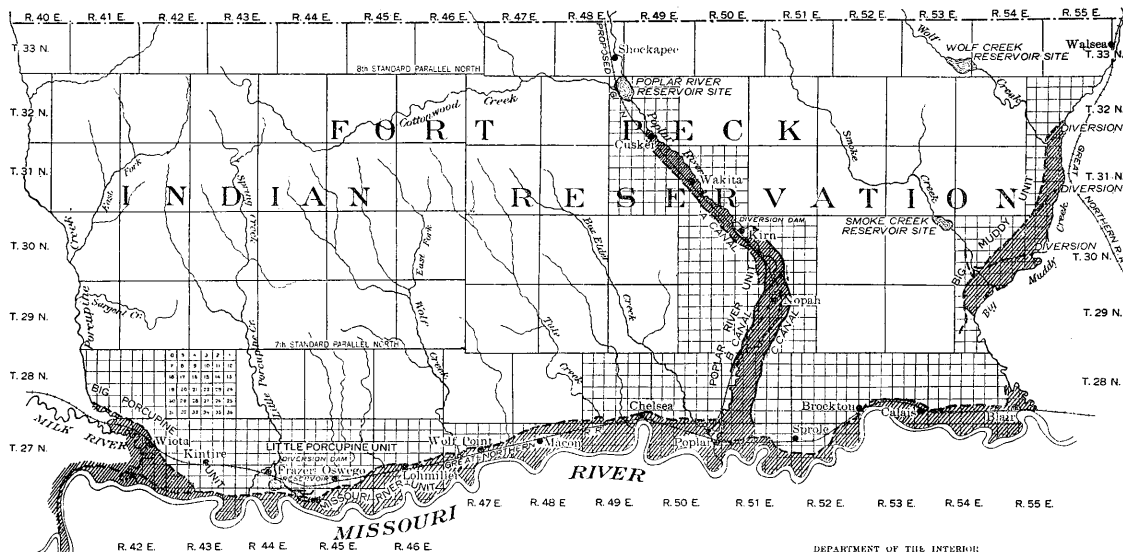
DEPT. OF THE INTERIOR
OFFICE OF INDIAN AFFAIRS
BLACKFEET PROJECT MONTANA
1916



- EXPLANATION
- RAILROAD
 - - - RAILROAD PROPOSED
 - TELEPHONE LINE
 - TELEPHONE LINE, U.S.R.S.
 - CANALS
 - CANALS PROPOSED
 - TOWNSHIPS
 - ▨ IRRIGABLE AREA
 - ▨▨▨▨ COMPLETED WORKS

FLATHEAD COUNTY - OLD RESERVATION BOUNDARY
SANDERS COUNTY





DEPARTMENT OF THE INTERIOR
 OFFICE OF INDIAN AFFAIRS
FORT PECK PROJECT MONTANA
 1914

- Legend
 Canals constructed.....
 proposed.....
 Irrigable lands.....



IRRIGABLE LANDS

Big Forepine	4,000 Acres.
Little "	2,000 "
Poplar River	28,000 "
Big Muddy	16,000 "
Missouri River	84,000 "
Galpin Pumping	10,000 "
Milk River Pumping	8,000 "