STATE OF NEBRASKA

DEPARTMENT
OF
PUBLIC WORKS

REPORT OF SECRETARY

1919--1920

Thirteenth Biennial Report

OF THE

Department of Public Works

TO THE

GOVERNOR OF NEBRASKA

For the Years 1919-1920

Lincoln, Neb.

To His Excellency,
SAMUEL R. McKELVIE,
Governor of Nebraska.

Sir:

I have the honor to transmit herewith the Thirteenth Biennial Report of the Department of Public Works, for the two fiscal years ending November 30, 1920.

Very respectfully yours,
GEO. E. JOHNSON,
Secretary.

LIST OF OFFICERS AND EMPLOYEES

Bureau of Irrigation, Water Power and Drainage

George E. Johnson.....Secretary
Robert H. Willis.....Chief of Bureau
Page T. Francis.....Water Superintendent, Division No. 2
T. C. Palmer.....Hydrographer, Division No. 1
K. I. Ward.....Chief Clerk
F. M. Porter.....Stenographer

Water Commissioners

O. M. Finley.....Scottsbluff
W. F. Chaloupka.....Bridgeport
E. H. Hartman.....Lewellen
G. F. Palmer.....Sutherland
George M. Rannie.....North Platte
Floyd Bailey.....Culbertson
A. W. Hall.....Kimball
C. S. Radcliffe.....Sidney
John Cook.....Agate

WATER DIVISIONS AND WATER DISTRICTS.

Section 6780 of Cobbey's Annotated Statutes: Irrigation - Water Power—Water Divisions:

"The State of Nebraska is hereby divided into water divisions, denominated Water Division No. 1 and Water Division No. 2, respectively."

Section 6781—Boundaries of Division One:

"Water Division No. 1 shall consist of all the lands of the state drained by the Platte River; and also all other lands lying south of the Platte and South Platte Rivers, that may be watered from other superficial or subterranean streams not tributary to said Platte River."

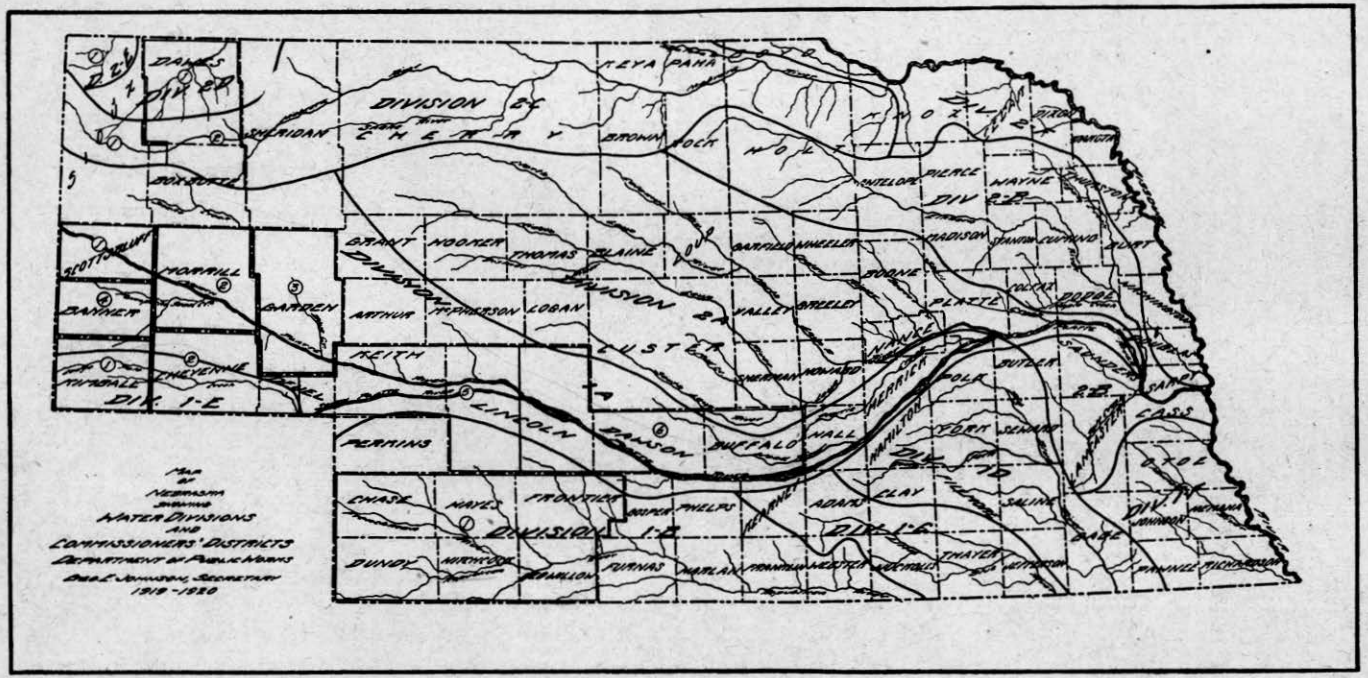
Section 6782—Boundaries of Division Two:

"Water Division No. 2 shall consist of all lands that may be watered from the Loup, White, Niobrara and Elkhorn rivers, and their tributaries, and all other lands of the state not included in any other water division."

For convenience in the adjudication of claims and in the distribution of water, these divisions have been subdivided into twelve water divisions, denominated 1-A, 1-B, 1-C, 1-D, 1-E, 1-F, 2-A, 2-B, 2-C, 2-D, 2-E, 2-F, as shown on the opposite page.

Water Commissioners.

Div. No	Dist. No.	Name	Address
1-A	1	O. M. Finley	Scottsbluff
1-A	2	W. F. Chaloupka	Bridgeport
1-A	3	E. H. Hartman	Lewellen
1-A	4		
1-A	5	G. F. Palmer	Sutherland
1-A	6	George M. Rannie	North Platte
1-B	1	Floyd Bailey	Culbertson
1-E	1	A. W. Hall	Kimball
1-E	2	C. S. Radcliffe	Sidney
2-C	1	John Cook	Agate
2-C	2		
2-D	1		
2-E	1		



Map of Nebraska showing WATER DIVISIONS AND COMMISSIONERS' DISTRICTS Department of Public Works Chas. E. Johnson, Secretary 1919 - 1920

REPORT OF CHIEF, BUREAU OF IRRIGATION, POWER AND DRAINAGE.

Bridgeport, Nebraska, November 30, 1920.

George E. Johnson, Secretary,
Department of Public Works,
Lincoln, Nebraska.

Dear Sir:

I have the honor of submitting a report covering the work of the past two years in the Bureau of Irrigation, Power and Drainage.

This report covers all matters that formerly were conducted by the State Board of Irrigation. It was the intention to show in this report the status of all irrigation projects in Nebraska, the possibilities of the water supply of the state for some beneficial use, some of the experiences met by the officials, and suggestions for bettering the good work, but the result of our efforts fell short of our original intentions for the reason that the co-operation of the water users in many projects was lacking. However, the fault is not altogether with the water users and project managers, as the twelfth Biennial Report should have been in the hands of the water users early in the year 1919, instead of late in the year 1920, in order to give a better idea of what the department is doing in the interests of the water users. It was intended to interest the appropriator to the point where he would co-operate with the state to protect his water rights. The work necessary to develop this interest should never be abandoned, although at times it is quite discouraging to the officials of the bureau to meet with so much indifference and lack of interest. Many of the appropriators cannot see the need of making acreage reports, gage height reports, etc., continually, season after season.

To administer the duties of the Bureau of Irrigation, Power and Drainage to give the greatest service to the water users, can best be done through co-operative methods.

The officials of the bureau have endeavored to remove every obstacle to give an applicant a permit to use, benificially, the public waters within the state, rather than seeking reasons for not doing so.

It is not the desire of the officers of the department to deprive any sincere water user of the use of water in times of scarcity. It has been the practice to give the senior appropriator the water he is entitled to, the amount of which is based on the acreage actually farmed and irrigated, which method is only fair to and due the junior appropriator. To carry out this policy the department must have acreage reports,

prompt gage height reports, suitable rating flumes, effective control gates and liberal assistance on the part of the project managers.

The scheme as planned in 1917 was continued through the years 1919 and 1920 with some minor changes.

The installation of automatic gage height recorders in many ditches for the season of 1920 furnished more satisfactory reports than were received in previous years.

Greater co-operation was attained in 1919 than in 1920, due to the scarcity of water in 1919. When there is plenty of water, project managers become very indifferent to state regulations. When there is a scarcity the managers are very keen to interview the state officials, and show great willingness to co-operate with them.

Attempt was again made in the season 1919 to exercise jurisdiction by the department over the Mitchell Irrigation District during a period of scarcity. This canal diverted from the North Platte River a maximum of 300 second feet. This district has approximately ten or twelve thousand acres of irrigable land, all in Nebraska. The diversion point is about 2000 feet in Wyoming beyond the Nebraska-Wyoming line—not an acre is irrigated in Wyoming. There are seven legal appropriations, senior in right to the Mitchell District, on the North Platte River, aggregating 1,869 second feet. The Mitchell Irrigation District, which was formed in 1897, claims a priority date of June 20, 1890, which is conceded as correct by old settlers. The appropriation has never been adjudicated in Nebraska, although the officers of the district have been solicited repeatedly by the department to co-operate. The laws of Nebraska require all projects to file acreage reports and gage heights, which this district has declined to do.

In order to show the extent of co-operation and for comparative purposes, a tabulated statement is given below, as it is desired to know whether the efforts put forth by the department are bearing results.

Co-operation of irrigation project managers with the Bureau of Irrigation will give the department a greater leverage to maintain a supply of water to a greater area for crops when needed.

For the department to give to the water user the greatest service possible it is necessary to know daily the amount of water available, the amount diverted and the area to be supplied. This information must be given promptly. It is then necessary for every ditch to have well installed rating flumes, report acreage to be irrigated, install automatic gage height recorders, report gage heights, maintain good gaging stations and have the rating flume measured by the state hydrographers at regular periods during the irrigating season.

The tabulation shows five headings, each heading is given 20 points. When all five headings have been fully met with, the total percentage of co-operation will be 100.

STATUS OF CO-OPERATION SHOWN ON THE PERCENTAGE BASIS FOR THE SEASON 1919.

Name of Project	Acreage Reported	Rating Flume	Aut'matic Gage	Gage Ht. Reports 20 Weeks	Condition Gaging Station	Total Per Cent Co-op.
Alfalfa District	20	20	0	5	20	65
Alliance District	20	10	0	20	10	60
Blue Creek District	20	15	0	15	10	60
Bridgeport District	20	20	0	20	20	80
Beerline Canal	20	5	0	20	10	55
Brown's Creek District	20	20	0	20	20	80
Cody & Dillon	20	20	0	5	5	50
Court House R. Canal	0	20	20	20	15	75
Castle Rock District	15	20	0	20	20	75
Cozad Canal	20	0	0	15	20	55
Chimney Rock District	20	20	0	20	20	80
Central Canal District	20	0	0	20	10	50
Dawson Ditch	20	0	0	15	15	50
Enterprise District	20	20	0	20	20	80
Empire District	20	20	0	20	15	75
Gothenburg Canal	20	20	0	15	10	65
Gering District	20	20	0	20	20	80
Graf Ditch	20	20	0	20	20	80
Hooper Ditch	20	20	0	20	20	80
Keith & Lincoln Co. D	20	0	0	20	15	55
Kearney Canal	20	0	0	20	15	55
Lyons Irrigation District	20	15	0	5	15	55
Lisco District	20	0	0	20	15	55
Megeme Canal	0	0	0	5	5	10
Minatare Canal	20	0	0	15	10	45
North Platte Canal	20	20	0	20	15	75
Nine Mile Irrigation Dis	20	0	0	15	15	50
Paxton & Hershey Canal	20	20	0	20	20	80
Paisley Irrigation District	0	20	0	15	20	55
Ramshorn District	20	20	0	15	15	70
Signal Bluff Canal	20	0	0	15	10	45
Six Mile	20	0	0	15	10	45
Orchard and Alfalfa	20	0	0	15	10	45
Suburban District	20	20	0	10	20	70
Spohn	20	0	0	10	10	40
Tri-State	20	20	20	20	20	100
Union	20	15	0	20	20	75

STATUS OF CO-OPERATION SHOWN ON THE PERCENTAGE BASIS FOR THE SEASON OF 1920 ON IRRIGATION CANALS 1-A.

Name of Project	Acreage Reported	Rating Flume	Aut'matic Gage	Gage Ht. Reports 20 Weeks	Condition Gaging Station	Total Per Cent Co-op.
Alfalfa District	20	20	0	0	20	60
Alliance District	20	10	0	5	10	45
Alliance-Red Willow	20	0	0	15	10	45
Birdwood District	0	5	0	0	15	20
Blue Creek District	20	15	0	0	15	50
Bridgeport District	20	20	0	20	20	80
Beerline Canal	20	5	20	10	5	60
Brown's Creek District	20	20	20	20	20	100
Central District	20	0	0	15	10	45
Court House Rock	20	20	20	20	15	95
Castle Rock District	20	20	20	10	20	90
Cozad Canal	20	0	20	8	20	68
Chimney Rock District	20	20	0	5	20	65
Cody & Dillon	20	10	0	0	20	50
Capron Ditch	0	0	0	0	10	10
Dawson County Ditch	20	0	0	15	15	50
Enterprise District	0	20	20	15	20	75
Enterprise-Tub Springs	0	0	0	0	0	0
Empire District	20	20	0	0	10	50
Gothenburg Diversion	20	15	0	0	10	45
Gering Canal	20	20	0	0	20	60
Graf Ditch	20	20	0	0	15	55
Burke & Kent Ditch	20	20	20	5	20	85
Hooper Ditch	20	0	0	0	20	40
Inman Ditch	0	20	20	20	20	80
Keith-Lincoln Co.	20	0	20	15	20	75
Keystone	0	20	20	5	20	65
Kearney	20	10	10	15	10	65
Lyons Canal	20	15	20	10	15	80
Lamore	20	20	20	15	20	95
Lisco	20	15	20	15	15	85
Last Chance	20	20	0	0	10	50
Logan	20	0	0	0	0	20
Meredith	0	0	0	0	10	10
Minatare	0	0	0	20	15	35
Mutual	20	0	0	0	5	25
State Line Ditch	20	0	0	0	0	20
Gilmore Ditch	20	20	0	20	10	70
Meglemre Ditch	20	20	20	20	20	100
Meeker Ditch	20	20	20	15	20	95
Northport Ditch	20	20	20	15	15	90
North Platte Canal	20	20	0	20	15	75
Nine Mile Canal	20	0	0	0	10	30
Niehus Ditch	20	20	20	0	10	70
Overland	0	0	0	0	15	15
Orchard and Alfalfa	0	0	0	15	15	30
Otter Creek Ditch	0	20	0	0	20	40
Cascade	20	20	0	0	20	60

STATUS OF CO-OPERATION SHOWN ON THE PERCENTAGE BASIS FOR THE SEASON OF 1920 ON IRRIGATION CANALS 1-A (Continued).

Name of Project	Acreage Reported	Rating Flume	Aut'matic Gage	Gage Ht. Reports 20 Weeks	Condition Gaging Station	Total Per Cent Co-op.
Holcombe	20	20	0	0	20	60
Oshkosh	20	20	20	10	15	85
Paxton & Hershey	20	20	20	15	20	95
Paisley Canal	20	20	0	0	20	60
Rush Creek Ditch	0	20	0	0	15	35
Round House Rock	20	0	0	0	0	20
Ramshorn Ditch	20	20	20	15	15	90
Signal Bluff Ditch	20	0	0	0	10	30
Short Line Canal	20	20	0	20	15	75
Schermerhorn	20	0	0	0	15	55
Six Mile	0	0	0	0	15	15
Suburban	0	20	0	0	20	40
Steamboat	20	0	0	0	10	30
Spohn	20	20	0	5	10	55
Tri-State Canal	20	5	5	10	10	50
Trinnier	20	20	20	15	20	95
Union	20	20	0	0	20	60
Winters Creek Ditch	0	20	0	10	20	50
Winters Creek Diversion	0	0	0	0	5	5
Western Irrigation District	20	20	20	20	20	100

Laws of Nebraska for 1919, Chapter 190, Page 851, Section 15, provides:

"Watered Lands to Be Listed by Officers of Company—By the first day of April each year, a verified list of all lands to be irrigated, the acreage of each tract, the names of the owners or controllers, or, in the case of a corporation or an association, of its officers, shall be furnished the department for every ditch, reservoir or other device for appropriating, diverting, carrying or distributing water to be used as a basis for the distribution of water until the first day of April of the following year. A recording gauge of a design to be approved by the department shall be installed by the owners or controllers in every canal or waste ditch, to record the amount of water used. The department shall not furnish any water to be delivered to, or used by, or through any ditch, reservoir or other contrivance for the appropriation, use or storage of water, until the provisions of this section have been complied with, and may construct bars or dams to prevent such delivery or use."

Upon request, the Department of Public Works will furnish blue prints of rating flume and housing for automatic gauge.

HYDROGRAPHY.

Two hydrographers were employed during the irrigation seasons of 1919 and 1920. One through the winter of 1919-1920 to measure seep streams and return flow of the North Platte River.

The following number of gagings were made:

Season	River	Canals	Tributaries
1919	190	629	357
1920	150	576	566

Stream measurements are tabulated and shown elsewhere in this report.

CANAL GAGINGS.

The hydrographers, as a part of their duties, measure the flow of all canals. In this work, where co-operation is practiced, good results are inevitable. To reduce to a minimum the errors, and to expedite the operation of gaging, a rating flume, properly installed, is necessary. Rating flumes should be located as near the wastegate as possible and far enough below to eliminate cross currents and eddies, but not so far below as to be affected by back water caused by checking. The flume should be slightly less in width than the bed width of canal and floor about one-tenth of a foot above canal grade, so it will scour. Weir measurement of canal flow is all right, but the department has adopted the rating flume method as the most practicable. Both methods have their faults, but we believe the rating flume has the least.

The following is an extract from Experiment Station Bulletin 86, U. S. Department of Agriculture:

Relative Merits of Weirs and Flumes in the Measurement of Water.

Reference has already been made to the fact that some of the weirs put in did not prove satisfactory. This was due to the deposit of silt above them. Sediment investigations made during the season showed that certain southern streams carry, during floods, as high as 5 per cent of solid matter in suspension, and that canals and laterals taking water from these streams have to be cleaned from two to three times each year. Even where the percentage was much less than this, the deposit of sediment was so rapid in some cases as to fill the lateral or ditch above the weir to a level with its crest in twenty-four hours. Where this happened, the velocity of approach became a disturbing factor, the influence of which could not be determined, owing to the constant change of conditions. Some canal companies which employ weirs operate in connection therewith a sluicing device which removes the accumulated sediment once each day, but the objection to this is that the conditions are never stable and it is impossible to tell for what length of time weir table used agreed with the actual discharge. The recent investigations

in the flow of water over dams and over weirs, other than those with sharp edges, may aid in securing the adoption of a form of weir better suited to the sediment-laden waters of the Southwest than that employed but so far as knife-edged weirs are concerned, there are few ditches in that section where it is not possible to secure rating tables for flumes which will give much more reliable and accurate results. It was also found that in a number of canals the grades are too small and the banks too low to secure the requisite fall below the weir, and in such cases flumes would not only be preferable, but an inevitable substitute.

The most serious objection to the use of flumes is the labor of perparing accurate rating tables, and the fact that a current meter is required for doing this. The recent improvements in these instruments, by which their convenience and accuracy have both been increased, have made it a simple matter to prepare a discharge table for flumes in which the flow is reasonably uniform. With ordinary care this discharge can be determined within the limits of accuracy permitted by the meter employed, and in the best instruments this error is as low as 1 per cent. This margin of error is below what is permissible in the delivery of water, or attainable in this investigation.

DISTRIBUTION.

After the middle of July, 1919, there was a scarcity of water in the North Platte Valley, which required a restriction of water supply to all canals. There were a few canals having junior rights closed for a short period.

The problem of water distribution has become more complicated since storage water and return flow have become large factors in the flow of the North Platte river.

With no storage water in the river, the distribution is a simple matter providing the return flow is taken to be a part of the natural flow. Receiving just enough storage water at state line to supply storage contracts does not complicate the distribution to any extent, but too much storage water must be considered as natural flow and distributed to appropriators in the order of their priority, notwithstanding protests by those projects who have purchased storage water.

Based on acreage reports filed, the following irrigable areas were provided for in the water delivery schedules for the seasons of 1919 and 1920:

Water Division 1-A	1919 Acres	1920 Acres
Diverted from River—		
East of Bridgeport	122,794	158,218
West of Bridgeport	178,943	227,171
Diverted from Tributaries—		
East of Bridgeport	34,916	35,628
West of Bridgeport	6,307	5,263
Total	342,960	426,280
Water Division 1-B		11,745
Water Division 1-C		80
Water Division 1-D		
Water Division 1-E		13,390
Water Division 2-A		7,365
Water Division 2-B		
Water Division 2-C		5,671
Water Division 2-D		3,450
Water Division 2-E		2,913
Total in Nebraska		470,894

During the period of scarcity in August, 1919, orders were issued to the water commissioner of the 1-A watershed to close ditches having appropriations dating later than October 17, 1889, leaving only seven ditches open to divert the natural flow from the North Platte River. Two of these ditches purchased and were taking storage water.

The amount of water flowing in the river crossing the Nebraska-Wyoming line during this period fluctuated from 50 second feet to 400 second feet. Four of the canals not closed were demanding 300 second feet of natural flow not including the North Platte and Kearney Canals, and six other canals were demanding 481 second feet of storage water.

The Mitchell Canal was diverting as high as 300 second feet of water which belongs to prior appropriators during this period. The officers of the Mitchell Irrigation District were brought into the county court of Scotts Bluff County, charged with taking water without authority. The judge found for the district on the ground that the state did not have jurisdiction. The water was intercepted in Wyoming, hence not public water in Nebraska.

Bulletins were prepared twice a week during the 1919 and 1920 seasons, showing the indicated discharge of the North Platte, South Platte and Platte Rivers, and once a week showing discharge of those canals cooperating with the department.

These bulletins were mailed to about one hundred who were interested, including county officers, irrigation project officers, and commercial clubs.

SUMMARY.

The following is a general summary of matters coming before the department during the past two years:

Permits issued to appropriate waters of the state for irrigation, power and storage..	50
Applictaions dismissed	17
Applications cancelled	50
Dockets cancelled by hearings	2
Applications disallowed by hearings	3
Cases appealed to supreme court	1
Applications pending	4
Irrigation districts organized and approved	3
Drainage districts approved	5
Water power districts approved	1
Maps filed	51
Order amending opinions rendered under dockets	9
Irrigation reports	262
Deeds recorded	49
Proof of appropriations issued	9
Permits to change location of headworks	6
Reinstatement of claim	1
Applications amended	3
Fees received—	
Filing applications, dam plans, petitions, proof of appropriation, financial report and recording deeds	$ 883.65
Bridge plans	120.00
Copying records	376.56
Total	$1,380.21

RECOMMENDATIONS.

The salary of water commissioners is too small to interest the class of men required for the duties of the office. The salary should be raised to six dollars per day and expenses.

Section 3458, Rev. Stat. 1913 should be amended so as to require county clerks to certify to the Department of Public Works the boundary and description of lands included in the irrigation district as finally determined by the county commissioners.

A law should be placed in the statutes providing that plans and specifications for improvements contemplated in connection with appropriations of public waters for any beneficial use shall be approved by the Department of Public Works before the state purchases the bonds issued therefor.

Respectfully submitted,

ROBERT H. WILLIS,

Chief, Bureau Irrigation, Power and Drainage.

REPORT OF WATER COMMISSIONER, DIVISION NO. 1-A.

Bridgeport, Nebr., November 30, 1920.

George E. Johnson, Secretary,
Department Public Works,
Lincoln, Nebraska.

Dear Sir:

The followinng is a report on the condition of the canals, flow of water and water distribution in that part of Water Division No. 1-A which lies within Morrill County, Nebraska, as observed by me during the season of 1919 and 1920.

During the season of 1919 considerable difficulty was encountered, due to the scarcity of water in the North Platte River. All of the canals whose priority was dated after the year 1889 were closed in order to supply prior appropriations. This condition was brought about twice during the season, and extended over a period of from two to three weeks. No serious difficulties arose over the closing of these canals, due to the better understanding of existing laws by the water users themselves. Also, light showers during this period had a tendency to improve growing conditions, and kept the crops from drying up until the shortage of water was relieved.

Lack of proper diversion dams and rating flumes caused some difficulty, but this was the most harmful to the water user himself, because the intake of the canals was left high and dry, causing the removal of a great deal of sediment before water could be diverted again. This, in turn, caused a serious delay in applying water to the already suffering crops when permission was finally granted to do so.

The larger canals were and always are in much better condition than are the smaller ones.

Most of the smaller appropriators are negligent relative to installing proper diversion works, rating flumes and automatic water gages. The latter condition is fast being remedied and the majority of the ditch owners have already installed or ordered their gages. However, to insure the most satisfactory results, the installing of these gages must be accompanied by proper diversion works and rating flumes.

A thorough cleaning of the ditches at least once in a season would also benefit the user by insuring quicker delivery and easier control.

The season of 1920 passed by with only one complaint. This complaint was, in my opinion, more of a misunderstanding of the law rather than the scarcity of water.

The season itself passed by with abundant water for all.

Another phase of the Water Commissioners "troubles" is the wasting of water onto the public highways. Very little was done to relieve this condition during the season of 1919, but the necessary steps to a good beginning were taken in 1920, and several careless water users were brought before a justice and the customary fine for the first offense was imposed. With our new system of state roads coming in, the wasteful

dumping of water onto them is sure to result unfavorably to the guilty offender.

It is also my opinion that the present compensation of the water commissioner must be raised, thereby insuring capable and efficient men to perform these duties.

Respectfully submitted,
W. F. CHALOUPKA,
Water Commissioner.

REPORT OF WATER COMMISSIONER, DIVISION NO. 1-A.

Scottsbluff, Nebr., November 30, 1920.

George E. Johnson, Secretary,
Department of Public Works,
Lincoln, Nebraska.

Dear Sir:

The following is a brief report of the general condition of Water Division No. 1-A, comprising the watersheds within the limits of Scotts-Bluff County, from the 28th day of May, 1920, at which time I received appointment as Water Commissioner for this district:

The flow of water in the Platte River and its tributaries has at all times been sufficient for irrigation and power purposes, and I have not been called upon to regulate its distribution to the several headgates. There was some difficulty between the users of Applications Nos. 407 and 983 on Horse Creek, but this matter was purely one of ownership in the carrying canal, which naturally involved the distribution of water in the canal. The distribution, only, was adjusted.

There also arose some difficulty in the distribution of water in lateral No. 2 of the Gering Canal. With the exception of a short period, there was no lateral rider on this canal, and while there was usually plenty of water in the lateral, the users at the lower end of the lateral received little or none. Proper results were not obtained up to the close of the season.

The above two cases were the only ones of any importance in this district, and very little complaint was received outside of these two.

It seems to be rather difficult to handle cases such as the Gering Lateral No. 2, under the present laws, without entailing a hardship on those who use water in the proper manner, as well as on those who do not. From my observations on this and other laterals, I conclude that no lateral having a number of users can be successfully operated from a standpoint of the conservative, a most beneficial use of the water, without the employment of a rider and the installation of proper turnout boxes and checks; and I would think that all districts or private canals should be required to see that such boxes and checks are installed, and that where there are a number of users from one lateral, it should be the business of such district or canal to see that a rider was employed.

Respectfully submitted,
O. M. FINLEY,
Water Commissioner.

REPORT OF WATER COMMISSIONER, DIVISION NO. 1-A.

Culbertson, Nebr., Nov. 30, 1920.

George E. Johnson, Secretary,
Department of Public Works,
Lincoln, Nebraska.

Dear Sir:

There is always an abundance of water in spring and fall for all the ditches that use water, and some to spare. The dry season starts from the middle of May to the middle of June, and continues to August and September. In the dry season I close from three to seven ditches on the Frenchman to supply water to prior water users. They are closed from ten days to two and three weeks—sometimes as long as six and eight weeks. I have closed no ditches on the Republican for prior water users. In the dry season the Republican goes dry from Benkleman to the mouth of the Frenchman.

The ditches in this division, with a few exceptions, have dirt dams, some that are rebuilt every season or after every big rain when water is needed. Others have permanent dirt dams with spill gates made of lumber or steel to control height of water in ditches, some that are easy to handle and others that take two or three men to operate. There was one ditch that built a rating flume in 1919 that was very good; another ditch built one, it was all right in width but too short. In 1920 they built on enough to make it all right. Five other ditches built rating flumes this summer. Six automatic gage height recorders were installed this season, three more on hand to be installed in the spring. There should be eight more automatic gage height recorders installed in this division, unless the ditches on Buffalo Creek do not intend to use water.

There are six ditches on the Republican that have been used very little, if any, in the past two or three years that should be put in shape or cancelled, as there are parties that would make more use of the water if they knew that these ditches would not interfere. They are Campbell, Cannon, Delaware, Karr & Riverside, Cottonwood and Anderson ditches. The last two named are very small, and would not amount to much if they did use water.

The rating flume in the McCook Ditch Co.'s ditch is too wide and low.

All the ditches on the Republican and Red Willow east of McCook in Red Willow County have been abandoned from three to fifteen years.

Respectfully submitted,

FLOYD F. BAILEY,
Water Commissioner.

IRRIGATION LEGISLATION.

The first law relative to irrigation was passed by the legislature of the state in 1877. This law enabled corporations formed to construct and operate canals for irrigation and other purposes to acquire rights of way, and declared such works internal improvements.

The Saint Raynor law, the first general irrigation law, was passed in 1889. It provided for the appropriation of running waters for useful or beneficial purposes by posting a notice at the point of diversion, a copy of the notice to be filed with the county clerk of the county in which the diversion was located, and construction to be begun within 60 days and prosecuted diligently and uninterruptedly to completion. The law provided that irrigation works should be exempt from taxation ;that the same land should not be covered by more than one ditch or lateral without the owner's consent; that irrigation works were internal improvements; that water from one stream should not be turned into another stream; that rights of way could be condemned for irrigation purposes; that excessive amounts of water should not be used, and that the waters appropriated should be distributed in certain ways. Under this law, there was no way of knowing the value of a right except by going into court, and a right was always open to attack.

The people of the western portion of the state wished to have some state control over rights and in 1891 an irrigation convention was held at Lincoln, and drafted a bill. This bill was introduced in the Legislature that winter, but was defeated. Another bill, almost identical with the first, was introduced in the Legislature in 1893, but was defeated after a spirited fight, and the friends of irrigation had to be contented with an amendment to the Saint Raynor law, allowing water rights to be filed on streams 20 feet or over in width, and permitting water, under certain conditions, to be turned from one stream into another. The members of the Legislature from the eastern portion of the state feared that the passage of an irrigation code would be looked upon as an advertisement to the outside world that the rainfall in the state was not sufficient to produce crops, and that this would have a tendency to check settlement. The complete failure of all crops because of the drought in 1894, caused the question of adopting an irrigation code to be made a campaign issue that fall. The Legislature, in 1895, passed an irrigation code modeled after the Wyoming code, and also an irrigation district law modeled after the Wright irrigation district law of California. The irrigation code created a State Board of Irrigation, consisting of the Governor, the Attorney General, and the Commissioner of Public Lands, the Governor being ex-officio president of the board, and divided the state into two water districts.

The law provided that at the first meeting of the state board it should elect a secretary, who should be a hydraulic engineer of theoretical knowledge and practical skill and experience, and an under secretary for each of the water divisions, and that it could employ an assistant secretary and such other assistants as might be necessary. The board, either directly or through its secretary or under secretaries, was charged with the measurement of all streams in the state, the determination of priorities, and amounts of all claims initiated prior to the passage of the law, and the issuance of certificates of appropriation for claims found valid, the distribution of all waters appropriated, the receiving, recording and considering of all future applications for permits to appropriate water, the granting of permits, if there was any unappropriated water in the streams, and the appropriation asked for would not in any other way be detrimental to the public welfare, and the issuance of certificates of appropriation when satisfied that the applications had been perfected according to law.

This law, besides granting the board certain police powers and fixing penalties, defined standards of measurement; dedicated the water of the state to public use; fixed the date of priority of applications and the order of preference in using water for different purposes; granted the right of eminent domain for irrigation works; exempted irrigation works from taxation, and provided for mutual irrigation companies.

In 1895 to 1911 a number of minor changes were made in the irrigation code, most of which were for the purpose of assisting the state board in its administrative work. At the sessions of the Legislature in 1911 and 1913, practically the entire code was revised and re-enacted, with amendments. Among some of the more important changes made were the following:

The "State Board of Irrigation" was changed to the "State Board of Irrigation, Highways, and Drainage"; the board was charged with the duty of examining into the condition of all water appropriations and of holding hearings and cancelling rights where the water had not been used for beneficial purposes for more than three years; the maximum amount of water that a tract could receive was limited to 3 acre-feet per acre per year; irrigation works were declared common carriers and the rates for water were to be determined by the State Railway Commission, and the list of all lands to be irrigated were required to be filed with the superintendent of each water division April 1 of each year.

The irrigation district law has been amended from time to time since its passage in 1895. The main provisions at present are as follows:

A majority of the electors, who also own or hold by leasehold a majority of the lands in the district susceptible of irrigation from a common system of works, may petition the county commissioners of the county in which the land, or the greater portion of it lies, asking that an

irrigation district be created including all the land. A copy of the plans, etc., submitted to the county commissioners, must be filed with the state engineer, who must examine them and submit a report to the board of county commissioners at the meeting set for the hearing of the petition. If the petition, either in its original form or in the amended form, is approved by the board of county commissioners, the board divides the proposed district into three divisions, and calls an election to vote upon the organization of an irrigation district, and to elect a director for each division, if the vote is favorable to organization. If, upon canvassing the vote the county commissioners find a majority favorable to organization, the district is declared organized, and the directors elected meet and organize. The board of directors has control of the affairs of the district in a general way and is authorized to make surveys, acquire rights of way, and to secure lands, water or other property by purchase or condemnation. All surveys, maps, plans and estimates must be made under the direciton of a competent engineer and sent to the state engineer, who shall file a report upon them with the board of directors. Having determined the amount of money required, the board of directors calls a special election to vote on the question of issuing bonds, and if a majority of the votes are in favor of issuing bonds, a special proceeding is begun in the district court to have the bonds examined, approved and confirmed. If the bonds are confirmed they are sent, together with a history of the district, to the auditor of public accounts for registration if he finds the law has been conformed with in all respects. When registered, the bonds may be sold at 95 per cent of their face value, or if not sold, can be used to pay for property or for construction at their par value. The bonds and interest are paid from the revenues derived from an annual assessment upon the real estate in the district. They bear interest at 6 per cent, and unless otherwise provided by a majority vote at the time of issuance, a certain per cent is payable each year, beginning with the expiration of the eleventh year. This per cent cannot be less than 5 at the end of the eleventh year. After the eleventh year the minimum increases 1 per cent a year through the eighteenth year, and is 15 per cent in the nineteenth year. All the bonds must be paid upon the expiration of the twentieth year. The secretary of the board of directors certifies to the county clerk the amount of money needed each year for the payment of interest, bonds and for operation and maintenance, and the taxes are collected by the county treasurer at the same time that other county taxes are collected.

The Department of Public Works under the Civil Administrative Code form of government as adopted in 1919, succeeds the State Board of Irrigation, Highways and Drainage.

Under the old law, it was necessary that all matters be submitted to the State Board of Irrigation, Highways and Drainage, and the final hearing be held in Lincoln and passed on by the board before any case could be carried to the higher courts. In some cases, before a quorum

of the board could meet and consider the matter, crops were burned and destroyed.

Under the code, the Chief of the Bureau of Irrigation, Power and Drainage is located in the center of the irrigation district, and he has full authority to hold hearings and adjust all matters with reference to irrigation. The department has outlined definite policies and the chief is authorized to carry out same, so that any difficulty arising can be adjusted immediately, and during shortage of water the official on the ground has full authority to handle all matters to the best interest of the irrigators, and if at any time such matters can not be adjusted by the chief, the secretary of the department is in position to give immediate assistance.

Information concerning water rights can be obtained by inspecting the records of the department and by consulting the secretary. The irrigation laws have been published in pamphlet form, and copies may be obtained by addressing the Department of Public Works at Lincoln.

NORTH PLATTE PROJECT OUTLINE OF OPERATIONS, 1919-1920.

(Andrew Weiss, U. S. R. S. Project Manager.)

Operation and Maintenance—Interstate Unit.

1. **Description of System Operated.** The irrigation system operated extends from the headworks at Whalen, Wyoming, to within two miles of Indian Creek, or about 10 miles northwest of Bridgeport, Nebraska. The first 46 miles of main canal extends from the headworks to the sand hills northeast of Torrington, and is known as the First Division Main Canal. Along this section of canal the only land watered is the Carey Act land, and for which land the government does not own nor operate the lateral system, but simply delivers the water from the main canal to the head of their laterals.

2. The irrigated lands of the project extend southeasterly from the sand hills northeast of Torrington to the lower end of the canal system, and covers about 111,900 acres of irrigated land, or a strip of land approximately six miles wide and sixty miles long, which is divided into three lateral districts. The first lateral district extends from the sand hills to Dry Spottedtail Creek, and contains 39,300 acres of irrigable land; the second lateral district from Dry Spottedtail Creek to Winters Creek, and contains 33,400 acres of irrigable land, and the third lateral district from Winters Creek to the lower end, and contains 39,200 acres of irrigable land.

3. **Weather.** The climatic conditions were in general favorable. The season of 1919 was particularly free from damaging winds and storms, but so extremely dry from the 1st of April to the 11th of September that there was an exceptionally heavy demand on the irrigation system during that time. On the 11th of September the drouth was broken by a heavy rain of from 4 to 5 inches, which was general over the entire valley. The season of 1920 has had the most favorable climatic conditions since the beginning of farming operations on this project.

The following tables give the record of seasonal frosts, and also monthly precipitation for a series of years:

4. KILLING FROSTS.

Year	Last in Spring	First in Fall	No. Days Between
1920	May 15	September 28	136
1919	June 2	September 22	112
1918	April 28	October 25	180
1917	May 11	October 18	160
1916	May 17	September 15	121
1915	May 21	October 5	137
1914	May 8	September 14	129
1913	May 3	September 20	140
1912	May 25	September 30	128
1911	May 15	September 23	131
1910	May 16	August 24	100
		Average (Days)	133

5. MONTHLY PRECIPITATION IN INCHES.

	1920	1919	1918	1917	1916	1915	1914	1913	1912	Av.
April	4.20	0.84	4.10	1.86	0.49	3.39	3.09	0.23	2.02	2.24
May	1.81	1.61	3.24	4.51	1.70	1.96	1.60	3.51	1.77	2.41
June	1.39	1.03	1.02	1.68	1.84	2.43	1.61	1.28	1.61	1.54
July	1.30	0.68	3.55	0.55	1.37	2.55	1.20	2.48	4.43	2.01
August	1.93	0.55	1.68	0.28	1.91	5.14	0.29	4.37	3.59	2.20
September	0.33	5.80	3.93	1.39	0.42	3.92	0.65	1.21	3.38	2.34
October		1.28	0.81	0.02	1.20	0.73	0.71	0.38	1.05	0.77
Total		11.79	18.33	10.29	8.93	20.12	9.15	13.46	18.85	13.51

6. **Irrigation.** The irrigation season of 1919 commenced on May 13 and closed on September 30, and that of 1920 commenced on May 27 and closed on September 30. The amount of water in acre feet delivered to the land for each season is shown in the following table:

MONTHLY WATER DELIVERIES TO THE LAND.

	1915	1916	1917	1918	1919	1920
May	1544	22070	712	14589	20418	330
June	17706	30257	26630	46872	52107	34770
July	40496	42618	53523	58776	55591	55000
August	21392	45095	57130	57980	52401	54400
September	15329	24200	39477	26602	20988	30000
Total	96467	164240	177472	204819	201505	174500
Acres Irrigated	70007	75620	83203	88771	88990	89000
Acre ft. per acre used	1.38	2.17	2.13	2.31	2.27	1.95

7. **Losses.** The loss in the canal system for the past four years has been approximately 26 per cent for the main canal and laterals down to Lake Alice, and approximately 40 per cent for the entire system, including the main canal, all the laterals on all three lateral districts, and the reservoirs Lake Alice, Lake Winters Creek and Lake Minatare.

8. **Seepage.** Since the beginning of irrigation on the project, the seepage conditions have been slowly but steadily growing, so that at the present time about 5 per cent of the irrigable land is affected by seepage, and only 3½ per cent of the land is seeped so badly as to render it unfit for cultivation.

9. **Farm Operation.** The cropped area for the season of 1919, including the area seeded to alfalfa without nurse crop, was 87,022 acres. The following table gives a comparison of the crop results for the years 1910 to 1919, inclusive.

AVERAGE VALUE OF CROPS.

Year	Number of Farms	Area Irrigated	Per Acre	Per Farm
1910	688	42362	6.47	398.57
1911	759	44736	8.67	557.80
1912	777	50252	10.38	650.34
1913	908	56829	13.84	864.12
1914	944	60532	14.95	943.01
1915	1095	70007	18.55	1154.17
1916	1189	75620	21.85	1375.75
1917	1274	83203	41.92	2657.46
1918	1310	86464	36.35	2367.00
1919	1300	89990	45.71	3012.87

10. The crop yield report for the season of 1919, showing the acreage in crops, yields, and values, is as follows:

DEPARTMENT OF THE INTERIOR
United States Reclamation Service
(*Water User or Project*) NORTH PLATTE (Interstate) PROJECT
Year, 1919.

IRRIGATED FOR PRODUCTION OF THIS CROP

Crop	Area, Acres	Unit of Yield	Total	Yields			Per Unit of Yield	Total	Per Acre
				Average	Maximum	Minimum			
Alfalfa Hay	33,446	ton	70,109	2.1	4.0	0	15.00	1,051,635.00	31.44
Alfalfa Seed		bu.					20.00		
Sweet Clover Sd.	387	bu.	717	1.9	3.1	0	18.00	12,906.00	33.35
Barley	3,720	bu.	101,067	27.2	92.0	0	1.25	126,333.75	33.96
Beans	95	bu.	747	8.0	20.0	0	3.00	2,241.00	23.59
Beets, Sgr., Tops	10,968	ton	116,310	10.6	20.0	0	11.00	1,279,410.00	116.65
Beets, Stock	29	ton	384	13.3	20.0	0	6.00	2,304.00	79.45
Cane	181	ton	326	1.8	10.0	0	4.00	1,304.00	7.20
Corn Fodder	97	ton	104	1.1	2.0	0	4.00	416.00	4.29
Corn	9,107	bu.	157,699	17.3	55.0	0	1.30	205,008.70	22.51
Garden	270							13,130.00	48.63
Hay (other)	616	ton	647	1.0	3.0	0	10.00	6,470.00	10.50
Millet Seed	289	bu.	1,161	4.0	35.0	0	1.50	1,741.50	6.03
Oats	6,620	bu.	159,815	24.1	75.0	0	0.80	127,852.00	19.31
Pasture Alfalfa	2,390	ac.					15.00	35,850.00	15.00
Pasture Sw. Clov.	361	ac.					15.00	5,415.00	15.00
Potatoes	6,284	bu.	713,257	113.5	430.0	0	1.00	713,257.00	113.50
Rye	859	bu.	5,771	6.7	19.0	0	1.25	7,213.75	8.40
Wheat	9,757	bu.	165,536	17.0	50.0	0	1.90	314,518.40	32.24
Miscellaneous	214							9,730.00	45.47
Total Crop	85,690				Total and averages			3,916,736.10	45.71

OTHER PURPOSES

Alfalfe seeding with N. C.	3,935
Alfalfa seeding without N. C.	1,332
Fall Wheat, 1920	1,846
Fall Rye, 1920	122
Less duplicated acres	3,935
Total other purpose	3,300
Grand total irrigated	89,990

Areas	Acres	Number Farms	Pct. of Project
Tot. irrigable area farms reported	98,807	1,300	87
Tot. irrigated areea farms reported	88,990	1,300	80
Under W. R. app.	87,890	1,285	78
Under rent. contracts	1,100	15	1
Total cropped areas farms reported	85,690	1,300	77

11. **Livestock.** The 1919 stock census shows the following summary of stock on the project in comparison with same for the past eight years:

Year	Horses	Cattle	Sheep	Hogs	Fowl	Bees
1919	7427	7500	3500	11200	65480	651
1918	7732	8500	3700	15250	64800	632
1917	6800	9380	1000	16550	56015	517
1916	6398	8080	1401	25123	59249	764
1915	5910	6941	2254	24928	46971	630
1914	4618	3190	605	22143	43898	476
1913	3785	2966	5000	14286	37620	315
1912	3329	2179	2000	9123	3000	80
1911	2722	1866	2000	7000	2000	50

Of the cattle listed above there were 3,500 milk cows in 1919, 3,400 in 1918, 3,345 in 1917, 3,040 in 1916, 2,216 in 1915, 1,521 in 1914, and 1,326 in 1913.

12. **Feeding Stock.** The following table gives the number of sheep, cattle, and horses brought in on the project for winter feeding:

Year	Sheep	Cattle	Horses
1919	56000	5300	200
1918	28000	4200	800
1917	80000	5400	500
1916	83500	4600	500
1915	83000	3000	500
1914	75000	4700	700
1913	63000	3000	
1912	55000		
1911	25000		

13. **Maintenance.** The maintenance work on the canal system during the past two seasons consisted in cleaning the canal and laterals, replacing old wooden structures on the laterals with concrete, enlarging the main canal in places and strengthening the main canal banks where necessary, besides the regular routine work on maintenance and repairs. One dragline has been used on the canal work in strengthening the banks and in widening the canal section.

14. **Wooden Structures.** Most of the wooden structures on the 1st and 2nd lateral districts placed in the years 1907 to 1910, inclusive, have deteriorated beyond repair and the work of replacing these with concrete has continued for the past five years. The following list gives the number of structures on the 1st and 2nd lateral districts renewed during 1919, the total to date, and the total number yet to be placed:

Replacements	Lat. & Farmer Headgates	Weirs	Checks	Drops	Total
1919—1st Lateral District	150	140	60	100	450
1919—2nd Lateral District	170	170	80	110	530
Total	320	310	140	210	980
Total to date 1st Lateral District	750	710	280	330	2070
Total to date 2nd Lateral District	420	420	150	190	1180
Total	1170	1130	430	520	3250
Approximtte total yet to replace—					
First Lateral District	100	100	40	20	260
Second Lateral District	220	200	100	120	640
Total	320	300	140	140	900

16. On the 3d lateral district some of the first structures placed in 1910 on the 26 and 27 lateral systems were also made of untreated lumber, and these, too, have deteriorated so badly that it may be necessary to renew them in the next two or three years. All of the structures placed in this lateral district since 1910 have been made of lumber treated with carbolincum, or railroad oil. These treated structures, some of which have been in the ground for nine years, are still in such good condition that but very little decay in the lumber has been noticed on any of them.

17. **Concrete Structures.** The concrete structures are practically all in as good condition as when new.

18. **Metal Flumes.** The metal flumes are all more or less affected by rust. The flume on lateral 34 was in the spring of 1918 found to be in a very bad condition on account of the rust having penetrated through the metal so badly that the bottom part of the metal flume was full of little holes varying from the size of a pinhole to about ⅛ inch across. This was temporarily remedied by applying one coat of coal tar to the inside of the flume. The coal tar seemed to seal all the holes so well that no trouble from leakage has been had since then. In 1916 and 1917 several flumes were painted with water gas and coal tar, and this paint has stuck very good, and seems to be about as good now as when first put on. Prior to that time the experience had with a variety of paints tried on metal flumes was that the paint would peel off during its first water season. It, therefore, appears that water gas and coal tar is a very good paint for metal flumes, and it is also a cheap paint.

19. **Gophers.** The gopher trouble this year was about the same as in the past, although considerable trapping and poisoning was done by some of the riders. Several boxes of poison were used by the riders with a variable degree of success. Some of the riders kept their rides very free from gophers, while others did not seem to have much success It appeared, however, that the success in poisoning the gophers depended largely on the interest the individual took in the work.

20. **Grasshoppers.** The grasshopper has been the principal pest on the project during the last four years. In 1917 there was practically nothing done towards combating this pest. In 1918 considerable poisoning was done by a number of individuals, but no concerted effort was made for the eradication of the grasshoppers. During the winter of 1918-19 a new pest law, more suitable for this country, was passed, and then the valley was divided and organized in pest districts, and plans made for an extensive grasshopper campaign. Five mixing plants were arranged for—one at each of the following towns: Morrill, Mitchell, Scottsbluff, Minatare and Bayard. A little concrete mixer operated by a gas engine was used at each plant for mixing the ingredients used for grasshopper poison and which consisted of bran, arsenic, anise oil, sal soda, and molasses. This preparation was mixed and sacked into 100 pound sacks and sold to the farmers at cost. A total of 8,227 sacks of this poison was used on the project in 1919, and the results were in general very gratifying. This same campaign was continued during the season of 1920, but with only two mixing plants instead of five—one at Minatare and one at Bayard, and a total of 1,580 sacks of poison were used on the project lands. This work was under the supervision of Mr. Phil Sheldon, Project and County Agent. One inspector was used to see that the poisoning was properly and consistently carried out. At the close of the 1920 season there were very few places where any noticeable damage was being done by the grasshoppers.

21. **Operation and Maintenance Costs.** The operation and maintenance costs for the year in comparison with same for the past four years is given in the following table:

	Actual Costs			
	1919	1918	1917	1916
General Expense	22,133	19,352	13,870	18,219
Engineering and Inpsection	7,630	4,050	1,749	1,940
Pathfinder Hydrography	3,013	2,950	3,339	4,379
Superintendence and Accounts	17,628	16,731	13,745	12,833
Ditchriders and Gate-Tenders	34,706	32,587	26,419	19,992
Labor—Men and Teams	108,229	113,523	60,477	45,215
Guarding		12,186	10,338	536
Dragline work	24,981			
Damage Claims	1,597			
Telephone	3,701	3,141	2,371	3,869
Depreciation	5,928	5,542	3,688	1,087
Camp Maintenance	10,438	12,530	6,440	3,818
Material and Supplies	12,292	12,586	7,558	6,508
Total	252,276	235,777	149,995	118,389
Less charge billed to private system	23,412	13,621	10,803	10,711
Net Total	228,865	221,558	139,192	107,678
Cost per acre irrigable	2.77	2.05	1.35	1.13
Cost per acre irrigated	2.55	2.50	1.67	1.41
Cost per farm served	175.75	169.13	109.26	90.60
Cost per acre foot delivered	1.13	1.08	.78	.66

22. **Experiment Farm.** The work at the expirement farm under the supervision of James A. Holden has been both experimental and demonstrative. The principal experiments have been for the purpose of testing out the adaptability of the various crops to these climatic and soil conditions, the importance of seed selection, rotation of crops under irrigation, cultural treatment, fertilizing tests, duty of water to various crops and ,to a certain extent. the feeding values of the various crops produced under local conditions.

Besides the above, there have been for the past few years a series of feeding experiments carried on for the purpose of determining the lowest possible cost of the production of beef, pork and mutton from home grown feed. There is also a demonstration dairy, principally for the purpose of determining the value of the various pasture grasses for milk production.

These experiments and demonstrations are of vital interest to the farmers ,and the farmers have also exhibited a great interest in this experiment farm work by their frequent visits, telephone calls and correspondence for advice and for a discussion on all kinds of farm and stock questions. The annual experiment farm picnic last summer was well attended and enjoyed by people from all over the valley.

23. **Settlement and Development.** The general condition of the settlers on the project has continued to improve. This improved condition is due principally to the good crops, exceptionally good prices for all produce, a general increase in the amount of stock raising, stock feeding and dairying, improved conditions of credit, increased confidence in the agricultural possibilities of the country, and an increasingly co-operative attitude and mutual trust between the settlers and the reclamation service.

24. **Commercial Development.** There were no new enterprises in operation on the project in 1919, but in 1920 a new sugar factory was built at Mitchell, and sugar beet spurs were built out over the project lands from Mitchell, Scottsbluff and Bayard. As a result of these extensions by the Great Western Sugar Company, the acreage of sugar beets was increased from 11,000 acres in 1919 to 17,500 acres in 1920. Several other enterprises, such as creameries, pickle factories and other smaller concerns have also been built during the year. Another sugar factory has been commenced at Minatare which will be ready for the 1921 crop.

25. **Land Transfers.** During the year 1919 approximately 300 farms on the project changed hands and about 100 farms in 1920, at an average price of $110.00 per acre of irrigable land. The maximum price paid was about $325.00 per acre. There are no unentered lands on the project that are now subject to entry.

26. **Northport Unit.** A petition for the organization of an irrigation district was filed in the Department of Public Works, and same was approved August 18, 1917.

Construction work on this unit has proceeded slowly, due to scarcity of funds. A permanent construction camp, designed to serve ultimately for operation and maintenance purposes, has been established. Approximately 3 miles of main canal have been completed. In addition, the lateral system has been built for about 2,500 acres of land in Indian Creek Valley. The cross-drainage structures are nearing completion on the upper ten miles of the main canal. A contract has been executed between the United States and the Bridgeport Electric Light and Power Company for furnishing the necessary energy to operate one electric dragline excavator, to be used on the main canal. The transmission lines and sub-stations required for its operation are in place, and operation of this electric excavator began about October 1, 1920. For excavating the heavier portions of this canal a class 14 gasoline driven Bucyrus dragline excavator has been contracted for, the delivery of which will be made in the early spring of 1921. This machine will be equipped with an 80 foot boom to facilitate the deep cutting necessary in these portions. It is hoped that during the coming biennium progress will be accelerated materially by reason of increased allotments. By the close of the calendar year 1920 a total of about $270,000.00 will have been expended on the construction of the Northport unit.

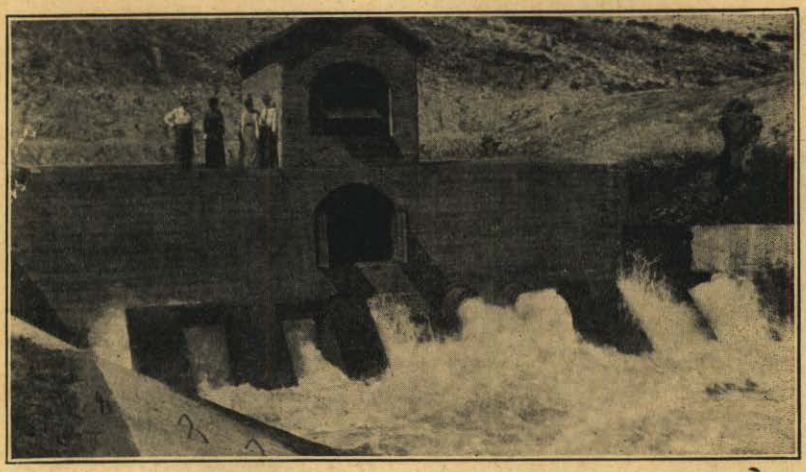
27. **Fort Laramie Unit.** A petition was presented to the board of county commissioners, copy of which was filed in the Department of Public Works, praying for the organization of an irrigation district. This petition was approved September 26, 1918.

On this unit construction has continued slowly owing to restricted funds. Nearly all construction has so far been confined to the upper, or Wyoming portion. In Nebraska, the main body of the Horse Creek lateral has been excavated with one of the electric dragline excavators. Approximately $55,000.00 has been expended on this feature. Likewise, a portion of the main canal immediately east of the state line, involving an expenditure of about $30,000.00. To this is to be added a system of high tension (33,000 volt) transmission lines and sub-stations, involving a total outlay of about $30,000.00, and a permanent construction camp with well equipped repair shops for making the numerous incidental repairs incident to this class of work. The future rate of progress of this work will be governed by the allotments which congress may make available for this feature.

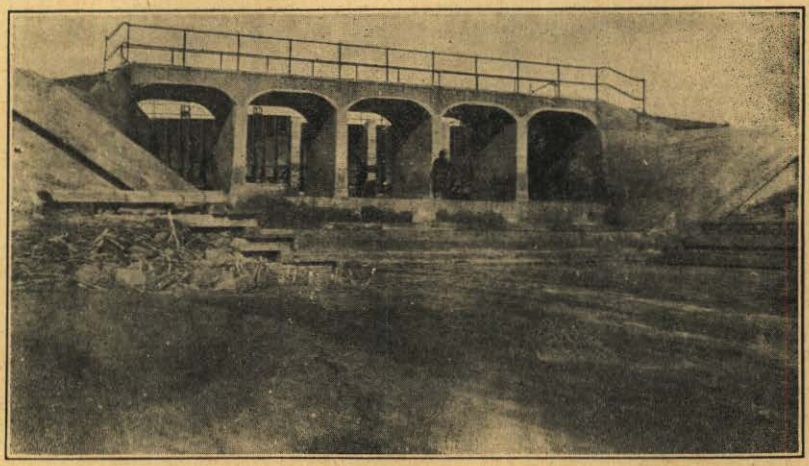
28. **Pathfinder Unit.** During the year 1919 it was decided to increase the outlet capacity of the reservoir, as well as to increase the security of operation by the installation of two additional outlet valves. These are to be of the same capacity and similar, but of improved construction to those now used. They will be connected with the north tunnel outlet. Construction of this feature is now under way, but has only been fairly started.

29. **Interstate Unit.** Practically no new construction has been undertaken aside from drainage, described in the following paragraph. Most of the construction has been in the nature of replacements of wooden structures elsewhere described. In addition, two dragline excavators of the Monighan walking type were employed in widening and strengthening the main canal during 1919, and one during 1920. These machines have moved the material at an average cost of about 15 cents per cubic yard, nearly all in wet ground.

Drainage—Interstate Unit. Generally speaking, the water table has risen over the project and seeped areas have spread. This is being combatted by continuous drainage construction of both open and closed drains. The soil structure is such that closed drains are built with great difficulty after the water rises above the grade of the drain. This is frequently later followed with maintenance difficulties. Owing to these facts and the heavy capacity demands, by far the greatest mileage is built of open construction. To date 14 miles of closed drains and 52 miles of open drains have been built and are in successful operation, principally in the first and second lateral districts. Two dragline excavators of the Monighan walking type are continuously employed in the extension of the open drainage system. Much of this work has, during the last biennium, been done on principal outlet drains connecting the Interstate unit lands with the river and extending through the Farmers Irrigation District land and other lower lying districts with whom co-operative contracts have been made covering these works. These latter are essentially flood water channels which serve the dual purpose of carrying flood waters from the catchment basin above and within the project lands and also the waste and seepage waters which are collected from the adjacent irrigated areas within and below the project to the river. The maintenance of these channels has so far been a problem of great difficulty, especially in those portions where heavy gradients prevail, and where large floods are frequently collected. We have not gotten much beyond the experimental stage in this kind of work. Little difficulty is encountered in the construction and maintenance of open collecting drains because the discharges are moderate in amount as compared with the principal flood channels. During the past biennium one or two dragline excavators have been continually at work excavating on the main outlet channels in Wild Horse and Nine Mile valleys, which are being built co-operatively between the Farmers Irrigation District and other private districts together with the United States, the cost being distributed to these co-operating districts on the basis of the tributary irrigable areas. This method of cost apportionment has become the usual and standard custom in this valley on these channels.



OUTLET MINATARE STORAGE RESERVOIR OF INTER-STATE PROJECT



WASTE GATE NO. 1, TRI-STATE CANAL

THE FARMERS IRRIGATION DISTRICT CANAL SYSTEM.

By B. J. Seger, Secretary-Treasurer.

The Farmers Irrigation District canal and lateral system is located in Scotts Bluff and Morrill Counties, the main headgate being located within one mile of the Nebraska-Wyoming state line, near the town of Henry, Nebraska. The following towns are in the immediate vicinity of the lands irrigated by this district, the approximate population of each being: Morrill, 700; Mitchell, 2,000; Scottsbluff, 7,000; Minatare, 500, and Bayard, 2,500. A sugar factory is located at Mitchell, Scottsbluff and Bayard, and two factories are to be built at Minatare during the coming year.

A needle dam, built of steel and concrete, is constructed entirely across the North Platte River, just below the headgate, and is reenforced with 400 carloads of iron ore rock. A rock apron, sixty feet wide on the lower side and twenty-five feet wide on the upper side, averaging four feet in thickness, makes the dam as substantial as possible. The headgate is made of concrete and steel, with steel shutter gates. There are three wasteways lined with concrete, built to the river for the purpose of regulating the flow of water in the canal, and to take care of the water when flood conditions prevail, or when a break occurs in the canal.

The water supply for the irrigation of lands of the district is ample and sure, a permanent water right having been purchased from the United States Reclamation Service in the Great Pathfinder Reservoir, located forty-eight miles northwest of Casper, Wyoming. This insures a good supply of water for the irrigation season, regardless of whether the river is high or low.

The length of the main canal is 96 miles. There are two hundred and thirty-five miles of laterals and eighty miles of drainage canals to take care of seepage and flood waters. Two hundred and sixty-one structures are located on the main canal, being composed of the following: 12 steel bridges, 56 wooden bridges, 9 concrete checks, 14 wooden checks, 100 steel and concrete headgates, 26 wooden gates, 12 concrete culverts, 21 tiled pipe culverts, and 11 timber and concrete head gates. On the canal system, there are 2,782 laterals and drainage structures.

The entire system is valued at $2,500,000.00, and has a total of 65,000 acres in the district, of which 63,000 acres are irrigable and approximately 50,000 acres are under a high state of cultivation. The lands under the district are valued at $13,500,000.00, and the canal has been in successful operation for the past six years. The upper portion of the canal has been in operation for about ten years. The district

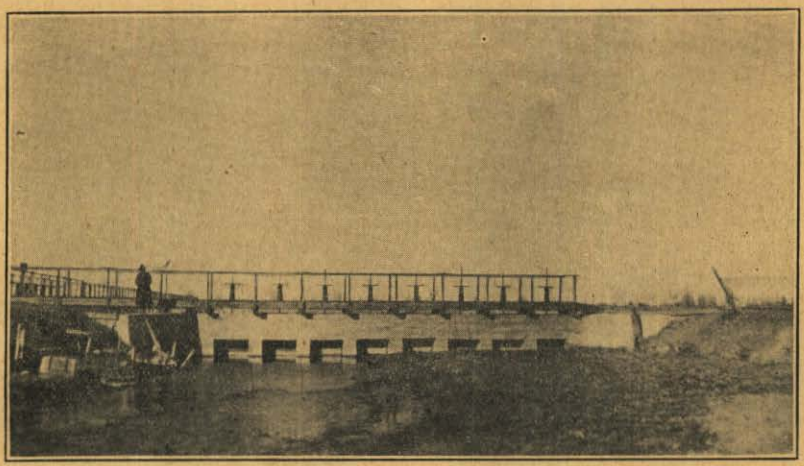
owns and operates a $25,000.00 drag line machine, besides having on hand $10,000.00 worth of material and equipment.

The bonded debt of the district is $2,203,000.00. These bonds begin to fall due in 1923, and the present plan is that they will be paid off in ten years. The present organization of the district is as follows: the board of directors, consisting of three members, one of the members being president of the board; secretary-treasurer, engineer and manager, attorney and district assessor.

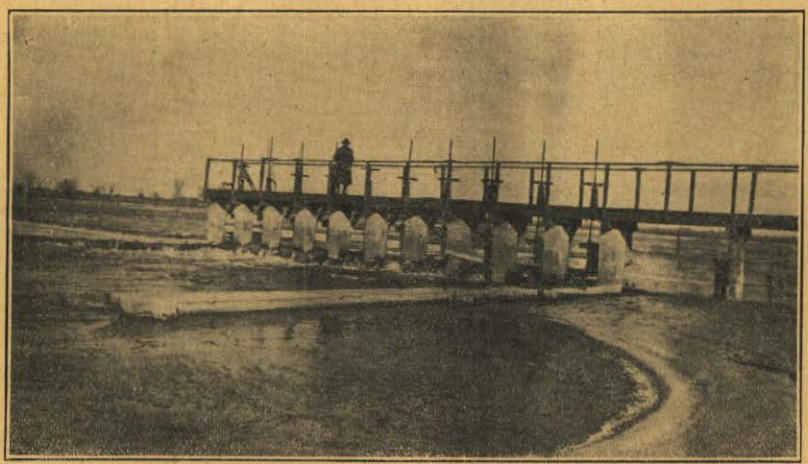
The district is divided into three divisions, and contains about the same acreage in each division. A director is elected from each division by the land owners each year. Each division has a foreman, who has charge of and is responsible for the work done by men under him and for the delivery of water to the land in his division. There are 24 canal riders, or water masters.

The value of the 1919 crop raised on lands under the district was approximately $4,500,000.00 Money for operating and maintaining the canal lateral system and building drainage canals is obtained by assessment on the lands under the district, made by the board of directors each year.

The board of directors of the district meets as a board of equalization in June of each year and sits as such board for a period of ten days for the purpose of equalizing the assessments which have been made by the district assessor. When the equalization is finished, the valuation of the lands as equalized by the board of equalization is ascertained, said board then proceeds to make the levy for the current year—so many mills for each dollar of valuation for general fund and so many mills for the interest coupon fund. As soon as the levy is made, warrants on the Farmers Irrigation District, signed by the president and secretary, may be issued from time to time as needed, and sold for cash to investors in securities. Warrants may be drawn up to ninety per cent of the total levy made. The irrigation tax is paid to the county treasurer, along with the state and county taxes. The land owner can not pay his state and county tax without paying his irrigation tax at the same time. The irrigation tax is then a lien on the land. The warrants are issued and paid in consecutive order—that is to say all 1919 warrants must be paid before any 1920 warrants are paid. The warrants run from eleven to eighteen months before being called for payment. The funds for the district are drawn from the county treasurer's office in the sums from $5,000 to $40,000.00 The district treasurer then calls for payment for as many warrants as the money received from the county treasurer will allow to be paid. These warrants may be termed a gilt-edge investment for in some ways they are considered better than a first mortgage on the land. These warrants draw seven per cent interest from date until paid.



WINTER CREEK CANAL HEADGATE



WINTER CREEK CANAL WASTE-GATE

Lisco Canal (D. 856, A. 991) and North River Irrigation Canal (A. 243, D. 787).

These two enterprises are so closely related that it will be best to consider them together. In July, 1893, Reuben Lisco posted a notice of appropriation for 32.86 second feet of water to be diverted on the north bank of the North Platte River, in section 14, township 18 north, range 47 west, and built the Lisco Canal, which was five miles long, for the purpose of irrigating his own lands. In 1896, the North River Irrigation Canal and Water Power Company was organized and made an application for a water right for 168.29 second feet of water. This company proposed to irrigate a stretch of territory east of that watered from the Lisco Ditch and desired to use the same right of way. A contract was entered into whereby the company enlarged the Lisco Canal, and in return agreed to carry free of charge the water to which Lisco was entitled. The company was composed entirely of farmers, who worked out the stock subscribed for upon the following basis: The entire yardage to be removed was estimated, from which the number of yards to be moved for each 40 acre tract was determined. The farmers built 33 miles of canal in addition to enlarging the five miles of the Lisco Ditch during the year 1896-1898. According to the yardage estimates made, it would have cost $33,000 to build the canal by contract.

The Lisco Canal formerly covered 1,500 acres, and the contemplated canal brought an additional 12,000 acres under the ditch. Water was used by the farmers in this larger area for several years; then dissensions over the use of the water arose and the ditch was allowed to deterioriate. It was not used after 1900, when a large break occurred in the Sand Draw which was never repaired. When the company failed to keep the canal in repair, in accordance with the contract, Lisco was forced to keep the upper end in running order to supply water to his lands. He immediately brought an action, and obtained a decree giving him his water right and the five miles of the canal on his former right of way. He then attached the canal of the company for the costs of the suit and took possession of the upper seven miles, thus making the Lisco Canal twelve miles long instead of five. In 1910 Lisco made an application for 3 second feet additional, in order to cover all the lands below the canal. He then listed his own lands for sale, attaching a water right to each tract sold. A mutual company, with a capital stock of $20,000, was organized and took over the management of the canal.

On May 1, 1918, a petition signed by 16 of the land owners was presented to the County Commissioners of Garden County, copy of which is on file in this department, same having been approved May 1, 1918. This district covers an area of 2,975 acres and lands under the following appropriations were included in the formation of the Lisco Irrigation District: Parts Docket 856, Docket 796, Application 991, Docket 787, and Application 243.

North River Irrigation District (App. 243 and Docket 787). Under date of November 22, 1918, a petition praying for the organization of the North River Irrigation District was filed in this department, which included lands under Application 243 and Docket 787, which were not embraced within the boundaries of the Lisco Irrigation District, amounting to 6,445 acres. The petition recommending the approval of the district by this department was mailed to the Board of County Commissioners of Garden County under date of November 19, 1918. A resolution was adopted by the board of directors of the North River Irrigation District on March 14, 1919, wherein it was resolved to raise the funds for the purchase of said appropriations and the construction of said canal and irrigation system by the issue and sale of bonds of the said North River Irrigation District. Plans and specifications of the headgate, weir gate and sluice gate of the proposed works, together with the estimated cost of same, were submitted to this department for inspection and approval. Plans and petition for the sale of bonds were approved under date of November 26, 1919.

Ramshorn Irrigation District (Docket 945). On March 24, 1893, a notice of appropriation was posted by individuals on the north bank of the North Platte River in the southeast quarter of the southeast quarter of section 12, township 23 north, range 58 west of the sixth principal meridian, for the Ramshorn Canal, a copy of the notice was filed with the county clerk of Scotts Bluff county. Construction was begun in April, 1893, and during that year the land owners under the ditch incorporated into a mutual stock company, and before April, 1894, completed the canal to a length of six and one-half miles at a cost of $6,250.

Under date of November 14, 1917, a petition signed by fourteen of the land owners under the canal was filed with this department, together with blue prints showing the lands which it was proposed to include within the district. Some of those lands were previously included in irrigation districts which had been organized, and there were also certain errors and ambiguities on record which made it necessary to investigate and correct before the department could act intelligently upon the petition. An amended petition, together with plat, was filed October 28, 1919, and we are now awaiting the receipt of certain papers before taking further action on the amended petition.

Oshkosh Irrigation District (Docket 797). A notice of appropriation was posted on the north bank of the North Platte River in section 34, township 17 north, range 44 west of the sixth principal meridian, under date of October 4, 1894, by Henry G. Gumaer and John Robinson, claiming the right to divert 2,000 inches of water under a four-inch pressure. This claim covers approximately 2,800 acres and was adjudicated August 10, 1898, granting the claimants 40 cubic feet per second of time.

In April, 1918, a petition was filed with the county commissioners of Garden county praying for the organization of an irrigation district, Order granting the prayers of the petitioner was approved by this department April 17, 1918. This district embraces an area of 2,730 acres. It was necessary to place the old canal in good condition with a new concrete wooden headgate, provided with wooden splash board gates for diverting the water from the North Platte River into the Oshkosh Canal has been constructed. The petition for the issuance of bonds under the proposed improvements of the Oshkosh Irrigation District was approved by this department to the amount of the estimates furnished by the engineer of the district.

Steamboat Irrigation District (A. 186, A. 350). Under date of October 22, 1895, A. B. Wood filed an application for a permit to appropriate 35 cubic feet of water per second of time from the North Platte River, headgate to be located on the south bank of the stream in the southeast quarter of the northwest quarter in section 4, township 21, range 54. A canal six miles in length was built and the area covered by this appropriation was 750 acres. An application for additional lands was filed by Mr. Woods under date of July 22, 1896.

July 30, 1920, a petition signed by the land owners was filed with the county commissioners, copy of which was filed with the Department of Public Works, praying for the organization of an irrigation district, same being duly approved October 7, 1920. This district includes an area of 484 acres.

RULES OF PROCEDURE

Adopted by

DEPARTMENT OF PUBLIC WORKS

Governing Matters Coming Before the Department

CLAIMS.

Section 6795, Cobbey's Annotated Statutes of Nebraska for 1911, reads as follows:

(Same—Determination of Priorities.) It shall be the duty of the department to make proper arrangement for the determination of priorities of right to use the public waters of the state, and determine the same. The method of determining the priority and amount of appropriation shall be fixed by the said department.

Filing of Claim Affidavit.

1. Claimants of the right to the use of public waters of the state of Nebraska for irrigation, power, or other useful purposes, who base their claims upon the law of 1877, upon the law of 1889, or by actual and beneficial use, shall file in the office of the Department of Public Works a claim affidavit, which shall be made upon a blank, prepared by the department, furnished by him free of cost, and filed by him under date of its receipt at his office.

2. This claim shall give the location of the diversion works, the land through which the canal runs, specifically describe the land irrigated, if for irrigation purposes; the location of all dams, flumes, headgates, canals, power house, etc., if for power or other purposes.

The claim shall also set forth the date of beginning construction work, the date of completion, and the time of the application of the water to the beneficial use for which it is claimed.

3. Upon the filing of any such claim affidavit, the Department of Public Works shall fix a time and place for the holding of a hearing.

Notices.

Notice of hearing shall be served in the following manner:

1. The department shall prepare an official notice, setting forth the time and place of the hearing, together with a general description of the rights claimed, and calling upon all interested parties to appear and protect their rights, to be inserted in a local paper of general circulation in the county in which the diversion works or plant of claimant is located, and also in some newspaper of general circulation

in the state, published at the state capitol, which notice shall run for four consecutive weeks in said papers at the expense of the claimant.

2. The Department of Public Works shall send by registered mail a duly certified copy of the above notice to each water user in the watershed in which the claim is located, as their names and addresses appear on the records in the Department of Public Works, at least thirty days before the date of said hearing, together with a copy of these rules.

3. Letters so addressed shall be registered according to the rules of the postoffice department, with a reuest for a return card, which card, when returned, shall be preserved with the papers in such case.

Hearing.

1. A hearing shall be held for the purpose of receiving testimony, offered by parties in interest, in support of and adverse to the rights claimed, and shall be presided over by the head of Department of Public Works or one of his assistants, as he may designate, who shall keep a complete record of the proceedings thereof.

2. All evidence shall be submitted in typewritten or printed form. If oral, it shall be taken down and transcribed at the expense of the claimant or contestant offering the same.

3. Claimants may appear in person or by attorney; but appearance must be made at time and place specified for hearing.

4. If any party to the proceedings shall desire to take the testimony of witnesses residing outside of the state, or whose attendance cannot be secured at any of the times and places fixed by the Department of Public Works, the testimony of such witnesses may be taken by deposition in the same manner and upon the same notice as that required for the taking of depositions in cases pending in the district court.

5. The Department of Public Works shall have the power to limit the time for the completion of the taking of the testimony.

6. When the taking of such testimony shall be completed, or the time fixed for the completion thereof shall have expired, the Department of Public Works shall fix the time for hearing argument upon the evidence taken, and permit interested parties to file briefs.

Opinion.

1. Upon the receipt of the written testimony, taken at the hearing, and any other investigations that the Department of Public Works may deem necessary to make, and briefs, if presented, there shall be rendered an opinion of facts and of law based upon the evidence presented.

2. Upon the rendition of a decision, the Department of Public Works shall forward a duly authorized copy of the same by registered

mail to all interested parties or their attorneys making an appearance of record in said hearing, as their names and addresses appear upon the records in the Department of Public Works, together with a copy of these rules. Return registry cards shall be requested and filed with papers in such cases.

Rehearings and Contests.

1. Any person deeming himself aggrieved by any decision may at any time within thirty days after receipt of such decision file with the Department of Public Works a petition for a rehearing. Said petition shall set forth the grounds relied upon for a rehearing and be duly verified.

2. In case sufficient reasons are found in the petition, providing for above to grant a rehearing, the petitioner will be notified of the same by the Department of Public Works.

3. Notices of holding of rehearings shall be given by mail to interested parties or their attorneys appearing of record.

4. The said hearing shall be held at a time and place designated, and interested parties may file briefs and oral argument may be made and limited to a reasonable time. In general, rules governing the original hearing shall apply to rehearing.

5. A contest against a claimant shall not be heard until after the rendition of a decision on the claim.

APPLICATIONS.

Any application made in accordance with the Irrigation Laws of the State of Nebraska to appropriate any of the public waters of the state shall be acted upon in the following manner:

Blanks.

1. Applications shall be made on blanks furnished by the Department of Public Works free of charge.

2. All questions shall be fully and carefully answered.

3. A careful drawing on township plat, showing all streams, with their names, canals and other improvements should be made; if for irrigation, land to be irrigated must be carefully shaded.

4. If application for permit to irrigate, owners of land should acknowledge their consent to have their lands watered through the allowance of the proposed application before a notary.

Filing Fees.

1. **Irrigation.** $5 for each 1,000 acres irrigated or fraction thereof.
2. **Storage.** $5 for each 5,000 acre feet or fraction thereof stored.
3. **Power.** $5 for each 50 theoretical horsepower or fraction thereof.

Rule on determining theoretical horsepower: The amount of theoretical water horsepower upon which fees shall be paid under the provisions of section 6918 of Cobbey's Annotated Statutes of Nebraska for 1911, shall be computed by multiplying the maximum amount of water claimed or diverted, expressed in cubic feet per second, by the average total fall utilized, expressed in feet, and dividing the product by 8.8.

Filings.

Upon receipt at the Department of Public Works of an application accompanied by the proper filing fee, the application shall be filed under date received and duly recorded.

Corrections.

1. Thirty days shall be given after date of filing for the Department of Public Works to examine an application, and if any defect is found therein, to return the same to the applicant for correction, with the endorsement of the Department upon the same, as to the corrections desired.

2. If application is returned, corrected within thirty day limit, it shall take priority of original filing.

Action Taken.

1. The Department of Public Works shall approve or dismiss the application according to the results of investigation of the same, as set forth by law.

2. The department shall return to the applicant by registered mail his application, with the endorsement of the Department of Public Works thereon, accompanied with a copy of these rules. Registry receipts shall be requested and filed with papers in above case.

3. Upon the receipt of an approved application by the applicant, the applicant shall be duly authorized to begin work of construction.

Work.

(Prosecution of Construction.) Within six months after the approval of any application for water for irrigation, power or other useful purpose under this act by the Department of Public Works the person or persons, corporation or association making such application shall commence the excavation or construction of the works in which it is intended to divert the water, also the actual construction of any water power plant and reservoir or reservoirs for storage in connection therewith, and shall vigorously, diligently and uninterruptedly prosecute such work to completion unless temporarily interrupted by some unavoidable and natural cause, and a failure to comply with this section shall work a forfeiture of the appropriation and all rights thereunder.

Provided, further, that the cost of promotion and engineering work shall not be considered as a part of the cost of construction, and that

the progress of the construction work shall be such that one-tenth of the total work shall have been completed within one year from the date of approval of the application. The applicant shall at the end of six months after the allowance of his application furnish to the Department a detailed report of the total amount of work necessary to complete the project, which report shall conform to the requirements of the Department, together with satisfactory evidence that the work of construction has been begun.

Provided, also, that the construction of all work required in connection with the proposed project shall be prosecuted in the manner above described and with such a force as shall assure the average rate of constructional progress necessary to complete such work or works within the time stipulated in the approval of such application, notwithstanding the ordinary delay and casualties that must be expected and provided against, to assure the completion of the project within a time certain.

Provided further, that in the case of an application for an appropriation granted for the development of water power, it shall be the duty of such grantee, on or before the 10th day of each month after the date fixed for the commencement of such work, to report under oath to the Department of Public Works the actual amount of money expended upon such power development during the preceding calendar month for right of way and land, labor, salaries, material and machinery, not including construction, equipment delivered upon the ground, and said report shall be made in form, detail and manner prescribed by said Department. A failure to carry on the construction of either an irrigation or water power project, as outlined above, or in the case of a water power development, to fail to file the above reports within the time required, shall work a forfeiture of the appropriation and all rights thereunder, and the Department shall cancel said appropraition within thirty days of such failure.

Provided further, the head of the department or one of his assistants shall have free access to all records, books, and papers of any irrigation or water power company and have the right to go upon the right of way and land of any said company, and shall inspect said works to see that it is being done according to plans and specifications approved by the Department of Public Works, and shall also keep a record of the cost of construction work where the same is deemed advisable for physical valuation purposes.

Maps.

Section 6808 of Cobbey's Annotated Statutes for 1911 reads as follows (Map, Plat—Penalty.): Upon approval and allowance of an application, the applicant shall file in the office of the Department of Public Works, within six months thereafter, a map or plat, which map or plat shall be made to conform to the rules and regulations of said Department as to material, size and coloring, and upon a scale of not less than two inches to the mile. Such map or plat shall show the source from

which the proposed appropriation is to be taken, and all proposed dams, dykes, reservoirs, canals, power houses and any other structures for the purpose of storing, conveying or using water for any purpose whatsoever under the irrigation law of this state, and their true courses or positions in connection with the boundary lines and corners of lands which they occupy, and when lands are listed for irrigation, such lands must be shown in government subdivisions, or fractions thereof, as the case may be, and the irrigable area in acres shall be actually shown for each smallest legal subdivision, and no rights shall be deemed to have been acquired until this section of the statutes shall have been complied with, and a failure to comply with this section shall work a forfeiture of the appropriation, and all rights thereunder.

II. (1) All maps filed to comply with the above law, must be on tracing cloth 14 inches wide and 16 inches long, with a one inch margin on the top, bottom and right hand end and a 3 inch margin on the left hand end for binding. Where the whole area cannot be shown on one sheet, additional sheets must be used, each sheet representing a township, until the whole area is covered.

(2) Short ditches and small areas must be made on a scale of 4, 6 or 8 inches to the mile, where, by using such scale, the area of the map will not exceed 12 inches square. In all other cases, where this cannot be done and where larger areas are to be shown, a scale of 2 inches to the mile is to be used.

(3) The position of the headgate must be indicated by some tie to a government section or quarter section corner, giving the course and distance therefrom. The course of the ditch or canal must also be shown.

(4) At intersections of section lines the distance from the nearest government corner to the center line of the ditch must be given in feet, and where the land reclaimed is fractional, the fractional area to be irrigated, of each quarter-quarter section must be marked on plat in acres.

(5) The center line of the proposed canal must be in red. Any other canals, and all streams and drains must be in medium blue. The area proposed to be irrigated must be carefully shaded in light red. If topography is shown by contour lines, such lines must be in burnt sienna. All other matter, such as hatching, land lines, lettering, figures, etc., must be in black.

(6) All maps must be made from actual measurements on the ground and properly certified by some competent engineer or surveyor.

(7) The presumption of the law is, that after a permit is allowed, it will require not more than six months to make the proper surveys, get the necessary information, and construct and file required map.

(8) The following or other appropriate certificates must be printed with india ink only upon the first sheet properly filled out and signed:

State of Nebraska, ...County, ss.

I hereby certify that the survey of ..... was made under my direction, and is accurately represented on this map, consisting of ..... sheets.

.....

Engineer (or Surveyor.)

Dated ....., 19.....

State of Nebraska ..... County, ss.

I hereby certify that this map, consisting of ..... sheets, was made with my full knowledge and consent and at my request, and correctly shows the location and course of the distributing works, the source from which the appropriation is taken, and the legal subdivisions of the land upon which the water appropriated is to be applied, as shown by Application No. ....., filed in the office of the Department of Public Works on the ..... day of .....

Dated ....., 19.....

(9) If the appropriation is for any purpose other than irrigation, this certificate must be so worded as to agree with the facts.

(10) At the time an application is filed, a preliminary map is to be made upon the township plats accompanying the blank furnished by this office, and which is made a part of the application, and the applicant should follow out the foregoing instructions as to color and shading and such other matter as is possible to gather and place upon a preliminary map. This map must contain sufficient data upon which to base an opinion in handling the application.

Contests and Hearings.

1. Any person deeming himself aggrieved by any decision may at any time within thirty days after the receipt of such decision, file with the Department of Public Works a petition for a hearing. Said petition shall set forth the grounds relied upon for such hearing and must be duly verified.

2. In case sufficient reasons are found in the petition, provided for above, to grant a hearing, the time and place for holding the same shall be set and notices of the same shall be given interested parties by registered mail by the Department of Public Works thirty days in advance of the holding of said hearing.

3. Interested parties may file with the Department of Public Works a brief, and also appear in person to introduce evidence and make oral argument.

4. A duly verified copy of a final decision shall be sent to all interested parties making an appearance, by registered mail by the Department of Public Works.

5. After the allowance of an application, contests may be brought by any interested party to show that the applicant has not faithfully complied with the irrigation laws of this state, or that the proposed project is a detriment to the public welfare.

6. An applicant feeling himself aggrieved by the opinion rendered by the department in the hearing had, may institute proceeding in the Supreme Court of Nebraska to reverse, vacate or modify the order complained of, the procedure to obtain such reversal, vacation or modification of any such decision or order made and adopted upon which a hearing has been had before said department shall be governed by the same provisions now in force with reference to appeals and error proceedings from the district court to the Supreme Court of Nebraska. The evidence presented before the department as reported by its official stenographer and reduced to writing, shall be duly certified to by said stenographer and the Secretary of the Department as the true bill of exceptions, which together with the pleadings and fillings duly certified in said case under the seal of the department shall constitute the complete record, and the evidence upon which the case shall be presented to the appellate court, provided, however, that the time for appeal from the orders and rulings of said department to the Supreme Court shall be limited to sixty days.

DAMS.

Plans and specifications of dams and petitions for approval of same.

(Dam—Reservoir.) Any person, corporation or association hereafter intending to construct any dam for reservoir purposes, or across the channel of any running stream, shall before beginning such construction, submit the plan of the same to the Department of Public Works for their examination and approval, and no dam shall be constructed until the same shall have been approved by such board. Any person constructing such a dam across the channel of any running stream without having obtained the consent and approval of the department therefor, shall be guilty of a misdemeanor and upon conviction thereof shall be fined in any sum not exceeding $100 and stand committed until the fines and costs are paid, and for every day that such dam so unlawfully constructed is maintained, it shall be considered as a new offense and as a new violation of the provision hereof and it shall be the duty of the secretary of the department to cause the provisions of this act to be strictly enforced.

Drawings.

The drawings representing the plan of a proposed dam should be made with a good quality of India ink upon sheets of tracing cloth 14 inches wide and 16 inches long with a 3 inch margin on the left

hand end for binding (extra lengths will be permitted, if necessary, but must be folded to the required size of 14"x16" for filing) as many such sheets to be used as requirements demand. These drawings must be numbered and given a proper title. They must include:

1. A map of the site showing the position of the dam, the meanders of the stream and the flow line boundaries of the reservoir, all properly connected to land lines and government corners, also the surface area of the reservoirs and the cubic contents in acre feet.

2. A cross section of the stream where the dam is to be built, showing the surface of the ground in profile with a sufficient number of soundings to indicate the underlying formation, the elevation of the dam and spillway, the surface of the impounded water and such openings or conduits through the dam as are contemplated.

3. A sketch of the dam in plan, or as viewed from above, outlining the top and slope lines of the dam, the water line, spillways, side walls, buttresses, etc.

4. Cross sections of the dam at several points such as will show the mechanical construction of the diffrent parts.

5. Specifications must accompany the drawings, explaining them and setting forth the material to be used and methods of construction in clear, plain and unmistakable terms.

6. Drawings must be certified to by some competent engineer and also by applicant with a certificate of the general form of the one set forth under maps of application.

Petition for Approval

Following is a general form of petition for approval of plans which can be varied according to requirements. This petition should show whether the petitioner is an individual, a partnership or a corporation and by what authority the waters of the State of Nebraska are appropriated.

Before Department of Public Works.

In the matter of the petition for approval of plans for the construction of a proposed dam under application No. ....., made by ..... to appropriate the waters of the state of Nebraska for .....

To the Honorable Secretary of the Department of Public Works:

Comes now your petitioner, ..., and states:

1. That he is the original applicant for the appropriation of water from ..... in the ..... ¼ ..... ¼ .....

of Section ....., T. ..... N., R. ....., in County, Nebraska, under application No. ....., filed in your office ....., 19....., and approved ....., 19.....

2. That in order to carry out, perfect and consummate the object of said appropriation, it is necessary to construct a dam across said ..... to a height of more than ten feet, and according to the laws of the state of Nebraska, in such cases made and provided, a plan of such proposed dam must be submitted to the Department of Public Works for their examination and approval, which approval must be obtained before such proposed dam can be constructed.

3. That your petitioner has employed engineers to make proper soundings and other measurements at the site of the proposed dam and to make plans and specifications for the proper construction of the same, which specifications are submitted herewith with plans marked: sheet No. 1, general map; sheet No. 2, cross section of dam site, showing borings; sheet No. 3, general drawings of dam; sheet No. 4, details of dam with cross sections; sheet No. 5, details and location of power houses; each of said sheets being also marked "....." and each of said sheets, with the specifications, being made a part of this petition.

Wherefore, your petitioner prays that said plans and specifications as above described and as submitted herewith be approved, and that such order be made by this department as shall be just and equitable to this petitioner.

State of Nebraska, ... County, ss.

....., being first duly sworn upon his oath, says that he is the original applicant for an appropriation of water under Application No. ..... and that the matters and facts set forth in the foregoing petition are true as he verily believes.

.....

Subscribed in my presence and sworn to before me this ..... day of ....., 19.....

.....,
Notary Public.

In cases where the petitioners are a corporation and in cases where transfers have been made the following forms of statements are suggested, but in all cases the facts must be shown, and the petition verified to correspond:

"Comes now your petitioner.....and states that it is a corporation duly organized and existing under and by virtue

of the laws of the State of Nebraska, being organized for the purpose of....."

"That on the.....day of.....filed in your office Application No..... for a permit to appropriate the waters of the State of Nebraska, which application was on the.....day of.....approved by this Department."

"That on the.....day of.....said..... assigned to this petitioner all of his rights and privileges under said permit, and that this petitioner then undertook to fulfill the conditions necessary to complete the appropriation contemplated under said permit."

Where the petitioner is a partnership, the statement should read:

"Comes now your petitioners.....and state that they are a partnership doing business under the name and style of....."

Action:—

1. Upon receipt of plans of a dam and petition for approval of the same, they shall be filed under date of arrival and the plans shall be given an official number for filing purposes.

2. The Department may require more complete data than that shown upon plans and specifications or may require changes in the same as in his judgment is best and shall have the right to return plans and specifications for corrections.

3. If at the discretion of the Department of Public Works, or upon request of any person, he deem it necessary, a personal inspection shall be made of the proposed dam site.

4. The Department of Public Works shall first act on the plans and specifications for a dam, which action shall be subject to the approval of the Department.

5. In approving plans of a dam of any kind the right is always reserved by the Department of Public Works to inspect said work while being built and order any changes he may deem necessary. Also after a dam is built, he may order changes or repairs as he may deem proper for public safety.

Contests and Hearings:—

I. Any person deeming himself aggrieved by any decision may at any time within thirty days after the receipt of such decision file with the Department of Public Works a petition for a hearing. Said petition shall set forth the grounds relied upon for such hearing and must be duly verified.

2. In case sufficient reasons are found in the petition provided for above to grant a hearing, the time and place for holding the same shall be set, and notices of the same shall be given interested parties, by registered mail by the Department of Public Works fifteen days in advance of the holding of said hearing.

3. Interested parties may file with the Department of Public Works a brief and also appear in person to introduce evidence and make oral argument.

4. A duly verified copy of a final decision shall be sent to all interested parties by registered mail by the Department of Public Works.

5. After the approval of dam plans, contests may be brought by any interested party to show that the applicant has not faithfully complied with the Irrigation Laws of the State, or that the proposed dam is a detriment to the public welfare.

Fees:—

1. For examination of plans for any proposed dam, fifty cents for each foot in height and actual expenses while visiting and examining the site thereof.

2. The height of a dam shall be measured from the deepest part of the foundations to the crest or top of the dam.

3. Piling of any sort shall be considered as part of the foundations.

PETITIONS.

Petitions for extension of time in which to complete work:

Following is a general form of petition for extension of time which can be varied accrding to requirements. This petition should state whether the petitioner is an individual, a partnership or a corporation and by what authority the waters of the State of Nebraska are appropriated and all transfers of title if any.

Form for Petition for Extension of Time:

BEFORE THE DEPARTMENT OF PUBLIC WORKS.

In the Matter of the petition for an extension of time in which to complete work under Application No.....made by..... .....for a permit to appropriate the waters of the State of Nebraska.

To the Honorable Secretary of the Department of Public Works:

Comes now your petitioner.....and states:

1. That he is the original applicant for an appropriation of water from.....in the.....¼.....¼ of Sec-

tion....., T.....N, R....., in.....
.....County Nebraska, under Application No.....filed in your office.....and approved.....

2. Your petitioner represents that he has used due diligence in the prosecution of the work of construction required to complete the ditch, and other work by the time required. (State reasons for cause of delay, which reasons must constitute good and sufficient grounds upon which to base an extension of time.)

3. Your petitioner represents that notwithstanding the foregoing hindrances and embarrassements, the causes of delay are now removed, and he is now ready, willing and able to complete said work of construction and the application of water by.....19.....

Wherefore your petitioner prays that the time for completing said canal under said permit granted under Application No.....be extended for a period of at least.....from and after.....or until....., 19....., and the date for the application of water to beneficial use be fixed not earlier than....., 19....., and that such order be made by this Department as shall be just and equitable to the petitioner.

State of Nebraska, }
} ss.
.....County }

.....being first duly sworn on his oath states that he is the original applicant under Application No..... for the appropriation of waters of the State of Nebraska; that he has read the above and foregoing petition and knows the contents thereof and that the facts therein set forth are true, as he verily believes.

.....

Subscribed in my presence and sworn to before me this..... day of....., 19.....

.....
Notary Public.

Action:—

1. Upon receipt at the Department the petition shall be filed under date of arrival and shall be acted upon by the Department of Public Works.

Hearing:—

1. Any person deeming himself aggrieved by any decision may at any time within thirty days after the receipt of such decision file with the Department of Public Works a petition for a hearing. Said petition shall set forth the grounds relied upon for such hearing and must be duly verified.

2. In case sufficient reasons are found in the petition provided for above to grant a hearing, the time and place for holding the same shall be set, and notices of the same given interested parties by registered mail by the Department thirty days in advance of the holding of said hearing.

3. Interested parties may file with the Department of Public Works a brief, and also appear in person to introduce evidence and make oral argument.

4. A duly verified copy of a final decision shall be sent to all interested parties by regsitered mail by the Department of Public Works.

Fee:—

A filing fee of fifty cents shall be charged for filing of above petition.

CONTESTS.

General Rules:

1. Any party desiring to contest a claim shall file with the Department of Public Works a written notice of contest and petition setting forth the grounds therefor, together with a verified proof of service of notice and petition upon the opposite party. Within fifteen days from the date of service of said notice and petition, the contestee shall file with the Department of Public Works his answer thereto, if any he desires to make, together with a verified proof of service of a copy of said answer upon the contestant, who shall then have ten days from the date of service of same in which to file with the said Department a reply; provided, however, that the Department of Public Works may extend the time for answer and reply upon good cause shown.

2. Where the contestee is a non-resident or cannot be found within the state, then the said contestant shall file with the Department of Public Works in lieu of said verified proof of service of notice of contest and petition an affidavit setting forth the fact, that service cannot be made in the State, whereupon the Department shall designate some newspaper published at the county seat of the county within which the original notice of appropriation was filed, in which newspaper shall be published for four consecutive weeks, a notice setting forth the following facts: (a) That such contest has been instituted, together with the name and address of the contestant or his attorney of record; (b) the name of the claimant and the name of the stream from which the contested appropriation is claimed, together with the location of the point of diversion of

such appropriation; (c) that a notice of contest and petition stating the grounds therefor are on file with the Department of Public Works; (d) the date upon or before which the answer must be filed by the contestee, which date shall not be earlier than ten days from the last date of publication of notice.

3. On or before the date set for the filing of the contestee's answer, said non-resident or absent contestee shall file the same with the Department of Public Works, together with a verified proof of service of a copy thereof upon the contestant or his attorney of record.

4. The said petition stating grounds of contest and answer thereto shall be verified.

5. Service upon corporations may be made upon the same officers and in the same manner as provided in the case of a summons issued by a court of law.

6. Proof of publication of the above notice shall be filed with the Department of Public Works on or before the date set for the filing of the contestee's answer.

7. When the issues have thus been made up, the Department of Public Works shall set a date and place for taking testimony and the hearing of the cause and each party thereto shall be notified thereof by registered mail.

8. At the time and place designated for hearing, each party shall produce his evidence, the contestant opening and closing.

9. Continuances may be granted at the discretion of the Department of Public Works to either party at or before the time for hearing upon good cause shown.

10. The testimony offered may be oral or by deposition. If oral, it should be taken down by a stenographer and transcribed at the expense of the party offering the same, except in case of cross examination, the expense of which shall be borne by the opposite party; the stenographer to receive the legal rate per folio therefor, payable at the time such evidence is offered. Depositions submitted must have been taken in accordance with the rules in a court of law.

11. Copies of decisions in matters of contests shall be mailed to parties in interest.

12. If the postoffice address of any person is unknown, then the decision shall be mailed to said claimant in care of the County Clerk of the County within which the claim is located.

Rehearing:—

1. Any person deeming himself aggrieved by any decision, may at any time within thirty days after receipt of such decision file with the Department of Public Works a petition for a rehearing. Said petition

shall set forth the grounds relied upon for a rehearing and be duly verified.

2. In case sufficient reasons are found in the petition provided for above, to grant rehearing, the petitioner shall be notified of the same by the Department of Public Works.

3. Interested parties may file with the Department of Public Works a brief and also appear in person to introduce evidence and make oral argument.

4. In general, the case shall be made up and be controlled by the rules governing contests.

The above rules and regulations have this day been approved and adopted by the Department of Public Works.

Approved—Sept. 8, 1919.

GEO. E. JOHNSON,
Secretary.

MISCELLANEOUS MEASUREMENTS OF WATER, AND CONVENIENT EQUIVALENTS.

A second foot is water flowing continuously at such a rate that one cubic foot passes a given point in one second of time.

An acre foot is water one foot deep upon one acre of land.

1 Acre foot equals 43,560 cubic feet equals 325,851 U. S. gallons.

1 Second-foot will supply one acre foot 12, 1 hours.

1 U. S. gallon = 231 cubic inches.

1 cubic foot = 7.48 U. S. gallons.

1 cubic foot of water weighs 1,000 ounces or 62.5 pounds avoirdupois.

1 U. S. gallon of water weighs 8.355 pounds avoirdupois.

1 horsepower is equivalent to raising 33,000 pounds one foot in one minute.

1 second-foot falling 8.8 feet is equivalent to one theoretical horsepower. 20 per cent of the theoretical horsepower is generally allowed for the friction of machinery, etc., leaving 80 per cent for the net horsepower, therefore one second foot falling 11 feet = one available horsepower (80 per cent efficiency). About ten per cent of this is lost when converted into electrical energy.

1 horsepower = 746 Watts = .746Kilowatts.

1 volt ampere = .0013405 horsepower.

The approximate rate of flow of water in open channels may be found by observing the velocity of a float on the surface of the stream. The velocity is greatest at the surface and least along the bottom and sides, being there retarded by friction.

Careful experiments have shown that the mean velocity is about 84 per cent of the maximum central surface velocity. The mean rate of flow is at six-tenths of the depth measured from the surface.

The most approved formula for determining the flow of water in canals is Kutter's:

$$v = \left(\frac{\frac{1.811}{n} + 41.6 + \frac{.00281}{s}}{1 + \left(41.6 + \frac{.00281}{s}\right)\frac{n}{\sqrt{r}}} \right) \sqrt{rs}$$

In this formula

v = the mean velocity in feet per second.

r = the hydraulic radius or mean depth in feet = the area of cross section in square feet divided by the wetted perimeter or width along the bottom and sides in feet.

s = the slope; that is the fall of the surface in any distance divided by that distance.

n = a co-efficient of roughness, varying in value from .010 for straight channels with smooth, glazed surfaces, to .035 for canals and rivers in bad order, having stones, detritus and aquatic plants in great quantities. This value has been found to be .025 for ordinary irrigation canals and about one-half this quantity for flumes of unplaned lumber.

The following table gives the velocity in feet per second, based on Kutter's Formula, Coefficient of Roughness .025 (F—fall in feet per mile; S—slope).

R=Average Depth	F=.528 S=.00010	F=.792 S=.00015	F=1.056 S=.00020	F=1.320 S=.00025	F=1.584 S=.00030	F=1.848 S=.00035	F=2.112 S=.00040	F=2.376 S=.00045	F=2.640 S=.00050	F=2.904 S=.00055	F=3.168 S=.00060	F=3.432 S=.00065	F=3.696 S=.00070	F=3.960 S=.00075
0.2	.13	.17	.20	.22	.25	.27	.29	.31	.33	.35	.36	.38	.39	.41
0.4	.24	.30	.36	.41	.45	.49	.53	.56	.59	.62	.65	.68	.71	.73
0.6	.34	.43	.50	.57	.63	.68	.73	.78	.82	.86	.90	.94	.98	1.01
0.8	.43	.54	.63	.72	.79	.86	.92	.98	1.03	1.08	1.13	1.18	1.23	1.27
1.0	.52	.65	.76	.85	.94	1.02	1.09	1.16	1.23	1.29	1.35	1.40	1.46	1.51
1.2	.60	.75	.87	.98	1.08	1.17	1.26	1.34	1.41	1.48	1.55	1.61	1.68	1.74
1.4	.68	.84	.99	1.11	1.22	1.32	1.41	1.51	1.59	1.66	1.74	1.81	1.88	1.95
1.6	.76	.94	1.09	1.23	1.35	1.46	1.56	1.66	1.76	1.84	1.92	2.00	2.08	2.15
1.8	.83	1.03	1.19	1.34	1.47	1.59	1.70	1.81	1.91	2.00	2.10	2.18	2.27	2.34
2.0	.90	1.11	1.29	1.45	1.59	1.72	1.84	1.96	2.06	2.17	2.26	2.36	2.45	2.53
2.2	.97	1.20	1.39	1.55	1.71	1.84	1.97	2.10	2.21	2.32	2.42	2.52	2.62	2.71
2.4	1.04	1.28	1.48	1.66	1.82	1.96	2.10	2.23	2.35	2.47	2.58	2.68	2.79	2.88
2.6	1.10	1.36	1.57	1.76	1.93	2.08	2.23	2.36	2.49	2.61	2.73	2.84	2.95	3.05
2.8	1.17	1.43	1.66	1.85	2.03	2.19	2.35	2.49	2.63	2.75	2.88	3.00	3.11	3.22
3.0	1.23	1.51	1.74	1.95	2.13	2.31	2.46	2.61	2.76	2.89	3.09	3.14	3.26	3.38
3.2	1.29	1.58	1.82	2.04	2.23	2.41	2.58	2.74	2.88	3.02	3.16	3.29	3.41	3.53
3.4	1.35	1.65	1.90	2.13	2.33	2.55	2.69	2.85	3.01	3.15	3.30	3.43	3.56	3.68
3.6	1.41	1.72	1.98	2.22	2.43	2.62	2.80	2.97	3.13	3.28	3.43	3.57	3.70	3.83
3.8	1.46	1.79	2.06	2.30	2.52	2.72	2.91	3.08	3.25	3.41	3.56	3.70	3.84	3.98
4.0	1.52	1.85	2.14	2.39	2.61	2.82	3.01	3.19	3.37	3.53	3.68	3.83	3.98	4.12
4.2	1.57	1.92	2.21	2.47	2.70	2.92	3.12	3.30	3.48	3.65	3.81	3.96	4.11	4.26
4.4	1.63	1.99	2.29	2.55	2.79	3.01	3.22	3.41	3.59	3.77	3.93	4.09	4.24	4.39
4.6	1.68	2.05	2.36	2.63	2.88	3.10	3.32	3.51	3.70	3.88	4.05	4.22	4.37	4.53
4.8	1.74	2.11	2.43	2.71	2.96	3.19	3.41	3.62	3.81	3.99	4.17	4.34	4.50	4.66
5.0	1.79	2.17	2.50	2.78	3.04	3.28	3.51	3.72	3.92	4.11	4.28	4.46	4.63	4.79

TRAPEZOIDAL WEIRS.

As a result of experiments made in Italy in 1886 by Cippoletti, he adopted a trapezoidal weir, the sides of which have an inclination of one-fourth horizontal to one vertical. This is based on the theory that the effective length / of a restangular weir being less than its true length owing to a contraction of the area if the weir be increased in proportion to its depth (since contraction increases in this ratio) and so as to balance the loss due in contraction, the flow through the weir will remain the same as though the weir were rectangular without contraction. The conditions called for in placing a rectangular weir must be nearly fulfilled with a trapezoidal weir, but the distance of the sill of the weir from the bottom of the canal must be at least three times the depth of the weir, and its length must be at least three times the depah of the water flowing over it.

This weir seems to possess some excellent qualities, the chief difficulty in connection with it being the same as arises in using the rectangular weir, namely, that where silt laden water is employed this may fill up above the front board of the weir. This weir may be used as a divisor, and for fairness of measurement is especially adapted to use on irrigation canals.

Still water exerts a pressure of 62.5 pounds per square foot, or .434 pounds per square inch, for each foot of depth. It is equal in all directions, downwards, upwards, or sideways, and is independent of the shape or size of the containing vessel.

This pressure is due solely to the "head" or height of the level surface of the water above the point at which the pressure is considered, and, to be exact, is equal to .43302 pounds per square inch for every foot of head, or 62.335 pounds per square foot for every foot of head (at 62 degrees F.).

The pressure of water against a vertical surface, as a retaining wall, at any point is in direct ratio to the head above that point, increasing from O at the level to a maximum at the bottom. The total pressure against a vertical strip of a unit's breadth increases as the area of a right-angled triangle whose perpendicular represents the height of the strip, and whose base represents the pressure on a unit of surface at the bottom; that is, it increases as the square of the depth. The sum of all the horizontal pressures is represented by the area of the triangle, and the resultant is equal to this sum exerted at a point one-third of the height from the bottom. (The center of gravity of the area of a triangle is one-third of its height.)

The horizontal pressure upon a vertical section of a dam, 1 foot in width, is 31.25 pounds multiplied by the square of the depth of water in feet.

DISCHARGE OVER CIPPOLETTI'S TRAPEZOIDAL WEIRS IN SECOND FEET.

Depth in Feet	Length 1 Feet	Length 2 Feet	Length 3 Feet	Length 4 Feet	Length 5 Feet	Length 7 Feet	Length 10 Feet
.05	.0377	.0754	.1131	.1508	.1885	.2640	.3771
.10	.1064	.2128	.3192	.4256	.5319	.7447	1.0639
.15	.1956	.3912	.5868	.7824	.9780	1.3692	1.9560
.20	.3010	.6020	.9029	1.2039	1.5049	2.1069	3.0098
.25	.4208	.8417	1.2625	1.6833	2.1041	2.9458	4.2083
.30	.5531	1.1063	1.6594	2.2126	2.7657	3.8720	5.5314
.35	.6972	1.3945	2.0917	2.7890	3.4862	4.8807	6.9724
.40		1.7035	2.5553	3.4071	4.2588	5.9624	8.5177
.45		2.0328	3.0492	4.0656	5.0820	7.1148	10.1640
.50		2.3805	3.5708	4.7610	5.9512	8.3318	11.9025
.55		2.7465	4.1198	5.4930	6.8663	9.6128	13.7326
.60		3.1293	4.6939	6.2585	7.8231	10.9524	15.6463
.65		3.5283	5.2924	7.0565	8.8206	12.3489	17.6413
.70		3.9437	5.9156	7.8874	9.8593	13.8030	19.7186
.75			6.5599	8.7466	10.9332	15.3065	21.8665
.80			7.2265	9.6354	12.0442	16.8619	24.9885
.85			7.9154	10.5538	13.1923	18.4692	26.3846
.90			8.6234	11.4978	14.3723	20.1212	28.7446
.95			9.3516	12.4688	15.5860	21.8204	31.1720
1.00			10.1000	13.5667	16.8333	23.5667	33.6667
1.05				14.4888	18.1110	25.3554	36.2220
1.10				15.5365	19.4206	27.1888	38.8412
1.15				16.6071	20.7588	29.0624	41.5177
1.20				17.7019	22.1274	30.9784	44.2548
1.25				18.8197	22.5240	32.9344	47.0492
1.30				19.9603	24.9503	34.9305	49.9007
1.35				21.1238	26.4047	36.9666	52.8095
1.40				22.3075	27.8844	39.0382	55.7688
1.45					29.3910	41.1474	58.7820
1.50					30.9245	43.2943	61.8490
1.55					32.4833	45.4766	64.9666
1.60					34.0685	47.6959	68.1370
1.65					35.6782	49.9495	71.3565
1.70					37.3111	52.2355	74.6222
1.75						54.5568	77.9383
1.80						56.9121	81.3030
1.85						59.3008	84.7154
1.90						61.7211	88.1730
1.95						64.1720	91.6743
2.00						66.6560	95.2228

IRRIGATION, OPERATION AND MAINTENANCE COST UNDER DISTRICT SYSTEM 1919.

Name of District	Acres	Valuation	Amount Raised	Gen. Fund Mills	Bond or Constrctn. Mills	Cost per acre
Alliance	6,109.00	$121,010.00	$15,368.27	100.0	27.0	1.98
Alfalfa	4,167.00	208,377.00	12,356.75	44.5	14.8	2.22
Birdwood	5,549.91	54,499.10	3,433.44	16.0	47.0	0.16
Blue Creek	2,970.00	29,706.00	1,188.24	40.0		0.40
Bridgept. (Belmt.)	13,944.37	309,537.60	24,763.00	65.0	15.0	1.59
Brown' Creek	6,339.05	250,710.33	14,541.20	58.0		0.58
Castle Rock	5,839.57	126,002.96	6,048.14	3.4	1.4	0.73
Central	1,972.64	50,480.29	5,300.43	70.0	35.0	1.79
Chimney Rock	5,562.00	184,661.00	11,079.66	41.0	19.0	1.36
Enterprise	6,910.00	126,900.74	7,614.44	50.0	10.0	0.97
Farmers (Tri-St.)	61,695.57	2,652,429.10	318,291.49	95.0	25.0	4.08
Frenchman Valley	9,740.00	681,317.00	11,650.52	17.1		1.20
Gering	13,448.53	276,098.51	52,458.72	105.0	85.0	2.16
Kimball	6,820.00	341,000.00	22,847.00	20.0	47.0	1.00
Lisco	2,450.00	31,815.00	6,172.11	150.0	44.0	1.80
Lyons	2,334.00	23,341.00	2,147.37	70.0	12.0	.70
Nine Mile	5,355.00	285,342.00	20,259.28	62.5	8.5	3.33
Northport	15,287.27	194,214.00	1,165.28	6.0		
North River						
Platte Valley	12,000.00	600,000.00	24,000.00	40.0		2.00
Paisley	1,030.00	10,300.00	566.50	55.0		.55
Ramshorn	315.00		245.00			
Short Line						
Suburban	7,100.00	83,510.00	17,119.00	45.0	160.0	2.41
Western	14,311.00	143,117.30	7,155.86	50.0		.50

IRRIGATION, OPERATION AND MAINTENANCE COST UNDER DISTRICT SYSTEM 1920.

Name of District	Acres	Valuation	Amount Raised	Gen. Fund Mills	Bond or Constrctn. Mills
Alliance	6,333.00	$178,520.00	$13,924.56	68.0	10.0
Alfalfa	4,206.00	420,604.00	13,249.02	14.0	17.5
Birdwood	5,509.91	55,099.10	2,865.15	5.0	47.0
Blue Creek	2,970.60	29,706.00	1,495.30	50.0	
Bridgept. (Belmt.)	14,294.87	303,811.60	27,343.04	75.0	15.0
Brown's Creek	6,332.57	253,359.30	15,201.55	60.0	
Castle Rock	5,821.68	116,393.60	9,655.56	8.3	
Central	2,326.39	49,036.95	9,807.39	150.0	50.0
Chimney Rock	5,638.60	185,109.00	18,510.90	80.0	20.0
Enterprise	6,871.25	105,410.52	9,357.29	75.0	13.77
Farmers (Tri-St.)	62,718.28	2,704,224.61	403,633.69	110.0	40.0
Frenchman Valley	9,740.00	681,340.00	11,582.78	17.0	
Gering	14,312.56	266,357.00	79,907.10	215.0	85.0
Kimball	6,820.00	341,000.00	20,460.00	13.0	47.0
Lisco	3,036.40	39,193.00	5,878.95	150.0	
Lyons	2,786.00	23,902.00	1,314.61	30.0	25.0
Nine Mile	5,482.00			116.0	9.0
Northport	14,550.00	194,743.00	1,557.94	*8.0	
North River	6,430.00	313,950.00	7,848.75	2.0	23.0
Platte Valley	12,000.00	600,000.00			
Paisley	1,320.00	65,320.00	7,054.56	108.0	
Ramshorn	315.00		245.00		
Short Line	2,994.15	192,245.00	14,418.38	71.0	4.0
Suburban	7,100.00	83,985.00	6,718.80	8.0	
Western					

* Note—Northport Irrigation District made a toll assessment of $4.00 per acre on 1,600 acres using water in 1920, in addition to the 8 mills.

WATER DELIVERY SCHEDULE 1-A.

For the season of 1920 based upon corrected acreage reports filed prior to June 1st, 1920.

This schedule will govern the distribution of the natural flow of the Platte, North Platte and South Platte Rivers and the tributaries during periods of scarcity by the water commissioner.

Natural flow includes all waters in this water shed except storage water under control and released for use under contracts filed in the Department of Public Works.

Name of Ditch	No.	Stream	Amount in Second Feet			
			River East	River West	Trib. East	Trib. West
Trinnier Extension	A 1551	Greenwood Creek			1.65	
Airdale Canal No. 1	A 1508	Pumpkinseed Cr.			4.42	
Savins Ditch	A 1495	Buffalo Creek			2.29	
O'Holloran Ditch	A 1473	Seepage No. Platte		0.86		
Power	A 1472	No. Platte River				
Ramshorn Ditch	A 1465	Sheep Cr. Seepage				0.30
Atkins Ditch	A 1450	No. Platte River	2.86			
Atkins Ditch	A 1449	No. Platte River	2.86			
King's Canal	A 1440	Lawrence Fork			2.07	
Dobson Lateral	A 1436	Platte R. & R. W.		0.25		
French Ditch	A 1433	No. Platte River		3.04		
Dobson Ditch	A 1432	Red Willow seep				1.99
Sheep Cr. Lateral Co.	A 1403	Dri. Tri. to Sh. Cr.				0.29
Stone Irrigation Canal	A 1401	No. Platte River	0.60			
Sheep Cr. Lateral Co.	A 1398	Sheep Creek seep.				0.93
Cedar Creek Feeder	A 1397	Cedar Creek			3.85	
Airdale Canal No. 1	A 1380	Pumpkinseed Cr.			0.52	
Plum Creek Ditch & Res.	A 1344	Plum Creek			0.58	
John Bratt Ditch	A 1316	White Horse Cr.			5.60	
Roberts Ditch	A 1241	Spotted Tail Cr.				1.65
Peterson Ditch	A 1240	Otter Creek			0.67	
Hagerty Ditch	A 1238	Dougout Creek			1.30	
Coon Creek Ditch	A 1225	Coon Creek Ditch			2.28	
Gatch Ditch	A 1220	Spring Cr. Trib.				0.93
Dobson Lateral	A 1181	No. Platte River		1.00		
Sheep Creek Lateral	A 1176	Sheep Creek			5.15	
Kilpatrick Res. Ditch	A 1159	Snake Creek			19.90	
The Eggers Extension	A 1154	Blue Creek				
French Ditch	A 1149	No. Platte River		11.00		
Airdale Canal No. 2	A 1133	Pumpkinseed Cr.				1.50
Clear Creek Extension	A 1111	Clear Creek			1.10	
Kilpatrick Res. No. 1	A 1104	Snake Creek				
Brown Ditch	A 1072	Spotted Tail Cr.				2.30
Jackson Extension	A 1000	Horse Creek				1.07
State Line Ditch	A 994	Horse Creek				2.29
Gilmore Ditch	A 983	Horse Creek				2.93
Peters Ditch	A 913	Pumpkinseed Cr.				2.58
Sunflower Ditch Ext. 1	A 881	Owl Creek				0.58
Sunflower Ditch No. 2	A 879	Owl Creek				1.44
Power	A 868	Spring Creek				

WATER DELIVERY SCHEDULE 1-A (Continued).

Name of Ditch	No.		Stream	Amount in Second Feet			
				River East	River West	Trib. East	Trib. West
North Platte River	A	866	No. Platte River		1.00		
Meglemre Extension	A	853	Greenwood Creek			1.72	
Owl Creek Sunflower D.	A	770	Owl Creek				1.15
Interstate Canal	A	768	No. Platte River		1700.		
Northport Extension	A	768	No. Platte River		25.36		
Stewarts Reservoir	A	743	Spotted Tail Cr.				1.43
Reservoirs Nos.1 , 2 & 3	A	711	Pumpkinseed Cr.			2.36	
Airdale Canal No. 2	A	699	Pumpkinseed Cr.				3.23
Harper Ditch	A	669	Lawrence Fork				0.65
Niehus Ditch	A	550	Lawrence Fork				1.00
Power and Reservoir	A	545b	Wood River				
White Bridge Park	A	545a	Wood River				
Crigler Extension	A	486	Lawrence Fork				1.39
Schermerhorn Ditch	A	418	No. Platte River		30.00		
Sunflower Ditch	A	411	Owl Creek				0.64
State Line Ditch	A	407	Horse Creek				4.58
Western Irr. District	A	393	South Platte			205.00	
Gering Canal	A	365	No. Platte River		212.40		
LaMore or Lee Creek	A	327	North Platte			17.00	
Smith & Wheeler N. D.	A	842	Pumpkinseed Cr.			1.30	
Meyer Canal	A	283	So. Platte River	1.00			
Steamboat Ditch	A	186	No. Platte River		8.37		
Coon Creek Ditch	A	69	Coon Creek			2.29	
Finch Ditch	A	964	Clear Creek			1.44	
Holcomb Ditch	A	1	No. Platte River	11.90			
Reed Ditch	D	751	White Tail Creek			0.29	
Miller Ditch	D	740	Skunk Creek			0.86	
Mathews Canal	D	750	Mathews Creek			1.00	
Alfalfa Irr. District	D	738	No. Platte River	58.81			
Signal Bluff Ditch	D	807	No. Platte River	20.50			
Miller & Warren Ditch	D	805	So. Platte River			20.30	
Cozad Irr. Canal	D	626	Platte River	425.95			
Lyons Irr. Canal	D	803	No. Platte River	35.92			
Spohn Ditch	D	801	No. Platte River	12.26			
Paisley Ditch	D	800	Blue Creek			17.00	
Beerline Irr. Assn.	D	887	No. Platte River	29.72			
Oshkosh Canal	D	797	No. Platte River	38.88			
Dawson Co. Ditch	D	622	Platte River	171.00			
Gothenburg P. & I. Co.	D	645b	Platte River	361.20			
Spring Creek Ditch	D	724	Spring Creek				
Midland Canal	D	789	No. Platte River	12.80			
Elmore Canal	D	567	Snake Creek			16.00	
Round House Rock Ditch	D	884	Pumpkinseed Cr.			1.72	
Scotts & Williams Ditch	D	747	Clear Creek			1.00	
Last Chance Ditch	D	883	Pumpkinseed Cr.			6.45	
Graf Ditch	D	788	Blue Creek			31.29	
Paxton & Hershey Canal	D	653	No. Platte River	111.92			
Keith & Lincoln	D	722	No. Platte River	92.42			
Cody & Dillon Irr. Canal	D	649	No. Platte River	18.65			
Blue Creek District	D	785	Blue Creek			41.88	
Nine Mile Canal	D	925	North Platte	200.00			

WATER DELIVERY SCHEDULE 1-A (Concluded).

Name of Ditch	No.	Stream	Amount in Second Feet			
			River East	River West	Trib. East	Trib. West
Hooper Canal	D 781	Blue Creek			14.15	
Lisco Irr. District	D 856	No. Platte River	42.86			
Clear Creek Canal	D 754	Clear Creek			10.22	
Redington Ditch	D 893	Lawrence Fork				.52
Short Line Canal	D 946	No. Platte River		50.00		
Soehl Canal	D 697b	Lonergan Creek			2.86	
Ramshorn Canal	D 945	No. Platte River		35.44		
Alliance Canal	D 874	No. Platte River		59.00		
Cooper Ditch	D 872	Dougout Cr. SWL				.87
Schuetz Spring Canal	D 881	Schuetz Springs			0.30	
Nelson Canal	D 845	Greenwood Creek			2.60	
Brown's Creek Canal	D 857	No. Platte River	90.45			
Kah Ditch	D 944	No. Platte River		4.58		
Spring Branch Ditch	D 862	Lawrence Fork			1.00	
E. S. Crigler Ditch	D 861	Lawrence Fork			0.66	
Empire Canal	D 858	No. Platte River		27.50		
Patrick Ditch	D 725	Sand Creek			2.43	
Trinnier Canal	D 849	Greenwood Creek			1.86	
Cascade Ditch	D 1032	Otter Creek			3.40	
Chimney Rock Canal	D 844	No. Platte River		75.00		
Mutual Ditch	D 843	Pumpkinseed Cr.			2.80	
Holcomb's Ditch	D 636	Pawnee Creek			8.00	
Court House Rock I. D.	D 840	Pumpkinseed Cr.			18.00	
Power (Gothenburg)	D 645a	Platte River				
Gothenburg P. & L. Co.	D 836	Springs on Sec. 28			0.60	
Central Canal District	D 926	No. Platte River				33.60
Union Irr. & W. P. Can.	D 763	Blue Creek			19.60	
Radcliffe Ditch No. 3	D 1034c	Cedar Creek			0.80	
Belmont Canal	D 828	No. Platte River	214.30			
Logan Irr. Canal Co.	D 821	No. Platte River		2.40		
E. Lonergan Ditch	D 699	Lonergan Creek			8.60	
Airdale Canal No. 1	D 698	Pumpkinseed Cr.				5.50
Soehl Canal	D 697a	Lonergan Creek			2.90	
Castle Rock Irr. District	D 921	No. Platte River		84.10		
Farmer's Canal	D 918	No. Platte River		890.00		
Farmer's Can. (Pref. R.)	D 918	No. Platte River		24.00		
Heard's Ditch No. 1-2	D 916	Pumpkinseed Cr.				
Radcliffe Ditch No. 2	D 1034b	Cedar Creek			1.20	
North Platte Canal	D 635	No. Platte River	181.40			
Lamplough Lakes	D 1023	White Horse Cr.			6.30	
Kearney Water & E. Co.	D 1023	Platte River	140.00			
Power & Reservoir	D 1023	Platte River	22.00			
Nelson & Radcliffe D.	D 1034a	Cedar Creek			2.80	
Power & Reservoir	D 994	Wood River				

When the supply of water begins to fall below the total amount required by this schedule, canals will be closed by water commissioners beginning with the top of this list.

The following is the list of storage water contracts with the U. S. government:

Name	July	August	September	
Interstate				
Farmers Irrigation District	713	713/500	500/300	Ends .....October 15th
Gering Canal	151	151/110	110/65	Ends ..September 15th
Central Canal	18	18/12	00/00	Ends ....September ~~1st~~ 15th
Chimney Rock Canal	47	47/33	33/27	Ends ..September 15th
Belmont Canal	169	169/81	00/00	Ends ....September 1st
Brown's Creek Canal	85	83/70	70/50	Ends ....September 1st
Beerline Canal	14	14/8	00/00	Ends ....September 1st
Northport Irrigation District	20	20/10	10/00	Ends ..September 30th

Area irrigated from river east of Bridgeport.....158218 acres
Area irrigated from river west of Bridgeport.....227171 acres
Area irrigated from Tribs. east of Bridgeport..... 35628 acres
Area irrigated from Tribs. west of Bridgeport..... 5263 acres
Total .....426280 acres

WATER DELIVERY SCHEDULE 1-B.

For the season of 1920 based upon acreage reports filed prior to June 1st, 1920.

This schedule will govern the distribution of the natural flow of the streams in 1-B Water Shed.

When the supply of water begins to fall below the total amount required by this schedule, canals will be closed by water commissioners, beginning with the top of the list.

Name of Ditch	No.	Stream	Amount in Sec. Ft.
Farmers Canal	A 1573	Canyon Sec. 17-3-31	2.22
Geo. Wacker & Son	A 1523	Surplus Water of Fr. Irr. D	0.52
Power & Reservoir	A 1522	Cook Creek	
Lake Imperial	A 1487	Frenchman River	
Power & Reservoir	A 1474	Frenchman River	
Power & Reservoir	A 1442	Republican River	
Sylvan Dell	A 1340	Driftwood Creek	2.86
Hesterworth Irr. Wks	A 1332	Driftwood Creek	0.22
Schmitz Irr. Works	A 1287	Driftwood Creek	1.47
Kilpatrick Res. Ditch	A 1160	Kilpatrick Co. Res. No. 1	16.15
Burlington Pipe Line	A 1143	Mauer Springs	
Power & Reservoir	A 1136	Frenchman River	
Ext. Aberdeen Ditch	A 1117	Frenchman River	1.58
Power & Reservoir	A 1108	Frenchman River	
Hoko's Power & Pump	A 1094	Frenchman River	0.22
Jenkins L. & L. S. Co. D	A 924	Buffalo Creek	1.43
McDonald Ditch	A 644	Republican River So. Fork	1.43
Power & Reservoir	A 591	Frenchman River	
Bloomington Mill Riv	A 483	Big Cottonwood River	
Power & Reservoir	A 481	Big Cottonwood River	
Shallenberger Canal	A 423	Frenchman River	1.78
Benkelman Ditch	A 373	Spring Creek	1.43
North Side Irr. Ditch	A 246	Frenchman River	2.00
Chase Co. L. & L. S. Ditch	A 56	Stinking Water Creek	1.10
Maranville Ditch	D 70-71	Frenchman River	5.29
Grant & Aberdeen Dit	D 68	Frenchman River	1.00
McLain Ditch	D 65	Stinking	2.00
Riverside Canal	D 18	Frenchman River	9.92
Anders Anderson Dit	D 151	Republican River	0.29
Farmers Canal	D 10	Frenchman River	10.30
Aberdeen Ditch	D 50	Frenchman River	1.75
Champion W. P. & I. Dit	D 47	Frenchman River	23.86
Meeker Canal	D 4-7-8-9	Republican River	38.12
Dundy County Ditch	D 118	Republican River	17.12
Allen & Larned Ditch	D 117	Buffalo Creek	1.50
Allen & Larned Ditch	D 117	Buffalo Creek	4.50
Culbertson Canal	D 24-25 29-30	Frenchman River	134.20
Power & Reservoir	D 179	Frenchman River	
Power & Reservoir	D 178	Frenchman River	
Phelan Ditch	D 138	Rock Creek	4.29
Power & Reservoir	D 1036	Republican River, So. Fork	

WATER DELIVERY SCHEDULE 1-C.

For the season of 1920 based upon acreage reports filed prior to June 1st, 1920.

This schedule will govern the distribution of the natural flow of the streams in 1-C Water Shed.

When the supply of water begins to fall below the total amount required by this schedule, canals will be closed by water commissioners, beginning with the top of the list.

Name of Ditch	No.	Stream	Amount in Sec. Ft.
Crystal Lake	A 1526	Little Blue River	1.14
Power & Reservoir	A 1467	Little Blue River	
Power & Reservoir	A 1219	Little Blue River	
Power & Reservoir	D 991	Little Blue River	

Area irrigated ..... 80 acres

WATER DELIVERY SCHEDULE 1-D.

For the season of 1920 based upon acreage reports filed prior to June 1st, 1920.

This schedule will govern the distribution of the natural flow of the streams in 1-D Water Shed.

When the supply of water begins to fall below the total amount required by this schedule, canals will be closed by water commissioners, beginning with the top of the list.

Name of Ditch	No.	Stream	Amount in Sec. Ft.
Power & Reservoir	A 1521	Big Blue River	
Power & Reservoir	A 1520	Big Blue River	
Power & Reservoir	A 1506	Big Blue River	
Power & Reservoir	A 1476	Blue River	
Power & Reservoir	A 1463	Blue River	
Pipe Line at Seward	A 1395	Big Blue River	
Pipe Line at Wymore	A 1394	Big Blue River	
C. B. & Q. Pipe Line	A 1366	Big Blue River	
Power & Reservoir	A 1265	Big Blue River	
Power & Reservoir	A 1261	Big Blue River	
Power & Reservoir	A 1262	Big Blue River	
Power & Reservoir	A 1153	Big Blue River	
Power & Reservoir	A 1095	Big Blue River	
Power & Reservoir	A 1006	Big Blue River	
Power & Reservoir	D 1021	Big Blue River	

WATER DELIVERY SCHEDULE 1-E.

For the season of 1920 based upon acreage reports filed prior to June 1st, 1920.

This schedule will govern the distribution of the natural flow of the streams in 1-E Water Shed.

When the supply of water begins to fall below the total amount required by this schedule, canals will be closed by water commissioners, beginning with the top of the list.

Name of Ditch	No.	Stream	Amount in Sec. Ft.
A. G. Neuman Ditch	A 1445	Lodge Pole Creek	2.88
Soderquist Ditch	A 1420	Lodge Pole Creek	2.33
Wiegand Ditch No. 2	A 1323	Lodge Pole Creek	0.43
Wiegand Ditch No. 3	1 1322	Lodge Pole Creek	1.21
Soderquist Ditch	A 1237	Lodge Pole Creek	2.00
Ruttner Canal	A 906	Lodge Pole Creek	0.72
Kimball Storage	A 897	Lodge Pole Creek	97.35
Tracy Ditch	A 870	Lodge Pole Creek	0.58
Yoder Extension	A 857	Lodge Pole Creek	2.58
Ralton Irr. System	A 847	Lodge Pole Creek	2.58
Smith Ditch	A 850	Lodge Pole Creek	3.87
New Ruttner Ditch	A 727	Lodge Pole Creek	0.51
Bickel Ditch	A 724	Lodge Pole Creek	0.15
Bickel Ditch	A 719	Lodge Pole Creek	0.93
Nashland Ditch	A 661	Lodge Pole Creek	0.86
Neuman Ditch	A 611	Lodge Pole Creek	1.45
Wiegand Ditch	A 563	Lodge Pole Creek	2.15
Bushnell Ditch	A 504	Lodge Pole Creek	3.00
Maltese Cross Ditch	A 454	Lodge Pole Creek	0.22
Bullock Canal	A 437	Lodge Pole Creek	1.00
Adam Ditch	D 369	Lodge Pole Creek	0.50
Private Ditch	D 335	Lodge Pole Creek (Spr. Cr. Tr.)	
Lyngholm Ditch	D 337	Lodge Pole Creek	0.36
Adams Ditch	D 370	Lodge Pole Creek	1.43
Richard Kreuger Ditch	D 968	Lodge Pole Creek	1.00
Oberfelder Ditch	D 306	Lodge Pole Creek	2.00
Trognitz Canal	D 365	Lodge Pole Creek	0.86
Christensen Ditch	D 366	Lodge Pole Creek	1.00
Hurley, Lilly & Polly	D 354	Lodge Pole Creek	2.78
Adams Ditch	D 371	Lodge Pole Creek	1.43
Ickes Ditch	D 329	Lodge Pole Creek	1.15
Hoover Ditch	D 353	Lodge Pole Creek	0.80
Kreuger Ditch No. 1	D 325	Lodge Pole Creek	3.00
Hale Ditch No. 2	D 319	Lodge Pole Creek	0.43
Persinger Ditch	D 297	Lodge Pole Creek	4.58
Oberfelder Ditch	D 333	Lodge Pole Creek	0.86
Ruttner Ditch	D 350	Lodge Pole Creek	1.15
Oberfelder Ditch	D 307	Lodge Pole Creek (Spr. Cr. Tr.)	2.29
Young Ditch	D 349	Lodge Pole Creek	0.50
Polley & Garrard Ditch	D 344	Lodge Pole Creek	0.43
Polly Ditch	D 342	Lodge Pole Creek	0.79
Independent Ditch	D 343	Lodge Pole Creek	3.22

WATER DELIVERY SCHEDULE 1-E (Continued).

Name of Ditch	No.	Stream	Amount in Sec. Ft.
Brodwell Ditch	D 302	Lodge Pole Creek	0.86
Smeed Ditch	D 341	Lodge Pole Creek	1.43
Premier Ditch	D 340	Lodge Pole Creek	1.93
Bordwell Ditch	D 303	Lodge Pole Creek	1.43
Hale Ditch No. 1	D 318	Lodge Pole Creek	1.15
Upper Whitney Ditch	D 316	Lodge Pole Creek	2.30
Bordquist Ditch	D 301	Lodge Pole Creek	1.29
Bordquist Ditch	D 300	Lodge Pole Creek	0.72
Kreuger Ditch No. 2	D 324	Lodge Pole Creek	2.29
Wolf Ditch	D 813	Lodge Pole Creek	1.00
Kreuger Ditch No. 2	D 323	Lodge Pole Creek	1.15
Howard Ditch	D 336	Lodge Pole Creek	0.86
McAuliffe Ditch	D 814	Lodge Pole Creek	2.29
Booth's Canal	D 309-310	Lodge Pole Creek	4.30
Lower Whitney Ditch	D 317	Lodge Pole Creek	2.29
Hale Ditch No. 3	D 320	Lodge Pole Creek	0.58
Hale Ditch No. 4	D 321	Lodge Pole Creek	0.72
Hale Ditch No. 5	D 322	Lodge Pole Creek	0.58
Otto Perso Ditch	D 373	Lodge Pole Creek	2.50
Runge Ditch No. 2	D 338	Lodge Pole Creek	0.65
Runge Ditch No. 1	D 339	Lodge Pole Creek	1.43
Gunderson Ditch	D 305	Lodge Pole Creek	1.15
Bay State Ditch	D 347	Lodge Pole Creek	1.18
Urbach Ditch	D 308	Lodge Pole Creek	0.86

Area Irrigated ..... 13,390 acres

WATER DELIVERY SCHEDULE 2-A.

For the season of 1920 based upon acreage reports filed prior to June 1st, 1920.

This schedule will govern the distribution of the natural flow of the streams in 2-A Water Shed.

When the supply of water begins to fall below the total amount required by this schedule, canals will be closed by water commissioners, beginning with the top of the list.

Name of Ditch	No.	Stream	Amount in Sec. Ft.
Power & Reservoir	A 1460	Loup River, So. Br.	
Power & Reservoir	A 1400	Loup River, So. Br.	
Loup River M. Br.	A 1396	Loup River, M. Br.	
Pipe Line at Ravenna	A 1393	Loup River	
Power & Reservoir	A 1373	Loup River, M. Br.	
Austin Irr. Ditch	A 1330	Loup River, M. Br.	22.30
Lundy's Lake Pump P.	A 1307	Loup River, M. Br.	39.00
Lundy's Lake Canal	A 1300	Loup River, M. Br.	17.50
Loup Val. Irr. Canal	A 1294	Loup River, M. Br.	0.36
	A 1239	Mira Res.	0.66
Nursey Ditch	A 1226	Loup River, M. Br.	1.00
Power & Reservoir	A 1224	Loup River, M. Br.	
Power & Reservoir	A 1182	Mira Creek	
Power & Reservoir	A 639	Beaver River	
Power & Reservoir	A 636	Cedar River	
Jewett Ditch	A 113	Loup River, M. Br.	4.45
Gottberg Irr. Plant	A 2	Shell Creek	1.15
Giles Ditch	D 187	Goose Creek	10.00
Schmitt Irr. Canal	D 292a	Shell Creek	2.30
Power & Reservoir	D 292b	Shell Creek	
Victoria Ditch	D 213	Victoria Creek	6.00
Power & Reservoir	D 1037	Beaver Creek	
Power & Reservoir	D 988	Loup River, So. Br.	
Power & Reservoir	D 999	Muddy Creek	
Power & Reservoir	D 1024	Loup River, M. Br.	
Power & Reservoir	D 1042	Muddy Creek	

Area irrigated ..... 7,365 acres

WATER DELIVERY SCHEDULE 2-B.

For the season of 1920 based upon acreage reports filed prior to June 1st, 1920.

This schedule will govern the distribution of the natural flow of the streams in 2-B Water Shed.

When the supply of water begins to fall below the total amount required by this schedule, canals will be closed by water commissioners, beginning with the top of the list.

Name of Ditch	No.	Stream	Amount in Sec. Ft.
Power & Reservoir	A 1516	Oak Creek	
Power & Reservoir	A 484	Battle Creek	
Power & Reservoir	A 415	Silver Creek	
Power & Reservoir	A 271	Elkhorn River	
Power & Reservoir	A 996	Elkhorn River, No. Fork	
Power & Reservoir	D 998	Union & Taylor Creeks	

WATER DELIVERY SCHEDULE 2-C.

For the season of 1920 based upon acreage reports filed prior to June 1st, 1920.

This schedule will govern the distribution of the natural flow of the streams in 2-C Water Shed.

When the supply of water begins to fall below the total amount required by this schedule, canals will be closed by water commissioners, beginning with the top of the list.

Name of Ditch	No.	Stream	Amount in Sec. Ft.
Morton Nursery Irr. D.	A 1488	Niobrara River	0.50
George Hitshew Ditch	A 1260	Niobrara River	6.18
Mettlen Ditch	A 1248	Niobrara River	5.00
Bennett Ditch	A 1249	Niobrara River	4.00
Litchte Ditch	A 1088	Niobrara River	0.86
Power & Reservoir	A 1019	Niobrara River	
Power & Reservoir	A 961	Niobrara River	
Power & Reservoir	A 791	Niobrara River	
Kay Ditch	A 791	Niobrara River	
Fendrick Ditch	A 617	Niobrara River	0.27
Fendrick Ditch	A 616	Niobrara River	0.42
Montague Ditch	A 575	Niobrara River	0.72
Power & Reservoir	A 359	Minnechaduza	
Mettlen Ditch	A 292	Niobrara River	1.00
Hay Springs Canal	A 173	Niobrara River	9.43
Moore Ditch	A 88	Niobrara River	16.00
Home Ditch	A 65	Whistle Creek	6.86
Hughes Ditch	A 53	Niobrara River	4.58
Excelsior Ditch	D 568	Niobrara River	3.43
Snow Ditch	D 485	Nobrara River	3.00
Furman Ditch	D 462	Niobrara River	3.65
Power & Reservoir	D 970	Niobrara River	
Power & Reservoir	D 612a	Fairfield Creek	
Power & Reservoir	D 415	Pine Creek	
Bigelow & Seymour D.	D 510	Niobrara River	2.28
McLaughlin Ditch	D 566	Niobrara River	6.85
Pioneer Ditch	D 442	Niobrara River	6.00

Area irrigated ..... 5,671 acres

WATER DELIVERY SCHEDULE 2-D.

For the season of 1920 based upon acreage reports filed prior to June 1st, 1920.

This schedule will govern the distribution of the natural flow of the streams in 2-D Water Shed.

When the supply of water begins to fall below the total amount required by this schedule, canals will be closed by water commissioners, beginning with the top of the list.

Name of Ditch	No.	Stream	Amount in Sec. Ft.
Betson Ditch	A 1481	Dry Canon	1.00
Power & Reservoir	A 1475	Dry Draw	
Chaulk Ditch	A 1406	Butte Creek Trunk	1.82
Haish & Weston Ditch	A 1361	Dry Run	3.08
Power & Reservoir	A 1276	Cottonwood Little	
Broadhurst Ditch	A 1264	Cottonwood Little	3.29
Power & Reservoir	A 1132	Squaw Creek	
Wm. Lockler Ditch	A 1017	Beaver Creek	2.86
Souther Lake	A 915	Hooker Creek	1.43
Jones Ditch	A 860	Canyon Trib. to W. R.	0.22
Spring Crk. Ditch No. 2	A 788	Spring Creek	2.72
McDowell Storage Sys.	A 772	English Creek	0.86
Slattery Ditch	A 749	Dead Horse Creek	1.50
Forbes Ditch No. 1	A 663	Spring Creek	0.43
Stuart & Maple Ditch	A 656	Cottonwood Little	0.98
Porter & Rasmussen Dit.	A 562	Deadman Creek	0.58
Todd Ditch	A 520	Ash Creek E. B.	0.38
O'Donnell's Ditch	A 432	Bordeaux Ditch	0.29
Cooper Ditch	A 333	Squaw Creek	2.86
Brockway Ditch	A 256	White Clay Creek	2.29
Cooper Ditch	A 42	White Clay Creek	2.29
Stuart Bros. Ditch	A 8	Cottonwood Little	2.90
Braddock Ditch	D 423	Beaver Creek	0.36
Spring Creek Ditch No. 1	D 473	Spring Creek T. L. C.	2.72
Morrisey Canal	D 491	Bordeaux Creek	
Bacon Ditch	D 445	Bordeaux Creek	0.20
Country Ditch	D 983	Bordeaux Creek	0.15
Tub Wilson Ditch	D 453	Chadron Creek	0.20
Lt. Ash Creek Irr. Co. Dit.	D 452	Ash Creek Lt. B.	4.60
Adams Ditch	D 450	Bordeaux Creek	8.12
Gallup Ditch	D 426	Chadron Creek	
Power & Reservoir	D 1030	White River	
Mace Ditch	D 428	Ash Creek	1.00

Area irrigated ..... 3,450 acres

WATER DELIVERY SCHEDULE 2-E.

For the season of 1920 based upon acreage reports filed prior to June 1st, 1920.

This schedule will govern the distribution of the natural flow of the streams in 2-E Water Shed.

When the supply of water begins to fall below the total amount required by this schedule, canals will be closed by Water Commissioners beginning with the top of the list.

Name of Ditch	No.	Stream	Amount in Sec. Ft.
Story Ditch	A 1509	Dry Creek	3.86
Supplement to C. Jordan	A 1470	Res. under 1399 Monroe Creek	1.46
Kite Ditch	A 1469	Monroe Creek	2.18
Power Ditch Reservoir	A 1399	Monroe Creek	
Roy C. Child's Ditch	A 1376	Dry Gulches Cr.	0.17
Cornelius Jordon Dit	A 1375	Monroe Creek	1.60
Coffee & Son	A 1236	Hat Creek	3.43
Warbonnet Ditch No. 2	A 892	Warbonnet Creek	1.48
Neil Jordan Ditch	A 841	Monroe Creek	2.17
Wickersham Ditch	A 701	Boggy Creek	3.43
Connell Ditch	A 587	Long Branch	0.22
Wassenberger Ditch	A 581	Jim Creek Trib.	1.15
Litckett Ditch	A 549	Lickett Creek	2.00
Zimmerman Ditch	A 532	Sou Belly Creek	0.58
Story's Ditch	A 168	Antelope Creek, N. B	3.65
Turner Ditch	D 537	Antelope Creek	0.86
Garton Ditch	D 503	Spring Br. Tr. to So. Warbonnet Creek	0.29
Spring Creek Ditch	D 532	Spring Creek Tr. to Sou Belly	0.29
Slattery Ditch	D 543	Jim Creek	0.29
Jim Creek Ditch	D 502	Jim Creek	0.43
Montgomery Ditch	D 559	Sou Belly Creek	1.00
Daut Ditch	D 539a	Warbonnet Cr., N. Br.	0.72
Daut Bros. Ditch	D 981	Jim Creek	0.86
Old Sou Belly Ditch	D 533	Sou Belly Creek	3.15
Warbonnett Ditch	D 548	Warbonnet Cr., N. Br.	3.63
Power & Reservoir	D 1002	Bazile Creek	
Lickett Ditch	D 1005	Lickett Ditch	2.00

Area irrigated ..... 2,913 acres

CLAIMS AND APPLICATIONS GRANTED, PENDING AND ABANDONED.

The following tables give a complete list of all claims and applications for water granted by the Department of Public Works and which have never been cancelled; also claims and applications pending. Following each division will show table of abandoned claims and applications which our records show are subject to cancellation.

In these tables, the claims and applications have been arranged in each water division by stream in alphabetical order, and the appropriations on each stream are arranged according to priority on that stream. Those having docket numbers are claims made covering rights acquired under the law prior to April 4, 1895, and those having application numbers are applications for permits to appropriate water made under the law of 1895.

Appropriations marked "O. D." designate other than the original diversion and carry the priority date of the original appropriation.

Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Akers Draw (No. Platte)	Enterprise Irr. District	Scottsbluff	Nelson Ditch	O. D.	10.00	13	23	57	Scotts Bluff	March	28	1899	920	1290
Atkins Drain (No. Platte)	Atkins, A. W.	Bridgeport	Atkins Ditch	O. D.	2.80	15	19	49	Morrill	Dec.	19	1899	828	1450
Ash Creek	Gilliard, George	Lewellen	Gilliard Ditch	Irrig.	1.43	3	16	42	Garden	Dec.	31	1899	812	.....
Beaver Creek	C., B. & Q. R. R.	Lincoln	C., B. & Q. Water Sup.	Steam	1.00	8	12	14	Buffalo	July	26	1919	.....	1550
Beaver Lake	Baldridge, A. F.	Alliance	Beaver Ditch	Irrig.	170.00	16	20	44	Garden	Aug.	6	1910	.....	1018
Birdwood Creek	Bird Wood Irr. Dist.	No. Platte	Birdwood Ditch	Irrig.	100.00	35	15	33	Lincoln	Oct.	21	1893	✓ 646	.....
Birdwood Creek	Northouse, Ed.	Sutherland	West Birdwood Ditch	Irrig.	8.57	22	15	33	Lincoln	Jan.	16	1894	652	.....
Birdwood Creek	Saxson, Bert	Sutherland	Beaucamp Ditch	Irrig.	3.00	15	15	33	Lincoln	Sept.	19	1894	677	.....
Blue Creek	Union Irr. & W. P. Co.	Lewellen	Union Canal	Irrig.	20.00	18	16	42	Garden	May	16	1890	✓ 763	.....
Blue Creek	Iowa Irr. & Imp. Co.	Lewellen	Hooper Ditch	Irrig.	12.86	6	16	42	Garden	Sept.	7	1893	✓ 781	.....
Blue Creek	Blue Creek Irr. Dist.	Lewellen	Blue Creek Canal	Irrig.	39.00	33	17	42	Garden	Dec.	27	1893	✓ 785	.....
Blue Creek	Mecker Ditch Co.	Lewellen	Graf Ditch	Irrig.	33.00	19	16	42	Garden	April	2	1894	✓ 788	.....
Blue Creek	Winterer, Jacob H.	Lewellen	Blue Creek Canal	Irrig.	3.79	21	17	42	Garden	Sept.	27	1894	795	.....
Blue Creek	Paisley Irr. Dist.	Lewellen	West Side Ditch	Irrig.	17.00	28	17	42	Garden	Nov.	20	1894	✓ 800	.....
Blue Creek	Paisley Irr. Dist.	Lewellen	Paisley Ditch	Irrig.	1.00	28	17	42	Garden	July	14	1899	.....	515
Blue Creek	Eggers, J. E.	Lewellen	Blue Creek Canal	Irrig.	.42	33	17	42	Garden	Jan.	4	1912	.....	1154
Bronco Lake	Irwin, H. C.	Kimball	Bronco Lake Ditch	Irrig.	11.42	6	24	48	Box Butte	May	20	1919	.....	1541
Brown's Creek	Haxby, George H.	Bridgeport	Haxberry Ditch	Irrig.	.43	19	20	48	Morrill	July	17	1903	.....	717
Buffalo Creek	Savins, Richard T.	Lexington	Savins Ditch	Irrig.	2.28	22	10	21	Dawson	Aug.	18	1917	.....	1495

Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Buffalo Creek, W.	Jenson, Anton	Cozad	Jensen's Project	Irrig.	1.14	23	11	23	Dawson	Oct.	6	1919	.....	1558
Camp Creek	Wehn, J. W.	Alliance	Camp Creek Ditch	Irrig.	1.43	13	18	49	Morrill	Mar.	16	1892	866	.....
Carter's Creek	Gardner, William, and Ewing, Emerson	Gering	Carter Ditch	Irrig.	1.43	27	21	56	Scotts Bluff	Mar.	2	1920	.....	1579
Cedar Creek	Radcliffe, Mack	Sidney	Nelson - Radcliffe	Irrig.	2.77	28	18	48	Morrill	June	1	1882	1034a	.....
Cedar Creek	Radcliffe, Mack	Sidney	Radcliffe Ditch No. 2	Irrig.	1.23	34	18	48	Morrill	July	1	1885	1034b	.....
Cedar Creek	Radcliffe, Mack	Sidney	Radcliffe Ditch No. 3	Irrig.	.76	27	18	48	Morrill	Feb.	14	1890	1034c	.....
Cedar Creek	Bridgeport Irr. Dist.	Bridgeport	Belmont Feeder	Irrig.	5.00	23	18	48	Morrill	Jan.	7	1915	.....	1397
Cedar Creek	Bandaret, Frank	Paxton	Cedar Creek Ditch	Irrig.	1.57	17	14	35	Keith	Jan.	3	1911	.....	1051
Clear Creek	Hooper, D. C.	Lewellen	Clear Creek Ditch	Irrig.	2.86	32	16	41	Keith	July	1	1888	748	.....
Clear Creek	Clear Creek Irr. Co.	Lewellen	Barber Ditch	Irrig.	14.57	29	16	41	Keith	May.	30	1893	754	.....
Clear Creek	Green, Nelson A.	Lewellen	Barber Ditch	Irrig.	1.14	32	16	41	Keith	May	30	1893	756	.....
Clear Creek	Green, Nelson A.	Lewellen	Barber Ditch	Irrig.	1.14	29	16	41	Keith	June	1	1893	745	.....
Clear Creek	Clark, Wesley, and Bairn, John	Lewellen	William's Ditch	Irrig.	1.00	28	16	41	Keith	May	18	1894	747	.....
Clear Creek	Barber, Frank H.	No. Platte	Finch Ditch	Irrig.	1.43	4	15	41	Keith	June	30	1895	964	.....
Clear Creek	Clear Creek Irr. Co.	Lewellen	Barber Ditch	Irrig.	1.14	31	16	41	Garden	July	5	1911	.....	1111
Cold Water Cr.	Lisco Irr. Dist.	Lisco	Cold Water Ditch	Irrig.	4.29	26	18	46	Deuel	Sept.	28	1894	796	.....
Coon Creek	Winterer, William H.	Keystone	Coon Creek Ditch	Irrig.	.71	34	15	37	Keith	July	3	1895	.....	69
Coon Creek	Winterer, William H.	Keystone	Coon Creek Ditch	Irrig.	1.42	34	15	37	Keith	Sept.	16	1911	.....	1225

Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Crescent Lake	Lake Water Carrying Co.	Lewellen	Crescent Lake Project	Supple		21	20	44	Garden	Jan.	30	1920 ✓		1575
(Blue Creek)	Lake Water Carrying Co.	Lewellen	Union Canal	Irrig.	20.00	18	16	42	Garden	May	16	1890	763	1575
(Blue Creek)	Lake Water Carrying Co.	Lewellen	Hooper Ditch	Irrig.	12.86	6	16	42	Garden	Sept.	7	1893	781	1575
(Blue Creek)	Lake Water Carrying Co.	Lewellen	Blue Creek Canal	Irrig.	39.00	33	17	42	Garden	Dec.	27	1893	785	1575
(Blue Creek)	Lake Water Carrying Co.	Lewellen	Graf Ditch	Irrig.	33.00	19	16	42	Garden	Apr.	2	1894	788	1575
(Blue Creek)	Lake Water Carrying Co.	Lewellen	Blue Creek Canal	Irrig.	3.79	21	17	42	Garden	Sept.	27	1894	795	1575
(Blue Creek)	Lake Water Carrying Co.	Lewellen	West Side Ditch	Irrig.	17.00	28	17	42	Garden	Nov.	20	1894	800	1575
(Blue Creek)	Lake Water Carrying Co.	Lewellen	Paisley Ditch	Irrig.	1.00	28	17	42	Garden	July	14	1899		515 (1575)
(Blue Creek)	Lake Water Carrying Co.	Lewellen	Blue Creek Canal	Irrig.	.42	33	17	42	Garden	Jan.	4	1912		1154 (1575)
Deep Cold Creek	Finn, J. L.	Dalton	Finn Bros. Ditch	Irrig.	.50	28	18	49	Morrill	July	1	1890	836	
Dugout Cr. Lower	Hagerty, M. H.	Broadwater	Cooper Ditch	Irrig.	.86	4	19	48	Morrill	Aug.	15	1892 ✓	872	
Dugout Cr. Lower	Mulloy, Francis C.	Irving	Mulloy Ditch	Irrig.	1.00	27	27	48	Morrill	July	18	1907		865
Dugout Cr. Lower	Hagerty, M. H.	Broadwater	Hagerty Ditch	Storage	34 AF	4	19	48	Morrill	Oct.	26	1912		1238
Dugout Cr. Lower	Hagerty, M. H.	Broadwater	Klondyke Reservoir	Irrig.	1.00	4	19	48	Morrill	Oct.	26	1912		1547
Golden Creek	Theis, M. J.	Ogalalla	Theis Ditch	Irrig.	2.71	25	15	39	Keith	Sept.	17	1895		160
Greenwood Cr.	Keenan, Mary K.	Fond Du Lac, Wisconsin	Trinnier	Irrig.	6.29	28	18	50	Morrill	April	6	1891	849	
Greenwood Cr.	Keenan, Mary K.	Fond Du Lac, Wisconsin	Nelson Ditch	Irrig.	3.00	33	18	50	Morrill	April	1	1892	845	
Greenwood Cr.	Shannon Bros.	Bridgeport	Capron Ditch	Irrig.	2.00	15	18	50	Morrill	Jan.	1	1893 ✓	890	
Greenwood Cr.	Meglemre, C. E.	Bridgeport	Meglemre Ditch	Irrig.	.59	10	18	50	Morrill	May	6	1896		294

Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Greenwood Cr.	Meglemre, C. E.	Bridgeport	Meglemre Ditch	Irrig.	1.14	10	18	50	Morrill	Mar.	11	1907	.....	853
Greenwood Cr.	Trott, James S.	Bridgeport	Trott Ditch	Irrig.	.....	10	18	50	Morrill	Dec.	14	1910	.....	1045*
Greenwood Cr.	Keenan, Mary K.	Fond Du Lac, Wisconsin	Trinnier	Irrig.	1.65	28	18	50	Morrill	Aug.	18	1919	.....	1551
Horse Creek	Mihan, John, Est.	Morrill	State Line Ditch	Irrig.	3.07	33	23	58	Scotts Bluff	Sept.	10	1897	.....	407
Horse Creek	Braziel-Marsh	Morrill	Marsh-Braziel Ditch	Irrig.	7.19	4	22	60	Wyoming	Nov.	24	1908	.....	921
Horse Creek	Gilmore Ditch Assn.	Morrill	Gilmore Ditch	Irrig.	9.00	33	23	58	Scotts Bluff	Feb.	21	1910	.....	983
Horse Creek	Mihan, John, Est.	Morrill	State Line Ditch	Irrig.	2.00	33	23	58	Scotts Bluff	Apr.	21	1910	.....	994
Horse Creek	Casteel-Husted	Morrill	Jackson Extension	Irrig.	1.00	27	23	58	Scotts Bluff	May	19	1910	.....	1000
Hoth Draw (No. Platte River)	O'Holloran, James	Bayard	O'Holloran Ditch	O. D.	1.00	28	21	52	Morrill	Sept.	16	1887	918	1473
Hoth Draw	Great Western Sugar Co.	Scottsbluff	Pump Line Bayard Fac.	Mfg.	.....	34	21	52	Morrill	Oct.	4	1920	.....	1593*
Huntington Spgs.	Cord, Fred	Hull	Cord Ditch	Irrig.	1.43	9	20	58	Scotts Bluff	Dec.	23	1904	.....	778
Indian Creek	Mann, John H.	Bridgeport	Wastewater Ditch	O. D.	2.30	30	21	50	Morrill	Sept.	19	1904	.....	768 1455
Jess Lake	Stearns, F. E.	Morrill	Jess Lake Pipe Line	Drain	.....	25	26	44	Scotts Bluff	Oct.	18	1917	.....	1502*
Kiowa Creek	Currie, Edw. A.	Mitchell	Currie Ditch	Irrig.	9.14	13	21	57	Scotts Bluff	Mar.	23	1892	938	.....
Lawrence Fork	Simms and Postal	Bridgeport	Laing Ditch	Irrig.	.50	28	18	52	Morrill	Dec.	31	1886	825	.....
Lawrence Fork	Lindburg, Fred R.	Bridgeport	E. S. Crigler Ditch	Irrig.	.57	1	18	52	Morrill	Sept.	11	1891	861	.....
Lawrence Fork	Neihus, J. W.	Redington	Spring Branch	Irrig.	1.00	11	18	52	Morrill	Oct.	23	1891	862	.....
Lawrence Fork	Neihus, J. W.	Redington	Redington Ditch	Irrig.	.50	11	18	52	Morrill	May	1	1893	893	.....
Lawrence Fork	Neihus, J. W.	Redington	Spring Branch Ext.	Irrig.	.57	1	18	52	Morrill	Oct.	13	1898	.....	476
Lawrence Fork	Lindburg, Fred	Bridgeport	Crigler Ext.	Irrig.	1.43	1	18	52	Morrill	Nov.	25	1898	.....	486

Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Lawrence Fork	Neihus, Dora	Redington	Neihus Ditch	Irrig.	.86	11	18	52	Morrill	Mar.	23	1900	.....	550
Lawrence Fork	Neihus, J. W.	Redington	Harper Ditch	Irrig.	1.43	11	18	52	Morrill	May	27	1902	.....	669
Lawrence Fork	Harper - Neihus	Redington	Harper Ditch No. 2	Irrig.	2.00	1	18	52	Morrill	June	16	1902	.....	674
Lawrence Fork	Simms and Postal	Bridgeport	Randall Ditch	Irrig.	2.57	21	18	52	Morrill	May	15	1911	.....	1100
Lawrence Fork	King, Wm. O.	Kearney	Kings Canal	Irrig.	4.00	15	18	52	Morrill	Dec.	8	1915 ✓	.....	1440
Lawrence Fork	King, Wm. O.	Kearney	Kings Canal	Irrig.	1.00	15	18	52	Morrill	July	3	1920	.....	1587
Lonergan Creek	Soehl, Herman A.	Lemoyne	Soehl Canal	Irrig.	2.00	17	15	39	Keith	May	10	1889	697a	.....
Lonergan Creek	Jacobs, Lee	Lemoyne	E. Lonergan Ditch	Irrig.	9.14	17	15	39	Keith	May	25	1889	699	.....
Lonergan Creek	Soehl, Herman A.	Lemoyne	Soehl Canal	Irrig.	.86	17	15	39	Keith	April	27	1893	697b	.....
Lonergan Creek	Harris, F. H.	Lemoyne	Haney Ditch	Irrig.	1.14	17	15	39	Keith	July	1	1893	719	.....
Mathews Creek	Mathews, Benjamin G.	Keystone	Mathews Canal	Irrig.	1.14	28	15	37	Keith	April	1	1893	750	.....
Nine Mile Draw (North Platte)	Nine Mile Irr. Dist.	Bayard	Nine Mile Canal	O. D.	79.00	10	21	53	Morrill	Dec.	6	1893	925	1431
No. Platte River	Platte Valley Irr. Dist.	Hershey	North Platte Canal	Irrig.	300.00	13	14	34	Lincoln	May	31	1884 ✓	635	.....
No. Platte River	Farmers Irrigation Dist.	Scottsbluff	Farmers Canal	Irrig.	1142.86	3	23	58	Scotts Bluff	Sept.	16	1887 ✓	918	.....
(Hoth Draw)	O'Holloran, James	Bayard	O'Holloran Ditch	O. D.	.....	3	23	58	Scotts Bluff	Sept.	16	1887	918	1473
No. Platte River	Minatare Mutual Canal and Irr. Co.	Minatare	Minatare Ditch	Irrig.	249.43	32	22	54	Scotts Bluff	Jan.	14	1888 ✓	919	.....
No. Platte River	Winter Creek Irr. Co.	Scottsbluff	Winter Creek Canal	Irrig.	124.29	17	22	55	Scotts Bluff	Oct.	18	1888 ✓	952	.....
(Winter Creek)	Winter Creek Can. Co.	Scottsbluff	Winter Creek Canal	O. D.	.....	19	22	54	Scotts Bluff	Oct.	18	1888	952	1446
No. Platte River	Enterprise Irr. Dist.	Scottsbluff	Enterprise Ditch	Irrig.	173.71	27	23	57	Scotts Bluff	Mar.	28	1889 ✓	920	.....
(Akers Draw)	Enterprise Irr. Dist.	Scottsbluff	Nelson Ditch	O. D.	.....	13	23	57	Scotts Bluff	Mar.	28	1889	920	1290

Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
No. Platte River	Castle Rock Irr. Dist.	McGrew	Castle Rock Canal	Irrig.	82.57	4	21	54	Scotts Bluff	Apr.	18	1889 ✓	921	.....
No. Platte River	Mont, Charles E.	Bridgeport	Logan Ditch	Irrig.	5.71	19	20	50	Morrill	Oct.	17	1889	821	.....
No. Platte River	Bridgeport Irr. Dist.	Bridgeport	Belmont Canal	Irrig.	270.00	18	20	51	Morrill	Dec.	19	1889 ✓	828	.....
(Atkins Drain)	Atkins, A. W.	Bridgeport	Atkins Ditch	O. D.	.....	15	19	49	Morrill	Dec.	19	1889	828	1450
No. Platte River	Central Irrigation Dist.	Gering	Central Canal	Irrig.	36.00	27	22	55	Scotts Bluff	June	23	1890 ✓	926	.....
No. Platte River	Meyers, T. A. et. al.	Ogalalla	Myers-Phelps Canal	Irrig.	7.14	34	15	39	Keith	Sept.	11	1890	709	.....
No. Platte River	Sheridan, J. Wake, Est.	Paxton	Sheridan-Wilson Ditch	Irrig.	10.00	20	14	35	Keith	Oct.	9	1890	710	.....
No. Platte River	Chimney Rock Irr. Dist.	Chimney Rock	Chimney Rock Canal	Irrig.	60.00	1	20	53	Morrill	Dec.	3	1890 ✓	844	.....
No. Platte River	Chimney Rock Irr. Dist.	Chimney Rock	Chimney Rock Canal	Irrig.	.....	1	20	53	Morrill	Dec.	3	1890	1031	.....
No. Platte River	Empire Canal Co.	Bridgeport	Empire Canal	Irrig.	28.57	18	20	51	Morrill	June	25	1891 ✓	858	.....
No. Platte River	Jurgens, Otto (Adm. Est. of D. Kah	Minatare	Kah Ditch	Irrig.	4.57	11	21	54	Scotts Bluff	Nov.	1	1891	944	.....
No. Platte River	Brown Creek Irr. Dist.	Bridgeport	Browns Creek Canal	Irrig.	188.71	20	20	50	Morrill	Jan.	20	1892 ✓	857	.....
No. Platte River	Brown Creek Irr. Dist.	Bridgeport	Browns Creek Canal	Irrig.	.....	20	20	50	Morrill	Jan.	20	1892	1033	.....
No. Platte River	Alliance Irrigation Dist.	Bridgeport	Alliance Canal	Irrig.	86.00	5	20	52	Morrill	Dec.	26	1892 ✓	874	.....
No. Platte River	Alliance Irrigation Dist.	Bridgeport	Alliance Can. & W. P.	Irrig.	.....	5	20	52	Morrill	Dec.	26	1892	1035	.....
(Red Willow)	Alliance Irrigation Dist.	Bridgeport	Alliance Canal	O. D.	.....	6	20	51	Morrill	Dec.	26	1892	874	1429
No. Platte River	Ramshorn Irr. Dist.	Morrill	Ramshorn Ditch	Irrig.	45.71	13	23	58	Scotts Bluff	Mar.	20	1893 ✓	945	.....
(Sheep Creek)	Ramshorn Irr. Dist.	Morrill	Ramshorn Ditch	O. D.	.....	21	23	57	Scotts Bluff	Mar.	20	1893	945	1465
No. Platte River	Short Line Irr. Dist.	Bayard	Short Line Canal	Irrig.	65.57	25	21	53	Scotts Bluff	May	1	1893 ✓	946	.....
No. Platte River	Lisco Irrigation District	Lisco	Lisco Ditch	Irrig.	32.86	14	18	47	Morrill	July	1	1893 ✓	856	.....

Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate S	T	R	County	Date of Priority Month	D	Yr.	Docket No.	App. No.
		Cody Land + Cattle Co.												
No. Platte River	Nine Mile Irr. District	Bayard	Nine Mile Canal	Irrig.	100.00	18	21	53	Scotts Bluff	Dec.	6	1893	925	.....
(Nine Mile Draw)	Nine Mile Irr. District	Bayard	Nine Mile Canal	O. D.	.....	10	21	53	Morrill	Dec.	6	1893	925	1431
No. Platte River	~~O. W. Waller Co.~~	North Platte	Cody-Dillon Canal	Irrig.	127.90	9	14	31	Lincoln	Dec.	29	1893	649	.....
No. Platte River	Keith-Lincoln Co. Irr. D.	Sutherland	Keith-Lincoln Canal	Irrig.	95.00	18	14	36	Keith	Feb.	2	1894	722	.....
No. Platte River	Paxton-Hershey Wat. Co.	Hershey	Paxton-Hershey Canal	Irrig.	130.00	18	14	33	Lincoln	Feb.	12	1894	653	.....
No. Platte River	Lisco Irrigation District	Lisco	Lisco Ditch	Irrig.	4.00	14	18	47	Morrill	Mar.	27	1894	787	.....
No. Platte River	North River Irr. District	Lisco	North River Ditch	Irrig.	16.00	14	18	47	Morrill	Mar.	27	1894	787	.....
No. Platte River	Suburban Irr. District	North Platte	Suburban Canal	Irrig.	124.00	12	14	33	Lincoln	May	22	1894	662	.....
No. Platte River	Roberts, C. F.	Oshkosh	Midland Canal	Irrig.	12.00	2	16	44	Garden	June	9	1894	789	.....
No. Platte River	Countryman, Charles	Lewellen	Overland Canal	Irrig.	20.00	1	16	44	Garden	Aug.	14	1894	791	.....
No. Platte River	Oshkosh Irrigation Dist.	Oshkosh	Oshkosh Canal	Irrig.	40.00	33	17	44	Garden	Oct.	5	1894	797	.....
No. Platte River	Beerline Canal Co.	Broadwater	Beerline Canal	Irrig.	30.00	24	19	49	Morrill	Oct.	13	1894	887	.....
No. Platte River	Spohn, William	Oshkosh	Spohn Ditch	Irrig.	13.14	13	17	45	Garden	Dec.	6	1894	801	.....
No. Platte River	Rush Creek Irr. Can. Co.	Lisco	Rush Creek Canal	Irrig.	9.64	2	17	46	Garden	Dec.	11	1894	802	.....
No. Platte River	Lyons Irrigation Dist.	Oshkosh	Lyons Canal	Irrig.	42.14	30	17	44	Garden	Dec.	22	1894	803	.....
No. Platte River	Orr, George B. et al.	Lewellen	Orr-Vance Canal	Irrig.	2.93	29	16	42	Garden	Dec.	24	1894	811	.....
No. Platte River	Western Land & Cattle Co., c/o ~~W. R. Taylor~~	Omaha	Signal Bluff Ditch	Irrig.	30.13	16	16	43 42	Garden	Jan.	16	1895	807	.....
No. Platte River	Jacobs, Lee	Ogalalla	Hay Land Canal	Irrig.	5.71	29	15	39	Keith	Jan.	19	1895	732	.....
No. Platte River	Theis, Perry J.	Ogalalla	Fernstron - Nissen	Irrig.	4.00	25	15	39	Keith	Mar.	23	1895	737	.....
No. Platte River	Alfalfa Irrigation Dist.	Ogalalla	Alfalfa Canal	Irrig.	100.00	1	15	42	Keith	Mar.	25	1895	738	.....
No. Platte River	Bushnell, H. J. and E. L.	Oshkosh	Bushnell Ditch	Irrig.	7.14	12	16	44	Garden	Mar.	27	1895	809	.....
No. Platte River	Steamboat Irr. Dist.	Gering	Steamboat Ditch	Irrig.	6.20	4	21	54	Scotts Bluff	Oct.	27	1895	.....	186
No. Platte River	North River Irr. Dist.	Lisco	North River Ditch	Irrig.	67.00	14	18	47	Morrill	Feb.	24	1896	.....	243
No. Platte River	Lisco Irrigation District	Lisco	North River Ditch	Irrig.	9.00	14	18	47	Morrill	Feb.	24	1896	.....	243
No. Platte	~~North Platte~~ Oshkosh I. Dist.	Oshkosh	Oshkosh-n	"	2.29									

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76.00 ? Garden

CLAIMS AND APPLICATIONS BY STREAMS IN DIVISION NO. 1-A—(Continued).

Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
			Lisco Cr. Canal											
No. Platte River....	Remick Duer Co.	Broadwater....	~~Lamore Ditch~~	Irrig.	20.00	34	19	48	Morrill.....	July	18	1896	.....	327
No. Platte River....	Steamboat Irr. Dist.	Gering.....	Steamboat Ditch.....	Irrig.	.71	4	21	54	Scotts Bluff....	July	22	1896	.....	350
No. Platte River...	Spanogle, Mark, Adm.....	Bridgeport.....	Tetreault Ditch No. 2....	Irrig.	3.43	1	19	50	Morrill.....	Aug.	15	1896	.....	353
No. Platte River...	Gering Irrigation Dist...	Gering.....	Gering Canal.....	Irrig.	208.62	4	23	58	Scotts Bluff....	Mar.	15	1897	.....	365
No. Platte River...	Schermerhorn, A. D.	Omaha.....	Schermerhorn Canal.....	Irrig.	29.71	16	20	51	Morrill.....	Oct.	25	1897	.....	418
									Scottsbluff	approx	14	1902		660
No. Platte River....	Secretary of Interior, U. S. R. S.	Mitchell.....	Interstate Canal.....	Irrig.	.....	19	29	83	Wyoming.....	Sept.	19	1904	.....	768
No. Platte River....	Liebhardt Bros.	Denver.....	Empire Extension.....	Irrig.	1.00	18	20	51	Morrill.....	July	20	1907	.....	866
No. Platte River....	Lisco Irrigation District	Lisco.....	Lisco Ditch.....	Irrig.	3.00	14	18	47	Garden.....	Apr.	6	1910	.....	991
No. Platte River....	French, John E.	Henry.....	French Ditch.....	Irrig.	11.00	9	23	60	Wyoming.....	Dec.	21	1911	.....	1149
No. Platte River....	Dobson, W. A.	Carrolton, Mo.	Dobson Lateral.....	Irrig.	1.14	5	20	52	Morrill.....	Feb.	28	1912	.....	1181
No. Platte River....	Stone, Myron K.	Lisco.....	Stone Canal.....	Irrig.	1.00	28	18	46	Morrill.....	Jan.	19	1915	.....	1401
No. Platte River....	French, John E.	Henry.....	French Ditch.....	Irrig.	3.14	9	23	60	Wyoming.....	Sept.	11	1915	.....	1433
No. Platte River....	Dobson, W. A.	Carrolton, Mo.	Dobson Lateral.....	Irrig.	.25	5	20	52	Morrill.....	Nov.	3	1915	.....	1436
No. Platte River....	Liebhardt Bros.	Denver, Colo	Liebhardt Lateral.....	Irrig.	2.90	6	20	52	Morrill.....	Mar.	1	1916	.....	1448
No. Platte River....	Intermountain Railway Light and Power Co.	Colo. Springs.	Gering Hydro-Elec. Pl.	Power	250.00	28	22	55	Scotts Bluff....	April	15	1916	.....	1452
(Indian Creek)....	Mann, John H.	Bridgeport.....	Wastewater Ditch.....	O. D.	.....	30	21	50	Morrill.....	Sept.	19	1904	.....	1455 and 768
No. Platte River...	U. P. Railway Co.	Omaha.....	Locomotive Water Sup..	Power	1.00	29	14	30	Keith.....	Jan.	19	1917	.....	1472
No. Platte River...	U. P. Railway Co.	Omaha.....	Frazier Lake.....	Ice	4.00	35	14	30	Lincoln.....	Sept.	6	1907	.....	868
No. Platte River....	French, John E.	Henry.....	French Ditch Ext.....	Irrig.	.60	9	23	60	Wyoming.....	Mar.	20	1920	.....	1581
N. Platte, Spring Creek, Trib.....	Gatch, Charles.....	Melbeta.....	Gatch Ditch.....	Irrig.	.93	25	21	54	Scotts Bluff....	Aug.	21	1912	.....	1220
No. Platte, Barrow Pit Trib.....	Taylor, A. O.	Minatare.....	Barrow Pit Ditch.....	Irrig.	.29	19	21	52	Scotts Bluff....	Apr.	23	1904	.....	751

Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Otter Creek	Fairchild, Louis F.	Lemoyne	Cascade Ditch	Irrig.	3.30	4	15	40	Keith	Apr.	1	1891	1032	
Otter Creek	Nissen, Pete & Co.	Belmar	Otter Canal	Irrig.	11.00	5	15	40	Keith	May	24	1912		1198
Otter Creek	Peterson, E. J.	Lemoyne	Holcomb Ditch	Irrig.	15.49	5	15	40	Keith	Nov.	6	1912		1
Otter Creek	Peterson, E. J.	Lemoyne	Peterson Ditch	Irrig.	1.32	5	15	40	Keith	Nov.	6	1912		1240
Owl Creek	Kellums, John H.	Morrill	Sunflower Ditch	Irrig.	.79	12	22	58	Scotts Bluff	Sept.	17	1897		411
Owl Creek	Kellums, John H.	Morrill	Sunflower Ditch	Irrig.	1.14	12	22	58	Scotts Bluff	Oct.	10	1904		770
Owl Creek	Kellums, John H.	Morrill	Sunflower Ditch No. 2	Irrig.	1.14	12	22	58	Scotts Bluff	Nov.	29	1907		879
Owl Creek	Kellums, John H.	Morrill	Sunflower Ext. No. 1	Irrig.	.57	12	22	58	Scotts Bluff	Nov.	29	1907		881
Owl Creek	Marfindale, Ora	Gering	Martinale Ditch	Irrig.		18	21	56	Scotts Bluff	May	21	1920		1584
Pawnee Creek	Kent-Burke Company	Omaha	Kent-Burke	Irrig.	8.00	13	13	28	Lincoln	Oct.	18	1890	636	
Platte River	Central Power Co.	Grand Island	Kearney Canal	Irrig.	22.00	3	8	16	Buffalo	Sept.	10	1882	1023	
				Power	140.00									
Platte River	Gothenburg L. & P. Co.	Gothenburg	Gothenburg Canal	Power	200.00	29	12	26	Lincoln	July	5	1890	645a	
Platte River	Dawson County Irr. Co.	Lexington	Dawson Canal	Irrig.	1142.86	18	10	23	Dawson	June	26	1894	622	
Platte River	Gothenburg L. & P. Co.	Gothenburg	Gothenburg Canal	Irrig.	240.00	29	12	26	Lincoln	Sept.	22	1894	645b	
Platte River	Six Mile Ditch Co.	Gothenburg	Six Mile Ditch	Irrig.	40.00	11	11	26	Lincoln	Oct.	22	1894	680	
Platte River	Gothenburg So. Side Irr. Co.	Gothenburg	Gothenburg S. Canal	Irrig.	357.14	30	12	26	Lincoln	Oct.	26	1894	681	
Platte River	Cozad Irrigation Co.	Cozad	Cozad Canal	Irrig.	614.29	15	11	25	Dawson	Dec.	28	1894	626	
Platte River	So. Side Irrigation Co.	Cozad	Orchard - Alfalfa	Irrig.	300.00	9	10	24	Dawson	Jan.	23	1895	627	
Platte River	Appleford, Henry	Maxwell	Appleford Canal	Irrig.	2.86	15	13	29	Lincoln	Mar.	28	1895	690	
Platte River	Central Power Co.	Grand Island	Central Power Plant	Power	485.00	3	8	18	Buffalo	Feb.	12	1920		1577
Platte River	Central Power Co.	Grand Island	Central Pwr. Co. St. Pl.	Steam	925.00	29	11	8	Merrick	Aug.	12	1920		1588
Platte River	Steele, Charles	Elm Creek	Cottonwood Canal	Irrig.		7	8	18	Phelps	Aug.	26	1920		1589

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Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Plum Creek	Eggers, Thomas	Lewellen	Plum Creek Reservoir	Irrig.	1.14	23	16	42	Garden	Jan.	12	1914		1344
Pumpkinseed	Zingg, Henry N.	Platte Center	Heard's Ditches, Nos. 1 and 2	Irrig.	1.29	14	19	54	Banner	June	1	1887	916	
Pumpkinseed	Olson, Albert H.	Harrisburg	Logan Ditch	Irrig.	4.00	7	19	55	Banner	July	16	1890	902	
Pumpkinseed	Court House Rk. Irr. Co.	Bridgeport	Court House R. Canal	Irrig.	30.50	30	19	50	Morrill	Oct.	6	1890	840	
Pumpkinseed	Court House Rk. Irr. Co.	Bridgeport	Court House R. Canal	Irrig.		30	19	50	Morrill	Oct.	6	1890	1028	
Pumpkinseed	Trinnier, Mrs. Daisy	Denver, Colo.	Smith - Wheeler	Irrig.	1.57	26	19	51	Morrill	Oct.	16	1890	842	
Pumpkinseed	Mutual Ditch Co.	Redington	Mutual Ditch	Irrig.	8.57	33	19	52	Morrill	Nov.	1	1890	843	
Pumpkinseed	Sweet, C. A.	Omaha	Meredith - Ammer	Irrig.	18.86	23	19	50	Morrill	Feb.	20	1893	876	
Pumpkinseed	Finn-Trott	Bridgeport	Last Chance	Irrig.	8.00	27	19	50	Morrill	Apr.	12	1894	983	
Pumpkinseed	Loy, Mrs. E. P.	Bridgeport	Round House Rock	Irrig.	3.00	28	19	51	Morrill	May	29	1894	884	
Pumpkinseed	Boyd, P. D.	Redington	Maxwell Ditch	Irrig.	.50	23	19	52	Morrill	June	30	1894	885	
Pumpkinseed	Quinn, T. E.	Bridgeport	Bird Cage Ditch	Irrig.	1.00	20	19	51	Morrill	June	1	1895	892	
Pumpkinseed	Trinnier, Mrs. Daisy	Denver, Colo.	Smith - Wheeler N. Ditch	Irrig.	.71	26	19	51	Morrill	June	1	1896	842	
Pumpkinseed	Cluck, Millard	Harrisburg	Peters Ditch	Irrig.	2.57	34	20	56	Banner	July	1	1902	913	
Pumpkinseed	Airedale Ranch and Cattle Co.	Scottsbluff	Airedale Canal No. 1	Irrig.	5.52	2	19	55	Banner	Jan.	24	1903		698
Pumpkinseed	Airedale Ranch and Cattle Co.	Scottsbluff	Airedale Canal No. 2	Irrig.	3.22	1	19	55	Banner	Jan.	24	1903		699
Pumpkinseed	Simon, Lincoln G.	Sidney	Res. Nos. 1, 2 and 3	Irrig.	1.31	7	19	55	Banner	June	24	1903		711
Pumpkinseed	Airedale Ranch and Cattle Co.	Scottsbluff	Airedale Canal No. 2	Irrig.	1.57	1	19	55	Dawes	Oct.	26	1911		1133
Pumpkinseed	Airedale Ranch and Cattle Co.	Scottsbluff	Airedale Canal No. 1	Irrig.	.51	2	19	55	Banner	Sept.	4	1914		1380
Pumpkinseed	Airedale Ranch and Cattle Co.	Scottsbluff	Airedale Canal No. 1	Irrig.	10.00	3	19	55	Banner	June	23	1915		1458

Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Pumpkinseed	Green, Thomas L.	Scottsbluff	Airedale Canal No. 3	Irrig.	4.41	2	19	55	Banner	Mar.	15	1918	.....	1508
Pumpkinseed	Quinn, T. E.	~~Bridgeport~~	Quinn Ditch	Irrig.	.02	20	19	51	Morrill	Oct.	15	1919	.....	1561
	E.C. Cunningham Leonard, now			~~Stor.~~	0.86					Sept	10	1915		
Red Willow	Dobson, W. A.	Carrolton, Mo.	Dobson Lateral	Irrig.	~~2.00~~	12	20	51	Morrill	~~Feb.~~	~~28~~	~~1912~~	.....	1432
Red Willow	Alliance Irrigation Dist.	Bridgeport	Alliance Canal	O. D.	60.00	6	20	51	Morrill	Dec.	26	1892	874	1429
Sand Creek	Smith Bros.	Lemoyne	Smith Ditch	Irrig.	7.00	10	15	40	Keith	May	20	1889	698	.....
Sand Creek	Dudley, W. H.	Lemoyne	Patrick Ditch	Irrig.	2.43	3	15	40	Keith	May	31	1891	725	.....
Sand Creek	Nissen, Peter	Lemoyne	Nissen Ditch	Irrig.	3.07	10	15	40	Keith	Mar.	18	1901	.....	606
Seep from Lake	Huffman, M. J.	Gering	Huffman Ditch	Irrig.	6.43	26	21	54	Scotts Bluff	Mar.	19	1909	.....	937
Schuetz Springs	Schuetz, Louis	Bridgeport	Schuetz Canal	Irrig.	.21	28	18	50	Morrill	May	10	1892	.....	881
Sheep Creek	Sheep Lateral Co.	Morrill	Sheep Creek Lateral	Irrig.	5.00	8	23	57	Scotts Bluff	Feb.	26	1912	.....	1176
Sheep Creek (No. Platte)	Ramshorn Irrigation Dist.	Morrill	Ramshorn Ditch	O. D.	13.00	21	23	57	Scotts Bluff	Mar.	20	1893	945	1465
Sheep Creek	Sheep Cr. Lateral Co.	Morrill	Sheep Creek Lateral	Irrig.	.92	8	23	57	Scotts Bluff	Jan.	12	1915	.....	1398
Sheep Creek Draw, Trib. to	Sheep Cr. Lateral Co.	Morrill	Sheep Creek Lateral	Irrig.	.28	17	23	57	Scotts Bluff	Feb.	20	1915	.....	1403
Skunk Creek	Knight, H. H.	Keystone	Miller Ditch	Irrig.	2.29	1	14	37	Keith	Apr.	1	1895	740	.....
Snake Creek	Kilpatrick Bros.	Beatrice	Oasis Ditch	Irrig.	54.86	6	24	51	Box Butte	June	6	1894	567	.....
Snake Creek	Kilpatrick Bros.	Beatrice	Kilpatrick Res. No. 1	Stor.	65000 Ac. Ft.	1	24	52	Box Butte	June	7	1911	.....	1104
Kilpatrick Res Snake Creek	Kilpatrick Bros.	Beatrice	Kilpatrick ~~Res. No. 2~~ Ditch	Irrig.	200.00	6	24	51	Box Butte	Jan.	25	1912	.....	1159

Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate S	T	R	County	Date of Priority Month	D	Yr.	Docket No.	App. No.
So. Platte River	Hollingsworth, A.	Ogalalla	Hollingsworth Ditch	Irrig.	30.00	12	13	39	Keith	June	5	1894	723	
So. Platte River	Stebbins, Lucien	North Platte	Stebbins Canal	Irrig.	30.00	32	14	32	Lincoln	Dec.	17	1894	683	
So. Platte River	Miller & Kimball Co.	Big Springs	Miller - Warren	Irrig.	53.86	7	12	42	Deuel	Jan.	5	1895	805	
So. Platte River	Ryans, J. T.	Brule	Home Ditch	Irrig.	3.14	30	13	40	Keith	Mar.	2	1895	736	
So. Platte River	Myer, Henry	Brule	Myer Canal	Irrig.	1.46	22	13	40	Keith	Apr.	14	1896		283
So. Platte River	Western Irrigation Dist	Big Springs	Western Ditch	Irrig.	~~180.29~~	29	13	41	Deuel	June	14	1897		393
Platte River	Brown, C. M.	Kearney	Tail Race Canal	Irrig.	1.28	3	8	16	Buffalo	Jan.	16	1917		1471
Spotted Tail, Dry	Severns, Viola	Gering	Roberts Ditch	Irrig.	2.00	16	23	56	Scotts Bluff	Nov.	6	1912		1241
Spotted Tail, Dry	Stewart, H. G.	Morrill	Stewart Power Plant	Power	50.00	16	23	56	Scotts Bluff	Mar.	2	1920		1578
Spotted Tail, Dry	Great Western Sugar Co.	Scottsbluff	Mitchell Factory	Dom.	15.00	21	23	56	Scotts Bluff	Mar.	24	1920		1582
Spotted Tail, Wet	Wallace, Wm. E.	Mitchell	Stewart Reservoir	Irrig.	1.43	2	23	56	Scotts Bluff	Mar.	2	1904		743
Spotted Tail, Wet	Wallace, Wm. E.	Mitchell	Brown's Ditch	Irrig.	2.28	2	23	56	Scotts Bluff	Mar.	17	1911		1072
Spring Branch	Brogan Bros.	Keystone	Brogan Bros. Ditch	Irrig.	.57	35	15	37	Keith	Sept.	24	1897		416
Spring Creek	Peterson, E. J.	Lemoyne	Spring Creek Ditch	Irrig.	.57	12	15	40	Keith	June	18	1894	724	
Spring Creek	Freiday, Florian F.	Lexington	Freiday Canal	Irrig.	1.00	20	9	20	Dawson	Nov.	25	1910		1040
Spring Creek, Lit.	Keystone Irrig. Co.	Keystone	Lit. Spring Ditch	Irrig.	.57	29	15	37	Keith	Apr.	1	1903		659
Spring Creek, Lit.	Beatty, Wallace D.	Scottsbluff	Shramek Canal	Irrig.	1.50	22	22	55	Scotts Bluff	June	9	1913		1295
Spring Creek, Lit.	McClenahan, E.	Scottsbluff	Shramek's Ext.	Irrig.	.57	22	22	55	Scotts Bluff	July	30	1917		1492
Spring Creek, Lit.	Nelson, Martin	Scottsbluff	Ext. of Shramek's Canal	Irrig.	.14	22	22	55	Scotts Bluff	June	3	1918		1515
White Horse Cr.	Lamplough, Harry	North Platte	Lamplough's Lake	Irrig.	2.86	8	14	30	Lincoln	Dec.	31	1883	668	~~658~~
White Horse Cr.	Bratt, John	North Platte	John Bratt Ditch	Irrig.	6.00	9	14	30	Lincoln	Aug.	25	1913		1316

Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
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White Tail Creek..	Keystone Irrigation Co...	Keystone.....	Halloway - Phelps.....	Irrig.	4.00	36	15	38	Keith.....	June	1	1892	717	.....
White Tail Creek..	Leonard Bros.	Keystone.....	Little Dandy.....	Irrig.	2.00	22	15	38	Keith.....	Oct.	12	1894	727	.....
White Tail Creek..	Keystone Irrigation Co...	Keystone.....	Foster - Keystone.....	Irrig.	18.36	26	15	38	Keith.....	Oct.	30	1894	730	.....
White Tail Creek..	Noble, Bert A.	Keystone.....	Reed Ditch.....	Irrig.	.57	15	15	38	Keith.....	May	15	1895	751	.....
White Tail Creek..	Keystone Irrigation Co...	Keystone.....	Keystone Canal.....	Irrig.	51.71	26	15	38	Keith.....	Apr.	26	1902	.....	662b
White Tail Creek..	Keystone Irrigation Co...	Keystone.....	Keystone Ditch.....	Irrig.	4.30	26	15	38	Keith.....	Nov.	30	1906	.....	843
White Tail Creek..	Keystone Irrigation Co...	Keystone.....	W. Keystone Ditch.....	Irrig.	1.75	26	15	38	Keith.....	May	27	1910	.....	1001
White Tail Creek.	Keystone Irrigation Co...	Keystone.....	Keystone Ditch.....	Irrig.	9.86	27	15	38	Keith.....	May	27	1910	.....	1003
Wht. Tail, Spring Cr., Trib. to.....	Keystone Irrigation Co...	Keystone.....	Spring Creek Ditch.....	Irrig.	1.57	19	15	37	Keith.....	June	21	1890	704	.....
Wht. Tail, Springs Trib. to.....	Keystone Irrigation Co...	Keystone.....	Spring Ditch No. 1.....	Irrig.	1.13	19	15	37	Keith.....	May	27	1910	.....	1002
Wild Horse Draw	McCarter, Frank.....	Bayard.....	McCarter Power Plant..	Power	.....	34	21	52	Morrill.....	Jan.	18	1920	.....	1572*
Wind Springs.....	Lamcomer, Geo. & Chas.	Gering.....	Wind Springs Canal.....	Irrig.	1.43	12	24	55	Sioux.....	Mar.	1	1892	954	.....
Winters Creek.....	Bouton, Charles A.	Gering.....	Bouton's Ditch.....	Irrig.	1.00	3	22	54	Scotts Bluff....	Aug.	17	1889	923	.....
Winters Creek.....	Shumway, G. L.	Scottsbluff.....	.....	Power	.....	8	22	54	Scotts Bluff....	Jan.	3	1911	.....	1050*
Winter Creek (No. Platte).....	Winter Creek Irr. Co.....	Scottsbluff.....	Winter Creek Canal.....	O. D.	70.00	19	22	54	Scotts Bluff....	Oct.	18	1888	952	1446
Winter Creek, Trib. No. Platte	Shields, Thos. and Barbour, William M...	Scottsbluff.....	Winter Cr. Power Canal	Power	100.00	8	22	54	Scotts Bluff....	Dec.	22	1916	.....	1468
Winter Creek.....	Barbour, William M.	Scottsbluf.....	Winter Cr. Power Plant	Power	.....	8	22	54	Scotts Bluff....	Mar.	6	1919	.....	1536*
Winter Creek.....	Great Western Sugar Co.	Scottsbluff.....	Main Water Supply Scottsbluff Factory.....	Mfg.	15.00	19	22	54	Scotts Bluff....	Oct.	4	1920	.....	1592
Wood River.....	Ashburn, J. N.	Gibbon.....	Ashburn Canal.....	Power	40.00	13	9	14	Buffalo.....	Nov.	1	1873	993	.....

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Wood River	Shelton Mill and G. Co.	Shelton	Shelton Canal	Power	40.00	1	9	13	Buffalo	Oct.	16	1873	994	.....
Wood River	Bearss, Guy S.	Kearney	Bearss Canal	Power	25.40	13	9	16	Buffalo	May	1	1881	995	.....
Wood River	Klein, J. J.	Kearney	White Bridge Park	Irrig.	.03	8	9	15	Buffalo	Mar.	14	1900	.....	545a
Wood River	Klein, J. J.	Kearney	White Bridge Park	Power	10.00	8	9	15	Buffalo	Mar.	14	1900	.....	545b
Wood River	Jacobson, C. A.	Riverdale	Jacobson's Canal	Irrig.	.50	31	10	16	Buffalo	Nov.	10	1910	.....	1038
Wood River	Kimbrough, Cora	Shelton	Kimbrough Canal	Irrig.	4.00	36	10	13	Buffalo	Sept.	21	1912	.....	1227
Wood River	Quail, T. J.	Miller	Wood River Ditch	Irrig.	2.29	14	11	18	Buffalo	May	1	1913	.....	1286
Wood River	Jacobson, C. A.	Riverdale	Jacobson's Canal	Stor.	9000AF	31	10	16	Buffalo	Feb.	3	1920	.....	1576
Wood River	Hang, James	Shelton	Hang's Project	Irrig.	.....	9	9	13	Buffalo	Sept.	7	1920	.....	1590

STREAM	NAME OF APPLICANT	Use to which Applied	Sec. Feet Granted	LOCATION OF HEADGATE				Doc. No.	App. No.
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Ash Creek	Vance, Rocoe	Irrig.	1.14	27	16	42	Garden	765	.....
Ash Creek	McCormick, C.	Irrig.	.....	16	16	42	Garden	1011	.....
Blue Creek	Slessar, David	Power	62.60	4	18	43	Garden	.....	1009
Buckhorn Spring	Maddox, P. P.	Irrig.	2.28	8	14	36	Keith	.....	918
Buffalo Creek	Absalom, Henry	Irrig.	.07	23	11	23	Dawson	.....	570
Fremont Creek	Eq. Farm & S. Imp. Co.	Irrig.	9.29	15	13	30	Lincoln	686	.....
Greenwood Creek	Keenan, Mrs. Mary K.	Irrig.	4.00	15	18	50	Morrill	830	.....
Greenwood Creek	Dean, H. T.	Irrig.	8.86	10	18	50	Morrill	.....	844
Horse Creek	Marsh & Braziel	Irrig.	13.00	4	22	60	Wyoming	.....	1126
Horse and Owl Creek	Pizer, H. J.	Irrig.	.86	34	23	58	Scotts Bluff	.....	742
Kiowa Creek	Kellums, J. H.	Irrig.	2.43	11	22	58	Scotts Bluff	.....	641
Kiowa Creek	Lowry, Ellis	Irrig.	.52	31	22	57	Scotts Bluff	.....	746
Kiowa Creek	Kellums, J. H.	Irrig.	.57	1	22	58	Scotts Bluff	.....	880
Lawrence Fork	Gilman & Crigler	Irrig.	.57	36	19	52	Morrill	820	.....
Middle Creek	Bartling, Henry	Irrig.	.29	28	18	51	Morrill	870	.....
Middle Creek	Bartling, Henry	Irrig.	.29	28	18	51	Morrill	891	.....

STREAM	NAME OF APPLICANT	Use to which Applied	Sec. Feet Granted	LOCATION OF HEADGATE S	T	R	County	Doc. No.	App. No.
North Platte River	Bridgeport Irr. Dist.	Irrig.	115.71	18	20	51	Morrill	....	902
North Platte River	Hale, Will A.	Irrig.	11.43	21	22	55	Scotts Bluff	941	....
North Platte River	Clark, Henry T.	Irrig.	9.43	22	20	51	Morrill	875	....
North Platte River	So. Side I. & L. Co.	Irrig.	270.00	14	14	34	Lincoln	667	....
North Platte River	Keith, Morrill C.	Irrig.	71.00	36	14	30	Lincoln	657	....
North Platte River	Maycock, Joseph	Irrig.	5.71	10	23	58	Scotts Bluff	950	....
North Platte River	Smith, Agustus	Irrig.	20.00	36	14	30	Lincoln	676	....
North Platte River	Hannah Irr. Canal Co.	Irrig.	5.71	24	18	47	Morrill	886	....
North Platte River	Williams, E. C. et al.	Irrig.	26.57	35	16	42	Garden	804	....
North Platte River	Gyger, J. C.	Irrig.	10.86	10	16	44	Garden	806	....
North Platte River	Dikeman, S. F.	Irrig.	30.00	9	14	32	Lincoln	684	....
North Platte River	Hubbard, E.	Irrig.	65.70	20	14	30	Lincoln	691	....
North Platte River	Johnson, E. A.	Irrig.	....	10	12	27	Lincoln	654	....
North Platte River	~~Frank, Wm.~~ Farmers Irr. Dist	Irrig.	600.00	3	23	58	Scotts Bluff	....	660
North Platte River	McCaffree, F. S.	Power	500.00	3	23	58	Scotts Bluff	....	1499
Pawnee Creek	Murphy, E. D.	Irrig.	8.57	29	13	27	Lincoln	669	....
Pawnee Creek	Plumer, Wm. H.	Irrig.	10.00	19	13	27	Lincoln	672	....
Platte River	Farmer D. & C. Co.	Irrig.	280.00	17	13	29	Lincoln	666	....
Platte River	Farmers Irrig. Co.	Irrig.	114.00	25	10	23	Dawson	621	....
Platte River	Fowles, Russell H.	Irrig.	27.14	29	13	28	Lincoln	673	....
Platte River	Appleford, Henry	Irrig.	10.00	15	13	29	Lincoln	....	674
Platte River	Sides, Leroy	Irrig.	20.00	13	8	14	Kearney	629	....
Platte River	Platte River Irr. Co.	Irrig.	400.00	13	9	22	Dawson	624	....
Platte River	Farmers Mut. Irr. Co.	Irrig.	180.00	12	8	16	Buffalo	234 235 628	....

not all abandoned part in Farmers Irr. Dist

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Platte River	McCullough, John	Irrig.	30.00	35	13	28	Lincoln	679	.....
Platte River	Booker, H. C	Irrig.	100.00	16	11	25	Dawson	625	.....
Platte River	Lincoln-Dawson Co. Irr. Dist	Irrig.	642.86	9	13	29	Lincoln	687	.....
Pumpkinseed	Wright, John S	Irrig.	2.00	5	19	54	Banner	904	.....
Pumpkinseed	Hampton, R. R. & W. D	Irrig.	1.29	25	20	57	Banner	906	.....
Pumpkinseed	Kelley, Wm. J	Irrig.	1.43	5	19	54	Banner	915	.....
Pumpkinseed	Wright, John S	Irrig.	2.86	5	19	54	Banner	905	....
Pumpkinseed	Waitman, P. P	Irrig.	2.86	25	19	53	Banner	847	.....
Pumpkinseed	Endered, Chas. O	Irrig.	1.00	21	19	53	Banner	903	.....
Pumpkinseed	Reddish, Fred	Irrig.	1.43	25	19	51	Morrill	888	.....
Pumpkinseed	Coulter, Warren	Irrig.	.36	24	19	51	Morrill	889	.....
Pumpkinseed	Wisner, S. R. et al	Irrig.	.....	23	19	53	Banner	917	.....
Pumpkinseed	Beatty, D. E	Irrig.	.84	8	19	55	Banner	.....	839
Pumpkinseed	Belden, Jno.	Irrig.	.43	29	19	50	Morrill	.....	851
Pumpkinseed	Johnson, Theodore	Irrig.	2.29	2	19	55	Banner	819	.....
Pumpkinseed	Pierson, A. H	Irrig.	1.71	31	20	56	Banner	.....	888
Pumpkinseed	Beatty, Daisy E	Irrig.	.19	5	19	55	Banner	.....	1004
Pumpkinseed	Seeley, W. J	Irrig.	.57	28	19	52	Morrill	.....	1052
~~Sand~~ Gravel Creek	Maddox & Sillasen	Irrig.	15.70	9	14	36	Keith	.....	974
Sheep Creek	Nicholas, Yorick	Irrig.	1.00	10	24	58	Scotts Bluff	.....	745
Sheep Creek	Covert, Pitt	Irrig.	3.57	36	27	58	Sioux	.....	859
Sheep Creek	West Fork Ditch Co	Irrig.	5.14	1	26	58	Sioux	.....	871
Sheep Creek	Cunningham, H. B	Irrig.	.37	11	25	58	Sioux	.....	875
Sheep Creek	Speese, R. L	Irrig.	1.79	25	26	58	Sioux	.....	876

STREAM	NAME OF APPLICANT	Use to which Applied	Sec. Feet Granted	LOCATION OF HEADGATE				Doc. No.	App. No.
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Sheep Creek	Speese, R. L.	Irrig.	1.29	25	26	58	Sioux	.....	877
Sheep Creek	Speese, R. L.	Irrig.	2.86	36	27	58	Sioux	.....	885
Sheep Creek	Cunningham, H. B.	Irrig.	2.50	2	25	58	Sioux	.....	890
Sheep Creek	Hovey, Ethel L.	Irrig.	.27	19	26	57	Sioux	.....	873
Skunk Creek	Maddox, P. P.	Irrig.	5.00	6	14	36	Keith	.....	968
South Platte	Eaton, John	Irrig.	20.00	25	13	41	Keith	755	.....
South Platte	Searle, E. M.	Irrig.	2.86	17	13	39	Keith	744	.....
South Platte	Shireman, W. H.	Irrig.	1.43	17	13	39	Keith	733	.....
South Platte	Kimball, W. Et Al.	Irrig.	8.93	35	13	42	Deuel	810	.....
Spotted Tail Creek	Stewart, H. G.	Irrig.	1.00	10	23	56	Scotts Bluff	.....	449
Spotted Tail Creek	Whitehead, Jas. T.	Power	10.00	26	24	56	Sioux	.....	1215
Spring Creek, Little	Gilchrist, M. B.	Irrig.	.14	22	22	55	Scotts Bluff	.....	1310
Springs and Slough	Cundall, Harry	Irrig.	.71	19	20	51	Morrill	.....	1148
Stream	Newberry, H.	Irrig.	1.14	22	14	32	Lincoln	688	.....
Willow Creek	Everett, R. L.	Irrig.	.57	16	19	56	Banner	.....	650
Willow Creek	Everett, R. L.	Irrig.	.86	16	19	56	Banner	.....	651
White Tail Creek	McCarthy, John M.	Irrig.	1.00	36	15	38	Keith	749	.....
White Tail Creek	McGinley, Geo.	Irrig.	1.42	36	15	38	Keith	.....	420
Wind Springs	Smith, Jas. S.	Irrig.	2.86	12	24	55	Sioux	.....	986

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Big Cottonwood	Hansberry, J. T.	Bloomington	Bloomington Ditch	Irrig.	.50	25	2	16	Franklin	Dec.	31	1881	185	.....
Big Cottonwood	Siegel, Lewis A.	Bloomington	Bloomington Mill	Power	6.00	25	2	16	Franklin	Nov.	23	1898	.....	483
				Irrig.	1.57									
Buffalo Creek	Allen, Frank B. et al	Haigler	Allen - Larned	Irrig.	6.00	18	1	40	Dundy	Oct.	16	1890	117	.....
Buffalo Creek	Porter, J. R. & Son	Haigler	Porter Ditch	Irrig.	2.86	1	1	41	Dundy	Nov.	26	1890	171	.....
Buffalo Creek	Jenkins, Charles T.	Haigler	Jenkins Ditch No. 1	Irrig.	4.29	18	1	40	Dundy	Dec.	12	1908	.....	924
Buffalo Creek	Porter Land & Inv. Co.	Haigler	J. R. Porter Ditch	Irrig.	3.32	1	1	41	Dundy	June	23	1913	.....	1298
Brush Creek	Lofton, Frank S.	McCook	Brush Creek Reservoir	Stor.	3.50	3	2	29	Red Willow	June	1	1912	.....	1201
Canyon No. 10 Frenchman R.	Wacker, George	Culbertson	Wacker Ditch	O. D.	.70	17	3	31	Hitchcock	Dec.	19	1893	10	1523
Canyon No. 10 Frenchman R.	Farmers Canal Co.	Culbertson	Farmers Canal	O. D.	2.21	17	3	31	Hitchcock	Dec.	19	1893	10	1573
Cook Creek	Haskell, W. G.	Alma	Cook Creek Canal	Irrig.	1.42	33	2	18	Harlan	July	21	1917	.....	1491
Cook Creek	Shaffer, Frank	Alma	Shaffer Ditch	Irrig.	1.08	33	2	18	Harlan	July	10	1918	.....	1517
Cook Creek	Shaffer, Frank	Alma	Shaffer Ditch	Stor.		33	2	18	Harlan	Aug.	24	1918	.....	1522
Crooked Creek	Kaley, C. H.	Red Cloud	Fish Pond	Fish	1.00	1	1	11	Webster	May	7	1902	.....	665
Crooked Creek	Slawson, E. R.	Red Cloud	Slawson Ice Pond	Stor.	.75	1	1	11	Webster	Aug.	8	1912	.....	1213
Driftwood Creek	Schmitz, Mrs. J. A.	McCook	Schmitz Irr. Works	Irrig.	1.50	12	2	30	Red Willow	May	3	1913	.....	1287
Driftwood Creek	Hesterworth, John T.	McCook	Hesterworth Irr. Works	Irrig.	1.00	14	2	30	Red Willow	Nov.	17	1913	.....	1332
Driftwood Creek	Wasson, Monroe A.	McCook	Sylvan Dell	Irrig.	2.80	1	2	30	Red Willow	Dec.	6	1913	.....	1340
Elk Creek	Murray, Esther	Arapahoe	Murray Irr. Works	Irrig.	2.85	11	4	23	Furnas	Aug.	13	1913	.....	1315
Frenchman R.	Athey, H. E.	Wauneta	Wauneta Mills	Power	35.00	11	5	36	Chase	July	31	1886	178	.....

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Frenchman R.	Est. of M. H. Yaw	Champion	Champion Mills	Power	28.30	21	6	39	Chase	Dec.	31	1887	179	.....
Frenchman R.	Sheridan, R. B.	McCook	Aberdeen Ditch	Irrig.	2.00	3	5	38	Chase	July	1	1888	50a	.....
Frenchman R.	McGillen, W. J.	Imperial	Harlem Ditch	Irrig.	2.00	1	5	38	Chase	July	1	1888	56	.....
Frenchman R. and Stinking Water Creek	Frenchman Valley Irr. District	Culbertson	Culbertson Canal	Irrig.	215.00	31	5	33	Hayes	May	16	1890	24-25, 29-30	.....
Frenchman R.	Kilpatrick Bros.	Beatrice	Champion Ditch	Irrig.	24.00	23	6	40	Chase	Dec.	23	1890	47*	.....
Frenchman R.	Sheridan, R. B.	McCook	Aberdeen Ditch	Irrig	.50	3	5	38	Chase	Feb.	2	1891	50b	.....
Frenchman R.	Farmers Canal Co.	Culbertson	Farmers Canal	Irrig.	10.00	11	3	32	Hitchcock	Dec.	19	1893	10	.....
Canyon No. 10.	Wacker, George	Culbertson	Wacker Ditch	O. D.	.70	17	3	31	Hitchcock	Dec.	19	1893	10	1523
Canyon No. 10.	Farmers Canal Co.	Culbertson	Farmers Canal	O. D.	2.21	17	3	31	Hitchcock	Dec.	19	1893	10	1573
Frenchman R.	Fuller, C. B.	Imperial	Fuller Ditch	Irrig.	25.00	4	5	36	Chase	June	12	1894	62	.....
Frenchman R.	Riverside Irr. Co.	Culbertson	Riverside Canal	Irrig.	12.00	33	4	32	Hitchcock	July	28	1894	18	.....
Frenchman R.	Dissmore, George A.	Des Moines, I.	Frenchman Valley Canal	Irrig.	10.00	32	5	33	Hayes	Aug.	23	1894	38	.....
Frenchman R.	Groesback, Rose	Omaha	Gould Ditch	Irrig.	2.00	1	5	38	Chase	Oct.	9	1894	67	.....
Frenchman R.	Sheridan, R. B.	McCook	Grant - Aberdeen Ditch	Irrig.	2.00	3	5	38	Chase	Oct.	16	1894	68	.....
Frenchman R.	Maranville, E. et al.	Champion	Maranville Ditch	Irrig.	6.00	12	6	41	Chase	Dec.	8	1894	70, 71	.....
Frenchman R.	Wise, J. S.	Palisade	Wise Ditch	Irrig.	2.00	15	5	35	Hayes	Dec.	28	1894	42	.....
Frenchman R.	Woods, John and Francis	Wauneta	N. Gurnsey Ditch	Irrig.	5.00	3	5	37	Chase	Jan.	14	1895	74	.....
Frenchman R.	Woods, John and Francis	Wauneta	S. Gurnsey Ditch	Irrig.	24.00	10	5	37	Chase	Jan.	14	1895	75	.....
Frenchman R.	Inman, Norton	Champion	Inman Ditch	Irrig.	1.50	17	6	40	Chase	Feb.	28	1895	79	.....
Frenchman R.	Kilpatrick Bros.	Beatrice	No. Side Ditch	Irrig.	.79	21	6	39	Chase	Feb.	25	1896	.....	246
Frenchman R.	Shallenberger, George	Elwood	Shallenberger Canal	Irrig.	1.77	25	6	39	Chase	Dec.	21	1897	.....	423
Frenchman R.	Inman Irrigation Co.	Imperial	Inman Ditch	Irrig.	6.43	17	6	40	Chase	Feb.	10	1898	.....	436
Frenchman R.	Hoke, J. A.	Champion	Creamery Ditch	Power	34.40	21	6	39	Chase	Dec.	12	1900	.....	591
Frenchman R.	Follett - Krotter	Palisade	Follet - Krotter	Irrig.	4.20	35	5	34	Hayes	April	30	1903	.....	705

* Docket 47—24.00 S. F. Amount affirmed by Supreme Court.

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						S	T	R	County	Month	D	Yr.		
Frenchman R.	Follett - Krotter	Palisade	Follet - Krotter	Irrig.	2.57	35	5	34	Hayes	Aug.	11	1903	.....	720
Frenchman R.	Krotter, F. C.	Palisade	Follet - Krotter	Irrig.	10.46	35	5	34	Hayes	Jan.	15	1910	.....	975
Frenchman R.	Krotter, F. C.	Palisade	Krotter Power Plant	Power	55.00	35	5	34	Hayes	Aug.	17	1910	.....	1021
Frenchman R.	Krotter, F. C.	Palisade	Krotter Power Plt. No. 3	Irrig.	2.42	35	5	34	Hayes	Dec.	15	1910	.....	1047
Frenchman R.	Hoke, J. A.	Champion	Hoke's Pwr. & P. Plant	Irrig.	2.28	21	6	39	Chase	May	1	1911	.....	1094
Frenchman R.	Kilpatrick Bros.	Beatrice	Kilpatrick Res. No. 1	Stor.	1000.00 A. F.	23	6	40	Chase	June	22	1911	.....	1108
Frenchman R.	Sheridan, R. B.	McCook	Ext. of Aberdeen	Irrig.	1.57	2	5	38	Chase	July	29	1911	.....	1117
Frenchman R.	Theobald & Athey	Wauneta	Wauneta Power Plant	Power	75.00	11	5	36	Chase	Nov.	16	1911	.....	1136
Frenchman R.	Arteburn, E. E.	Lincoln	Arteburn Storage Res.	St.-Irr.	160.00	11	6	41	Chase	Nov.	28	1911	.....	1142
Frenchman R.	Bishop, Stephen S.	Lincoln	Inman Storage Reservoir	Stor.	125.00	17	6	40	Chase	Dec.	8	1911	.....	1145
Frenchman R.	Oliver Bros.	Wauneta	Oliver Bros. Power Plt.	Power	50.00	7	5	35	Hayes	April	28	1913	.....	1284
Frenchman R.	Oliver Bros.	Wauneta	Oliver's Canal	Irrig.	3.20	7	5	35	Hayes	April	28	1913	.....	1285
Frenchman R.	Krotter, F. C.	Palisade	Krotter Power Plant	Power	65.00	35	5	34	Hayes	Dec.	2	1913	.....	1339
Frenchman R.	Village of Imperial	Imperial	Imperial Power Plant	Power	55.00	25	6	39	Chase	Feb.	7	1917	.....	1474
Frenchman R.	Shallenberger, O. P.	Imperial	Lake Imperial	Irrig.	4.57	25	6	39	Chase	May	14	1917	.....	1487
Frenchman R.	Frenchman Valley Irr. District	Culbertson	Harvey Reservoir	Stor.	15000 A. F.	3	5	38	Chase	Oct.	16	1919	.....	1562
~~Frenchman R.~~	Krotter, F. C.	Palisade	Krotter-Hamlet Pwr. Plt.	Power	100.00	23	5	35	Hayes	Jan.	26	1920	.....	1574
Horse Creek	Nesbit, J. M. et al.	Parks	Horse Creek Ditch	Irrig.	1.86	23	1	39	Dundy	Aug.	31	1885	159, 173	.....
Indian Creek	Chamberlain, J. C.	Mt. Sterling, Illinois	Chamberlain Ditch	Irrig.	.06	18	2	36	Dundy	Oct.	4	1895	.....	240
Indian Creek	Thompson & Van Sickle	Benkleman	Thompson-Van Sickle	Irrig.	.93	8	2	37	Dundy	June	20	1895	.....	237
Indian Creek	Stonberg, Sanford	Max	Stoneberg Ditch	Irrig.	1.00	2	2	37	Dundy	March	13	1911	.....	1070

Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Kilpatrick Res. No. 1	Kilpatrick Bros. Co.	Beatrice	Kilpatrick Res. Ditch	Irrig.	17.00	30	6	39	Chase	Jan.	25	1912	.....	1160
Medicine Creek	Cambridge Milling Co.	Cambridge	Cambridge Ditch	Power	68.00	29	4	25	Furnas	Dec.	31	1878	92, 93	.....
Medicine Creek	Crete Mills	Curtis	Curtis Lake	Power	.....	32	8	28	Frontier				364	
Medicine Creek	Maywood Milling Co.	Maywood	Maywood Mills	Power	11.88	16	8	29	Frontier	May	4	1907	.....	858
Red Willow Cr.	Helm, John F.	McCook	Helm Ditch	Irrig.	10.00	8	3	28	Red Willow	Dec.	5	1910	.....	1042
Red Willow Cr.	Masters, Charles	Indianola	Master's Ditch	Irrig.	1.14	6	3	28	Red Willow	July	29	1912	.....	1212
Republican R.	Gearhart & Benson	Arapahoe	Arapahoe Star Mill	Power	196.00	27	4	23	Furnas	July	24	1879	1029	.....
Republican R.	Pioneer Irrigation Co.	Haigler	Haigler Ditch	Irrig.	77.00	2	1	43	Dundy	April	4	1890	1025	.....
Republican R.	Dundy County Irr. Co.	Benkleman	Dundy County Ditch	Irrig.	45.00	24	1	39	Dundy	Nov.	22	1890	118	.....
Republican R.	McCook I. & W. P. Co.	McCook	Meeker Canal	Irrig.	143.00	15	3	31	Hitchcock	Dec.	22	1890	4-9, 8-7	.....
Republican R.	Anderson, Anders	Benkleman	Anderson Ditch	Irrig.	2.00	1	1	37	Dundy	Jan.	26	1894	151	.....
Republican R.	Ballard, Henry L.	Oxford	Ballard Ditch	Irrig.	8.00	8	3	21	Furnas	June	9	1894	91	.....
Republican R.	Walsh, Patrick	McCook	Walsh Canal	Irrig.	11.00	35	3	30	Red Willow	Jan.	31	1900	.....	537
Republican R.	Lee, J. L.	McCook	Harmon Ditch	Ice	10.00	32	3	29	Red Willow	Jan.	22	1900	.....	535
Republican R.	Hurst, J. C. et al	Trenton	H. D. Canal	Irrig.	7.00	28	2	35	Hitchcock	March	2	1911	.....	1068
Republican R.	Anderson, C. et al	Benkleman	Cottonwood Ditch	Irrig.	3.35	6	1	36	Dundy	Feb.	19	1912	.....	1172
Republican R.	Rupert Ditch Co.	Culbertson	Rupert Ditch	Irrig.	20.00	32	3	32	Red Willow	April	19	1912	.....	1192
Republican R.	Pringle, George N.	Parks	Parks Ditch	Irrig.	16.00	20	1	39	Dundy	June	18	1912	.....	1202
Republican R.	Republican River P. Co.	Omaha	.....	Power	300.00	15	1	9	Webster	Aug.	26	1912	.....	1221
Republican R.	Kirtland, E. S.	Orleans	Orleans Mill Co.	Power	.....	27	2	19	Harlan				1043	.....
Republican R.	Barnett, William C.	Alma	Lake Disappointment	Stor.	5.00	32	2	18	Harlan	Dec.	18	1915	.....	1442
Republican R.	Everson, P. M. and Mitchell, J. C.	Alma	Everson Canal	Irrig.	1.07	13	2	18	Harlan	Dec.	18	1915	.....	1443
Republican R. North Fork	Pringle, George N.	Parks	Parks Ditch	Irrig.	2.00	20	1	39	Dundy	Dec.	31	1915	.....	1444

Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Republican R. North Fork	Pringle, George N.	Parks	Parks Ditch Extension	Irrig.	1.14	20	1	39	Dundy	Sept.	5	1919		1555
Republican R. South Fork	Southern Nebr. Pwr. Co.	Superior	Guthrie Canal	Power	400.00	34	1	7	Nuckolls	Sept.	1	1877	1036	
Republican R. South Fork	McDonald, J. A.	Benkleman	McDonald Ditch	Irrig.	.79	36	1	38	Dundy	Nov.	13	1901		644
Republican R. South Fork	Bailey, W. J.	Oxford	Bailey Ditch	Irrig.	64.00	6	3	21	Furnas	Sept.	8	1913		1321
Rock Creek	Phelan, J. R. et al	Parks	Phelan Ditch	Irrig.	4.29	17	1	39	Dundy	Dec.	31	1883	138	
Sappa Creek	Zulauf, George W.	Stamford	Stamford Mills	Power		21	2	20	Harlan				997	
Spring Creek	Carlon, J. C.	Benkleman	Benkleman Ditch	Irrig.	1.29	19	1	37	Dundy	Dec.	31	1896		373
Stinking Wtr. Cr.	Kilpatrick Bros.	Beatrice	Chase Ditch	Irrig.	2.86	10	7	38	Chase	March	10	1894	57	
Stinking Wtr. Cr.	McLain, Frank	Imperial	McLean Ditch	Irrig.	2.50	28	7	37	Chase	Sept.	24	1894	65	
Stinking Wtr. Cr.	Kilpatrick Bros.	Beatrice	Chase Ditch No. 7	Irrig.	4.57	36	7	37	Chase	Dec.	21	1894	72, 175	
Stinking Wtr. Cr.	Kilpatrick Bros.	Beatrice	Chase Ditch No. 6	Irrig.	2.00	13	7	38	Chase	Jan.	28	1895	76	
Stinking Wtr. Cr.	Kilpatrick Bros.	Beatrice	Chase Ditch No. 5	Irrig.	1.50	14	7	38	Chase	Jan.	29	1895	77	
Stinking Wtr. Cr.	Kilpatrick Bros.	Beatrice	Chase Ditch No. 3	Irrig.	1.71	14	7	38	Chase	Jan.	29	1895	78	
Stinking Wtr. Cr.	Kilpatrick Bros.	Beatrice	Chase Ditch No. 4	Irrig.	.91	14	7	38	Chase	June	27	1895		56
Stinking Wtr. Cr.	Kilpatrick Bros.	Beatrice	Chase Ditch No. 1	Irrig.	.70	4	7	38	Chase	June	27	1895		57
Stinking Wtr. Cr.	Krotter, F. C.	Palisade	Krotter Power Plant	Irrig.	3.00	35	5	34	Hayes	Dec.	15	1910		1046
~~Stinking Wtr. Cr.~~	Krotter, F. C.	Palisade	Palisade Power Plant	Power	72.00	25	5	34	Hayes	April	21	1917		1484
~~Stinking Wtr. Cr.~~	Krotter, F. C.	Palisade	Palisade Reservoir	Irrig.	150.00	25	5	34	Hayes	April	21	1917		1485

STREAM	NAME OF APPLICANT	Use to which Applied	Sec. Feet Granted	LOCATION OF HEADGATE				Doc. No.	App. No.
				S	T	R	County		
Arickaree River	Jenkins, Chas. T.	Irrig.	171.00	15	1	42	Colorado	.....	979
Center Creek	Gregory, A. B. & P. C.	Irrig.	4.00	1	1	15	Franklin	182	.....
Frenchman River	Daschosifsky, G.	Power	30.00	18	6	40	Chase	1013	.....
Frenchman River	Hagerman, Wm.	Irrig.	.86	19	5	34	Hayes	.....	935
Horse Creek, Springs, Trib. to	Pringle, Esther L.	Irrig.	.57	11	1	39	Dundy	.....	364
Horse Creek, Springs, Trib. to	Pringle, Geo. N.	Irrig.	1.57	14	1	39	Dundy	.....	824
Indian Creek	Foster, Chas.	Irrig.	1.42	23	2	36	Dundy	.....	268
Medicine Creek	Sanders, John L.	Irrig.	1.43	27	7	27	Frontier	83	.....
Mauer Springs	C. B. & Q. R. R. Co.	Irrig.	1.48	23	2	11	Chase	.....	1143
Red Willow Creek	Moore, Wm. H.	Power	.....	16	3	28	Red Willow	181	.....
Rod Willow Creek	Holland, L. J.	Irrig.	35.00	16	3	28	Red Willow	95	.....
Red Willow Creek	Helm, John F.	Irrig.	2.00	17	3	28	Red Willow	111	.....
Red Willow Creek	Clark, A. R.	Irrig.	14.29	31	4	28	Red Willow	.....	781
Red Willow Lake	Cooper, Jas.	Irrig.	2.00	36	9	33	Lincoln	647	.....
Republican River	Carson, A.	Irrig.	1.43	27	3	30	Red Willow	103	.....
Republican River	Brown, W. A.	Irrig.	11.00	11	1	42	Dundy	115	.....
Republican River	Trites, W. H.	Irrig.	7.00	20	3	31	Hitchcock	3	.....

STREAM	NAME OF APPLICANT	Use to which Applied	Sec. Feet Granted	LOCATION OF HEADGATE				Doc. No.	App. No.
				S	T	R	County		
Republican River	Trenton Farmers' Irrigation Ass'n	Irrig.	32.00	10	2	34	Hitchcock	5	.....
Republican River	Carson, A.	Irrig.	18.00	27	3	30	Red Willow	102	.....
Republican River	Neighbors, E. G.	Irrig.	2.86	24	1	39	Dundy	133	.....
Republican River	Cambridge-Arapahoe Irr. & Imp. Co.	Irrig.	170.00	28	4	25	Furnas	89	.....
Republican River	Republican River Irr. Company	Irrig.	30.00	29	1	38	Dundy	147	.....
								148	.....
Republican River	Larned, W. H., Et Al	Irrig.	3.00	22	1	40	Dundy	150	.....
Republican River	Marr, Lorenza	Irrig.	4.29	16	3	31	Hitchcock	11	.....
Republican River	Groesback & Cannon	Irrig.	10.00	10	1	37	Dundy	153	.....
Republican River	Thomas, A. J.	Irrig.	2.00	24	1	40	Dundy	154	.....
Republican River	Wilcox, F. S.	Irrig.	4.50	32	3	29	Red Willow	109	.....
Republican River	Deleware-Hickman	Irrig.	20.00	17	1	37	Dundy	157	.....
Republican River	Allen, E. M., Et Al	Irrig.	14.00	2	3	26	Red Willow	110	.....
Republican River	Spooner, J. A.	Irrig.	1.00	25	1	40	Dundy	.....	413
Republican River	Campbell Ditch Co.	Irrig.	9.14	9	2	34	Hitchcock	.....	828
Republican River	Rogers, W. N.	Irrig.	38.00	26	3	29	Red Willow	.....	1049
Republican River	McConnell Bros.	Irrig.	180.00	10	2	34	Hitchcock	.....	1055
Republican River	Cappell, Geo.	Irrig.	1.57	19	3	30	Red Willow	.....	1093
Republican River	Rogers, W. M.	Irrig.	7.00	25	3	29	Red Willow	.....	1129
Republican River, S. F.	Karr, J. W.	Irrig.	2.00	20	1	37	Dundy	155	.....
Republican River, S. F.	Riverside Ditch Co.	Irrig.	13.00	29	1	37	Dundy	156	.....
Rock Creek	Owens, J. S.	Irrig.	.36	31	2	39	Dundy	265	.....
Rock Creek	Campbell, R. R.	Irrig.	.33	13	2	40	Dundy	.....	526
Rock Creek	Benkleman Light Association	Power	20.00	8	1	39	Dundy	.....	1245
Turkey Creek	Wilt & Polly	Power	.....	4	1	16	Franklin	183	.....

Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
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Little Blue River..	Myer Hydro-Elec. P. Co.	Oak	Oak Mill Race	Power		16	3	5	Nuckolls				991	
Little Blue River...	Myer Hydro-Elec. P. Co.	Oak	Myer Hydro P. Plant	Power	150.00	16	3	5	Nuckolls	July	27	1916		1467
Little Blue River...	Larkin, M. E.	Hastings	Crystal Lake	Stor.	1.50	27	6	10	Adams	Aug.	17	1912		1219
Little Blue River...	Lyon, George Jr.	Nelson	Lyons Little Blue P. Pl.	Power		29	4	6	Nuckolls	Aug.	10	1916		1462*
~~Little Blue River~~	Larkin, M. E.	Hastings	Crystal Lake	~~Stor~~ Pow.		27	6	10	Adams	Nov.	9	1918		1526
Little Blue River	Bozarth - Carter	Hebron	Hebron Power Plant	Power	216.00	9	2	2W	Thayer	March	31	1919		1538
Little Blue River	Campbell, J. T.	Hebron	Blue Valley Power Co...	Power	200.00	5	2	1	Thayer	May	28	1919		1542

Crystal Lake Reservoir

ABANDONED CLAIMS AND APPLICATIONS IN DIVISION NO. 1-C.

STREAM	NAME OF APPLICANT	Use to which Applied	Sec. Feet Granted	LOCATION OF HEADGATE				Doc. No.	App. No.
				S	T	R	County		
Little Blue River	Lyon, Geo. Jr.	Power	150.00	29	4	6	Nuckolls		1410
Little Blue River	Lyon, Geo. Jr.	Irrig.	4.00	18	4	6	Nuckolls		1411

Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Bear Creek	Public Lds. and Bldgs.	Lincoln	Water Works	Irrig.	1.00	36	4	6 E	Gage	May	20	1898	.....	455
Beaver Creek	Wright, G. D.	York		Power	40.00	7	10	2 W	York	Nov.	1	1878	963	.....
Blue River, Big	Holmesville M. & P. Co.	Holmesville	Holmesville Power Co.	Power	500.00	29	3	7	Gage	April		1882	1021	.....
Blue River, Big	Holmesville M. & P. Co.	Holmesville	Holmesville Power Co.	Power	.....	29	3	7 E	Gage	April		1882	.....	1095
Blue River, Big	Boyes, Burdette	Seward		Power	200.00	19	9	4 E	Seward	July	8	1910	.....	1006
Blue River, Big	Jacobs, E.	Staplehurst	Jacobs Power Plant	Power	41.00	26	12	2 E	Seward	Nov.	13	1911	.....	1135
Blue River, Big	Blue River P. Co.	Seward	Big Blue Plant No. 2	Power	100.00	32	9	3 E	Seward	Jan.	3	1912	.....	1153
Blue River, Big	Blue River P. Co.	Seward	Big Blue Plant No. 2	Power	.....	32	9	3 E	Seward	Jan.	3	1912	.....	1520
Blue River, Big	Steinmeyer, George	Barnston	Hoag Power Plant	Power	.....	12	4	5	Gage	Feb.	18	1913	.....	1261*
Blue River, Big	Steinmeyer, George	Barnston	Barnston Power Plant	Power	500.00	13	1	7	Gage	Feb.	18	1913	.....	1262
Blue River, Big	Beatrice Power Co.	Barnston	Beatrice Power Co. Pl.	Power	.....	13	1	7	Gage	Feb.	18	1913	.....	1585
Blue River, Big	Boyes, Burdette	Seward	Blue River Plant No. 3	Power	100.00	5	8	4	Saline	March	13	1913	.....	1265
Blue River, Big	Blue River Power Co.	Seward	Blue River Plant No. 3	Power	.....	5	8	4	Saline	March	13	1913	.....	1521
Blue River, Big	Mares, Marketa	Wilber	Mares Canal	Irrig.	2.28	2	6	4	Saline	Aug.	12	1913	.....	1314
Blue River, Big	C., B. & Q. R. R. Co.	Lincoln	C., B. & Q. Pipe Line	Irrig.	.50	2	9	3	Seward	April	30	1914	.....	1366
Blue River, Big	C., B. & Q. R. R. Co.	Lincoln	Pipe Line at Wymore	Irrig.	.50	21	2	7	Gage	Dec.	24	1914	.....	1394
Blue River, Big	C., B. & Q. R. R. Co.	Lincoln	Pipe Line at Seward	Irrig.	.50	21	11	3	Seward	Dec.	14	1914	.....	1395
Blue River, Big	Blue River Power Co.	Seward	Hydro-Electric Pwr. Plt.	Power	100.00	32	9	4	Seward	Aug.	14	1916	.....	1463
Blue River, Big	Babson, H. B.	Chicago	Shestak Power Plant	Power	200.00	35	7	4 E	Saline	Feb.	6	1918	.....	1506
Blue River, Big	Steinmeyer, J. H.	Beatrice		Power	.....	13	1	7 E	Gage	Feb.	24	1919	.....	1534*
Blue River and School Creek	Garbe, Frank	Grafton	Blue Park Dam	Power	66.00	1	8	4	Fillmore	Aug.	7	1917	.....	1494

STREAM	NAME OF APPLICANT	Use to which Applied	Sec. Feet Granted	LOCATION OF HEADGATE				Doc. No.	App. No.
				S	T	R	County		
Blue River, Big	Johnson, Jas. F.	Power	125.00	19	4	6E	Gage	.....	1416
Blue River, Big	Johnson, Jas. F.	Power	100.00	1	5	4E	Gage	.....	1417
Blue River, Big	Johnson, Jas. F.	Power	175.00	3	4	5E	Gage	.....	1422
Blue River, Big	Blue River Power Co.	Power	100.00	11	8	3E	Seward	.....	1476
Turkey Creek	Lane, J. K.	Power	.....	4	7	3E	Saline	990	.....
Turkey Creek	Lane, J. K.	Irrig.	.09	4	7	3E	Saline	.....	81
Turkey Creek	Lane, J. K.	Irrig.	.....	....	....	....	Saline	.....	84

Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Lodge Pole	Lodge Pole Land Co. care F. B. Knapp	Fremont	Bay State Ditch	Irrig.	1.50	29	15	55	Kimball	Dec.	31	1876	347	.....
Lodge Pole	Johnson, Charles W.	Potter	Adams-Tobbins Ditch	Irrig.	1.14	35	14	50	Cheyenne	Oct.	1	1878	638	.....
Lodge Pole	Gunderson, A.	Potter	Gunderson Ditch	Irrig.	1.43	1	14	52	Cheyenne	June	1	1879	305	.....
Lodge Pole	Callahan, Charles	Burlington, Wash.	Runge Ditch No. 1	Irrig.	1.71	20	14	50	Cheyenne	April	15	1880	339	.....
Lodge Pole	Callahan, Charles	Burlington, Wash.	Runge Ditch No. 2	Irrig.	.50	20	14	50	Cheyenne	April	15	1882	338	.....
Lodge Pole	Perso, Otto	Dalton	Anderson Ditch No. 1	Irrig.	2.50	8	14	51	Cheyenne	June	30	1882	373	.....
Lodge Pole	Lodge Pole Land Co., care F. B. Knapp	Fremont	Circle Arrow Ditch	Irrig.	3.71	29	15	55	Kimball	July	1	1882	346	.....
Lodge Pole	Fuller, H. R.	Sidney	Urbach Ditch	Irrig.	.86	15	14	51	Cheyenne	Sept.	1	1882	308	.....
Lodge Pole	Buckner, George R.	Sidney	Hale Ditch No. 3	Irrig.	.57	36	14	49	Cheyenne	April	30	1883	320	.....
Lodge Pole	Buckner, George R.	Sidney	Hale Ditch No. 4	Irrig.	.71	36	14	49	Cheyenne	April	30	1883	321	.....
Lodge Pole	Buckner, George R.	Sidney	Hale Ditch No. 5	Irrig.	.57	36	14	49	Cheyenne	April	30	1883	322	.....
Lodge Pole	Buckner, George R.	Sidney	Lower Whitney	Irrig.	.29	31	14	48	Cheyenne	May	1	1883	317	.....
Lodge Pole	Booth, Firth, Est. of	Sunol	Booth's Canal	Irrig.	4.29	29	14	47	Cheyenne	May	31	1883	309, 310	.....
Lodge Pole	McAuliffe, F.	Chappell	McAuliffe Ditch	Irrig.	2.29	21	13	45	Deuel	Dec.	31	1884	814	.....
Lodge Pole	Webster, Wm.	Plainville	Kinney Ditch No. 2	Irrig.	2.71	33	15	56	Kimball	Dec.	31	1884	348	.....
Lodge Pole	Libby, H. H.	Lodge Pole	Libby Ditch	Irrig.	2.00	36	14	47	Cheyenne	Dec.	31	1884	312	.....
Lodge Pole	Dickinson, F.	Lodge Pole	Dickinson Ditch	Irrig	1.14	26	14	47	Cheyenne	Jan.	1	1885	969	.....
Lodge Pole	Howard, A. T.	Sunol	Howard Ditch	Irrig.	.86	31	14	47	Cheyenne	April	10	1885	336	.....
Lodge Pole	Kreuger, R. and F. W.	Sidney	Kreuger Ditch No. 3	Irrig.	1.14	32	14	48	Cheyenne	May	1	1885	323	.....
Lodge Pole	Wolfe H. D.	Chappell	Wolf Ditch	Irrig.	1.00	18	13	45	Deuel	Dec.	31	1885	813	.....
Lodge Pole	Lodge Pole Land Co., care F. B. Knapp	Fremont	McIntosh Ditch	Irrig.	3.31	29	15	55	Kimball	April	16	1886	351	.....
Lodge Pole	Kreuger, R. and F. W.	Sidney	Kreuger Ditch No. 2	Irrig.	2.29	32	14	48	Cheyenne	Oct.	10	1886	324	.....

Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Lodge Pole	Swartzlander, W. E.	Sidney	Borquist Ditch	Irrig.	1.29	34	14	49	Cheyenne	April	30	1887	301	.....
Lodge Pole	Swartzlander, W. E.	Sidney	Borquist Ditch	Irrig.	.71	34	14	49	Cheyenne	April	30	1887	300	.....
Lodge Pole	Buckner, George R.	Sidney	Upper Whitney	Irrig.	2.29	36	14	49	Cheyenne	May	1	1887	316	.....
Lodge Pole	McLaughlin, M.	Sidney	McLaughlin Ditch	Irrig.	1.00	25	14	48	Cheyenne	May	1	1887	966	.....
Lodge Pole	Buckner, George R.	Sidney	Hale Ditch No. 1	Irrig.	1.14	36	14	49	Cheyenne	July	1	1887	318	.....
Lodge Pole	Mitchell, J.	Sidney	Mitchell Ditch	Irrig.	.86	8	14	51	Cheyenne	Sept.	1	1887	304	.....
Lodge Pole	Craig, John	Lodge Pole	Tobin Ditch	Irrig.	2.29	28	14	47	Cheyenne	July	31	1888	330	.....
Lodge Pole	Keedrick, Mrs. Jessie	Cedar Rapids, Iowa	Bordwell Ditch	Irrig.	1.43	35	14	49	Cheyenne	Aug.	1	1888	303	.....
Lodge Pole	Wearin, William H.	Carrolton, Mo.	Premier Ditch	Irrig.	2.43	3	14	58	Kimball	April	11	1889	340	.....
Lodge Pole	Wearin, William H.	Carrolton, Mo.	Smeed Ditch	Irrig.	1.43	8	14	58	Kimball	April	12	1889	341	.....
Lodge Pole	Keedrick, Mrs. Jessie	Cedar Rapids, Iowa	Bordwell Ditch	Irrig.	.86	35	14	49	Cheyenne	April	27	1889	302	.....
Lodge Pole	Eubank, John	Kimball	Polly Ditch	Irrig.	.79	30	15	55	Kimball	May	6	1889	342	.....
Lodge Pole	Wearin, William H.	Carrolton, Mo.	Independent Ditch	Irrig.	3.14	7	14	58	Kimball	May	6	1889	343	.....
Lodge Pole	Atkins, D. K.	Kimball	Atkins Ditch	Irrig.	.43	30	15	55	Kimball	May	6	1889	344	.....
Lodge Pole	Webster, William	Plainville	Kinney Ditch	Irrig.	2.00	31	15	56	Kimball	May	14	1889	345	.....
Lodge Pole	Young, W. T.	Kimball	Young Ditch	Irrig.	.50	33	15	57	Kimball	May	28	1889	349	.....
Lodge Pole	Lehmkuhl, John	Kimball	Ruttner Ditch	Irrig.	1.14	36	15	57	Kimball	June	4	1889	350	.....
Lodge Pole	Oberfelder, R. S.	Sidney	Oberfelder Ditch	Irrig.	.43	31	14	46	Cheyenne	June	10	1889	333	.....
Lodge Pole	Buckner, G. R.	Sidney	Hale Ditch No. 2	Irrig.	.43	36	14	49	Cheyenne	June	26	1889	319	.....
Lodge Pole	Carter, J. G.	Lodgepole	Bullock Ditch	Irrig.	9.14	3	13	46	Deuel	June	25	1889	296	.....
Lodge Pole	Persinger, A. B.	Lodgepole	Persinger Ditch	Irrig.	4.57	33	14	46	Deuel	June	25	1889	297	.....
Lodge Pole	Kreuger, R. and F. W.	Sidney	Kreuger Ditch No. 1	Irrig.	3.00	29	14	48	Cheyenne	June	26	1889	325	.....
Lodge Pole	Lodge Pole Land Co., care F. B. Knapp	Fremont	Brady Ditch	Irrig.	.71	29	15	55	Kimball	Aug.	16	1889	352	.....

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						S	T	R	County	Month	D	Yr.		
Lodge Pole	Gross, Mary E.	Pine Bluff, Wyoming	Hoover Ditch	Irrig.	1.43	12	14	59	Kimball	Sept.	4	1889	353	.....
Lodge Pole	Bentley, B. M.	Sidney	Ickes Ditch	Irrig.	2.50	28	14	50	Cheyenne	March	25	1891	329	.....
Lodge Pole	Johnson, Charles W.	Potter	Adams Ditch	Irrig.	1.43	3	14	52	Cheyenne	July	1	1891	371	.....
Lodge Pole	Girrard, F. G. & R. F.	Kimball	Hurley-Lily and Polly	Irrig.	2.57	26	15	56	Kimball	Oct.	1	1891	354	.....
Lodge Pole	Thorstensen, Nels	Sidney	Christensen's Ditch	Irrig.	.57	7	14	51	Cheyenne	April	15	1893	366	.....
Lodge Pole	Thorstensen, Nels	Sidney	Christensen's Ditch No. 1	Irrig.	.43	7	14	51	Cheyenne	April	15	1893	367	.....
Lodge Pole	Van Aelstyn, Herman	Sidney	Trognitz Canal	Irrig.	1.00	36	14	50	Cheyenne	June	1	1893	365	.....
Lodge Pole	Oberfelder, R. S.	Sidney	Oberfelder Ditch	Irrig.	2.00	31	14	46	Cheyenne	Dec.	30	1893	306	.....
Lodge Pole	Kreuger, Richard	Sidney	Richard Kreuger Ditch	Irrig.	1.00	29	14	48	Cheyenne	May	1	1894	968	.....
Lodge Pole	Anderson, Charles	Sidney	Anderson Ditch No. 2	Irrig.	.57	10	14	51	Cheyenne	June	1	1894	372	.....
Lodge Pole	Lyngholm, N. P.	Potter	Lyngholm Ditch	Irrig.	.36	14	14	51	Cheyenne	Nov.	1	1894	337	.....
Lodge Pole	Dickinson, F.	Lodgepole	Dickinson's Ditch	Irrig.	2.29	33	14	47	Cheyenne	May	10	1896	967	.....
Lodge Pole	Persinger, A. B.	Lodgepole	Bullock's Canal	Irrig.	.57	4	13	46	Deuel	Feb.	16	1898	.....	437
Lodge Pole	Girem, T. A.	Kimball	Maltese Cross	Irrig.	.21	36	15	57	Kimball	May	16	1898	.....	454
Lodge Pole	Wearin, Wm. H.	Carrolton, Mo.	Bushnell Ditch	Irrig.	3.00	2	14	58	Kimball	April	15	1899	.....	504
Lodge Pole	Wiegand, Henry G.	Chappell	Wiegand Canal	Irrig.	2.00	17	13	45	Deuel	May	31	1900	.....	563
Lodge Pole	Brown, J. H.	Chappell	Neuman Can. Nos. 1, 2	Irrig.	1.89	36	13	45	Deuel	June	12	1900	.....	565
Lodge Pole	McHatton, James W.	Chappell	Wertz Bros. Ditch	Irrig.	2.86	12	13	46	Deuel	Feb.	14	1901	.....	600
Lodge Pole	Neuman, A. G.	Chappell	Neuman Ditch	Irrig.	1.29	26	13	45	Deuel	April	17	1901	.....	611
Lodge Pole	Johnson, J. C.	Chappell	Johnson Ditch	Irrig.	2.14	23	13	45	Deuel	April	17	1901	.....	612
Lodge Pole	Lodge Pole Land Co., care F. B. Knapp	Fremont	Bennett Reservoir	Stor.	700.00 A. F.	29	15	55	Kimball	March	13	1902	.....	657
Lodge Pole	Lodge Pole Land Co.	Fremont	Reservoir Ditch	Irrig.	1.87	29	15	55	Kimball	Oct.	2	1902	.....	691
Lodge Pole	Forsling, C. A.	Kimball	Forsling Ditch	Irrig.	1.83	33	15	56	Kimball	July	25	1903	.....	718
Lodge Pole	Gieselking, Herman	Altamont, Ill.	Bickel Ditch	Irrig.	.93	30	15	55	Kimball	Aug.	3	1903	.....	719
Lodge Pole	Thortensen, Finley	Sidney	Pomeroy Ditch No. 1	Irrig.	.57	15	14	51	Cheyenne	Aug.	20	1903	.....	723

Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Lodge Pole	Atkins, D. K.	Kimball	Faden Ditch	Irrig.	.14	30	15	55	Kimball	Sept.	9	1903	.....	724
Lodge Pole	Geddes, E. W.	Kimball	Owasco Ditch	Irrig.	22.28	29	15	55	Kimball	Sept.	12	1903	.....	725
Lodge Pole	Lodge Pole Land Co. care F. B. Knapp	Fremont	Owasco Ditch	Irrig.	1.75	29	15	55	Kimball	Dec.	15	1903	.....	734
Lodge Pole	Forsling, Alfred	Kimball	Forsling Ditch	Irrig.	.86	34	15	57	Kimball	Dec.	6	1905	.....	806
Lodge Pole	Soderquist, Peter	Chappell	Smith's Ditch	Irrig.	3.57	12	12	45	Deuel	Aug.	18	1906	.....	850
Lodge Pole	Soderquist, Peter	Chappell	Ralton Irr. System	Irrig.	19.14	36	13	45	Deuel	Jan.	4	1907	.....	847
Lodge Pole	Forsling, Clarence	Kimball	Yoder Extension	Irrig.	2.71	36	15	57	Kimball	April	9	1907	.....	857
Lodge Pole	Walker, I. S.	Kimball	Walker Ditch	Irrig.	1.71	31	15	56	Kimball	Sept.	16	1907	.....	869
Lodge Pole	Wilkinson, Mrs. John	Pine Bluff, Wyoming	Tracy Ditch	Irrig.	.50	12	14	59	Kimball	Sept.	21	1907	.....	870
Lodge Pole	Kimball Irr. District	Kimball	Kimball Storage	Irrig.	20,000 A. F.	36	15	57	Kimball	April	15	1908	.....	897
Lodge Pole	Lehmkuhl, John	Kimball	New Ruttner	Irrig.	.51	36	15	57	Kimball	Sept.	16	1903	.....	727
Lodge Pole	Wilds, Turner	Chappell	Wilds' Ditch	Irrig.	1.71	11	13	46	Deuel	June	2	1908	.....	904
Lodge Pole	Ruttner, Carl	Sidney	Ruttner Canal	Irrig.	.50	30	14	47	Cheyenne	June	25	1908	.....	906
Lodge Pole	Lodge Pole Land Co., care F. B. Knapp	Fremont	Bennett Ditch No. 3	Irrig.	1.00	29	15	54	Kimball	Feb.	17	1909	.....	934
Lodge Pole	Maginnis, P.	Kimball	Maginnis Ice Pond	Stor.	3.00	26	15	56	Kimball	Sept.	19	1911	.....	1127
Lodge Pole	Soderquist, Peter	Chappell	Soderquist Ditch	Irrig.	2.00	36	12	45	Deuel	Oct.	22	1912	.....	1237
Lodge Pole	Heming, Howard C.	Chappell	Wiegand Ditch No. 3	Irrig.	1.28	16	13	45	Deuel	Sept.	10	1913	.....	1322
Lodge Pole	Heming, Howard C.	Chappell	Wiegand Ditch No. 2	Irrig.	.42	16	13	45	Deuel	Sept.	10	1913	.....	1323
Lodge Pole	Neuman, A. G.	Chappell	Neuman Ditch	Irrig.	6.00	26	13	45	Deuel	Jan.	5	1916	.....	1445
Lodge Pole	Soderquist, Peter	Chappell	Soderquist Ditch	Irrig.	2.33	36	13	45	Deuel	June	29	1915	.....	1420
Lodge Pole	Bentley, Bertha M.	Sidney	Bentley Ditch	Res.	1.00	34	14	50	Cheyenne	Feb.	14	1917	.....	1478
Lodge Pole	Sudman, Mrs. Minnie	Chappell	Sudman Ditch	Irrig.	.78	22	13	45	Deuel	April	5	1917	.....	1483
Lodge Pole	Bogle, J. W.	Bushnell	Young Ditch	Irrig.	.57	33	15	57	Kimball	June	20	1919	.....	1544

Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Lodge Pole, Spring Creek, Trib. to	Oberfelder, R. S.	Sidney	Oberfelder Ditch	Irrig.	2.29	31	14	46	Cheyenne	May	29	1889	307	.....
Lodge Pole, Springs, Trib. to	Chambers, Charles P.	Sidney	Private Ditch	Irrig.	.04	14	13	51	Cheyenne	March	19	1895	335	.....
Lodge Pole, Spring Branch Trib. to	Libby, H. H.	Lodgepole	Spring Branch Ditch	Irrig.	.29	36	14	47	Cheyenne	July	1	1901	.....	623

ABANDONED CLAIMS AND APPLICATIONS IN DIVISION NO. 1-E.

STREAM	NAME OF APPLICANT	Use to which Applied	Sec. Feet Granted	LOCATION OF HEADGATE				Doc. No.	App. No.
				S	T	R	County		
Lodgepole	Johnson, Chas. W.	Irrig.	1.43	10	14	52	Kimball	370	.....
Lodgepole	Johnson, Chas. W.	Irrig.	.50	10	14	52	Kimball	369	.....
Lodgepole	Nasland, J. A.	Irrig.	.90	1	12	45	Deuel	.....	661
Lodgepole	Wood, Andrew J.	Irrig.	.57	27	15	54	Kimball	.....	683
Lodgepole	Wood, Andrew J.	Irrig.	.57	26	15	54	Kimball	.....	684
Lodgepole	Forsling, Alf.	Irrig.	1.50	34	15	57	Kimball	.....	703
Lodgepole	Soderquist, Peter	Irrig.	12.40	36	13	45	Deuel	.....	882
Flood from Hill	Fifield, C. M.	Irrig.	.57	22	15	56	Kimball	.....	1091

Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Weeping Water....	Gilmore, Charles.....	Weeping Wtr..	Gilmore Ditch.....	Ice	8.00	2	10	11	Cass.....	Aug.	5	1909	.....	955

Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Beaver Creek	Albion Light & P. Co.	Albion	Albion Power Plant	Power	67.00	26	20	6	Boone	Oct.	3	1901	.....	639
Beaver Creek	St. Edward Elec. P. Co.	St. Edward	St. Edward Power Plant	Power	134.00	27	19	5	Boone	Feb.	11	1911	.....	1058
Beaver Creek	The Ravenna Mills	Ravenna	The Ravenna Mills	Power	.....	8	12	14	Buffalo			.....	1037	.....
Beaver Creek	Albion Light & P. Co.	Albion	Albion Power Plant	Power	70.00	26	20	6	Boone	Feb.	20	1917	.....	1480
Cedar River	Fullerton L. & P. Co.	Fullerton	Fullerton Power Plant	Power	200.00	12	16	6	Nance	Sept.	9	1901	.....	636
Cedar River	Erickson Lake Co.	Lincoln	Erickson Power Plant	Power	175.00	25	21	12	Wheeler	May	24	1915	.....	1415
Cow Creek	Price, Ralph B.	Lewanna	Homestead Ditch	Irrig.	2.29	7	26	27	Cherry	July	14	1894	194	.....
Dane Creek	Koupal, Frank	Ord	Koupal Ditch	Irrig.	.14	20	19	14	Valley	July	5	1912	.....	1207
Goose Creek	Giles, R. P. et al	Elsmere	Giles Ditch	Irrig.	10.00	2	25	25	Cherry	June	1	1895	187	.....
Looking Glass Cr.	Girrard, E. A. and F. H.	Monroe	Monroe Ditch	Irrig.	2.86	1	17	3	Platte	June	12	1894	289	.....
Loup River	C., B. & Q. R. R. Co.	Lincoln	Pipe Line at Ravenna	Irrig.	.50	9	12	14	Buffalo	Dec.	24	1914	.....	1393
Loup River, M. B.	Lundy, James W.	Sargent	Lundy M. & P. Plant	Power	400.00	4	19	19	Custer	Aug.	1	1886	1024	.....
Loup River, M. B.	Lundy, James W.	Sargent	Lundy M. & P. Plant	Power	.....	4	19	19	Custer	Aug.	1	1886	.....	1224
Loup R., M. B.	Conger, James W.	Loup City	Sherman County Canal	Power	125.00	26	17	16	Valley	Fall of		1888	229a	.....
Loup R., M. B.	Conger, James W.	Loup City	Sherman County Canal	Irrig.	244.00	26	17	16	Valley	Aug.	13	1894	229b	.....
Loup R., M. B.	Rieck, Emil	Dunning	Jewett Ditch	Irrig.	4.29	30	22	24	Blaine	Aug.	12	1895	.....	113
Loup R., M. B.	Webster Irr. & Can. Co.	Comstock	Webster Canal	Irrig.	1.71	20	19	17	Custer	March	5	1898	.....	442
Loup R., M. B.	Longwood Irr. Can. Co.	Comstock	Longwood Canal	Irrig.	12.93	20	19	17	Custer	Feb.	21	1912	.....	1175
Loup R., M. B.	U. S. of America	Halsey	Nursery Ditch	Irrig.	1.00	3	22	26	Thomas	Sept.	16	1912	.....	1226
Loup R., M. B.	Holmes, Eddy	Nemo	Loup Valley Canal	Irrig.	.85	36	20	21	Custer	May	31	1913	.....	1294

Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Loup R., M. B.	Lundy, James W.	Sargent	Lundy's Lake Canal	Irrig.	28.31	4	19	19	Custer	June	27	1913		1300
Loup R., M. B.	Lundy, James W.	Sargent	Lundy's Lake	Stor.	8.00	2	19	19	Custer	July	19	1913		1306
Loup R., M. B.	Lundy, James W.	Sargent	Lundy's Lake	Irrig.	6.34	4	19	19	Custer	July	19	1913		1307
Loup R., M. B.	Austin Irrigation Co.	Loup City	Austin Ditch	Irrig.	50.00	32	13	14	Sherman	Nov.	6	1913		1330
Loup R., M. B.	Central Power Co.	Grand Island	Central Power Co.	Power	1000.00	10	13	12	Hall	July	14	1914		1373
Loup R., M. B.	C., B. & Q. R. R. Co.	Lincoln	Pipe Line at Seneca	Irrig.	.50	18	24	30	Thomas	Dec.	28	1914		1396
Loup R., S. B.	Callaway Mill Co.	Callaway	Callaway Mill	Power		2	15	23	Custer				988	
Loup R., S. B.	Central Power Co.	Grand Island	Grand Island Elec. Co.	Power	840.00	35	13	12	Howard	Jan.	18	1915		1400
Loup R., S. B.	Brittan, Fred	Arnold	Brittan Electric Co.	Power	131.00	25	17	25	Custer	July	19	1916		1460
Loup R., S. B.	Brittan, Fred	Arnold	Hydro-Elec. Plant No. 2	Power	62.50	31	17	24	Custer	Aug.	20	1919		1553
Loup-Platte and Tributaries	Nebraska Water Power District	Omaha	Nebraska Water Power Dist. Plts. Nos. 1, 2, 3	Power	4950.00	7 3 36	17 17 18	1E 3E 7E	Platte Colfax Dodge	July	16	1919		1548†
Muddy Creek	Penn, Charles	Broken Bow	Penn's Ditch	Irrig.	.50	33	17	20	Custer	Aug.	14	1894	215	
Muddy Creek	Mason City Roller Mill and Light Plant	Mason City	Mason City Mill and Light Plant	Power					Custer				1042*	
Mira Creek	McClellan, M. E.	North Loup	Mira Reservoir	Stor.	1.14	26	18	13	Valley	March	8	1912		1182
Mira Reservoir	McClellan, M. E.	North Loup	McClellan Canal	Irrig.	1.32	26	18	13	Valley	Oct.	30	1912		1239
Mira Creek	Hutchins, W. T.	North Loup	Hutchins Dam	Irrig.	.20	26	18	13	Valley	April	18	1916		1453
Oak Creek	Hatt, Hans N.	Dannebrog	Oak Creek Plant No. 1	Irrig.	2.28	2	13	11	Howard	Jan.	18	1919		1530

† Denotes district's petition approved.

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						S	T	R	County	Month	D	Yr.		
Platte River	Carey, William L.	Omaha	Hydro-Electric Pwr. Co.	Power		4	14	10	Douglas	Dec.	30	1918		1528*
Platte-Loup and Tributaries	Nebraska Water Power District	Omaha	Nebraska Water Power Dist. Plts. Nos. 1, 2, 3	Power	4950.00	7	17	1E	Platte					
						3	17	3E	Colfax	July	16	1919		1548†
						36	18	7E	Dodge					
Platte River	Woods, M. W. and G. J.	Lincoln	Nebraska Hydro-Electric Power Plant	Power		4	14	10	Douglas	July	18	1919		1549*
Sand Creek	Steger, Phillip	Callaway	Troyer's Pumping Plant	Irrig.	.24	10	15	23	Custer	Feb.	21	1916		1447
Shell Creek	Schmitt, P.	Columbus	Schmitt's Canal	Irrig.	3.00	19	18	1	Platte	Dec.	17	1894	292a	
Shell Creek	Schmitt, P.	Columbus	Schmitt's Canal	Power	30.50	19	18	1	Platte	Dec.	17	1894	292b	
Shell Creek	Gottberg, Max	Columbus	Gottburg's Canal	Irrig.	1.00	24	18	1	Platte	June	6	1895		2
Short & "L" Lk	Pipe, Lucien, and Lovejoy, B. C.	Woodlake		Drain.		25	28	27	Cherry	May	10	1918		1512*
Spring Branch	Milldale F. & L. S. Improvement Co.	Council Bluff	Haskill Ditch	Irrig.	7.00	31	17	24	Custer	Feb.	27	1914		1357
Victoria Creek	Dailey-Gilligan & Co	Anselmo	Victoria Irrigation Plt.	Irrig.	2.29	1	19	21	Custer	March	17	1894	210, 212	
Victoria Creek	Victoria Ditch Assn.	Gates	Victoria Ditch	Irrig.	4.29	1	19	21	Custer	July	17	1894	213	
Victoria Creek	Bishop, E. N.	Gates	Laughran & Bell Ditch	Irrig.	15.70	1	19	21	Custer	April	2	1912		1189

* Denotes district's petition approved.

STREAM	NAME OF APPLICANT	Use to which Applied	Sec. Feet Granted	LOCATION OF HEADGATE				Doc. No.	App. No.
				S	T	R	County		
Beaver Creek	Thornton, W. B	Irrig.	3.57	22	20	6	Boone	287	.....
Beaver Creek	Long, Wm. M	Irrig.	.14	14	17	4	Nance	.....	277
Goose Creek	Erickson, P. C	Irrig.	8.00	18	25	24	Brown	209	.....
Goose Creek	Crook, F.	Irrig.	8.00	33	25	24	Brown	.....	345
Gracie Creek	Shoemaker, A. E	Irrig.	.29	29	23	17	Loup	.....	397
Lillian Creek	Lundy, Jas. W	Irrig.	5.00	1	19	20	Custer	.....	1233
Loup River	Nebraska Cen. I. Co	P. & I.	2700.00	27	17	4	Nance	.....	709
Loup River	Boggs, Chas. T	Power	2000.00	28	17	1	Platte	.....	1187
Loup River, N. B	North Loup Irr. & Improvement Co	Irrig.	143.00	27	19	14	Valley	227 228 232 188	....
Loup River, N. B	Lee, J. R	Irrig.	40.00	25	27	29	Cherry	189 356	....
Loup River, N. B	Burwell Irr. Co	Irrig.	110.00	27	21	17	Loup	224	.....
Loup River, N. B	Newton Irr. Dist	Irrig.	115.14	35	23	21	Blaine	205	.....
Loup River, N. B	Erickson, P. C	Irrig.	51.43	27	23	22	Blaine	.....	152
Loup River, M. B	Mid. Loup Valley Irr. Canal	Irrig.	560.29	15	21	22	Blaine	202	.....
Loup River, M. B	Douglas Grove Irrigation Dist	Irrig.	88.57	15	19	18	Custer	214	.....
Loup River, M. B	Thedford I. & P. Co	Irrig.	43.00	4	23	29	Thomas	198	.....
Loup River, M. B	Purdum, J. W	Irrig.	2.86	31	24	29	Thomas	199	.....
Loup River, M. B	Lillian, P. D	Irrig.	140.00	30	21	21	Blaine	204 216	....

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Loup River, M. B	Harris, L. H	Irrig.	5.71	16	22	25	Blaine	.....	248
Loup River, M. B	Muhlbach, Fred	Power	124.00	6	24	32	Hooker	.....	1185
Loup River, M. B	St. Paul Elec. Co	Power	2000.00	3	14	10	Howard	.....	1216
Loup River, M. B	Tillson, W. Z	Irrig.	15.57	29	12	15	Buffalo	236	.....
Loup River, S. B	Boblitz, E. J	Irrig.	.50	10	14	21	Custer	219-A	.....
Loup River, S. B	Boblitz, E. J	Power	20.00	10	14	21	Custer	219-B	.....
Loup River, S. B	Brown, A. D	Irrig.	.86	31	17	24	Custer	.....	363
Loup River, S. B	Hartzell, B. F	Irrig.	.37	27	18	26	Logan	.....	390
Muddy Creek	Benson, Wm. C	Power	.....	33	14	16	Sherman	999	.....
Platte River	Fremont C. & P. Co	I. & P.	2500.00	30	17	4	Butler	.....	40
Platte River	City of Omaha	Power	2000.00	30	17	4	Butler	.....	894
Spring Creek	Hendrix, H. J	Irrig.	1.33	2	17	3	Platte	290	.....
Victoria Creek	Laughran, T., Et Al	Irrig.	4.00	3	19	21	Custer	217	.....

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Battle Creek	Scheerger, George	Battle Creek	Battle Creek Mills	Power	10.67	36	24	3	Madison	Nov.	12	1898	.....	484
Battle Creek	Scheerger, George	Battle Creek	Battle Creek Mills	Power	20.00	36	24	3	Madison	Apr.	20	1906	.....	818
Clear Creek	Lyons Drainage District	Lyons	Main Ditch No. 1	Drain.	.....	14	23	8	Burt	March	9	1911	.....	1069
Elkhorn River	Skrdla, Joseph	Atkinson	Atkinson Mill	Power	38.50	30	30	14	Holt	Nov.	1	1883	271	.....
Elkhorn River	Norfolk Cereal and Flr. Mills (C. S. Bridge)	Norfolk	Norfolk Flour Mill	Power	100.00	23	24	1	Madison	March	1	1870	996	.....
Elkhorn, S. B	Rothleutner, Albert	Ewing	Flouring Mill	Power	33.00	3	26	9	Holt	Aug.	21	1898	.....	464
Middle Creek	Malone, Robert	Lincoln	Malone Ice Plant	Ice	10.00	30	10	6	Lancaster	Dec.	26	1907	.....	883
Oak Creek	Central Realty and I. Co.	Lincoln	Capitol Beach	Stor.	50.00	16	10	6	Lancaster	June	5	1918	.....	1516
Silver Creek	Armour & Co.	So. Omaha	Armour & Co. Reservoir	Ice	10.00	7	13	9	Saunders	Oct.	18	1897	.....	415
Union Creek	Sanders, F. L.	Stanton	Stanton Power Plant	Power	80.00	6	22	2E	Stanton	March	12	1920	.....	1580
Union and Taylor Creek	Breechler & Neely	Madison	Union Valley Mills	Power	.....	32	22	1	Madison				998*	.....

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Elkhorn River	Elkhorn Irr. Co.	Irrig.	131.43	22	29	13	Holt	259 263	.....
Elkhorn River	Davis, Jos.	Irrig.	1.43	31	29	11	Holt	260	.....
Elkhorn River	Carlon, Thomas	Irrig.	1.00	32	29	11	Holt	261	.....
Elkhorn River	Carlon, Thomas	Irrig.	5.00	30	29	11	Holt	262	.....
Elkhorn River	Cain, N. E., Et. Al.	Irrig.	5.00	32	20	11	Holt	283	.....
Elkhorn River	Ross, Chas. P.	Power	500.00	14	15	10	Douglas	.....	971
Elkhorn River	Neligh, W. T. S.	Power	400.00	18	22	6	Cuming	.....	1250
Oak Creek	Eiche, Herman	Irrig.	.71	17	10	6	Lancaster	.....	489
Platte River	Ross, Chas. P.	Power	2500.00	6	14	10	Douglas	.....	970
Platte River	Parmlee & Rawls	Power	2000.00	32	13	13	Cass	.....	1379
Ryans Lake	Elk River Drainage District	Drain	.....	4	17	9	Dodge	.....	966
Springs	Newton Land Co.	Irrig.	.07	13	14	13	Sarpy	.....	29
Stevens Creek	Moore, R. E.	Irrig.	1.00	2	10	7	Lancaster	.....	1335

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Ashburn Creek	Zilmer, W. H.	Valentine	Ashburn Canal	Irrig.	.43	27	34	26	Cherry	June	17	1905	.....	676
Bear Creek	Skinner, Thomas	Springview	Skinner Ditch	Irrig.	.22	15	32	21	Keya Paha	June	20	1888	609	.....
Beeman Creek	Barnard, C. O.	Springview	Barnard Ditch	Irrig.	.43	21	32	20	Keya Paha	June	1	1892	603	.....
Beeman Creek	Beeman, J. D.	Springview	Beeman Ditch	Irrig.	1.00	23	32	20	Keya Paha	May	20	1892	620	.....
Beeman Creek	Rickman, A. L.	Springview	Beeman & Rickman	Irrig.	.29	23	32	20	Keya Paha	July	25	1895	613	.....
Big Alkali Lake	Beale, Harry A.	Lincoln		Drain.	.....	27	31	28	Cherry	Feb.	28	1918	.....	1507
Box Butte Creek	Sandoz, William	Moomaw	Billy's Ditch	Irrig.	.21	29	29	45	Sheridan	Jan.	13	1900	.....	533
Brush Creek, E. B	McCarthy, M. H. et al	O'Neil	McCarthy Ditch No. 1	Irrig.	.50	24	32	14	Holt	July	1	1894	264	.....
Brush Creek, W. B	McCarthy, M. H. et al	O'Neil	McCarthy Ditch No. 2	Irrig.	.63	26	32	14	Holt	Aug.	15	1894	266	.....
Cedar Creek	McNamee, K. M.	Wood Lake	Cedar Creek Ditch	Irrig.	.43	4	30	21	Cherry	Sept.	28	1910	.....	1027
Cottonwood Creek	Fendrich & Lichte	Dunlap	Fendrich & Lichte	Irrig.	.64	22	29	48	Dawes	May	9	1896	.....	336
Cottonwood Creek	Lichte, Hugo	Dunlap	Dunlap Ditch	Irrig.	.50	22	29	48	Dawes	July	18	1911	.....	1113
Cross Creek	Hutchinson, W. H.	Penbrook	Hutchinson Ditch	Irrig.	.21	8	33	24	Keya Paha	Sept.	1	1888	615	.....
Cub Creek	Tissue & Patterson	Springview	Tissue - Patterson	Irrig	.03	16	33	22	Keya Paha	June	30	1894	618	.....
Fairfield Creek	Kuhre, William M.	Johnstown	Kuhre's Pond	Power	25.00	31	33	23	Brown	Sept.	1	1893	612a	.....
Fairfield Creek	Kuhre, William M.	Johnstown	Kuhre's Canal	Irrig.	.14	31	33	23	Brown	April	1	1894	612b	.....

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Horse Shoe Lake...	Horse Shoe Lake Drainage District	Irwin	Horse Shoe Lake	Drain.		13	34	40	Cherry	June	27	1916		1461
Huggins Creek	Soper, H. K.	Enterprise	Soper Ditch	Irrig.	.14	21	35	20	Keya Paha	Nov.	6	1894	592	
Lewis Spring	Lewis, Ralph	Enterprise	Lewis Ditch	Irrig.	.14	29	35	19	Keya Paha	Aug.	30	1895		139
Long Pine Creek..	Kyner, S. H.	Long Pine	Long Pine Power Plant	Power	48.00	30	30	20	Brown	April	2	1909		941
Middle E. Branch	Allen, M. M.	Norden	Allen Ditch	Irrig.	.50	29	33	23	Keya Paha	June	1	1891	616	
Minnechaduza	S. F. Gillman Mill Co.	Neligh	Pierce Milling Co.	Power	35.00	30	34	27	Cherry	Sept.	12	1896		359
Niobrara River	The Coffe Cattle Co.	Chadron	Earnest Ditch No. 1	Irrig.	2.86	9	29	56	Sioux	May	1	1885	514a	
Niobrara River	Cook, J. H.	Agate	McGinley-Stover Lower North Ditch	Irrig.	8.21	25	29	56	Sioux	May	1	1887	513a	
Niobrara River	Furman, Nellie B.	Marsland	Pioneer Ditches	Irrig.	7.14	36	29	51	Dawes	Aug.	1	1887	442a	
Niobrara River	McLaughlin, A. H.	Marsland	McLaughlin Ditch	Irrig.	7.14	9	28	52	Box Butte	May	1	1888	566	
Niobrara River	Cook, J. H.	Agate	McGinley-Stover Lower South Ditch	Irrig.	1.71	25	29	56	Sioux	May	1	1890	513b	
Niobrara River	The Coffee Cattle Co.	Chadron	Earnest Ditch No. 2	Irrig.	2.14	9	29	56	Sioux	May	15	1891	514b	
Niobrara River	Cook, J. H.	Agate	Cook Ditch No. 1-2	Irrig.	3.54	1	28	56	Sioux	May	31	1891	980	
Niobrara River	Elliott Bros.	Van Tassell, Wyoming	Biglow - Seymour	Irrig.	2.40	19	31	57	Sioux	June	8	1891	510	
Niobrara River	Skavdahl, Oscar and Harris, Octave	Marsland	Harris-Neece Ditch	Irrig.	8.57	3	28	55	Sioux	July	1	1892	517	
Niobrara River	Furman, Nellie B.	Marsland	Pioneer Ditches	Power	10.00	31	29	50	Dawes	Aug.	1	1893	442b	
Niobrara River	Taylor, George L.	Marsland	Enterprise Ditch	Irrig.	5.71	27	29	50	Dawes	Jan.	27	1894	461	
Niobrara River	Furman, H. G.	Marsland	Furman Ditch	Irrig.	3.64	29	29	50	Dawes	Feb.	2	1894	462	
Niobrara River	Warnecke, Henry	Harrison	Johnson Ditch	Irrig.	2.86	36	31	57	Sioux	May	1	1894	511	

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Niobrara River....	McMannis, J. T. et al.....	Hemingford....	McMannis - Neeland.....	Irrig.	.86	29	29	49	Dawes.....	June	15	1894	463	.....
Niobrara River....	McCully, S. J.	Carns.....	McCully Ditch.....	Irrig.	8.57	25	32	20	Keya Paha.....	Aug.	7	1894	583	.....
Niobrara River....	Iodence, W. M.	Dunlap.....	Lichte Ditch.....	Irrig.	1.43	27	29	48	Dawes.....	Jan.	24	1895	479	.....
Niobrara River....	Warneke, H.	Harrison.....	Warneke's Ditch.....	Irrig.	1.57	27	31	57	Sioux.....	Feb.	13	1895	505	.....
Niobrara River....	Cook, J. H.	Agate.....	McGinley - Stover Upper Ditch	Irrig.	2.86	23	29	56	Sioux.....	Feb.	25	1895	521	.....
Niobrara River....	Harris, Octave.....	Marsland.....	LaBelle Ditch.....	Irrig.	2.00	6	28	54	Sioux.....	March	12	1895	518	.....
Niobrara River....	Furman, H. G.	Marsland.....	Snow Ditch.....	Irrig.	2.86	35	29	51	Dawes.....	March	26	1895	485	.....
Niobrara River....	Hughes, Mary F.	Marsland.....	Excelsior Ditch.....	Irrig.	2.86	10	28	52	Box Butte.....	May	15	1895	568	.....
Niobrara River....	Mann, John E.	Harrison.....	Bourett Ditch.....	Irrig.	2.00	33	30	56	Sioux.....	June	8	1895	.....	4
Niobrara River....	Bourett, John S.	Harrison.....	Bourett Sr. Ditch.....	Irrig.	1.43	29	30	56	Sioux.....	June	10	1895	.....	5
Niobrara River....	Hughes, John, Estate of	Marsland.....	Hughes Ditch.....	Irrig.	1.00	1	28	52	Box Butte.....	June	26	1895	.....	53
Niobrara River....	Harris, Octave.....	Marsland.....	La Belle Ditch.....	Irrig.	3.14	6	28	54	Sioux.....	July	3	1895	.....	60
Niobrara River....	Bennett, Sadie C.	Omaha.....	Moore Ditch.....	Irrig.	5.71	9	28	53	Sioux.....	July	22	1895	.....	88
Niobrara River....	Peters, H. A. et al.....	Hay Springs....	Hay Springs Canal.....	Irrig.	14.29	29	29	47	Dawes.....	Sept.	27	1895	.....	173
Niobrara River....	Sandoz, George.....	Marsland.....	Mettlem Ditch.....	Irrig.	10.00	4	28	54	Sioux.....	April	27	1896	.....	292
Niobrara River....	Neeland, Sarah J.	Hemmingford	McMannus - Neeland.....	Irrig.	1.93	29	29	49	Dawes.....	April	9	1898	.....	448
Niobrara River....	Bourett, J. F.	Harrison.....	Bourett Ditch.....	Irrig.	1.00	29	30	56	Sioux.....	March	5	1900	.....	542
Niobrara River....	Bourett, J. S.	Harrison.....	J. S. Bourrett Ditch.....	Irrig.	1.71	19	30	56	Sioux.....	March	17	1900	.....	546
Niobrara River....	Montague, James.....	Dunlap.....	Montague - Lichte.....	Irrig.	.43	27	29	48	Dawes.....	Sept.	27	1900	.....	575
Niobrara River....	Fendrich, B.	Dunlap.....	Chladek Ditch.....	Irrig.	.30	26	29	48	Dawes.....	March	18	1901	.....	607
Niobrara River....	Fendrich, G. A.	Dunlap.....	Fendrich Ditch.....	Irrig.	.29	32	29	48	Dawes.....	June	1	1901	.....	616
Niobrara River....	Fendrich, G. A.	Harrison.....	Fendrich Ditch.....	Irrig.	.27	32	29	48	Dawes.....	June	1	1901	.....	617
Niobrara River....	Cornell, C. M.	Valentine.....	Valentine Power Plant..	Power	1600.00	27	24	34	Cherry.....	Jan.	29	1902	.....	652
Niobrara River and Pepper Cr.	Taylor, D. T.	Hay Springs....	Taylor Ditch.....	Irrig.	4.57	28	29	47	Dawes.....	Aug.	8	1904	.....	766
Niobrara River....	Kay, John L.	Marsland.....	Kay Ditch.....	Irrig.	2.00	6	28	53	Dawes.....	May	12	1905	.....	791

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Niobrara River	Kirk, E. L.	Sioux City	Nebraska Power Co.	Power	900.00	34	32	7	Knox	Sept.	24	1909	.....	961
Niobrara River	McCormack, George W.	Harrison	Beiser Ditch	Irrig.	.75	4	29	56	Sioux	Jan.	23	1911	.....	1056
Niobrara River	McCormack, George W.	Harrison	Ext. of Bourrett Ditch	Irrig.	1.21	33	30	56	Sioux	Jan.	23	1911	.....	1057
Niobrara River	Iodence, W. M.	Dunlap	Lichte Ditch	Irrig.	3.00	27	29	48	Dawes	April	7	1911	.....	1086
Niobrara River	Montague, James	Dunlap	Lichte Ditch	Irrig.	.71	27	29	48	Dawes	April	19	1911	.....	1088
Niobrara River	Hopkins, Thomas L.	Hemmingford	Potmesil Bros. Ditch	Irrig.	.28	25	29	48	Sioux	Jan.	2	1912	.....	1152
Niobrara River	Bourrett, John	Harrison	J. Bourrett Ext. No. 1	Irrig.	.11	29	30	56	Sioux	March	25	1912	.....	1188
Niobrara River	Bourrett, John	Harrison	J. Bourrett Ext. No. 2	Irrig.	.21	32	30	56	Sioux	July	19	1912	.....	1209
Niobrara River	Bennett, Sadie C.	Omaha	Mettlen Ditch	Irrig.	5.00	4	28	54	Sioux	Dec.	18	1912	.....	1248
Niobrara River	Bennett, Sadie C.	Omaha	Bennett Ditch	Irrig.	4.00	1	28	54	Sioux	Dec.	18	1912	.....	1249
Niobrara River	Fox, Jim	Marsland	George Hitshew's Ditch	Irrig.	6.00	6	28	52	Box Butte	Feb.	17	1913	.....	1260
Niobrara River	Coffee Cattle Co.	Chadron	Coffee Ditch No. 3	Irrig.	2.50	15	29	56	Sioux	March	24	1914	.....	1362
Niobrara River	U. S. Forest Reserve	Nenzel	Morton Nursery Ditch	Irrig.	.50	30	33	32	Cherry	June	15	1907	.....	1488
Pine Creek	Colclesser, Henry	Colclesser	Pine Creek Mill	Power	32.00	33	30	44	Sheridan	June	5	1893	415	.....
Plum Creek	Wilbert, R.	Ainsworth	Wilbert Ditch	Irrig.	.43	35	32	23	Brown	May	5	1896	.....	329
Plum Creek	Ainsworth L. & P. Co.	Ainsworth	Plum Creek Plant	Power	150.00	29	32	22	Brown	May	15	1909	.....	947
Rickman Creek	Byington, W. W.	Springview	Byington Ditch	Irrig.	1.00	22	32	20	Keya Paha	May	19	1891	582	.....
Rock Creek	Dugger Bros.	Bassett	Dugger Ditch	Irrig.	4.57	33	32	18	Rock	April	24	1919	.....	1539
Rock Spring Cr.	Chase, Albert B.	Ainsworth	Moore's Ditch	Irrig.	1.43	12	32	22	Keya Paha	June	30	1887	593	.....
Spring Creek	Kuskie, A. K.	Sparks	Garden Ditch	Irrig.	.86	27	34	25	Cherry	March	30	1900	.....	555
Wyman Creek	McCully, R. A.	Carns	McCully Ditch	Irrig.	.80	19	32	19	Keya Paha	June	10	1891	604	.....

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Abitz Creek	Fullerton, J. B.	Irrig.	.36	18	30	13	Holt	.....	278
Antelope Creek	Julian, R. R., Et Al.	Irrig.	.36	21	32	40	Cherry	.....	798
Bear Creek	Cedarburg, P.	Irrig.	.02	3	32	21	Keya Paha	.....	479
Big Sandy Creek	Pickler, W. S.	Irrig.	1.14	12	33	14	Holt	.....	667
Big Sandy Creek	Johnson, C. A.	Power	35.00	12	33	14	Holt	.....	685
Blackbird Creek	Mullen, A. F.	Irrig.	1.00	20	31	11	Holt	267	.....
Bluebird Creek	Murphy, P.	Irrig.	1.00	26	30	11	Holt	273	.....
Boardman Creek	Robert-Fowles	Irrig.	6.86	6	29	33	Cherry	973	.....
Boardman Creek	Bachelor, J. H.	Irrig.	28.57	33	30	32	Cherry	.....	1155
Brush Creek	Nebr. Townsite Co.	Power	15.00	23	33	13	Holt	.....	474
Burton Creek	Mutz, Otto	Irrig.	.57	19	34	19	Keya Paha	608b	.....
Burton Creek	Mutz, Otto	Irrig.	.35	2	33	20	Keya Paha	.....	142
Canyon	Reese, B. F., and Thomas, A. G.	Irrig.	14.29	36	30	54	Sioux	.....	863
Cottonwood Creek	Bender Bros.	Irrig.	.71	17	29	48	Dawes	481	.....
Crooked Creek	Mutz, Otto	Power	3.00	19	34	19	Keya Paha	608A	.....
Crooked Creek	Mutz, Otto	Irrig	1.00	19	34	19	Keya Paha	608b	.....

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Cub Creek	Karr, John, and Tissue, E. H.	Irrig.	.10	28	33	22	Keya Paha	589	.....
Eagle Creek	Bokhof, Wm.	Irrig.	2.86	6	30	13	Holt	275	.....
Eagle Creek	Robinson, J. A.	Irrig.	2.29	1	30	14	Holt	280	.....
Eagle Creek, S. B	Becker, Samuel	Irrig.	1.14	8	30	13	Holt	274	.....
Holt Creek	Schoettger, F. J.	Irrig.	.14	32	35	20	Keya Paha	595	.....
Holt Creek, S. B.	Akers, J. W.	Irrig.	.14	1	34	21	Keya Paha	611	.....
Horse Head Creek	Bruce, A.	Irrig.	.17	16	33	24	Keya Paha	.....	149
Jewett Creek	Serek, Theo. A.	Irrig.	.71	5	32	21	Keya Paha	590	.....
Keya Paha River	Yocum, J. C.	Irrig.	1.14	23	34	15	Boyd	573	.....
Keya Paha River	Bruce, Andrew	Power	100.00	24	34	16	Boyd	.....	729
Kibby Creek	Green, Martha J.	Irrig.	.01	28	34	16	Boyd	.....	747
Middle, E. B.	McGuire, M. W.	Irrig.	.71	32	33	23	Keya Paha	606	.....
Middle, E. B.	Allen, M. N.	Irrig.	1.00	29	33	23	Keya Paha	.....	753
Minnechaduza	City of Valentine	Power	40.00	29	34	27	Cherry	.....	1279
Newman Creek	Newman, Philo	Irrig.	.21	17	33	24	Keya Paha	617	.....
Niobrara River	Bruce, A.	Power	60.00	16	33	24	Keya Paha	610	.....
Niobrara River	Roll Mill Co.	Power	35.00	5	28	51	Box Butte	970	.....

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Niobrara River	Green, Frank J. Meridian Canal	Irrig.	.57	25	29	50	Dawes	459	.....
Niobrara River	Fienken, Chas.	Irrig.	1.00	12	33	16	Boyd	575	.....
Niobrara River	Wilson, J. A.	Irrig.	5.71	18	32	21	Keya Paha	591	.....
Niobrara River	Est. of John Hughes	Irrig.		1	28	52	Box Butte	987	.....
Niobrara River	Bond & Tissot	Irrig.	1.16	19	29	46	Sheridan	.....	82
Niobrara River	Armstrong, T. S.	Power	150.00	9	33	13	Boyd	.....	452
Niobrara River	Hunter, Jas. A.	Irrig.	5.14	25	29	50	Dawes	.....	469
Niobrara River	Pofmesil Bros.	Irrig.	6.00	26	29	48	Dawes	.....	757
Niobrara River	Kirk, E. L.	Power	700.00	34	32	7	Knox	.....	1019
Niobrara River	Dieriex, Camille	Irrig.	1.53	19	30	43	Sheridan	.....	1087
Niobrara River	Wells, Harry E.	Irrig.	1.64	32	32	40	Sheridan	.....	1193
Niobrara River	Buhman, Herman P.	Power	900.00	1-6	32	10	Boyd	.....	1243
Plum Creek	Plum Creek Irr. Co.	Irrig.	26.00	4	29	24	Brown	405	.....
Pole Creek	Julian, A. R., Et Al.	Irrig.	.57	28	32	40	Cherry	.....	799
Rock Creek	Eastlick, B. J.	Irrig.	.35	29	32	18	Rock	395	.....
Rock Creek	Wile, H.	Irrig.	.86	9	31	18	Rock	397	.....
Rock Springs	Van Koten, J.	Irrig.	.07	25	33	22	Keya Paha	619	.....
Shobe Branch	Lamb, A. J.	Irrig.	.14	30	33	11	Holt	.....	322
Snake River	Jackson, W. S.	Power	180.00	9	31	30	Cherry	.....	1352
Springs	Bakewell, Geo. C.	Irrig.	.85	26	33	24	Brown	.....	1067

STREAM	NAME OF APPLICANT	Use to which Applied	Sec. Feet Granted	LOCATION OF HEADGATE				Doc. No.	App. No.
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Stream—no name	Grant, C. G.	Irrig.	.14	4	31	20	Rock	400	.....
Stream—no name	Conger, C. K.	Irrig.	.11	5	33	24	Keya Paha	.....	158
Snider Creek	Pickler, W. S.	Irrig.	.01	31	33	19	Keya Paha	607	.....
Spotted Tail Creek	Rhodes, J. G.	Irrig.	.25	4	34	17	Keya Paha	601	.....
Turkey Creek	LaRue, Chas.	Irrig.	.43	35	33	23	Keya Paha	.....	539
Turkey Creek	LaRue, Chas.	Irrig.	2.00	35	33	23	Keya Paha	.....	754
Verdigris Creek	Drayton, Jno. T.	Irrig.	2.86	8	28	8	Antelope	248	.....
Wyman Creek	Koenig, Joe	Irrig.	.14	17	32	19	Keya Paha	587	.....
Young Creek	Lamb, A. J.	Irrig.	.29	32	33	11	Holt	.....	311

Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Ash Creek	Connell, W. D.	Whitney	Connell Ditch	Irrig.	.63	6	32	50	Dawes	June	17	1898	.....	459
Ash Creek	Cripps, Fred W.	Whitney	Cripps Ditch No. 2	Irrig.	1.00	13	32	51	Dawes	Jan.	10	1899	.....	491
Ash Creek	Cripps, Fred W.	Whitney	Cripps Ditch	Irrig.	1.14	13	32	51	Dawes	Dec.	26	1903	.....	735
Ash Creek, E. B.	Tomlin, H. B.	Whitney	Ox Yoke Ditch	Irrig.	2.86	31	32	50	Dawes	May	31	1880	447	.....
Ash Creek, E. B.	Aird, Ada L.	Crawford	Barron Ditch	Irrig.	1.14	32	32	50	Dawes	July	1	1888	438	.....
Ash Creek, E. B.	Ivins, Orville R.	Crawford	Sheldon Ditch	Irrig.	1.43	30	32	50	Dawes	Jan.	26	1899	.....	493
Ash Creek, E. B.	Todd, Frank P.	Crawford	Todd Ditch	Irrig.	.38	5	31	50	Dawes	Sept.	12	1899	.....	520
Ash Creek, E. B.	Stumph, Nellie	Whitney	Stumph Ditch	Irrig.	.....	31	32	50	Dawes				1023½*	.....
Ash Creek, W. B.	Vetter, Andrew	Crawford	Mace Ditch	Irrig.	1.00	2	31	51	Dawes	July	31	1884	428	.....
Ash Creek, W. B.	Wall, C. W.	Whitney	W. Ash Cr. Irr. Co. D.	Irrig.	1.62	36	32	51	Dawes	July	4	1893	452	.....
Ash Creek, W. B.	Ivins, Orville R.	Crawford	Woodward Ditch	Irrig.	.14	25	32	51	Dawes	Feb.	3	1898	.....	434
Ash Creek, W. B.	Broadhurst, Nathan	Crawford	Broadhurst Reservoir	Stor.	5.00	35	32	51	Dawes	Nov.	17	1913	.....	1333
Beaver Creek	Braddock, William	Chadron	Braddock Ditch	Irrig.	.36	18	34	46	Sheridan	April	15	1895	423	.....
Beaver Creek	Braddock, William	Chadron	Wm. Lockler Ditch	Irrig.	.....	34	35	47	Dawes				.....	1017*
Beaver Creek	U. R. L. & Cattle Co.	Chadron	Cilek	Irrig.	.36	4	33	46	Sheridan	June	19	1889	.....	513
Beaver Creek	Cavins, J. A.	Chadron	Rickman Ditch	Irrig.	1.00	9	33	46	Sheridan	July	2	1902	.....	681
Bordeaux Creek	Naylor, W. W.	Chadron	Richards Ditch	Irrig.	.14	36	33	48	Dawes	Sept.	10	1890	430	.....
Bordeaux Creek	Naylor, W. W.	Chadron	Richards Ditch	Irrig.	.36	36	33	48	Dawes	Sept.	7	1892	446	.....
Bordeaux Creek	Naylor, Charles	Chadron	Mann's Ditch	Irrig.	.23	25	33	48	Dawes	Dec.	31	1892	975	.....
Bordeaux Creek	Roberts, R. O.	Chadron	Adams Ditch	Irrig.	.14	2	32	48	Dawes	March	5	1893	450	.....
Bordeaux Creek	County of Dawes	Chadron	County Ditch	Irrig.	.14	23	33	48	Dawes	July	31	1893	983	.....
Bordeaux Creek	Kebbard, K. M.	Chadron	Bacon Ditch	Irrig.	.21	21	34	48	Dawes	July	1	1894	445	.....
Bordeaux Creek	Morrissey, M.	Chadron	Morrissey Canal	Irrig.	.08	15	33	48	Dawes	Aug.	25	1894	491	.....

Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Bordeaux Creek	O'Donnell, John	Chadron	O'Donnell Ditch	Irrig.	.14	9	34	48	Dawes	Jan.	17	1898	.....	432
Bordeaux Creek	Nelson, P. B.	Chadron	Nelson's Ditch	Irrig.	.36	14	33	48	Dawes	Oct.	19	1898	.....	478
Bordeaux Creek	Naylor, Charles	Chadron	Burns Ditch	Irrig.	4.00	36	33	48	Dawes	Nov.	5	1900	.....	584
Bordeaux Creek	Naylor, W .W.	Chadron	Naylor Ditch	Irrig.	.42	36	33	48	Dawes	July	22	1918	.....	1519
Bordeaux, Lit	Lebo, George E.	Chadron	Hartzell	Irrig.	.57	13	33	48	Dawes	June	1	1893	448	.....
Bordeaux, Lit	Butler, J. A.	Chadron	Butler Ditch	Irrig.	.11	33	33	47	Dawes	June	1	1894	443	.....
Bordeaux, Lit	Collin, Jacob	Chadron	Collins Reservoir	Irrig.	.31	14	32	48	Dawes	Feb.	27	1905	.....	780
Bordeaux, Lit	Good, J. W.	Chadron	Good Ditch	Irrig.	7.00	29	33	47	Dawes	March	6	1905	.....	783
Bull Creek	Johnson, W. S.	Glen	Johnson Ditch No. 1	Irrig.	.29	7	30	53	Sioux	March	13	1895	519	.....
Butte Cr. Trunk	Chaulk, John J.	Chadron	Chaulk Ditch	Irrig.	3.00	25	33	50	Dawes	March	13	1915	.....	1406
Chadron Creek	City of Chadron	Chadron	Chadron Water Works	W. S.	1.00	18	32	48	Dawes	Dec.	31	1888	1022	.....
Chadron Creek	Gorr, James	Chadron	Gallup's Ditch	Irrig.	.08	15	33	49	Dawes	Dec.	20	1890	426	.....
Chadron Creek	City of Chadron	Chadron	Water Works Extension	Stor.	.....	...	...	...	Dawes	April	8	1920	.....	1583*
Cottonwood Cr	Rasmussen, J. J. & C. M.	Whitney	Rasmussen Ditch	Irrig.	2.29	10	33	52	Dawes	March	8	1898	.....	444
Cottonwood Cr	Rasmussen, J. J. & C. M.	Whitiney	Rasmussen Ditch	Irrig.	18.00	10	33	52	Dawes	Dec.	26	1899	.....	528
Cottonwood, Lit	Golden, T. F.	Crawford	Thos. Stuart Ditch	Irrig.	.36	8	32	52	Dawes	Dec.	21	1890	425	.....
Cottonwood, Lit	Price, J. A. and Golden, T. F.	Crawford	Stuart Bros. Ditch	Irrig.	2.86	8	32	52	Dawes	June	10	1895	.....	8
Cottonwood, Lit	Kusel, William T.	Chadron	Kusel Ditch	Irrig.	1.14	9	32	51	Dawes	Oct.	16	1895	.....	183
Cottonwood, Lit	Kusel, William T.	Chadron	Kusel Ditch No. 2	Irrig.	.43	8	32	51	Dawes	May	19	1900	.....	560
Cottonwood, Lit	Dunn, J. G.	Crawford	Dunn's Ditch	Irrig.	1.43	9	32	52	Dawes	Jan.	14	1902	.....	649

Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
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Cottonwood, Lit....	Erickson, John R.	Crawford.....	Stuart - Maple.....	Irrig.	.29	3	32	52	Dawes.....	March	10	1902	.....	656
Cottonwood, Lit....	Kusel, William T.	Chadron.....	Kusel - Speain.....	Irrig.	.71	8	32	51	Dawes.....	June	30	1902	.....	677
Cottonwood, Lit....	Lawrence, Thomas E....	Crawford.....	Broadhurst Ditch.....	Irrig.	3.02	7	32	51	Dawes.....	Feb.	25	1913	.....	1264
Cottonwood, Lit....	Dodd & McDowell.....	Crawford.....	Dodd McDowell.....	Stor.	10.00	18	32	5	Sioux.....	April	15	1913	.....	1276
Dead Horse Cr.....	Woodruff, F. B. & E. F.	Chadron.....	Flag Butte Ditch.....	Irrig.	.03	32	32	49	Dawes.....	April	10	1891	427	.....
Dead Horse Cr.....	Goff, G. L.	Chadron.....	Goff Ditch.....	Irrig.	.....	4	31	49	Dawes.....	June	10	1895	.....	7
Dead Horse Cr.....	Geiser, B. A.....	Chadron.....	Geiser Ditch.....	Irrig.	.15	17	32	49	Dawes.....	March	18	1902	.....	658
Dead Horse Cr.....	White, Charles et al	Chadron.....	.....	Irrig.	1.29	32	33	49	Dawes.....	April	6	1904	.....	749
Deadman Creek....	Phillips, W. S.	Crawford.....	Phillips Ditch.....	Irrig.	.14	18	30	52	Dawes.....	March	19	1900	.....	547
Deadman Creek....	Glendy, Thos. J.	Crawford.....	Porter - Rasmussen.....	Irrig.	1.43	1	30	53	Sioux.....	May	29	1900	.....	562
Deadman Creek....	Linderman, Con.	Crawford.....	Linderman Ditch.....	Irrig.	.14	18	30	52	Dawes.....	June	11	1900	.....	564
Deep Creek.....	Hanks, John.....	Glen.....	Deep Creek Ditch.....	Irrig.	.06	9	30	53	Sioux.....	May	1	1887	525	.....
Deep Creek.....	McMaster, William A.	Glen.....	Green Ditch.....	Irrig.	.20	9	30	53	Sioux.....	Oct.	5	1895	.....	203
Dry Run.....	Campbell, F. J.	Chadron.....	Campbell Ditch.....	Irrig.	1.00	35	34	49	Dawes.....	Nov.	9	1908	.....	919
Dry Run.....	Guse, William.....	Crawford.....	Wm. Guse Reservoir.....	Stor.	20.00	35	34	52	Dawes.....	Jan.	13	1914	.....	1345
Dry Run.....	Harrison & Weston.....	Crawford.....	Harsh - Weston Ditch....	Irrig.	3.00	31	34	51	Dawes.....	March	11	1914	.....	1361
Dry Canon.....	Betson, William A.	Crawford.....	Betson Ditch.....	Irrig.	1.00	33	32	51	Dawes.....	March	22	1917	.....	1481
Dry Draw.....	Glaze, William A. (Heath, W. E., Agent)	Chadron.....	Heath Reservoir.....	Irrig.	1.00	12	32	53	Sioux.....	Feb.	7	1917	.....	1475
English Creek.....	McDowell, E. C.	Crawford.....	McDowell Storage Sys....	Irrig.	.87	12	31	52	Dawes.....	Oct.	24	1904	.....	772

Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
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Flood Water	Lenehan, Delia	Crawford	Lenehan Reservoir	Stor.	4.00	25	34	52	Dawes	April	16	1913	.....	1278
Flood Water	Arner, Jessie B.	Crawford	Arner Ditch	Irrig.	.14	27	33	53	Sioux	May	6	1913	.....	1289
Flood Water (White River)	Wilson, C. L. et al	Whitney	Whitney Ditch	Irrig.	12.42	1	32	51	Dawes	Nov.	27	1919	.....	1567
Hooker Creek	Bauerbach, Lena	Crawford	Bauerbach Ditch	Irrig.	1.00	7	31	51	Dawes	Dec.	31	1889	492	.....
Hooker Creek	Sheldon, C. E.	Crawford	Alcorn Ditch	Irrig.	1.21	31	32	51	Dawes	Nov.	17	1905	.....	803
Hooker Creek	Souther, Mabel G.	Crawford	Souther Lake	F. & I.	1.42	30	32	51	Dawes	Sept.	24	1908	.....	915
Indian Creek	Renfro, O. S.	Chadron	Seegrist Ditch	Irrig.	.03	3	31	50	Dawes	Nov.	1	1893	489	.....
Indian Creek	Renfro, O. S.	Chadron	Flood Ditch	Irrig.	.07	33	32	50	Dawes	Feb.	13	1894	460	.....
Indian Creek	Boyer, F.	Whitney	Boyer Ditch	Irrig.	.86	28	32	50	Dawes	April	30	1900	.....	559
Indian Creek	Renfro, Oscar S.	Chadron	Seegrist Extension	Irrig.	6.64	3	31	50	Dawes	Nov.	29	1919	.....	1568
Indian Creek	Renfro, Oscar S.	Chadron	Renfro Reservoir	Stor.	480.00 A. F.	3	31	50	Dawes	Nov.	29	1919	.....	1569
Indian-Creek, Tr..	Kaiser, Omar A.	Whitney	Kaiser Ditch	Irrig.	.57	28	32	50	Dawes	Feb.	15	1900	.....	540
Indian-Creek, Tr..	Honnold Bros.	Whitney	Honnold - Wilson	Irrig.	.07	3	31	50	Dawes	May	25	1912	.....	1199
Kane Creek	McConnell, J. S.	Whitney	McConnell Reservoir	Irrig.	4.29	29	34	50	Dawes	Jan.	14	1909	.....	931
Kyle Creek	Sturgeon, Ralph	Crawford	Kyle Creek Ditch	Irrig.	.57	3	30	54	Sioux	June	30	1882	522	.....
Lone Tree, S. Fk...	Thomas, J. C.	Whitney	Thomas Ditch	Irrig.	1.00	28	34	51	Dawes	April	29	1905	.....	789
Lone Tree Creek....	Sides, Frank	Whitney	Sides Reservoir	Stor.	3.00	13	34	52	Dawes	Nov.	25	1914	.....	1392

Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
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Madden Creek	Flannigan, T. F.	Chadron	Dams	Irrig.	.57	26	35	49	Dawes	July	11	1904		763
Madden Creek	Flannigan, O. R.	Chadron	Trier Ditch	Irrig.	1.21	6	34	48	Dawes	Aug.	1	1906		830
Madden Cr. and North Creek	Flannigan, O. R.	Chadron	Dams	Irrig.	.57	31	35	48	Dawes	Oct.	17	1904		771
McDowell & Dodd Res. A. 1276	Dodd, Calvin H.	Crawford	Dodd Reservoir	Irrig.		13	32	53	Dawes	Jan.	5	1920		1571*
Rush Creek	Braddock, H. T.	Chadron	Braddock Ditch	Irrig.	3.00	10	34	49	Dawes	May	4	1903		706
Rush Creek	Braddock, H. T.	Chadron	Braddock Extension	Irrig.	1.57	11	34	49	Dawes	May	31	1906		825
Sand Creek, Tr. to Cottonwood	Rasmussen, K.	Whitney	Rasmussen Ditch	Irrig.	17.00	3	32	52	Dawes	Jan.	8	1906		811
Sand Creek, Tr. to Cottonwood	Dunn, John T.	Crawford	Syndicate Ditch	Irrig.	27.42	32	33	52	Dawes	April	2	1912		1190
Saw Log, East	Stuart, H. E.	Crawford	Little Saw Log	Irrig.	.71	12	30	52	Dawes	Jan.	23	1907		849
Saw Log, East	Van Treek, P. H.	Crawford	Van Treek Canal	Irrig.	.37	4	30	51	Dawes	May	8	1911		1098
Spring Creek	Swinbank, Sam et al.	Crawford	Moszeter Ditch	Irrig.		13	32	52	Dawes				1014*	
Spring Creek	Forbes, J. B.	Crawford	Forbes Ditch No. 1	Irrig.	.57	20	32	52	Dawes	April	28	1902		663
Spring Creek	Swinbank, Samuel	Crawford	Swinbank Reservoir	Stor.	2.00	13	32	52	Dawes	March	3	1914		1358
Spring Creek, Trib. to Lit. Cottonwood	Pinney, B. G.	Crawford	Spring Creek Ditch	Irrig.	.86	13	32	52	Dawes	May	10	1894	466	

Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Spring Creek, Trib. to Lit. Cottonwood	Lawrence, Thos. E.	Crawford	Spring Creek Ditch No. 1	Irrig.	2.00	7	32	51	Dawes	Dec.	1	1894	473	.....
Spring Creek, Trib. to Dead Horse Cr.	Lawrence, Thos. E.	Crawford	Spring Creek Ditch No. 1	Irrig.	5.00	13	32	52	Dawes	April	7	1905	.....	788
Squaw Creek	Hall, Leroy and F. L.	Crawford	Cooper Ditch	Irrig.	2.29	36	32	52	Dawes	May	8	1896	.....	333
Squaw Creek	McDowell, E. C.	Crawford	Squaw Creek	Stor. Irrig.	3.00	12	31	52	Dawes	Oct.	3	1911	.....	1132
White Clay Creek	Tandy, A. M.	Crawford	McFarland Ditch	Irrig.	1.64	35	32	52	Dawes	May	18	1891	960	.....
White Clay Creek.	White River Irr. Co.	Crawford	White River Ditch	Irrig.	8.71	35	32	52	Dawes	Dec.	31	1894	477	.....
White Clay Creek.	Hall, Leroy and F. L.	Crawford	Cooper Ditch	Irrig.	3.71	2	31	52	Dawes	June	22	1895	.....	42
White Clay Creek.	Brockway, Maggie	Red Oak, Iowa	Brockway Ditch	Irrig.	.71	36	31	52	Dawes	Feb.	27	1896	.....	256
White Clay Creek.	Pine Ridge Indian Ag.	Pine Ridge S.	Pine Ridge Ditch	Irrig	.....	.....	.....	.....	Sheridan	.....	....	.....	419*	.....
White Clay Creek.	Adams, George M.	Crawford	Rincker Ditch	Irrig.	.57	11	31	52	Dawes	June	8	1901	.....	618
White Clay Creek.	Hutzel, John C.	Rushville	Hutzel Ditch	Irrig	.57	13	31	52	Dawes	April	30	1903	.....	704
White Clay Creek.	Townsend, Charles	White Clay	Townsend Ditch	Irrig.	.80	25	25	45	Sheridan	Jan.	21	1911	.....	1054
White Clay Creek.	Handschugel, Eva U.	Crawford	Handschugel Lake	Stor.	1.30	11	31	52	Dawes	Dec.	17	1915	.....	1441
White Clay Cr., East Branch	Stewart, H. E.	Crawford	Little Saw Log	Irrig.	.71	12	30	52	Dawes	Jan.	23	1907	.....	849
White Clay and Squaw Creek	White River Irr. Co.	Crawford	White River Ditch	Irrig.	8.00	36	32	52	Dawes	March	3	1902	.....	655
White River	Hall, LeRoy	Crawford	Halls Ditch No. 1-2	Irrig.	24.83	34	32	52	Dawes	Sept.	10	1885	478a	.....
White River	Harris & Cooper Irr. A.	Crawford	Harris - Cooper	Irrig.	16.78	25	32	52	Dawes	March	9	1894	464	.....
White River	Harris & Cooper Irr. A.	Crawford	Harris - Cooper	Irrig.	1.57	25	32	52	Dawes	June	15	1894	464	.....

Power

Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
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White River.....	Harris & Cooper Irr. A.	Crawford.....	Harris - Cooper.....	Irrig.	.28	25	32	52	Dawes.....	Oct.	31	1894	464	.....
White River.....	Est. of Charles Rasher	Crawford.....	Rasher Ditch.....	Irrig.	1.14	19	32	51	Dawes.....	June	20	1894	467	.....
White River.....	White River Irr. Co.	Crawford.....	White River Ditch.....	Irrig.	8.71	35	32	52	Dawes.....	Dec.	31	1894	477	.....
White River.....	Hall, LeRoy.....	Crawford.....	Halls Mill.....	~~Power~~	26.40	34	32	52	Dawes.....	Jan.	10	1895	478b	.....
White River.....	C., B. & Q. R. R. Co.	Lincoln.....	C., B. & Q. Line at Crawford.....	Irrig.	.80	3	31	52	Dawes.....	Sept.	14	1889	1030	.....
White River.....	Coffee, C. S.	Chadron.....	Lewis Ditch.....	Irrig.	.14	27	31	55	Sioux.....	May	19	1896	.....	340
White River.....	Schwabe, Lena.....	Chadron.....	Schwabe Ditch.....	Irrig.	1.14	25	34	49	Dawes.....	June	24	1897	.....	394
White River.....	Grant, Cecil.....	Crawford.....	Wilkinson Ditch.....	Irrig.	.71	24	32	52	Dawes.....	Nov.	18	1897	.....	421
White River.....	Forbes, Jeanette et al....	Crawford.....	Rasher Ditch.....	Irrig.	.50	19	32	51	Dawes.....	May	23	1898	.....	456
White River.....	Zurn, Adam.....	Crawford.....	Zurn - Schmeizleh.....	Irrig.	1.00	19	32	51	Dawes.....	Oct.	13	1898	.....	475
White River.....	Rasher, Frank.....	Crawford.....	Rasher Ditch.....	Irrig.	1.43	19	32	51	Dawes.....	Jan.	16	1900	.....	534
White River.....	Village of Crawford.....	Crawford.....	Crawford Pump Station	Power	18.00	3	31	52	Dawes.....	March	30	1903	.....	702*
White River.....	Hebbert, Minnie L. and Hebbert, Scott D.	Chadron.....	Hebbert Ditch.....	Irrig.	.29	34	33	50	Dawes.....	May	11	1903	.....	707
White River.....	Nance & Simon Irr. Co.	Whitney.....	Simmons - Harris.....	Irrig.	1.00	16	32	51	Dawes.....	Oct.	26	1903	.....	730
White River.....	Peterson, Charles R.	Crawford.....	Ext. to C. Rasher.....	Irrig.	1.29	20	32	51	Dawes.....	Feb.	5	1904	.....	740
White River.....	White River Irr. Co.	Crawford.....	White River—S. Br.	Irrig.	1.43	25	32	52	Dawes.....	March	11	1909	.....	936
White River.....	Jenson, J. L.	Whitney.....	Jenson Irrigation Plant.	Irrig.	1.14	26	33	50	Dawes.....	June	27	1900	.....	1110
White River.....	Pinney & Denslon	Crawford.....	Penney & Denslon Res. No. 1-2-3.....	I. & S.	20.00	26	32	52	Dawes.....	Aug.	10	1911	.....	1122
White River.....	Forbes, William T.	Crawford.....	Forbes Extension.....	Irrig.	.85	19	32	51	Dawes.....	Sept.	26	1911	.....	1128
White River.....	Hebbert, Minnie L. et al	Chadron.....	Hebbert Ditch.....	Irrig.	.71	34	33	50	Dawes.....	March	10	1914	.....	1360
White River, Canyons, Tr. to Wilkinson's Lake.	Jones, C. W. ..... Naylor, Charles.....	Crawford..... Chadron.....	Jones Ditch..... Naylor Ditch.....	Irrig. Drain.	.29	9 16	31 26	51 45	Dawes..... Dawes.....	May Oct.	20 20	1907 1917	....	860 1504*

STREAM	NAME OF APPLICANT	Use to which Applied	Sec. Feet Granted	LOCATION OF HEADGATE				Doc. No.	App. No.
				S	T	R	County		
Ash Creek	Compton, W. L.	Irrig.	.03	12	32	51	Dawes	455	.....
Ash Creek	Howard, W. C.	Irrig.	.57	13	32	51	Dawes	.....	835
Beaver Creek	Braddock, J. F.	Irrig.	.04	1	34	47	Dawes	974	.....
Beaver Creek	Braddock, J. F.	Irrig.	.63	1	34	47	Dawes	.....	463
Bordeaux Creek	Lockett, T. E.	Irrig.	.07	11	32	48	Dawes	.....	494
Bordeaux Creek	Bryant, S. A.	Irrig.	.29	14	33	48	Dawes	434	.....
Bordeaux Creek	Hall. O. W.	Irrig.	.07	15	33	48	Dawes	437	.....
Bordeaux Creek	Nelson, P. B.	Irrig.	.14	14	33	48	Dawes	.....	494
Bordeaux Creek	Martens, Wm.	Irrig.	.57	28	34	48	Dawes	.....	690
Bordeaux Creek	Martens, Wm.	Irrig.	1.14	21	34	48	Dawes	.....	848
Bordeaux, Little	Frady, C. H.	Irrig.		30	33	47	Dawes	1009	.....
Cedar Canyon	Pelren, J. E.	Irrig.	.43	16	33	53	Sioux	.....	380
Chadron Creek	Wilson, W. W.	Irrig.	.07	12	32	49	Dawes	454	.....
Chadron Creek	Chadron Hereford Bull Farm	Irrig.	.57	1	32	49	Dawes	468	.....
Charcoal Creek	Weber, M. J.	Irrig.	.11	33	31	53	Sioux	982	.....
Ravine, Trib. to Cottonwood	Carlson, A. A.	Irrig.	.71	21	33	52	Dawes	.....	409
Cottonwood, Little	Simmons, Raner	Irrig.	1.14	9	32	51	Dawes	.....	521
Dead Horse Creek	Kemery, John	Irrig.	.01	32	32	49	Dawes	493	.....
Dead Horse Creek	Goff, L. L.	Irrig.	.17	9	31	49	Dawes	487	.....

STREAM	NAME OF APPLICANT	Use to which Applied	Sec. Feet Granted	LOCATION OF HEADGATE				Doc. No.	App. No.
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Dead Horse Creek	Spracklen, John	Irrig.	.01	32	32	49	Dawes	488	.....
Deadman Creek	Phillips, W. S.	Irrig.	.21	19	30	52	Dawes	.....	334
Dry Draw	Earnest, Geo. A.	Irrig.	3.71	22	35	49	Dawes	.....	1061
Sand Creek, Trib. to Cottonwood	Metz, Scott & Greenwood, A. G.	Irrig.	.57	35	33	53	Sioux	.....	189
Sand Creek, Trib. to Cottonwood	Carlson & Rasmussen	Irrig.	30.00	32	33	52	Dawes	.....	767
Sand Creek, Trib. to Cottonwood	Arner, J. & H.	Irrig.	2.57	26	33	53	Sioux	.....	779
Sand Creek, Trib. to Cottonwood	Jordan, M. D.	Irrig.	.50	31	33	53	Sioux	.....	551
Saw Log, East	Stephenson, Chas.	Irrig.	1.14	25	31	52	Dawes	.....	852
Saw Log, East	Baker, A. D.	Irrig.	.29	5	30	51	Dawes	.....	884
Sheridan Creek	Getchell, G. C.	Irrig.	.07	27	34	45	Sheridan	418	.....
Soldier Creek	Reif, Emma	Irrig.	.14	5	30	51	Sioux	546	.....
Spring Branch, Trib to White River	Tucker, J. S.	Irrig.	.17	34	31	54	Sioux	557	.....
Spring Creek, Trib. to Lit. Cott'w'd	Goff, T. L.	Irrig.	.14	30	32	49	Dawes	441	.....
Trunk Butte Creek	Smock, M.	Irrig.	.07	26	32	50	Dawes	465	.....
White Clay Creek	Hazelton, Wm. S.	Irrig.	1.14	13	31	52	Dawes	475	.....
White Clay Creek	Brooks, J. M.	Irrig.	.42	36	35	45	Sheridan	.....	1120

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White River	Lambert, Ray	Irrig.	.14	32	31	53	Sioux	561	.....
White River	Cutler, Jennie R.	Irrig.	.21	1	30	54	Sioux	562	.....
White River	Est. of N. Welling	Irrig.	.57	17	32	51	Dawes	469	.....
White River	Carpenter & Co.	Irrig.	2.86	1	32	51	Dawes	487	.....
White River	City of Crawford	City		32	32	52	Dawes	1026	.....
White River	Meecham, S. R.	Irrig.	2.86	17	32	51	Dawes	.....	500
White River	Mason, J. F.	Irrig.	.14	32	31	53	Sioux	.....	337
White River	Bartlett, A. M.	Irrig.	.71	18	34	48	Dawes	.....	391
White River	Shaefer, Geo., Et Al.	Irrig.	3.00	2	32	51	Dawes	.....	525
White River	Carlson, John	Irrig.	1.43	6	32	50	Dawes	.....	588
White River	Schwabe, August	Irrig.	.57	24	34	49	Dawes	.....	758
White River	Schwabe, August	Power	5.00	24	34	49	Dawes	.....	759
White River	Wright Bros.	Irrig.	4.00	16	32	51	Dawes	.....	775
White River	Schwabe, Aug.	Irrig.	.29	24	34	49	Dawes	.....	815
White River	Roby, I. M.	Irrig.	.33	3	31	52	Dawes	.....	838
White River	Stephenson, Ira J.	Power	15.00	34	31	53	Sioux	.....	854
White River	Schwabe, August	Irrig.	3.43	31	34	48	Dawes	.....	908
White River, Canyons Trib. to	Martens, Wm.	Irrig.	.29	14	34	48	Dawes	.....	696

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Antelope Creek	Est. of George H. Turner	Harrison	Turner Ditch	Irrig.	.86	26	34	57	Sioux	Oct.	31	1894	537	.....
Antelope Creek	Seaman, S. R.	Warren, Wyo.	Ellis Ditch	Irrig.	.29	9	33	57	Sioux	May	17	1896	.....	338
Antelope Creek	Gayhart, M. J.	Montrose	Gayhart Ditch	Irrig.	2.43	16	34	55	Sioux	June	18	1904	.....	760
Antelope Creek North Branch	Story, O. W.	Story	Story Ditch	Irrig.	2.00	8	34	56	Sioux	Nov.	11	1895	.....	168
Antelope, Dry	Schnurr, Albert	Harrison	Grammercy Dam	Stor.	10.00 A. F.	13	34	57	Sioux	Sept.	24	1920	.....	1591
Boggy Creek	Readinger, H. Y.	Harrison	Wickersham Ditch	Irrig.	3.00	31	33	54	Sioux	Feb.	28	1903	.....	701
Boggy Creek	Bannonn, J. S.	Harrison	Bannon's Ditch	Irrig.	.06	7	32	54	Sioux	July	1	1886	560	.....
Boggy Cr., N. B.	Hill, Albert S.	Harrison	Hill Ditch	Irrig.	.86	11	32	55	Sioux	Jan.	20	1908	.....	886
Cedar Creek	Knori, Samuel	Harrison	Schelt's Creek Ditch	Irrig.	.57	35	33	56	Sioux	May	15	1885	507	.....
Cedar Creek	Valdez, M.	Harrison	Valdez Ditch	Irrig.	.50	10	32	56	Sioux	April	5	1886	976	.....
Cedar Creek	Plunkett, John	Harrison	Plunkett Ditch	Irrig.	.....	4	32	56	Sioux				985*	.....
Cherry Creek	Ruffing, M.	Harrison	Cherry Creek Ditch	Irrig.	.03	29	33	54	Sioux	May	1	1893	549	.....
Dry Creek	Story, Oscar W.	Story	Story Ditch	Irrig	5.71	9	34	56	Sioux	March	26	1918	.....	1509
Hat Creek	Thayer, John A.	Harrison	W. Hat Creek Ditch	Irrig.	.43	16	32	55	Sioux	June	1	1880	553a	.....
Hat Creek	Coffee, Charles S.	Harrison	C. F. Coffee Ditch	Irrig.	4.29	26	33	55	Sioux	Sept.	1	1881	512	.....
Hat Creek	Thayer, John A.	Harrison	W. H. Creek Ditch	Irrig.	.57	16	32	55	Sioux	May	31	1886	553	.....
Hat Creek	Coffee, J. T. et al	Harrison	Miller Ditch	Irrig.	.37	23	33	55	Sioux	May	19	1896	.....	341
Hat Creek	Haas, Peter	Harrison	Haas Ditch	Irrig.	.08	2	33	55	Sioux	May	8	1899	.....	510
Hat Creek	Lyon, E. B.	Harrison	Antrim's Ditch	Irrig.	.57	3	32	55	Sioux	Dec.	24	1900	.....	594
Hat Creek	Lyon, E. B.	Harrison	Antrim's Dam	Irrig.	.57	3	32	55	Sioux	Aug	20	1906	.....	834
Hat Creek	Coffee, John T.	Harrison	Coffee Flood Water Dam	Irrig.	6.00	14	33	55	Sioux	Oct.	22	1912	.....	1236

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Hat Creek	Zerbe, Harry T.	Harrison	Zerbe Reservoir	Stor.	2.00	35	33	55	Sioux	March	25	1915	.....	1407
Hat Cr., Canyon Trib. to	Konrath, James	Montrose	Konrath Ditch	Irrig.	1.43	17	34	54	Sioux	Dec.	28	1905	.....	808
Indian Creek, Draw Trib. to	Meier, Aug.	Ardmore, S. D.	Meier Dam	Irrig.	2.00	24	35	55	Sioux	Nov.	5	1900	.....	585
Jim Creek	Dout, L.	Harrison	Dout Bros. Ditch	Irrig.	.86	7	33	56	Sioux	May	15	1889	981	.....
Jim Creek	Anderson, Nels	Harrison	Jim Creek Ditch	Irrig.	.43	8	33	56	Sioux	Dec.	15	1890	502	.....
Jim Creek	Slattery, William	Harrison	Slattery Ditch	Irrig.	.29	13	33	57	Sioux	May	31	1891	543	.....
Jim Creek	Coffee, John T.	Harrison	Hunter Ditch	Irrig.	.03	26	33	54	Sioux	May	12	1898	.....	451
Jim Creek, E. Fk.	Wassenberger, J.	Montrose	Wassenberger Ditch	Irrig.	2.29	29	34	54	Sioux	Oct.	13	1900	.....	581
Lickett Creek	Coffee, S. B.	Chadron	Lickett Ditch	Irrig.	.....	27	33	54	Sioux				1005*	.....
Lickett Creek	Coffee, S. B. Est.	Chadron	Lickett Ditch	Irrig.	1.43	27	33	54	Sioux	March	21	1900	.....	549
Long Branch	O'Connell, Dennis	Ardmore, S. D.	O'Connell Ditch	Irrig.	.20	22	35	54	Sioux	Nov.	10	1900	.....	587
Long Branch	Ebert, L. J.	Ardmore, S. D.	Ebert Ditch	Irrig.	.14	19	35	53	Sioux	Aug.	22	1901	.....	635
Monroe Creek	Knori, Samuel	Harrison	Big Monroe Creek Ditch	Irrig.	1.43	33	33	56	Sioux	May	1	1888	506	.....
Monroe Creek	Knori, Samuel	Harrison	Schilts Monroe Ditch	Irrig.	.50	27	33	56	Sioux	July	2	1888	509	.....
Monroe Creek	Holz, Ferdinand	Harrison	Noreisch Ditch	Irrig.	.04	33	33	56	Sioux	July	19	1895	.....	83
Monroe Creek	Jordan, C.	Montrose	Neil Jordan Ditch	Irrig.	2.20	13	33	56	Sioux	Nov.	12	1906	.....	841
Monroe Creek	Jordan, C.	Montrose	Cornelius Jordan Ditch	Irrig.	2.00	13	33	56	Sioux	July	30	1914	.....	1375
Monroe Creek	Jordan, Richard	Harrison	Wooden Shoe	Stor.	5.00	22	33	56	Sioux	Aug.	24	1914	.....	1377

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Monroe Creek	Jordan, Cornelius	Montrose	Neal Jordan Extension to A. 841	Irrig.	4.00	13	33	56	Sioux	Jan.	14	1915	.....	1399
Monroe Creek (Res. under A. 1399)	Jordan, Cornelius	Montrose	Kite Ditch	Irrig.	2.20	13	33	56	Sioux	Jan.	14	1915	.....	1469
Monroe Creek (Res. under A. 1399)	Jordan, Cornelius	Montrose	Supple. to Cornelius Jordan Ditch, A. 1375	Stor.	1.40	13	33	56	Sioux	Jan.	14	1915	.....	1470
Prairie Dog Cr.	Knori, Samuel	Harrison	Schilt's Prairie Dog D.	Irrig.	1.14	35	33	56	Sioux	May	31	1886	508	.....
Sou Belly Creek	Shaefer, W. J.	Harrison	Old Sou Belly Ditch	Irrig.	3.00	7	32	55	Sioux	June	1	1887	533	.....
Sou Belly Creek	Parson, Con. Adm.	Van Tassel, Wyoming	Montgomery Ditch	Irrig.	1.00	21	33	55	Sioux	Dec.	1	1890	559	.....
Sou Belly Creek	Zimmerman, Irvin S.	Harrison	Zimmerman Ditch	Irrig.	.71	34	33	55	Sioux	Jan.	11	1900	.....	532
Sou Belly Creek	Jordan, S.	Harrison	Jordan Ditch	Irrig.	.14	21	33	55	Sioux	May	26	1902	.....	668
Sou Belly Creek	Barnes, Paul T.	Harrison	Barnes Reservoir	Stor.	10.00	19	32	55	Sioux	March	24	1913	.....	1268
Sou Belly Creek, Spring Creek Tributary to	Hall, W. S. and F. M.	Harrison	Hall's Spring Creek D.	Irrig.	.57	6	32	55	Sioux	March	26	1889	550	.....
Sou Belly Creek, Spring Creek Tributary to	Shaefer, Nick	Harrison	Spring Creek Ditch	Irrig.	.29	7	32	55	Sioux	June	1	1893	532	.....
Squaw Creek	Dunn, Thos.	Harrison	Dunn's Ditch	Irrig.	.36	15	33	57	Sioux	June	1	1890	552	.....
Squaw Creek	Thomas, Sam	Harrison	Hamlin's Ditch	Irrig.	.01	10	33	57	Sioux	April	1	1891	555	.....
Squaw Creek	Dunn, Thomas	Harrison	Thos. Dunn Reservoir	Irrig.	.57	10	33	57	Sioux	Aug.	5	1895	.....	100
Squaw Creek	Dunn, P. D.	Harrison	Dunn's Ditch	Irrig.	.19	3	33	57	Sioux	Jan.	22	1897	.....	376

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Squaw Creek	Thomas, S. M.	Harrison	Thomas Ditch	Irrig.	.50	10	33	57	Sioux	July	23	1901	.....	627
Warbonnett Cr.	Anderson, John A.	Harrison	Warbonnett Ditch	Irrig.	3.63	21	33	56	Sioux	July	31	1880	548	.....
Warbonnett Cr.	Anderson, J. A.	Harrison	Warbonnett Ditch No. 2	Irrig.	1.43	20	33	56	Sioux	March	11	1908	.....	892
Warbonnett Cr., Tributary	Anderson, J. A.	Harrison	No. Branch Warbonnett Creek Ditch	Irrig.	.71	30	33	56	Sioux	May	31	1889	539a	.....
Warbonnett Cr., Tributary	Anderson, J. A.	Harrison	No. Branch Warbonnett Creek Ditch	Irrig.	.29	30	33	56	Sioux	Dec.	31	1891	539b	.....
Warbonnett Cr., Tributary	Zerbst, Carl F.	Harrison	Zerbst Ditch No. 1	Irrig.	.03	26	33	57	Sioux	March	6	1915	.....	1405
Warbonnett Cr., Tributary	Zerbst, Carl F.	Harrison	Zerbst Ditch No. 2	Irrig.	.17	25	33	57	Sioux	March	6	1915	.....	1404
So. Warbonnet, Spring Branch Tributary to	Biehle, Charles	Harrison	Biehle's Ditch	Irrig.	.23	32	33	56	Sioux	April	1	1891	538	.....
So. Warbonnet, Spring Branch Tributary to	Anderson, John A.	Harrison	Garton Ditch	Irrig.	1.43	31	33	56	Sioux	Oct.	16	1893	503	.....
No. Warbonnet, Sprinb Branch Tributary to	Kay, J. L.	Harrison	Kays Ditch	Irrig.	.14	26	33	57	Sioux	May	1	1887	958	.....
Warbonnett Cr., Spring Br. Tr.	Easley, J. H.	Harrison	Nolan Ditch No. 1	Irrig.	.01	23	33	57	Sioux	March	15	1887	957	.....
Warbonnett Cr., Spring Br. Tr.	Easley, J. H.	Harrison	Nolan Ditch No. 2	Irrig.	.29	23	33	57	Sioux	May	1	1888	959	.....
Whitehead Creek	Harrison, R.	Harrison	Harrison Ditch	Irrig.	.06	13	33	54	Sioux	May	30	1888	547	.....

STREAM	NAME OF APPLICANT	Use to which Applied	Sec. Feet Granted	LOCATION OF HEADGATE				Doc. No.	App. No.
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Boggy Creek	Holly, Thos.	Irrig.	.11	30	33	54	Sioux	956	.....
Boggy Creek	Readinger, H. T.	Irrig.	.28	31	33	54	Sioux	526	.....
Boggy Creek, Little Branch	Marten, Wm.	Irrig.	.36	18	32	54	Sioux	.....	342
Jim Creek, Trib.	Coffee, S. B.	Irrig.	.22	22	33	54	Sioux	984	.....
Little Red Creek	Zerbst, P.	Irrig.	.14	25	33	56	Sioux	551	.....
Sou Belly Creek	Jordan, Sarah	Irrig.	.43	21	33	55	Sioux	556	.....
Sou Belly Creek	Nutto, F.	Irrig.	.43	24	32	56	Sioux	.....	404
Sou Belly Creek	Jordan, Sarah	Irrig.	.50	21	33	55	Sioux	.....	424
Sou Belly Creek	Carroll, M. J.	Irrig.	.14	7	32	55	Sioux	.....	516
Sou Belly Creek	O'Connell, M. J.	Irrig.	10.00	9	33	55	Sioux	.....	1288

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Bazile Creek	Jirous, Frank	Creighton	Creighton Mill Race	Power		21	29	5	Knox				1002*	
Bazile Creek	Moss, O. H. and Buckler, Fred	Battle Creek	Creighton Mill	Power	30.00	21	29	5	Knox	Sept.	24	1908		914

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Little Blue River..	Larkin, M. E.	Hastings	Crystal Lake Reservoir	Irrig.	1.14	27	6	10	Adams	Nov.	9	1918	.....	1526
Oak Creek	Hatt, Hans N.	Dannebrog	Oak Creek Project No. 1	Irrig.	2.28	2	13	11	Howard	Jan.	18	1919	.....	1530
Platte River	Steele, Charles	Elm Creek	Cottonwood Canal	Irrig.	4.28	7	8	18	Phelps	Feb.	24	1919	.....	1535
Frenchman River	Krotter, F. C.	Palisade	Krotter Plant No. 3	Power	100.00	15	5	35	Hayes	March	26	1919	.....	1537
Little Blue River..	Carter, T. H. and Bozarth, W. L.	Hebron	Hebron Power Co.	Power	216.00	9	2	2W	Thayer	March	31	1919	.....	1538
Rock Creek	Dugger Bros.	Bassett	Dugger Canal	Irrig.	4.57	33	32	18	Rock	April	24	1919	.....	1539
Bronco Lake	Irwin, H. C.	Alliance	Bronco Lake Canal	Irrig.	11.42	6	24	48	Box Butte	May	20	1919	.....	1541
Little Blue River..	Campbell, J. T. and Carter, T. H.	Hebron	Blue Valley Power Co.	Power	200.00	3	2	1W	Thayer	May	28	1919	.....	1542
Muddy Creek	Amsberry, F. A.	Mason City	Amsberry Canal	Irrig.	6.85	30	15	17	Custer	June	4	1919	.....	1543
Lodge Pole Cr.	Bogle, J. W.	Bushnell	Young Ditch	Irrig.	.57	33	15	57	Kimball	June	20	1919	.....	1544
No. Platte River...	City of North Platte	North Platte	U. P. R. R. Intake and Pipe Line	Steam	1.00	29	14	30	Lincoln	July	7	1919	.....	1545
Lower Dugout Cr.	Hagerty, M. H.	Broadwater	Klondyke Reservoir	Stor.	33.50	4	19	49	Morrill	July	11	1919	.....	1547
Platte - Loup Rivers and Trs.	Water Power District of Omaha	Omaha	Nebraska Water Power District Plants Nos. 1, 2 and 3	Power	4950.00	17	17	3W	Platte	July	16	1919	.....	1548
						22	17	1W	Platte					
						30	17	4 E	Colfax					

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Beaver Creek	C., B. & Q. R. R. Co.	Lincoln	C., B. & Q. R. R. Water Supply	Steam	1.00	8	12	14	Buffalo	July	26	1919		1550
Greenwood Creek	Keenan, Mary K.	Fond Du Lac, Wisconsin	Trinnier Extension	Irrig.	1.65	28	18	50	Morrill	Aug.	18	1919		1551
Carter Creek	Gardner, William E. and Ewing, Emerson E.	Gering	Carter Creek Ditch	Irrig.	2.28	27	21	56	Scotts Bluff	Aug.	20	1919		1552
South Loup	Brittan, Fred	Arnold	Hydro-Electric Plt. No. 2	Power	62.50	31	17	24	Custer	Aug.	20	1919		1553
Republican River	Hester, Elmer E.	Benkleman	Riverside Ditch	Irrig.	7.91	19	1	39	Dundy	Sept.	5	1919		1554
Republican River North Fork	Pringle, George	Parks	Park's Extension	Irrig.	1.14	20	1	39	Dundy	Sept.	5	1919		1555
Oak Creek	Larsen, L. E.	Dannebrog	Dannebrog Reservoir	Irrig.		2	13	11	Howard	Sept.	16	1919		1556
Center Creek	Chitwood, W. A.	Franklin	Chitwood Ditch	Irrig.	4.57	35	2	15	Franklin	Sept.	18	1919		1557
Buffalo Creek, West Branch	Jensen, Anton	Cozad	Jensen's Canal	Irrig.	1.14	23	11	23	Dawson	Oct.	6	1919		1558
Lodge Pole Creek	McAuliffe, Frank	Chappell	McAuliffe Ditch No. 2	Irrig.	1.77	21	13	45	Deuel	Oct.	6	1919		1559
Pumpkinseed	Quinn, T. E.	Bridgeport	T. E. Quinn Ditch	Irrig.	0.02	20	19	51	Morrill	Oct.	15	1919		1561
Frenchman River	Frenchman Valley Irrigation Distrct	Culbertson	Harvey Reservoir	Stor.	15,000 A. F.	3	5	38	Chase	Oct.	16	1919		1562
Bad Land Draw	Shaw, George J.	Orella	Shaw's Reservoir	Stor.	60 A. F.	9	33	53	Sioux	Oct.	21	1919		1563

Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Antelope Creek	Story, Oscar W.	Story	Story Canal	Irrig.	5.00	19	34	56	Sioux	Nov.	10	1919		1564
White River	Whitney Ditch Co.	Whitney	Whitney Ditch	Irrig.	12.42	1	32	51	Dawes	Nov.	27	1919		1567
Indian Creek	Renfro, Oscar S.	Chadron	Seegrist Extension	Irrig.	6.64	3	31	50	Dawes	Nov.	29	1919		1568
Indian Creek	Renfro, Oscar S.	Chadron	Renfro Reservoir	Stor.	480.00 A. F.	3	31	50	Dawes	Nov.	29	1919		1569
McDowell & Dodd Reservoir	Dodd, Calvin H.	Crawford	Dodd Reservoir	Irrig.	2.85 A. F.	13	32	53	Dawes	July	16	1913		1571
Canyon No. 10	Farmers Canal Co.	Culbertson	Farmers Canal	O. D.	2.21	17	3	31	Hitchcock	Dec.	19	1893	10	1573
Frenchman River	Krotter, F. C.	Palisade	Krotter-Hamlet Power Plant	Power	100.00	23	5	35	Hayes	Jan.	26	1920		1574
Beaver (or Crescent) Blue Lks. and Tributaries	Roberts, Guy F.	Lewellen	Crescent Lake Irrigation Project	Supp.		21	20	44	Garden	Jan.	30	1920		1575
Wood River	Jacobsen, C. A.	Riverdale	Jacobsen's Canal	Stor.	9000.00 A. F.	31	10	16	Buffalo	Feb.	3	1920		1576
Platte River	Central Power Co.	Grand Island	Central Power Co. Power Plant	Power	485.00	3	8	13	Buffalo	Feb.	12	1920		1577
Dry Spotted Tail Creek	Stewart, H. G.	Morrill	Stewart's Power Plant	Power	50.00	16	23	56	Scotts Bluff	March	2	1920		1578
Carter Creek	Gardner, Wm. E. and Ewing, Emerson E.	Gering	Carter Creek Ditch	Irrig.	1.42	27	21	56	Scotts Bluff	March	2	1920		1579

Source	Name of Claimant	Post-Office	Carrier	Use to which applied	Second feet granted	Location of Headgate				Date of Priority			Docket No.	App. No.
						S	T	R	County	Month	D	Yr.		
Union Creek	Sanders, F. L.	Stanton	Stanton M. & P. Plant	Power	80.00	1	22	2	Stanton	March	12	1920	.....	1580
North Platte	French, J. E.	Henry	French Ditch Extension	Irrig.	.06	9	23	60	Wyoming	March	20	1920	.....	1581
Dry Spotted Tail	Great Western Sug. Co.	Scottsbluff	Mitchel Factory	Mfg.	15.00	21	23	56	Scotts Bluff	March	24	1920	.....	1582
Owl Creek	Martindale, Ora	Gering	Martindale Ditch	Irrig.	.....	18	21	56	Scotts Bluff	May	21	1920	.....	1584
Big Blue River	Steinmeyer, George	Barnston	Beatrice Power Plant	Power	A. 1262	13	1	7	Gage	May	27	1920	.....	1585
North Platte	City of North Platte	North Platte	U. P. R. R. Pumping Plant and Pipe Line	Steam	.125	29	14	30	Lincoln	June	16	1920	.....	1586
Lawrence Fork	King, William O.	Kearney	King's Canal	Irrig.	1.00	15	18	52	Morrill	July	3	1920	.....	1587
Platte River	Central Power Co.	Grand Island	Central Power Co. Steam Plant	Steam	925.00	29	11	8	Merrick	Aug.	12	1920	.....	1588
Platte River	Steele, Charles	Elm Creek	Cottonwood Canal	Irrig.	.....	7	8	18	Phelps	Aug.	26	1920	.....	1589
Wood River	Hang, James	Shelton	Hang' Project	Irrig.	.....	9	9	13	Buffalo	Sept.	7	1920	.....	1590
Dry Antelope	Schnurr, Albert	Harrison	Grammercy Dam	Stor.	10 A. F.	13	34	57	Sioux	Sept.	24	1920	.....	1591
Winter Creek	Great Western Sug. Co.	Scottsbluff	Scottsbluff Factory	Mfg.	15.00	19	22	54	Scotts Bluff	Oct.	4	1920	.....	1592

STREAM	NAME OF APPLICANT	LOCATION OF HEADGATE				App. No.
		S	T	R	County	
Niobrara River	Buhman, Herman P.	1-6	32	10	Boyd	1243B*
Platte River	Woods, Mark W. & Geo. J.	4	14	10	Douglas-Saunders	1451*
Seepage from Winter Creek	Enterprise Irr. Dist.	8	22	54	Scotts Bluff	1493
Snow Lake	Beale, Harry A.	21	25	44	Scotts Bluff	1503*
Big Alkali Lake	Beale, Harry A.	27	31	28	Cherry	1507*
Big Blue River	Babson, Henry B.	13	1	7	Gage	1511
Winter Creek	Hall, T. M.	17	22	54	Scotts Bluff	1513
Beaver-Crescent (or Blue) Lakes and Tribs.	Roberts, Guy	21	20	44	Garden	1527*
Owl Creek	Logan, Frank L.	12	22	58	Scotts Bluff	1529
Waste and Flood Waters	Crows, C. G.	17	3	31	Hitchcock	1531
Beaver-Crescent (or Blue) Lakes and Tribs.	Roberts, Guy	21	20	44	Garden	1532*
Shell Creek	Henggler, Anton	1	20	18	Platte	1533
Tail Race from Kearney Power Pl't	Scoutt, Will J.	3	8	16	Buffalo	1540
Dry Spotted Tail	Stufft, Ray	20	23	57	Scotts Bluff	1560
Frenchman River	Tuxhorn, Ed	19	6	39	Chase	1565
Seepage	Stewart, H. G.	10	23	57	Scotts Bluff	1566
Beaver Creek	Umbarger, G. B.	15	17	4W	Nance	1570*

* Denotes applications withdrawn by applicant before acted upon by this department.

STREAM	NAME OF APPLICANT	LOCATION OF HEADGATE				Doc. No.	App. No.
		S	T	R	County		
Cedar	Nebraska Irrigation & Power Company	22	21	12	Wheeler	221	.....
Lawrence Fork	King, W. O.	15	18	52	Morrill	850	.....
Squaw Creek	Stetson, Dan, and Daniels, F. C.	19	31	51	Dawes	.....	27
Snake Creek	Kilpatrick Bros.	30	25	51	Box Butte	.....	41
Whistle Creek	Watson, Mathilda	12	28	54	Sioux	.....	58
Whistle Creek	Miller, Wm. K.	13	28	54	Sioux	.....	65
South Platte	Stafford, D.	2	13	36	Keith	.....	184
South Platte	Lute & Sheridan	9	13	37	Keith	.....	231
Indian Creek	Kinsey, J. W., Et Al	10	2	37	Dundy	.....	261
Middle Loup	Patton, James W.	16	17	16	Valley	.....	262
North Loup	Tzschuck Canal Co.	30	22	19	Loup	.....	301
South Platte	Tressler, Wesley	16	13	39	Keith	.....	357
South Platte	Allen, W. F.	24	13	40	Keith	.....	370
Lodge Pole	Burg, C. C.	30	15	53	Kimball	.....	381
White River	Wright, Frank	10	32	51	Dawes	.....	427
South Platte	Kimball, Walter, Et Al	4	12	42	Deuel	.....	482
Coates Creek	Burton, R. D.	33	2	14	Franklin	.....	501
Platte	Lexington So. Side Irr. Company	8	9	22	Dawson	.....	576
Republican River	Republican River Irrigation Company	29	1	38	Dundy	.....	577
Birdwood, E. F.	McCabe, N.	3	16	33	Lincoln	.....	602
Center Creek	Rose, C. H.	36	2	15	Franklin	.....	648
Lawrence Fork	Harper, J. W.	11	18	52	Morrill	.....	670
Frenchman River	Dissmore, Geo. A.	8	4	33	Hitchcock	.....	714
Frenchman River	Follett & Krotter	35	5	34	Hayes	.....	748
Tekamah Creek	Glasson, Joseph	19	21	11E	Burt	.....	839
Dry Draw	Hibberln, John	24	35	56	Sioux	.....	872
Tekamah Creek	Glasson, Joseph	19	21	11E	Burt	.....	887
Stinking Water Creek	Troutman, A. C.	30	5	33	Hayes	.....	907

STREAM	NAME OF APPLICANT	LOCATION OF HEADGATE				Doc. No.	App. No.
		S	T	R	County		
Mud Creek	Horan, T. W.	34	14	13E	Sarpy	.....	958
Republican River	Holmes, H. R., and Dickson, W. H.	27	1	41	Dundy	.....	997
Lower Dugout	Hubbard, Henry	4	19	48	Morrill	.....	1005
Lillian Creek	Lundy, James W.	1	19	20	Custer	.....	1233
Middle Loup	Lundy, James W.	36	20	21	Custer	.....	1234
Middle Loup	Lundy, James W.	36	20	21	Custer	.....	1308
South Platte	McConnell, Edw. B.	34	14	33	Lincoln	.....	1382
Little Blue	Bozarth, W. L., and Carter, T. H.	9	2	2W	Thayer	.....	1486
Spring Creek	Keplinger, Ralph B.	20	34	27	Cherry	.....	1489
Bronco Lake	McCorkle, N. A.	6	24	48	Box Butte	.....	1501
Carlson Draw	Guse, Wm.	13	33	52	Dawes	.....	1505
Rock Creek	Dugger, Andrew N.	33	32	18	Rock	.....	1514
Oak Creek	Hatt, Hans N.	2	13	11W	Howard	.....	1518
Spring Creek, Trib. to Loup River	Carstensen, Lawrence P.	23	17	1	Platte	.....	1524
Sheep Creek	Utter, Lewis E.	36	27	58	Scotts Bluff	.....	1525
Platte River	Steele, Chas.	7	8	18	Phelps	.....	1535
Frenchman River	Krotter, F. C.	15	5	35	Hitchcock	.....	1537
Muddy Creek	Amsberry, F. A.	30	15	17	Custer	.....	1543
North Platte	City of North Platte	29	14	30	Lincoln	.....	1545
Carter Creek	Gardner, Wm. E., and Ewing, Emerson E.	27	21	56	Scotts Bluff	.....	1552
Republican River	Hester, Elmer E.	19	1	39	Dundy	.....	1554
Center Creek	Chitwood, W. A.	35	2	15	Franklin	.....	1557
Bad Land Draw	Shaw, Geo. J.	9	33	53	Sioux	.....	1563
Middle Branch, Antelope Creek	Story, Oscar W.	19	34	56	Sioux	.....	1564

RELOCATION.

In the following appropriations, the location of headgate has been changed.

No.	STREAM	NAME OF CANAL	NEW LOCATION				
				S	T	R	County
D 653	North Platte River	Hershey Canal	NW¼ of NE¼	18	14	33	Lincoln
A 1238	Lower Dugout	Hagerty Canal	NE¼ of SE¼	4	19	48	Morrill
A 853	Greenwood Creek	Megelmre Extension	SW¼ of NE¼	10	18	50	Morrill
D 892	Pumpkinseed	Bird Cage Ditch	SW¼ of SW¼	20	19	51	Morrill
A 1238	Lower Dugout	Hagerty Ditch	SE¼ of NE¼	4	19	48	Morrill
D 1024	Middle Loup	Lundy's Power Plants	SW¼ of SW¼	4	19	19	Custer
A 1224							
A 243	North Platte	North River Canal and W. P. Co.	Lot 1	35	4	46	Garden*
D 787	North Platte	Bower Ditch	Lot 1	33	18	46	Garden*

* Denotes applications denied.

PRIORITIES IN WATER DISTRICTS.

The following tables give a complete list of all claims and applications for water which have been granted by the Department of Public Works, and which have never been cancelled.

In these tables the claims and applications have been arranged for each drainage area according to the date of priority for that particular drainage area.

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
D 994	Wood River	Shelton Mill Canal	Power	40.00	1	9	13	Oct.	16	1873
D 993	Wood River	Ashburn Canal	Power	40.00	13	9	14	Nov.	1	1873
D 995	Wood River	Bearss Canal	Power	25.40	13	9	16	May	1	1881
D 1034a	Cedar Creek	Radcliffe Ditch	Irrig.	2.77	28	18	48	June	1	1882
D 1023	Platte River	Kearney Canal	I. & P.	162.00	3	8	16	Sept.	10	1882
D 904	Pumpkinseed Creek	Wright Ditch No. 1	Irrig.	2.00	5	19	54	Dec.	31	1882
D 658	White Horse Creek	Lamplough	Irrig.	2.86	8	14	30	Dec.	31	1883
D 635	North Platte River	North Platte Canal	Irrig.	300.00	13	14	34	May	31	1884
D 1034b	Cedar Creek	Radcliffe Ditch	Irrig.	1.23	34	18	48	July	1	1885
D 915	Pumpkinseed Creek	Kelly Ditch	Irrig.	1.43	5	19	54	May	10	1886
D 825	Lawrence Fork	Laing Ditch	Irrig	.51	28	18	52	Dec.	31	1886
D 916	Pumpkinseed Creek	Heard's Ditches Nos. 1 and 2	Irrig.	1.29	14	19	54	June	1	1887
D 918	North Platte River	Farmer's Canal	Irrig.	1142.86	3	23	58	Sept.	16	1887
D 905	Pumpkinseed Creek	Wright Ditch No. 2	Irrig.	2.86	5	19	54	Dec.	31	1887
D 919	North Platte River	Minatare Canal	Irrig.	249.43	32	22	54	Jan.	14	1888
D 748	Clear Creek	Clear Creek Ditch	Irrig.	2.86	32	16	41	July	1	1888
D 952	North Platte River	Winter Creek Canal	Irrig.	124.29	17	22	55	Oct.	18	1888
D 920	North Platte River	Enterprise Ditch	Irrig.	173.71	27	23	57	Mar.	28	1889
D 921	North Platte River	Castle Rock Ditch	Irrig.	82.57	4	21	54	Apr.	18	1889
D 697a	Lonergan Creek	Sochi Canal	Irrig	2.00	17	15	39	May	10	1889
D 698	Sand Creek	Holcombe & Smith	Irrig.	7.00	7	10	15	May	20	1889
D 699	Lonergan Creek	East Lonergan	Irrig.	9.14	17	15	39	May	25	1889
D 923	Winter Creek	Bouton's Ditch	Irrig.	1.00	3	22	54	Aug.	17	1889
D 820	Lawrence Fork	Redington Ditch	Irrig.	.57	36	19	52	Oct.	9	1889
D 821	North Platte River	Logan Ditch	Irrig.	5.71	19	20	50	Oct.	17	1889
D 828	North Platte River	Belmont Canal	Irrig.	270.00	18	20	51	Dec.	19	1889
D 830	Greenwood Creek	Coulter Ditch	Irrig.	4.00	15	18	50	Feb.	3	1890
D 1034c	Cedar Creek	Radcliffe Ditch	Irrig.	.76	27	18	48	Feb.	14	1890

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
D 763	Blue Creek	Union Canal	Irrig.	20.00	18	16	42	May	16	1890
D 765	Ash Creek	Vance Ditch	Irrig.	1.14	27	16	42	June	14	1890
D 704	Spring Creek Tributary to White Tail	Spring Creek Ditch	Irrig.	1.57	19	15	37	June	21	1890
D 926	North Platte River	Central Canal	Irrig	36.00	27	22	55	June	23	1890
D 836	Springs	Finn Bros. Ditch	Irrig.	.50	28	18	49	July	1	1890
D 645a	Platte River	Gothenburg Power Canal	I. & P.	200.00	29	12	26	July	5	1890
D 749	White Tail Creek	McCarthy Ditch	Irrig.	1.00	36	15	36	July	15	1890
D 902	Pumpkinseed Creek	Logan Ditch	Irrig.	4.00	7	19	55	July	16	1890
D 709	North Platte River	Myers & Phelps	Irrig.	7.14	34	15	39	Sept.	11	1890
D 840	Pumpkinseed Creek	Courthouse Rock Canal	Irrig.	30.50	30	19	50	Oct.	6	1890
D 710	North Platte River	Sheridan & Wilson	Irrig.	10.00	20	14	35	Oct.	9	1890
D 842	Pumpkinseed Creek	Smith & Wheeler S. D.	Irrig.	1.57	26	19	51	Oct.	16	1890
D 636	Pawnee Creek	Holcombe Ditch	Irrig.	8.00	13	13	28	Oct.	18	1890
D 843	Pumpkinseed Creek	Mutual Ditch	Irrig.	8.57	33	19	52	Nov.	1	1890
D 844	North Platte River	Chimney Rock Canal	Irrig.	60.00	1	20	53	Dec.	3	1890
D 1031	North Platte River	Chimney Rock Canal	Irrig.	.....	1	20	53	Dec.	3	1890
D 812	Ash Creek	Gilliard Ditch	Irrig.	1.43	3	16	42	Dec.	31	1890
D 847	Pumpkinseed Creek	Waitman Ditch	Irrig.	2.86	25	19	53	Mar.	12	1891
D 1032	Otter Creek	Cascade Ditch	Irrig.	3.30	4	15	40	Apr.	1	1891
D 849	Greenwood Creek	Trinnier Canal	Irrig.	6.29	28	18	50	Apr.	6	1891
D 902	Pumpkinseed Creek	Endered Ditch	Irrig.	1.00	21	19	53	May	27	1891
D 725	Sand Creek	Patrick Ditch	Irrig.	2.43	3	15	40	May	31	1891
D 858	North Platte River	Empire Canal	Irrig.	28.27	18	20	51	June	25	1891
D 870	Springs Tributary to Mid. Creek	Bartling Ditch	Irrig.	.29	28	18	51	July	31	1891
D 861	Lawrence Fork	Crigler Ditch	Irrig.	.57	1	18	52	Sept.	11	1891
D 862	Lawrence Fork	Spring Branch	Irrig.	1.00	11	18	52	Oct.	23	1891
D 944	North Platte River	Kah Ditch	Irrig.	4.57	11	21	54	Nov.	1	1891
D 857	North Platte River	Brown Creek Ditch	Irrig.	188.71	29	20	50	Jan.	20	1892

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
D 1033	North Platte River	Brown Creek Ditch	Irrig		20	20	50	Jan.	20	1892
D 954	Wind Springs	Wind Springs	Irrig.	1.43	12	24	55	Mar.	1	1892
D 866	Camp Creek	Camp Creek Ditch	Irrig.	1.43	13	18	49	Mar.	16	1892
D 938	Kiowa Creek	Currie Ditch	Irrig.	9.14	13	21	57	Mar.	23	1892
D 845	Greenwood Creek	Nelson Canal	Irrig.	3.00	33	18	50	Apr.	1	1892
D 881	Schuetz Spring	Schuetz Spring Canal	Irrig.	.21	28	18	50	May	10	1892
D 941	North Platte River	Homestead Ditch	Irrig.	11.43	21	22	55	June	29	1892
D 872	S. W. Lower Dugout	Cooper Ditch	Irrig.	.86	4	19	48	Aug.	15	1892
D 874	North Platte River	Alliance Canal	Irrig.	86.00	5	20	52	Dec.	26	1892
D 1035	North Platte River	Alliance Canal	Irrig.		5	20	52	Dec.	26	1892
D 890	Greenwood Creek	Capron & Lamb	Irrig.	2.00	15	18	50	Jan.	1	1893
D 875	North Platte River	Clark Canal	Irrig.	9.43	22	20	51	Feb.	2	1893
D 876	Pumpkinseed Creek	Meredith & Ammer	Irrig.	18.86	23	19	50	Feb.	20	1893
D 945	North Platte River	Ramshorn Ditch	Irrig.	45.71	13	23	58	Mar.	20	1893
D 906	Pumpkinseed Creek	Hampton Ditch	Irrig.	1.29	25	50	57	Apr.	5	1893
D 697b	Lonergan Creek	Soehl Canal	Irrig.	.86	17	15	39	Apr.	27	1893
D 893	Lawrence Fork	Redington Ditch	Irrig.	.50	11	18	52	May	1	1893
D 946	North Platte River	Short Line Canal	Irrig.	65.57	25	21	53	May	1	1893
D 754	Clear Creek	Clear Creek Canal	Irrig.	14.57	29	16	41	May	30	1893
D 756	Clear Creek	Clear Creek Canal	Irrig.	1.14	32	16	41	May	30	1893
D 717	White Tail Creek	Holloway & Phelps	Irrig.	4.00	36	15	38	June	1	1893
D 745	Clear Creek	Greens Ditch	Irrig.	1.14	29	16	41	June	1	1893
D 719	Lonergan Creek	Haney Ditch	Irrig.	1.14	17	15	39	July	1	1893
D 856	North Platte River	Lisco Ditch	Irrig.	32.86	14	18	47	July	1	1893
D 781	Blue Creek	Blue Creek Ditch	Irrig.	12.86	6	16	42	Sept.	7	1893
D 646	Birdwood Creek	Birdwood Ditch	Irrig.	100.00	35	15	33	Oct.	21	1893
D 925	North Platte River	Nine Mile Canal	Irrig.	100.00	18	21	53	Dec.	6	1893
D 785	Blue Creek	Blue Creek ~~Canal~~	Irrig.	39.00	33	17	42	Dec.	27	1893

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
D 649	North Platte River	Cody & Dillon	Irrig.	127.00	9	14	31	Dec.	29	1893
D 652	Birdwood Creek	West Birdwood Ditch	Irrig.	8.57	22	15	33	Jan.	15	1894
D 686	Fremont Creek	Fremont Creek Ditch	Irrig.	9.29	15	13	30	Jan.	31	1894
D 722	North Platte River	Sutherland & Paxton	Irrig.	95.00	18	14	36	Feb.	2	1894
D 653	North Platte River	Paxton & Hershey	Irrig.	130.00	18	14	33	Feb.	12	1894
D 787	North Platte River	Bower Ditch	Irrig.	21.37	6	17	45	Mar.	27	1894
D 788	Blue Creek	Graf Ditch	Irrig.	33.00	19	16	42	Apr.	2	1894
D 755	South Platte River	Eaton & McGrath	Irrig.	20.00	25	13	41	Apr.	3	1894
D 833	Pumpkinseed Creek	Last Chance	Irrig.	8.00	27	19	50	Apr.	12	1894
D 747	Clear Creek	Scott & Williams	Irrig.	1.00	28	16	41	May	18	1894
D 662	North Platte River	Farmers and Merchants Canal	Irrig.	124.00	12	14	33	May	22	1894
D 884	Pumpkinseed Creek	Round House Rock	Irrig.	3.00	28	19	51	May	29	1894
D 891	Middle Creek	Bartling Ditch No. 1	Irrig.	.29	28	18	51	June	1	1894
D 666	Platte River	Farmers Ditch	Irrig.	280.00	17	13	29	June	2	1894
D 723	South Platte River	Hollingsworth Ditch	Irrig.	30.00	12	13	29	June	5	1894
D 567	Snake Creek	Oasis Ditch	Irrig.	54.86	6	24	51	June	6	1894
D 667	North Platte River	South Side Canal	Irrig.	270.00	14	14	34	June	6	1894
D 669	Pawnee Creek	Murphy Ditch	Irrig.	8.57	29	13	27	June	9	1894
D 789	North Platte River	Midland Ditch	Irrig.	2.00	2	16	44	June	9	1894
D 621	Platte River	Farmers Ditch	Irrig.	114.00	25	10	23	June	14	1894
D 672	Pawnee Creek	Plumer Ditch	Irrig.	10.00	19	13	27	June	15	1894
D 724	Spring Creek	Spring Creek Ditch	Irrig.	.57	12	15	40	June	18	1894
D 622	Platte River	~~Farmers and Merchants Ditch~~	Irrig.	1142.86	18	10	28	June	26	1894
D 885	Pumpkinseed Creek	Maxwell Ditch	Irrig.	.50	23	19	52	June	30	1894
D 673	Platte River	Maxwell Ditch	Irrig.	27.14	29	13	28	July	5	1894
D 657	North Platte River	Keith Canal	Irrig.	71.00	36	14	30	July	7	1894
D 674	Platte River	Appleford Ditch	Irrig.	10.00	15	13	29	July	7	1894
D 629	Platte River	Sides Ditch	Irrig.	20.00	13	8	14	July	23	1894

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location S	Location T	Location R	Date of Priority Month	Date of Priority D.	Date of Priority Yr.
D 950	North Platte River	Rooster Ditch	Irrig.	5.71	10	23	58	July	29	1894
D 676	North Platte River	Smith's Canal	Irrig.	20.00	36	14	30	Aug.	9	1894
D 791	North Platte River	Overland Ditch	Irrig.	20.00	1	16	44	Aug.	14	1894
D 624	Platte River	Platte River Canal	Irrig.	400.00	13	19	22	Sept.	15	1894
D 677	Birdwood Creek	Beauchamp	Irrig.	3.00	15	15	33	Sept.	19	1894
D 645b	Platte River	Gothenburg Canal	Irrig.	240.00	29	12	26	Sept.	22	1894
D 886	North Platte River	Hannah Canal	Irrig.	5.71	24	18	47	Sept.	24	1894
D 234, 235, 628	Wood River	Farmers Canal	Irrig.	180.00	12	8	16	Sept.	24	1894
D 795	Blue Creek	Blue Creek Canal	Irrig.	3.79	21	17	42	Sept.	27	1894
D 796	Cold Water Creek	Cold Water Ditch	Irrig.	4.29	26	18	46	Sept.	28	1894
D 797	North Platte River	Oshkosh Ditch	Irrig.	40.00	33	17	44	Oct.	5	1894
D 727	White Tail Creek	Little Dandy	Irrig.	2.00	22	15	38	Oct.	12	1894
D 887	North Platte River	Beerline	Irrig.	30.00	24	19	49	Oct.	13	1894
D 679	Platte River	McCullough	Irrig.	30.00	35	13	28	Oct.	20	1894
D 680	Platte River	Six Mile Ditch	Irrig.	40.00	11	11	26	Oct.	22	1894
D 681	Platte River	Gothenburg S. S.	Irrig.	357.14	30	12	26	Oct.	26	1894
D 730	White Tail Creek	Foster Keystone	Irrig.	13.86	36	15	38	Oct.	30	1894
D 625	Platte River	Booker Canal	Irrig.	100.00	16	11	25	Nov.	9	1894
D 800	Blue Creek	West Side Ditch	Irrig.	17.00	28	17	42	Nov.	20	1894
D 801	North Platte River	Spohn	Irrig.	13.14	13	17	45	Dec.	6	1894
D 802	North Platte River	Rush Creek Canal	Irrig.	9.64	2	17	46	Dec.	11	1894
D 683	South Platte River	Stebbins Ditch	Irrig.	30.00	32	14	32	Dec.	17	1894
D 744	South Platte River	Riverside Canal	Irrig.	2.86	17	13	39	Dec.	22	1894
D 803	North Platte River	Lyons Canal	Irrig.	42.14	30	17	44	Dec.	22	1894
D 811	North Platte River	Orr & Vance Ditch	Irrig.	2.93	29	16	42	Dec.	24	1894
D 626	Platte River	Cozad Ditch	Irrig.	614.29	15	11	25	Dec.	28	1894

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
D 804	North Platte River	Robins & Williams	Irrig.	26.57	25	16	42	Jan.	4	1895
D 805	South Platte River	Miller & Warren	Irrig.	53.86	7	12	42	Jan.	5	1895
D 806	North Platte River	Gyger Ditch	Irrig.	10.86	10	16	44	Jan.	5	1895
D 684	North Platte River	Dikeman Ditch	Irrig.	30.00	9	14	32	Jan.	14	1895
D 807	North Platte River	Signal Bluff	Irrig.	30.13	16	16	43	Jan.	16	1895
D 732	North Platte River	Hayland Ditch	Irrig.	5.71	29	15	39	Jan.	19	1895
D 627	Platte River	Orchard - Alfalfa Ditch	Irrig.	300.00	9	10	24	Jan.	23	1895
D 687	Platte River	Lincoln and Dawson Canal	Irrig.	642.86	9	13	29	Feb.	22	1895
D 688	Ravine	Newberry Canal	Irrig.	1.14	22	14	32	Feb.	25	1895
D 889	Pumpkinseed Creek	Dunlap Ditch	Irrig.	.36	24	19	51	Mar.	1	1895
D 736	South Platte River	Home Ditch	Irrig.	3.14	30	13	40	Mar.	2	1895
D 691	North Platte River	Hubbert & Hall Ditch	Irrig.	65.70	20	14	30	Mar.	3	1895
D 737	North Platte River	Fernstrom & Nissen	Irrig.	4.00	25	15	39	Mar.	23	1895
D 738	North Platte River	Alfalfa Irrigation District Ditch	Irrig.	100.00	1	15	42	Mar.	25	1895
D 888	Pumpkinseed Creek	Willard Ditch	Irrig.	1.43	25	19	51	Mar.	27	1895
D 809	North Platte River	Bushnell Bros. Ditch	Irrig.	7.14	12	16	44	Mar.	27	1895
D 690	Platte River	Appleford Ditch	Irrig.	2.86	15	13	29	Mar.	28	1895
D 740	Skunk Creek	Miller Ditch	Irrig.	2.29	1	14	37	Apr.	1	1895
D 750	Mathews Creek	Mathews Ditch	Irrig.	1.14	28	15	37	Apr.	1	1895
D 733	South Platte River	South Side Plain Ditch	Irrig.	1.43	17	13	39	Apr.	27	1895
D 810	South Platte River	Big Springs Canal	Irrig.	8.93	35	13	42	Apr.	27	1895
D 751	White Tail Creek	Reed Ditch	Irrig.	.57	15	15	38	May	15	1895
D 892	Pumpkinseed Creek	Birdcage Ditch	Irrig.	1.00	20	19	51	June	1	1895
D 964	Clear Creek	Finch Ditch	Irrig.	1.43	4	15	41	June	30	1895
A 69	Coon Creek	Coon Creek Ditch	Irrig.	.71	34	15	37	July	3	1895
A 160	Golden Creek	Theis Ditch	Irrig.	2.71	25	15	39	Sept.	17	1895
A 186	North Platte River	Steamboat Ditch	Irrig.	6.20	4	21	54	Oct.	22	1895
A 243	North Platte River	North River Canal	Irrig.	168.29	14	18	47	Feb.	24	1896

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
A 283	South Platte River	Meyer's Canal	Irrig.	1.46	22	13	40	Apr.	14	1896
A 294	Greenwood Creek	Meglemre Ditch	Irrig.	.57	10	18	50	May	6	1896
D 842	Pumpkinseed Creek	Smith & Wheeler North Ditch	Irrig.	.71	26	19	51	June	1	1896
A 357	South Platte River	Cereal Ditch	Irrig.	4.86	16	13	39	July	10	1896
A 327	North Platte River	Lamore Ditch	Irrig.	20.00	34	19	48	July	18	1896
A 350	North Platte River	Steamboat Ditch	Irrig.	.71	4	21	54	July	22	1896
A 353	North Platte River	Tetreault Ditch No. 2	Irrig.	3.43	1	19	50	Aug.	15	1896
A 365	North Platte River	Gering Canal	Irrig.	208.62	24	23	58	Mar.	15	1897
A 393	South Platte River	Western Ditch	Irrig.	180.00	29	13	41	June	14	1897
A 407	Horse Creek	State Line Ditch	Irrig.	3.07	33	23	58	Sept.	10	1897
A 411	Owl Creek	Sunflower	Irrig.	.78	12	22	58	Sept.	17	1897
A 410	Spring Branch	Brogan Bros. Ditch	Irrig.	.57	35	15	37	Sept.	24	1897
A 418	North Platte River	Shermerhorn Ditch	Irrig.	29.71	16	20	51	Oct.	25	1897
A 420	White Tail Creek		Irrig.	1.43	36	15	38	Oct.	29	1897
A 449	Spotted Tail Creek		Irrig.	1.00	10	23	56	May	2	1898
A 476	Lawrence Fork	Spring Branch Extension	Irrig.	.57	1	18	52	Oct.	13	1898
A 486	Lawrence Fork	Crigler Extension	Irrig.	1.43	1	18	52	Nov.	25	1898
A 515	Blue Creek	Paisley Ditch	Irrig.	1.00	28	17	42	July	14	1899
A 545a	Wood River	White Bridge P. K.	Irrig.	.03	8	9	15	Mar.	14	1900
A 545b	Wood River	White Bridge P. K.	Power	10.00	8	9	15	Mar.	14	1900
A 550	Lawrence Fork	Niehus Canal	Irrig.	1.86	11	18	52	Mar.	23	1900
A 570	W. Buffalo Creek	Henry Ditch	Irrig.	.07	23	11	23	July	2	1900
A 606	Sand Creek	Nissen Ditch	Irrig.	3.07	10	15	40	Mar.	18	1901
A 641	Kiowa Creek	Kellums Ditch	Irrig.	2.43	11	22	58	Oct.	18	1901
A 650	Willow Creek	Willow Springs No. 1	Irrig.	.57	16	19	56	Jan.	21	1902
A 651	Willow Creek	Willow Springs No. 2	Irrig.	.86	16	19	56	Jan.	21	1902
A 659	Little Springs Creek	Little Springs Canal	Irrig.	.57	29	15	37	Apr.	1	1902
A 660	North Platte River	Columbia	Irrig.	600.00	3	23	58	Apr.	14	1902

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
A 662b	White Tail Creek	Keystone Canal	Irrig.	51.71	26	15	38	Apr.	26	1902
A 669	Lawrence Fork	Harper Ditch	Irrig.	1.43	11	18	52	May	27	1902
A 674	Lawrence Fork	Harper Ditch No. 2	Irrig.	2.00	1	18	52	June	16	1902
D 913	Pumpkinseed Creek	Peters Ditch	Irrig.	2.57	34	20	56	July	1	1902
A 698	Pumpkinseed Creek	Airedale Canal No. 1	Irrig.	5.52	2	19	55	Jan.	24	1903
A 699	Pumpkinseed Creek	Airedale Canal No. 2	Irrig.	3.22	1	19	55	Jan.	24	1903
A 711	Pumpkinseed Creek	Reservoir Nos. 1, 2, 3	Irrig.	1.31	7	19	55	June	24	1903
A 717	Brown's Creek	Hackberry Ditch	Irrig.	.43	19	20	48	July	17	1903
A 742	Horse Creek	Horse Creek Ditch	Irrig.	.86	34	23	58	Feb.	29	1904
A 743	Spotted Tail Creek	Stewart's Reservoir	Irrig.	1.43	2	23	56	Mar.	2	1904
A 745	Sheep Creek	Little Moon	Irrig.	1.00	10	24	58	Mar.	23	1904
A 746	Kiowa Creek	Ellis Lowery Canal	Irrig.	.52	31	22	57	Mar.	25	1904
A 751	Barrows Pits, Trib. to No. Platte River	Barrow Pit Ditch	Irrig.	.29	19	21	52	Apr.	23	1904
A 768	North Platte River	Pathfinder Reservoir	Irrig.	.....	19	29	83	Sept.	19	1904
A 770	Owl Creek	Sunflower	Irrig.	1.14	12	22	58	Oct.	10	1904
A 778	Huntington's Springs	Cord Ditch	Irrig.	1.43	9	20	58	Dec.	23	1904
A 819	Pumpkinseed Creek	Johnson's Canal	Irrig.	2.29	2	19	55	Apr.	20	1906
A 836	Pumpkinseed Creek	Beaty Ditch	Irrig.	.86	8	19	55	Sept.	1	1906
A 843	White Tail Creek	Keystone Ditch	Irrig.	4.29	26	15	38	Nov.	30	1906
A 844	Greenwood Creek	Dean Ditch	Irrig.	8.86	10	18	50	Dec.	5	1906
A 851	Pumpkinseed Creek	Swanger Ditch	Irrig.	.43	29	19	50	Feb.	28	1907
A 853	Greenwood Creek	Meglemre Ext. Ditch	Irrig.	1.50	10	18	50	Mar.	11	1907
A 855	Pumpkinseed Creek	Pumpkin Creek Mills	Power	25.00	23	19	50	Mar.	26	1907
A 902	North Platte River	Belmont Canal	Irrig.	115.71	18	20	51	Mar.	28	1907
A 859	Sheep Creek	Nebraska Reservoir	Irrig.	3.57	36	27	58	May	18	1907
A 865	Lower Dugout Creek	Mulloy Ditch	Irrig.	1.00	27	20	48	July	18	1907
A 866	North Platte River	Empire Extension	Irrig.	1.00	18	20	51	July	20	1907
A 868	Trib. to North Platte River	Frazier Lake	Ice	4.00	35	14	30	Sept.	6	1907

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
A 871	Sheep Creek	West Fork Ditch	Irrig.	5.14	1	26	58	Sept.	21	1907
A 873	Trib. to Sheep Creek	Favorable Ditch	Irrig.	.27	19	26	57	Oct.	25	1907
A 875	Sheep Creek	Lower Canal	Irrig.	.37	11	25	58	Nov.	22	1907
A 876	Sheep Creek	Home Ranch	Irrig.	1.79	25	26	58	Nov.	2	1907
A 877	Sheep Creek	Horse Pasture	Irrig.	1.29	25	26	58	Nov.	2	1907
A 879	Owl Creek	Sunflower Ditch No. 2	Irrig.	1.14	12	22	58	Nov.	29	1907
A 880	Kiowa Creek	Kellums Ditch No. 2	Irrig.	.57	1	22	58	Nov.	29	1907
A 881	Owl Creek	Sunflower Extension No. 1	Irrig.	.57	12	22	58	Nov.	29	1907
A 885	Sheep Creek	Horse Camp Reservoir	Irrig.	2.86	36	27	58	Jan.	20	1908
A 888	Pumpkinseed Creek	Clear Field Canal	Irrig.	1.70	31	20	56	Jan.	23	1908
A 890	Sheep Creek	No. 2	Irrig.	2.50	2	25	58	Feb.	24	1908
A 918	Buckhorn Springs	Maddox Ditch	Irrig.	2.29	8	14	36	Oct.	3	1908
A 921	Horse Creek	Marsh & Braziel Canal	Irrig.	8.00	4	22	60	Nov.	24	1908
A 937	Lake	Huffman Ditch	Irrig.	6.43	26	21	54	Mar.	19	1909
A 968	Skunk Creek	Skunk Creek Ditch	Irrig.	5.00	6	14	36	Nov.	5	1909
A 974	Sand Creek	Sand Creek Ditch	Irrig.	15.70	9	14	36	Jan.	3	1910
A 983	Horse Creek	Gilmore Ditch	Irrig.	9.00	33	23	58	Feb.	21	1910
A 986	Wind Springs Creek	Smith's Ditch	Irrig.	2.86	12	24	55	Mar.	14	1910
A 991	North Platte River	Lisco Ditch	Irrig.	3.00	14	18	47	April	6	1910
A 992	North Platte River	Round House Rock	Irrig.		4	21	54	April	13	1910
A 994	Horse Creek	State Line Ditch	Irrig.	2.00	33	23	58	April	21	1910
A 1000	Horse Creek	Jackson Extension	Irrig.	1.07	27	23	58	May	19	1910
A 1001	White Tail Creek	West Keystone	Irrig.	1.76	26	15	38	May	27	1910
A 1002	Spring Creek, Trib to No. Platte	Spring Creek No. 1	Irrig.	1.13	19	15	37	May	27	1910
A 1003	White Tail Creek	Keystone Canal	Irrig.	9.86	26	15	38	May	27	1910
A 1004	Pumpkinseed Creek	Beaty Canal	Irrig.	.19	5	19	55	June	2	1910
A 1009	Blue Creek	Fairview	Power	62.60	4	18	43	July	18	1910
A 1018	Beaver Lake	Beaver Ditch	Irrig.	170.00	16	24	44	Aug.	6	1910

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
A 1038	Wood River	Jacobsen's Canal	Irrig.	.50	31	10	16	Nov.	10	1910
A 1040	Spring Creek	Freiday Canal	Irrig.	1.00	20	9	20	Nov.	25	1910
A 1051	Cedar Creek	Cedar Creek Ditch	Irrig.	1.57	17	14	35	Jan.	3	1911
A 1052	Pumpkinseed Creek	Seeley Ditch	Irrig.	.57	27	19	52	Jan.	19	1911
A 1072	Spotted Tail Creek	Brown's Ditch	Irrig.	2.28	2	23	56	Mar.	17	1911
A 1100	Lawrence Fork	Randall Bros. Ditch	Irrig.	2.57	21	18	52	May	15	1911
A 1104	Snake Creek	Kilpatrick Reservoir	Irrig.	6500A.F.	1	24	52	June	7	1911
A 1111	Clear Creek	Clear Creek Canal	Irrig.	1.14	31	16	41	July	5	1911
A 1126	Horse Creek	Marsh & Braziel Extension	Irrig.	13.00	4	22	60	Sept.	18	1911
A 1133	Pumpkinseed Creek	Airedale Canal No. 2	Irrig.	1.57	1	19	55	Oct.	26	1911
A 1148	Springs and Slough	Cundall Ditch	Irrig.	.71	19	20	51	Dec.	15	1911
A 1149	North Platte River	French Ditch	Irrig.	11.00	9	23	60	Dec.	21	1911
A 1154	Blue Creek	Blue Creek Canal	Irrig.	.41	33	17	42	Jan.	4	1912
A 1159	Snake Creek	Kilpatrick Ditch No. 2	Irrig.	200.00	6	24	51	Jan.	25	1912
A 1176	Sheep Creek	Sheep Creek Lateral	Irrig.	5.00	8	23	57	Feb.	26	1912
A 1181	North Platte River	Dobson's Lateral	Irrig.	1.14	5	20	52	Feb.	28	1912
A 1198	Otter Creek	Otter Canal	Irrig.	11.00	5	15	40	May	24	1912
A 1215	Spotted Tail Creek	Whitehead Power Plant	Power	10.00	26	24	56	Aug.	10	1912
A 1217	Sheep Creek	General Utility L. & P. Co.	Power	70.00	17	23	57	Aug.	17	1912
A 1220	Spring Creek, Trib. to No. Platte	Gatch Ditch	Irrig.	.93	25	21	54	Aug.	21	1912
A 1225	Coon Creek	Coon Creek Ditch	Irrig.	1.42	34	15	37	Sept.	16	1912
A 1227	Wood River	Kimbrough Canal	Irrig.	4.00	36	10	13	Sept.	21	1912
A 1238	Lower Dugout	Hagerty Ditch	Irrig.	1.00	4	19	48	Oct.	26	1912
A 1	North Platte River	Holcombe Ditch	Irrig.	15.49	16	15	40	Nov.	6	1912
A 1240	Otter Creek	Peterson Ditch	Irrig.	1.32	5	15	40	Nov.	6	1912
A 1241	Spotted Tail Creek	Roberts Ditch	Irrig.	2.00	16	23	56	Nov.	6	1912
A 1286	Wood River	Wood River Ditch	Irrig.	2.28	14	11	18	May	1	1913
A 1290	Akers Draw	Nelson Ditch	O. D.	10.00	13	23	57	May	21	1913

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
A 1295	Little Spring Creek	Shramek Canal	Irrig.	1.50	22	22	55	June	9	1913
A 1310	Little Spring Creek		Irrig.	.14	22	22	55	July	29	1913
A 1316	White Horse Creek	John Bratt Ditch	Irrig.	6.00	19	14	30	Aug.	25	1913
A 1344	Plum Creek Springs	Plum Creek Ditch and Reservoir	Irrig.	1.14	23	16	42	Jan.	12	1914
A 1380	Pumpkinseed Creek	Airedale Canal No. 1	Irrig.	.51	2	19	55	Sept.	4	1914
A 1397	Cedar Creek	Belmont Feeder	Irrig.	5.00	23	18	48	Jan.	7	1915
A 1398	Sheep Creek	Sheep Creek Lateral	Irrig.	1.00	8	23	57	Jan.	12	1915
A 1401	North Platte River	M. H. Stone Canal	Irrig.	1.00	28	18	46	Jan.	19	1915
A 1403	Sheep Creek Draw	Sheep Creek Lateral	Irrig.	.04	17	23	57	Feb.	20	1915
A 1429	Red Willow Draw	Alliance Irrigation Canal	O. D.	60.00	6	20	51	Aug.	5	1915
A 1431	Nine Mile Canyon	Nine Mile Ditch	O. D.	79.00	10	21	53	Aug.	19	1915
A 1432	Red Willow Creek	Dobson Ditch	O. D.	2.00	12	20	51	Sept.	10	1915
A 1433	North Platte River	French Ditch	Irrig.	3.00	9	23	60	Sept.	11	1915
A 1436	Platte River and Red Willow Creek	Dobson Lateral	Irrig.	.59	12	20	51	Nov.	3	1915
A 1440	Lawrence Fork	King's Canal	Irrig.	4.00	15	18	52	Dec.	8	1915
A 1446	Winter Creek Draw		O. D.	70.00	17	22	54	Feb.	9	1916
A 1448	North Platte River	Liebhardt Lateral	Irrig.	2.90	6	20	52	Mar.	1	1916
A 1450	North Platte River	Atkins Ditch	Irrig.	5.00	15	19	49	Mar.	27	1916
A 1452	North Platte River	Gering Hydro-Electric Plant	Power	250.00	28	22	55	April	5	1916
A 1455	North Platte River—Waste Water	Waste Water Ditch	Irrig.	2.30	30	21	50	June	2	1916
A 1458	Pumpkinseed Creek	Airedale No. 1	Irrig.	10.00	3	19	55	June	23	1916
A 1468	Winter Creek, Trib. to No. Platte	Winter Creek Power Canal	Power	100.00	8	22	54	Dec.	22	1916
A 1471	South Platte River	Tail Race Ditch	Irrig.	1.28	3	8	16	Jan.	16	1917
A 1472	North Platte River	Union Pacific Railway Co.	Power	100.00	29	14	30	Jan.	19	1917
A 1473	Hoth Draw	O'Holloran Ditch	O. D.	1.07	28	21	52	Jan.	26	1917
A 1492	Little Spring Creek	McClenahan Ext. Shramek Canal	Irrig.	.05	22	22	55	July	30	1917
A 1495	Buffalo Creek	Savins Ditch	Irrig.	2.28	22	10	21	Aug.	17	1917
A 1499	North Platte River	Tri-City Power System	Power	500.00	3	23	58	Oct.	5	1917

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
A 1508	Pumpkinseed	Ai:edale Canal No. 3	Irrig.	4.41	2	19	55	Mar.	15	1918
A 1515	Little Spring Creek	Extension of Shramek Canal	Irrig.	.14	22	22	55	June	3	1918
A 1541	Bronco Lake	Bronco Lake Ditch	Irrig.	11.42	6	24	48	May	20	1919
A 1547	Dugout Creek	Klondyke Reservoir	Irrig.	1.28	4	19	48	July	11	1919
A 1550	Beaver Creek	C., B. & Q. Water Supply	Irrig.	1.00	8	12	14	July	26	1919
A 1551	Greenwood Creek	Trinnier Extension	Irrig.	1.65	28	18	50	July	18	1919
A 1558	Buffalo Creek, West Branch	Jensen's Project	Irrig.	1.14	23	11	23	Oct.	6	1919
A 1559	Lodgepole Creek	McAuliffe Ditch	Irrig.	1.77	21	13	45	Oct.	6	1919
A 1561	Pumpkinseed Creek	T. E. Quinn Ditch	Irrig.	.02	20	19	51	Oct.	15	1919
A 1575	Beaver, Crescent Lakes and Tributaries	Crescent Lake Project	Supple		21	20	44	Jan.	30	1920
A 1576	Woodriver	Jacobson's Ditch	Storage	9000A.F.	31	10	16	Feb.	3	1920
A 1577	Platte River	Central Power Company	Power	485.00	35	9	16	Feb.	12	1920
A 1578	Dry Spotted Tail	Stewart Power and Light Plant	Power	50.00	16	23	56	Mar.	2	1920
A 1579	Carter Creek	Carter Creek Ditch	Irrig.	1.42	27	21	56	Nov.	2	1920
A 1581	North Platte	French Ditch Extension	Irrig.	.60	9	23	60	Mar.	20	1920
A 1582	Dry Spotted Tail	Mitchell Factory of Great Western Sugar Company	Mfg.	15.00	21	23	56	Mar.	24	1920
A 1584	Owl Creek	Martindale Ditch	Irrig.		18	21	56	May	21	1920
A 1586	North Platte	U. P. R. R. Pumping Plant and Pipe Line	Steam	.125	29	14	30	June	16	1920
A 1587	Lawrence Fork	King's Canal	Irrig.	1.00	15	18	52	July	3	1920
A 1588	Platte River	Central Power Co. Steam Plant	Steam	925.00	29	11	8W	Aug.	12	1920
A 1589	Platte River	Cottonwood Project	Irrig.		7	8	18	Aug.	26	1920
A 1590	Wood River	Hang's Project	Irrig.		9	9	13	Sept.	7	1920
A 1592	Winter Creek	Main Water Supply Scottsbluff Factory	Mfg.	15.00	19	22	54	Oct.	4	1920

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
D 183	Turkey Creek		Power		4	1	16	Dec.	31	1874
D 1036	Republican River S. F.	Guthrie & Company	Power	400.00	34	1	7	Sept.	1	1877
D 92	Medicine Creek		Power	68.00	29	4	25	Dec.	31	1878
93										
D 1029	Republican River	Arapahoe Star Mills	Power	196.00	27	4	23	July	24	1879
D 185	Big Cottonwood Creek	Bloomington Ditch	Irrig.	.50	25	2	16	Dec.	31	1881
D 138	Rock Creek	Phelan Ditch	Irrig.	4.29	17	1	39	Dec.	31	1883
D 159	Horse Creek	Horse Creek Ditch	Irrig.	1.86	23	1	39	Aug.	31	1885
D 173										
D 181	Red Willow Creek	Red Willow Mill	Power		16	3	28	Jan.	1	1886
D 178	Frenchman River	Wauneta Mill	Power	35.00	11	5	36	July	31	1886
D 1013	Frenchman River	Lamar Roller Mills	Power	30.00	18	6	40	Sept.	30	1887
D 179	Frenchman River	Champion Mills	Power	28.00	21	6	39	Dec.	31	1887
D 50	Frenchman River	Aberdeen	Irrig.	2.00	3	5	38	July	1	1888
D 56	Frenchman River	Harlam Ditch	Irrig.	2.00	1	5	38	July	1	1888
D 103	Republican River	Carson Ditch No. 1	Irrig.	1.43	27	3	30	July	1	1888
D 1025	Republican River, No. Fork	Haigler Land & Cattle Company	Irrig.	77.00	2	1	43	April	4	1890
D 24-25	Frenchman River									
29-30	Stinky Water Creek	Culbertson Irr. & Imp. Company	Irrig.	215.00	21	5	33	May	16	1890
D 115	Republican River, N. Fork	Sand Point Ditch Co.	Irrig.	11.00	11	1	42	Sept.	25	1890
D 117	Buffalo Creek	Allen & Larned	Irrig.	6.00	18	1	40	Oct.	16	1890
D 118	Republican River	Dundy County Ditch	Irrig.	45.00	24	1	39	Nov.	22	1890
D 171	Buffalo Creek	Porter & Sons	Irrig.	2.86	1	1	41	Nov.	26	1890
D 3	Republican River	Trites & Davenport	Irrig.	7.00	20	3	31	Dec.	18	1890
D 4-7-8-9	Republican River	Meeker Canal	Irrig.	143.00	15	3	31	Dec.	22	1890
D 47	Frenchman River	Champion Irr. & W. P.	Irrig.	24.00	23	6	40	Dec.	23	1890
D 5	Republican River	Trenton's Farmers D.	Irrig.	32.00	10	2	34	Dec.	24	1890
D 95	Red Willow Creek	Holland Ditch	Irrig.	35.00	16	3	28	Jan.	23	1891

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location S	T	R	Date of Priority Month	D.	Yr.
D 50	Frenchman River	Aberdeen Ditch	Irrig.	.50	3	5	38	Feb.	2	1891
D 133	Republican River	Neighbor's Ditch	Irrig.	2.86	24	1	39	Mar.	18	1891
D 102	Republican River	Carson Ditch No. 2	Irrig.	18.00	27	3	30	May	5	1891
D 89	Republican River	C. & A. Irr. & Imp. Co.	Irrig.	170.00	28	4	25	Aug.	26	1891
D 147										
148	Republican River	Republican River Co. Ditch	Irrig.	30.00	29	1	38	May	2	1892
D 150	Republican River	White & Larned	Irrig.	3.00	22	1	40	April	29	1893
D 10	Frenchman River	Farmers Canal	Irrig.	10.00	11	3	32	Dec.	19	1893
D 647	Red Willow Lake	Red Willow	Irrig.	2.00	36	9	33	Dec.	20	1893
D 11	Republican River	Marr Ditch	Irrig.	4.29	16	3	31	Jan.	22	1894
D 151	Republican River	Anderson Ditch	Irrig.	2.00	1	1	37	Jan.	26	1894
D 57	Stinking Water	Chase County L. & Live Stock Co.	Irrig.	2.86	10	7	38	Mar.	10	1894
D 153	Republican River	Groesbeck & Cannon	Irrig.	10.00	10	1	37	Mar.	27	1894
D 154	Republican River	Thomas Ditch	Irrig.	2.00	24	1	40	June	5	1894
D 91	Republican River	Ballard Ditch	Irrig.	8.00	8	3	21	June	9	1894
D 62	Frenchman River	Fuller Ditch	Irrig.	25.00	4	5	36	June	12	1894
D 155	Republican River, S. Fork	Karr Ditch	Irrig.	2.00	20	1	37	July	28	1894
D 18	Frenchman River	Riverside Canal	Irrig.	12.00	33	4	32	July	28	1894
D 156	Republican River, S. Fork	Riverside Ditch	Irrig.	13.00	29	1	37	Aug.	5	1894
D 182	Center Creek	Gregory Ditch	Irrig.	4.00	1	1	15	Aug.	11	1894
D 38	Frenchman River	Frenchman Valley Canal	Irrig. & Power	10.00	32	5	33	Aug.	23	1894
D 65	Stinking Water Creek	McLain Ditch	Irrig.	2.50	28	7	37	Sept.	24	1894
D 109	Republican River	Wilcox Ditch	Irrig.	4.50	32	3	29	Oct.	4	1894
D 67	Frenchman River	Gould Ditch	Irrig.	2.00	1	5	38	Oct.	9	1894
D 68	Frenchman River	Grant Ditch	Irrig.	2.00	3	5	38	Oct.	16	1894
D 70										
71	Frenchman River	Maranville Ditch	Irrig.	6.00	12	6	41	Dec.	8	1894

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location S	T	R	Date of Priority Month	D.	Yr.
D 72, 175	Stinking Water Creek	Chase County L. & Live Stock Co.	Irrig.	4.57	36	7	37	Dec.	21	1894
D 42	Frenchman River	Wise Ditch	Irrig.	2.00	15	5	35	Dec.	28	1894
D 157	Republican River	Delaware-Hickman Ditch	Irrig.	20.00	17	1	37	Jan.	7	1895
D 74	Frenchman River	N. Gurnsey Ditch	Irrig.	5.00	3	5	37	Jan.	14	1895
D 75	Frenchman River	S. Gurnsey Ditch	Irrig.	24.00	10	5	37	Jan.	14	1895
D 110	Republican River	Allen Ditch	Irrig.	14.00	2	3	26	Jan.	26	1895
D 76	Stinking Water Creek	Chase County L. & Live Stock Co.	Irrig.	2.00	13	7	38	Jan.	28	1895
D 77	Stinking Water Creek	Chase County L. & Live Stock Co.	Irrig.	1.50	14	7	38	Jan.	29	1895
D 78	Stinking Water Creek	Chase County L. & Live Stock Co.	Irrig.	1.71	14	7	38	Jan.	29	1895
D 83	Medicine Creek	Sanders Plant	Irrig.	1.43	27	7	27	Feb.	8	1895
D 111	Red Willow Creek		Irrig.	2.00	17	3	28	Feb.	18	1895
D 79	Frenchman River	Inman Ditch	Irrig.	1.50	17	6	40	Feb.	28	1895
A 237	Indian Creek	Thompson & Vansickle	Irrig.	.93	8	2	37	June	20	1895
A 265	Rock Creek	Owens Ditch	Irrig.	.36	31	2	39	June	20	1895
A 268	Indian Creek	Wilson Ditch	Irrig.	1.42	23	2	36	June	22	1895
A 56	Stinking Water Creek	Chase County L. & Live Stock Co.	Irrig.	.91	14	7	38	June	27	1895
A 57	Stinking Water Creek	Chase County L. & Live Stock Co.	Irrig.	.70	4	7	38	June	27	1895
A 240	Indian Creek	Chamberlain Ditch	Irrig.	.06	18	2	36	Oct.	4	1895
A 246	Frenchman River	Northside Irr. Company	Irrig.	.79	21	6	39	Feb.	25	1896
A 373	Spring Creek	Benkleman Ditch	Irrig.	1.29	19	1	37	Dec.	31	1896
A 364	Springs, Tributary to Horse Creek	Pringle Ditch	Irrig.	.57	11	1	39	Jan.	12	1897
A 413	Republican River	Private Ditch	Irrig.	1.00	25	1	40	Oct.	7	1897
A 423	Frenchman River	Shallenberger Ditch	Irrig.	1.77	25	6	39	Dec.	21	1897
A 436	Frenchman River	Inman Ditch	Irrig.	6.43	17	6	40	Feb.	10	1898
A 483	Big Cottonwood Creek	Bloomington Mill Race	Power	6.00	25	2	16	Nov.	23	1898
A 483	Big Cottonwood Creek		Irrig.	1.57	25	2	16	Nov.	23	1898
A 526	Rock Creek	Rock Creek Ditch Co.	Irrig.	.33	13	2	40	Dec.	18	1899

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
A 535	Republican River	Harmon Ditch	Ice	10.00	32	3	29	Jan.	22	1900
A 537	Republican River	Walsh Canal	Irrig.	11.00	35	3	30	Jan.	31	1900
A 591	Frenchman River	Creamery Ditch	Power	34.40	21	6	39	Dec.	12	1900
A 644	Republican River, South Fork	McDonald Ditch	Irrig.	.79	36	1	38	Nov.	13	1901
A 665	Crooked Creek	Fish Pond	Fish	1.00	1	1	11	May	7	1902
A 705	Frenchman River	Follette & Krotter	Irrig.	4.29	35	5	34	April	30	1903
A 708	Frenchman River	Krotter Power Plant	Power	19.00	35	5	34	May	12	1903
A 720	Frenchman River	Ext. Follett - Krotter	Irrig.	2.57	35	5	34	Aug.	11	1903
A 781	Red Willow Creek	Red Willow Valley Md.	Irrig.	14.29	31	4	28	Feb.	27	1905
A 824	Springs, Tributary to Horse Creek	Pringle Ditch	Irrig.	1.57	14	1	39	May	11	1906
A 828	Republican River	Campbell Canal	Irrig.	9.14	9	2	34	July	13	1906
A 858	Medicine Creek	Maywood Milling Co.	Power	11.88	16	8	29	May	4	1907
A 924	Buffalo Creek	Jenkin's L. & Live Stock Co.	Irrig.	4.29	18	1	40	Dec.	12	1908
A 935	Frenchman River		Irrig.	.86	19	5	34	Mar.	11	1909
A 975	Frenchman River	Follett & Krotter	Irrig.	10.46	35	5	34	Jan.	15	1910
A 979	Arickaree River	Haigler Reservoir Canal	Irrig.	171.00	15	1	42	Jan.	21	1910
A 1021	Frenchman River	Krotter Power Plant	Power	55.00	35	5	34	Aug.	17	1910
A 1042	Red Willow Creek	Helm Ditch	Irrig.	10.00	8	3	28	Dec.	5	1910
A 1046	Frenchman River	F. C. Krotter No. 2	Irrig.	3.00	35	5	34	Dec.	15	1910
A 1047	Frenchman River	F. C. Krotter No. 3	Irrig.	2.42	35	5	34	Dec.	15	1910
A 1049	Republican River	Shadeland Park Ditch	Irrig.	38.00	26	3	29	Jan.	3	1911
A 1055	Republican River	McConnell Bros. Canal	Irrig.	180.00	10	2	34	Jan.	23	1911
A 1068	Republican River	H. D. Canal	Irrig.	7.00	28	2	35	Mar.	2	1911
A 1070	Indian Creek	Stoneberg Ditch	Irrig.	1.00	2	2	37	Mar.	13	1911
A 1093	Republican River	G. Cappel Ditch	Irrig.	1.57	19	3	39	May	1	1911
A 1094	Frenchman River	Hokes Pump & Power Plant	Irrig.	2.28	21	6	39	May	1	1911
A 1108	Frenchman River	Kilpatrick Reservoir No. 1	Storage	60.00	23	6	40	June	22	1911
A 1117	Frenchman River	Ext. of Aberdeen Ditch	Irrig.	1.57	2	5	38	July	29	1911

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
A 1129	Republican River	Shadeland Park Ditch	Irrig.	7.00	25	3	29	Sept.	28	1911
A 1136	Frenchman River	Wauneta Mills and Light Plant	Power	75.00	11	5	36	Nov.	16	1911
A 1142	Frenchman River	Arteburn Storage Reservoir	S. & I.	160.00	11	6	41	Nov.	28	1911
A 1143	Maurer Springs	Burlington Pipe Line	Irrig.	1.48	23	2	11	Nov.	28	1911
A 1145	Frenchman River	Inman Storage Reservoir	Storage	125.00	17	6	40	Dec.	8	1911
A 1160	Kilpatrick Reservoir	Kilpatrick Reservoir Ditch	Irrig.	17.00	30	6	39	Jan.	25	1912
A 1172	Republican River	Cottonwood Ditch	Irrig.	3.35	6	1	36	Feb.	19	1912
A 1192	Republican River	Rupert Ditch	Irrig.	20.00	32	3	32	April	19	1912
A 1201	Brush Creek	Brush Creek Reservoir	Storage	3.5	3	20	29	June	1	1912
A 1202	Republican River, North Fork	Parks Ditch	Irrig.	17.00	20	1	39	June	18	1912
A 1212	Red Willow Creek	Master's Ditch	Irrig.	1.14	6	3	28	July	29	1912
A 1213	Crooked Creek	Slawson's Ice Pond	Storage	.75	1	1	11	Aug.	8	1912
A 1221	Republican River		Power	300.00	15	1	19	Aug.	26	1912
A 1245	Rock Creek	Benkleman Light Association	Power	20.00	8	1	39	Nov.	30	1912
A 1284	Frenchman River	Oliver Bros. Power Plant	Power	50.00	7	5	35	April	28	1913
A 1285	Frenchman River	Oliver Bros. Canal	Irrig.	3.20	7	5	35	April	28	1913
A 1297	Driftwood Creek	Schmitz Works	Irrig.	1.50	12	2	30	May	3	1913
A 1298	Buffalo Creek	J. R. Porter Ditch	Irrig.	3.32	1	1	41	June	23	1913
A 1315	Elk Creek	Murray Works	Irrig.	2.85	11	4	23	Aug.	13	1913
A 1321	Republican River	W. J. Bailey Ditch	Irrig.	.64	6	3	21	Sept.	8	1913
A 1332	Driftwood Creek	Hesferwerth Works	Irrig.	1.00	14	2	30	Nov.	17	1913
A 1339	Frenchman River	Krotter Power Plant	Power	65.00	35	5	34	Dec.	2	1913
A 1340	Driftwood Creek	Sylvan Dell	Irrig.	2.80	1	2	30	Dec.	6	1913
A 1442	Republican River	Lake Disappointment	Storage	5.00	32	2	18	Dec.	18	1913
A 1443	Republican River	Everson Canal	Irrig.	1.07	13	2	18	Dec.	18	1913
A 1444	Republican River	The Parks Ditch	Irrig.	2.00	20	1	39	Dec.	31	1915
A 1474	Frenchman River	Municipal Water and Light Plant	Power	55.00	25	6	39	Feb.	7	1917
A 1484	Stinking Water	Palisade Power Plant	Power	72.00	25	5	34	April	21	1917

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
A 1485	Stinking Water	Palisade Reservoir	Irrig.	150.00	25	5	34	April	21	1917
A 1487	Frenchman River	Lake Imperial	Irrig.	4.57	25	6	39	May	14	1917
A 1491	Cook Creek	Cook Creek Canal	Irrig.	1.43	33	2	18	July	21	1917
A 1517	Cook Creek	Shaffer's Canal	Irrig.	.108	33	25	18	July	10	1918
A 1522	Cook Creek	Shaffer's Reservoir	Storage		33	25	18	Aug.	24	1918
A 1523	Canyon No. 10	Wacker & Son Ditch	O. D.	.70	17	3	31	Sept.	4	1918
A 1555	Republican River, North Fork	Parks Ditch Extension	Irrig.	1.14	20	1	39	Sept.	5	1919
A 1562	Frenchman River	Harvey Reservoir	Storage	15000AF	3	5	38	Oct.	16	1919
A 1573	Canyon	Farmers Canal	O. D.	2.21	17	3	31	Jan.	21	1920
A 1574	Frenchman River	Krotter & Hamlet Power Plant	Power	100.00	23	5	35	Jan.	26	1920

PRIORITIES, WATER DIVISION NO. 1-C.

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
D 991	Little Blue River	Oak Mill Race	Power		16	3	5	July	19	1895
A 1219	Little Blue River	Crystal Lake	Storage	1.50	27	6	10	Aug.	17	1912
A 1410	Little Blue River	Lyons Little Blue Electric Co.	Power	150.00	29	4	6	April	26	1915
A 1411	Little Blue River		Irrig.	4.00	18	4	6	April	26	1915
A 1467	Little Blue River	Meyer Hydro-Electric Power Co.	Power	150.00	16	3	5	July	7	1916
A 1526	Little Blue River	Crystal Lake	Irrig.	A-1219	27	6	10	Nov.	9	1918
A 1538	Little Blue River	Hebron Light & Power Co.	Power	216.00	10	2	2W	Mar.	31	1919
A 1542	Little Blue River	Blue Valley Power Co.	Power	200.00	3	2	1W	May	28	1919

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
D 963	Beaver Creek	Wright Canal	Power	40.00	7	10	2	Nov.	1	1878
D 1021	Big Blue River	Holmesville M. & P. Co.	Power	500.00	29	3	7	April		1882
A 1095	Big Blue River	Holmesville M. & P. Co.	Power	D-1021	29	3	7	April		1882
A 81	Turkey Creek	Lane Model	Irrig.	.09	4	7	3	July	16	1895
A 455	Bear Creek	Feeble Minded Inst.	D. I.	1.00	36	4	6	May	20	1898
A 1006	Big Blue River	Blue River Power Station No. 1.	Power	200.00	19	9	4	July	8	1910
A 1135	Big Blue River	Jacob's Electric Co.	Power	41.00	26	12	2	Nov.	13	1911
A 1153	Big Blue River	Blue River Power Plant No. 2	Power	100.00	32	9	3	Jan.	3	1912
A 1520	West Fork Big Blue River	Blue River Power Plant No. 2	Power	A-1153	32	9	3	Jan.	3	1912
A 1262	Big Blue River	Barneston Power Plant	Power	500.00	13	1	7	Feb.	18	1913
A 1585	Big Blue River	Barneston Power Plant	Power	A-1262	13	1	7	Feb.	18	1913
A 1265	Big Blue River	Blue River Power Plant No. 3	Power	100.00	5	8	4	Mar.	13	1913
A 1521	West Fork Big Blue River	Blue River Power Plant No. 3	Power	A-1265	5	8	4	Mar.	13	1913
A 1314	Big Blue River	Marr's Canal	Irrig.	2.28	2	6	4	Aug.	12	1913
A 1366	Big Blue River	C., B. & Q. Pipe Line	Irrig.	.50	2	9	3	April	30	1914
A 1394	Big Blue River	Pipe Line at Wymore	Irrig.	.50	21	2	7	Dec.	24	1914
A 1395	Big Blue River	Pipe Line at Seward	Irrig.	.50	21	11	3	Dec.	24	1914
A 1416	Big Blue River	Johnson Power Station No. 4	Power	125.00	19	4	6	June	7	1915
A 1417	Big Blue River	Johnson Power Station No. 2	Power	100.00	1	5	4	June	7	1915
A 1422	Big Blue River	Johnson Power Station No. 3	Power	175.00	3	4	5	July	7	1915
A 1463	Big Blue River	Blue River Power Station No. 4	Power	100.00	32	9	4	Aug.	14	1916
A 1476	Big Blue River	Blue River Power Station No. 5	Power	100.00	11	8	3	Feb.	13	1917
A 1494	Blue River and School Creek	Blue River Park Dam	Power	66.70	1	8	4	Aug.	4	1917
A 1506	Big Blue River	Shestak Power Plant	Power	200.00	35	7	4	Feb.	6	1918

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
D 347	Lodgepole Creek	Bay State Ditch	Irrig.	1.50	29	15	55	Dec.	31	1876
D 368	Lodgepole Creek	Adams and Tobin	Irrig.	1.14	35	14	50	Oct.	1	1878
D 305	Lodgepole Creek	Gunderson Ditch	Irrig.	1.43	1	14	52	June	1	1879
D 339	Lodgepole Creek	Runge Ditch No. 1	Irrig.	1.71	20	14	50	April	15	1880
D 338	Lodgepole Creek	Runge Ditch No. 2	Irrig.	.50	20	14	50	April	15	1882
D 373	Lodgepole Creek	Anderson Ditch No. 1	Irrig.	2.50	8	14	51	June	30	1882
D 346	Lodgepole Creek	Circle Arrow	Irrig.	3.71	29	15	55	July	1	1882
D 308	Lodgepole Creek	Urbach Ditch	Irrig.	.86	15	14	51	Sept.	1	1882
D 320	Lodgepole Creek	Hale Ditch No. 3	Irrig.	.57	36	14	49	April	30	1883
D 321	Lodgepole Creek	Hale Ditch No. 4	Irrig.	.71	36	14	49	April	30	1883
D 322	Lodgepole Creek	Hale Ditch No. 5	Irrig.	.57	36	14	49	April	30	1883
D 317	Lodgepole Creek	Lower Whitney Ditch	Irrig.	.29	31	14	48	May	1	1883
D 309 310	Lodgepole Creek	Booth's Canal	Irrig.	4.29	29	14	47	May	31	1883
D 814	Lodgepole Creek	McAuliffe Ditch	Irrig.	2.29	21	13	45	Dec.	31	1884
D 348	Lodgepole Creek	Kinney Ditch No. 2	Irrig.	2.71	33	15	56	Dec.	31	1884
D 312	Lodgepole Creek	Libbey Ditch	Irrig.	2.00	36	14	47	Dec.	31	1884
D 969	Lodgepole Creek	Dickinson Ditch	Irrig.	1.14	26	14	47	Jan.	1	1885
D 336	Lodgepole Creek	Howard Ditch	Irrig.	.86	31	14	47	April	10	1885
D 323	Lodgepole Creek	Krueger Ditch No. 3	Irrig.	1.14	32	14	48	May	1	1885
D 813	Lodgepole Creek	Wolf Ditch	Irrig.	1.00	18	13	45	Dec.	31	1885
D 351	Lodgepole Creek	McIntosh Ditch	Irrig.	3.31	29	15	55	April	16	1886
D 324	Lodgepole Creek	Krueger Ditch No. 2	Irrig.	2.29	32	14	48	Oct.	10	1886
D 301	Lodgepole Creek	Bergquist Ditch	Irrig.	1.29	34	14	49	Apr.	30	1887
D 300	Lodgepole Creek	Bergquist Ditch	Irrig.	.71	34	14	49	Apr.	30	1887
D 316	Lodgepole Creek	Upper Whitney Ditch	Irrig.	2.29	36	14	49	May	1	1887
D 966	Lolgepole Creek	McLaughlin Ditch	Irrig.	1.00	25	14	48	May	1	1887
D 318	Lodgepole Creek	Hale Ditch No. 1	Irrig.	1.14	36	14	49	July	1	1887

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
D 304	Lodgepole Creek	Mitchell Ditch	Irrig.	.86	8	14	51	Sept.	1	1887
D 330	Lodgepole Creek	Tobin Ditch	Irrig.	2.29	28	14	47	July	21	1888
D 303	Lodgepole Creek	Bordwell Ditch	Irrig.	1.43	35	14	49	Aug.	1	1888
D 340	Lodgepole Creek	Premier Ditch	Irrig.	2.43	3	14	58	April	11	1889
D 341	Lodgepole Creek	Smeed Ditch	Irrig.	1.43	8	14	58	April	12	1889
D 302	Lodgepole Creek	Bordwell Ditch	Irrig.	.86	35	14	49	April	27	1889
D 342	Lodgepole Creek	Polly Ditch	Irrig.	.79	30	15	55	May	6	1889
D 343	Lodgepole Creek	Independent Ditch	Irrig.	3.14	7	14	58	May	6	1889
D 344	Lodgepole Creek	Lehnkuhl Ditch	Irrig.	.43	30	15	55	May	6	1889
D 345	Lodgepole Creek	Kinney Ditch	Irrig.	2.00	31	15	56	May	14	1889
D 349	Lodgepole Creek	Young Ditch	Irrig.	.50	33	15	57	May	28	1889
D 307	Spring Creek Trib. to Lodgepole Creek	Oberfelder Ditch	Irrig.	2.29	31	14	46	May	29	1889
D 350	Lodgepole Creek	Ruftner Ditch	Irrig.	1.14	36	15	57	June	4	1889
D 333	Lodgepole Creek	Oberfelder Ditch	Irrig.	.43	31	14	46	June	10	1889
D 319	Lodgepole Creek	Hale Ditch No. 2	Irrig.	.43	36	14	49	June	26	1889
D 296	Lodgepole Creek	Bullock Ditch	Irrig.	9.14	3	13	46	June	25	1889
D 297	Lodgepole Creek	Persinger Ditch	Irrig.	4.57	33	14	46	June	25	1889
D 325	Lodgepole Creek	Krueger Ditch No. 1	Irrig.	3.00	29	14	48	June	26	1889
D 352	Lodgepole Creek	Brady Ditch	Irrig.	.71	29	15	55	Aug.	16	1889
D 353	Lodgepole Creek	Hoover Ditch	Irrig.	1.43	12	14	59	Sept.	4	1889
D 329	Lodgepole Creek	Ickes Ditch	Irrig.	2.50	28	14	50	Mar.	25	1891
D 371	Lodgepole Creek	Adams Ditch	Irrig.	1.43	3	14	52	July	1	1891
D 354	Lodgepole Creek	Hurley et al	Irrig.	2.57	26	15	56	Oct.	1	1891
D 366	Lodgepole Creek	Christensen Ditch	Irrig.	.57	7	14	51	April	15	1893
D 367	Lodgepole Creek	Christensen Ditch	Irrig.	.43	7	14	51	April	15	1893
D 365	Lodgepole Creek	Trognitz Ditch	Irrig.	1.00	36	14	50	June	1	1893
D 306	Lodgepole Creek	Oberfelder Ditch	Irrig.	2.00	31	14	46	Dec.	30	1893
D 968	Lodgepole Creek	Krueger Ditch	Irrig.	1.00	29	14	48	May	1	1894

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
D 372	Lodgepole Creek	Anderson Ditch No. 2	Irrig.	.57	10	14	51	June	1	1894
D 370	Lodgepole Creek	Adams Ditch	Irrig.	1.43	10	14	52	Sept.	1	1894
D 337	Lodgepole Creek	Lyngholm Ditch	Irrig.	.36	14	14	51	Nov.	1	1894
D 335	Spring Creek Trib. to Lodgepole Creek	Private Ditch	Irrig.	.04	14	13	51	Mar.	19	1895
D 369	Lodgepole Creek	Adams Ditch	Irrig.	.50	10	14	52	Aug.	1	1895
D 967	Lodgepole Creek	Dickinson Ditch	Irrig.	2.29	33	14	47	May	10	1896
A 437	Lodgepole Creek	Bullock Canal	Irrig.	.57	4	13	46	Feb.	16	1898
A 454	Lodgepole Creek	Maltese Cross	Irrig.	.21	36	15	57	May	16	1898
A 504	Lodgepole Creek	Bushnell Ditch	Irrig.	3.00	2	14	58	April	15	1899
A 563	Lodgepole Creek	Wiegand Ditch	Irrig.	2.00	17	13	45	May	31	1900
D 565	Lodgepole Creek	Neuman Canal Nos 1 and 2	Irrig.	1.89	36	13	45	June	12	1900
A 600	Lodgepole Creek	Wertz Bros. Ditch	Irrig.	2.86	12	13	46	Feb.	14	1901
A 611	Lodgepole Creek	Neuman Canal	Irrig.	1.29	26	13	45	April	17	1901
A 612	Lodgepole Creek	Johnson's Canal	Irrig.	2.14	23	13	45	April	17	1901
A 623	Spring Creek Trib. to Lodgepole Creek	Spring Branch Ditch	Irrig.	.29	36	14	47	July	1	1901
A 657	Lodgepole Creek	Bonnett Reservoir	Storage	700 A. F.	29	15	55	Mar.	13	1902
A 661	Lodgepole Creek	Nasland Ditch	Irrig.	.90	1	12	45	April	16	1902
A 683	Lodgepole Creek	Clausen South Side	Irrig.	.57	27	15	54	July	25	1902
A 684	Lodgepole Creek	Clausen North Side	Irrig.	.57	26	15	54	July	25	1902
A 691	Lodgepole Creek	Reservoir Ditch	Irrig.	1.87	29	15	55	Oct.	2	1902
A 703	Lodgepole Creek	Forsling Ditch	Irrig.	1.50	34	15	57	April	24	1903
A 718	Lodgepole Creek	Forsling Ditch	Irrig.	1.83	33	15	56	July	25	1903
A 719	Lodgepole Creek	Bickel Ditch	Irrig.	.93	30	15	55	Aug.	3	1903
A 723	Lodgepole Creek	Pomeroy Ditch No. 1	Irrig.	.57	15	14	51	Aug.	20	1903
A 724	Lodgepole Creek	Faden Ditch	Irrig.	.14	30	15	55	Sept.	9	1903
A 725	Lodgepole Creek	Owasco Ditch	Irrig.	22.28	29	15	55	Sept.	12	1903
A 734	Lodgepole Creek	Owasco Ditch	Irrig.	1.75	29	15	55	Dec.	15	1903
A 806	Lodgepole Creek	Forsling Ditch	Irrig.	.86	34	15	57	Dec.	6	1905

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
A 850	Lodgepole Creek	Smith Ditch	Irrig.	3.57	12	12	45	Aug.	18	1906
A 847	Lodgepole Creek	Ralton Irrigation System	Irrig.	19.14	36	13	45	Jan.	4	1907
A 857	Lodgepole Creek	Yoder Extension	Irrig.	2.71	36	15	57	April	9	1907
A 869	Lodgepole Creek	Walker Ditch	Irrig.	1.71	31	15	56	Sept.	16	1907
A 870	Lodgepole Creek	Tracy Ditch	Irrig.	.50	12	14	59	Sept.	21	1907
A 882	Lodgepole Creek	Ralton Irrigation District	Irrig.	12.40	36	13	45	Dec.	4	1907
A 897	Lodgepole Creek	Kimball Stor. & Res. Irr. System	Irrig.	20000AF	36	15	57	April	15	1908
A 904	Lodgepole Creek	Wild's Ditch	Irrig.	1.71	11	13	46	June	2	1908
A 906	Lodgepole Creek	Ruttner Canal	Irrig.	.50	30	14	47	June	25	1908
A 934	Lodgepole Creek	Bennett Ditch No. 5	Irrig.	1.00	29	15	54	Feb.	17	1909
A 1091	Flood Water from Hills	Fifield Ditch	Irrig.	.57	22	15	56	April	27	1911
A 1127	Lodgepole Creek	McGinnis Ice Pond	Storage	3.00	26	15	56	Sept.	19	1911
A 1237	Lodgepole Creek	Soderquist Ditch	Irrig.	2.00	36	13	45	Oct.	22	1912
A 1322	Lodgepole Creek	Wiegand Ditch No. 3	Irrig.	1.28	16	13	45	Sept.	10	1913
A 1323	Lodgepole Creek	Wiegand Ditch No. 2	Irrig.	.42	16	13	45	Sept.	10	1913
A 1420	Lodgepole Creek	S derquist Ditch	Irrig.	2.33	36	13	45	June	29	1915
A 1445	Lodgepole Creek	A. G. Neumann Ditch	Irrig.	6.00	26	13	45	Jan.	5	1916
A 1478	Lodgepole Creek	Bentley Canal	Reser.	1.00	34	14	50	Feb.	14	1917
A 1483	Lodgepole Creek	Sudman Ditch	Irrig.	.78	22	13	45	April	5	1917
A 1544	Lodgepole Creek	Young's Ditch	Irrig.	.57	33	15	57	June	20	1919

PRIORITIES, WATER DIVISION NO. 1-F.

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
A 955	Weeping Water	Gilmore Ditch	Ice	8.00	2	10	11	Aug.	5	1911

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
D 1024	Loup River, Mid. Branch	Lundy Mill and Power Plant	Power	200.00	4	19	19	Aug.	1	1885
D 229a	Middle Loup River	Sherman County Canal	Power	125.00	26	17	16	Fal. of		1883
227 D 228 232	North Loup River	North Loup Ditch	Irrig.	143.00	27	19	14	Sept.	30	1893
D 210	Victoria Ditch	Victoria Plant	Irrig.	2.29	1	19	21	Mar.	17	1894
D 202	Middle Loup River	Middle Valley Co.	Irrig.	560.29	15	21	22	June	6	1894
D 289	Looking Glass Creek	Monroe Ditch	Irrig.	2.86	1	17	3	June	12	1894
D 290	Spring Creek	Hendryx Ditch	Irrig.	1.33	2	17	3	June	25	1894
D 194	Caw Creek	Homestead Ditch	Irrig.	2.29	7	26	27	July	14	1894
D 213	Victoria Creek	Victoria Ditch	Irrig.	4.29	1	19	21	July	17	1894
189 D 188 356	North Loup River	Lee Ditch	Irrig.	40.00	25	27	29	Aug.	7	1894
D 214	Middle Loup River	Wescott Ditch	Irrig.	88.57	15	19	18	Aug.	8	1894
D 229b	Middle Loup River	Sherman County Canal	Irrig.	244.00	26	17	16	Aug.	13	1894
D 215	Muddy Creek	Penn's Ditch	Irrig.	.50	33	17	20	Aug.	14	1894
D 198	Middle Loup River	Thedford Ditch	I. & P.	43.00	4	23	29	Aug.	25	1894
D 224	North Loup River	Burwell Ditch	Irrig.	110.00	27	21	17	Sept.	7	1894
D 199	Middle Loup River	Norway Ditch	Irrig.	2.86	31	24	29	Sept.	8	1894
D 217	Victoria Creek	Loughran & Bell	Irrig.	4.00	3	19	21	Sept.	22	1894
D 216 204	Middle Loup River	Lillian Precinct Ditch	Irrig.	140.00	30	21	21	Oct.	19	1894
D 287	Beaver Creek	Pioneer Ditch	Irrig.	3.57	22	20	6	Dec.	8	1894
D 292a	Shell Creek	Schmitt's Ditch	Irrig.	3.00	19	18	1	Dec.	17	1894
D 292b	Shell Creek	Schmitt's Ditch	Power	30.50	19	18	1	Dec.	17	1894
D 236	South Loup River	Tillson Ditch	Irrig.	15.57	29	12	15	Dec.	28	1894
D 219a	South Loup River	Bobbitt's Ditch	Power	20.00	10	14	21	Jan.	17	1895

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
D 219b	South Loup River	Bobbitt's Ditch	Irrig.	.50	10	14	21	Jan.	17	1895
D 205	North Loup River	Newton's Ditch	I. & P.	115.14	35	23	21	Feb.	5	1895
D 209	Goose Creek	Erickson's Ditch	Irrig.	8.00	18	25	24	April	3	1895
D 187	Goose Creek	Giles' Ditch	Irrig.	10.00	2	25	25	June	1	1895
A 2	Shell Creek	Gottbrog Canal	Irrig.	1.00	24	18	1	June	6	1895
A 40	Platte River	Fremont Canal	I. & P.	2500.00	30	17	4	June	21	1895
A 113	Middle Loup River	Jewett Ditch	Irrig.	4.29	30	22	24	Aug.	12	1895
A 248	Middle Loup River	Harris Canal	Irrig.	5.71	16	22	25	Feb.	21	1896
A 277	Beaver River	Wind Mill Irrigation	Irrig.	.14	14	17	4	Mar.	31	1896
A 345	Goose Creek	Crook Ditch	Irrig.	8.00	33	25	24	June	2	1896
A 363	South Loup River	Brown Canal	Irrig.	.86	31	17	24	Feb.	23	1897
A 390	South Loup River	Hartzell Ditch	Irrig.	.37	27	18	26	May	1	1897
A 397	Gracie Creek	Gracie High Line	Irrig.	.29	29	23	17	July	9	1897
A 442	Middle Loup River	Webster	Irrig.	1.71	20	19	17	Mar.	5	1898
A 636	Cedar Creek	Fullerton L. & P. Co.	Power	200.00	12	16	6	Sept.	9	1901
A 639	Beaver Creek	Albion L. & P. Plant	Power	67.00	26	20	6	Oct.	3	1901
A 709	Loup River	Columbus Development	I. & P.	2700.00	27	17	4	June	10	1903
A 894	Platte River	Fremont & Omaha Power Co.	Power	2000.00	30	17	4	Mar.	25	1908
A 1058	Beaver Creek	St. Edward L. & P. Co.	Power	134.00	27	19	5	Feb.	11	1911
A 1175	Middle Loup River	Long Wood Canal	Irrig.	12.93	20	19	17	Feb.	21	1912
A 1182	Mira Creek	Mira Reservoir	Storage	1.14	26	18	13	Mar.	8	1912
A 1185	Middle Loup River	Mullen Grist and Light Plant	Power	124.00	6	24	32	Mar.	12	1912
A 1187	Loup River	Schuyler Plant	Power	2000.00	28	17	1	Mar.	23	1912
A 1189	Victoria Creek	Victoria Ditch	Irrig.	15.70	1	19	21	April	2	1912
A 1207	Dane Creek		Irrig.	.14	20	19	14	July	5	1912
A 1216	Middle Loup River	St. Paul Electric Works	Power	2000.00	3	14	10	Aug.	12	1912
A 1224	Middle Loup River	Lundy Mill and Power Plant	Power	400.00	4	19	19	Sept.	16	1912
A 1226	Middle Loup River	Nursery Ditches	Irrig.	1.00	3	22	26	Sept.	16	1912

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
A 1239	Mira Reservoir		Irrig.	1.32	26	18	13	Oct.	30	1912
A 1275	South Loup River	W. J. Flagg	Irrig.	5.71	11	12	18	April	15	1913
A 1294	Middle Loup River	Loup Valley Canal	Irrig.	.85	36	20	21	May	31	1913
A 1300	Middle Loup River	Lundy's Lake Canal	Irrig.	28.31	4	19	19	June	27	1913
A 1306	Middle Loup River	Lundy's Lake	Storage	8.00	2	19	19	July	19	1913
A 1307	Middle Loup River	Lundy's Lake	Irrig.	6.34	4	19	19	July	19	1913
A 1330	Middle Loup River	Austin Ditch	Irrig.	50.00	32	13	14	Nov.	6	1913
A 1357	Spring Branch	Haskill's Ditch	Irrig.	7.00	31	17	24	Feb.	27	1914
A 1373	Middle Loup River	Central Power Co.	Power	1000.00	30	13	12	July	14	1914
A 1393	Loup River	Pipe Line at Ravenna	Irrig.	.50	9	12	14	Dec.	24	1914
A 1396	Middle Loup River	Pipe Line at Seneca	Irrig.	.50	18	24	30	Dec.	28	1914
A 1400	South Loup River	Grand Island Electric Co.	Power	840.00	35	13	12	Jan.	18	1915
A 1415	Cedar River	Erickson Lake Company	Power	175.00	25	21	12	May	24	1915
A 1447	Sand Creek	Troyer's Pumping Plant	Irrig.	.24	10	15	23	Feb.	21	1916
A 1453	Mira Creek	Hutchin's Dam	Irrig.	.20	26	18	13	April	18	1916
A 1460	South Loup River	Brittan Electric Co.	Power	131.00	25	17	25	July	19	1916
A 1480	Beaver Creek (Supple. A. 639)	Albion Electric Plant	Power	70.00	26	20	6	Oct.	3	1901
A 1530	Oak Creek	Oak Creek Irr. No. 1	Irrig.	2.28	2	13	11	Jan.	18	1919
A 1548	Loup-Platte and Tributaries	Nebraska Water Power District Plants Nos. 1, 2 and 3	Power	4950.00	7 3 36	17 17 18	1 E 3 E 7 E	July	16	1919*
A 1553	South Loup	Hydro-Electric Plant No. 2	Power	63.00	31	17	24	Aug.	20	1919

* Water Power District's Petition Approved.

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
D 996	Elkhorn River, South Branch	Sugar City Cereal Mills	Power	100.00	23	24	1	Mar.	1	1870
D 271	Elkhorn River	Atkinson Mill	Power	38.50	30	30	14	Nov.	1	1883
D 259 }										
D 263 }	Elkhorn River	Elkhorn Irrigation Company	Irrig.	131.43	22	29	13	Feb.	3	1894
D 260	Elkhorn River	Davis Ditch	Irrig.	1.43	31	29	11	Feb.	8	1894
D 261	Elkhorn River	Carlon Ditch No. 1	Irrig.	1.00	32	29	11	Feb.	8	1894
D 262	Elkhorn River	Carlon Ditch No. 2	Irrig.	5.00	30	29	11	Feb.	8	1894
D 283	Elkhorn River		Irrig.	5.00	32	29	11	Feb.	20	1895
A 29	Springs	Spring Brook Aqueduct	Irrig.	.07	13	14	13	June	18	1895
A 415	Sliver Creek	Armour & Co. Ditch	Ice	10.00	7	13	9	Oct.	18	1897
A 464	Elkhorn River, South Branch	Flouring Mill	Power	33.00	3	26	9	Aug.	21	1898
A 484	Battle Creek	Battle Creek Mills	Power	10.67	36	24	3	Nov.	12	1898
A 489	Oak Creek	Eicho's Plant	Irrig.	.71	17	10	6	Jan.	4	1899
A 818	Battle Creek	Battle Creek Mills	Power	20.00	36	24	3	April	20	1906
A 883	Middle Creek	Malone Ice Pond	Irrig.	10.00	30	10	6	Dec.	26	1907
A 966	Ryan's Lake	Cut-off "H"	Drain		4	17	9	Oct.	16	1909
A 970	Platte River	Platte River Hydro Plant	Power	2500.00	6	14	10	Nov.	24	1909
A 971	Elkhorn River	Platte River Hydro Plant	Power	500.00	14	15	10	Nov.	24	1909
A 1069	Clear Lake	Main Ditch No. 1	Drain		14	23	8	Mar.	9	1911
A 1250	Elkhorn River	West Point Hydro-Development	Power	400.00	18	22	6	Dec.	26	1912
A 1335	Stevens Creek	Stevens Creek Project	Irrig.	1.00	2	10	7	Nov.	19	1913
A 1379	Platte River	Plattsmouth Power Plant	Power	2000.00	32	13	13	Sept.	4	1914
A 1516	Oak Creek	Capitol Beach	Storage	50.00	16	10	6	June	5	1918
A 1580	Union Creek	Stanton Hydro-Electric Plant	Power	80.00	6	22	2 E	Mar.	12	1920

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
D 606	Middle Creek	McGuire Ditch	Irrig.	.71	32	33	23	June	1	1884
D 619	Rock Creek	Van Koten Ditch	Irrig.	.07	25	33	22	Jan.	1	1885
D 514a	Niobrara River	Earnest Ditch No. 1	Irrig.	2.86	9	29	56	May	1	1885
D 610	Niobrara River	Bruce Mill Dam	Power	60.00	16	33	24	April	1	1886
D 513a	Niobrara River	McGinley & Stover Ditch	Irrig.	8.21	25	29	56	May	1	1887
D 593	Rock Springs	Moore's Ditch	Irrig.	1.43	12	32	22	June	30	1887
D 442a	Niobrara River	Pioneer Ditches	Irrig.	7.14	36	29	51	Aug.	1	1887
D 566	Niobrara River	McLaughlin Ditch	Irrig.	7.14	9	28	52	May	1	1888
D 609	Bear Creek	Skinner Ditch	Irrig.	.22	15	32	21	June	20	1888
D 617	Newman Creek	Newman Ditch	Irrig.	.21	17	33	24	July	1	1888
D 615	Cross Creek	Hutchinson Ditch	Irrig.	.21	8	33	24	Sept.	1	1888
D 608a	Crooked Creek	Burton Ditch	Power	3.00	19	34	19	Dec.	31	1889
D 513b	Niobrara River	McGinley & Stover	Irrig.	1.71	25	29	56	May	1	1890
D 514b	Niobrara River	Earnest Ditch No. 1	Irrig.	2.14	9	29	56	May	15	1890
D 582	Rickman Creek	Byington Ditch	Irrig.	1.00	22	32	20	May	19	1891
D 980	Niobrara River	Cook Ditch Nos. 1 and 2	Irrig.	3.54	1	28	56	May	31	1891
D 616	West Middle Creek	Allen Ditch	Irrig.	.50	29	33	23	June	1	1891
D 510	Niobrara River	Bigelow Ditch	Irrig.	2.40	19	31	57	June	8	1891
D 604	Wymer Creek	McCulley	Irrig.	.80	19	32	19	June	10	1891
D 620	Beeman Creek	Beeman Ditch	Irrig.	1.00	23	32	20	May	20	1892
D 603	Beeman Creek	Barnerd Ditch	Irrig.	.43	21	32	20	June	1	1892
D 517	Niobrara River	Harris & Neese	Irrig.	8.57	3	28	55	July	1	1892
D 415	Pine Creek	Pine Creek Mills	Power	32.00	33	30	44	June	5	1893
D 442b	Niobrara River	Pioneer Ditches	Power	10.00	31	29	50	Aug.	1	1893
D 612a	Fairfield Creek	Kuhres Ditch	Power	25.00	31	33	23	Sept.	1	1893
D 970	Niobrara River	Roll Milling Co.	Power	35.00	5	28	51	Sept.	10	1893
D 459	Niobrara River	Meridan Ditch	Irrig.	.57	25	29	50	Jan.	10	1894
D 461	Niobrara River	Enterprise Ditch	Irrig.	5.71	27	29	50	Jan.	27	1894

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
D 462	Niobrara River	Furman Ditch	Irrig.	3.64	29	29	50	Feb.	2	1894
D 612b	Fairfield Creek		Irrig.	.14	31	33	23	April	1	1894
D 511	Niobrara River	Johnson Ditch	Irrig.	2.86	36	31	57	May	1	1894
D 607	Snider Creek	Olds Ditch	Irrig.	.01	31	33	19	May	1	1894
D 587	Wyman Creek	Horton's Ditch	Irrig.	.14	17	32	19	June	5	1894
D 463	Niobrara River	McManus & Neeland	Irrig.	.86	29	29	49	June	15	1894
D 618	Cub Creek	Tissue & Patterson	Irrig.	.03	16	33	22	June	30	1894
D 264	East Brush Creek	McCarthy Ditch No. 1	Irrig.	.50	24	32	14	July	1	1894
D 611	Holt Creek	Akers Ditch	Irrig.	.14	1	34	21	Aug.	1	1894
D 583	Niobrara River	McCulley Ditch	Irrig.	8.57	25	32	20	Aug.	7	1894
D 248	Verdigris Creek	Drayton Ditch	Irrig.	2.86	8	28	8	Aug.	11	1894
D 266	West Brush Creek	McCarthy Ditch No. 2	Irrig.	.63	26	32	14	Aug.	15	1894
D 589	Cub Creek	McComber Ditch	Irrig.	.10	28	33	22	Aug.	15	1894
D 267	Blackbird Creek	Mullen Ditch	Irrig.	1.00	20	31	11	Aug.	18	1894
D 273	Bluebird Creek	Murphy's Ditch	Irrig.	1.00	26	30	11	Sept.	7	1894
D 573	Keya Paha River	Yocum Ditch	Irrig.	1.14	23	34	15	Sept.	7	1894
D 275	Eagle Creek	Bokhof Ditch	Irrig.	2.86	6	30	13	Sept.	18	1894
D 575	Niobrara River	Fienken Ditch	Irrig.	1.00	12	33	16	Oct.	1	1894
D 591	Niobrara River	Wilson Ditch	Irrig.	5.71	18	32	21	Oct.	18	1894
D 590	Jewett Creek	B. L. Ditch	Irrig.	.71	5	32	21	Oct.	23	1894
D 592	Huggings Creek	Soper Ditch	Irrig.	.14	21	35	20	Nov.	6	1894
D 274	Eagle Creek, South Branch	Becker Ditch	Irrig.	1.14	8	30	13	Nov.	30	1894
D 405	Plum Creek	Johnstown Ditch	Irrig.	26.00	4	29	24	Dec.	18	1894
D 400	Stream, No Name	Grant Ditch	Irrig.	.14	4	31	20	Jan.	1	1895
D 395	Rock Creek	Necessity Ditch	Irrig.	.35	29	32	18	Jan.	17	1895
D 479	Niobrara River	Liehte Ditch	Irrig.	1.43	27	29	48	Jan.	24	1895
D 505	Niobrara River	Warneke Ditch	Irrig.	1.57	27	31	57	Feb.	13	1895
D 481	Cottonwood Creek	Morrissey's Ditch	Irrig.	.71	17	29	48	Feb.	16	1895

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
D 595	Holt Creek	Schoettger Ditch	Irrig.	.14	32	35	20	Feb.	23	1895
D 521	Niobrara River	McGinley & Stover	Irrig.	2.86	23	29	56	Feb.	25	1895
D 518	Niobrara River	LaBelle Ditch	Irrig.	2.00	6	28	54	Mar.	12	1895
D 280	Eagle Creek	Eagle Valley Ditch	Irrig.	2.29	1	30	14	Mar.	15	1895
D 485	Niobrara River	Snow Ditch	Irrig.	2.86	35	29	51	Mar.	26	1895
D 397	Rock Creek Branch	Wiles Ditch	Irrig.	.86	9	31	18	April	3	1895
D 973	Boardman Creek	Lee Ditch	Irrig.	6.86	6	29	33	April	25	1895
D 568	Niobrara River	Excelsior Ditch	Irrig.	2.86	10	28	52	May	15	1895
D 601	Spotted Tail Creek	Spotted Tail Ditch	Irrig.	.25	4	34	17	May	17	1895
D 608b	Burton Creek	Burton Creek Ditch	Irrig.	.57	19	34	19	June	30	1895
A 4	Niobrara River	Bourrett Ditch	Irrig.	2.00	33	30	56	June	8	1895
A 5	Niobrara River	Bourrett Ditch	Irrig.	1.43	29	30	56	June	10	1895
A 53	Niobrara River	Hughes Ditch	Irrig.	1.00	1	28	52	June	26	1895
A 60	Niobrara River	Labelle Ditch	Irrig.	3.14	6	28	54	July	3	1895
A 82	Niobrara River	Usher Ditch	Irrig.	1.16	19	29	46	July	17	1895
A 88	Niobrara River	Moore Ditch	Irrig.	5.71	9	28	53	July	22	1895
D 613	Beeman Creek	Beeman & Rickman Ditch	Irrig.	.29	23	32	20	July	25	1895
A 139	Lewis Spring Creek	Lewis Ditch	Irrig.	.14	29	35	19	Aug.	30	1895
A 142	Burton Creek	One Trip Ditch	Irrig.	.35	2	33	20	Sept.	2	1895
A 149	Horse Head Creek	Bruce Canal	Irrig.	.17	16	33	24	Sept.	7	1895
A 158	Stream, No Name	Conger Dam	Irrig.	.11	5	33	24	Sept.	16	1895
A 173	Niobrara River	Hay Springs Ditch	Irrig.	14.29	29	29	47	Sept.	27	1895
A 278	Abitz Creek	Fullerton Ditch No. 2	Irrig.	.36	18	30	13	Mar.	23	1896
A 292	Niobrara River	Mettlin Ditch	Irrig.	10.00	4	28	34	April	27	1896
A 329	Plum Creek	Wilbert Ditch	Irrig.	.43	35	32	23	May	5	1896
A 336	Cottonwood Creek	Fendrick & Lichte	Irrig.	.64	22	29	48	May	9	1896
A 311	Young Creek	Harvey & Lambe	Irrig.	.21	32	33	11	June	13	1896
A 322	Shobe & Sizer Branch	Lamb Ditch	Irrig.	.14	30	33	11	July	6	1896

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location S	T	R	Date of Priority Month	D.	Yr.
A 359	Minnechudza Creek	Pierce Milling Co.	Power	35.00	30	34	27	Sept.	12	1896
A 448	Niobrara River	McManus & Nedland	Irrig.	1.93	29	29	49	April	9	1898
A 452	Niobrara River	Armstrong Canal	Power	150.00	9	33	13	May	14	1898
A 469	Niobrara River	Meridan Ditch	Irrig.	5.14	25	29	50	Aug.	29	1898
A 474	Brush Creek	Brush Creek Power Co.	Power	15.00	23	33	13	Sept.	28	1898
A 479	Bear Creek	Ciderburg Ditch No. 1	Irrig.	.02	3	32	21	Oct.	3	1898
A 533	Box Butte Creek	Billys Ditch	Irrig.	.21	29	29	45	Jan.	13	1900
A 539	Turkey Creek	Turkey Creek Ditch	Irrig.	.43	35	33	53	Feb.	9	1900
A 542	Niobrara River	Bourrett Ditch	Irrig.	1.00	29	30	56	Mar.	5	1900
A 546	Niobrara River	Bourrett Ditch	Irrig.	1.71	19	30	56	Mar.	17	1900
A 555	Spring Creek	Garden Ditch	Irrig.	.86	27	34	25	Mar.	30	1900
A 575	Niobrara River	Montague & Lichte	Irrig.	.43	27	29	48	Sept.	27	1900
A 607	Niobrara River	Chladek Ditch	Irrig.	.30	26	29	48	Mar.	18	1901
A 616	Niobrara River	Fendrick Ditch	Irrig.	.29	32	29	48	June	1	1901
A 617	Niobrara River	Fendrick Ditch	Irrig.	.27	32	29	48	June	1	1901
A 667	Big Sandy Creek	Badger Ditch	Irrig.	1.14	12	33	14	May	16	1902
A 676	Ashburn Creek	Ashburn Canal	Irrig.	.43	27	34	26	June	17	1902
A 685	Big Sandy Creek	Badger Mill	Power	35.00	12	33	14	Aug.	28	1902
A 729	Keya Paha River	Bruce Roller Mills	Power	100.00	24	34	15	Oct.	5	1903
A 747	Kibby Creek	Green Ditch	Irrig	.01	28	34	16	April	1	1904
A 753	West Middle Creek	Continuance M. M. Allen Ditch	Irrig.	1.00	29	33	23	May	2	1904
A 754	Turkey Creek	Turkey Creek No. 2	Irrig.	2.00	35	33	23	May	11	1904
A 757	Niobrara River	Potmesil Ditch	Irrig.	6.00	26	29	48	May	19	1904
A 766	Niobrara River and Pepper Creek	Taylor's Ditch	Irrig.	4.57	28	29	47	Aug.	8	1904
A 791	Niobrara River	John L. Kay	Irrig.	2.00	6	28	53	May	12	1905
A 798	Antelope Creek	Antelope Ditch	Irrig.	.36	21	32	40	June	29	1905
A 799	Pole Creek	Pole Creek Ditch	Irrig.	.57	28	32	40	June	29	1905
A 863	Dry Canyon	Gilmore Canal	Irrig.	14.29	36	30	54	July	5	1907

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
A 941	Long Pine Creek	Long Pine Power Plant	Power	48.00	30	30	20	April	2	1909
A 947	Plum Creek	Plum Creek	Power	150.00	32	32	22	May	15	1909
A 961	Niobrara River	Nebraska Power Co.	Power	900.00	34	32	7	Sept.	24	1909
A 1019	Niobrara River	Nebraska Power Co.	Power	700.00	34	32	7	Aug.	9	1910
A 1027	Cedar Creek	Cedar Creek Ditch	Irrig.	.43	4	30	24	Sept.	28	1910
A 1056	Niobrara River	Bieser Ditch	Irrig.	.75	4	29	56	Jan.	23	1911
A 1057	Niobrara River	Extension Bourrett Ditch	Irrig.	1.21	33	30	56	Jan.	23	1911
A 1067	Springs	Glen Cove Ditch	Irrig.	.85	26	33	24	Mar.	1	1911
A 1086	Niobrara River	Lichte Ditch	Irrig.	3.00	27	29	48	April	7	1911
A 1087	Niobrara River	Camille Ditch	Irrig.	1.53	19	30	43	April	10	1911
A 1088	Niobrara River	Lichte Ditch	Irrig.	.71	27	29	48	April	19	1911
A 1113	Cottonwood Creek	Dunlap Ditch	Irrig.	.50	22	29	48	July	18	1911
A 1152	Niobrara River	Potmesil Ditch	Irrig.	.28	25	29	48	Jan.	2	1912
A 1155	Boardman Creek	Boardman Ditch	Irrig.	28.57	33	30	32	Jan.	17	1912
A 1188	Boardman Creek	Bourrett Extension No. 1	Irrig.	.11	29	30	56	Mar.	25	1912
A 1193	Niobrara River	Wells Pumping System	Irrig.	1.64	32	32	40	May	2	1912
A 1209	Niobrara River	Bourrett's Extension No. 2	Irrig.	.21	32	30	56	July	19	1912
A 1243	Niobrara River	Bristow-Lynch Power Plant	Power	900.00	1-6	32	10	Nov.	14	1912
A 1248	Niobrara River	Mettlen Ditch	Irrig.	5.00	4	28	54	Dec.	18	1912
A 1249	Niobrara River	Bennett Ditch	Irrig.	4.00	1	28	54	Dec.	18	1912
A 1260	Niobrara River	George Hitshew Ditch	Irrig.	6.00	6	28	52	Feb.	17	1913
A 1279	Minnechaduza Creek	Valentine Power Plant	Power	40.00	29	34	27	April	16	1913
A 1352	Snake Creek	Snake Hydro-Electric Co.	Power	180.00	9	31	30	Feb.	16	1914
A 1362	Niobrara River	Coffey Ditch No. 3	Irrig.	2.50	15	29	56	Mar.	24	1914
A 1461	Horse Shoe Lake	Horse Shoe Lake Drain	Drain		13	34	40	June	27	1916
A 1488	Niobrara River	Morton Nursery Ditch	Irrig.	.50	30	33	32	June	15	1917
A 1539	Rock Creek	Dugger Ditch	Irrig.	4.57	33	32	18	April	24	1919

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					S	T	R	Month	D.	Yr.
D 447	East Ash Creek	Ox Yoke	Irrig.	2.86	31	32	50	May	31	1880
D 522	Kyle Creek	Kyle Creek Ditch	Irrgi.	.57	3	30	54	June	30	1882
D 982	Charcoal Creek	Klein Ditch	Irrig.	.11	33	31	53	Aug.	1	1882
D 561	White River	Jacobson's Ditch	Irrig.	.14	32	31	53	Oct.	1	1882
D 546	Soldier Creek	Rodger's Ditch	Irrig.	.14	5	31	53	April	30	1883
D 557	Spring Branch, Trib. to White River	Tucker's Ditch	Irrig.	.17	34	31	54	June	1	1883
D 428	West Ash Creek	Mase Ditch	Irrig.	1.00	2	31	51	July	31	1884
D 478a	White River	Hall's Ditch Nos. 1 and 2	Irrig.	24.83	34	32	52	Sept.	10	1885
D 494	Big Bordeaux Creek	Locket Ditch	Irrig.	.07	11	32	48	June	30	1886
D 525	Deep Creek	Deep Creek Ditch	Irrig.	.06	9	30	53	May	1	1887
D 438	East Ash Creek	Barron Ditch	Irrig.	1.14	32	32	50	July	1	1888
D 1022	Chadron Creek	Chadron Water Works	W. S.	1.00	18	32	48	Dec.	31	1888
D 1030	White River	C., B. & Q. Pipe Line—Crawford	Irrig.	.80	3	31	52	Sept.	14	1889
D 492	Springs, Tributary to Hooper Creek	McMannis Ditch	Irrig.	1.00	7	31	51	Dec.	31	1889
D 493	Dead Horse Creek		Irrig.	.01	32	32	49	Sept.	1	1890
D 562	White River	Diedrickson's Ditch	Irrig.	.21	1	30	54	Sept.	1	1890
D 430	Big Bordeaux Creek	Richard's Ditch	Irrig.	.14	36	33	48	Sept.	10	1890
D 426	Chadron Creek	Gallup's Ditch	Irrig.	.08	15	33	49	Dec.	20	1890
D 425	Little Cottonwood Creek	Thomas Stuart's Ditch	Irrig.	.36	8	32	52	Dec.	21	1890
D 434	Big Bordeaux Creek	Bryants Ditch	Irrig.	.29	14	33	48	Feb.	4	1891
D 437	Bordeaux Creek	Hall's Ditch	Irrig.	.07	15	33	48	Mar.	1	1891
D 441	Springs	Goff Ditch	Irrig.	.14	30	32	49	April	2	1891
D 427	Dead Horse Creek	Flagg Butte	Irrig.	.03	32	32	49	April	10	1891
D 960	White Clay Creek	McFarland Ditch	Irrig.	1.64	35	32	52	May	18	1891
D 446	Bordeaux Creek	Richard's Ditch	Irrig.	.36	36	33	48	Sept.	7	1892
D 975	Bordeaux Creek	Mann's Ditch	Irrig.	.23	25	33	48	Dec.	31	1892
D 450	Bordeaux Creek	Adams' Ditch	Irrig.	.14	2	32	48	Mar.	5	1892
D 448	Little Bordeaux Creek	Hartzell Ditch	Irrig.	.57	13	33	48	June	1	1893

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
D 452	West Ash Creek	West Ash Creek Irrigation Co.	Irrig.	1.62	36	32	51	July	4	1893
D 453	Chadron Creek	Tug Wilson Ditch	Irrig.	.20	12	32	45	July	13	1892
D 454	Chadron Creek	Wallace Wilson Ditch	Irrig.	.07	12	32	49	July	14	1893
D 455	Ash Creek		Irrig.	.03	12	32	51	July	15	1893
D 983	Big Bordeaux Creek	County Ditch	Irrig.	.14	23	33	48	July	31	1893
D 457	Dead Horse Creek	Goff Ditch	Irrig.	.17	9	31	49	Aug.	27	1893
D 489	Indian Creek	Seegrist Ditch	Irrig.	.03	3	31	50	Nov.	1	1893
D 460	Indian Creek	Flood Ditch	Irrig.	.07	33	32	50	Feb.	13	1894
D 464	White River	Harris & Cooper, F. A.	Irrig.	16.79	25	32	52	Mar.	9	1894
D 466	Spring Creek	Spring Creek Ditch	Irrig.	.86	13	32	52	May	10	1894
D 475	White Clay Creek	Hazelton Ditch	Irrig.	1.14	13	31	52	May	15	1894
D 443	Little Bordeaux Creek	Butler Ditch	Irrig.	.11	33	33	47	June	1	1894
D 464	White River	Harris & Cooper, F. A.	Irrig.	1.57	25	32	52	June	15	1894
D 468	Chadron Creek	Half Diamond	Irrig.	.57	1	32	49	June	17	1894
D 467	White River	Rahser Ditch	Irrig.	1.14	19	32	51	June	20	1894
D 445	Bordeaux Creek	Bacon Ditch	Irrig.	.21	21	34	48	July	1	1894
D 469	White River	Welling Ditch	Irrig.	.57	17	32	51	July	13	1894
D 418	Sheridan Creek	Getchell Ditch	Irrig.	.07	27	34	45	Aug.	1	1894
D 488	Dead Horse Creek		Irrig.	.01	32	32	49	Aug.	1	1894
D 491	Bordeaux Creek	Morrissey Canal	Irrig.	.08	15	33	48	Aug.	25	1894
D 464	White River	Harris & Cooper Ditch	Irrig.	.28	25	32	52	Oct.	31	1894
D 473	Spring Creek	Spring Ditch No. 1	Irrig.	2.00	7	32	51	Dec.	1	1894
D 487	White River	Carpenter's Ditch	Irrig.	2.86	1	32	51	Dec.	2	1894
D 477	White River and White Clay Creek	White River Ditch	Irrig.	8.71	35	32	52	Dec.	31	1894
D 478b	White River	Hall's Mill	Power	26.40	34	32	52	Jan.	10	1895
D 519	Bull Creek	Johnson Ditch No. 1	Irrig.	.29	7	30	53	Mar.	13	1895
D 423	Beaver Creek	Braddock Ditch	Irrig.	36.00	18	34	46	April	15	1895
D 974	Beaver Creek		Irrig.	.04	1	34	47	April	15	1895

	No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
						S	T	R	Month	D.	Yr.
A	7	Dead Horse Creek	Goff Ditch	Irrig.		4	31	49	June	10	1895
A	8	Little Cottonwood	Stuart Ditch	Irrig.	2.86	8	32	52	June	10	1895
A	42	White Clay Creek	Cooper Ditch	Irrig.	3.71	2	31	52	June	22	1895
A	500	White River	Metcham et al Ditch	Irrig.	2.86	17	32	51	June	27	1895
D	465	Trunk Butte Creek	Smock's Ditch	Irrig.	.07	26	32	50	June	28	1895
A	203	Deep Creek	Green Ditch	Irrig.	.20	9	30	53	Oct.	5	1895
A	183	Little Cottonwood	Kusel Ditch	Irrig.	1.14	9	32	51	Oct.	16	1895
A	189	Sand Creek	Bendix Irrigation Ditch	Irrig.	.57	35	33	53	Nov.	19	1895
A	256	White Clay and Little Sawlog Creek	Brockway Ditch	Irrig.	.71	36	31	52	Feb.	27	1896
A	333	Squaw Creek	Cooper Ditch	Irrig.	2.29	36	32	52	May	8	1896
A	334	Deadman Creek	Stewart Ditch	Irrig.	.31	19	30	52	May	8	1896
A	337	Seepage, White River	Mason	Irrig.	.14	32	31	53	May	12	1896
A	340	White River	Lewis Ditch	Irrig.	.14	27	31	55	May	19	1896
A	380	Cedar Canyon	Cedar Canyon Ditch	Irrig.	.43	16	33	53	Mar.	1	1897
A	391	White River	Jones Ditch	Irrig.	.71	18	34	48	May	21	1897
A	394	White River	Schwabe Ditch	Irrig.	1.14	25	34	49	June	24	1897
A	409	Ravine, Tributary to Cottonwood	Carlson Ditch	Irrig.	.71	21	33	52	Sept.	20	1897
A	421	White River	Wilkinson Ditch	Irrig.	.71	24	32	52	Nov.	18	1897
A	463	Beaver Creek	Braddock Ditch	Irrig.	.63	1	34	47	Nov.	24	1897
A	432	Bordeaux Creek	O'Donnell	Irrig.	.14	9	34	48	Jan.	17	1898
A	434	West Ash Creek	Woodard Ditch	Irrig.	.14	25	32	51	Feb.	3	1898
A	444	Big Cottonwood	Rasmussen Ditch	Irrig.	2.29	10	33	52	Mar.	8	1898
A	456	White River	Rasher Ditch	Irrig.	.50	19	32	51	May	23	1898
A	459	Ash Creek	Connell Ditch	Irrig.	.63	6	32	50	June	17	1898
A	475	White River	Zeun & Schmeizle	Irrig.	1.00	19	32	51	Oct.	13	1898
A	478	Bordeaux Creek	Nelson's Ditch	Irrig.	.36	14	33	48	Oct.	19	1898
A	491	Ash Creek	Cripp's Ditch	Irrig.	1.00	13	32	51	Jan.	10	1899
A	493	East Ash Creek	Sheldon Ditch	Irrig.	1.43	30	32	50	Jan.	26	1899

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					S	T	R	Month	D.	Yr.
A 494	Bordeaux Creek	Nelson Ditch	Irrig.	.14	14	33	48	Jan	28	1899
A 513	Beaver Creek	Celek Ditch	Irrig.	.36	4	33	46	June	19	1899
A 520	East Ash Creek	Todd Ditch	Irrig.	.38	5	31	50	Sept.	12	1899
A 521	Little Cottonwood	Simmons	Irrig.	1.14	9	32	51	Sept.	12	1899
A 525	White River	Shaefer Blust Ditch	Irrig.	3.00	2	32	51	Dec.	18	1899
A 528	Cottonwood Creek	Rasmussen	Irrig.	18.00	10	33	52	Dec.	26	1899
A 534	White River	Rasher Ditch	Irrig.	1.43	19	32	51	Jan.	16	1900
A 540	Indian Creek Tributary	Kaiser	Irrig.	.57	28	32	50	Feb.	15	1900
A 547	Deadman Creek	Phillip's Ditch	Irrig.	.14	18	30	52	Mar.	19	1900
A 551	Sand Creek Tributary	Jordon	Irrig.	.50	31	33	53	April	2	1900
A 559	Indian Creek	Boyer	Irrig.	.86	28	32	50	April	30	1900
A 560	Little Cottonwood Creek	Kusel Ditch No. 2	Irrig.	.43	8	32	51	May	19	1900
A 562	Deadman Creek	Porter & Rasmussen	Irrig.	1.43	1	30	53	May	29	1900
A 564	Deadman Creek	Lindeman Ditch	Irrig.	.14	18	30	52	June	11	1900
A 584	West Bordeaux Creek	Burns' Ditch	Irrig.	4.00	36	33	48	Nov.	5	1900
A 588	White River	Carlson Ditch	Irrig.	1.43	6	32	50	Nov.	26	1900
A 618	White Clay Creek	Rinker Ditch	Irrig.	.57	11	31	52	June	8	1901
A 649	Little Cottonwood Creek	Dunn Ditch	Irrig.	1.43	9	32	52	Jan.	14	1902
A 655	White Clay Creek	White River Irrigation Co.	Irrig.	8.00	36	32	52	Mar.	3	1902
A 656	Little Cottonwood	Stewart & Maple Ditch	Irrig.	.29	3	32	52	Mar.	10	1902
A 658	Dead Horse Creek	Geiser Ditch	Irrig.	.15	17	32	49	Mar.	18	1902
A 663	Spring Creek	Forbes Ditch No. 1	Irrig.	.57	20	32	52	April	28	1902
A 677	Little Cottonwood	Kusel & Spearman	Irrig.	.71	8	32	51	June	30	1902
A 681	Beaver Creek	Rickman	Irrig.	1.00	9	33	46	July	2	1902
A 690	Bordeaux Creek	Martens Ditch	Irrig.	.57	28	34	48	Sept.	22	1902
A 696	White River	Martens Ditch	Irrig.	.29	14	34	48	Dec.	26	1902
A 702	White River	Crawford Pumping Station	Power	18.00	3	31	52	Mar.	30	1903
A 704	White Clay Creek	Hutzell Ditch	Irrig.	.57	13	31	52	April	30	1903

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
A 706	Rush Creek	Braddock Ditch	Irrig.	3.00	10	34	49	May	4	1903
A 707	White River	Hobbert Ditch	Irrig.	.29	34	33	50	May	11	1903
A 730	White River	Simmons - Harris Ditch	Irrig.	1.00	16	32	51	Oct.	26	1903
A 735	Ash Creek	Cripp's Ditch No. 2	Irrig.	1.14	13	32	51	Dec.	26	1903
A 740	White River	Extension to Rasher Ditch	Irrig.	1.29	20	32	51	Feb.	5	1904
A 749	Dead Horse Creek		Irrig.	1.29	32	33	49	April	6	1904
A 767	Sand Creek	Carlson & Rasmussen Ditch	Irrig.	30.00	32	33	52	April	12	1904
A 758	White River	Schwabe Ditch	Irrig.	.57	24	34	49	June	13	1904
A 759	White River	Schwabe Power Plant	Power	5.00	24	34	49	June	13	1904
A 763	Madden Creek	Dams	Irrig.	.57	26	35	49	July	11	1904
A 771	Madden and North Creek	Dams	Irrig.	.57	31	35	48	Oct.	17	1904
A 772	English Creek	McDowell's Storage System	Irrig.	.87	12	31	52	Oct.	24	1904
A 775	Platte River	Wright's Ditch	Irrig.	4.00	16	32	51	Dec.	5	1904
A 779	Sand Creek	Arner Ditch	Irrig.	2.51	26	33	53	Jan.	12	1905
A 780	Little Bordeaux	Collins' Reservoir	Irrig.	.31	14	32	48	Feb.	27	1905
A 783	Little Bordeaux	Good Ditch	Irrig.	7.00	29	33	47	Mar.	6	1905
A 788	Spring Creek	Spring Creek No. 1	Irrig.	5.00	13	32	52	April	7	1905
A 789	Lone Tree Creek	J. C. Thomas Ditch	Irrig.	1.00	28	34	51	April	29	1905
A 803	Hooker Creek	Alcorn Ditch	Irrig.	1.21	31	32	51	Nov.	17	1905
A 811	Sand Creek	Kirstine & Rasmussen	Irrig.	17.00	3	32	52	Jan.	8	1906
A 815	White River	Schwabe Ditch	Irrig.	.29	24	34	49	Mar.	19	1906
A 825	Rush Creek	Extension of Braddock Ditch	Irrig.	1.57	11	34	49	May	31	1906
A 830	Madden Creek	Trier Ditch	Irrig.	1.21	6	34	48	Aug.	1	1906
A 835	Ash Creek	Cripp's Ditch	Irrig.	.57	13	32	51	Aug.	27	1906
A 838	White River	Roby's Ditch and Dam	Irrig.	.33	3	31	52	Sept.	13	1906
A 848	Bordeaux Creek	Marten Ditch	Irrig.	1.14	21	34	48	Jan.	14	1907
A 849	Little Sawlog and White Clay	Little Sawlog Ditch	Irrig.	.71	12	30	52	Jan.	23	1907
A 852	East Sawlog	Stephenson Ditch	Irrig.	1.14	25	31	52	Mar.	5	1907

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
A 854	White River	Stephenson's Power Plant	Power	15.00	34	31	53	Mar.	15	1907
A 860	Stream, Tributary to White River	Jones' Ditch	Irrig.	.29	9	31	51	May	20	1907
A 884	East Sawlag	Baker Ditch	Irrig.	.29	5	30	51	Jan.	3	1908
A 908	White River	Schwabe Ditch	Irrig.	3.43	31	34	48	July	23	1908
A 915	Hooker Creek	Souther Lake	F. & I.	1.43	30	32	51	Sept.	24	1908
A 919	Dry Run	Campbell Ditch	Irrig.	1.00	35	34	49	Nov.	9	1908
A 931	Kane Creek	McConnell Ditch and Reservoir	Irrig.	4.29	29	34	50	Jan.	14	1909
A 936	White River; White Clay Creek	White River Irr. Co. S. Br.	Irrig.	1.43	25	32	52	Mar.	11	1909
A 1054	White Clay Creek	Townsend Ditch	Irrig.	.80	25	25	45	Jan.	21	1911
A 1061	Dry Draw	G. Earnest Ditch	Irrig.	3.71	22	35	49	Feb.	20	1911
A 1098	Saw Log	Van Treek Ditch	Irrig.	.37	4	30	51	May	8	1911
A 1110	White River	Jensen's Plant	Irrig.	1.14	26	33	50	June	27	1911
A 1120	White Clay Creek	Brooks Ditch	Irrig.	.42	36	35	45	Aug.	2	1911
A 1122	White River	Pinney & Denslow Res. 1, 2, 3	I. & S.	20.00	26	32	52	Aug.	10	1911
A 1128	White River	Forbes Extension	Irrig.	.85	19	32	51	Sept.	26	1911
A 1132	Squaw Creek	Squaw Creek Ditch	Storage	3.00	12	31	52	Oct.	3	1911
A 1190	Sand Creek Tributary	Syndicate Ditch	Irrig.	27.42	32	33	52	April	2	1912
A 1199	Indian Creek	Honnold Wilson Ditch	Irrig.	.07	3	31	50	May	25	1912
A 1264	Little Cottonwood	Broadhurst Ditch	Irrig.	3.20	7	32	51	Feb.	25	1913
A 1276	Little Cottonwood	Dodd & McDowell	Storage	10.00	18	32	53	April	15	1913
A 1278	Flood Water	Lenehan Reservoir	Storage	4.00	25	34	52	April	16	1913
A 1289	Flood Water	Arner Ditch	Irrig.	.14	27	33	53	May	6	1913
A 1333	Ash Creek, West Branch	Broadhurst Reservoir	Storage	5.00	35	32	51	Nov.	17	1913
A 1345	Dry Run	Wm. Guse Reservoir	Storage	20.00	35	34	52	Jan.	13	1914
A 1358	Spring Creek	Swinbank Reservoir	Storage	2.00	13	32	52	Mar.	3	1914
A 1360	White River	Hebbert Ditch	Irrig.	.71	34	33	50	Mar.	10	1914
A 1361	Dry Run	Harsh & Weston Ditch	Irrig.	3.00	31	34	51	Mar.	11	1914
A 1392	Lone Tree Creek	Sides Reservoir	Storage	3.00	13	34	52	Nov.	25	1914

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
A 1406	Butte Creek	Chaulk Ditch	Irrig.	3.00	25	33	50	Mar.	13	1915
A 1441	White Clay Creek	Handschiegel Lake	Storage	1.30	11	31	52	Dec.	17	1915
A 1475	Dry Draw	Heath Reservoir	Storage	1.00	12	32	52	Feb.	7	1917
A 1481	Dry Canyon	Betson Ditch	Irrig.	1.00	33	32	51	Mar.	22	1917
A 1567	Flood Water, White River	Whitney Ditch	Irrig.	12.42	1	32	51	Nov.	29	1919
A 1568	Indian Creek	Extension of Seegrist Ditch	Irrig.	6.64	3	31	50	Nov.	29	1919
A 1569	Indian Creek	Renfro Reservoir	Storage	480 A. F.	3	31	50	Nov.	29	1919

	No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
						S	T	R	Month	D.	Yr.
D	553a	Hat Creek	W. Hat Creek Ditch	Irrig.	.43	16	32	55	June	1	1880
D	513	Warbonnet Creek	Warbonnett Ditch	Irrig.	3.63	21	33	55	July	31	1880
D	512	Hat Creek	Coffee Ditch	Irrig.	4.29	26	33	55	Sept.	1	1881
D	507	Cedar Creek	Schilts' Ditch	Irrig.	.57	35	33	56	May	15	1885
D	976	Cedar Creek	Valdez Ditch	Irrig.	.50	10	32	56	April	5	1886
D	553b	West Hat Creek	West Hat Creek Ditch	Irrig.	.57	16	32	55	May	31	1886
D	508	Prairie Dog Creek	Schilts' Prairie Dog Ditch	Irrig.	1.14	35	32	56	Mar.	31	1886
D	560	Boggy Creek	Bannon's Ditch	Irrig.	.06	7	32	54	July	1	1886
D	957	Warbonnet Creek Branch	Nolan Ditch No. 1	Irrig.	.01	23	33	57	Mar.	15	1887
D	958	Warbonnet Creek, North Branch	Kay's Ditch	Irrig.	.14	26	33	57	May	1	1887
D	533	Sowbelly Creek	Old Sowbelly Ditch	Irrig.	3.00	7	32	55	June	1	1887
D	506	Big Monroe Creek	Big Monroe Creek Ditch	Irrig.	1.43	33	33	56	May	1	1888
D	959	Warbonnet Creek, Branch	Nolan Ditch No. 2	Irrig.	.29	23	33	57	May	1	1888
D	547	Tributary of White Head Creek	Harrison Ditch	Irrig.	.06	13	33	54	May	30	1888
D	509	Monroe Creek	Schilts' Ditch	Irrig.	.50	27	33	56	July	2	1888
D	956	Boggy Creek		Irrig.	.11	30	33	54	Dec.	31	1888
D	550	Spring Creek, Tributary to Sow Belly	Hall's Ditch	Irrig.	.57	6	32	55	Mar.	26	1889
D	981	Jim Creek	Dout Bros. Ditch	Irrig.	.86	7	33	56	May	15	1889
D	439a	Warbonnett Creek	Dout Ditch No. 2	Irrig.	.71	30	33	56	May	31	1889
D	984	Tributary to Jim Creek	Homestead Ditch	Irrig.	.22	22	33	54	May	31	1890
D	552	Squaw Creek	Dunn's Ditch	Irrig.	.36	15	33	57	June	1	1890
D	559	Sowbelly Creek	Montgomery Ditch	Irrig.	1.00	21	33	55	Dec.	1	1890
D	502	Jim Creek	Jim Creek Ditch	Irrig.	.43	8	33	56	Dec.	15	1890
D	538	Spring Branch, Tributary to Warbonnett	Biehls' Ditch	Irrig.	.23	32	33	56	April	1	1891
D	555	Squaw Creek	Hamlin Ditch	Irrig.	.01	10	33	57	April	1	1891
D	543	Jim Creek	Slattery Ditch	Irrig.	.29	13	33	57	May	31	1891
D	539b	Warbonnett Creek	Dout Ditch No. 2	Irrig.	.29	30	33	56	Dec.	31	1891
D	526	Boggy Creek	Smith's Ditch	Irrig.	.28	31	33	54	May	1	1892

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
D 549	Cherry Creek	Cherry Creek Ditch	Irrig.	.03	29	33	54	May	1	1893
D 551	Little Red Creek	Zerbst Ditch	Irrig.	.14	25	33	56	May	1	1893
D 532	Spring Creek, Tributary to Sowbelly	Spring Creek Ditch	Irrig.	.29	7	32	55	June	1	1893
D 503	Spring Branch, Trib. to Warbonnett	Gorton Ditch	Irrig.	1.43	31	33	56	Oct.	16	1893
D 537	Antelope Creek	Turner Ditch	Irrig.	.86	26	34	57	Oct.	31	1894
D 556	Sowbelly Creek	Jordan's Ditch	Irrig.	.43	21	33	55	June	1	1895
A 83	Monroe Creek	Noreisch Ditch	Irrig.	.04	33	33	56	July	19	1895
A 100	Squaw Creek	Thos. Dunn Ditch and Reservoir	Irrig.	.57	10	33	57	Aug.	5	1895
A 168	Antelope, North Branch	Story's Ditch	Irrig.	2.00	8	34	56	Nov.	11	1895
A 424	Sowbelly Creek	Jordan's Ditch	Irrig.	.50	21	33	55	May	11	1896
A 339	Antelope Creek	Ellis Ditch	Irrig.	.29	9	33	57	May	17	1896
A 341	Hat Creek	Miller Ditch	Irrig.	.37	23	33	55	May	19	1896
A 342	East Boggy Creek	Martin Ditch	Irrig.	.36	18	32	54	May	19	1896
A 376	Squaw Creek	Phillip Dunn Ditch	Irrig.	.19	3	33	57	Jan.	22	1897
A 404	Sowbelly Creek	Nutto Ditch	Irrig.	.43	24	32	56	Sept.	4	1897
A 451	Jim Creek Tributary	Hunter Ditch	Irrig.	.03	26	33	54	May	12	1898
A 510	Hat Creek	Haas Ditch	Irrig.	.08	2	33	55	May	8	1899
A 516	Sowbelly Creek	Carroll Ditch	Irrig.	.14	7	32	55	July	12	1899
A 532	Sowbelly Creek	Zimmerman Ditch	Irrig.	.71	34	33	55	Jan.	11	1900
A 549	Licket Creek	Licket Ditch	Irrig.	1.43	27	33	54	Mar.	21	1900
A 581	Jim Creek Tributary	Wasserberger Ditch	Irrig.	2.29	29	34	54	Oct.	13	1900
A 585	Peterson Draw	Meyer Dam	Irrig.	2.00	24	35	55	Nov.	5	1900
A 587	Long Branch Creek	O'Connell Ditch	Irrig.	.20	22	35	54	Nov.	10	1900
A 594	Hat Creek	Antrim's Ditch	Irrig.	.57	3	32	55	Dec.	24	1900
A 627	West Squaw Creek	Thomas' Ditch	Irrig.	.50	10	33	57	July	23	1901
A 635	Long Branch Creek	Ebert Ditch	Irrig.	.14	19	35	53	Aug.	22	1901
A 668	Sowbelly Creek	Jordan Canal	Irrig.	.14	21	33	55	May	26	1902
A 701	Boggy Creek	Wickersham Ditch	Irrig.	3.00	31	33	54	Feb.	28	1903

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
A 760	Antelope Creek	Gayhart Ditch	Irrig.	2.43	16	34	55	June	18	1904
A 808	Canyon, Tributary to Hat Creek	Joseph Konrath Ditch	Irrig.	1.43	17	34	54	Dec.	28	1905
A 834	Hat Creek	Antrim's Dam	Irrig.	.57	3	32	55	Aug.	20	1906
A 841	Monroe Creek	Niel Jordan Dam	Irrig.	2.20	13	32	56	Nov.	12	1906
A 886	Little Boggy Creek	Hill Ditch	Irrig.	.86	11	32	55	Jan.	20	1908
A 892	Warbonnett Creek	Warbonnett Ditch No. 2	Irrig.	1.43	20	33	56	Mar.	11	1908
A 1236	Hat Creek	Coffee & Son Flood Water	Irrig.	6.00	14	33	55	Oct.	22	1912
A 1268	Sowbelly Creek	Barnes Reservoir	Storage	10.00	19	32	55	Mar.	24	1913
A 1288	Sowbelly Creek	O'Connell's Canal	Irrig.	10.00	9	33	55	May	5	1913
A 1375	Monroe Creek	Cornelius Jordan Ditch	Irrig.	2.00	13	33	56	July	30	1914
A 1376	Squaw Creek	Roy C. Child's Ditch	Irrig.	.57	28	34	56	Aug.	14	1914
A 1377	Monroe Creek	Wooden Shoe	Storage	5.00	22	33	56	Aug.	14	1914
A 1399	Monroe Creek	Neal Jordan Ext. to A 841	Storage	4.00	14	33	56	Jan.	14	1915
A 1469	Reservoir under A. 1399, Monroe Creek	Kite Ditch	Irrig.	2.20	13	33	56	Jan.	14	1915
A 1470	Reservoir under A. 1399, Monroe Creek	Supple. to Cornelius Jordan Ditch A. 1375	Irrig.	1.40	13	33	56	Jan.	14	1915
A 1404	Warbonnett Creek	Zerbst Ditch No. 2	Irrig.	.17	25	33	57	Mar.	6	1915
A 1405	Warbonnett Creek	Zerbst Ditch No. 1	Irrig.	.03	26	33	57	Mar.	6	1915
A 1407	Hat Creek	Zerbe Reservoir	Storage	2.00	35	33	55	Mar.	25	1915
A 1509	Dry Creek	Story Ditch	Irrig.	5.91	9	34	56	Mar.	26	1918
A 1591	Dry Antelope	Grammercy Dam	Storage	10 A. F.	13	34	57	Sept.	24	1920

PRIORITIES, WATER DIVISION NO. 2-F.

No.	NAME OF STREAM	CARRIER	Use	Sec. Ft.	Location			Date of Priority		
					S	T	R	Month	D.	Yr.
A 914	Bazile Creek	Creighton Milling Co.	Power	30.00	21	29	5	Sept.	24	1908

WATER POWER.

Water Power in Nebraska.

The first law relating to the use of water for irrigation or water power was passed by the Legislature of 1877. This law was very brief and merely gave to companies desiring to construct such work the right of eminent domain and declared them to be works of internal improvement. No mention whatever was made of any course of procedure whereby title or the right of property to the use of water could be acquired.*

The next legislation covering the use of water was passed by the Legislature of 1889. This act provided the right to acquire the use by appropriation of running water flowing in any river or stream or down any canyon or ravine; provided that the same be used for beneficial or useful purposes, and that when any appropriator or successor in interest ceased to use the water so appropriated for such a purpose the right ceased; that no land was to be burdened with more than one ditch, without the consent of the owner thereof; that all ditches were exempt from taxation; that the point of diversion might be changed if others were not injured; that the water so diverted must be returned to the stream from which it was taken; that as between appropriators the one first in time was first in right; that a notice be posted by the party desiring to appropriate water at the point of intended diversion, stating the point of diversion, the amount of appropriation, the purpose for which claimed, the place of intended use, and the means by which it was intended to divert; that a copy of the notice be recorded in the office of the county clerk of the county in which the notice was posted; that excavation must commence within sixty days from the time of posting notice and continue to completion; that completion meant conducting the water to the place of intended use; that a permanent right was granted to the use of all water beneficially used through ditches which had previously been completed; that the owners of land bordering on streams were entitled to use of water on adjoining lands; that the right was given for condemnation for right-of-way; sites for reservoirs, and to enlarge ditches; that ditch companies were authorized to borrow money and issue bonds; that canals constructed for irrigating or water power purposes were declared works of internal improvement; that ditches must be kept in proper repair; and provided a penalty for interfering with ditches or gates.

The next law governing the use of water was enacted by the Legislature of 1895, which passed the first comprehensive law regarding and

* Session Laws of Nebraska for 1877, page 168.
† Session Laws of Nebraska for 1899, chapter 68, page 503.

relating to the use of water for irrigation and water power purposes. The most important features of this law as pertaining to water power were as follows: The dedication of the water of every natural stream to public use; the right to divert unappropriated water for beneficial use was never to be denied; stated the priority of the use of water gave preference to the use as follows: First, for domestic use; second, for irrigation, and, third, for power and manufacturing purposes; divided the state into two water divisions and these divisions into districts; provided for the measurement of water in streams; created the State Board of Irrigation; required county clerks to send certified copies of notices of all water appropriations on their records to the State Board; provided for the adjudication of existing rights by the State Board; provided for the future applications for appropriations of water; the examination and approval or disallowance of said applications; appeals from decision of the Board; and a complete record of all water rights to be kept in the office of the State Board.* This law has been amended from time to time and improvement in it made thereby.

The State Board of Irrigation organized itself on April 24, 1895, being composed of the Governor, as President of the Board; the Attorney General and the Commissioner of Public Lands and Buildings. The State Board appointed its Secretary, State Engineer and other assistants, and at once prepared claim blanks which were sent to water users of record in the offices of the different county clerks, which were filled out and returned to the office of the State Board. Hearings were had on those claims and the rights of the different claimants adjudicated for convenience of keeping a record of these claims, the hearings were numbered in order in which they were held, and were called "Dockets". Thus all claims for the right to the use of water prior to April, 1895 are known as "Dockets". Special attention is called to this for the reason that it is necessary to know the docket number of a particular water right in order to look it up.

After a hearing on one of these claims which were presided over by the Secretary, an opinion was rendered by the State Board upon the evidence submitted, which determined the amount of water, the use to which it was applied, the point of diversion, the locations of the project, and the date of priority. These opinions are bound in book form in the Department of Public Works and binding except where appealed from to the District Court.

For all water rights since April, 1895, the Board upon its organization at once prepared blanks, known as "Application Blanks", which were

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* Session Laws for 1895, chapter 69, page 244.

† Copies of the claim blanks used for water power purposes together with complete record of adjudication of the water right may be found in the Department of Public Works.

supplied to persons desiring to obtain a permit for the use of waters of the State of Nebraska. These were filed on the date and hour received at the office of the Board, given a numerical number and recorded. All rights, acquired since 1895, are therefore known as "Applicatoin No. .....". These blanks, among other things, set forth the name of the applicant, his address, the source of the appropriation, amount, and use to which applied. The date of priority to the right to use water under all applications, dates from the filing of the application in the Department of Public Works, which is considered the date of priority. These applications are taken up and investigated and acted upon through the Secretary, same being approved or dismissed.

Under the Civil Administrative Code form of government, which was passed by the Legislature in 1919, the Department of Public Works replaces the State Board of Irrigation, Highways and Drainage, said department exercises the power and performs the duties which were assigned to the State Board of Irrigation, Highways and Drainage. The secretary of the department, who is also the state engineer, has full authority to act upon such matters coming before the department, and an applicant feeling himself aggrieved by the action taken by the secretary on his application for a permit to appropriate water, may ask for a hearing, at which hearing testimony may be submitted for and against any proposed appropriation, the department having the right to summon any witnesses and in all things act as a court rendering a final decision in the matter, from which decision an applicant may appeal directly to the Supreme Court of the state, the same as in cases before the State Railway Commission. Cases pertaining to irrigation and water coming before the Supreme Court are advanced on the docket, so as to receive prompt consideration.

Upon the allowance of an application, the applicant shall begin the actual work of excavation and construction within six months from the date of approval of said application. The application being in fact, simply a permit to the right of the water and no perfected rights are supposed to have been acquired until the project has been completed and the water beneficially used and applied. The work of construction of a power plant must be vigorously, diligently and uninterruptedly prosecuted to completion and one-tenth of the total work must be completed within one year from the date of approval. Also the applicant must file by the tenth of each month a report under oath to the department giving the actual amount of money expended on such power development during the preceding calendar month.

The time for completing the appropriation and applying the water to beneficial use is left to the discretion of the department and in most cases a year is allowed after the completion of the construction work for

the application of water to beneficial use. When the time for applying the water to beneficial use has expired the applicant is required to file a Proof of Appropriation on a blank furnished by the Department of Public Works. This Proof of Appropriation shows how much water has been applied to beneficial use and the purpose, and is made under oath and attested to by witnesses. Upon receipt of this, the department makes a personal investigation and verifies the proof. If everything is found to be according to law the certificate is issued, which certificate grants the applicant the right to the use of the water which has been applied to the beneficial purpose and the right to the use of the same for as long as the applicant shall apply the same to beneficial use.

Under the law of 1911, three years consecutive non-use of water under any water right constitutes an abandonment and a forfeiture to the state.

Report of Several Water Power Projects on the Loup and Platte Rivers, Together With Approximate Cost of Each, Amount of Power, and Probable Revenue From Same.

(Geo. E. Johnson, Secretary)

Nearly a quarter of a century ago, Mr. L. D. Richards, et al., filed upon the waters of the Platte River, for power, one year later, Mr. H. E. Babcock of Columbus filed on the waters of the Loup for irrigation and power. Surveys made by them showed possibilities of large water power developments. Companies were organized, engineers employed and reports made by some of the leading engineers of that day, nearly all favorable. The mistake these men made was in trying to build too large developments. They were ahead of the market. There has been a flood of filings since that time, some of which have real merit. The market at the present time is controlled by the various public utility companies in Omaha and Lincoln. It has increased so rapidly in the past five years, that it is doubtful if any one large plant from the Loup or Platte River can supply the demand.

There has been a large amount of litigation in the past over water rights, and each session of the Legislature discusses state ownership with a result that there has been very little development, as the constant changing of laws regarding water power has had the effect of making the development of our water power unattractive to financiers.

It is unfortunate that so many sites were available. Had there been only one, it undoubtedly would have been constructed many years ago.

We are spending millions for good roads and reclamation of our arid land and swamp lands, but true conservation demands that all of

our natural resources should be developed. Millions of dollars worth of coal are being used in our cities and factories, not a pound of which is produced in this state. We pay for the coal and freight. Nearly all of this could be saved by the development of our water power. Today the waters of the Loup and Platte flow silently away to sea, unharnessed and unobstructed.

In the making of this report I have endeavored to be conservative, at the same time put it in shape so that all may understand. I have had access to the surveys and the private records of Messrs. McEathron and Ross of Omaha; also the reports of L. D. Hough of New York; Geo. W. Sturtevant of Chicago, and Dean & Main's report. These reports have been changed to suit the recent changes in plans in both the upper and lower projects.

Projects Reported Are as Follows:

1. The revised Columbus Plan of 1911-1912.
2. The Schuyler Plan of Chas. T. Bogg, et al.
3. The Platte River Hydro-Electric, or Ross Project.
4. The original Fremont Canal.
5. A proposed canal line North of Ames, and other projects on the Loup.

Water Records and Stream Flows.

The flow of the Loup and Platte Rivers is given in the U. S. Geological and State Engineer's reports.

Mr. Houghs' report on the Loup in 1905 gives as water available for Columbus plans as follows:

2500 C. F. S.	40% of the time
2000 C. F. S.	58% of the time
1500 C. F. S.	2% of the time
	100%

Later investigations and later actual measurements exceed in volume the old records, which were recorded in a crude way. Both the Loup and the Platte show more water in their channels, owing to more careful gauging than formerly.

Recent investigations show for the Loup at Columbus:

3000 C. F. S.	for over 40% of the time
2500 C. F. S.	20% of the time
2000 C. F. S.	35% of the time
1500 C. F. S.	2 to 5% of the time
	100%

These figures have been used for basis of calculations.

Computations on Loup Projects are based on canals carrying 2400 C. F. S. which is there 60% to 70% of the time and in some years all the time. Any deficiency to supply the maximum, to be made up by relying on some one of the various streams plants as an auxiliary.

The effect of the Pathfinder dam, in releasing waters for irrigation, in the western part of the state has been to increase the flow in the lower reaches of the stream, a large percentage of the irrigation waters returning to the parent stream in form of seepage. In time we will not hear of the Platte going dry west of Columbus, as formerly.

Seepage and Evaporation.

In the Dean & Mains' report,—seepage in the Columbus Project with its 3400 acres of reservoirs was placed at 30 cubic feet per second, and evaporation at 60 C. F. S., a total of 90 C. F. S.—about the same as Beaver Creek water flow at Genoa. Measurements by O. V. P. Stout at Kearney in 1906 shows the following loss by months:

April	15	inches
May	38¾	inches
June	34½	inches
July	54	inches
August	68¾	inches
September	55½	inches
October	45	inches

Which in the Columbus Canal and Reservoirs as formerly projected would amount to 9 or 10% of the flow in the Canal. This is off-set by 27 inches rainfall, which to some extent would reduce the percentage to 4 or 5; and a still further reduction when only 1000 acres of reservoirs are contemplated, brings it down to 2 or 2½%, or about the same as Mains' report. (2½% of 2400 equals 60 C. F. S.)

TABLE OF LOWEST PERIODS ON LOUP RIVER FOR YEARS 1895 TO 1906, INCLUSIVE, (U. S. G. S. WATER SUPPLY PAPER 230) AND CORRESPONDING PERIODS ON ELKHORN AND PLATTE RIVERS.

Year	Date	Loup C. F. S.	Elkhorn C. F. S.	Platte C. F. S.	Total C. F. S.
1895	July 26 to Aug. 5	1850	300 or over	1109	Over 2959
1896	June 11 to 20, inc	2105	300	9233	Over 11333
1897	Aug. 11 to Aug 21	1188		5500	Over 6688
1898	Sept. 1 to Sept. 10	1588	300 or over	Dry .	Over 1900
1899	July 12 to 21	1130	555	13900	Over 15585
1900	Only 3 Ds. below	2050	430	Dry	Over 3480
1901	July 12 to Aug. 10	1200	1000	O. O. to 725	Over 2200
1902	Only 2 Ds. below	2060	552	350	Over 2962
1903	Only 24 to 29	2040	1441	3100	Over 6581
1904	Aug. 25 to 30	1660	300 or over	Dry	Over 2000
1905	Oct. 1—Lowest flow	3180	300 or over	670	Over 4150
1906	Aug. 16 to 26	1330	300 or over	448	Over 2070

LOWEST ACTUAL MEASUREMENTS OF LOUP RIVER.

Year			C. F. S.
1895	O. V. P. Stout	Sept. 7	1896
1896	O. V. P. Stout	Mar. 15	1550
1897	Adna Dobson	Sept. 4	1389
1899	Glen E. Smith	July 23	1792
1900	Adna Dobson	July 29	1322
1901	O. V. P. Stout	July 14	1211
1902	J. C. Stevens	Sept. 11	2514
1903.	J. C. Stevens	Dec. 20	2280
1904	J. C. Stevens	July 31	2723
1905	J. S. Dobson	Sept. 27	3153
1906	——— Arthur	July 13	2248
1914	D. P. Weeks, Jr.	Oct. 18	1847
1914	D. P. Weeks, Jr.	Nov. 1-27	2170
1914	D. P. Weeks, Jr.	Dec. 12	1012
1914	D. P. Weeks, Jr.	Dec. 23	1260
1915	D. P. Weeks, Jr.	Jan. 2	2060
1915	D. P. Weeks, Jr.	Jan. 10	3215
1915	D. P. Weeks, Jr.	Jan. 25	2470
1915	D. P. Weeks, Jr.	Feb. 7	1710
1915	D. P. Weeks, Jr.	Feb. 18	2660
1915	D. P. Weeks, Jr.	Mar.	2440 } 3250 }

PLATTE RIVER AT FREMONT.

Year		C. F. S.	
1914	Oct. 5	3260	
1914	Oct. 31	3938	
1915	Sept. 2	7270	
1915	July 23	8160	
Lowest from April 1 to Feb. 1			
Gauge Height 4.80			
Freezing			
Ice			

Winter Flow of the Loup.

The amount of water available for power in winter measured by Mr. Weeks, Jr., of this office, shows that it is greater than in the low

flow period of summer or autumn, and is shown by the sheets which accompanied the original report of the Platte, Loup and Elkhorn Rivers' Flow.

The winter flow taken at Genoa by Mr. McEathron continuously during the winter of 1913-1914 when conditions were ideal for measuring the flow of the Loup, there being no rains of any note to increase the flow of the stream for several months, are here given:

Year		Year	
1913 Dec. 1	1800	1914 Feb. 6	2350
1913 Dec. 7	2700	1914 Feb. 7	1300
1913 Dec. 15	2500	(Zero to 10 degrees below.)	
1913 Dec. 21	1000	1914 Feb. 15	2200
(10 degrees below zero. River frozen over.)		1914 Feb. 21	3500
1913 Dec. 25	1500	1914 Mar. 1	3750
1914 Jan. 1	2000	1914 Mar. 10	5000
1914 Jan. 7	2500	1914 Mar. 15	2350
1914 Jan 15	2100	1914 Mar. 21	1550
1914 Jan. 21	2250	(5 degrees below.)	
1914 Jan. 23	1500	1914 Mar. 31	2250
(Zero weather.)			
1914 Jan. 31	2100		

The stream was carefully measured and gauges placed in headgate of canal.

The Columbus Plan of 1911-1912.

First:

This canal formerly used for irrigation purposes, was filed upon by Babcock of Columbus in 1896, and 72 miles of canal and laterals were in active use for a period of five years. Three miles of canal have been built for power purposes, a reinforced concrete penstock, frame power house, 460 H. P. wheels belted to 250 K.W. generator and one and one-half miles of pole line connected to the Genoa Plant which was operated for about one year. Contests over water rights, for a period of two years prevented the building of a larger plant and very little work has been done since that time.

The present canal and power house are owned by Messrs. Bancroft and Doty, who obtained it on a lien for work performed on canal five years ago. Elevation of low water in Loup at the intake is 1558 sea level, and canal follows a depression for three miles to Beaver Creek, where scouring sluices and dam were contemplated. From this point the line follows the 1545 and 1540 contour for 14 miles to a reservoir site of 1000 acres or more, then through reservoir for four miles to top of bluff north of Columbus, where elevation of water is 1537. The level of Platte River southeast of Columbus at Buck Island is 1421, and allowing for six feet fall in tail race leaves 110 feet head for power purposes.

The present plan is to build a canal with fall of about three-fourths foot per mile, cross section 800 square feet, which will carry 2400 cubic feet per second.

Schuyler Project.

Second:

Filing for this development was made by Chas. T. Boggs of Lincoln, and approved March 23rd, 1912. Surveys were made, a small tract of land bought at the head and a small amount of scraper work done, and no work has been done since on the construction.

Canal proposed to head in the bend of the Loup, just west of Columbus in the northwest Quarter Section 23, Township 17, Range 1 West. Low water at this point is 1448 6/10 feet sea level. Line of canals run east to point two miles north of Schuyler, where a head of 66 feet is claimed, although 81 feet can be had. Tail race runs south just east of Schuyler to Platte River in Section 25, Township 17, Range 3 East.

Water supply is same as for Columbus, although no reservoirs are shown. Canal is located too low for practical purposes. The building of this canal would make the Columbus canal impractical, reducing the head some 30 feet, and as the parties were in litigation when filing was made, it is probable that it was made for that purpore. Estimates are made just as if it had a reservoir of sufficient size to hold up the flow for 12 hour period.

Platte River Hydro-Electric Plant.

Third:

This is the Ross project, the rights which were contested several years ago. Originally, canal started about two miles north of Douglas county line, running southeast crossing the Elkhorn River, thence south under the Burlington Railroad, south of the Melia Station, thence to a forebay formed by building a dam across Spring Creek, which is about one mile northwest of the State Fisheries. Considerable work has been done on this project and surveys have all been made. The building of the Chalco-Yutan Cut-Off by the Burlington has necessitated a complete change of plans which calls for a first development above the Burlington crossing and a diversion from the Elkhorn below it, and plans have been made accordingly.

This project has the advantage in location over any other on the two streams. Maximum head of first development is 27 feet. Computations are for an average of 22 feet. Head of second development is 61 with an average of 55 feet. Forebay contains 240 acres with additional storage at head of 810 acres, and some along line of canal.

Fremont Canal.

Fourth:

The original canal was filed on June 21, 1895, by L. D. Richards, et al., of Fremont.

Canal started on south bank of Platte River below Schuyler, thence to Linwood following steep bluffs for fourteen miles, four of which would require paving, thence over the C. & N. W. R. R., one-half mile north of Cedar Bluffs, thence to a reservoir located on a ravine across the river from Fremont. A 100 foot dam was contemplated and a 65 foot cut necessary to get into the reservoir which, taken in conjunction with the heavy bluff work, makes it too expensive to build as Mains stated in his report. The head was 120 feet, which would produce more power than Columbus, but according to a Union Pacific report the cost was about twice as much.

A New Project North of Ames and Other Power Sites.

Fifth:

A study of the contour maps and surveys made east of Rogers some years ago, shows that a canal line could be taken from the Platte River on the north side of the river near Rogers and taken to the top of the bluff, north of Ames where a head from 90 to 100 feet could be obtained if a favorable location for a power house could be found. As no other contour maps are available on these bluffs, and no surveys made, except to a point three miles east of Rogers, a complete report can not be made at this time.

There is also a canal line, spoken of for many years, running from near the fork of the Loup, east of St. Paul to the top of the bluff, or "leap" at Fullerton, where a 100 foot head is available; also beginning south of Fullerton and carrying a canal to top of bluff, directly west of Genoa with 80 foot head. No surveys have been made on these projects, and as they are both expensive but might prove more feasible than contour map shows. It is, therefore, true that beginning below St. Paul, at lease five large power developments could be used and not interfere with each other and that approximately 100,000-24 Hr. H. P. could be produced from such plants.

ESTIMATES ON COST.

	Columbus 1920		Schuyler, 1920	Platte River Hydro-Electric Ross 1916 Estimates	
REAL ESTATE	Owned by Wood-Bancroft & Doty			Total cost of first	
	100 acres	$10,000		development	$805,350
	Canal—525 acres	129,000		Canal and reservoir	96,000
	Reservoir—1000″	200,000			
	Tail race—350″	70,000			
	Power site—50″	12,500			
	Pole line right of way	25,000			
	Sub station	12,000			
	Fencing	10,500			
Dam and headworks		155,000			$52,850
Bridges		150,000			66,000
Canal excavation		360,000			352,800
Reservoir embankment		320,000			122,500
Slope paving		50,000		Rock	112,500
Pipe lines, gates, rock, etc		550,000			216,000
Tail race		150,000			17,000
Power station		200,000			210,000
Hydro-electric equipment		1,000,000			495,000
Transmission lines		550,000			250,000
Sub stations & equip		200,000			100,000
Cranes, telephone, etc		25,000			25,000
Eng'n'n'g—legal & cont.		418,700	Based on Columbus Estimates		292,100
		$4,605,700	$3,400,000.00		$3,213,100

COLUMBUS WATER POWER DEVELOPMENT.

Water Pct. of Time	110′ Head Sec. Ft.	H. P. 24 Hours	H. P. 12 Hours	At Swithboard Lincoln-Omaha	H. P. Hours	Total H. P. Hours
40%	3000	30,000	60,000	48,000	Not fig. on	
20%	2400	24,000	48,000	38,400	85,798,800	
35%	2000	20,000	40,000	32,000	41,492,000	
5%	1500	15,000	30,000	24,000	4,608,000	130,808,800
				Overload, add 20%		26,161,760
				Total H. P. hours 310 days in year		156,970,560
				K. W. hours		117,727,920

SCHUYLER WATER POWER DEVELOPMENT—81 FT. HEAD.

Water Pct. of Time	110′ Head Sec. Ft.	H. P. 24 Hours	H. P. 12 Hours	At Switchboard Lincoln-Omaha	H. P. Hours	Total H. P. Hours
Same as Columbus	Same as Columbus	21,900	43,800	35,040		
		17,520	35,040	28,332	63,237,024	
		14,600	29,200	23,360	30,274,560	
		11,950	23,900	19,120	3,671,040	97,182,624
				Overload, add 20%.....		19,436,525
				Total H. P. hours 310 days in year		116,619,149
				K. W. hours.....		87,464,361

PLATTE RIVER HYDRO-ELECTRIC POWER DEVELOPMENT (ROSS PROJECT)—22 AND 55 FT. HEADS.

Water Pct. of Time	110′ Head Sec. Ft.	H. P. 24 Hours	H. P. 12 Hours	At Switchboard Lincoln-Omaha	H. P. Hours	Total H. P. Hours
98%	3000	21,000	42,000	33,600	120,960,000	
2%	2000	14,000	28,000	22 400	2,688,000	113,648,000
				Add 20% overload.....		30,912,000
				Total H. P. hours 310 days in year		154,560,000
				K. W. hours.....		115,920,000

Mr. Ross figures that 130,000,000 K.W. can be delivered in Omaha.

Total in Two Great Developments.

Columbus .....117,737,920 K.W. Hrs.
Ross Project .....115,920,000 K.W. Hrs.

Grand Total .....233,647,920 K.W. Hrs. for 310 days.

What Power Can Be Sold For.

Mains' estimates made thirteen years ago on what power could be sold for, as compared with steam, in Omaha were as follows:

For 24 Hr. Power .....7/10c per K.W. Hour
For 16 Hr. Power .....8/10c per K.W. Hour
For 10 Hr. Power .....1c per K.W. Hour

At that time coal was selling for from $1.80 to $2.00 per ton. The present cost of producing electricity with steam in large quantities, including cost of maintenance, deprecitaion and operation is from one and one-third to one and one-half cents per K.W. hour for 10 hour power,—a little less for 12 hour power.

If the entire output of one large plant was wholesaled at one cent per K.W. hour, for 117,000,000 K.W. hours, the gross revenue would be $1,170,000.

At 1c per K.W. Hour in 1919		$1,170,000
Less interest at 5% on bonds	$225,000	
Sinking Fund 2%	90,000	
Taxes, Insurance and Repairs	135,000	
Salaries, Office Expense, Etc	50,000	500,000
Total Annual Expense	$500,000	
Surplus		$ 670,000

This surplus would build a second plant in about six years.

POWER USED IN LINCOLN, OMAHA AND COUNCIL BLUFFS.

LINCOLN.

Name of Company	Tons of Coal	H. P. Boiler Capacity	Generator	1919—K. W. Total Output
Lincoln G. & E. Co.	22,000	5000	5000	8,410,000
Lincoln Traction Co.	Oil and Coal, $170,000 Equivalent to 34,000 tons	over 4500	3900	11,000,000
Municipal Plants	11,000	2000	1500	Coal used for heating, lighting and air
Havelock Shops	41,000	2460	1000	
Other Industries	18,000	3200	2000	
Total for Lincoln	124,000	17160	13400	
Council Bluffs	36,000	7500	6000	

Omaha approximated by Mr. Israel Levitt, City Electrician:

Nebraska Power Co.—70,000 tons, $300.000.

Omaha Street Railway—75,000 tons, $325,000.

Other steam plans—500,000 tons, 30,000 24 hrs., 22,500 K. W.

Total in large steam plants—645,000 tons at $5.00 equals $3,225,000.

Steam coal dealers in Omaha report that steam coal used in Omaha and vicinity yearly amounts to one and one-half million tons, costing about $7,000,000, and according to reports is equal to $75.00 per horse power per annum.

Taking in account the amount of power which can be produced by any one plant, there is very little difference between the Columbus and the lower Platte River projects, both are good and the best on those streams as far as known. Columbus has a greater head and larger reservoir, but less water, vice versa.

The short distance to market makes a material saving in cost of transmission lines. The estimated cost of power by steam in—

1905		1919
For 16 Hr. Power 365 days....	$36.20 per H.P.	$80.00 to $85.00
For 12 Hr. Power 310 days....	25.10 per H.P.	45.00 to 47.00

nearly double; but this will be reduced as price of coal declines. One and one-half million dollars worth of coal are used by four large concerns in Omaha; nearly three-quarter million dollars worth in Lincoln,—a total of two and one-fourth million dollars.

WATER POWER PLANTS IN OPERATION OR UNDER CONSTRUCTION.

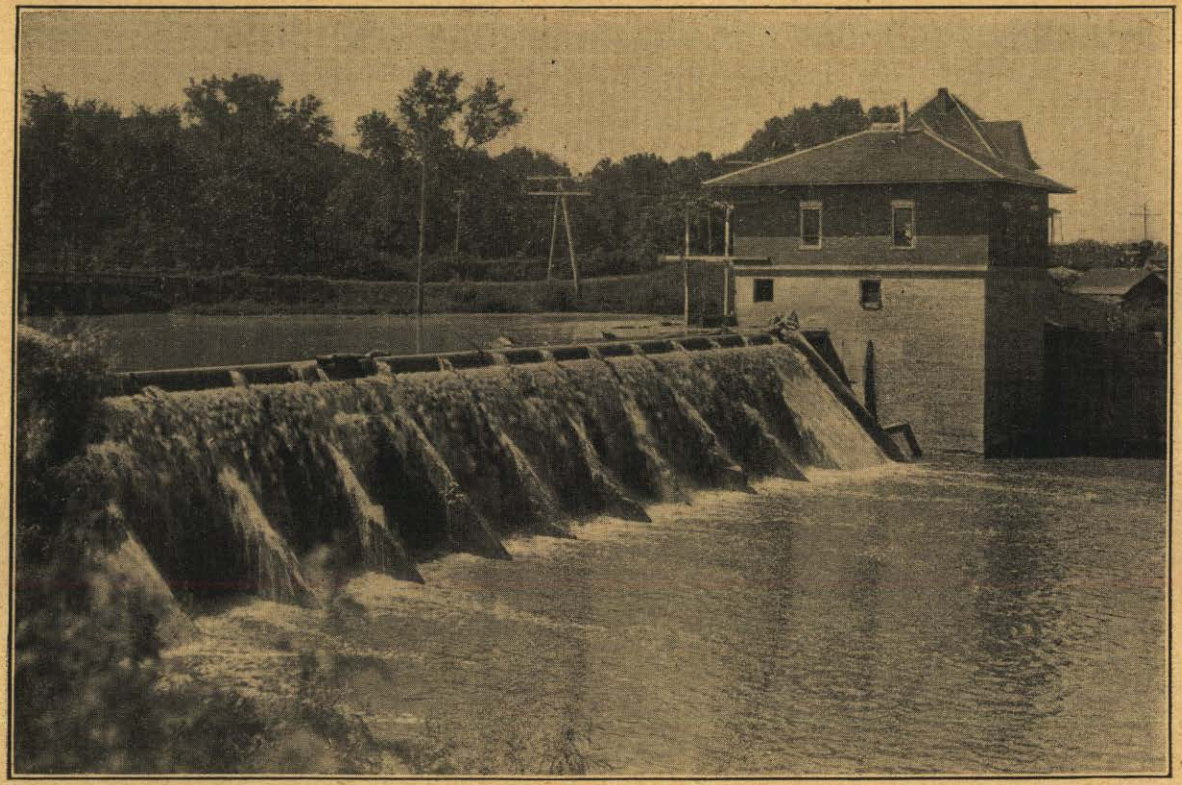
Blue River Power Station No. 1 (A. 1006). This plant is located on the north fork of the Big Blue River about four miles below Milford, and was completed and put in operation during the summer of 1911.

The dam, penstock and abutments are constructed of reinforced concrete and built upon limestone ledge. The dam is 18 feet in height with 150 foot spillway.

This plant is equipped with four horizontal Smith turbines connected to two 150 K.W. Westinghouse generators which feed onto the 22,000 volt transmission system of the Company, supplying twenty-five towns with light and power in Seward, Saline, Butler, York and Saunders Counties.

Blue River Power Station No. 2 (A. 1153). This development is located on the west fork of the Blue River, four miles north of Dorchester, and was completed and put into operation during July, 1917. The power equipment consists of a vertical Leffel turbine direct connected to a 175 K. W. Electric Machinery Company generator running at a speed of 200 R.P.M. The amount of this appropriation is 100 second feet. An application for a permit to raise the dam from 15 to 20 feet was filed in this department under date of August 21, 1918, and same was approved August 24, 1918.

Blue River Power Station No. 3 (A. 1265). Located on the west fork of the Big Blue River and has an appropriation of 100 second feet. Power is used exclusively for hydro-electric purposes. This plant was completed and put into operation during the fall of 1914. The original height of this dam was 16 feet. A permit to raise the dam from 16 to 22 feet was approved by this department August 24, 1918. This dam rests on a ledge of shale and is 20 feet in height and 150 feet long. The power equipment consists of a vertical Leffel turbine direct connected to a 210 K.W. General Electric generator running at a speed of 180 R.P.M.



STATION NO. 1, BLUE RIVER POWER CO.
(A-1006)

Blue River Power Station No. 4 (A. 1463). The power plant is located on the south bank of the Big Blue River in the northwest quarter of Section 32, Township 9, North of Range 4 East of the 6th P. M. in Seward County, Nebraska. At this point there is an outcropping of shale upon which is built a concrete flume, abutments and footings for the frame spillway which is 150 feet in length.

Upon the top of the concrete flume is built a brick power house 18 by 24 feet in dimension in which is located a 125 K.W. 200 R.P.M., 2400 volt, three phase General Electric generator, together with other necessary electric equipment.

This generator is direct connected through a vertical connecting shaft with a vertical Leffel water wheel.

The spillway of the dam is constructed of frame works of 10 by 10 inch square timbers with decking of three inch planking, the apron portion of which is covered with one-fourth inch steel plates.

The framework of the dam is 20 feet high, which maintains a working head at the normal flow of the river of 18 feet; the entire height of the dam including the concrete footings for the timber structure and the cut-off walls is 25 feet. This Station requires no operator, being remote controlled from Station No. 3.

Shestak Power Station (A. 1506). This plant is located on the Big Blue River about three miles north of Wilber and was completed during the fall of 1920 and develops 409 theoretical horse power under a 16 foot head.

Power equipment consists of a Leffel turbine direct connected to a vertical generator of 240 K.W. capacity running at a speed of 120 R.P.M. This plant is equipped with automatic control apparatus, thus dispensing with the need of an operator.

All of the Blue River Power Company's plants feed onto the 22,000 volt transmission system, supplying power to twenty-five towns in the different counties above mentioned.

Ainsworth Light and Power Company (A. 947). This plant is located on Plum Creek, 16 miles northwest of Ainsworth in Brown County, Nebraska, and furnishes the town of Ainsworth with light, heat and power. This plant was built in 1909 and is one of the most modern small plants in the state.

The plant consists of a 40 acre impounding lake, modern buttressed dam, concrete power house and all modern equipment for regulating and distributing electric power.

The dam which is made of concrete is 38 feet from top of crest to bottom of waste water discharge and of a buttressed type, heavily reinforced with two fixed scouring sluices to remove silt. One scouring

sluice is 4 feet by 6 feet raised and lowered by rack and pinion, the other is a 2 foot steel pipe with screw valve attached. By using both, the impound can be emptied within twenty-four hours.

The fire proof power house is entirely of concrete and steel and lies east of the dam, which forms the west wall of the power house.

The equipment consists of two units, a Leffel and a Johns-Manville turbine of modern type, each is fed by a steel penstock five feet in diameter. Generators are direct connected with the turbines, each working as a unit or in tandem and under normal conditions producing 200 to 350 K.W. per 24 hour day. Each electric unit is equipped with Woodward governors and 125 volt, 64 ampere exciter. The total head available is 30 feet, but by raising the crest of the dam and making the impound of larger capacity, could be increased 30%.

Shell Creek Roller Mills (Peter Schmitt Owner—D. 292). This plant is located on Shell Creek, a tributary of the Platte River, eight miles north of Columbus in Platte County.

The banks of the creek are high and the adjacent soil heavy, the creek bed having a slope toward the river of approximately five and one-half feet per mile.

The plant consists of a dam, penstock, two water wheels, two low pressure centrifugal pumps, and one high pressure centrifugal pump and a modern flour and feed grinding mill of sixty barrel capacity.

Dam consists of heavy parapet walls, supporting reinforced concrete beams 4 feet wide, 12 feet high and 50 feet long. The face of the dam is boarded and cribbed, having a 3 foot steel silting vent with valves which extend through the dam, keeping mud and silt from depositing in front of the dam and penstock. Flashboards can be used to raise the head to 14 feet, provisions for these having been made in the plans for the dam.

The penstock is constructed of planed and matched planks and is 8 feet wide, 5 feet deep and 200 feet long.

Two modern Moline McCormick horizontal water wheels, 18 and 21 inches, respectively, form the units of power, and generate 80 horse power per 24 hour day.

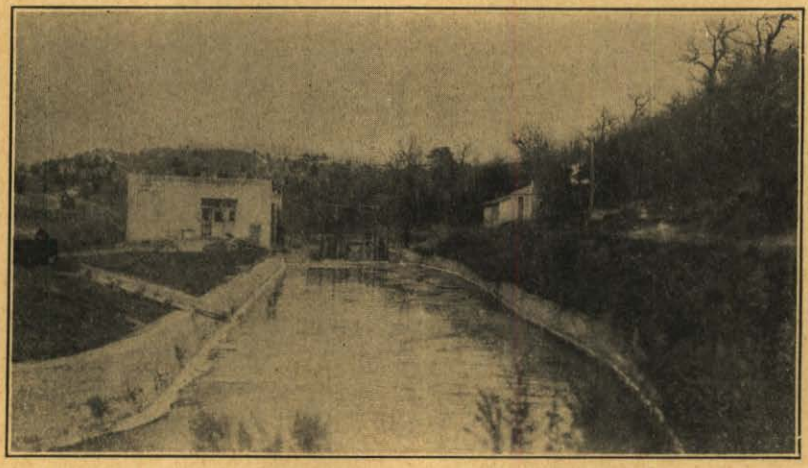
One 4 inch and one 6 inch centrifugal pump is used for irrigation on the owner's land contiguous to the mill, while a 250 gallon high pressure pump is installed and used for fire protection.

The mill consists of suitable frame buildings, and houses a modern 60 barrel flour mill as well as the power units and supplies flour and ground grain to the surrounding territory.

Cornell Hydro-Electric Company (A. 652). This hydro-electric plant is located on the Niobrara River,four miles northeast of Valentine, and

supplies the city of Valentine with light and power. The plant consists of a dam, concrete race and power house, the minimum capacity being 300 H.P.

The dam, which is 187 feet long, is of timber crib type filled with rock and board faced with concrete wings set into the steep brule clay



RACE OF CORNELL HYDRO-ELECTRIC PLANT

CORNELL HYDRO-ELECTRIC PLANT, VALENTINE, NEB.

banks of the river. The dam is 12 feet high, and with flash boards can be raised 14 feet, developing 360 H.P.

The race to the power house is of concrete construction 300 feet long, with head gates and flood gates. Gates are of screw lift type and are raised and lowered by hand power.

This plant is housed in a reinforced concrete building on the east side of the river, and consists of two Leffel water turbines with Allis-Chalmers generators. The two generators and water turbines are direct connected and equipped with exciters and Lombard governors of special type.

Considerable difficulty has been encountered on this project due to the silting of the race and inlet thereto, and in order to supply the demand of the city an auxilliary steam plant is operated at times, delivering 133 H.P. 24 hours per day.

Long Pine Electric Light and Power Company (A. 941). The development of the Long Pine Electric Power Company on Pine Creek is located about one mile northwest of Long Pine, and supplies the town with light, heat and power, as well as city water. The plant which was built some years ago and now in the process of reinstallation, consists of a 24 acre impounding lake and earthen dam with concrete core walls, together with a modern power plant housed in a frame building.

The dam consists of a heavy clay fill with reinforced concrete core wall 18 inches thick in the center with concrete intakes and circular steel penstocks 54 inches in diameter leading to the wheel. A concrete spillway 28 feet long with flash boards takes care of excess flood water.

This power plant consists of one 26 inch Leffel water turbine and generates 112 K.W. 24 hours per day. A Minneapolis Machine Company's generator is used to generate power and is equipped with a Woodward governor. Two Gould triple action pumps, operated by water power, furnish water to Long Pine and pump against a 260 foot head through a 6 inch pipe. The total available head as now used is 18 feet and application will be filed to increase the head to 25 feet.

Tht Central Power Company (D. 1023). This company has a right to one hundred and forty second feet of water which is diverted from the Platter River about three miles southeast of Elm Creek and returns the water near Kearney. This plant has been in operation for a long period of time for power, being used at one time to operate a cotton mill and has been furnishing current to the city of Kearney since about 1886. This canal is approximately twenty-four miles long and is operated throughout the entire year.

Application No. 1577 was granted to the Central Power Company of Grand Island, March 5, 1920, with permit to appropriate 485 cubic feet per second of time, in addition to that already appropriated under Docket 1023. This project contemplates the enlargement of the existing power canal from its intake out of the Platte River near Elm Creek, Nebraska,

to the fore-bay of the existing power station at Kearney, Nebraska. The water will be taken from the canal at Kearney just east of the now existing spillway and will flow through trash racks having a depth of nine feet below spillway crest and width of 33 feet, realizing a net velocity through the trash rack opening of about two feet per second.

Behind the trash rack will be a pair of timber gates operated by a chain block traveling on an overhead I-beam. The water, after passing the trash racks, will converge into a flume of 18 feet in width, and a depth of nine feet below elevation of spillway crest, with a total depth of 12 feet to provide for surges and wasting over the spillway. This flume will pass through the canal bank and have a total length of about 70 feet, with water velocity of 2.78 feet per second.

This flume will discharge into a wheel pit and draft tube, consisting of a concrete lined circular shaft sunk into the indurated clay material of which the ground is here composed. A short section of flume made flexible by expansion joints will connect the solid wheel pit to the flume.

Below tailwater level the draft tube turns into horizontal direction through an elbow formed in the concrete shaft lining, and discharges into a tunnel, which, in turn, discharges into the tailrace on the east bank, just below the spillway discharge.

The tunnel will be built in two rectangular compartments, each seven feet wide by eight feet high, and will be concrete lined with central division wall. The mean velocity in this tunnel will be four feet per second. The station will be equipped with one James Leffel vertical shaft open flume type of hydraulic turbine, guaranteed to deliver 2,350 horsepower at a head of 54 feet, running at a speed of 225 revolutions per minute. This will drive by direct connection a Westinghouse 1,750 K. V. A., 60 cycle, three phase, 2,300 volt, 225 R. P. M. electric generator with direct connected exciter. The unit will be controlled from the switchboard in the existing and adjacent old steam and hydro-electric station of the company. Detailed plans of this project are on file in this department; also progress reports on file show considerable work has already been done.

Krotter-Hamlet Power Plant (Application No. 1574). This development is located on the Frenchman River in Section 16, Township 5, Range 35 West. Three hundred horsepower will be developed under a 40 foot head. This permit was recently granted and construction work has just been commenced.

Application No. 1542. By J. T. Campbell and T. H. Carter for a permit to appropriate 200 cubic feet from the Little Blue River for power purposes. This plant will be located in the Northwest Quarter of Section 3, Township 2, Range 1 West. Power is to be obtained through a turbine wheel under a 10 foot head.

Application No. 1538 was issued to Bozarth and Carter of Hebron on March 29, 1920, with permission to divert 216 cubic feet per second of time from the Little Blue River. This plant is located on the Northwest Quarter of Section 10, Township 2, Range 2 West of the Sixth P. M. This filing is very recent and we do not have any other data available.

Beatrice Power Company. Application No. 1262 was granted by the State of Nebraska to George W. Steinmeyer, who organized the Beatrice Power Company, and assigned the appropriation to this company. The grant permits the use of 500 second feet of water under an 18 foot head for a hydro-electric plant which is located on the Big Blue River at Barnston, in Gage County. The construction of the plant was started in 1919, and will be completed in 1921.

The generating equipment will consist of two 425 K. V. A. General Electric umbrella type generators, directly connected with two S. Morgan Smith vertical wicket gate turbines, mounted in open concrete penstocks The combined rating of each is 928 H. P. The water from the turbines will be discharged through concrete draft tubes. The governor equipment will consist of two 6,700 foot pound Woodward oil pressure governors.

The powerhouse sub-structure and penstock walls are built of reinforced concrete. The powerhouse is built of rock, with a ten ton traveling crane for handling machinery.

The dam section will consist of four Tainter gates, 13x24 feet each, operated by an electric hoist, and a 250 foot section of concrete rollway spillway, built to an elevation of 16 feet above tailwater, with two-foot flashboards.

The above plant will be constructed entirely of concrete, brick and steel, on a rock foundation approximately 12 feet below tailwater. The yearly output will be approximately 3,500,000 K. W. H. in years of normal rainfall.

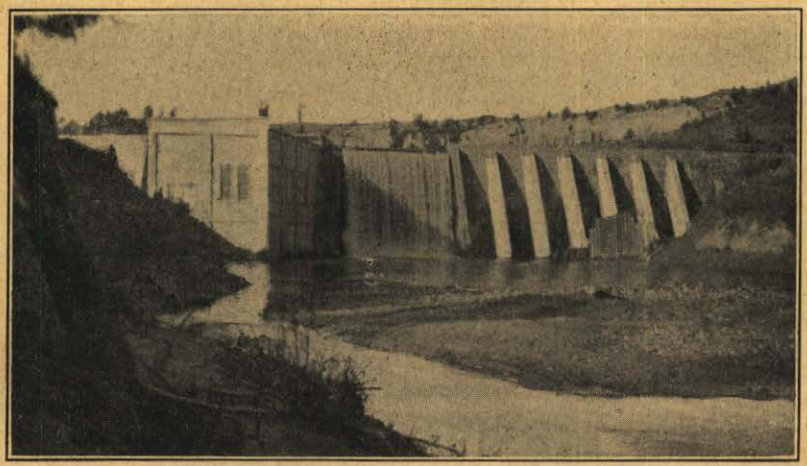
A 33,000 volt transmission line will be built up the Blue Valley to Wymore and Blue Springs, and connect with the hydro-electric plant at Holmesville, and a line will be used jointly from Holmesville to Beatrice.

Minnechaduza Power Plant (Application 359). Valentine, Nebraska, has two water power developments, one of which is on the Niobrara River and the other on Minnechaduza Creek, a tributary thereto. The Minnechaduza rises in the southern part of South Dakota and empties into the Niobrara River four miles below Valentine. The stream bed of the creek lies between abrupt brule clay bluffs, and the flow of water is rapid, due to the steep slopes of the drainage area, and floods occur causing considerable damage.

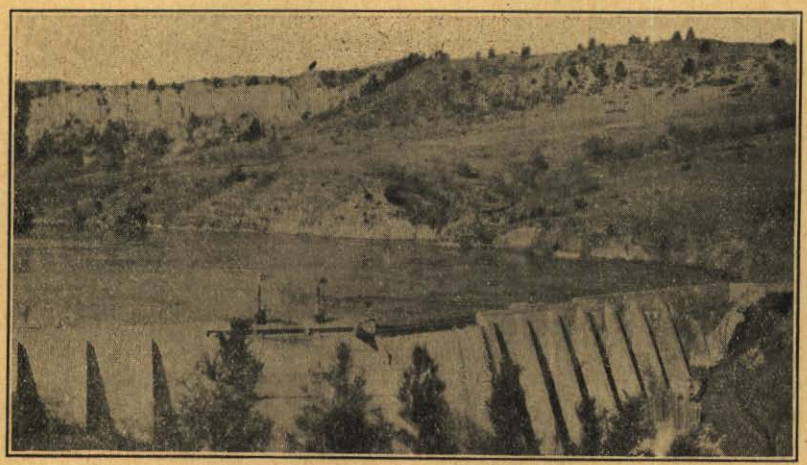
The plant consists of a dam, impounding lake and powerhouse, fully equipped with modern electric machinery.

This dam is of earthwork, 38 feet high, with concrete core in which are set the floodgates, penstocks and headgates; and owing to the hardness of the soil in the drainage area of this creek, very little trouble is caused by silt. The impounding lake covers 60 acres, and by increasing the height of the dam and enlarging the impound considerably more power could be developed if necessity should demand.

The powerhouse is located east of the dam, and houses two electric units, developing 350 horsepower per 24 hour day, and supplies the city



POWER HOUSE AND DAM, AINSWORTH POWER PLANT, AINSWORTH, NEB.



AINSWORTH POWER PLANT, PLUM CREEK

of Valentine and the Gillman Mills with light, heat and power. Considerable trouble has been experienced with back-water pressure due to irregular brule clay dykes in the stream bed below the turbine discharge, but a contract has been let recently to excavate these dykes, and bids fair to be a great success.

Neligh Water Power Plant (A. 1250). This plant is located in the southern part of the town of Neligh, Antelope County, Nebraska, and power is obtained from the waters of the Elkhorn River.

The plant has not been in operation since the spring of 1920, owing to destruction caused by flood, but steps are now being taken to replace the dykes and miscellaneous repairs which have been long neglected. This plant consists of a dam, impounding lake and powerhouse.

The dam is of lumber crib type, 12 feet high, set upon a foundation of piling, and has timber protection walls on each side. Considerable trouble has been experienced with deposit of silt and clay, reducing the efficiency of the plant. The impounding lake was formed in the bed of the Elkhorn, and by means of high earth dykes with gated floodways, the entire river was diverted to the power plant. Two turbines are used to develop horsepower sufficient to run a 250 barrel flour mill 24 hours per day.

Bazile Mills Water Power Plant (A. 914). Bazile Creek rises in the northern part of Antelope County and flows northeasterly through Knox County to the Niobrara River and affords numerous water power sites, but owing to the irregular channel and the damaging floods, the Bazile Mills Plant is the only development which has withstood the ravages of this turbulent stream. The plant consists of a dam, impounding lake and powerhouse.

The dam is of massive concrete type, supported by counterparts 160 feet in length and 12 feet in height, and has three silting removing gates and a 60 foot floodway.

The impounding lake contains 60 acres and varies in depth from 12 feet to 2 feet and with the normal flow of the stream supplies water to develop 46 H. P. for 24 hours per day.

The power unit is a 24 inch Victor turbine with concrete penstock and necessary headgates, and with a normal 12 foot head develops power enough to run a 100 barrel flour mill.

Norfolk Cereal and Flour Mill (Docket 996). This plant is located on the north fork of the Elkhorn River, near the east city limits of the town of Norfolk, Madison County, and furnishes direct power for a 150 barrel flour mill, and electric power for the corn grinding mills of this company, which are located some distance away.

The city water plant consists of a dam and spillway, impounding lake, mill race and powerhouse.

The dam is of timber crib type, with sloping face and has concrete apron and side walls. The available head without flashboards is 11 feet, but this can be raised to 13 feet when necessity demands. The impounding lake is located in the old stream bed of the north fork, and during high water overflows the surrounding territory as no provision has been given to the care of flood waters.

Mill race, which is 30 feet wide and 600 feet long, with two geared headgates, adjusts the water to the turbines. The two turbines, developing 140 horsepower, comprise the power plant. One is directly connected with the flour mill and the other to a Bullock electric generator. The generator is equipped with a Woodward governor, Trumph exciter and Westinghouse switchboard.

On the following pages is a tabulated list of all appropriations on record in this office relating to water power developments.

LOUP RIVER DRAINAGE AREA.

No.	SOURCE	Sec. feet Granted	Head	Theo. H. P.	Date of Comp.	REMARKS
D 219	South Loup River	20	4.5	10	1895	Rec'ds indicate pl't never built
D 292	Shell Creek	30.5	15	52	1897	Flour mill in operation
D 988	South Loup River	83	9	85	1890	Grist mill & elec. pl't in oper.
D 999	Mud Creek	54	12	74	1889	Flour mill in operation
D 1024	Middle Loup R...	200	11	250	1886	Power plant
A 1224	Middle Loup R...	400	.....	.....	1914	Additional to D 1024
D 1037	Beaver Creek	.....	13	121	1896	Flour mill—running
D 1042	Muddy Creek	.....	12	934	1890	Flour mill—running
A 636	Cedar River	200	12	273	1902	Fullerton light plant
A 639	Beaver Creek	67	9	69	1902	Albion light plant
A 1480	Beaver Creek	70	12	95.4	1919	Supplemental—D 639
A 709	Loup River	2700	110	33800	1912	Rec'ds show no w'k since 1915
A 1029	Loup River	32000	.....	.....	.....	Same as A 709
A 1058	Beaver Creek	134	7.5	114	1912	Hydro-electric plant
A 1185	Middle Loup R...	124	6	81	1913	Grist mill & lt. pl't. Abandoned
A 1187	Middle Loup R...	2000	66	1500	1915	Abandoned
A 1216	Middle Loup R...	2000	5	100	1913	Power plant
A 1373	Middle Loup R...	1000	27	3068	1917	Hydro-electric plant at Boelus
A 1400	South Loup R.....	840	7	670	1916	Hydro-electric plant
A 1415	Cedar River	175	12.5	250	1916	In operation
A 1460	South Loup R.....	131	10	100	1916	In operation since 1917
A 1553	South Loup	62.5	10	50	1919	Hydro-electric plant

NOTE: Water power district indexed under Platte River drainage area.

PLATTE RIVER DRAINAGE AREA.

No.	SOURCE	Sec. feet Granted	Head	Theo. H. P.	Date of Comp.	REMARKS
D 645	Platte River	200	45	1022	1891	Good condition
D 683	South Platte R.....	30	.....	.....	.....	Never built
D 993	Wood River	40	10	46	1873	Flour mill
D 994	Wood River	40	11.5	52	1873	Flour mill in operation
D 995	Wood River	25	13	38	1881	Flour mill in operation
D 1023	Platte River	140	60	954	1882	Kearney light plant
A 40	Platte River	2500	150	42600	1906	Never built
A 894	Platte River	2000	150	34100	1915	Same as App. 40
A 545a	Wood River	10	4	5	1901	Pumping plant for garden
A 855	Pumpkinseed Cr...	25	8	23	1908	Mill. Rec'ds indicate not in use
A 970	Platte River	2500	70	19900	1913	Plant never completed
A 1009	Blue Creek	63	10	71	1913	Flour and feed mill. Records indicate not in use.
A 1050	Winters Creek	.....	60	6820	.....	Pending
A 1215	Spotted Tail Cr...	10	10	13	1913	Abandoned
A 1217	Sheep Creek	70	12	96	1913	Never built
A 1379	Platte River	2000	17	3862	1916	Records indicate not compl't'd
A 1452	North Platte	250	75	2130	1919	Hydro-elec. pl. Not compl't'd
A 1468	Winters Creek	100	.....	400	1920	Not completed
A 1499	North Platte	500	.....	.....	1918	Never built
A 1528	Platte River	.....	20	6818	.....	Pending—not approved
A 1536	Winters Creek	.....	60	400	.....	Pending—not approved
A 1548	Platte-Loup Rivers and tribs. (Water Power District of Omaha)	4950	15	45000	1924	Petition approved
A 1549	Platte	.....	15	2727	.....	Pending—not approved
A 1572	Wild Horse Draw	.....	25	50	.....	Pending—not approved
A 1577	Platte	485	50	2750	1921	Progress reports being filed
A 1578	Dry Spotted Tail..	50	8	45	1923	Hydro-elec. plant

ELKHORN RIVER AND TRIBUTARIES.

No.	SOURCE	Sec. feet Granted	Head	Theo. H. P.	Date of Comp.	REMARKS
D 271	Elkhorn River	39	7	31	1883	Atkinson Light and Mill Plant In use
D 996	North Elkhorn R.	100	13	148	1870	Cereal mill in operation
D 998	Union & Taylor....	75	14	119	.....	Pending
A 464	S. Fork Elkhorn..	33	8	30	1900	Certificate issued. In use
A 484	Battle Creek	11	12	15	1906	Mills, in operation
A 818	Battle Creek	20	13	30	1907	Flour mill—in operation
A 971	Elkhorn River	500	70	3980	1913	Records indicate not in use
A 1250	Elkhorn River	400	22	1000	1915	Power plant. Records indicate not in use
A 1580	Union Creek	80	24	175	1922	Recently granted

NIOBRARA RIVER DRAINAGE AREA.

No.	SOURCE	Sec. feet Granted	Head	Theo. H. P.	Date of Comp.	REMARKS
D 415	Pine Creek	32	14	50	1893	Flour mill
D 442	Niobrara River....	10	18	20	1893	Flour and feed mill
D 608	Crooked Creek	3	.....	.....	1893	Mill—not in use
D 610	Niobrara River....	60	5	31	1886	Flour and saw mill, not in use
D 612a	Fairfield Creek	25	7	20	1893	Feed and saw mill
D 970	Niobrara River....	35	11	44	1893	Flour & meal mill—not in use
A 359	Minnechaduza Cr.	35	29	114	1901	Mill in use
A 452	Niobrara River....	150	.....	.....	1901	Pumping and running machinery (not in use)
A 474	Niobrara River....	15	.....	.....	1901	Records indicate not in use
A 652	Niobrara River....	1600	50	9090	1907	In operation
A 685	Big Sandy Creek	35	15	60	1903	Flour mill—Records indicate plant not in use
A 729	Keya Paha River	100	5	57	1905	Roller mills—records indicate not in use
A 941	Long Pine Creek					Light plant in operation
A 947	Plum Creek	48	18	99	1912	Ainsworth plant—running
A 961	Niobrara River....	150	30	511	1910	Not compl't'd. In 1915 const.
		900	50	5110	1912	work was discontinued during war. No work has been done
		700	50	3980	1912	recently
A 1019	Niobrara River....					Construction work discontin'd during war. No work has been done recently.
A 1243	Niobrara River....	900	98	10023	1915	Records show project has never been completed
A 1352	Snake Creek	180	44	900	1916	Project never completed

BIG BLUE RIVER DRAINAGE AREA.

No.	SOURCE	Sec. feet Granted	Head	Theo. H. P.	Date of Comp.	REMARKS
D 963	Beaver Creek	40	10	46	1878	Mill and mfg.—records indicate this plant not in use.
D 990	Turkey Creek	.....	17	35	1870	Flour mill—not in use
D 1021	Big Blue River....	500	12	782	1882	Light plant at Holmesville.
A 1095	Big Blue River....	.....	3	.....	1912	Permit to raise dam—same as Docket 1021
A 1006	Big Blue River....	200	18	409	1911	Power plant in operation
D 1044	Big Blue River....	.....	.....	.....	.....	Milford plant in operation
A 1135	Big Blue River....	41	8	30	1912	Built and running
A 1153	W. Fork Big Blue	100	12	135	1913	Completed in 1916
A 1261	Big Blue River....	200	12	272	.....	Pending
A 1262	Big Blue River....	500	15	838	.....	Nearly completed
A 1265	W. Fork Big Blue	100	13	147	1915	Completed Hydro-elec. plant
A 1410	Little Blue River	150	17	290	1916	Not developed
A 1416	Big Blue River....	125	14	199	1916	Not developed
A 1417	Big Blue River....	100	15	170	1916	Not developed
A 1422	Big Blue River....	175	15	298	1916	Not developed
A 1423	Big Blue River....	.....	13	295	.....	Pending
A 1462	Little Blue River	.....	.....	.....	.....	Pending
A 1463	Blue River	100	18	200	1919	Electric power plant
A 1467	Little Blue River	150	16	200	1926	Flour, grist and electric plant
A 1476	Big Blue River....	100	16	180	1919	Not being constructed
A 1486	Little Blue River	150	14	200	1918	Hydro-electric plant
A 1494	Blue River and School Creek	66.7	10	77	1918	Hydro-electric plant
A 1506	Big Blue River....	400	18	409	1920	Hydro-electric plant
A 1511	Big Blue River....	.....	18	.....	.....	Disallowed by Dept. Appealed to supreme court
A 1520	W. Fork Big Blue	.....	17	57	1920	Permit to raise dam. Same as A 1153
A 1521	W. Fork Big Blue	.....	20	80	1920	Permit to raise dam—A 1265
A 1534	Big Blue River....	.....	18	800	.....	Application not approved
A 1538	Little Blue River	216	15	300	1921	Light and power plant
A 1542	Little Blue River	200	10	200	1921	Light and power plant
A 1585	Big Blue River....	.....	3	170	1921	Permit to raise dam—A 1262

REPUBLICAN RIVER DRAINAGE AREA.

No.	SOURCE	Sec. feet Granted	Head	Theo. H. P.	Date of Comp.	REMARKS
D 92	Medicine Creek....	68	9	80	1878	Flour mill in operation
D 178	Frenchman River	35	12	50	1886	Flour mill in operation
D 179	Frenchman River	29	12	40	1887	Champion Mills & Mfg.
D 181	Red Willow Creek	.....	.....	.....	.....	Abandoned 15 years ago
D 183	Turkey Creek	.....	18	33	1874	Abandoned
D 185	Cottonwood Creek	50	30	.....	1888	Flour mill in operation—undershot wheel
D 364	Medicine Creek....	66	15	112	1888	Flour mill—2 dams at Crete
D 997	Sappa Creek.....	.....	8	37	1887	Flour and corn mill
D 1013	Frenchman River	30	12	35	1887	Records indicate abandoned
D 1029	Republican River	196	8	178	1879	Flour mill at Arapahoe
D 1036	Republican River	400	21	1000	1878	Flour mill in operation
D 1043	Republican River	.....	.....	.....	.....	Orleans M. & E. Co.—pending
A 591	Frenchman River	35	8	31	1902	Pumping and electric plant
A 858	Medicine Creek....	12	18	24	1907	Flour mill. Records indicate abandoned
A 1021	Frenchman River	55	18	113	1914	Elec. power plant in operation
A 1136	Frenchman River	75	14	120	1912	Flour mill and electric plant
A 1221	Republican River	300	42	1480	.....	Never built
A 1245	Rock Creek	20	30	65	.....	Plant never completed
A 1339	Frenchman River	50	8	50	1914	Pumping plant for irrigation
A 1408	Frenchman River	65	20	270	1914	Same as A 1021 for 55 sec. ft. more—already built
A 1474	Frenchman River	55	23	143	1918	Municipal water and light plant at Imperial
A 1484	Stinking Water C.	72	25	143	1919	Palisade power plant
A 1574	Frenchman River	100	40	436	1921	Hydro-electric plant

WHITE RIVER DRAINAGE AREA.

No.	SOURCE	Sec. feet Granted	Head	Theo. H. P.	Date of Comp.	REMARKS
A 702	White River	18	10	21	1904	Abandoned
A 759	White River	5	10	6	1905	Pump for irrigation
A 854	White River	15	15	26	1908	Abandoned
A 1583	Chadron Creek....	.....	.....	.....	.....	Objections filed—app. pending

MISCELLANEOUS DRAINAGE AREA.

No.	SOURCE	Sec. feet Granted	Head	Theo. H. P.	Date of Comp.	REMARKS
D 1002	Bazile Creek	.....	8	10	.....	Creighton mill—pending
D 914	Bazile Creek	30	12	41	1909	Flour mill at Creighton

DRAINAGE IN NEBRASKA.

The Drainage Law passed in 1913, was amended by the Legislature of 1919, to read as follows:

All plans for proposed Drainage Districts shall be approved by the Department of Public Works before any contract is let or work begun. The department shall have authority to order any change in said plans, and require the Drainage District to conform thereto, and at all times during the construction have the right to inspect said work and make recommendations pertaining to the same. Upon request of any party in interest, the department may prepare and furnish at cost plans and specifications for any proposed drainage work. (Art. 5, Div. 2, Sec. 29, P. 414.)

The following gives the names of the districts, together with other data:

Name of District	Location	Date of Approval of Plans	Remarks
Burt-Washington County Drainage District	Burt-Washington Counties	Plans approved	Work completed 1917.
Yanike Drainage District	Butler County		Completed 1916.
Drainage District No. 1	Butler County	August 5, 1918	
Drainage District No. 2	Butler County	July 26, 1917	
Drainage District No. 2	Dakato County	April 18, 1914	
Homar Drainage District	Dakato County	January 10, 1919	
Elkhorn Valley Drainage District	Douglas and Sarpy Counties	June 24, 1919	
Wakefield Drainage District	Dixon-Wayne and Thurston Counties	January 18, 1917	
Drainage District No. 1	Frontier County	March 31, 1918	
Drainage District No. 1	Merrick County	February 17, 1919	
Minatare Drainage District	Morrill County		Maps returned for correction.
Drainage District No. 3	Nemaha County	July 6, 1916	
Drainage District No. 1	Nuckolls County		Contemplated. Records show no work has been done.
Drainage District No. 1	Otoe-Johnson Counties	October 31, 1914	
Holdrege Drainage District	Platte County		Contemplated construction in 1915.
Drainage District No. 1	Richardson County		
Drainage District No. 4	Richardson County	April 13, 1906	
Drainage District No. 5	Richardson County	May 8, 1920	
Little Papillion Drainage District	Sarpy County	March 2, 1920	
Western Sarpy Drainage District	Sarpy County	November 15, 1917	
Scotts Bluff Drainage District	Scotts Bluff County	February 28, 1918	
Pender Drainage District	Thurston County	February 21, 1918	
Gering Drainage District	Morrill County	June 2, 1920	

Burt-Washington County Drainage District. The work of the district includes all of the former operations in both Burt and Washington counties. The natural drainage of the Missouri River valley extends from Decatur, south along the west margin of the valley near the town of Tekamah in Burt county, and Herman in Washington county, with the outlet opposite the town of Blair. The district between the above mentioned terminal is about 32 miles. Manifestly, it becomes necessary to do work in each county in order to obtain a comprehensive system. About forty miles of new work was added to the system of ditches of about sixty miles, which were cleaned out and dredged. The most important problem which presents itself is the handling of the heavy burden of silt which was washed down from the hills into the branch and main ditches, entirely filling the ditch into which the muddy water was conducted. The grade of the main ditches was less than one and one-half feet per mile, some being about one foot per mile. The branch ditches began at a grade of 20 feet per mile and joined the main ditch at various lighter grades, all of which were equal to, and greater than, the grade of the main ditch at the junction, with perhaps one exception. This resulted in the silt deposit being carried into the main ditches and filling them and, in turn, the silt carried down the main ditches was backed up in the branch ditches, thereby closing their outlets and making lagoons without drainage, of a greater part of the valley.

This silt problem was met by the introduction of 18 settling basins where the branch ditches were made by emptying their water onto a tract of land without a definite channel running through the tract. Levees enclosing the basins prevented the flooding of other lands, the outlet from the basins conducting the clear waters back into the channel of the branch ditch and thence into the main ditch. This is, briefly, the outline for the basins, some of which were as small as three or four acres, others forty acres and in one case, for York Creek, below the town of Herman, a watershed of thirty square miles. The basin was made by the consent of the land owners to consist of 360 acres. All basins were exempted from benefit taxes, and have been made valuable lands by the addition of silt to a depth of from one to three feet during the past five years.

The waters of Tekamah Creek, Silver Creek and Mud Creek, east of the town of Tekamah, were gathered into a diversion ditch, which carried the silt burdened flood waters three miles east to a chute of the Missouri River. In order to maintain the north and south drainage ditches, the floodway above mentioned was carried over the drainage ditches. The water of the drainage ditch was conducted through culverts under the floodway, which were built of reenforced concrete. Three structures were required, two of which were single-barrel, eight feet wide by nine feet high, the third structure being three barrels of the same dimensions as above stated.

This work was started in 1915 and practically completed in 1917. The results have been most satisfactory. The basins have all been effective. Some have filled more rapidly than contemplated, but otherwise have done the work. The floodway has protected all the ditches, and excepting a few minor repairs, has demonstrated its capacity to be sufficient.

It will be necessary in the future to provide new basins when the old ones are filled to an extent which will make it impossible to use them without excessive construction of levees around the basins, and upstream. This, we believe, will be done in about ten years from the beginning of the original work, and from the demonstration of the increase in the quality of land, we hope that other lands which are low and have a heavy soil will be available and ready to receive the fill, without charging a high rental. A rental fee of $3 per acre on a number of basins has been paid, and on one other $5 per year. There are 60,000 acres included in this district.

Butler County Drainage District No. 2. Ditch No. 1 diverts the flood water entering the Drainage District from the southwest, gathering the same by means of a road ditch along the east side of the public road running north through the center of Section 30, and by means of the present ditch system, which will be cleaned out for a little more than one-fourth of a mile north of Section 30. The outlet ditch running north through the center of Sections 19-18-7 and 6 to the Platte River has a minimum fall of 7 feet per mile, which will produce a scouring velocity between 5 and 6 feet per second, and will cut back from the Platte River until the fall is equalized, which will produce a somewhat higher velocity and will insure against filling up the ditch with sediment washed down from the hills. The principal obstruction along the route of this ditch is a sand ridge along the north part of Section 19, through which the maximum cut is approximately 17 feet. At that point a boring was made to ascertain the character of the soil and found from 8 to 10 feet of compact sand at the surface, underlaid by a yellowish clay. The sand and clay were lifted on a 2 inch auger when damp. Ditch No. 1 is designed with a bottom width of 4 feet and with side slopes of 1 horizontal to 1 vertical. The capacity of the ditch is regulated by the depth. The minimum depth along the outlet being 8 feet and the maximum, excepting the sand ridge, about 13 feet. The lower section of this ditch also intercepts and diverts certain flood waters coming from the west, which now find their outlet in Bone Creek. That part of the main ditch, from the junction of its branches, north to the sand ridge in Section 19, should be constructed with continuous waste banks, which also serve as levees to confine the flood waters and raise the flood plane to a sufficient elevation to overcome any filling which might temporarily obstruct the ditch in the vicinity of the sand ridge, thus insuring successful operation.

The right-of-way required for Ditch No. 1 will be a strip two rods in width for the construction of the road ditch in Section 30, four rods in width through the south half of Section 19, and six rods in width for the outlet, all as shown on the map filed in this department. The acreage in right-of-way is marked upon each 40-acre tract, the distance is indicated by the scale of the map, being 1,000 feet per inch. Bridges will be required at the center and south line of Section 7-16-3, and at the south line of Section 18 and 19, making four bridges in all. The total estimated cost is $18,500.00.

If at any time it becomes desireable to supplement the plan of improvement above outlined to provide relief from flood waters from Bone Creek, the engineer recommends a diversion of Bone Creek in a northwesterly direction through Section 9, with outlet along the north and south center line of the west half of Section 4.

Elkhorn Valley Drainage District—Douglas and Sarpy Counties. The Elkhorn Valley Drainage District, comprising about 55,000 acres, was organized under Chapter 153 of the Laws of 1907, and amendments thereto, by vote of the land owners, in the year 1909. The greater part of this land is in Douglas County, taking in the Platte and Elkhorn Valleys, running from the north line of Douglas County to the mouth of the Elkhorn River. The properties benefitted are the lands, tracts, town lots in the villages of Waterloo and Valley, the U. P. Railroad, the C., B. & Q. Railroad, public roads and easements of telephone, telegraph and power companies, elevators and oil distributing plants.

In the year 1910, according to plans, the district constructed ditches for the purpose of straightening the Elkhorn River, a small part north of Waterloo, and the greater part of the balance toward the lower part of the district. The river was very crooked and the work reduced the length of the stream by nine miles through the district. A branch ditch, known as the "Creamery Slough Ditch", five miles long, was constructed running from a point toward the town of Valley, and then emptying into the Elkhorn River two miles south of Waterloo. Other ditches were constructed in the northern part, a majority being projections of ditches of the Elkhorn River Drainage District on the north, emptying into the Elkhorn River.

Most of the assessments were paid in cash, and in 1910 on tracts not paid, a bond issue was made running twenty years, which was sold to the state.

As the improvements were chiefly to benefit the eastern portion of the district, the lands in the western portion had been assessed lighter, and in the year 1918 the district undertook a new improvement. The plan was to construct a dyke fifteen miles in length. The smaller portion was built in that year and during 1919-20 it was completed. Owing to the overflow of the Platte River in Dodge County, causing the waters to flow southeasterly over the district, this dyke was made to tie to

the fill of the C., B. & Q. R. R. at Fremont, and it was extended down the left bank of the Platte about 200 feet from the bank to a point near the Chalco-Yutan cutoff of said C., B. & Q. R. R. Co. Other and smaller improvements were also constructed.

Since new and different plans had been adopted, it became necessary to make new apportionment of the benefits. This was done, and an assessment based thereon in 1919 was also made, which was a single assessment and no bonds issued. The cost of all improvement was $330,000.00

It may be well to mention that in straightening the Elkhorn River, the flow of water was started through the ditches and by the process of erosion they were enlarged the full width of the river in a few years.

The various properties within the district have been greatly benefitted and advanced in market value. Prior to the construction of the large dyke, the overflow from the Platte River overspread large areas of the district, and the remedy has been successful in preventing this overflow. This district is almost completed.

Western Sarpy Drainage District. The western portion of Sarpy County, which is located in the Elkhorn and Platte valleys, consists of flat or low lands, sloping eastward from the rivers toward the hills. In this unit there are 8,000 acres, which lands were menaced by flood waters from the hills and overflow waters from the Platte and Elkhorn rivers, and little of this land could be cultivated before drainage.

In the year 1885 the county, under the old law, constructed a small ditch, which proved useless. In 1905 this ditch was enlarged, but still proved inadequate However, in 1909, by vote of the land owners, the Western Sarpy Drainage District was organized to improve this area. The main ditch was constructed by a large boat dredge, running from the north end to the extreme southern end of the district, emptying into the Platte River, and constructed lateral road ditches leading into the main ditch on the north edge of the public roads, and these roads were improved by the use of the waste banks. A few levees were built along the river to prevent overflow.

The district lies well below all the important tributaries of both rivers, and is perhaps menaced by water more than any other district in the state. The original improvement, costing $75,000, redeems the rich land of this district for cultivation. The improvement of this project has caused but very little litigation until recently. In the year 1917, owing to the straightening of the Elkhorn River in the Elkhorn Valley Drainage District, shortening the distance of the flow therein nine miles, the force of the waters therefrom emptying into the Platte caused the left bank of the Platte to be eroded more in one flood than had occurred in the previous twenty years, destroying the dyke and permitting the overflow to destroy many crops. The district in 1918 constructed

new dykes along the rivers and also reconstructed the dykes which were destroyed. The river water is now well under control. By reason of these improvements, the property within the district has been much enhanced in value, as nearly all the land has been improved to a high state of cultivation. The last improvement was made at an expenditure of $60,000.00.

Drainage District No. 1—Otoe-Johnson Counties. This district comprises 16,000 acres of land in the valleys of the Little Nemaha and South Branch Rivers. Prior to the construction of the ditch, much of this land was low and swampy, and all of it subject to the ravages of annual and sometimes more frequent overflows of those streams and their tributaries. The land had no staple value for farming purposes.

Preliminary work and surveys were made in 1909. The organization was had under Peabody's Drainage District Law. From 1909 to 1913 the formation of the district was held in abeyance by proceedings in the district and supreme courts.

The general plan of the work resulted in the construction of an independent ditch, with occasional tappings of the old bed. In this way use was made of the old river channel as well as the new. The old stream is gradually filling, and the new channel, on the other hand, has been gradually eroding until at the present time it is about sixty to seventy per cent larger than when originally constructed.

The work comprises about twenty-five miles of main stem ditch, and about an equal number of lateral ditches. The main channel of the Little Nemaha River begins near Syracuse and discharges into another drainage project south and east of Talmage, Nebraska. Another main stem runs from near Burr and Cook to Talmage. The size of those ditches varies as to the watershed to be accommodated, the bottom width varying from 28 to five feet, the latter dimension being for laterals having a very small watershed. The depth of the ditch varies from five to 25 feet, the average depth of the main channel being fifteen feet, and the average depth of the laterals is five feet. The slopes in all cases are one foot vertical and one foot horizontal.

The grade of the main channel is slightly in excess of five feet per mile. The grade of the laterals depends upon local conditions, and varies greatly from five to ten feet per mile.

The entire catchment basement to be accommodated is 640 square miles. The entire cost of this project was $225,000.00, which cost was defrayed in the following manner:

Paid by property owners benefitted	$191,800.00
Paid by Otoe County	20,000.00
Paid by Johnson County	3,000.00
Paid by M. P. R. R. Co.	9,000.00
Paid by B. M. R. R. Co.	1,200.00
Total	$225,000.00

The amount assessed to property owners benefitted was assigned according to the benefits of the particular tracts of land. The cost per acre ranged from a very few cents per acre to a maximum of $17.90 per acre. The average value of the land at the time of the construction ranged from $50.00 to $80.00 per acre. Since the completion of the improvement, lands have sold for as much as three to four hundred dollars per acre. The project as a whole is a complete success.

Drainage District No. 5—Richardson County. This district is an extension of Richardson County Drainage District No. 1 on Muddy Creek, which empties into Nemaha River. The outlet is on the south line of Section 6, Township 1 North, Range 17 East. The upper end is on the west line of Section 24, Township 2 North, Range 15 East, the fall between these two points being 37 feet. The length of the main ditch will be 8.2 miles, having an eight foot base with one to one side slopes. Little Muddy Creek between the above points is 14.45 miles, shortening the water course 6.25 feet per mile. The natural fall of the creek is 2.56 feet per mile. The creek at the upper end has a depth of 14.5 feet, while the ditch will average 17.5 feet in depth, varying from one to four feet deeper than the creek.

All excavated material is being deposited in spoil banks on each side of the ditch, with a 15 foot berm. Laterals will have a four foot base with one to one side slopes and a 10 foot berm. There will be 15 laterals, totaling 35,300 feet in length.

The area within this district is 4371 acres. Three thousand two hundred eighty-eight acres of this is overflow land which will be reclaimed for agricultural purposes, with the exception of the area within the ditch and spoil banks. The total drainage area within the watershed, above the outlet, is 263 square miles, of which 194 square miles are above and outside the proposed district.

There are 7.48 miles of public highway and 3.66 miles main line of the Missouri Pacific Railroad within the district.

Five bridges will be built to carry public highways over the main ditch. These bridges will be 15 ton Nebraska standard trusses of 90 foot span, and have been estimated to cost $2,600.00 each. The county has assumed the cost of the bridges in lieu of the assessment of benefits derived. To date no contract has been let for the construction of the bridges.

The contract for the main ditch and the lateral construction was let to Fred M. Crane Company, who started work on October 25, 1920, and expect to complete the work within 300 working days.

Drainage District No. 4—Richardson County. This district is situated on the south fork of the Great Nemaha River, and is four miles south of Humboldt, Nebraska. The area included within the boundary of the district is 3,564 acres of wet and overflow land. A watershed of 564 square miles of rolling agricultural land lies above the district. The soil within the district is classified as "Wabash silt loam and Wabash silt clay loam."

The greater part of land within the district, if relieved of the flood damage of the overflows from the river, would have sufficient drainage to take care of the storm water falling upon the land itself, so the plan of drainage adopted was a large, open ditch to take care of the river water, and lateral ditches for the storm water coming down from adjacent table land. It was left to the individual owner to tile drain any wet and seepy land within the district.

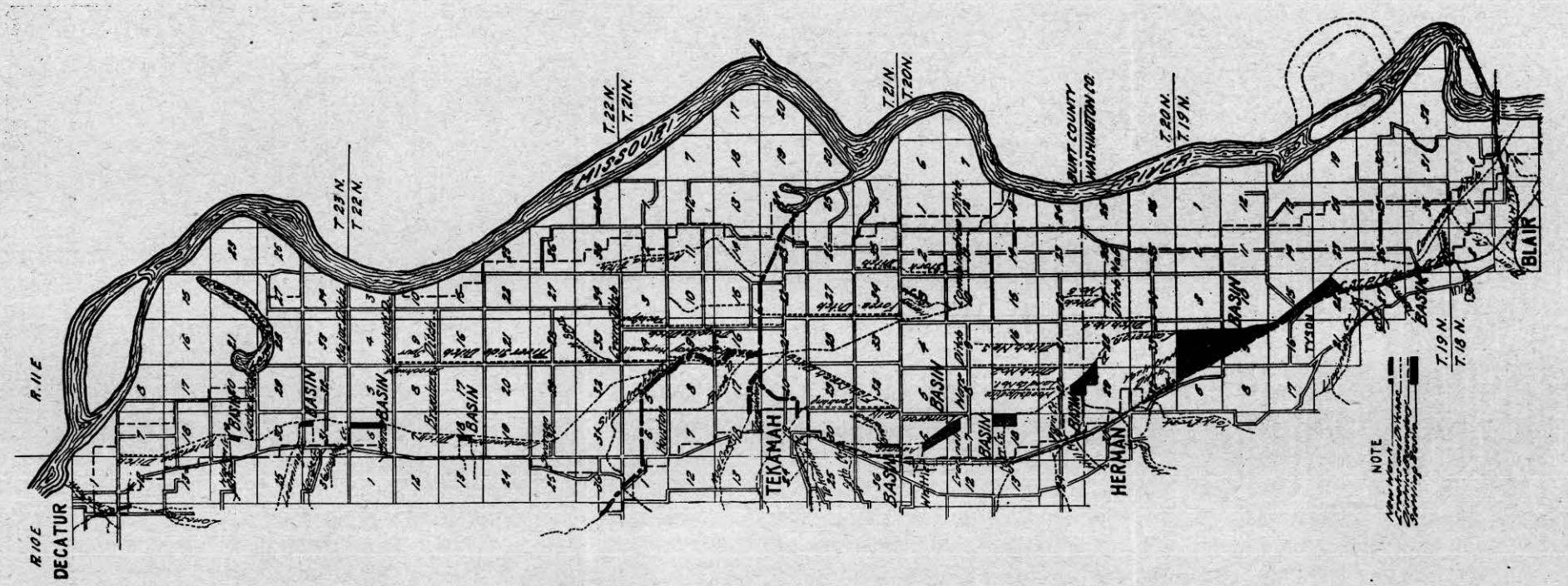
The main ditch was dug with an eight foot base, three-fourths to one side slope, with an average depth of twenty feet. The length of the main ditch is 6.77 miles, and the length of the old river bed is 11.55 miles, making a reduction of 4.77 miles. This gives an average fall of 4.02 feet per mile along the line of the new ditch.

The work was completed in the spring of 1918 at a total cost of $76,204.00.

This has been a very successful project, as most of the waste and wet land within the district has been put under cultivation. Lands within the district, which were selling for $40.00 per acre, now command a price of $250 to $300 per acre.

Pender Drainage District—Thurston County. This district, which covers an area of 7,500 acres, was completed in 1918 at a cost of approximately $85,000.00. It consists of a main ditch about eight miles in length, connecting with the Wakefield project above, and the Bancroft project below. There is one lateral just above the town of Pender which diverts the waters of Rattlesnake Creek into the main ditch which carries the waters of the Logan.

This work was of unusual depth for ditches in that locality, the average depth being about 17 feet, which was from four feet to six feet below the old stream. The bottom width was 16 feet, with side slopes of one-half horizontal to one vertical. This section produces considerable enlargement of the channel by rapid erosion. The fall of the ditch varies from three to five feet per mile. The results have been entirely satisfactory, and the town of Pender was protected from the flood of last summer, in fact, the water did not get out of the bank in the main ditch as the diversion ditch saved the town from any damage.



BURT-WASHINGTON DRAINAGE DISTRICT, TEKAMAH, NEBRASKA.

Nebraska Hydrographic Report

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TABLE SHOWING LOSS OR GAIN IN ACRE FEET FOR JUNE, 1919, ON THE NORTH PLATTE AND PLATTE RIVERS.

North Platte River at	Acre Feet	Acre Feet	Gain	Loss
Torrington, Wyoming	179,110	.....	.....	.....
Diversions between Torrington and Morrill	.....	81,252	.....	.....
Morrill, Nebraska	.....	104,580	.....	.....
	179,110	185,832	6,722	.....
Morrill, Nebraska	104,580	.....	.....	.....
Diversions between Morrill and Melbeta	.....	15,895	.....	.....
Melbeta, Nebraska	.....	103,142	.....	.....
	104,580	119,037	14,457	.....
Melbeta, Nebraska	103,142	.....	.....	.....
Diversions between Melbeta and Bridgeport	.....	18,428	.....	.....
Bridgeport, Nebraska	.....	104,035	.....	.....
	103,142	122,463	19,321	.....
Bridgeport, Nebraska	104,035	.....	.....	.....
Diversions between Bridgeport and Broadwater	.....	460	.....	.....
Broadwater, Nebraska	.....	109,093	.....	.....
	104,035	109,553	5,518	.....
Broadwater, Nebraska	109,093	.....	.....	.....
Diversions between Broadwater and Belmar	.....	4,545	.....	.....
Belmar, Nebraska	.....	121,093	.....	.....
	109,093	125,638	16,545	.....
Belmar, Nebraska	121,093	.....	.....	.....
Diversions between Belmar and North Platte	.....	12,486	.....	.....
North Platte, Nebraska	.....	144,994	.....	.....
	121,093	157,480	36,387	.....
North Platte, Nebraska	144,994	.....	.....	.....
Diversions between North Platte and Lexington	.....	11,858	.....	.....
Lexington on Platte River	.....	182,680	.....	.....
	144,994	194,538	49,544	.....
Lexington, Nebraska, on Platte	182,680	.....	.....	.....
Overton, Nebraska, on Platte River	.....	164,829	.....	.....
	182,680	164,829	.....	17,851
Overton, Nebraska, on Platte River	164,829	.....	.....	.....
Diverted by Kearney Canal	.....	9,949	.....	.....
	164,829	9,949	.....	.....

TABLE SHOWING LOSS OR GAIN IN ACRE FEET FOR JULY, 1919, ON THE NORTH PLATTE AND PLATTE RIVERS.

North Platte River at	Acre Feet	Acre Feet	Gain	Loss
Torrington, Wyoming	129,969	.....	.....	.....
Diversions between Torrington and Morrill, Nebraska	.....	95,857	.....	.....
Morrill, Nebraska	.....	38,728	.....	.....
	129,969	134,585	4,616	.....
Morrill, Nebraska	38,728	.....	.....	.....
Diversions between Morrill and Melbeta	.....	12,447	.....	.....
Melbeta, Nebraska	.....	38,174	.....	.....
	38,728	50,621	11,893	.....
Melbeta, Nebraska	38,174	.....	.....	.....
Diversions between Melbeta and Bridgeport	.....	22,527	.....	.....
Bridgeport, Nebraska	.....	51,125	.....	.....
	38,174	73,652	35,478	.....
Bridgeport, Nebraska	51,125	.....	.....	.....
Diversions between Bridgeport and Broadwater	.....	448	.....	.....
Broadwater, Nebraska	.....	65,654	.....	.....
	51,125	66,102	14,977	.....
Broadwater, Nebraska	65,654	.....	.....	.....
Diversions between Broadwater and Belmar	.....	4,343	.....	.....
Belmar, Nebraska	.....	45,720	.....	.....
	65,654	50,063	.....	15,591
Belmar, Nebraska	45,720	.....	.....	.....
Diversions between Belmar and North Platte	.....	12,333	.....	.....
North Platte, Nebraska	.....	70,315	.....	.....
	45,720	82,648	36,928	.....
North Platte, Nebraska	70,315	.....	.....	.....
Diversions between North Platte and Lexington	.....	9,945	.....	.....
Lexington, Nebr., on Platte River	.....	45,323	.....	.....
	70,315	55,268	.....	15,047
Lexington, Nebr., on Platte River	45,323	.....	.....	.....
Diversions between Lexington and Overton	.....	.....	.....	.....
Overton, Nebraska, on Platte River	.....	48,844	.....	.....
	45,323	48,844	3,521	.....
Overton, Nebraska, on Platte River	48,844	.....	.....	.....
Diverted by Kearney Canal	.....	6,583	.....	.....
	48,844	6,583	.....	.....

TABLE SHOWING LOSS OR GAIN IN ACRE FEET FOR AUGUST, 1919, ON THE NORTH PLATTE AND PLATTE RIVERS.

North Platte River at	Acre Feet	Acre Feet	Gain	Loss
Torrington, Wyoming	115,241	.....	.....	.....
Diversions between Torrington and Morrill	.....	78,488	.....	.....
Morrill, Nebraska	.....	44,063	.....	.....
	115,241	122,551	7,310	.....
Morrill, Nebraska	44,063	.....	.....	.....
Diversions between Morrill and Melbeta	.....	14,173	.....	.....
Melbeta, Nebraska	.....	48,298	.....	.....
	44,063	62,471	18,408	.....
Melbeta, Nebraska	48,298	.....	.....	.....
Diversions between Melbeta and Bridgeport	.....	16,171	.....	.....
Bridgeport, Nebraska	.....	55,836	.....	.....
	48,298	72,007	23,709	.....
Bridgeport, Nebraska	55,836	.....	.....	.....
Diversions between Bridgeport and Broadwater	.....	327	.....	.....
Broadwater, Nebraska	.....	51,174	.....	.....
	55,836	51,501	.....	4,335
Broadwater, Nebraska	51,174	.....	.....	.....
Diversions between Broadwater and Belmar	.....	3,225	.....	.....
Belmar, Nebraska	.....	58,414	.....	.....
	51,174	61,639	10,465	.....
Belmar, Nebraska	58,414	.....	.....	.....
Diversions between Belmar and North Platte	.....	12,810	.....	.....
North Platte, Nebraska	.....	53,406	.....	.....
	58,414	66,216	7,802	.....
North Platte, Nebraska	53,406	.....	.....	.....
Diversions between North Platte and Lexington	.....	19,513	.....	.....
Lexington, Nebr., on Platte River	.....	14,866	.....	.....
	53,406	34,379	.....	19,027
Lexington, Nebr., on Platte River	14,866	.....	.....	.....
Diversions between Lexington and Overton	.....	.....	.....	.....
Overton, Nebraska	.....	10,215	.....	.....
	14,866	10,215	.....	4,651
Overton, Nebraska, on Platte River	10,215	.....	.....	.....
Diverted by Kearney Canal	.....	1,672	.....	.....
	10,215	1,672	.....	.....

TABLE SHOWING LOSS OR GAIN IN ACRE FEET FOR SEPT., 1919, ON THE NORTH PLATTE AND PLATTE RIVERS.

North Platte River at	Acre Feet	Acre Feet	Gain	Loss
Torrington, Wyoming (no record)	.....	.....	.....	.....
Diversions between Torrington and Morrill	.....	16,119	.....	.....
Morrill, Nebraska	.....	64,355	.....	.....
	.....	80,474	.....	.....
Morrill, Nebraska	64,355	.....	.....	.....
Diversions between Morrill and Melbeta	.....	6,966	.....	.....
Melbeta, Nebraska	.....	93,869	.....	.....
	64,355	100,835	36,480	.....
Melbeta, Nebraska	93,869	.....	.....	.....
Diversions between Melbeta and Bridgeport	.....	11,858	.....	.....
Bridgeport, Nebraska	.....	103,192	.....	.....
	93,869	115,050	21,181	.....
Bridgeport, Nebraska	103,192	.....	.....	.....
Diversions between Bridgeport and Broadwater	.....	393	.....	.....
Broadwater, Nebraska	.....	95,753	.....	.....
	103,192	96,146	.....	7,046
Broadwater, Nebraska	95,753	.....	.....	.....
Diversions between Broadwater and Belmar	.....	3,748	.....	.....
Belmar, Nebraska	.....	105,225	.....	.....
	95,753	108,973	13,220	.....
Belmar, Nebraska	105,225	.....	.....	.....
Diversions between Belmar and North Platte	.....	7,280	.....	.....
North Platte, Nebraska	.....	101,654	.....	.....
	105,225	108,934	3,709	.....
North Platte, Nebraska	101,654	.....	.....	.....
Diversions between North Platte and Lexington	.....	19,995	.....	.....
Lexington, Nebr., on Platte River	.....	87,810	.....	.....
	101,654	107,805	6,151	.....
Lexington, Nebr., on Platte River	87,810	.....	.....	.....
Diversions between Lexington and Overton	.....	.....	.....	.....
Overton, Nebr., on Platte River	.....	58,067	.....	.....
	87,810	58,067	.....	29,743
Overton, Nebr., on Platte River	58,067	.....	.....	.....
Diverted by Kearney Canal	.....	4,308	.....	.....
	58,067	4,308	.....	.....

TABLE SHOWING LOSS OR GAIN IN ACRE FEET FOR JUNE, 1920, ON THE NORTH PLATTE AND PLATTE RIVERS.

North Platte River at	Acre Feet	Acre Feet	Gain	Loss
Morrill, Nebraska	514,321	.....	.....	.....
Diversions between Morrill and Mitchell	.....	1,793	.....	.....
Mitchell, Nebraska	.....	475,445	.....	.....
	514,321	477,238	.....	37,083
Mitchell, Nebraska	475,445	.....	.....	.....
Diversions between Mitchell and Bridgeport	.....	11,589	.....	.....
Bridgeport, Nebraska	.....	454,420	.....	.....
	475,445	466,009	.....	9,436
Bridgeport, Nebraska	454,420	.....	.....	.....
Diversions between Bridgeport and Broadwater	.....	.....	.....	.....
Broadwater, Nebraska	.....	481,990	.....	.....
	454,420	481,990	27,570	.....
Broadwater, Nebraska	481,990	.....	.....	.....
Diversions between Broadwater and Belmar	.....	.....	.....	.....
Belmar, Nebraska	.....	568,074	.....	.....
	481,990	568,074	86,084	.....
Belmar, Nebraska	568,074	.....	.....	.....
Diversions between Belmar and North Platte	.....	9,964	.....	.....
North Platte, Nebraska	.....	531,776	.....	.....
	568,074	541,740	.....	26,334
North Platte, Nebraska	531,776	.....	.....	.....
Diversions between North Plattee and Lexington	.....	10,079	.....	.....
Lexington, Nebr., on Platte River	.....	590,890	.....	.....
	531,776	600,969	69,193	.....

TABLE SHOWING LOSS OR GAIN IN ACRE FEET FOR JULY, 1920, ON THE NORTH PLATTE AND PLATTE RIVERS.

North Platte River at	Acre Feet	Acre Feet	Gain	Loss
Morrill, Nebraska	204,598	.....	.....	.....
Diversion between Morrill and Mitchell	.....	3,888	.....	.....
Mitchell, Nebraska	.....	187,639	.....	.....
	204,598	191,527	.....	13,071
Mitchell, Nebraska	187,639	.....	.....	.....
Diversions between Mitchell and Bridgeport	.....	26,186	.....	.....
Bridgeport, Nebraska	.....	219,474	.....	.....
	187,639	245,660	58,021	.....
Bridgeport, Nebraska	219,474	.....	.....	.....
Diversions between Bridgeport and Broadwater	.....	500	.....	.....
Broadwater, Nebraska	.....	248,532	.....	.....
	219,474	249,032	29,558	.....
Broadwater, Nebraska	248,532	.....	.....	.....
Diversions between Broadwater and Belmar	.....	2,166	.....	.....
Belmar, Nebraska	.....	261,263	.....	.....
	248,532	263,429	14,897	.....
Belmar, Nebraska	261,263	.....	.....	.....
Diversions between Belmar and North Platte	.....	18,186	.....	.....
North Platte, Nebraska	.....	212,036	.....	.....
	261,263	230,222	.....	31,041
North Platte, Nebraska	212,036	.....	.....	.....
Diversions between North Platte and Lexington	.....	20,263	.....	.....
Lexington, Nebr., on Platte River	.....	224,835	.....	.....
	212,036	245,098	33,062	.....

TABLE SHOWING LOSS OR GAIN IN ACRE FEET FOR AUGUST, 1920, ON THE NORTH PLATTE AND PLATTE RIVERS.

North Platte River at	Acre Feet	Acre Feet	Gain	Loss
Morrill, Nebraska	109,687	.....	.....	.....
Diversion between Morrill and Mitchell	.....	1,708	.....	.....
Mitchell, Nebraska	.....	77,654	.....	.....
	109,687	79,362	.....	30,325
Mitchell, Nebraska	77,654	.....	.....	.....
Diversions between Mitchell and Bridgeport	.....	23,337	.....	.....
Bridgeport, Nebraska	.....	110,580	.....	.....
	77,654	133,917	56,263	.....
Bridgeport, Nebraska	110,580	.....	.....	.....
Diversion between Bridgeport and Broadwater	.....	350	.....	.....
Broadwater, Nebraska	.....	129,720	.....	.....
	110,580	130,070	19,490	.....
Broadwater, Nebraska	129,720	.....	.....	.....
Diversions between Broadwater and Belmar	.....	4,512	.....	.....
Belmar, Nebraska	.....	145,292	.....	.....
	129,720	149,804	20,084	.....
Belmar, Nebraska	145,292	.....	.....	.....
Diversions between Belmar and North Platte	.....	21,021	.....	.....
North Platte, Nebraska	.....	127,539	.....	.....
	145,292	148,560	3,268	.....
North Platte, Nebraska	127,539	.....	.....	.....
Diversions between North Platte and Lexington	.....	27,193	.....	.....
Loxinton, Nebr., on Platte River	.....	106,521	.....	.....
	127,539	133,714	6,175	.....

TABLE SHOWING LOSS OR GAIN IN ACRE FEET FOR SEPT., 1920, ON THE NORTH PLATTE AND PLATTE RIVERS.

North Platte River at	Acre Feet	Acre Feet	Gain	Loss
Morrill, Nebraska	85,488	.....	.....	.....
Diversion between Morrill and Mitchell	.....	.....	.....	.....
Mitchell, Nebraska	.....	54,287	.....	.....
	85,488	54,287	.....	31,201
Mitchell, Nebraska	54,287	.....	.....	.....
Diversions between Mitchell and Bridgeport	.....	12,752	.....	.....
Bridgeport, Nebraska	.....	106,545	.....	.....
	54,287	119,297	65,010	.....
Bridgeport, Nebraska	106,545	.....	.....	.....
Diversion between Bridgeport and Broadwater	.....	350	.....	.....
Broadwater, Nebraska	.....	117,224	.....	.....
	106,545	117,574	11,029	.....
Broadwater, Nebraska	117,224	.....	.....	.....
Diversions between Broadwater and Belmar	.....	5,060	.....	.....
Belmar, Nebraska	.....	145,182	.....	.....
	117,224	150,242	33,018	.....
Belmar, Nebraska	145,182	.....	.....	.....
Diversions between Belmar and North Platte	.....	12,307	.....	.....
North Platte, Nebraska	.....	154,515	.....	.....
	145,782	166,822	21,100	.....
North Platte, Nebraska	154,515	.....	.....	.....
Diversions between North Platte and Lexington	.....	10,500	.....	.....
Lexington, Nebr., on Platte River	.....	123,785	.....	.....
	154,515	134,285	.....	20,230

VISIBLE RETURN FLOW IN THE NORTH PLATTE VALLEY—RUN OFF IN ACRE FEET, BY MONTHS.
Henry to Bridgeport, Year 1920.

Name	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Total 10 Mos.
Bayard Sugar Factory Drain	2206	1870	1545	2126	1878	1350	2257	2408	2834	2317	20791
Camp Clark Seep	161	151	101	109	123	95	261	670	688	414	2773
Dry Spotted Tail	1509	1418	1382	1527	1535	1490	3592	2973	3127	2285	19838
Fanning Drain *	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	~~1643~~ 3258
Fairfield Drain	351	232	352	541	768	456	535	403	266	323	4227
Kronberg Seep	122	99	77	81	81	119	121	176	192	216	1284
Nine Mile Drain	6434	5752	6141	7010	6851	8275	8951	11437	13424	10877	85152
Red Willow Creek	2890	2420	2561	2107	2802	7478	5601	3810	3455	7903	41027
Scottsbluff Drain	744	450	585	514	633	815	1061	1154	1398	1158	8512
Sheep Creek	3530	3302	3667	3628	3789	3364	3949	5234	5057	4135	39655
Stewart's Drain	391	315	192	103	107	186	188	291	262	178	2213
Snell Drain	222	202	170	178	167	159	238	379	516	448	2679
Tub Springs	2491	1735	1894	1537	1491	2127	3001	2989	3209	2708	23182
Wet Spotted Tail Creek	1143	912	815	789	688	849	890	1176	2041	1448	10751
Winter's Creek	3773	2844	3100	3029	3318	4004	4606	5549	3469	3595	37277
Wild Horse Drain	2374	1993	2340	3259	3259	3669	3671	3184	3143	4035	30927
Total for months	28485	23805	25062	26686	27809	34616	38034	42029	43219	42186	331931

* was not reduced to acre feet

VISIBLE RETURN FLOW IN THE NORTH PLATTE VALLEY—RUN OFF IN ACRE FEET, BY MONTHS.
Henry to Bridgeport, Year 1919.

Name	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Bayard Drain No. 3	1674	1288	1178	1140	744	1640	2914	3906	3960	3254	2250	1686	25634
Bayard Sugar Fac. Dr.	1425	1350	1300	1235	1122	1387	1484	2375	3518	2929	2386	1775	22286
Camp Clark Seep	180	140	124	150	109	240	596	1023	1100	444	190	171	4467
Dry Spotted Tail	496	588	744	795	792	1650	2083	2774	1134	608	560	498	12722
East Enterprise	551	510	458	400	496	660	890	1024	1425	1306	782	456	8958
Fanning Seep	190	178	220	200	195	210	240	490	525	400	380	372	3600
Fairfield Seep	180	173	200	215	200	220	260	480	500	415	380	377	3600
Melbeta Seep	120	114	95	115	160	175	225	470	425	360	300	241	2800
Kronberg Seep	110	95	70	60	65	70	115	225	190	160	140	100	1400
Minatare Drain	4750	3850	3600	4100	4880	8495	11951	11563	10788	9054	9065	7000	89096
Red Willow	2139	1904	2010	1950	2542	3000	3068	3849	4292	3348	2880	3007	33989
Scottsbluff Drain	270	252	270	390	744	1085	1395	1705	1719	1147	1020	899	10896
Sheep Creek	4247	3444	3379	3180	3209	3585	5087	5317	6356	5000	4897	4068	51769
Stewart's Drain	682	588	713	750	620	780	899	992	840	1116	900	672	9552
Snell Drain	120	113	96	120	155	180	220	465	430	355	305	241	2800
Tub Springs	1302	1344	1612	1498	1784	2381	2374	2872	3430	2077	1390	1282	23346
Winter's Creek	4371	3384	3441	2640	2614	3300	4334	4743	5273	5332	4980	4588	49000
Wet Spotted Tail	651	532	527	510	539	605	812	1004	1300	1396	1000	744	9620
Total	23458	19847	20037	19448	20970	29663	38947	45277	47205	38701	33805	28177	365535

PATHFINDER INFLOW, IN CUBIC FEET PER SECOND, FOR YEAR 1919.

Day	January	February	March	April	May	June
1	160	290	400	2300	3900	7860
2	310	410	480	2640	2970	7430
3	230	390	480	3000	3140	5110
4	240	470	550	3020	3050	5220
5	310	390	400	2950	2940	5030
6	310	470	330	2970	2980	3950
7	310	540	400	2560	3400	3040
8	380	540	400	2060	3320	1810
9	310	470	330	2070	3420	1740
10	380	470	330	1820	3040	2770
11	310	390	410	1820	2980	3280
12	310	390	400	880	3150	3070
13	380	320	410	880	2820	2900
14	310	400	400	1050	2870	2780
15	240	390	480	1580	2520	3190
16	240	400	650	1760	3210	3290
17	240	390	650	1250	3640	2790
18	240	400	650	1240	3680	2790
19	310	390	650	1250	3870	2920
20	310	400	650	1430	4000	2380
21	310	480	650	1640	5310	3490
22	310	390	650	2060	4920	2800
23	310	480	810	2870	5630	2220
24	310	470	970	3080	5720	1850
25	390	400	1130	3090	5840	1940
26	240	400	1300	3650	6300	1390
27	310	330	1300	4210	6250	1270
28	310	400	1310	3890	6500	2230
29	320	.....	1310	3960	6680	1470
30	290	.....	2000	2580	6440	1350
31	.....	.....	2000	.....	6490	.....
Total	8930	11260	21580	39560	130980	93360
Mean	297	402	696	1318	4225	3112
Max.	390	540	2000	4210	6680	7860
Min.	160	290	330	880	2520	1270
acre feet	17712	22342	42903	78467	259798	185179

PATHFINDER INFLOW, IN CUBIC FEET PER SECOND, FOR YEAR 1919 (Continued).

Day	July	August	September	October	November	December
1	1210	220	320	340	410	290
2	1110	490	130	220	350	380
3	710	450	130	410	380	440
4	810	520	80	550	590	510
5	910	520	100	360	580	440
6	1120	520	90	260	530	450
7	1070	160	300	250	500	380
8	970	700	190	490	390	390
9	620	670	160	500	410	360
10	750	670	120	540	410	330
11	650	720	130	500	380	330
12	360	690	110	300	350	330
13	190	670	160	310	330	330
14	150	580	170	370	320	330
15	240	410	320	410	300	300
16	270	180	210	410	530	300
17	280	60	180	420	570	290
18	140	200	110	430	600	300
19	100	380	100	460	600	330
20	270	290	220	490	600	330
21	270	220	370	590	570	390
22	400	130	350	590	610	460
23	600	130	170	580	610	520
24	550	120	160	570	610	530
25	540	260	180	620	430	520
26	160	340	110	620	370	530
27	190	150	230	600	310	470
28	390	170	170	610	260	380
29	380	140	370	410	200	370
30	370	170	360	410	200	340
31	240	170	.....	410	.....	340
Total	16020	11100	5800	14030	13300	11990
Mean	716	358	193	453	443	386
Max.	1210	720	370	620	610	530
Min.	100	60	80	220	200	290

31775 22016 11504 27828 26380 23782

PATHFINDER OUTFLOW, IN CUBIC FEET PER SECOND, FOR YEAR 1919.

Day	January	February	March	April	May	June
1	15	15	15	15	1650	5515
2	15	15	15	15	1650	5515
3	15	15	15	15	1625	5515
4	15	15	15	15	1625	5595
5	15	15	15	15	1650	5705
6	15	15	15	15	1625	5765
7	15	15	15	15	1485	5765
8	15	15	15	15	1625	5765
9	15	15	15	15	1650	5765
10	15	15	15	15	1650	4970
11	15	15	15	15	1595	5035
12	15	15	15	15	1570	4995
13	15	15	15	15	1650	5050
14	15	15	15	15	1540	4950
15	15	15	15	15	2780	5135
16	15	15	15	15	2960	5410
17	15	15	15	15	2960	5555
18	15	15	15	15	3155	5410
19	15	15	15	15	3155	5410
20	15	15	15	15	2210	5020
21	15	15	15	15	5015	4970
22	15	15	15	15	4135	5000
23	15	15	15	15	4760	5000
24	15	15	15	15	4825	4990
25	15	15	15	15	4825	4980
26	15	15	15	15	5015	5000
27	15	15	15	15	4960	4575
28	15	15	15	15	5015	4505
29	15	....	15	980	5120	5000
30	15	....	15	1080	4375	4585
31	15	....	15	.....	4855	.....
Total	465	420	465	2480	92710	156450
Mean	15	15	15	82	2990	5215
Max.	15	15	15	1080	5120	5765
Min.	15	15	15	15	1485	4505

PATHFINDER OUTFLOW, IN CUBIC FEET PER SECOND, FOR YEAR 1919.

Day	July	August	September	October	November	December
1	4580	3890	3160	1600	15	15
2	4360	3710	3005	1600	15	15
3	4360	3945	2805	1600	15	15
4	4000	3915	2790	1600	15	15
5	4035	3875	2725	1600	15	15
6	4325	3860	2540	1600	15	15
7	4150	3845	2515	1600	15	15
8	4150	3480	2715	1600	15	15
9	4150	4005	2395	1600	15	15
10	3780	3825	2350	1600	15	15
11	4235	3825	2300	2000	15	15
12	4210	3855	2300	1600	15	15
13	3870	3810	2270	1600	15	15
14	3815	3785	1805	1600	15	15
15	3675	3680	1805	1600	15	15
16	3760	3500	1940	1600	15	15
17	3810	3135	1675	1600	15	15
18	3755	2905	1635	1600	15	15
19	3640	3130	1560	1600	15	15
20	3610	3300	1545	1600	15	15
21	3585	3200	1655	1600	15	15
22	3690	3120	1800	1600	15	15
23	3840	3035	1775	1600	15	15
24	4025	3020	1585	1600	15	15
25	3990	2995	1570	1600	15	15
26	3990	3125	1585	1600	15	15
27	3990	3195	1505	1600	15	15
28	3715	2990	1620	335	15	15
29	3915	3000	1555	15	15	15
30	3905	2955	1745	15	15	15
31	3975	2975	.....	15	....	15
Total	122890	106885	62230	43980	450	465
Mean	3964	3448	2074	1418	15	15
Max.	4580	4005	3160	2000	15	15
Min.	3585	2905	1505	15	15	15

PATHFINDER STORAGE, IN ACRE FEET, FOR YEAR 1919.

Day	January	February	March	April	May	June
1	641720	659290	681800	729840	862900	925190
2	642300	660070	682720	735050	865520	928790
3	642730	660810	683650	740960	868530	927790
4	643170	661700	684720	746910	871170	926790
5	643750	662450	685490	752730	873430	924790
6	644330	663340	686110	758580	876090	920800
7	644910	664380	686880	763630	879510	914850
8	645640	665430	687650	767690	882560	906380
9	646220	666330	688270	771760	885630	897900
10	646950	667230	688890	775340	888130	893330
11	647540	667980	689670	778930	890630	889470
12	648130	668730	690440	780650	893330	884860
13	648860	669330	691220	782370	895270	879890
14	649450	670090	691990	784430	897210	874950
15	640890	670840	692920	787540	896050	870410
16	650330	671600	694170	791000	896050	865330
17	650780	672350	695420	793440	896820	859170
18	651220	673110	696670	795870	897210	853050
19	651800	673860	697920	798320	898180	847700
20	652390	674620	699180	801120	901100	841860
21	652980	675540	700430	804450	901100	838240
22	653570	676290	701690	808500	902080	833190
23	654160	677210	703260	814190	903050	826890
24	654750	678120	705160	820260	904230	819910
25	655490	678890	707370	826350	905790	813120
26	655930	679650	709910	833550	907750	805330
27	656520	680270	712450	841860	909720	797970
28	657110	681030	715010	849540	912080	792740
29	657710	.....	717550	855450	914450	784950
30	658150	.....	721420	858430	917630	777560
31	658740	.....	725300	.....	920800	.....
Total	20157220	18770540	21606330	23748740	27714000	25923200
Mean	650233	670376	696978	791625	894000	864106
Max.	658740	681080	725300	858430	920800	928790
Min.	641720	659290	681800	729840	862900	777560

PATHFINDER STORAGE, IN ACRE FEET, FOR YEAR 1919 (Cont.).

Day	July	August	September	October	November	December
1	770050	541080	343650	230140	174270	199730
2	762950	534540	337790	227300	174970	200460
3	755230	527920	332240	225220	175720	201310
4	748570	520110	326670	223220	176880	202290
5	741950	512900	321160	220750	178030	203140
6	734890	505790	316090	218080	179080	204000
7	727740	498080	311410	215390	180070	204730
8	720780	492350	306180	213190	180840	205480
9	713250	485330	301640	211000	181620	206160
10	706420	478740	297060	208890	182400	206780
11	698550	472220	292580	205910	183130	207400
12	690290	465540	288030	203320	183800	208020
13	682410	458820	283650	200760	184420	208640
14	674470	452080	280100	198320	185030	209260
15	667230	445190	277020	195960	185590	209820
16	659780	439230	273400	193600	186620	210380
17	652250	432810	270190	191260	187720	210930
18	644330	427080	267000	188940	188880	211490
19	636740	421340	264000	186670	190040	212120
20	629720	415080	261190	184470	191200	212750
21	622570	408980	258690	182460	192300	213500
22	615500	402820	255850	180450	193480	214390
23	608550	396630	252590	178480	194660	215390
24	601230	390640	240660	176380	195840	216420
25	593970	384900	246780	174430	196670	217440
26	585820	379050	243630	172480	197370	218470
27	577740	372720	240890	170490	197960	219380
28	570710	366850	238090	171030	198440	220100
29	563210	360840	235730	171840	198810	220810
30	556310	355040	232900	172650	199180	221460
31	548700	349640	.....	173460	.....	222110
Total	20451910	13694340	8396860	6066540	5615020	6534360
Mean	660061	441752	279895	195694	187167	210785
Max.	770050	541080	343650	230140	199180	199730
Min.	548700	349640	232900	170490	174270	222110

PATHFINDER INFLOW, IN SECOND FEET, FOR YEAR 1920.

Day	January	February	March	April	May
1	320	510	560	910	2050
2	310	600	640	880	1950
3	350	630	560	830	3190
4	350	590	440	700	8250
5	320	450	400	740	7900
6	350	560	520	1380	9030
7	320	590	490	1390	8860
8	280	750	520	1940	8940
9	320	750	560	2980	8680
10	250	610	650	5750	8380
11	460	530	850	6300	8510
12	320	680	940	6370	9020
13	290	750	860	5170	10000
14	430	680	1140	3300	9520
15	290	500	1630	3410	7780
16	360	500	1130	4320	6830
17	430	460	1130	4320	7850
18	360	540	1430	3840	7280
19	290	620	1100	3890	7720
20	400	510	1020	2810	8510
21	330	580	930	1710	8800
22	330	630	1530	1710	9880
23	360	710	2130	1720	11120
24	400	550	1860	1730	11560
25	300	520	1740	1570	11960
26	440	590	1990	1690	11720
27	510	560	2570	1420	13650
28	470	560	2280	1190	13920
29	400	480	1360	1790	14480
30	580	.....	1540	1560	13290
31	440	.....	1270	.....	13180
Total	11460	16990	35770	78320	283810
Mean	369	586	1154	2610	9155
Acre Ft.	22730	33699	70950	155347	562928
Max.	580	750	2570	6370	14480
Min.	290	450	400	700	1950

PATHFINDER INFLOW, IN SECOND FEET, FOR YEAR 1920 (Cont.).

Day	June	July	August	September	October
1	13800	6390	1400	560	440
2	15340	6040	1080	710	610
3	14840	5790	1040	910	510
4	11840	4870	1400	950	460
5	11670	4430	1870	820	350
6	12450	4220	1600	730	340
7	11320	3930	1210	430	440
8	12580	3620	1540	390	610
9	12900	3090	1350	360	570
10	14610	3520	1390	380	680
11	15020	2440	1020	330	750
12	14870	2480	760	370	750
13	15130	3030	860	410	830
14	14190	2160	1280	370	710
15	13680	2740	1500	420	550
16	12950	2840	990	520	540
17	12610	2250	860	580	570
18	11850	2060	890	580	660
19	10780	1500	1120	820	490
20	9630	1750	1610	890	400
21	8470	2150	1030	1000	810
22	7860	1930	830	920	630
23	7130	1560	780	840	660
24	6790	1420	1550	830	740
25	7520	1880	2180	830	740
26	7050	1980	1450	840	740
27	7440	1560	930	610	660
28	6860	1920	850	600	660
29	6160	1700	850	370	600
30	6540	1540	780	320	670
31	.....	1440	600	.....	670
Total	333880	88230	36600	18690	18840
Mean	11129	2846	1180	623	608
Acre Ft.	662239	174993	72575	37060	37358
Max.	15340	6390	2180	1000	830
Min.	6160	1440	600	320	340

PATHFINDER OUTFLOW, IN SECOND FEET, FOR YEAR 1920.

Day	January	February	March	April	May
1	15	15	15	15	15
2	15	15	15	15	15
3	15	15	15	15	15
4	15	15	15	15	15
5	15	15	15	15	15
6	15	15	15	15	15
7	15	15	15	15	15
8	15	15	15	15	15
9	15	15	15	15	20
10	15	15	15	15	20
11	15	15	15	15	20
12	15	15	15	15	20
13	15	15	15	15	20
14	15	15	15	15	20
15	15	15	15	15	20
16	15	15	15	15	20
17	15	15	15	15	20
18	15	15	15	15	20
19	15	15	15	15	20
20	15	15	15	15	20
21	15	15	15	15	20
22	15	15	15	15	20
23	15	15	15	15	20
24	15	15	15	15	20
25	15	15	15	15	20
26	15	15	15	15	20
27	15	15	15	15	20
28	15	15	15	15	4540
29	15	15	15	15	5350
30	15	....	15	15	5410
31	15	....	15	....	5410
Total	465	435	465	450	21210
Mean	15	15	15	15	684
Acre. Ft.	922	863	922	892	42070
Max.	15	15	15	15	5410
Min.	15	15	15	15	15

PATHFINDER OUTFLOW, IN SECOND FEET, FOR YEAR 1920 (Cont.).

Day	June	July	August	September	October
1	5450	6535	4210	3420	1500
2	5450	6225	4250	3275	1500
3	5475	5980	4235	3410	1500
4	6165	5660	4170	3600	1500
5	7150	5210	4160	3610	1500
6	7980	4845	4150	3490	1350
7	8350	4590	4140	3410	1500
8	9410	5375	4130	3075	1500
9	8435	5815	4110	2990	1500
10	9650	5760	4100	2990	1500
11	10930	6315	4085	2990	1500
12	11870	5830	4075	2940	1500
13	11560	6400	3815	490	1500
14	11755	5840	3900	1670	1500
15	12150	5620	4030	2940	1185
16	12260	5620	4020	2955	1165
17	11840	5620	3995	1500	1205
18	11430	5620	3855	1500	1500
19	11150	5620	3855	1500	1165
20	10670	5600	3900	1500	1165
21	9995	5600	3960	1500	1165
22	9310	5600	3930	1500	270
23	8640	5140	3610	1500	15
24	8015	4770	3700	1500	15
25	7730	4630	3900	1500	15
26	7460	4770	3900	1200	15
27	7370	4210	3885	1500	15
28	7240	4210	3800	1500	15
29	7020	4210	3710	1500	15
30	6710	4210	3695	1415	15
31	.....	4210	3615	.....	15
Total	268620	165640	122890	67870	29805
Mean	8954	5343	3964	2262	961
Acre Ft.	532808	328546	243752	134620	59118
Max.	12260	6535	4250	3610	1500
Min.	5450	4210	3610	490	15

PATHFINDER STORAGE, IN ACRE FEET, FOR YEAR 1920.

Day	January	February	March	April	May
1	222710	244760	277710	348380	505070
2	223300	245920	278940	350090	508910
3	223960	247140	290020	351710	515210
4	224620	248290	280870	353060	531540
5	225220	249160	281640	354500	547170
6	225890	250240	282640	357200	565050
7	226500	251390	283580	359930	582580
8	227030	252850	284590	363750	600270
9	227640	254310	285680	371620	617460
10	228100	255480	286930	383000	634040
11	228980	256500	288580	395470	650920
12	229590	257820	290420	408080	670240
13	230140	259280	292100	418300	690750
14	230970	260600	294340	424810	709590
15	231520	261560	297550	431550	724970
16	232210	262520	299750	440080	738990
17	233040	263410	301960	448620	754230
18	233730	264450	304770	456200	768020
19	234280	265650	306930	463880	782710
20	235040	266630	308920	469420	799020
21	235660	267760	310740	472780	815970
22	236280	268970	313740	476140	835350
23	236970	270340	317940	479530	857500
24	237740	271400	321500	482940	879890
25	238300	272400	324940	486020	903050
26	239140	273550	328850	489340	925590
27	240120	274630	333920	492120	951100
28	241030	275710	338410	494450	969090
29	241800	276630	341080	497960	986530
30	242920	.....	344100	501030	1001450
31	243770	.....	346600	.....	1016540

PATHFINDER STORAGE, IN ACRE FEET, FOR YEAR 1920 (Cont.).

Day	June	July	August	September	October
1	1032820	1127930	947420	761600	656520
2	1051980	1126740	940490	756230	654160
3	1070000	1125540	933420	750890	651800
4	1081980	1123150	927990	745250	649340
5	1090370	1120780	922970	739320	646810
6	1098360	1118880	917230	733420	644470
7	1103760	1116750	910900	727240	642150
8	1109170	1112720	905210	721750	639830
9	1117230	1106580	899150	716290	637660
10	1126020	1101430	893140	710860	635770
11	1133400	1093100	886210	705060	634040
12	1138450	1085830	879510	699500	632890
13	1144770	1078360	873250	698710	631350
14	1148830	1070450	867590	695420	629720
15	1151340	1064120	861970	689820	628290
16	1152070	1057820	855450	684570	626860
17	1152800	1050640	848810	682410	625430
18	1153050	1043040	842220	680270	623570
19	1152070	1034150	836250	678430	622000
20	1149630	1025770	831930	676900	621280
21	1145990	1018330	825990	675380	620570
22	1142350	1010070	819550	673860	621280
23	1138740	1002100	813300	672350	622570
24	1135600	994600	808500	670690	624000
25	1134650	988650	804450	668880	625430
26	1132950	982640	799020	667830	626860
27	1132710	976830	792740	665880	628150
28	1131520	971590	786500	663640	629430
29	1130320	965760	780650	661260	630580
30	1129130	959740	774310	658890	631880
31	.....	953560	767690	.....	633180

DAILY DISCHARGE, IN SECOND FEET, OF NORTH PLATTE RIVER AT WHALEN, WYOMING, FOR YEAR 1919.

Day	January	February	March	April	May	June
1	200	250	200	175	895	2182
2	200	225	200	175	805	3235
3	200	280	200	175	1053	3234
4	200	250	200	175	1002	3241
5	200	280	200	175	1305	3226
6	200	340	200	250	1388	3370
7	200	340	200	275	1392	3525
8	200	340	200	275	1392	3524
9	200	370	200	275	1187	3647
10	200	340	200	300	920	3667
11	200	370	200	325	925	3581
12	200	370	200	195	1037	2828
13	200	315	200	195	941	2879
14	200	340	200	195	597	2788
15	200	340	200	195	569	2927
16	200	370	200	305	545	2840
17	200	340	200	295	545	3205
18	200	340	200	295	1898	3701
19	200	280	200	295	1559	4672
20	200	280	200	305	1686	4798
21	200	280	200	497	1686	3698
22	200	250	175	425	1840	3073
23	250	225	175	562	1605	3023
24	250	225	175	646	2517	2940
25	250	200	175	865	2756	2948
26	275	200	175	805	2773	2937
27	275	200	175	720	2927	2901
28	300	200	175	1055	2828	2919
29	300	.....	175	1153	2881	2458
30	300	.....	175	1061	2940	2415
31	300	.....	175	.....	2792	.....
Total	6900	8140	5950	12639	49186	96382
Mean	222	290	192	421	1586	3212
Ac. Ft.	13686	16146	11802	25069	97560	191174
Max.	300	370	200	1153	2940	3667
Min.	200	200	175	175	545	2182

DAILY DISCHARGE, IN SECOND FEET, OF NORTH PLATTE RIVER AT WHALEN, WYOMING, FOR YEAR 1919.

Day	July	August	September	October	November	December
1	2928	2739	916	620	1011	80
2	2378	2142	1270	460	540	80
3	2503	2197	1118	545	420	80
4	2320	2033	1016	515	400	80
5	2449	1972	949	816	350	80
6	2023	2079	897	741	340	80
7	2023	1908	900	580	265	80
8	2142	1935	670	585	215	80
9	2084	1950	600	520	40	80
10	2132	1715	835	495	50	80
11	2076	2076	685	500	50	80
12	1770	1955	996	435	50	65
13	2051	1897	1333	425	50	65
14	2098	1933	1045	999	65	55
15	1833	1920	869	455	65	55
16	1739	1865	896	495	165	55
17	1625	1725	580	500	190	60
18	1585	1678	535	505	190	60
19	1658	1456	535	505	200	70
20	1575	1067	450	540	200	70
21	1565	1349	400	550	200	60
22	1641	1499	400	540	200	60
23	1562	1412	400	470	190	65
24	1525	1349	430	485	215	80
25	1734	1216	335	490	215	80
26	2020	1235	390	533	35	100
27	1995	1242	320	645	35	100
28	1947	1362	390	605	40	110
29	1992	1355	390	815	75	150
30	1798	1098	395	1440	90	125
31	3913	1066	.....	925	....	110
Total	62684	52425	20918	18734	6151	2475
Mean	2022	1691	697	604	205	79
Ac. Ft.	124334	103985	41491	37159	12201	4909
Max.	3913	2739	1333	1440	1011	150
Min.	1525	1066	320	425	35	55

DAILY DISCHARGE, IN SECOND FEET, OF NORTH PLATTE RIVER AT WHALEN, WYO., FOR YEAR 1920.

Day	January	February	March	April	May
1	120	205	60	260	1875
2	105	205	90	235	2412
3	170	180	35	241	3296
4	170	200	40	195	3623
5	90	205	40	172	4205
6	80	200	35	145	5195
7	65	205	55	197	5843
8	65	140	78	253	6710
9	90	194	133	263	6619
10	80	204	122	215	7011
11	80	151	159	987	7134
12	70	120	204	1365	8839
13	70	76	410	1005	11195
14	80	76	297	741	9297
15	85	94	619	958	7720
16	90	52	246	876	6378
17	90	69	939	1382	5533
18	95	112	759	1849	5067
19	110	101	246	1733	5365
20	80	200	731	1250	5721
21	100	180	425	932	5523
22	120	180	710	1049	4940
23	105	105	431	1965	4034
24	145	25	420	1516	3687
25	130	40	939	1066	3162
26	130	25	893	1141	2799
27	100	30	607	1064	2696
28	110	45	700	798	2423
29	170	20	370	1242	1899
30	180	....	260	1766	3441
31	180	....	293	.....	5615
Total	3355	3639	11346	26861	159257
Mean	108	121	366	895	5137
Acre Ft.	6655	7208	22495	53269	315876
Max.	180	205	939	1965	11195
Min.	70	20	35	145	1875

DAILY DISCHARGE, IN SECOND FEET, OF NORTH PLATTE RIVER AT WHALEN, WYO., FOR YEAR 1920 (Continued).

Day	June	July	August	September	October
1	5987	5741	2406	2350	1068
2	6165	5384	2566	2216	1022
3	5715	5031	2449	2151	1078
4	5622	4835	2577	1946	1187
5	5559	4720	2571	2137	1164
6	5615	4298	2472	2464	1158
7	6124	4157	2622	2352	1202
8	6636	3776	2605	2253	1176
9	6946	3400	2476	2437	1146
10	6880	3450	2333	2015	1122
11	6636	3594	2880	1838	1262
12	7447	3860	2657	1840	1197
13	8038	4211	2529	1867	1326
14	8461	4110	2568	1970	1304
15	7936	4451	2090	1664	1247
16	8617	3978	2273	1500	1190
17	8933	4129	2377	870	1190
18	10840	3905	2374	2036	772
19	9183	3861	2319	1725	848
20	9172	3835	2244	1154	1105
21	8449	3760	2434	769	1366
22	8422	3778	2551	759	892
23	8182	3805	2416	759	880
24	7742	3641	2314	615	847
25	7131	3630	2119	635	613
26	6803	3161	1787	652	550
27	6394	2970	2246	750	430
28	6739	3624	2682	891	368
29	6629	2713	2537	774	276
30	7308	2368	2327	1037	231
31	.....	2552	2432	.....	265
Total	220311	120728	75235	46446	29482
Mean	7344	3895	2427	1548	951
Acre Ft.	436987	239464	149229	92126	58477
Max.	10840	5741	2880	2464	1366
Min.	5559	2368	1787	615	231

ACTUAL DISCHARGE MEASUREMENTS, OF NORTH PLATTE RIVER AT TORRINGTON, WYOMING, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4- 5	T. C. Palmer	267.90	2.15	3.00	576.20	11
2	4-23	T. C. Palmer	345.40	2.20	3.35	760.00	11
3	4-29	T. C. Palmer	638.00	2.50	4.20	1596.60	11
4	5- 7	T. C. Palmer	583.10	2.45	4.00	1432.40	11
5	5-13	T. C. Palmer	496.30	2.46	3.80	1222.20	11
6	.....	John K. Rohrer	.....	.....	4.03	1319.00	11
7	.....	John K. Rohrer	.....	.....	5.55	3012.00	11
8	.....	John K. Rohrer	.....	.....	4.00	1394.00	11
9	6-17	T. C. Palmer	922.10	2.95	5.05	2720.70	18
10	6-29	John K. Rohrer	.....	.....	5.01	2664.00	....
11	7-12	John K. Rohrer	.....	.....	4.56	1988.00	....
12	7-23	Palmer-Woodman	730.40	2.52	4.32	1841.80	18
13	7-30	Palmer-Woodman	732.80	2.83	4.55	2073.70	18
14	7-22	John K. Rohrer	.....	.....	4.40	1875.00	....
15	8- 8	John K. Rohrer	.....	.....	4.50	1963.00	....
16	8-22	John K. Rohrer	.....	.....	3.85	1444.00	....
17	9-19	John K. Rohrer	.....	.....	3.85	1181.00	....

DAILY DISCHARGE, IN SECOND FEET, OF NORTH PLATTE RIVER AT TORRINGTON, WYOMING, FOR YEAR 1919.

Day	April	May	June	July	August
1	.....	1400	2350	2500	3400
2	.....	1275	2650	2650	2900
3	.....	1300	3100	2650	2350
4	.....	1325	3100	2650	2350
5	550	1325	3100	2350	2100
6	700	1400	3100	2200	1900
7	700	1400	3200	2050	1900
8	700	1500	3400	2350	1950
9	700	1400	3400	2350	1950
10	700	1275	3400	2150	1950
11	700	1275	3400	2175	1900
12	650	1225	3000	2100	1950
13	700	1175	3000	2025	1950
14	700	1100	3000	1950	1950
15	700	1100	2650	1950	1950
16	700	1100	2650	1725	1925
17	750	1000	2800	1950	1925
18	750	1000	3200	1750	1900
19	750	1400	3600	1950	1850
20	700	1725	4000	1800	1600
21	700	1725	3850	1850	1500
22	700	2100	3000	1900	1500
23	750	2350	2900	1850	1550
24	825	2100	2800	1650	1500
25	1200	2175	2650	1850	1500
26	1400	2550	2650	1850	1500
27	1400	2700	2650	1950	1500
28	1600	2650	2650	1950	1500
29	1600	2800	2650	1950	1500
30	1600	2650	2400	2050	1450
31	.....	2500	.....	3400	1450
Total	22925	52000	90300	65525	58100
Mean	881	1677	3010	2114	1874
Acre Ft.	45472	103142	179110	129969	115241
Maximum	1600	2800	4000	3400	3400
Minimum	550	1000	2350	1650	1450

ACTUAL DISCHARGE MEASUREMENTS, OF NORTH PLATTE RIVER AT HENRY, NEBRASKA, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-22	Woodman-Palmer	173.40	2.00	.....	347.40	23
2	8-15	T. C. Palmer.....	114.30	2.22	.....	476.20	23
3	9- 1	Palmer-Woodman	115.50	1.61	.....	185.40	23
4	9-10	T. C. Palmer.....	333.50	1.53	.....	51.08	23

NORTH PLATTE RIVER AT MORRILL, NEBRASKA, 1919-1920.

Location. About two miles south of Morrill.

Gages. One wooden staff nailed to a square staff about 15 feet up-stream from north end of old wooden highway bridge and under west side of north span of new state aid bridge. Also one wooden staff nailed to square pile about 75 feet up-streeam from new state aid bridge.

Bench Mark. No bench mark data is at hand concerning these gages. However, they have been referred to bench marks and information concerning their location and datum will be on file in the Department of Public Works.

Observer. ~~Francis Corder~~, ~~Myron Birdley~~, ~~Sam Richards~~, ~~1919~~; Virgil Q. Corder, ~~1920~~. 1922.

General. Because of the collapsible dam of the Enterprise Irrigation Ditch and ~~relation~~ between gage height and discharge has been found to be so inconsistent that no records of data discharge are ~~herewith published~~ for 1919. ~~Construction of~~ new state aid bridge ~~interfered with~~ the gagings more or less in 1920.

Elevation. 3980 feet.

Distance from Pathfinder Reservoir. 298 miles.

ACTUAL DISCHARGE MEASUREMENTS, OF NORTH PLATTE RIVER AT MORRILL, NEBRASKA, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4-24	T. C. Palmer	403.30	2.06	1.80	834.20	11
2	4-30	T. C. Palmer	615.10	2.59	2.25	1595.90	11
3	5- 8	T. C. Palmer	655.10	2.53	2.30	1659.50	11
4	5-14	T. C. Palmer	384.00	2.31	1.79	886.40	11
5	5-21	T. C. Palmer	321.10	1.92	1.70	617.00	18
6	6-12	T. C. Palmer	817.90	2.49	2.80	2042.90	18
7	6-18	T. C. Palmer	659.02	2.22	2.55	1464.70	18
8	6-25	T. C. Palmer	690.30	2.32	2.70	1604.90	18
9	7- 2	T. C. Palmer	501.40	2.18	2.50	1092.80	18
10	7-23	Palmer-Woodman	208.90	1.75	1.90	365.00	18
11	7-30	Palmer-Woodman	279.80	1.68	2.10	472.20	18
12	8- 2	T. C. Palmer	638.50	1.99	2.60	1276.90	18
13	8- 8	T. C. Palmer	410.90	1.87	2.30	769.70	18
14	8-15	T. C. Palmer	281.80	1.68	2.05 N 0.60 S	473.80	18
15	8-20	T. C. Palmer	329.70	1.83	2.16 N 0.70 S	602.70	18
16	8-27	T. C. Palmer	198.20	1.72	1.90 N 0.36 S	339.80	18
17	8-28	T. C. Palmer	194.70	1.60	1.90 N 0.35 S	311.30	18
18	9- 2	T. C. Palmer	165.20	1.47	1.80 N 0.30 S	243.10	23
19	9- 9	T. C. Palmer	156.90	1.51	1.80 N 0.32 S	236.80	23
20	9-24	T. C. Palmer	491.60	2.22	2.45 N 1.35 S	..... 1093.70	 23
21	10- 1	T. C. Palmer	501.70	2.18	2.32 N 1.00 S	1091.20	23
22	10- 8	T. C. Palmer	555.60	2.20	2.35 N 1.20 S	1224.90	18
23	10-21	T. C. Palmer	563.10	2.39	2.26 N 1.05 S	1347.50	18
24	10-30	T. C. Palmer	596.10	2.42	2.32 N 1.05 S	1442.80	18
25	11- 6	T. C. Palmer	479.20	2.31	2.10 N 0.80 S	1106.00	23

DAILY DISCHARGE, IN SECOND FEET, OF NORTH PLATTE RIVER AT MORRILL, NEBRASKA, FOR YEAR 1919.

Day	April	May	June	July	August	Sept.	October
1	.....	1400	1300	1000	3800	340	1200
2	.....	1450	1000	1250	1500	275	1525
3	.....	1450	1750	1190	950	325	1475
4	.....	1375	1800	1130	950	225	1425
5	.....	1300	2200	1070	850	240	1400
6	.....	1450	2200	1010	850	225	1350
7	.....	1550	1900	950	800	225	1500
8	.....	1650	1925	700	775	250	1300
9	.....	1450	2000	700	775	225	1400
10	.....	1450	2100	950	750	225	1150
11	.....	1300	1900	800	530	215	1175
12	.....	1150	1900	700	850	2550	1200
13	.....	1000	1550	525	600	2200	1200
14	.....	850	1550	325	600	2500	1225
15	.....	750	1400	325	525	2350	1750
16	.....	725	1250	450	600	1950	1450
17	.....	700	1150	550	690	2000	1200
18	.....	650	1350	425	690	1700	1150
19	.....	750	1550	425	700	1500	1150
20	.....	700	3500	475	530	1400	1175
21	.....	750	2800	550	410	1250	1400
22	.....	650	2100	550	325	1200	1550
23	.....	825	1450	325	380	1150	1350
24	850	900	1900	325	385	1150	1325
25	1050	1075	1700	225	380	1050	1150
26	1200	1300	1550	225	325	1100	1300
27	1300	1300	1700	325	325	1300	1275
28	1400	1450	1700	475	330	1000	1275
29	1450	1450	1400	425	325	1150	1275
30	1350	1525	1150	550	355	1175	1450
31	.....	1600	.....	600	360	.....	.....
Total	8600	35925	52725	19525	22215	32445	41025
Mean	1228	1159	1757	630	717	1081	1323
Acre Ft.	17058	71257	104580	38728	44063	64355	81373
Max.	1450	1650	3500	1250	3800	2550	1750
Min.	850	650	1000	225	325	215	1150

ACTUAL DISCHARGE MEASUREMENTS, OF NORTH PLATTE RIVER AT MORRILL, NEBRASKA, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	1- 3	T. C. Palmer	281.70	2.80	1.80	788.20	18
2	3-24	T. C. Palmer	470.70	2.23	2.00	1051.00	18
3	4-30	Palmer-Baumgartner	799.30	2.54	2.45	2032.70	18
4	5-17	T. C. Palmer	2664.70	3.58	4.40	9548.56	18
5	5-18	T. C. Palmer	2335.30	3.44	4.13	8027.40	18
6	5-19	T. C. Palmer	2363.80	3.28	4.05	7753.10	18
7	6-11	T. C. Palmer	2318.30	3.63	3.97	7421.50	18
8	6-19	T. C. Palmer	3301.80	3.58	5.15	11828.50	18
9	6-30	T. C. Palmer	2179.50	3.13	3.85	6815.50	18
10	7-15	T. C. Palmer	1181.30	2.71	3.10	3200.70	18
11	7-28	T. C. Palmer	805.40	2.28	2.78	1834.10	18
12	8-17	T. C. Palmer	648.90	2.26	2.55	1466.80	18
13	8-26	T. C. Palmer	478.70	2.08	2.50	998.00	18
14	9- 7	T. C. Palmer	728.70	2.36	2.80	1718.70	18
15	9-16	T. C. Palmer	420.90	2.23	2.35	938.70	9
16	9-27	T. C. Palmer	335.20	1.95	1.87	655.80	9
17	11- 9	T. C. Palmer	555.00	2.39	2.20	1325.20	9

DAILY DISCHARGE, IN SECOND FEET, OF NORTH PLATTE RIVER AT MORRILL, NEBRASKA, FOR YEAR 1920.

Day	April	May	June	July	August	Sept.
1	1100	2900	7200	6800	2000	2100
2	1050	2300	7200	6500	2700	1900
3	1150	3300	7400	5500	2500	1750
4	1050	4800	7200	5400	2000	1500
5	1050	5200	6700	5350	1750	1700
6	1350	6400	6700	4600	1900	1850
7	1150	7950	7000	2700	1450	2000
8	900	9000	7000	3200	1900	2000
9	1050	9800	6700	3200	2300	1900
10	1150	9800	7500	2300	2300	2000
11	1050	11900	7000	3500	1900	1900
12	1050	11900	7500	2700	1900	1900
13	1400	12000	8000	3400	1650	1900
14	1700	12700	8500	4100	2000	1500
15	1700	11000	9000	3600	1900	1450
16	1700	9500	9500	3600	1700	1500
17	1850	8900	10200	3900	1500	1050
18	2000	8100	11800	4200	1450	1000
19	2150	7950	11800	4600	1300	1000
20	2300	8100	11800	2300	1200	2500
21	2000	8100	11800	2000	1200	1900
22	2000	7950	11800	2300	1450	850
23	2000	7100	10600	2100	1750	750
24	2050	6100	10400	2300	1500	700
25	2100	5300	11200	2150	1450	850
26	2150	4600	8700	2000	1300	700
27	2150	3700	7500	1900	1200	650
28	2000	3200	7000	1750	1450	650
29	2000	2350	7600	2300	1900	600
30	2150	2100	7000	1500	2500	1050
31	.....	2200	.....	1400	2300	.....
Total	48500	216200	259300	103150	55300	43100
Mean	1617	6974	8643	3327	1784	1437
Ac. Ft.	96199	428832	514321	204598	109687	85488
Max.	2300	12700	11800	6800	2700	2000
Min.	900	2100	6700	1400	1200	600

NORTH PLATTE RIVER AT MITCHELL, NEBRASKA, 1920.

Location. At highway bridge one mile south of town in Section 27, Township 23 North, Range 56 West.

Record Available. From the 2nd of June, 1901, to July 10, 1913.

Drainage Area. 24,400 square miles. ~~≈~~ to 1912

Gages. No. 1 Enamel staff nailed to a square pile 50 feet upstream from south end of state aid bridge. No. 2 is a wooden staff nailed to old bridge pile 20 feet downstream from the south end of state aid bridge and set at same level as No. 1.

Bench Marks. A standard aluminum bench mark cap marked U. S. G. S. leading into the top of a two-inch gas pipe four feet long, located about 900 feet north and 50 feet east of the left end of the down-stream handrail.

Channel. The river channel narrows to 600 feet at the gaging station and widens to 1500 to 2000 feet one-quarter mile down-stream.

Accuracy. Affected by shallow water and shifting sand.

Observer. C. G. Waldo, ~~1920.~~ 1921 - 1922

Elevation. 3945 feet.

Distance from Pathfinder Reservoir. 304 miles.

ACTUAL DISCHARGE MEASUREMENTS, OF NORTH PLATTE RIVER AT MITCHELL, NEBRASKA, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	3-24	T. C. Palmer	522.30	2.17	1.65	1135.42	18
2	4-30	Baumgartner-Palmer	821.90	2.36	2.10	1938.60	18
3	5-17	T. C. Palmer	2690.90	3.33	3.72	8858.00	18
4	5-18	T. C. Palmer	2025.60	3.65	3.56	7403.10	18
5	5-19	T. C. Palmer	1997.70	3.55	3.30	7100.50	18
6	6-11	T. C. Palmer	1796.80	3.18	3.12	5726.50	18
7	6-30	T. C. Palmer	1890.30	3.32	3.05	6280.20	18
8	7-13	J. K. Rohrer	.....	.....	1.90	2783.00	....
9	7-15	T. C. Palmer	1061.00	2.67	1.85	2827.50	18
10	7-28	T. C. Palmer	670.90	2.53	1.60	1697.50	18
11	8-17	T. C. Palmer	530.60	2.37	1.40	1259.40	18
12	8-18	T. C. Palmer	529.30	2.32	1.35	1224.00	18
13	8-27	T. C. Palmer	358.20	2.10	1.03	752.20	18
14	8-26	T. C. Palmer	373.50	2.33	1.05	870.20	18
15	9- 9	T. C. Palmer	577.10	2.39	1.30	1376.10	18
16	9-16	T. C. Palmer	443.90	2.18	1.00	968.90	18
17	9-24	J. K. Rohrer	.....	.....	0.70	583.00	....
18	9-27	T. C. Palmer	246.80	2.14	0.82	528.70	18
19	11- 9	T. C. Palmer	560.80	2.41	1.30	1352.60	18

DAILY DISCHARGE, IN SECOND FEET, OF NORTH PLATTE RIVER AT MITCHELL, NEBRASKA, FOR YEAR 1920.

Day	May	June	July	August	Sept.	October
1	2700	6600	6100	1500	1000	600
2	2700	7100	5100	1500	1200	650
3	3600	7100	4900	2100	1200	650
4	4800	6900	4500	1600	1200	650
5	5500	6200	4100	1600	1200	850
6	6100	5700	3700	1800	1200	1050
7	7300	5700	3000	1700	1200	1050
8	8000	6200	2500	1550	1400	1050
9	8200	5900	2500	1450	1250	1050
10	8350	6600	2300	1500	1250	1100
11	8500	6900	2300	1450	1350	1150
12	8900	6600	2300	1700	1275	1150
13	9100	7500	3000	1800	1200	1050
14	9200	8900	3700	1800	1100	1150
15	9100	9800	3100	1400	800	1200
16	9050	9300	3100	1200	800	1150
17	8950	10400	3400	1000	800	1200
18	7600	11100	3800	1100	700	1250
19	7000	12600	4300	1200	750	1150
20	7200	10500	3400	1200	800	1150
21	7300	11100	2800	750	600	1150
22	7300	11100	2800	650	600	1300
23	6700	9700	2700	550	600	1350
24	6100	8900	2600	500	500	1300
25	5000	8400	2300	450	600	1250
26	4400	7400	2100	800	550	1050
27	3100	6600	2000	800	500	1150
28	2800	6000	1700	900	600	900
29	2400	6400	1700	1100	600	1050
30	2400	6100	1300	1200	600	1150
31	2400	.....	1500	1300	.....	1250
Total	191750	239700	94600	39150	27425	33200
Mean	6185	7990	3052	1263	914	1071
Ac. Ft.	380336	475445	187639	77544	54287	65742
Max.	9200	12600	1100	2100	1400	1350
Min.	2400	5700	1300	450	500	600

NORTH PLATTE RIVER AT MELBETA-MINATARE, NEBRASKA, 1919.

Location. On highway bridge between Melbeta and Minatare.

Gage. ~~Enameled~~ staff ~~nailed~~ to wooden abutment ~~on up-stream side of~~ bridge at south end.

Bench Mark. No bench mark data is at hand concerning this gage. However, it ~~has been~~ referred to bench marks and in formation concerning its location and datum will be on file in the Department of Public Works.

Observer. ~~L. E. Johnson, 1919.~~

General. The conditions at this station are very good, considering the conditions at the other stations as a whole. However, there is some tendency towards shifting sand preventing the best results. Width, 1500 feet. Due to the fact that during the gaging season of 1920 a new state aid bridge was under construction no gagings were made or data kept for 1920.

Elevation. 3820 feet.

Distance from Pathfinder Reservoir. 322 miles.

ACTUAL DISCHARGE MEASUREMENTS, OF NORTH PLATTE RIVER AT MELBETA, NEBRASKA, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5- 1	T. C. Palmer	1006.00	1.87	2.40	1888.30	11
2	5- 9	T. C. Palmer	1023.00	1.83	2.38	1871.60	11
3	5-15	T. C. Palmer	774.40	1.72	2.20	1333.20	11
4	5-22	T. C. Palmer	626.80	1.54	2.20	963.60	18
5	5-30	T. C. Palmer	817.70	1.70	2.22	1392.70	18
6	6-12	T. C. Palmer	1218.20	1.91	2.59	2334.20	18
7	6-20	T. C. Palmer	1264.30	2.04	2.65	2584.60	18
8	6-26	T. C. Palmer	883.60	1.72	2.30	1518.80	18
9	7-21	T. C. Palmer	411.30	1.48	2.00	607.90	18
10	8- 1	T. C. Palmer	397.60	1.48	2.05	590.20	18
11	8- 3	T. C. Palmer	574.90	1.65	2.10	949.40	18
12	8-28	T. C. Palmer	345.30	1.22	2.00	422.60	18
13	9- 4	T. C. Palmer	340.50	1.24	1.98	421.30	18
14	9-11	T. C. Palmer	396.50	1.29	2.00	514.80	18
15	9-26	T. C. Palmer	886.70	1.79	2.40	1585.50	18
16	10- 2	T. C. Palmer	837.10	1.76	2.38	1472.60	18
17	10-18	T. C. Palmer	937.70	1.83	2.45	1712.90	18

DAILY DISCHARGE, IN SECOND FEET, OF NORTH PLATTE RIVER AT MELBETA, NEBRASKA, FOR YEAR 1919.

Day	May	June	July	August	Sept.	October
1	1625	1150	775	750	500	1600
2	1625	900	850	2600	500	1600
3	1625	1150	900	1300	650	1700
4	1600	1625	900	1150	500	1825
5	1600	1800	1150	1000	575	1950
6	1650	1900	1300	1150	650	1950
7	1525	1900	1150	1000	675	1950
8	1525	1900	900	1000	700	1950
9	1500	2000	825	750	750	1825
10	1450	2000	750	750	750	1750
11	1375	2400	750	750	650	1600
12	1300	2150	750	750	650	1600
13	1200	1800	750	750	1500	1600
14	1100	1775	650	750	4000	1775
15	1000	1625	300	750	3500	1950
16	1000	1300	650	650	3200	1950
17	1000	1300	500	750	3000	1950
18	1000	1450	500	750	2750	1950
19	1000	1625	300	625	2500	1850
20	1000	2800	500	500	2200	1750
21	1000	3800	650	500	1900	1750
22	1000	3300	475	500	1600	1750
23	1000	1800	300	500	1700	1750
24	1000	1625	300	575	1750	1750
25	1000	1300	300	650	1600	1750
26	1000	1450	300	500	1600	1750
27	1025	1225	400	650	1750	1750
28	1025	1000	500	500	1950	1750
29	1050	1000	400	500	1775	1750
30	1050	1000	400	500	1600	1750
31	1300	.....	575	500	.....	2000
Total	38050	52000	19750	24350	47325	55575
Mean	1227	1733	637	785	1578	1793
Ac. Ft.	75472	103142	38174	48298	93869	110233
Max.	1625	3800	1300	2600	4000	2000
Min.	1000	900	300	500	500	1600

NORTH PLATTE RIVER AT BRIDGEPORT, NEBRASKA, 1919-1920.

Observer. Automatic Recorder.

Location. One-half mile north of town on the public road in Section 28, Township 20 North, Range 50 West.

Gage. Painted rod fastened in a concrete well on down-stream side at north end of concrete bridge.

Bench Marks. No. 1, a six-inch by six-inch stone marked U. S. & G. S., located in the northeast quarter of Section 32, Township 20 North, Range 50 West of the 6th P .M., 30 feet east of east gate of stock yards and 300 feet northwest of northwest corner of public school building. Elevation, 9.94 feet. No. 2, the regular aluminum U. S. G. B. M. cap set in a 28-inch by 12-inch stone, top of which is filled with concrete to form a truncated pyramid, located about fifty feet south and a little east of the northeast corner of lot four, block two, Riverside Addition to Bridgeport. Elevation, 11.32 feet. The concrete well constructed in second concrete pier of wagon bridge from the north end. The gage rod fastened on the inside of the well, zero of which is 15.18 feet below the top of the northwest corner of iron frame of door. Stevens' Long Distance Water Recorder has been in operation at this station since June, 1917.

Channel. The river channel narrows to 700 feet at the gage section, and widens to 3,000 feet one-half mile below.

Accuracy. It is difficult to obtain satisfactory results at this station because of the narrowed section and the shifting conditions of the sandy bed.

Observer. Automatic.

Elevation. 3,675 feet.

Distance from Pathfinder Reservoir. 341 miles

ACTUAL DISCHARGE MEASUREMENTS OF NORTH PLATTE RIVER AT BRIDGEPORT, NEBRASKA, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4- 2	Wade Flynn	54.20	1.74	5.90	959.20	10
2	4-10	Palmer-Manning	728.29	1.70	5.92	1241.45	11
3	4-22	T. C. Palmer	631.10	1.72	5.81	1088.50	11
4	4-26	T. C. Palmer	908.00	1.80	5.98	1637.10	11
5	5- 2	T. C. Palmer	975.00	1.82	6.15	1779.00	11
6	5- 9	Earl North	930.60	1.95	6.10	1802.00	10
7	5-16	T. C. Palmer	681.90	1.77	5.88	1207.00	11
8	5-23	T. C. Palmer	722.80	1.57	5.85	1139.10	18
9	5-26	T. C. Palmer	558.30	1.55	5.68	867.93	18
10	6- 6	T. C. Palmer	1045.00	1.89	6.20	1973.80	18
11	6-13	T. C. Palmer	1041.80	1.97	6.20	2050.90	18
12	6-27	T. C. Palmer	713.30	1.79	5.90	1275.10	18
13	7-11	T. C. Palmer	551.60	1.83	5.75	1008.30	18
14	7-18	T. C. Palmer	449.70	1.60	5.60	722.00	18
15	7-26	T. C. Palmer	222.30	1.31	5.33	290.30	18
16	8-23	T. C. Palmer	347.60	1.39	5.56	482.60	18
17	8-30	T. C. Palmer	320.70	1.33	5.49	427.60	23
18	9-12	North-Palmer	1357.90	2.22	6.72	3020.50	18
19	9-13	T. C. Palmer	1822.70	2.28	6.98	4163.20	18
20	9-20	T. C. Palmer	1020.20	1.97	6.14	2010.10	18
21	9-27	T. C. Palmer	852.60	2.08	6.00	1774.40	18
22	10-13	T. C. Palmer	971.90	1.83	6.10	1775.49	18
23	10-22	Earl North	1053.50	1.79	6.10	1883.72	10
24	11- 1	T. C. Palmer	977.60	2.13	6.21	2084.40	18
25	11-22	T. C. Palmer	842.10	1.90	6.01	1601.70	18

DAILY DISCHARGE, IN SECOND FEET, OF NORTH PLATTE RIVER AT BRIDGEPORT, NEBRASKA, FOR YEAR 1919.

Day	March	April	May	June	July	August	Sept.	October
1	.....	1150	1950	1400	1150	750	625	1550
2	.....	1150	1950	1400	1050	1500	675	1525
3	.....	1150	1950	1400	1050	2750	700	1525
4	.....	1150	1800	1250	1150	1800	750	1800
5	.....	1050	1700	1700	1400	1500	825	2150
6	.....	950	1925	2050	1400	1400	900	2100
7	.....	1400	1850	2050	1250	1150	900	2000
8	.....	1450	1800	2050	1500	950	950	2000
9	.....	1450	1800	2125	1650	900	950	2000
10	.....	1250	1800	2200	1300	1050	1050	1850
11	.....	1250	1950	2050	1050	1050	950	1850
12	.....	1250	1950	2050	850	950	2500	1850
13	.....	1250	1800	2050	750	675	4300	1800
14	.....	1460	1700	1950	750	700	3300	1800
15	.....	1275	1550	1550	850	675	3000	1850
16	.....	1275	1250	1475	750	600	2600	1850
17	.....	1400	1125	1300	750	600	2450	1800
18	.....	1400	1150	1150	800	750	2400	1850
19	.....	1250	1150	1150	675	700	2250	2250
20	.....	1150	1125	1450	675	700	2050	2225
21	.....	1150	1125	2350	600	625	2050	2025
22	.....	1050	1250	3000	600	675	2050	1850
23	.....	1050	1150	2750	525	650	2050	1800
24	.....	1050	850	2200	450	600	2050	1800
25	.....	1050	675	1800	350	625	1800	1800
26	1400	1500	750	1650	350	675	1775	1800
27	1400	1650	750	1300	300	700	1525	1800
28	1400	1700	850	1300	300	750	1525	1775
29	1400	1900	850	1150	350	600	1550	1800
30	1250	1950	850	1150	300	525	1550	1800
31	1150	.....	1150	.....	850	575	.....	1800
Total	8000	39160	43525	52450	25775	28150	52025	57675
Mean	1333	1305	1404	1748	831	908	1734	1860
Ac. Ft.	15868	77674	86332	104035	51125	55836	103192	114389
Max.	1400	1950	1950	3000	1650	2750	4300	2250
Min.	1150	950	675	1150	300	525	625	1525

ACTUAL DISCHARGE MEASUREMENTS, OF NORTH PLATTE RIVER AT BRIDGEPORT, NEBRASKA, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	3-30	T. C. Palmer	838.65	1.79	6.00	1497.00	18
2	4- 6	Baumgartner-Palmer	948.22	1.56	6.13	1484.40	10
3	4-25	Baumgartner-Palmer	1343.20	2.04	6.50	2736.60	10
4	4-27	Baumgartner-Palmer	1293.54	1.96	6.41	2532.00	10
5	4-28	Baumgartner-Palmer	1149.40	2.10	6.35	2418.30	10
6	5- 6	Baumgartner-Palmer	2041.65	2.41	7.00	4927.80	10
7	5- 7	Baumgartner-Palmer	2155.58	2.41	7.05	5196.50	10
8	5- 8	Baumgartner-Palmer	2459.70	2.42	7.40	5958.50	10
9	5-17	G. K. Baumgartner	3282.78	2.80	7.60	9478.81	10
10	5-19	G. K. Baumgartner	2629.50	2.72	7.00	7158.31	10
11	5-26	T. C. Palmer	1917.45	2.68	6.75	5146.70	18
12	6- 7	T. C. Palmer	2446.90	2.44	6.95	5980.50	18
13	6-16	T. C. Palmer	2876.40	2.66	7.44	7666.70	18
14	6-21	Baumgartner-Palmer	3840.90	2.91	7.85	10142.40	18
15	7- 6	T. C. Palmer	1518.10	2.46	6.32	3729.00	10
16	7-15	J. K. Rohrer	.....	.....	6.25	3491.00	....
17	7-17	T. C. Palmer	1472.90	2.16	6.35	3184.90	18
18	7-24	T. C. Palmer	1343.40	2.03	6.40	2723.10	18
19	8- 6	T. C. Palmer	1198.30	2.18	6.16	2611.90	18
20	8-11	T. C. Palmer	1118.90	1.84	6.16	2055.60	18
21	8-12	T. C. Palmer	1090.20	1.84	6.15	2007.40	18
22	8-21	T. C. Palmer	641.40	1.57	5.75	1009.40	18
23	8-24	T. C. Palmer	600.10	1.69	5.75	1010.00	18
24	9-11	T. C. Palmer	1155.20	2.03	6.25	2347.80	18
25	9-17	T. C. Palmer	944.90	1.82	6.08	1723.80	18
26	9-18	T. C. Palmer	937.70	1.74	6.02	1630.60	18
27	9-25	T. C. Palmer	714.10	1.61	5.77	1151.50	18
28	9-27	J. K. Rohrer	.....	.....	5.90	1638.00	18
29	10- 2	T. C. Palmer	829.60	1.70	5.94	1410.40	18
30	10- 9	T. C. Palmer	973.60	1.71	6.05	1665.20	18
31	11- 5	T. C. Palmer	1016.20	1.83	6.07	1855.40	18

DAILY DISCHARGE, IN SECOND FEET, OF NORTH PLATTE RIVER AT BRIDGEPORT, NEBRASKA, FOR YEAR 1920.

Day	April	May	June	July	August	Sept.	October
1	1500	2100	6000	6700	2100	2150	1100
2	1300	2200	7200	6200	2700	2150	1350
3	1300	2400	7400	4600	2300	2150	1350
4	1500	2700	7200	3600	2500	2150	1350
5	1500	3400	6000	3600	2200	2150	1450
6	1700	4900	6000	3600	2000	2150	1600
7	1700	5100	6000	3800	2200	2300	1550
8	1500	6400	6000	3600	2200	2300	1700
9	1400	7700	6000	3500	2200	2300	1700
10	1300	9200	6000	3500	2200	2300	1700
11	1400	9200	6500	3400	2200	2300	1700
12	1400	10400	6700	3400	2000	2300	1700
13	1300	10300	6700	3500	2000	2150	1700
14	1500	10000	7400	3500	2000	2000	1700
15	1700	11100	8600	3500	1900	1800	1700
16	1800	10300	8500	3500	1900	1800	1700
17	2100	9100	8100	3950	1600	1550	1700
18	2000	8100	8600	4100	1450	1600	1700
19	2400	6200	9400	4100	1450	1500	1700
20	2500	6200	10100	4600	1450	1400	1700
21	2500	6200	10200	3800	1100	1400	1700
22	2500	6200	10200	3500	1100	1400	1700
23	2400	7400	10000	3400	1100	1400	1850
24	2500	6700	9300	3100	1000	1300	1850
25	2850	6000	8600	2700	1000	1100	1700
26	2850	5100	8100	2600	900	1300	1600
27	2500	5200	7600	2400	900	1300	1600
28	2400	4600	7400	2400	1350	1200	1600
29	2400	4800	6500	2300	2150	1100	1600
30	2100	4800	6700	2100	2150	1100	1600
31	.....	4300	.....	2100	2150	.....	1400
Total	57800	198300	229100	110650	55750	53100	50050
Mean	1927	6396	7637	3569	1798	1770	1650
Acre Ft.	114646	393328	454420	219474	110580	106545	~~104350~~ 99474
Max.	2859	11100	10200	6700	2700	2300	1850
Min.	1300	2100	6000	2100	900	1100	1100

NORTH PLATTE RIVER AT BROADWATER, NEBRASKA, 1919-1920.

Location. At highway bridge about three-quarters of a mile south of Broadwater.

Gage. Wooden staff nailed to a pile in the abutment on the up-stream side of the bridge at the north end.

Bench Marks. On nail driven in base of second telephone pole north of river on east side of highway. Elevation, 100.34. Top of bolt driven in ground one foot west of above described telephone pole. Elevation, 100.00. Elevation of zero of gage is 9357.

Channel. Straight for about one mile above and one mile below the gage section. The section has been narrowed somewhat by the construction of bridge approach of earth.

Accuracy. Very satisfactory results are obtainable at this station, ~~including~~ the shifting condition of the sandy bed.

General. The width of the section is 1,800 feet, making actual measurements fairly accurate. ~~It should be an ideal station for gaging on~~ the North Platte River.

Observer. Ward Gibson, ~~1919; Grade Olinger, 1920~~.

Elevation. 3,620 feet.

Distance from Pathfinder Reservoir. 300 miles.

ACTUAL DISCHARGE MEASUREMENTS, OF NORTH PLATTE RIVER AT BROADWATER,, NEBRASKA, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4- 2	T. C. Palmer	822.00	1.73	2.35	1428.50	11
2	4-11	Palmer-North	902.20	1.57	2.32	1416.40	11
3	4-22	Earl North	900.70	1.65	2.27	1488.90	10
4	4-26	T. C. Palmer	1208.40	1.83	2.45	2219.60	11
5	5- 3	T. C. Palmer	1269.40	1.76	2.55	2238.80	11
6	5- 7	Earl North	1086.30	1.86	2.60	2017.30	10
7	5-10	Palmer-North	1129.10	1.71	2.49	1926.80	11
8	5-17	T. C. Palmer	792.30	1.83	2.40	1450.10	11
9	5-24	T. C. Palmer	768.70	1.60	2.31	1222.90	18
10	6- 7	T. C. Palmer	1269.60	1.77	2.50	2248.30	18
11	6-14	North-Palmer	1173.30	1.66	2.48	1952.10	18
12	6-28	T. C. Palmer	916.50	1.53	2.45	1406.90	18
13	7-17	T. C. Palmer	591.90	1.37	2.20	811.60	18
14	7-26	T. C. Palmer	333.20	0.94	2.00	313.80	18
15	8-11	T. C. Palmer	763.40	1.43	2.20	1094.10	18
16	8-29	Earl North	509.20	1.21	2.05	619.80	10
17	9-15	T. C. Palmer	1849.70	1.95	2.78	3602.10	10
18	9-29	T. C. Palmer	1162.50	1.71	2.45	1985.60	10
19	10- 6	T. C. Palmer	1282.70	1.70	2.55	2184.40	18
20	10-16	T. C. Palmer	1263.50	1.64	2.54	2077.00	18
21	10-21	Earl North	1509.80	1.94	2.50	2936.80	10
22	11- 4	T. C. Palmer	1191.60	1.86	2.53	2210.50	18

ACTUAL DISCHARGE MEASUREMENTS, OF NORTH PLATTE RIVER AT BROADWATER, NEBRASKA, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4- 8	Palmer-Baumgartner	949.93	1.63	2.45	1548.43	10
2	5- 7	Baumgartner-Palmer	2592.20	2.25	3.10	5842.40	18
3	5-18	G. K. Baumgartner	3408.60	2.69	3.55	9180.37	10
4	5-27	T. C. Palmer	2410.26	2.36	2.98	5705.60	18
5	6- 2	G. K. Baumgartner	2905.60	2.63	3.30	7646.44	18
6	6-15	G. K. Baumgartner	3442.60	2.49	3.40	8572.10	18
7	7- 7	G. K. Baumgartner	1843.90	2.57	2.85	4748.60	10
8	7-15	J. K. Rohrer	.....	.....	2.72	3624.00	....
9	7-23	G. K. Baumgartner	1421.10	1.93	2.55	2742.40	10
10	8-10	G. K. Baumgartner	1542.90	1.99	2.50	3069.66	10
11	8-13	T. C. Palmer	1130.60	1.73	2.38	1961.10	10
12	8-26	G. K. Baumgartner	794.80	1.61	2.20	1278.00	10
13	9- 1	T. C. Palmer	1484.10	1.89	2.55	2816.60	10
14	9-14	T. C. Palmer	1299.60	1.75	2.50	2277.70	10
15	9-28	J. K. Rohrer	.....	.....	2.25	1449.00	....

DAILY DISCHARGE, IN SECOND FEET, OF NORTH PLATTE RIVER AT BROADWATER, NEBRASKA, FOR YEAR 1919.

Day	April	May	June	July	August	Sept.	October
1	1550	2500	1550	1550	900	350	1800
2	1200	2500	1800	1200	1200	475	1550
3	1200	2250	1800	1200	1550	600	1350
4	1550	2000	1550	1350	2000	600	1550
5	1550	2000	1550	1550	1550	600	1550
6	1550	2000	2000	1550	1200	900	2000
7	1650	2250	2000	1350	1000	900	2250
8	1825	2000	2250	1800	1000	1000	2250
9	2000	2000	2550	1550	1100	900	2250
10	1350	2000	2550	1550	1000	1000	2000
11	1200	2000	2550	1550	900	900	2250
12	1200	2000	2000	1350	900	900	2000
13	1350	2000	2000	1350	700	1000	1800
14	1800	1550	2000	1350	600	3700	1550
15	1550	1800	1800	1200	600	3400	2500
16	1350	1550	1550	1200	600	2800	2250
17	1550	1550	1550	900	350	2500	2250
18	1550	1350	1200	900	350	2500	2250
19	1350	1200	1000	900	600	2500	2250
20	1350	1200	1200	900	700	2000	2250
21	1350	1200	1550	900	900	2000	2000
22	1200	1200	2250	900	700	2250	2000
23	1200	1000	3400	900	900	2250	2000
24	1350	1000	2000	600	700	2000	1550
25	1550	1000	1800	600	700	2000	1550
26	1800	1000	1550	350	600	1800	1550
27	1800	1200	1550	350	600	1550	1550
28	2000	1200	1350	350	600	1550	1550
29	2300	1200	1550	350	600	1550	1550
30	2400	1200	1550	350	350	1800	1550
31	.....	1200	.....	1200	350	.....	1550
Total)	46625	50100	55000	33100	25800	48275	58300
Mean	1554	1616	1833	1068	832	1609	1880
Acre Ft.	92480	99373	109093	65654	51174	95753	115638
Max.	2400	2500	3400	1800	2000	3700	2500
Min.	1200	1000	1000	350	350	350	1350

DAILY DISCHARGE, IN SECOND FEET, OF NORTH PLATTE RIVER AT BROADWATER, NEBRASKA, FOR YEAR 1920.

Day	April	May	June	July	August	September
1	.....	2300	4500	6500	2500	2700
2	.....	2300	7500	7200	3700	2200
3	.....	2900	7000	6500	3700	2400
4	.....	3600	7500	5700	2500	2400
5	.....	4700	7500	5000	2500	2700
6	.....	5100	7500	5000	2500	3000
7	.....	5100	7000	4700	2200	1950
8	.....	5100	6600	4000	2100	2200
9	.....	4400	6200	3700	2000	2200
10	1250	4400	7000	3700	2700	2300
11	1600	4400	7000	3700	3000	2300
12	1600	6600	7500	3500	2200	2400
13	1600	6600	7500	3500	1800	2400
14	1600	8000	7700	3500	1700	2400
15	1800	8000	8500	3600	1700	2200
16	1800	11800	9200	3600	2000	2000
17	1800	10000	8500	4500	1600	1600
18	2000	8800	8500	3600	1600	1600
19	2500	6900	10600	3400	1450	1600
20	3000	5700	11500	3600	1600	1600
21	3300	5700	11300	3600	2000	1600
22	2900	8000	10900	3600	1300	1600
23	2900	7500	9900	3000	850	1450
24	2900	6900	9500	4500	2000	1450
25	2900	5700	9200	3000	2700	1450
26	2900	5700	8500	3700	1800	1450
27	2300	5000	7800	4400	1300	1600
28	2300	5000	7500	3300	2200	1600
29	2300	5000	7100	3000	2000	1450
30	2300	3600	6500	2200	2000	1300
31	.....	3600	.....	2500	2200	.....
Total	47550	178400	243000	125300	65400	59100
Mean	2264	5755	8100	4042	2109	1970
Acre Ft.	94315	353856	481990	248532	129720	117224
Max.	3300	11800	11500	7200	3700	3000
Min.	1250	2300	4500	2200	850	1300

NORTH PLATTE RIVER AT BELMAR, NEBRASKA, 1919-1920.

Location. Highway bridge south of Belmar.

Gage. ~~Enameled section~~ Vertical staff nailed to the downstream pile of the north abutment of bridge.

Observer. ~~G. A. Parrish, 1919; Thomas Eggers, 1920.~~ Jones Ed Pratt 1921-1922

General. The river at this section is narrowed to 2,190 feet. Fairly accurate measurements are obtainable here.

Elevation. 3,230 feet.

Distance from Pathfinder Reservoir. 410 miles.

ACTUAL DISCHARGE MEASUREMENTS, OF NORTH PLATTE RIVER AT BELMAR, NEBRASKA, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4-19	Palmer-North	911.40	1.61	.98	1473.90	10
2	4-24	Earl North	961.90	1.54	1.12	1486.90	10
3	5- 6	Earl North	1355.20	1.73	1.20	2345.70	10
4	5-13	Earl North	1568.60	1.66	1.25.	2595.20	10
5	5-24	Earl North	847.30	1.54	1.00	1308.20	10
6	5-30	Earl North	754.90	1.28	0.95	964.80	10
7	6-12	Earl North	1501.60	1.82	1.30	2738.90	10
8	7-14	Earl North	619.10	1.45	0.85	899.50	10
9	8- 5	Palmer-Hartman	1341.90	1.76	1.30	2358.10	10
10	8-26	Earl North	548.20	0.99	0.85	542.60	10
11	8-30	Earl North	468.60	1.21	0.85	568.90	10
12	9- 8	Earl North	562.60	1.14	0.90	644.10	10
13	9-15	Earl North	1812.70	1.85	1.55	3356.60	10
14	10- 6	Earl North	1685.10	1.83	1.30	3075.30	10
15	10-17	Earl North	1701.60	1.89	1.25	3218.40	10

DAILY DISCHARGE, IN SECOND FEET, OF NORTH PLATTE RIVER AT BELMAR, NEBRASKA, FOR YEAR 1919.

Day	April	May	June	July	August	Sept.	October
1	.....	2500	1250	800	800	250	2500
2	.....	2750	2000	1050	1250	250	2200
3	.....	2750	2000	1250	1250	350	1750
4	.....	2750	2250	1250	1500	350	1750
5	.....	2750	2250	1250	2750	350	2200
6	.....	2750	2250	1250	1750	400	2500
7	.....	2750	2500	1250	1750	400	2500
8	.....	2500	2750	1250	1500	400	2200
9	.....	2250	2750	1250	1250	800	2200
10	.....	2500	3200	1750	1250	800	2200
11	.....	2750	3000	1750	1050	1050	2200
12	.....	2750	2500	1250	1050	1050	2200
13	.....	2500	2750	800	800	800	2700
14	.....	2500	2250	550	1050	2000	2500
15	.....	1750	2250	800	600	4500	2700
16	.....	1625	1750	800	350	3500	2700
17	.....	1500	1500	600	350	3200	2500
18	.....	1500	1750	400	250	2700	2500
19	.....	1250	1250	400	400	2700	2200
20	2000	1250	1050	400	400	2500	2200
21	2000	1050	800	400	1250	2700	2500
22	2000	1050	1250	400	1050	2700	2200
23	2000	800	2250	350	800	2700	2200
24	2000	1250	3200	350	800	2500	2000
25	1750	1250	2750	250	600	2500	2200
26	2000	1250	2250	250	600	2500	2700
27	2000	1250	2000	250	600	2200	2700
28	2000	1050	1250	150	600	2200	2700
29	2250	1050	1250	200	600	2200	2700
30	2500	1050	800	100	600	2500	2700
31	.....	1250	.....	250	.....	.....	2500
Total	22500	57925	61050	23050	29450	53050	73500
Mean	2045	1868	2035	743	950	1768	2370
Acre Ft.	44629	114894	121093	45720	58414	105225	145787
Max.	2500	2750	3200	1750	2750	4500	2700
Min.	1750	1050	800	100	250	250	1750

ACTUAL DISCHARGE MEASUREMENTS, OF NORTH PLATTE RIVER AT BELMAR, NEBRASKA, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-14	Baumgartner-Palmer	4931.40	2.67	2.50	13165.90	10
2	5-24	G. K. Baumgartner	3592.40	2.40	2.20	8638.30	10
3	6- 2	G. K. Baumgartner	2778.70	2.09	1.74	5810.70	10
4	6- 8	G. K. Baumgartner	3515.40	2.25	2.00	7895.50	10
5	6-16	G. K. Baumgartner	3910.20	2.46	2.20	9622.60	10
6	6-25	G. K. Baumgartner	4876.30	2.72	2.55	13256.90	10
7	7- 2	G. K. Baumgartner	3153.80	2.28	2.00	7182.20	10
8	7-16	J. K. Rohrer	.....	.....	1.44	3373.00	....
9	7-19	J. K. Rohrer	2036.30	2.10	1.50	4281.80	10
10	7-28	G. K. Baumgartner	1774.30	1.88	1.40	3343.20	10
11	8- 6	G. K. Baumgartner	1774.40	1.92	1.40	3405.20	10
12	8-12	G. K. Baumgartner	1472.40	1.86	1.20	2746.10	10
13	8-23	G. K. Baumgartner	888.70	1.56	0.80	1392.70	10
14	9- 2	Palmer-Willis	1721.50	1.87	1.23	3218.90	10
15	9-29	J. K. Rohrer	.....	.....	1.00	1572.00	....

DAILY DISCHARGE, IN SECOND FEET, OF NORTH PLATTE RIVER AT BELMAR, NEBRASKA, FOR YEAR 1920.

Day	May	June	July	August	September	October
1	.....	4100	7900	2700	1850	1850
2	.....	5000	8400	2900	2500	1800
3	.....	8400	9500	2900	2750	1700
4	.....	10500	6400	3900	2900	1550
5	.....	9500	6000	3100	2800	1700
6	.....	9000	5000	3400	2800	1850
7	.....	8400	5700	3200	2950	1850
8	.....	7400	5000	2900	2900	1700
9	.....	6900	4400	2900	2900	1850
10	.....	6900	4400	2900	2900	1850
11	.....	6900	3400	2500	2800	1850
12	.....	7400	3400	2500	2900	1550
13	.....	8400	2900	2700	2500	1850
14	.....	7400	2900	2500	2500	1850
15	.....	8400	3400	2500	2500	1850
16	.....	9000	3600	2500	2500	1850
17	.....	9500	3900	2500	2500	1850
18	.....	9500	3400	2150	2150	1850
19	.....	11800	3400	2150	2150	1850
20	9500	12900	3400	2150	2500	1850
21	9000	14300	3600	2150	2500	1850
22	9500	13200	3600	2150	2500	1850
23	9500	12900	3100	2150	2150	1850
24	9000	12900	2900	1300	2000	1550
25	9000	13200	3900	1150	2000	1550
26	7300	11700	2900	1300	2000	1850
27	6500	11700	3100	1300	2000	2150
28	6000	10100	3400	1550	1900	2150
29	5000	10100	3400	1550	1850	2500
30	4400	9000	2900	1550	1850	2150
31	5000	.....	2700	2150	.....	2150
Total	89700	286400	131900	73250	73200	57500
Mean	7475	9547	4255	2363	2440	1855
Ac. Ft.	177920	568074	261263	145292	145182	114051
Max.	9500	14300	9500	3400	3100	2500
Min.	4400	4100	2700	1300	1850	1550

NORTH PLATTE RIVER AT NORTH PLATTE, NEBRASKA, 1919-1920.

Location. At highway bridge one-half mile north of North Platte ~~at~~ Section 28, Township 14 North, Range 30 West, ~~one mile below mouth of Front Creek and~~ four and one-half miles above the junction with the South Platte.

Record Available. ~~From February 25, 1895, to September 30, 1914.~~ from 1895 to 1909, and 1911 to [illegible] for open season.

Gage. A staff gage installed October 15, 1910. From October 5, 1894, to May 31, 1910, the gage was a vertical staff at the railroad bridge two miles east of North Platte. On March 25, 1910, the station was moved two miles up-stream to its present site and a chain gage reading to this datum was installed. This gage was stolen July 1, 1910, and the records interrupted until October 15, 1910, when the present staff gage was placed in position.

Datum. For 1916, .35 feet above previous gage.

Observer. ~~Raul Meyer, S. C. Mecombeer~~, 1919; A. W. Shilling, Jr., 1920.

Bench Mark. No. 1—The top of the southwest corner of the east concrete abutment of the U. P. bridge. Elevation, 8.20 feet above zero of the gage of that section. No. 2—Two square wrought iron nails in the east side of a telephone pole on the west side of the road at the gage at the highway bridge. No. 3—Two nails in each side of a telephone pole on the west side of the road at the south end of the bridge one foot above the ground. Elevation, 7.55 feet above zero of the staff gage at the highway bridge.

Channel. Straight for about 500 feet above and below the section at the highway bridge; very shifting.

Accuracy. Only fair because of the shifting nature of the river bed.

Elevation. 2,800 feet.

Distance from Pathfinder Reeservoir. 480 miles.

ACTUAL DISCHARGE MEASUREMENTS, OF NORTH PLATTE RIVER AT NORTH PLATTE, NEBRASKA, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4-14	Palmer-North	1383.00	2.07	3.75	2914.80	10
2	4-17	Palmer-North	1154.50	2.16	3.60	2495.90	10
3	4-29	Earl North	1087.20	2.21	3.55	2403.80	10
4	5- 2	Earl North	1121.90	2.03	3.55	2275.90	10
5	5-16	Earl North	1119.00	2.11	3.50	2365.20	10
6	5-21	Earl North	868.80	1.89	3.35	1641.60	10
7	6- 1	Earl North	1012.50	2.15	3.60	2174.60	10
8	6- 7	Earl North	1193.70	2.12	3.50	2531.60	10
9	7-17	Earl North	549.40	1.57	3.15	865.10	10
10	7-21	Earl North	431.20	1.66	2.90	717.80	10
11	7-25	Earl North	296.60	1.54	2.70	456.40	10
12	7-29	Earl North	140.35	1.25	2.50	175.70	10
13	8- 4	Earl North	718.60	1.71	3.30	1232.10	10
14	8- 7	Earl North	965.40	1.78	3.50	1719.80	10
15	8-11	Earl North	674.50	1.65	3.10	1113.80	10
16	8-14	Earl North	578.20	1.40	2.85	811.50	10
17	9- 2	Earl North	455.90	1.59	3.05	725.60	10
18	9-17	Earl North	1738.00	2.13	4.10	3700.90	10
19	9-19	Earl North	1511.50	2.00	3.90	3028.30	10
20	10- 9	Earl North	1229.10	1.98	3.90	2433.30	10
21	10-11	Earl North	1104.80	1.91	3.70	2113.70	10
22	10-29	Earl North	1204.20	1.93	3.80	2333.40	10
23	10-31	Earl North	1172.20	1.99	3.80	2341.20	10

ACTUAL DISCHARGE MEASUREMENTS, OF NORTH PLATTE RIVER AT NORTH PLATTE, NEBRASKA, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4-20	Baumgartner-Palmer	1689.10	2.51	3.00	4232.60	10
2	5-11	Baumgartner-Palmer	2688.50	3.04	3.72	8165.90	10
3	5-24	G. K. Baumgartner	2696.50	3.38	3.80	8945.60	10
4	5-29	G. K. Baumgartner	1844.50	3.20	3.00	5910.90	10
5	6-10	G. K. Baumgartner	2030.30	3.11	3.30	6306.10	10
6	6-15	G. K. Baumgartner	2178.50	3.13	3.30	6809.90	10
7	6-21	G. K. Baumgartner	3251.50	3.38	3.80	10995.80	10
8	7- 1	G. K. Baumgartner	2631.50	2.54	3.40	7675.20	10
9	7-12	G. K. Baumgartner	1725.70	2.35	2.50	4055.40	10
10	7-16	G. K. Baumgartner	1347.70	2.65	2.50	3576.80	10
11	7-17	J. K. Rohrer	.....	.....	2.50	3330.00	....
12	7-31	G. K. Baumgartner	1096.80	2.25	2.40	2478.40	10
13	8- 5	G. K. Baumgartner	1266.20	2.36	2.45	2988.40	10
14	8-16	G. K. Baumgartner	983.50	2.20	2.30	2165.80	10
15	8-21	G. K. Baumgartner	993.50	2.22	2.20	2209.70	10
16	9- 4	Palmer-Willis	1269.90	2.26	2.50	2874.40	10
17	9-30	J. K. Rohrer	.....	.....	2.25	1769.00	....

DAILY DISCHARGE, IN SECOND FEET, OF NORTH PLATTE RIVER AT NORTH PLATTE, NEBRASKA, FOR YEAR 1919.

Day	April	May	June	July	August	Sept.	October	Nov.
1	.....	1800	2400	1350	600	600	2125	2350
2	.....	1800	2250	1250	1150	600	2175	2300
3	.....	2250	2250	1600	1450	500	2200	2300
4	.....	2400	3200	2000	1400	400	2100	2350
5	.....	2300	3200	2150	1200	500	2075	2350
6	.....	2600	2850	2000	1700	500	1950	2300
7	.....	2400	2100	1600	1850	450	2250	2300
8	.....	2700	2000	1600	1450	450	2550	2300
9	.....	2600	4000	1450	1350	450	3000	.....
10	.....	2400	3600	1450	1350	450	2150	.....
11	.....	3050	3400	1450	1000	450	2300	.....
12	.....	2900	2700	1600	850	650	2300	.....
13	.....	2900	2250	1800	750	1350	2325	.....
14	.....	2900	2700	2000	650	1800	2325	.....
15	.....	2300	2400	1450	600	1950	2350	.....
16	.....	2100	2700	1150	600	2350	2350	.....
17	2400	2000	2400	1050	450	3550	2475	.....
18	2100	1850	1850	1150	300	3200	2525	.....
19	2100	2000	1850	1050	200	3200	2525	.....
20	2100	2000	2300	950	175	2850	2475	.....
21	2100	1850	1850	1150	100	2875	2475	.....
22	2100	1600	1850	1150	500	2875	2550	.....
23	2400	1450	1750	750	850	2700	2500	.....
24	2400	1350	2000	350	1000	2700	2450	.....
25	1850	1600	2850	200	1000	2700	2550	.....
26	1850	1600	2850	150	850	2550	2475	.....
27	1850	1600	2250	150	850	2350	2400	.....
28	2100	1250	1850	125	650	2150	2400	.....
29	1850	1350	1850	100	750	2000	2475	.....
30	1825	1050	1600	75	650	2100	2350	.....
31	.....	1600	.....	1150	650	.....	2350	.....
Total	29025	63550	73100	35450	26925	51250	73500	18550
Mean	2073	2050	2436	1143	868	1708	2371	2318
Ac. Ft.	57571	126051	144994	70315	53406	101654	145787	36794
Max.	2400	3050	4000	2150	1850	3550	2550	2350
Min.	1825	1050	1600	75	100	400	1950	2300

DAILY DISCHARGE, IN SECOND FEET, OF NORTH PLATTE RIVER AT NORTH PLATTE, NEBRASKA, FOR YEAR 1920.

Day	April	May	June	July	August	Sept.	October
1	.....	3500	5600	6200	2000	2600	1600
2	.....	3500	5600	6200	2000	2600	2200
3	.....	3500	5600	6200	1800	2800	2200
4	.....	3500	8600	6600	2900	2900	2300
5	.....	4200	8600	5600	2900	3100	2300
6	.....	4900	8600	5600	2900	2900	2300
7	.....	4200	8600	5600	2600	2900	2300
8	.....	4200	7800	5100	2600	2900	2500
9	.....	5500	7000	4300	2600	2900	2600
10	.....	6500	7000	3600	2600	2900	2600
11	.....	8900	6200	2900	2300	2900	2600
12	.....	10000	6200	2600	2300	2900	2500
13	.....	10000	6200	2300	2600	2900	2500
14	.....	10000	6200	2300	2300	2600	2500
15	.....	10000	7000	2100	2300	2600	2700
16	.....	10000	7000	1800	1800	4800	2900
17	.....	10000	7000	2900	1800	2100	2900
18	.....	10000	11000	2900	1800	2100	2900
19	.....	10000	11000	2800	1400	2600	2900
20	4200	8200	12700	2600	2300	2100	2900
21	4800	8200	13500	2600	1600	2300	2900
22	4800	8000	14500	2600	1600	2300	2900
23	4800	7200	13300	2600	1600	2100	2900
24	6300	7200	14000	2300	1600	2100	2900
25	5500	7200	14800	2300	1600	2200	2900
26	5500	6500	12500	2600	1600	2200	2900
27	4900	6500	10200	2600	1600	2200	2900
28	4900	5600	8600	2600	1600	2200	2900
29	4200	5000	7000	2300	2100	2100	2900
30	3900	4500	6200	2200	1800	2100	2900
31	.....	5000	.....	2000	1800	.....	2900
Total	53800	211500	268100	106900	64300	77900	82100
Mean	4891	6822	8937	3448	2074	2597	2648
Acre Ft.	106712	419510	531776	212036	127539	154515	162845
Max.	6300	10000	14800	6600	2900	4800	2900
Min.	3900	3500	5600	1800	1400	2100	1600

SOUTH PLATTE RIVER AT NORTH PLATTE, NEBRASKA, 1919-1920.

Location. Section 4 and 9, Township 13 North, Range 30 West, about four miles above its junction with the North Platte.

Records Available. From June 1, 1914, to ~~September 20, 1914~~.

Gage. Painted staff nailed to wooden pile on south side of river about 150 feet west of south end of new state aid concrete bridge.

Observer. ~~Paul Meyer, S. C. Mecomber, 1919;~~ A. W. Shilling, Jr., ~~1920~~.

Bench Mark. U. S. bench mark located on top of floor of the bridge on the west side at a distance of 132 feet north of the south abutment. Elevation, 2,808.46 feet above mean sea level.

Accuracy. Affected by shifting sand.

Elevation. 2,800 feet.

~~**Distance from Pathfinder Reservoir, 180 miles.**~~

ACTUAL DISCHARGE MEASUREMENTS, OF SOUTH PLATTE RIVER AT NORTH PLATTE, NEBRASKA, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4-14	North-Palmer	505.10	2.23	5.25	1228.00	10
2	4-17	North-Palmer	467.30	2.28	5.00	1066.00	10
3	4-29	Earl North	251.80	2.19	4.50	550.70	10
4	5- 2	Earl North	259.70	2.10	4.50	546.00	10
5	5-16	Earl North	324.50	2.17	4.70	705.20	10
6	5-21	Earl North	174.90	1.71	4.35	299.80	10
7	6- 1	Earl North	150.80	1.81	4.40	273.00	10
8	6- 7	Earl North	197.30	1.90	4.50	375.30	10
9	7-21	Earl North	.....	.....	.....	0.00	10

ACTUAL DISCHARGE MEASUREMENTS, OF SOUTH PLATTE RIVER AT NORTH PLATTE, NEBRASKA, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4-21	Baumgartner-Palmer	533.30	2.39	5.00	1273.40	10
2	5-11	Baumgartner-Palmer	625.10	2.58	5.25	1613.30	10
3	5-24	G. K. Baumgartner	397.80	2.27	4.75	903.50	10
4	5-29	G. K. Baumgartner	437.20	2.39	5.00	1043.20	10
5	6-10	G. K. Baumgartner	107.60	1.29	4.20	139.50	10
6	6-15	G. K. Baumgartner	62.50	0.96	4.00	59.80	10
7	7- 1	G. K. Baumgartner	157.70	1.54	4.35	243.60	10
8	7-12	G. K. Baumgartner	45.80	1.24	4.00	56.70	10
9	7-17	G. K. Baumgartner	6.60	1.11	3.70	7.35	10
10	9- 4	Palmer-Willis	102.50	1.28	3.00	132.00	10

DAILY DISCHARGE, IN SECOND FEET, OF SOUTH PLATTE RIVER AT NORTH PLATTE, NEBRASKA, FOR YEAR 1919.

Day	April	May	June	July	August
1	.....	450	350	30	60
2	.....	450	310	25	70
3	.....	350	225	50	100
4	.....	350	660	120	90
5	.....	400	700	200	90
6	.....	450	660	170	70
7	.....	350	450	150	80
8	.....	325	400	120	70
9	.....	550	860	100	60
10	.....	350	550	80	55
11	.....	500	350	60	30
12	.....	700	270	60	45
13	.....	860	250	60	30
14	.....	800	250	100	....
15	.....	700	250	90	....
16	.....	660	225	80	....
17	960	550	180	60	....
18	860	550	150	60	....
19	860	450	150	60	....
20	700	300	150	55	....
21	550	270	225	80	....
22	550	270	180	60	....
23	960	250	180	60	....
24	600	225	140	40	....
25	450	225	110	20	....
26	450	180	100	20	....
27	350	170	80	20	....
28	450	200	70	....	....
29	550	250	50	....	....
30	500	280	40	....	....
31	.....	250	....	70	....
Total	8790	12665	8565	2100	850
Mean	627	409	285	68	27
Acre Ft.	17435	25121	16989	4165	1686
Max.	960	860	860	200	100
Min.	350	170	40	....	....

DAILY DISCHARGE, IN SECOND FEET, OF SOUTH PLATTE RIVER AT NORTH PLATTE, NEBRASKA, FOR YEAR 1920.

Day	March	April	May	June	July	August	Sept.	October
1	900	450	1050	1200	350	.....	.....	250
2	900	500	1050	1050	250	.....	.....	130
3	2500	450	1050	1050	250	.....	.....	130
4	1600	450	1050	750	140	.....	130	130
5	1900	750	1050	600	140	.....	140	200
6	1600	600	1050	350	75	.....	175	200
7	750	400	1050	250	50	.....	200	130
8	1400	350	1050	250	75	.....	225	130
9	1100	500	900	140	100	.....	250	175
10	1600	350	1050	125	75	.....	250	175
11	1900	450	1200	75	75	.....	300	200
12	1900	1050	1600	75	60	.....	250	200
13	2300	1050	1900	75	60	.....	250	200
14	1100	1000	1700	75	40	.....	250	200
15	400	650	1700	140	30	.....	250	200
16	450	900	1700	140	10	.....	250	225
17	600	900	1400	140	10	.....	250	225
18	150	900	1400	50	10	.....	300	225
19	75	1200	1200	50	10	.....	300	225
20	250	1400	1200	140	10	.....	225	225
21	450	1200	1200	75	10	.....	200	200
22	500	1200	1050	50	5	.....	250	200
23	450	1200	900	50	....	.....	250	200
24	450	1550	750	140	....	.....	150	200
25	500	1550	750	350	....	.....	225	250
26	450	1700	600	450	....	.....	250	250
27	450	1550	450	450	....	.....	250	200
28	500	1350	250	400	....	.....	250	200
29	350	1200	900	400	....	.....	130	175
30	450	1050	1050	400	....	.....	130	200
31	450	.....	1200	.....	....	.....	.....	300
Total	28375	27850	34450	9490	1835	.....	6080	6150
Mean	915	928	1111	316	59	.....	203	198
Ac. Ft.	56281	55240	68332	18823	3640	.....	12059	12198
Max.	2500	1700	1900	1200	350	.....	300	300
Min.	75	350	250	50	.....	.....	.....	130

ACTUAL DISCHARGE MEASUREMENTS, NORTH PLATTE RIVER AT SUTHERLAND, NEBRASKA, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	8-22	Earl North	420.80	1.21	.....	509.70	10

PLATTE RIVER AT OVERTON, NEBRASKA, 1919-1920.

Location. Highway bridge two miles south of Overton. Section six (6), Township eight (10), Range twenty-one (21) West.

Gage. Vertical staff nailed to four inch pile at north end of bridge ~~and up-stream side~~.

Observer. Nils Brunzell, ~~1919-1920~~.

Channel. Straight at gaging station, reduced from natural width of about 2,000 feet to a little over 800 feet.

Elevation. 2,320 feet.

Distance from Pathfinder Reservoir. [illegible] miles.

ACTUAL DISCHARGE MEASUREMENTS, OF PLATTE RIVER AT OVERTON, NEBRASKA, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-19	Earl North	1154.00	2.34	3.60	2706.70	10
2	6- 6	Earl North	1686.70	2.60	3.90	4389.70	10
3	7- 1	Earl North	596.50	1.92	3.00	1143.80	10
4	7-18	Earl North	334.70	1.43	2.80	479.70	10
5	7-23	Earl North	295.60	1.39	2.70	410.00	10
6	7-26	Earl North	99.40	0.84	2.40	84.10	10
7	7-30	Earl North	.....	.....	.....	0.00	10
8	8- 5	Earl North	.....	.....	.....	0.00	10
9	8- 9	Earl North	197.20	1.56	2.60	307.90	10
10	8-13	Earl North	226.60	1.38	2.60	313.70	10
11	8-20	Earl North	.....	.....	.....	0.00	10
12	9- 4	Earl North	.....	.....	.....	0.00	10
13	9-18	Earl North	445.00	1.49	2.70	665.70	10
14	10-10	Earl North	1226.30	1.90	3.30	2324.00	10
15	10-30	Earl North	1219.10	1.89	2.90	2307.90	10

ACTUAL DISCHARGE MEASUREMENTS, OF PLATTE RIVER AT OVERTON, NEBRASKA, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4-16	Baumgartner-Palmer	1881.10	2.69	2.40	5059.70	10
2	5-27	G. K. Baumgartner	3024.90	3.45	2.35	10432.90	10
3	6-11	G. K. Baumgartner	2474.50	2.94	2.00	7281.30	10
4	6-14	G. K. Baumgartner	2101.50	2.90	1.90	6099.10	10
5	6-29	G. K. Baumgartner	2964.50	3.54	2.30	10485.30	10
6	7-14	G. K. Baumgartner	1452.00	2.56	1.50	3722.10	10
7	7-19	J. K. Rohrer	.....	.....	.....	2257.00	....
8	8- 3	G. K. Baumgartner	557.30	2.43	0.60	1355.30	* 10
9	8-18	G. K. Baumgartner	838.50	2.24	0.80	1877.40	10
10	9- 6	Palmer-Willis	1113.60	2.28	1.25	2543.90	10

DAILY DISCHARGE, IN SECOND FEET, OF PLATTE RIVER AT OVERTON, NEBRASKA, FOR YEAR 1919.

Day	May	June	July	August	September	October
1	.....	1100	1050	.....	275	1750
2	.....	1250	1500	.....	175	1050
3	.....	1750	850	....	.....	1050
4	.....	2450	950	.....	.....	1050
5	.....	2450	1050	....	.....	1300
6	.....	4400	1400	.....	.....	1550
7	.....	5000	1750	500	.....	1750
8	.....	5000	1150	350	.....	2100
9	.....	5000	1050	450	.....	1750
10	.....	4050	1250	650	.....	2100
11	.....	6400	1050	850	.....	2800
12	.....	5400	650	650	.....	2800
13	.....	3800	1200	350	.....	2800
14	.....	2300	1750	350	.....	2100
15	.....	2100	1050	100	.....	2800
16	.....	2100	1250	50	.....	2800
17	.....	2100	1250	....	1250	3250
18	.....	1750	650	.....	450	2800
19	.....	1600	500	....	3800	2650
20	.....	1750	575	....	2800	2450
21	.....	1900	650	....	2400	2450
22	1500	2175	850	....	2250	2800
23	1250	2450	650	....	2450	2450
24	1150	1600	200	....	2250	2450
25	1125	1250	200	....	2100	2450
26	1100	1050	90	....	2450	2725
27	1150	1750	50	....	1750	3000
28	1150	2600	10	....	1625	2800
29	1250	2925	....	200	1500	2800
30	1200	3250	....	350	1750	2800
31	1050	.....	....	300	.....	2450
Total	11925	83100	24625	5150	29275	71875
Mean	1192	2770	794	166	976	2318
Acre Ft.	23653	164829	48844	10215	58067	142564
Max.	1500	6400	1750	850	3800	3250
Min.	1050	1100	.....	.....	.....	1050

DAILY DISCHARGE, IN SECOND FEET, OF PLATTE RIVER AT OVERTON, NEBRASKA, FOR YEAR 1920.

Day	April	May	June	July	August	September
1	.....	7000	8100	13200	1600	1800
2	.....	6200	9400	10200	1600	1800
3	.....	5800	10200	7200	1600	1850
4	.....	5800	9400	8200	1600	1900
5	.....	6400	9700	9200	2000	2300
6	.....	6400	10600	10200	1900	2700
7	.....	7500	9700	9200	1800	2700
8	.....	8500	9550	8200	2000	2700
9	.....	9500	9400	7200	2200	2700
10	.....	10500	9400	8200	2200	2100
11	.....	10700	9400	7200	1800	2400
12	.....	15000	9400	7200	1800	2700
13	.....	16500	8300	5600	2000	3000
14	.....	18000	7200	3600	2000	3000
15	.....	18500	8200	3200	1900	3000
16	5100	19000	9200	2800	1800	3000
17	5700	17500	8200	2500	2000	3000
18	6100	21500	9200	2700	2000	2700
19	6500	18700	10500	3200	1600	2300
20	8000	16500	14000	4000	1600	1900
21	7000	14200	15000	3600	2700	1900
22	7300	12500	17000	3600	2600	2700
23	8200	10800	16000	2900	2500	2500
24	8500	9300	15000	2900	1800	3300
25	9000	11800	13000	2900	1450	2500
26	9500	13200	12000	3000	1300	2400
27	9500	11300	11000	3000	1450	2300
28	9500	9300	10500	3100	2400	2000
29	8500	8700	10600	1900	2200	2100
30	7500	8700	13700	1600	2000	2200
31	.....	8700	.....	1600	1800	.....
Total	115900	364000	334550	163100	59200	73450
Mean	7727	11742	10761	5261	1845	2448
Ac. Ft.	229887	721994	640372	323508	113456	145688
Max.	9500	21500	17000	13200	2700	3300
Min.	5100	5800	8100	1600	1300	1800

PLATTE RIVER AT LEXINGTON, NEBRASKA, 1919-1920.

Location. Highway bridge two miles south of Lexington, Section 20. Township 9 North, Range 21 West.

Gage. Vertical staff nailed to pile on revetment north end of bridge and up-stream side of bridge.

Bench Marks. The datum used since ~~1916~~ 1921 bears no relation to the datum used in former years.

Observer. Ray V. Duryea, ~~1919-1920~~. 1921-1922

Channel. Straight at gaging station, reduced from a width of about 2,000 feet to a little over 800 feet.

Elevation. 2389 feet

Distance from Pathfinder Reservoir. 535 miles.

ACTUAL DISCHARGE MEASUREMENTS, OF PLATTE RIVER AT LEXINGTON, NEBRASKA, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4-16	North-Palmer	1672.60	2.83	4.20	4739.50	10
2	4-30	Earl North	1258.60	2.13	3.90	2689.20	10
3	4-20	Earl North	1055.00	2.02	3.75	2133.80	10
4	6- 5	Earl North	1494.00	2.38	4.00	3563.40	10
5	7- 1	Earl North	671.50	1.88	3.70	1267.10	10
6	7-18	Earl North	331.30	1.46	3.25	483.90	10
7	7-23	Earl North	317.50	1.06	3.15	336.90	10
8	7-25	Earl North	98.30	0.62	2.90	61.10	10
9	7-30	Earl North	.....	.....	.....	0.00	10
10	8- 5	Earl North	131.50	1.01	2.95	132.30	10
11	8- 9	Earl North	633.00	1.55	3.60	984.10	10
12	8-12	Earl North	215.80	1.31	3.20	282.70	10
13	8-20	Earl North	.....	.....	.....	0.00	10
14	9- 3	Earl North	68.10	1.31	2.70	89.29	10
15	9-18	Earl North	1125.50	2.03	4.00	2283.40	10
16	10-10	Earl North	1263.40	2.01	3.90	2534.20	10
17	10-30	Earl North	1233.70	1.89	3.90	2341.40	10

DAILY DISCHARGE, IN SECOND FEET, OF PLATTE RIVER AT LEXINGTON, NEBRASKA, FOR YEAR 1919.

Day	April	May	June	July	August	Sept.	October
1	2950	2950	1600	1425	.....	80	2300
2	2950	3500	1850	1050	.....	70	1850
3	2950	2950	2950	550	.....	70	1425
4	3500	2625	2950	800	.....	80	1425
5	1425	2300	3500	1050	.....	70	1650
6	1850	2300	5250	1450	550	50	1850
7	2300	2950	5250	1850	250	....	1850
8	2300	2950	5250	1050	250	....	2950
9	2950	2300	5250	1050	1425	....	2950
10	4700	2950	5950	1050	1200	....	2950
11	4400	3225	5250	800	1050	....	3500
12	4100	3500	4700	550	550	....	3275
13	4400	4700	4700	1050	350	....	2950
14	4700	4100	3550	1050	250	....	2300
15	4700	4100	3250	1050	70	1425	3500
16	4700	4100	2950	1850	60	1850	3500
17	4100	3500	2300	1050	....	1050	3500
18	4100	2750	1850	800	....	4700	3500
19	2300	1850	1425	800	....	4100	3500
20	2625	1425	2300	550	....	4100	3500
21	2950	1425	2300	550	....	3800	2950
22	2300	1425	2300	550	....	3500	3500
23	1850	1425	2300	250	....	3500	2950
24	2300	1050	1425	250	....	4100	2950
25	2300	1050	1050	90	....	2650	3500
26	2950	1050	1050	90	....	2950	3500
27	2625	1050	2950	70	350	1425	3500
28	2300	1050	2950	50	350	1425	2950
29	2950	1050	1850	25	550	1425	3500
30	2950	1425	1850	25	140	1850	3500
31	.....	1425	.....	25	.....	.....	2950
Total	93975	74450	92100	22850	7495	44270	89975
Mean	3133	2401	3070	737	242	1475	2902
Acre Ft.	186399	147672	182680	45323	14866	87810	178465
Max.	4700	4700	5950	1850	1425	4700	3500
Min.	1425	1050	1050	25	.....	.....	1425

ACTUAL DISCHARGE MEASUREMENTS, OF PLATTE RIVER AT LEXINGTON, NEBRASKA, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4-16	Baumgartner-Palmer	1708.50	2.48	4.10	4237.40	10
2	5-27	G. K. Baumgartner	2824.10	2.99	4.20	8447.30	10
3	6-11	G. K. Baumgartner	2112.50	2.93	4.00	6199.40	10
4	6-14	G. K. Baumgartner	1990.50	2.92	4.00	5812.40	10
5	6-29	G. K. Baumgartner	2958.00	3.28	4.30	9697.80	10
6	7-14	G. K. Baumgartner	1328.80	2.58	3.50	3430.80	10
7	7-18	J. K. Rohrer	.....	.....	3.30	2043.00	....
8	8- 3	G. K. Baumgartner	594.90	2.11	3.20	1259.40	10
9	8-18	G. K. Baumgartner	853.50	2.17	3.55	1854.80	10
10	9- 5	Palmer-Willis	1125.10	2.34	3.80	1580.00	10
11	9-30	J. K. Rohrer	.....	.....	3.45	1580.00	....
12	11- 3	T. C. Palmer	1188.30	2.23	3.80	2644.10	18

DAILY DISCHARGE, IN SECOND FEET, OF PLATTE RIVER AT LEXINGTON, NEBRASKA, FOR YEAR 1920.

Day	April	May	June	July	August	Sept.	October
1	.....	5000	6200	7500	1600	1800	1800
2	.....	5000	6200	5500	1500	1600	1600
3	.....	5000	6200	5500	1700	2300	1700
4	.....	4400	7300	6200	1600	2300	1800
5	.....	4400	9700	6900	1800	2600	1800
6	.....	4400	9700	7500	2000	2600	2000
7	.....	6000	8600	6200	2150	2600	2000
8	.....	6000	10300	5500	2300	2600	2000
9	.....	6000	9700	4100	2450	2600	2000
10	4200	6000	8600	5500	2300	2900	2000
11	4200	6000	8600	4800	2300	2600	2000
12	4200	8400	8600	4100	2300	2300	2000
13	4200	11000	8000	3750	2100	2300	2600
14	5200	14000	8000	3400	1800	2600	2300
15	7000	14000	8600	3200	1700	2300	3300
16	4200	12000	7300	2500	1600	2600	2600
17	4200	11000	8500	2500	1800	2600	2600
18	4700	14000	8500	2500	2000	2300	2600
19	5200	11000	10400	3200	1600	2300	2600
20	7500	11000	14000	3200	3300	2000	2600
21	7000	8500	15000	2700	2600	2000	2900
22	7900	6000	16400	2700	2200	2000	2300
23	7900	5200	15800	2400	1800	2000	2300
24	8100	4400	14200	2400	1600	2300	2300
25	8500	5000	13600	2300	1250	2000	2300
26	9000	7000	12000	2100	1250	1900	2300
27	9000	4400	11500	2100	1100	1800	2600
28	9000	3800	10900	2500	1600	1800	2300
29	8000	3800	10900	2200	1600	1600	2600
30	7100	4600	9700	1900	1600	1800	2000
31	.....	5400	.....	1600	1800	.....	2100
Total	136300	222700	303000	118450	58300	67000	69900
Mean	6490	7183	10100	3820	1881	2233	2255
Acre Ft.	260241	431615	590890	224835	106529	123785	129537
Max.	9000	14000	16400	7500	3300	2900	3300
Min.	4200	3800	6200	1600	1100	1600	1600

ACTUAL DISCHARGE MEASUREMENTS, OF SOUTH PLATTE RIVER AT BIG SPRINGS, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4-26	Earl North	247.4	1.92	2.20	476.70	10
2	5-14	Earl North	324.9	1.93	2.20	619.60	10
3	5-29	Earl North	17.5	1.21	1.20	21.20	10
4	6-17	Earl North	22.3	1.02	1.00	22.86	10
5	7-12	Earl North	Est.	.....	.....	1.00	1
6	8-25	Earl North	17.8	1.01	1.55	18.00	1

DAILY DISCHARGE, IN SECOND FEET, OF SOUTH PLATTE RIVER AT BIG SPRINGS, NEBRASKA, FOR YEAR 1919.

Day	May	June
1	.....	75
2	.....	75
3	.....	75
4	.....	200
5	.....	200
6	.....	200
7	.....	200
8	.....	195
9	.....	150
10	.....	500
11	.....	500
12	.....	300
13	.....	50
14	600	50
15	600	50
16	500	50
17	500	40
18	400	40
19	300	30
20	250	30
21	200	30
22	100	25
23	50	25
24	50	25
25	40	25
26	40	25
27	40	25
28	40	25
29	75	25
30	75	25
31	75	....
Total	3935	3265
Mean	218	109
Acre Feet	7805	6476
Maximum	600	500
Minimum	40	25

ACTUAL DISCHARGE MEASUREMENTS, OF BAYARD SUGAR FACTORY DRAIN ONE MILE SOUTH OF FACTORY AT G. S., FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter/ No.
1	4- 3	T. C. Palmer	7.95	2.62	.....	20.86	11
2	4-22	T. C. Palmer	7.52	2.88	.....	21.70	23
3	4-28	T. C. Palmer	6.90	2.41	.....	16.64	23
4	5- 6	T. C. Palmer	6.90	2.63	.....	18.11	23
5	5-12	T. C. Palmer	8.05	2.83	.....	22.72	23
6	5-20	T. C. Palmer	6.90	1.93	.....	13.36	23
7	6- 3	T. C. Palmer	10.35	3.46	.....	35.81	23
8	6-10	T. C. Palmer	8.05	3.40	.....	27.38	23
9	7-19	T. C. Palmer	9.20	2 72	.....	25.02	23
10	7-22	T. C. Palmer	8.80	3.08	.....	27.07	23
11	8-13	T. C. Palmer	10.50	3.80	.....	49.72	23
12	9- 8	T. C. Palmer	14.95	4.10	.....	61.74	23
13	9- 4	T. C. Palmer	12.65	3.17	.....	40.12	23
14	9-22	T. C. Palmer	17.25	4.46	.....	76.95	23
15	9-30	T. C. Palmer	14.95	4.00	.....	59.67	23
16	10- 7	T. C. Palmer	12.65	3.65	.....	46.13	23
17	10-17	T. C. Palmer	12.65	3.90	.....	49.36	23
18	10-29	T. C. Palmer	13.80	3.26	.....	45.01	9
19	11- 5	T. C. Palmer	14.38	2.78	.....	40.00	23

DAILY DISCHARGE, IN SECOND FEET, OF BAYARD SUGAR FACTORY DRAIN, ONE-HAIF MILE SOUTHWEST OF BAYARD, FOR YEAR 1919.

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	23	23	22	21	14	33	26	33	40	58	43	39
2	23	23	22	21	15	36	25	34	40	56	42	39
3	23	23	22	21	16	36	26	35	40	55	41	39
4	23	23	22	21	17	35	26	35	40	52	41	39
5	23	23	22	21	18	34	26	36	45	50	40	39
6	23	23	22	21	18	33	26	37	50	48	40	39
7	23	23	22	21	19	32	26	38	55	46	40	39
8	23	23	22	21	20	31	26	38	62	46	40	39
9	23	23	22	21	21	29	26	39	63	47	40	39
10	23	23	22	21	22	28	26	39	64	47	40	39
11	23	23	21	21	23	28	26	40	65	48	40	39
12	23	23	21	21	23	27	26	40	66	48	40	39
13	23	23	21	21	22	27	25	41	67	48	40	39
14	23	23	21	22	21	27	25	41	69	49	40	39
15	23	23	21	22	19	27	25	41	70	49	40	39
16	23	23	21	22	18	27	25	40	71	50	40	38
17	23	23	21	22	18	27	25	40	72	50	40	38
18	23	22	21	22	17	27	25	40	73	50	40	38
19	23	22	21	22	16	26	26	40	74	49	39	38
20	23	22	21	22	14	26	26	40	75	49	39	38
21	23	22	21	22	14	26	26	40	76	48	39	38
22	23	22	21	22	15	26	27	40	77	47	39	38
23	23	22	21	21	17	26	27	40	75	47	39	38
24	23	22	21	20	19	26	28	40	73	47	39	38
25	23	22	21	18	20	26	29	40	70	46	39	38
26	23	22	21	15	23	26	29	40	69	46	39	38
27	23	22	21	14	25	26	30	40	67	46	39	38
28	23	22	21	13	26	26	31	40	65	45	39	38
29	23	....	21	12	28	26	31	40	52	45	39	38
30	23	....	21	13	30	26	32	40	60	44	39	38
31	23	....	21	....	33	....	33	40	....	43	....	38
T.	713	633	661	619	651	856	827	1207	1895	1499	1195	1193
M.	23	23	21.3	21	21	29	26	39	63	48	40	39
A.	1414	1256	1311	1228	1291	1698	1640	2394	3759	2973	2370	2366
Ma.	23	23	22	22	33	36	33	40	77	58	43	39
Mi.	23	22	21	12	14	26	25	33	40	43	39	38

Tot. Ac. Ft.,23 700; T.—Total; M.—Mean; A.—Acre Ft.; Ma.—Maximum; Mi.—Minimum.

ACTUAL DISCHARGE MEASUREMENTS, OF BAYARD DRAIN NO. 2, ONE MILE SOUTH OF BAYARD, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4- 3	T. C. Palmer	.....	.....	.....	.....	11
2	4-22	T. C. Palmer	3.22	0.36	.....	1.16	23
3	4-28	T. C. Palmer	3.40	0.44	.....	1.50	23
4	5- 6	T. C. Palmer	1.50	1.27	.....	1.90	23
5	5-12	T. C. Palmer	1.18	0.72	.....	0.85	23
6	5-20	T. C. Palmer	0.85	0.60	.....	0.51	23
7	9-30	T. C. Palmer	6.35	0.66	.....	4.19	23
8	10-29	T. C. Palmer	1.13	0.66	.....	0.74	23

ACTUAL DISCHARGE MEASUREMENTS, OF BAYARD DRAIN NO 3, AT B. & M. DEPOT, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4- 3	T. C. Palmer	7.55	2.04	.....	15.47	11
2	4-22	T. C. Palmer	5.30	1.55	.....	8.20	23
3	5- 6	T. C. Palmer	6.70	1.50	.....	10.00	23
4	5-12	T. C. Palmer	6.30	1.57	.....	9.91	23
5	5-20	T. C. Palmer	7.71	1.30	.....	10.06	23
6	6-10	T. C. Palmer	7.60	2.26	.....	17.18	23
7	6-23	T. C. Palmer	22.00	1.51	.....	33.30	23
8	7-28	T. C. Palmer	26.40	2.09	.....	55.20	23
9	9- 4	T. C. Palmer	25.95	2.69	.....	69.90	23
10	9- 8	T. C. Palmer	28.60	2.32	.....	66.28	23
11	9-30	T. C. Palmer	21.70	2.89	.....	62.88	23
12	10- 7	T. C. Palmer	22.00	2.44	.....	53.67	23
13	10-17	T. C. Palmer	26.40	2.00	.....	52.83	23
14	10-29	T. C. Palmer	28.45	1.88	.....	53.60	23
15	11- 5	T. C. Palmer	25.00	1.68	.....	42.18	23

DAILY DISCHARGE, IN SECOND FEET, OF BAYARD DRAIN NO. 3, FOR YEAR 1919.

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	30	25	21	16	9	14	38	57	69	61	49	40
2	30	25	21	16	9	14	39	57	69	60	46	40
3	30	25	21	16	10	15	40	58	70	59	45	40
4	29	24	20	16	10	15	40	58	70	57	44	40
5	29	24	20	15	10	16	41	59	69	56	43	40
6	29	24	20	15	10	16	41	59	68	55	42	40
7	29	24	20	14	10	16	42	60	67	55	42	40
8	28	24	19	14	10	17	43	60	67	54	42	40
9	28	24	19	13	10	17	43	61	66	54	42	40
10	28	24	19	13	10	17	44	61	66	54	42	40
11	28	24	19	13	10	17	45	62	66	53	41	40
12	28	23	19	12	10	18	45	62	65	53	41	40
13	28	23	19	12	10	19	46	62	65	53	41	40
14	27	23	19	12	10	21	46	63	65	53	41	40
15	27	23	19	11	10	22	47	63	65	53	41	40
16	27	23	18	11	10	24	47	63	64	53	41	40
17	27	23	18	10	10	25	48	64	64	53	41	40
18	27	23	18	10	10	26	49	64	64	53	41	40
19	27	22	18	9	10	27	50	64	64	53	41	40
20	27	22	18	9	10	29	51	65	64	53	41	40
21	27	22	17	9	10	30	51	65	63	53	41	40
22	27	22	17	8	10	31	52	66	63	53	41	39
23	27	22	17	8	11	32	52	66	63	53	41	39
24	26	22	17	9	11	33	53	66	63	54	41	39
25	26	22	17	9	12	34	54	67	63	54	41	39
26	26	22	17	9	12	35	54	67	63	54	41	39
27	26	21	17	9	12	36	55	67	63	54	41	39
28	26	21	16	9	13	36	55	68	63	54	40	39
29	25	....	16	9	13	37	56	68	63	54	40	39
30	25	....	16	....	14	38	56	68	62	53	40	39
31	25	....	16	....	14	....	57	69	....	51	....	39
T.	875	646	587	345	320	727	1480	1896	1892	1682	1254	1230
M.	28	23	18	12	10.3	24	47.50	61	63	54	42	40
A.	1735	1281	1164	684	615	1442	2936	3761	3753	3336	2487	2440
Ma.	30	25	21	16	14	38	57	69	70	61	49	40
Mi.	25	21	16	8	9	14	38	57	62	51	40	39

Tot. Ac. Ft., 25,634; T.—Total; M.—Mean; A.—Ac. Ft.; Ma.—Maximum; Mi.—Minimum.

ACTUAL DISCHARGE MEASUREMENTS, OF BIRDWOOD CREEK AT OLD GAGING STATION, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4-18	North-Palmer	93.55	1.94	1.40	182.39	10
2	5- 5	Earl North	92.70	1.92	1.35	178.84	10
3	5-15	Earl North	92.50	1.84	.....	170.44	10
4	5-23	Earl North	84.80	1.89	1.10	160.94	10
5	9- 2	Earl North	99.10	1.94	1.10	192.93	10

ACTUAL DISCHARGE MEASUREMENTS, OF BLUE CREEK AT OLD GAGING STATION, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4-19	North-Palmer	44.80	1.84	2.35	82.68	10
2	4-23	Earl North	41.50	2.18	2.35	90.47	10
3	5- 7	Earl North	47.75	1.94	2.40	92.59	10
4	5-12	Earl North	46.30	1.96	2.30	90.75	10
5	5-24	Earl North	26.60	1.56	1.80	41.52	10
6	5-28	Earl North	10.80	1.06	1.30	11.48	10
7	6-13	Earl North	8.50	0.99	1.30	8.46	10
8	6-20	Earl North	6.80	0.67	1.20	4.53	10
9	7- 7	Earl North	27.70	1.45	1.90	40.31	10
10	7-15	Earl North	.....	.....	.....	0.00	10
11	8- 5	Palmer-Hartman	5.77	0.94	1.20	5.38	10
12	8-30	Earl North	29.30	1.54	1.80	45.11	10
13	9- 8	Earl North	44.80	1.24	1.25	5.95	10

DAILY DISCHARGE, IN SECOND FEET, OF BLUE CREEK BELOW DITCHES AT MOUTH, FOR YEAR 1919.

Day	June	July	August	September
1	.....	1.00	4.00	1.00
2	.....	1.00	4.00	1.00
3	.....	1.00	9.00	1.00
5	.....	7.00	4.00	.....
6	.....	10.00	4.00	.....
7	.....	10.00	1.00	4.00
8	.....	11.00	1.00	5.00
9	.....	10.00	1.00	1.00
10	.....	1.00	1.00	1.00
11	18.00	1.00	4.00	2.00
12	20.00	1.00	48.00	1.00
13	10.00	1.00	4.00	3.00
14	10.00	1.00	4.00	4.00
15	10.00	1.00	4.00	4.00
16	10.00	1.00	7.00	35.00
17	1.00	1.00	8.00	40.00
18	5.00	1.00	10.00	30.00
19	7.00	1.00	16.00	28.00
20	7.00	1.00	86.00	28.00
21	1.00	1.00	86.00	28.00
22	3.00	1.00	87.00	10.00
23	3.00	18.00	87.00	10.00
24	3.00	10.00	76.00	10.00
25	2.00	1.00	81.00	10.00
26	1.00	1.00	76.00	10.00
27	1.00	1.00	72.00	45.00
28	1.00	1.00	70.00	25.00
29	40.00	1.00	51.00	27.00
30	4.00	3.00	47.00	35.00
31	.....	4.00	5.00	.....
Total	157.00	105.00	962.00	399.00
Mean	7.80	3.40	31.00	13.30
Maximum	40.00	18.00	87.00	45.00
Minimum	1.00	1.00	1.00	1.00
Acre Feet	311.00	208.00	1908.00	791.00

ACTUAL DISCHARGE MEASUREMENTS, OF BUFFALO CREEK BELOW CANAL, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-15	Palmer-Bailey	3.12	1.85	.....	5.78	23

ACTUAL DISCHARGE MEASUREMENTS, OF CAMP CLARK SEEP. ONE-QUARTER MILE NORTHWEST OF SCHOOL HOUSE, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4- 3	T. C. Palmer	1.50	1.01	.....	1.52	11
2	4-22	T. C. Palmer	1.73	1.48	.....	2.56	11
3	4-28	T. C. Palmer	1.32	0.94	.....	1.24	23
4	5-12	T. C. Palmer	1.43	1.13	.....	1.62	23
5	5-20	T. C. Palmer	1.06	1.32	.....	1.40	23
6	7-10	T. C. Palmer	3.70	1.94	.....	7.16	23
7	7-19	T. C. Palmer	4.15	2.14	.....	8.90	23
8	7-28	T. C. Palmer	5.38	1.96	.....	10.54	23
9	9- 8	T. C. Palmer	6.06	3.57	.....	21.62	23
10	9-30	T. C. Palmer	3.50	2.40	.....	8.41	23
11	10- 7	T. C. Palmer	3.65	2.02	.....	7.36	23
12	10-17	T. C. Palmer	2.95	1.68	.....	4.95	23
13	10-29	T. C. Palmer	3.75	1.58	.....	5.93	23
14	11- 5	T. C. Palmer	5.21	1.29	.....	6.71	23

ACTUAL DISCHARGE MEASUREMENT, OF CEDAR CREEK ABOVE BELMONT CANAL, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-10	North-Palmer	1.34	1.15	.....	1.55	23
2	5-17	T. C. Palmer	2.60	1.31	.....	3.41	23
3	5-24	T. C. Palmer	2.11	1.27	.....	2.68	23
4	6-14	North-Palmer	1.68	1.12	.....	1.88	23
5	6-28	T. C. Palmer	1.80	1.03	.....	1.85	23
6	9-29	T. C. Palmer	1.84	1.40	.....	2.60	23

ACTUAL DISCHARGE MEASUREMENTS, OF CEDAR CREEK BRIDGE AT MOUTH, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4- 3	Wade Flynn	6.90	1.56	.....	10.80	10
2	4-23	Earl North	11.98	1.25	.....	15.03	10
3	5- 3	T. C. Palmer	7.95	1.19	.....	9.52	23
4	5-10	Palmer-North	7.60	1.01	.....	7.70	23
5	6-14	North-Palmer	11.40	0.83	.....	9.43	23
6	8-11	T. C .Palmer	12.30	1.57	.....	19.30	23
7	9-15	T. C. Palmer	6.50	1.06	.....	6.90	23
8	9-29	T. C. Palmer	7.05	1.57	.....	11.00	23
9	10-16	T. C. Palmer	5.35	1.14	.....	6.11	23
10	10-21	Earl North	4.70	1.75	.....	8.24	23

ACTUAL DISCHARGE MEASUREMENTS, OF CLEAR CREEK AT FIRST BRIDGE ABOVE RIVER, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4-19	Palmer-North	4.30	1.62	.....	6.97	10
2	4-24	Earl North	5.06	1.36	.....	6.88	10
3	5- 6	Earl North	3.43	2.41	.....	8.28	10
4	5-13	Earl North	3.21	1.98	.....	6.53	10
5	5-24	Earl North	7.97	1.94	.....	7.38	10
6	5-26	Earl North	6.89	1.20	.....	8.29	10
7	9- 8	Earl North	1.60	1.08	.....	1.72	10

ACTUAL DISCHARGE MEASUREMENTS, OF CLEAR CREEK BELOW HOOPER DIVERSION, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	8-5	Palmer-Hartman	1.61	0.78	.....	1.23	23

ACTUAL DISCHARGE MEASUREMENTS, OF DRY SPOTTED TAIL AT GAGING STATION ABOVE ENTERPRISE, FOR YEAR 1919.

Taken by Enterprise Canal.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-21	T. C. Palmer	8.60	1.56	5.20	13.41	23
2	5-28	T. C. Palmer	19.50	0.61	6.25	11.85	23
3	6-11	T. C. Palmer	16.25	1.79	6.15	29.13	23
4	6-25	T. C. Palmer	15.08	1.95	6.15	29.48	23
5	7- 1	T. C. Palmer	15.95	1.82	.....	29.06	23
6	7-24	T. C. Palmer	17.53	2.17	6.25	37.97	23
7	7-29	T. C. Palmer	17.33	1.97	.....	34.09	23
8	8- 8	T. C. Palmer	20.60	2.41	6.45	49.67	23
9	8-16	T. C. Palmer	18.78	2.05	.....	38.51	23
10	8-21	T. C. Palmer	16.98	2.49	6.45	42.31	23
11	8-27	T. C. Palmer	21.60	2.43	6.40	52.55	23
12	9- 2	T. C. Palmer	19.08	2.38	6.40	45.37	23
13	9- 9	T. C. Palmer	18.35	2.60	6.30	47.73	23

See Table p 241

DAILY DISCHARGE, IN SECOND FEET, OF DRY SPOTTED TAIL, AT UPPER AND LOWER GAGING STATIONS. FOR YEAR 1919.

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	7	9	11	13	13	15	29	37	47	14	5	6
2	7	9	11	13	14	16	29	39	45	13	6	6
3	7	9	11	13	14	17	29	41	45	12	5	6
4	7	9	11	13	15	19	29	43	45	11	5	6
5	7	9	11	13	15	21	30	46	46	11	5	6
6	7	10	12	13	15	22	30	48	46	10	6	6
7	7	10	12	13	15	25	30	49	47	10	5	6
8	7	10	12	13	14	26	30	50	48	9	5	6
9	7	10	12	13	13	28	31	48	48	8	6	7
10	7	10	12	13	12	29	31	47	48	8	6	7
11	7	10	12	12	11	29	31	45	48	7	5	7
12	7	10	12	12	10	30	32	43	48	7	5	7
13	7	10	12	12	10	30	33	42	33	7	5	7
14	7	10	12	12	10	30	34	40	32	6	5	7
15	7	10	12	12	11	31	34	38	30	6	5	7
16	8	10	12	11	11	31	34	38	29	6	5	7
17	8	10	12	11	12	31	35	39	28	6	5	7
18	8	10	12	11	13	30	35	39	27	6	5	7
19	8	10	12	11	13	30	36	41	25	6	5	7
20	8	10	12	11	13	30	37	41	24	5	5	7
21	8	11	12	11	13	30	37	42	23	5	6	7
22	8	11	12	11	13	30	37	44	22	5	6	7
23	8	11	12	11	13	30	38	45	21	5	6	7
24	8	11	12	11	12	29	37	47	19	5	6	7
25	8	11	12	11	12	29	37	48	18	5	6	7
26	9	11	13	12	12	29	36	49	18	6	6	8
27	9	11	13	12	12	29	35	50	17	6	6	8
28	9	11	13	12	12	29	34	52	16	5	6	7
29	9	....	13	12	12	29	34	53	15	6	6	7
30	9	....	13	12	13	29	35	52	14	5	6	7
31	9	....	13	....	14	....	36	50	....	6	....	7
T.	239	283	373	360	382	813	1004	1386	972	227	164	211
M.	7.7	10	12	12	12.3	27	32.4	44.7	32.4	7.3	5.5	6.8
A.	474	561	740	714	758	1613	1991	2749	1928	450	325	419
Ma.	9	11	13	13	15	31	38	52	48	14	6	8
Mi.	7	9	11	11	12	15	29	37	14	5	5	6

Tot. Ac. Ft., 12,722; T.—Total; M.—Mean; Ma.—Maximum; Mi.—Minimum; A,— Acre Ft.

ACTUAL DISCHARGE MEASUREMENTS, OF DUCK CREEK SOUTHWEST OF HENRY ON STATE LINE, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	10- 1	Palmer-Woodman	4.80	1.39	.....	6.67	23

ACTUAL DISCHARGE MEASUREMENTS, OF EAST ENTERPRISE WASTE, ONE-HALF MILE SOUTH, ONE-HALF MILE EAST OF MITCHELL, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4- 4	T. C. Palmer.....	4.10	1.46	.....	6.00	11
2	4-23	T. C. Palmer.....	4.35	0.96	.....	4.20	23
3	4-29	T. C. Palmer.....	3.75	0.82	.....	3.10	23
4	5- 7	T. C. Palmer.....	4.20	0.89	.....	3.70	23
5	5-13	T. C. Palmer.....	3.25	0.83	.....	2.70	23
6	5-21	T. C. Palmer.....	2.65	0.97	.....	2.58	23
7	6-11	T. C. Palmer.....	4.65	1.11	.....	5.18	23
8	6-17	T. C. Palmer.....	2.65	0.76	.....	2.01	23
9	7- 1	T. C. Palmer.....	2.95	0.82	.....	2.40	23
10	7-23	T. C. Palmer.....	2.30	0.84	.....	1.93	23
11	7-29	T. C. Palmer.....	3.40	0.91	.....	3.09	23
12	9- 9	T. C. Palmer.....	3.70	0.93	.....	3.43	23
13	9-23	T. C. Palmer.....	16.70	2.80	.....	46.85	23
14	10- 1	T. C. Palmer.....	15.00	2.25	.....	33.97	23
15	10- 7	T. C. Palmer.....	15.55	2.32	.....	36.07	23
16	10-20	T. C. Palmer.....	14.10	2.16	.....	30.44	23
17	10-30	T. C. Palmer.....	12.25	1.93	.....	23.70	23
18	11- 6	T. C. Palmer.....	9.70	2.42	.....	23.50	23

ACTUAL DISCHARGE MEASUREMENTS, OF FANNING SEEP, 200 YARDS NORTH MITCHELL BRIDGE, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	8- 9	T. C. Palmer.....	9.70	1.00	.....	9.71	23
2	9-23	T. C. Palmer.....	5.54	1.04	.....	5.76	23
3	10- 8	T. C. Palmer.....	5.20	1.20	.....	6.26	23
4	11- 6	T. C. Palmer.....	4.00	1.07	.....	4.29	23

ACTUAL DISCHARGE MEASUREMENTS, OF FAIRFIELD SEEP, ONE-HALF MILE NORTH MELBETA BRIDGE, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-21	T. C. Palmer	1.61	1.39	.....	2.25	....
2	.....	.....	4.99	1.56	.....	7.78	....
3	.....	.....	3.20	1.63	.....	5.21	....

ACTUAL DISCHARGE MEASUREMENTS, ON FRENCHMAN RIVER, FOR YEAR 1919.

Bridge below Maranville Dam

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-14	Palmer-Bailey	4.30	0.72	.....	3.08	23

Below Champion Street plant

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-14	Palmer-Bailey	48.12	0.84	.....	40.29	18

At Culbertson

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	10-24	Palmer-Bailey	83.65	1.34	.....	112.23	18

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	10-23	Palmer-Bailey	50.33	1.88	.....	94.82	18

ACTUAL DISCHARGE MEASUREMENTS, OF GREENWOOD CREEK—FIRST, EAST OF HARRIS' HOUSE; SECOND, ONE MILE NORTH HARRIS' HOUSE; THIRD, SOUTH OF HARRIS' HOUSE; FOURTH AT NELSON DIVERSION—FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-27	W. F. Chaloupka	2.03	0.86	.....	1.75	9
2	8-10	W. F. Chaloupka	1.93	1.04	.....	2.00	9
3	8-10	W. F. Chaloupka	1.05	0.67	.....	0.70	9
4	8-13	W. F. Chaloupka	1.41	1.67	.....	2.35	9

ACTUAL DISCHARGE MEASUREMENTS, OF HORSE CREEK AT FIRST BRIDGE ABOVE GAGING STATION, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4- 4	T. C. Palmer	12.90	1.16	.....	15.00	11
2	4-23	T. C. Palmer	18.55	1.64	.....	30.41	11
3	4-29	T. C. Palmer	17.65	1.56	.....	27.58	11
4	5- 7	T. C. Palmer	10.70	1.04	.....	11.10	23

ACTUAL DISCHARGE MEASUREMENTS, OF HOTH SEEP, ONE MILE NORTH, THREE MILES WEST OF BAYARD, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4- 3	T. C. Palmer	2.27	1.72	.....	3.92	11
2	4-22	T. C. Palmer	1.83	1.53	.....	2.80	11
3	4-28	T. C. Palmer	1.75	1.55	.....	2.70	23
4	5- 6	T. C. Palmer	2.47	1.19	.....	2.96	23
5	5-12	T. C. Palmer	1.90	1.38	.....	2.62	23
6	5-20	T. C. Palmer	1.51	1.54	.....	2.33	23
7	6-10	T. C. Palmer	3.11	1.39	.....	4.32	23
8	6-29	T. C. Palmer	3.13	1.51	.....	4.72	23
9	7-28	T. C. Palmer	6.46	1.94	.....	12.55	23
10	8-25	T. C. Palmer	8.75	1.74	.....	15.26	23
11	9- 4	T. C. Palmer	9.90	1.62	.....	16.01	23
12	9- 8	T. C. Palmer	11.60	1.95	.....	22.66	23
13	9-22	T. C. Palmer	8.60	2.04	.....	17.50	23
14	9-30	T. C. Palmer	8.70	2.58	.....	22.45	23
15	10- 7	T. C. Palmer	7.25	2.46	.....	17.83	23
16	10-17	T. C. Palmer	7.70	2.41	.....	18.53	9
17	10-29	T. C. Palmer	8.30	1.65	.....	13.67	23
18	11- 5	T. C. Palmer	6.95	2.55	.....	17.71	23

DAILY DISCHARGE, IN SECOND FEET, OF HOTH SEEP, ONE MILE WEST AND ONE MILE NORTH OF BAYARD, FOR YEAR 1919.

Day	May	June	July	August	September	October
1	4	3	5	13	16	21
2	4	3	5	13	16	21
3	3	3	5	13	16	20
4	3	3	5	13	16	19
5	3	3	5	14	16	19
6	3	4	6	14	20	18
7	3	4	6	14	20	18
8	3	4	6	14	23	18
9	3	4	6	14	22	18
10	3	4	6	14	22	18
11	3	4	8	14	22	18
12	3	4	8	14	21	18
13	3	4	8	14	21	18
14	3	4	8	14	21	18
15	3	4	8	15	20	18
16	3	4	9	15	21	18
17	3	4	9	15	20	19
18	3	4	9	15	19	18
19	3	4	9	15	18	18
20	3	4	9	15	18	18
21	3	4	11	15	18	17
22	3	4	11	15	18	17
23	3	4	11	15	18	16
24	3	4	11	16	19	16
25	3	4	11	16	20	16
26	3	5	12	16	21	15
27	3	5	12	16	22	15
28	3	5	12	16	23	14
29	3	5	12	16	23	14
30	3	5	12	16	22	14
31	3	....	13	16	....	15
Total	95	120	268	455	592	522
Mean	3	4	8.7	14.7	19.7	16.8
Acre Ft.	188	238	531	902	1180	1034
Max.	4	5	13	16	23	21
Min.	3	3	5	13	16	14

Total Acre Feet, 4,074.

ACTUAL DISCHARGE MEASUREMENTS OF KRONBERG SEEP, 2 MILES EAST AND 2 MILES SOUTH OF MITCHELL, AT GAGING STATION, FOR YEAR 1919.

Sec 36-23-56

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	9- 9	T. C. Palmer	6.20	0.64	.....	3.95	23
2	.....	.....	5.90	0.63	.....	3.74	23

ACTUAL DISCHARGE MEASUREMENTS, OF LODGE POLE CREEK AT LOWER ST. GEORGE DAM, ON SECTION 36-14-49, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	10-10	Willis-Palmer	6.55	0.97	.....	6.34	9
2	10-10	Wilis-Palmer	4.83	1.18	.....	5.69	....

ACTUAL DISCHARGE MEASUREMENTS, OF MINATARE DRAIN, ONE MILE SOUTH AND ONE MILE EAST OF MINATARE AT G. S., FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4- 3	T. C. Palmer	41.95	1.90	2.05	83.44	11
2	4-22	T. C. Palmer	35.55	1.88	2.00	65.70	11
3	4-28	T. C. Palmer	36.75	1.89	2.00	69.70	11
4	5- 6	T. C. Palmer	36.35	1.88	2.00	68.54	11
5	5-12	T. C. Palmer	37.90	2.05	2.10	77.62	11
6	5-20	T. C. Palmer	34.80	2.85	2.14	99.32	18
7	6-10	T .C. Palmer	52.88	2.64	2.50	139.71	18
8	6-24	T. C. Palmer	55.81	3.02	2.60	168.53	18
9	6-30	T. C. Palmer	56.65	3.03	2.70	171.70	23
10	7-21	T. C. Palmer	62.10	3.05	3.05	189.37	23
11	7-28	T. C. Palmer	65.32	3.08	3.20	201.10	18
12	9- 4	T. C. Palmer	60.63	3.01	3.42	182.83	23
13	9- 8	T. C. Palmer	66.30	2.86	3.40	189.90	23
14	9-22	T. C. Palmer	62.45	3.10	4.45	193.89	23
15	9-30	T. C. Palmer	54.63	2.83	4.27	154.62	23
16	10- 6	T. C. Palmer	59.58	3.33	4.52	198.60	23
17	10-17	T. C. Palmer	53.38	3.04	4.25	162.71	18
18	10-29	T. C. Palmer	54.33	2.66	4.22	144.20	18
19	11- 5	T. C. Palmer	49.33	2.50	4.18	123.37	23

DAILY DISCHARGE, IN SECOND FEET, OF MINATARE DRAIN AT GAGING STATION, FOR YEAR 1919.

Day	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
1	70	73	111	183	214	181	80	146	146
2	72	67	111	183	220	164	88	138	146
3	73	73	111	198	235	196	44	154	154
4	67	73	126	189	217	179	94	164	164
5	58	67	111	187	225	177	94	154	164
6	73	73	126	208	208	212	112	164	154
7	46	73	126	204	207	197	130	164	154
8	30	73	120	205	213	172	130	154	154
9	97	81	126	177	203	172	180	146	154
10	81	81	143	203	208	225	164	138	154
11	89	81	150	205	207	225	155	154	164
12	81	73	143	202	205	260	164	146	164
13	81	73	143	197	196	260	164	138	164
14	89	73	143	196	187	260	164	138	154
15	73	58	159	188	177	260	154	146	154
16	81	73	183	200	176	260	164	146	146
17	73	97	135	199	184	240	164	154	138
18	73	81	135	186	180	230	164	164	146
19	67	103	135	190	178	230	164	154	138
20	67	81	150	188	176	210	164	146	146
21	67	89	180	180	174	200	164	154	138
22	67	81	159	205	166	190	170	154	146
23	58	81	159	190	190	180	164	164	154
24	67	89	164	190	182	139	164	164	146
25	67	97	164	202	173	94	170	154	146
26	67	81	164	208	172	62	170	146	138
27	67	89	164	213	184	104	164	154	146
28	73	97	180	203	192	112	164	154	138
29	67	97	180	196	183	112	164	164	146
30	67	120	183	194	183	94	170	154	146
31	....	164	....	....	176	....	164	....	154
Total	2058	2612	4384	6076	5991	5587	4565	4570	4656
Mean	68	84	146	196	193	186	147	152	150
Acre Ft.	4082	5181	8696	12052	11883	11082	9055	9065	9235
Max.	97	164	183	213	235	260	170	164	164
Min.	30	58	111	177	166	62	44	138	138

Total Acre Feet, 80,331.

DAILY DISCHARGE, IN SECOND FEET, OF NINE MILE DRAIN IN SECTION 1-21-53, FOR YEAR 1920.

(Minatare Drain)

Day	January	February	March	April	May	June
1	112	100	100	95	112	130
2	110	100	100	95	120	120
3	112	100	100	102	112	116
4	106	100	100	102	108	120
5	110	100	99	106	108	130
6	110	100	99	112	120	130
7	112	100	99	110	108	138
8	110	100	99	110	106	112
9	110	100	99	106	108	106
10	106	100	99	106	108	130
11	102	100	98	94	112	112
12	106	100	98	100	150	116
13	106	100	98	106	130	125
14	110	100	98	94	164	125
15	106	100	98	100	120	138
16	102	100	99	120	120	150
17	102	100	99	120	112	130
18	100	100	99	124	106	162
19	102	100	99	110	100	192
20	102	100	100	128	94	138
21	100	100	100	130	100	150
22	102	100	94	148	100	176
23	102	100	94	148	100	170
24	102	100	106	192	102	162
25	100	100	106	162	100	138
26	100	100	106	134	100	162
27	102	100	100	124	100	150
28	100	100	102	120	100	144
29	100	100	102	116	94	150
30	100	.....	106	120	120	150
31	100	.....	100	.....	120	.....
Total	3244	2900	3096	3534	3454	4172
Mean	104	100	100	117	111	139
Acre Ft.	6434	5752	6141	7010	6851	8275
Max.	112	100	106	192	164	192
Min.	100	100	94	94	94	106

DAILY DISCHARGE, IN SECOND FEET, OF NINE MILE DRAIN, IN SECTION 21-21-53, FOR YEAR 1920.

(Minatare Drain)

Day	July	August	September	October	November
1	138	250	230	190	162
2	125	210	250	190	162
3	120	230	230	190	162
4	150	138	230	189	162
5	130	210	230	188	162
6	150	162	230	187	162
7	130	162	306	186	162
8	138	162	270	185	162
9	138	210	230	184	160
10	130	150	250	183	159
11	130	150	290	182	158
12	138	150	250	181	157
13	138	150	210	180	156
14	120	150	230	179	155
15	138	150	250	178	154
16	138	150	210	177	153
17	138	176	210	176	152
18	134	192	210	175	151
19	138	210	192	174	150
20	138	176	230	173	149
21	150	162	210	172	148
22	162	192	210	171	147
23	110	192	210	170	146
24	138	210	210	169	145
25	134	210	192	168	144
26	138	210	185	167	143
27	138	210	210	166	142
28	192	210	220	165	141
29	230	192	192	164	140
30	192	210	192	163	140
31	230	230	.....	162	.....
Total	4513	5766	6769	5484	4586
Mean	145	186	225	177	153
Acre Ft.	8951	11437	13424	10877	9096
Max.	230	250	290	190	162
Min.	120	138	185	162	140

ACTUAL DISCHARGE MEASUREMENTS, OF OTTER CREEK AT OLD GAGING STATION, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4-18	Palmer-North	10.30	1.59	1.85	16.45	10
2	4-28	Earl North	11.90	1.72	.....	20.51	10
3	5- 5	Earl North	12.20	1.85	.....	22.61	10
4	5-13	Earl North	9.40	1.64	.....	15.44	10
5	5-24	Earl North	8.75	1.83	.....	16.01	10
6	5-30	Earl North	6.00	0.62	.....	3.69	10
7	6-11	Earl North	10.85	1.97	.....	21.40	10
8	8-23	Earl North	9.90	1.90	.....	18.83	10
9	9- 1	Earl North	10.80	1.47	.....	15.91	10

ACTUAL DISCHARGE MEASUREMENTS, OF PAWNEE CREEK BRIDGE AT BUCKE DAM, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-30	Earl North	4.27	1.45	.....	6.17	10
2	7-25	Earl North	3.66	1.25	.....	4.58	10
3	7 29	Earl North	3.74	1.31	.....	4.89	10
4	8- 8	Earl North	5.34	1.27	.....	6.79	10
5	8-19	Earl North	3.63	1.40	.....	5.09	10
6	9- 3	Earl North	4.43	1.57	.....	6.96	10
7	9-19	Earl North	4.43	1.73	.....	7.68	10

ACTUAL DISCHARGE MEASUREMENTS, OF PUMPKINSEED CREEK AT BRIDGE AT MOUTH, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4- 3	Wade Flynn	33.60	1.25	.....	42.00	10
2	4-12	T. C. Palmer	50.45	1.60	.....	80.90	11
3	4-21	T. C. Palmer	30.05	1.92	.....	57.91	10
4	4-22	T. C. Palmer	30.85	1.78	.....	54.96	10
5	4-26	T. C. Palmer	30.05	2.18	.....	65.57	11
6	5- 3	T. C. Palmer	32.35	1.55	.....	50.41	11
7	5-12	T. C. Palmer	34.25	1.96	.....	65.83	10
8	5-17	T. C. Palmer	29.55	1.40	.....	41.40	23
9	5-26	Earl North	19.00	1.35	.....	25.69	10
10	7-28	W. F. Chaloupka	1.88	0.82	.....	1.54	10
11	8- 4	W. F. Chaloupka	17.45	1.04	.....	18.01	10
12	8-11	T. C. Palmer	15.10	0.83	.....	12.60	10
13	8-11	W. F. Chaloupka	15.00	0.93	.....	14.01	10
14	9-15	T. C. Palmer	12.65	0.93	.....	11.79	10
15	9-29	T. C. Palmer	17.55	1.08	.....	18.92	10
16	10-16	T. C. Palmer	18.35	1.18	.....	21.72	9
17	10-21	Earl North	15.70	1.73	.....	27.22	10
18	11-17	T. C. Palmer	24.60	1.79	.....	44.07	23

ACTUAL DISCHARGE MEASUREMENTS, OF RED WILLOW CREEK AT OLD GAGING STATION, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4- 3	T. C. Palmer	15.45	2.12	3.40	32.84	11
2	4-22	T. C. Palmer	16.15	1.91	3.55	30.90	11
3	4-28	T. C. Palmer	15.45	1.82	3.40	28.20	11
4	5- 6	T. C. Palmer	18.20	1.80	3.40	32.80	11
5	5-12	T. C. Palmer	18.85	1.98	3.34	37.33	11
6	5-16	W. F. Chaloupka	37.50	3.99	4.40	149.71	9
7	5-20	T. C. Palmer	25.40	3.03	3.90	76.95	18
8	5-22	W. F. Chaloupka	44.25	3.57	4.50	157.75	9
9	5-23	T. C. Palmer	38.30	3.38	4.30	129.67	18
10	6- 3	T. C. Palmer	53.10	3.77	4.60	200.37	18
11	6-10	T. C. Palmer	33.53	3.35	4.10	112.37	18
12	6-26	T. C. Palmer	23.75	2.31	3.80	54.94	18
13	6-30	T. C. Palmer	21.45	2.29	3.70	49.00	18
14	7-10	T. C. Palmer	39.70	2.95	4.30	117.18	18
15	7-19	T. C. Palmer	33.30	2.60	4.15	86.56	18
16	7-28	T. C. Palmer	28.80	2.71	4.00	78.23	18
17	8-13	T. C. Palmer	28.90	2.50	3.90	72.20	18
18	9- 4	T. C. Palmer	30.20	2.41	4.00	72.83	18
19	9- 8	T. C. Palmer	38.80	2.78	4.20	108.10	18
20	9-30	T. C. Palmer	20.15	2.74	3.90	55.29	23
21	10- 3	T. C. Palmer	21.00	2.75	3.85	57.77	23
22	10- 7	T. C. Palmer	19.00	2.75	3.80	52.35	18
23	10-17	T. C. Palmer	19.40	2.82	3.80	54.65	18
24	10-29	T. C. Palmer	19.70	2.89	3.80	56.97	23
25	11- 5	T. C. Palmer	19.15	2.32	3.82	44.44	23

DAILY DISCHARGE, IN SECOND FEET, OF RED WILLOW CREEK, AT GAGING STATION, FOR YEAR 1919.

Day	April	May	June	July	August	Sept.	October
1	....	30	200	63	71	73	60
2	....	30	200	74	70	73	59
3	30	30	173	100	70	74	58
4	30	30	200	120	69	74	57
5	30	30	224	85	69	80	56
6	35	30	224	148	68	87	55
7	35	30	224	173	67	93	54
8	35	29	148	200	66	100	54
9	38	29	148	200	66	99	54
10	38	28	148	173	65	97	54
11	38	28	120	224	65	96	54
12	40	28	120	250	64	95	54
13	40	54	148	220	64	94	54
14	40	79	148	200	64	93	54
15	40	110	74	180	65	92	54
16	40	150	54	160	65	90	54
17	40	140	54	130	65	88	54
18	39	120	54	110	66	86	54
19	39	90	63	92	66	84	54
20	38	63	48	90	67	81	54
21	38	115	48	90	68	78	54
22	38	174	63	88	68	76	54
23	37	120	54	85	69	74	54
24	36	134	74	82	69	72	54
25	34	148	63	80	69	70	54
26	32	148	54	78	70	68	54
27	31	173	48	76	70	66	54
28	30	185	63	74	71	64	54
29	30	200	63	74	71	62	54
30	30	200	74	73	72	61	54
31	30	210	....	72	72	....	54
Total	1031	2965	3376	3864	2101	2449	1695
Mean	35	96	112	125	68	81	55
Acre Ft.	2045	5881	6696	7664	4167	4839	3362
Max.	40	210	224	250	72	100	60
Min.	30	28	48	63	64	61	54

Total Acre Feet, 34,654.

DAILY DISCHARGE, IN SECOND FEET, OF RED WILLOW CREEK ON SECTION 12-20-52, FOR YEAR 1920.

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.
1	45	43	43	35	50	125	25	75	76	228
2	45	43	43	35	50	121	20	45	105	220
3	46	42	45	35	50	120	20	45	63	210
4	46	42	43	35	50	115	20	53	63	202
5	47	42	43	25	39	115	20	165	60	194
6	47	42	42	30	32	110	45	53	60	189
7	47	42	42	25	32	100	37	45	60	184
8	48	42	42	25	45	95	37	45	46	179
9	48	42	42	39	32	91	40	45	46	174
10	49	42	42	39	32	87	37	45	46	170
11	49	42	42	31	25	83	82	35	46	162
12	50	42	42	31	32	80	82	35	60	154
13	50	42	42	31	32	76	54	24	60	146
14	50	42	42	25	32	72	63	24	63	138
15	49	42	42	26	39	68	175	18	63	130
16	49	42	42	27	39	64	165	15	60	123
17	49	42	42	27	39	60	54	40	66	116
18	49	42	42	25	39	60	105	40	60	109
19	48	42	41	26	32	60	45	40	46	102
20	48	42	41	39	32	90	45	47	49	94
21	48	42	41	50	32	90	33	40	40	89
22	47	42	41	50	39	60	33	40	40	84
23	47	42	41	50	5	45	75	40	46	79
24	46	42	41	50	26	37	172	73	46	74
25	46	42	41	50	39	134	63	73	53	70
26	45	42	41	50	39	37	45	46	63	70
27	45	42	41	32	26	40	45	40	63	70
28	44	42	41	36	121	134	54	40	73	70
29	44	42	40	39	121	37	135	113	66	70
30	43	....	40	45	121	30	45	113	63	70
31	43	....	40	....	127	....	53	105	....	70
Tot.	1457	1220	1292	1063	1430	3436	1924	1657	1742	4040
M.	47	42	42	35	46	115	62	53	58	130
A. F.	2890	2420	2561	2107	2802	6814	3816	3344	3455	7903
Max.	50	43	43	50	127	134	175	165	105	228
Min.	43	42	40	25	5	30	20	15	40	70

ACTUAL DISCHARGE MEASUREMENTS, OF REPUBLICAN RIVER BRIDGE AT SANBORN, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-15	Palmer Bailey	11.85	0.96	.....	11.32	23

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	10-24	Bailey-Palmer	66.00	1.25	.....	82.36	18

ACTUAL DISCHARGE MEASUREMENTS, OF ROCK CREEK BRIDGE BELOW MOUTH, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-15	Palmer-Bailey	9.65	1.33	.....	12.82	23

ACTUAL DISCHARGE MEASUREMENTS, OF SAND CREEK JUST ABOVE BRIDGE ABOVE NORTH PLATTE RIVER AT GAGING STATION, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4-18	North-Palmer	2.57	1.66	.....	4.05	10
2	4-28	Earl North	1.88	1.38	.....	2.59	10
3	5- 5	Earl North	1.60	1.63	.....	2.61	10
4	5-13	Earl North	1.91	1.63	.....	3.12	10
5	6-11	Earl North	1.52	1.49	.....	2.17	10
6	8-23	Earl North	1.73	1.75	.....	3.02	10

ACTUAL DISCHARGE MEASUREMENTS, OF SCOTTSBLUFF DRAIN SOUTH B. M. STOCK YARDS AT GAGING STATION, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4- 4	T. C. Palmer	5.00	0.84	.....	4.20	11
2	9- 3	T. C. Palmer	14.10	2.21	.....	31.13	23
3	9- 8	T. C. Palmer	14.20	1.75	.....	24.87	23
4	9-23	T. C. Palmer	10.30	2.10	.....	21.64	23
5	9-30	T. C. Palmer	9.25	2.20	.....	20.35	23
6	10-17	T. C. Palmer	8.85	1.88	.....	16.60	9
7	10-29	T. C. Palmer	9.70	1.84	.....	17.83	18

ACTUAL DISCHARGE MEASUREMENTS, OF SHEEP CREEK AT GAGING STATION, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4- 4	T. C. Palmer	24.40	2.04	2.60	50.00	11
2	4-23	T. C. Palmer	23.95	1.77	2.48	42.50	11
3	4-29	T. C. Palmer	23.65	1.94	2.55	45.90	11
4	5- 7	T. C. Palmer	24.05	1.81	2.50	43.70	11
5	5-13	T. C. Palmer	23.85	1.66	2.48	39.60	11
6	5-21	T. C. Palmer	21.50	1.18	2.20	25.32	18
7	6-11	T. C. Palmer	20.80	1.04	2.15	21.70	18
8	6-24	T. C. Palmer	18.75	1.32	2.40	24.74	23
9	7- 1	T. C. Palmer	20.95	1.11	2.20	23.43	23
10	8- 7	T. C. Palmer	17.30	0.41	1.90	7.02	23
11	9- 2	T. C. Palmer	20.40	0.80	2.80	16.42	23
12	9-23	T. C. Palmer	36.05	2.65	3.10	95.58	23
13	10- 1	T. C. Palmer	32.70	1.95	3.00	63.74	23
14	10- 7	T. C. Palmer	34.40	2.56	3.10	88.12	23
15	10-30	T. C. Palmer	33.20	2.28	3.00	76.33	18
16	11- 6	T. C. Palmer	35.60	2.44	3.10	85.46	18

DAILY DISCHARGE, IN SECOND FEET, OF SHEEP CREEK AT GAGING STATION, FOR YEAR 1919.

Day	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
1	....	44	26	25	12	70	76	82	144
2	....	44	25	25	12	63	76	76	144
3	....	44	24	25	12	63	76	76	144
4	....	44	23	31	7	63	102	76	113
5	....	38	22	31	7	70	102	76	95
6	50	57	21	31	7	70	82	76	89
7	38	50	20	31	12	95	76	70	70
8	50	44	18	43	31	95	76	63	70
9	57	44	18	31	12	70	82	63	80
10	50	44	25	31	12	95	82	63	70
11	57	50	18	31	12	95	82	57	89
12	50	44	25	....	12	150	82	63	89
13	57	44	25	....	12	144	76	57	89
14	63	38	25	....	12	95	76	57	95
15	50	44	18	4	12	95	76	50	125
16	57	38	18	1	18	89	76	89	150
17	50	44	18	1	12	95	76	89	140
18	50	44	18	1	18	82	76	82	150
19	50	25	18	1	25	82	108	76	150
20	50	25	31	1	25	76	89	76	140
21	50	25	25	1	44	82	89	76	102
22	50	25	25	1	50	82	82	76	82
23	44	25	25	1	50	82	89	76	82
24	44	25	31	1	44	82	89	89	80
25	44	25	31	1	50	82	89	102	80
26	50	25	25	4	50	76	89	108	80
27	44	25	25	7	50	76	76	113	80
28	44	25	25	1	50	76	76	113	80
29	44	18	25	4	50	76	76	144	80
30	44	25	25	4	50	70	82	154	80
31	....	25	....	18	57	....	76	....	....
Total	1237	1117	698	387	834	2541	2560	2468	3062
Mean	49	36	23	13	26	82	83	82	102
Acre Ft.	2454	2216	1385	768	1654	5040	5078	4895	6073
Max.	63	57	31	43	57	150	108	154	150
Min.	38	18	18	1	7	63	76	50	70

Total Acre Feet, 29,563.

DAILY DISCHARGE, IN SECOND FEET, OF SHEEP CREEK NEAR NORTHEAST CORNER SECTION 20-23-56, FOR YEAR 1920.

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.
1	62	62	59	54	52	1	21	30	25	69
2	62	62	60	55	48	1	18	70	32	69
3	59	59	61	55	113	1	18	65	30	69
4	70	59	62	55	62	1	18	23	30	69
5	62	62	63	56	62	1	18	21	32	68
6	59	62	64	56	59	1	18	18	32	68
7	59	62	65	56	48	1	35	17	32	68
8	48	62	66	57	52	1	23	21	32	68
9	42	59	67	57	52	1	21	21	32	68
10	42	59	68	58	48	1	21	21	30	68
11	48	59	69	45	108	1	21	21	30	68
12	59	59	70	48	170	1	17	21	35	68
13	59	62	70	48	75	3	....	21	40	68
14	59	59	68	48	62	3	10	21	35	68
15	62	59	66	48	62	3	....	21	35	68
16	62	59	64	45	82	3	17	21	35	68
17	62	59	62	120	59	3	21	21	35	68
18	62	59	60	59	1	195	21	21	35	68
19	62	59	58	48	1	65	21	21	35	67
20	59	59	56	82	1	50	21	23	35	57
21	59	59	54	88	1	35	....	23	35	67
22	59	59	52	82	1	21	....	25	34	67
23	48	48	50	70	1	21	....	25	32	66
24	42	42	48	70	1	21	....	25	32	66
25	59	42	50	75	1	21	....	25	32	66
26	59	48	51	62	1	21	....	25	32	66
27	59	48	52	59	1	21	18	32	32	65
28	59	59	53	62	1	21	18	40	32	65
29	59	59	53	59	1	21	18	27	32	65
30	59	....	54	52	1	21	18	27	32	65
31	59	....	54	....	1	....	30	25	....	65
Tot.	1780	1665	1849	1829	1228	561	462	818	982	2085
M.	57	57	59	61	40	19	15	26	33	67
A. F.	3530	3302	3667	3628	2436	1113	916	1622	1947	4135
Max.	70	62	70	120	170	195	35	70	40	69
Min.	42	42	48	45	1	1	....	17	25	65

ACTUAL DISCHARGE MEASUREMENTS, OF SNELL DRAIN, TWO MILES EAST SNELL BEET DUMP, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	10-29	T. C. Palmer	13.95	0.29	.....	4.04	23
2	11- 5	T. C. Palmer	12.75	0.34	.....	4.34	23

ACTUAL DISCHARGE MEASUREMENTS, OF STEWART'S DRAIN, ONE-HALF MILE WEST OF TOOHEY, AT GAGING STATION, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4- 4	T. C. Palmer	5.00	2.70	1.44	13.50*	11
2	4-23	T. C. Palmer	4.80	2.26	1.30	10.84*	23
3	4-29	T. C. Palmer	5.06	2.15	1.30	10.90*	23
4	5- 7	T. C. Palmer	5.03	2.13	1.30	10.75*	23
5	5-13	T. C. Palmer	5.12	2.15	1.40	11.00*	23
6	5-21	T. C. Palmer	4.91	1.70	1.30	8.35†	23
7	6-11	T. C. Palmer	5.78	2.17	1.45	12.54†	23
8	6-25	T. C. Palmer	6.19	2.25	1.60	13.95†	23
9	7- 1	T. C. Palmer	6.13	2.51	1.60	15.40†	23
10	7-24	Palmer-Woodman	5.56	2.48	1.55	13.76†	23
11	7-29	T. C. Palmer	5.62	2.13	1.50	11.99†	23
12	8- 8	T. C. Palmer	6.13	3.29	1.50	20.16†	23
13	8-16	T. C. Palmer	4.98	2.64	.....	13.14†	23
14	8-21	T. C. Palmer	5.78	2.57	1.50	14.82†	23
15	8-27	T. C. Palmer	6.35	2.78	1.60	17.65†	23
16	9- 2	T. C. Palmer	6.85	1.90	1.47	13.00†	23
17	9- 9	T. C. Palmer	10.30	1.19	1.45	12.27†	23
18	9-23	T. C. Palmer	8.24	1.80	1.52	14.85†	23
19	10- 1	T. C. Palmer	9.20	1.81	1.55	16.64*	23
20	10- 7	T. C. Palmer	9.30	1.97	.....	18.38*	23
21	10-20	T. C. Palmer	9.00	2.04	.....	18.36*	9
22	10-30	T. C. Palmer	8.65	1.96	.....	16.93*	....

* To River.
† Taken by Enterprise Canal.

DAILY DISCHARGE, IN SECOND FEET, OF WET SPOTTED TAIL, EAST OF ENTERPRISE WASTE-WAY, FOR YEAR 1919.

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	17	13	10	6	3	4	3	3	3	34	23	20
2	17	13	10	6	3	4	2	3	3	34	23	20
3	17	12	9	6	3	4	2	3	3	34	23	20
4	17	12	9	6	3	4	2	3	3	35	23	20
5	17	12	9	6	4	4	2	3	3	35	24	20
6	16	12	9	6	4	5	2	3	3	36	23	20
7	16	12	9	6	4	5	2	3	3	36	23	20
8	16	12	9	6	3	5	2	3	3	36	23	20
9	16	12	9	6	3	5	2	3	3	36	23	20
10	16	12	9	5	3	5	2	3	3	35	23	20
11	15	12	9	5	3	5	1	3	3	35	23	19
12	15	12	9	5	3	4	1	3	3	34	23	19
13	15	12	9	5	2	4	1	3	25	34	22	19
14	15	12	9	5	2	4	1	3	40	33	22	19
15	15	12	8	5	2	4	1	3	45	33	22	19
16	15	11	8	5	2	3	1	3	46	32	22	19
17	15	11	8	5	2	3	1	3	47	32	22	19
18	15	11	8	5	2	2	1	3	47	32	22	18
19	15	11	8	4	2	2	1	3	47	31	22	18
20	14	11	8	4	2	2	1	3	47	31	22	18
21	14	11	7	4	2	2	1	3	47	30	22	18
22	14	11	7	4	2	2	1	3	47	29	21	18
23	14	11	7	4	2	2	1	3	47	28	21	18
24	14	11	7	3	3	2	2	3	46	27	21	18
25	14	11	7	3	3	2	2	3	45	26	21	18
26	14	10	7	3	3	2	2	3	42	25	21	17
27	14	10	7	3	3	2	2	3	39	25	21	17
28	14	10	7	3	4	2	2	3	37	24	21	17
29	14	....	6	3	4	2	3	3	35	23	21	17
30	14	....	6	3	4	3	3	3	34	23	21	17
31	14	....	6	..	4	..	3	3	....	23	....	17
T.	468	322	250	140	89	99	53	93	799	961	664	579
M.	15	11.5	8	3.7	3	3	1.7	3	26.6	31	22	18.7
A.	928	639	496	278	177	196	105	184	1585	1906	1317	1147
Ma.	17	13	10	6	4	5	3	3	47	36	24	20
Mi.	14	10	6	3	2	2	1	3	3	23	21	17

Tot. Acre Ft. 8 958; T.—Total; M.—Mean; A.—Acre Ft.; Ma.—Maximum; Mi.—Minimum.

ACTUAL DISCHARGE MEASUREMENTS, OF TUB SPRINGS, 100 YARDS BELOW ENTERPRISE CANAL AT GAGING STATION, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4- 4	T. C. Palmer	12.00	2.32	2.50	27.90	11
2	4-23	T. C. Palmer	11.05	2.53	2.55	28.00	23
3	4-29	T. C. Palmer	12.85	2.43	2.55	31.30	23
4	5- 7	T. C. Palmer	10.80	2.58	2.58	27.80	23
5	5-13	T. C. Palmer	6.80	2.50	2.20	17.00	23
6	5-21	T. C. Palmer	4.63	1.90	1.90	8.80	23
7	5-28	T. C. Palmer	5.08	1.89	2.00	9.59	23
8	6-11	T. C. Palmer	10.05	2.39	2.35	24.03	23
9	6-12	T. C. Palmer	9.90	2.24	2.40	22.12	23
10	6-25	T. C. Palmer	9.80	2.23	2.40	21.83	23
11	7- 1	T. C. Palmer	11.70	2.51	2.50	29.34	23
12	7-24	T. C. Palmer-Woodman	5.10	1.65	1.90	8.42	23
13	7-29	T. C. Palmer	5.25	1.51	1.90	7.90	23
14	8- 8	T. C. Palmer	4.15	1.63	.....	6.76	23
15	8-27	T. C. Palmer	13.80	2.39	.....	32.94	23
16	9- 2	T. C. Palmer	13.45	2.41	.....	32.39	23
17	9- 9	T. C. Palmer	15.20	2.13	.....	32.36	23
18	9-23	T. C. Palmer	26.80	1.98	.....	52.99	23
19	10- 1	T. C. Palmer	24.95	2.04	.....	50.88	23
20	10- 7	T. C. Palmer	17.85	1.75	.....	31.28	9
21	10-20	T. C. Palmer	15.35	1.74	.....	26.67	9
22	10-30	T. C. Palmer	13.20	1.93	.....	25.42	23
23	11- 7	T. C. Palmer	13.80	1.45	.....	20.07	23

ACTUAL DISCHARGE MEASUREMENTS, OF WEST ENTERPRISE WASTE, ONE MILE WEST OF MITCHELL, TO RIVER, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4- 4	T. C. Palmer	4.80	2.77	.....	13.30	11
2	4-23	T. C. Palmer	4.20	2.43	.....	10.20	23
3	4-29	T. C. Palmer	4.80	2.67	.....	12.80	23
4	5- 7	T. C. Palmer	4.80	3.05	.....	14.64	23
5	5-13	T. C. Palmer	4.20	2.31	.....	9.70	23
6	6-25	T. C. Palmer	14.40	2.11	.....	30.39	23
7	7- 1	T. C. Palmer	.....	.....	.....	0.50	23
8	7-24	Palmer-Woodman	1.20	0.70	.....	0.84	23
9	7-29	T. C. Palmer	1.20	0.94	.....	1.13	23
10	9-23	T. C. Palmer	6.00	3.47	.....	20.84	23
11	10- 1	T. C. Palmer	4.80	2.93	.....	14.08	23
12	10- 7	T. C. Palmer	3.60	2.62	.....	9.45	23
13	10-20	T. C. Palmer	3.00	1.77	.....	5.30	7
14	10-30	T. C. Palmer	3.00	1.83	.....	5.48	23
15	11- 6	T. C. Palmer	3.00	1.91	.....	5.73	23

ACTUAL DISCHARGE MEASUREMENT, OF WET SPOTTED TAIL ABOVE TRI-STATE CANAL, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-25	T. C. Palmer	5.45	1.89	.....	10.31	23
2	7-29	T. C. Palmer	8.00	1.98	.....	15.88	23
3	8-21	T. C. Palmer	8.10	1.88	.....	15.24	....
4	12- 3	J. K. Rohrer	.....	.....	.....	12.00	....

DAILY DISCHARGE, IN SECOND FEET, OF WET SPOTTED TAIL, GAGED ABOVE THE TRI-STATE CANAL, FOR YEAR 1919.

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	11	10	9	8	9	10	12	16	18	26	21	13
2	11	10	9	8	9	10	12	16	18	26	21	12
3	11	10	9	8	9	10	12	16	18	25	21	12
4	11	10	9	8	9	10	12	16	19	25	21	12
5	11	10	9	8	9	10	12	16	19	24	21	12
6	11	10	9	8	9	10	13	16	19	24	21	12
7	11	10	9	8	9	10	13	16	20	23	21	12
8	11	10	9	8	9	10	13	15	20	23	20	12
9	11	10	9	8	9	10	13	15	20	23	20	12
10	11	10	9	8	9	10	13	15	21	23	20	12
11	11	10	9	8	9	10	14	15	21	23	20	12
12	11	10	9	8	9	10	14	15	22	22	19	12
13	11	10	9	8	9	10	14	15	22	22	19	12
14	11	10	9	8	9	10	14	15	23	22	19	12
15	11	10	9	8	9	10	14	15	23	22	19	12
16	11	10	9	8	9	11	15	15	23	22	18	11
17	11	10	9	8	9	11	15	16	24	22	18	11
18	11	10	9	8	9	11	15	15	24	22	17	11
19	11	10	9	8	9	11	15	16	25	22	17	11
20	11	10	9	8	9	11	15	15	26	22	17	11
21	10	9	8	8	9	11	15	16	26	22	16	11
22	10	9	8	8	9	11	15	16	26	21	16	11
23	10	9	8	8	9	11	15	16	27	21	16	11
24	10	9	8	8	9	11	16	16	27	21	16	11
25	10	9	8	8	9	11	16	16	27	21	16	11
26	10	9	8	8	9	11	16	16	26	21	15	11
27	10	9	8	8	9	11	16	16	26	21	14	11
28	10	9	8	8	9	11	16	16	26	21	14	11
29	10	....	8	8	9	11	16	17	26	21	13	11
30	10	....	8	8	9	12	16	17	26	21	13	11
31	10	....	8	....	9	....	16	....	....	21	....	11
T.	330	272	268	240	279	316	443	488	688	695	539	357
M.	10.6	9.7	8.5	8	9	10.5	14.3	15.7	22.9	22.4	18	11.5
A.	655	490	452	476	553	626	879	968	1365	1379	1069	708
Ma.	11	10	9	8	9	11	16	17	27	26	21	13
Mi.	10	9	8	8	9	10	12	15	18	21	13	11

Tot. Ac. Ft., 9,620; T.—Total; M.—Mean; A.—Acre Ft.; Ma.—Maximum; Mi.—Minimum.

ACTUAL DISCHARGE MEASUREMENTS, OF WHITE TAIL CREEK AT OLD GAGING STATION, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4-18	Palmer-North	14.90	2.08	.....	31.00	10
2	5- 5	Earl North	12.15	2.35	.....	28.64	10
3	5-15	Earl North	12.35	2.04	.....	25.18	10
4	5-23	Earl North	11.10	1.73	.....	19.22	10
5	6-11	Earl North	15.35	1.75	.....	26.85	10
6	7-16	Earl North	11.50	1.73	.....	19.86	10
7	8-22	Earl North	11.00	2.07	.....	22.80	10
8	9- 1	Earl North	11.40	1.92	.....	21.91	10
9	10- 7	Earl North	18.20	1.70	.....	30.95	10
10	10-13	Earl North	17.85	1.70	.....	30.40	10
11	10-28	Earl North	18.60	1.79	.....	33.37	10

DAILY DISCHARGE, IN SECOND FEET, OF WILD HORSE DRAIN AT SECTION 12-20-52, FOR YEAR 1920.

(Bayard Seep No. 3)

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.
1	39	35	35	53	53	53	60	59	53	90
2	39	35	35	53	53	53	58	63	53	88
3	39	35	35	53	53	53	58	58	53	86
4	39	35	35	53	53	53	63	58	53	84
5	39	35	35	53	53	53	63	53	53	82
6	40	35	37	55	53	55	60	53	53	80
7	40	35	37	53	53	58	60	53	53	78
8	40	35	37	53	53	58	60	53	53	76
9	40	35	37	53	53	55	55	53	53	74
10	40	35	37	53	53	53	53	53	53	73
11	39	35	39	53	53	53	53	53	55	72
12	39	35	39	53	53	53	53	53	53	70
13	39	35	39	50	53	53	53	53	53	69
14	39	35	39	53	53	53	53	53	55	68
15	39	35	39	53	53	53	69	50	53	66
16	39	34	41	53	53	53	60	50	53	65
17	39	34	41	53	53	63	55	53	53	64
18	39	34	41	53	53	74	63	53	53	63
19	39	34	41	53	53	90	53	50	55	61
20	39	34	41	53	53	79	55	50	55	60
21	38	34	42	53	53	74	53	50	58	58
22	38	34	42	53	53	79	53	53	58	57
23	38	34	41	53	53	63	58	53	63	56
24	38	34	41	53	53	68	74	53	63	56
25	38	34	41	53	53	58	63	50	63	56
26	37	35	39	53	53	55	53	53	53	56
27	37	35	38	53	53	79	53	53	53	56
28	37	35	36	53	53	74	53	53	53	56
29	37	35	34	53	53	74	90	53	53	56
30	37	....	33	53	53	63	85	53	55	57
31	37	....	33	...	53	....	63	53	....	57
Tot.	1197	1005	1180	1640	1643	1850	1855	1661	1640	2090
M.	39	35	38	53	53	62	60	54	54	67
A. F.	2374	1993	2340	3252	3259	3669	3671	3184	3143	4035
Max.	40	35	42	53	53	90	90	69	63	90
Min.	37	34	33	50	53	53	53	50	53	56

ACTUAL DISCHARGE MEASUREMENTS, OF WINTER'S CREEK ABOVE WINTER'S CREEK CANAL, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-20	T. C. Palmer	19.90	2.02	.....	40.02	23
2	5-28	T. C. Palmer	17.80	2.28	.....	40.68	23
3	6-10	T. C. Palmer	21.45	2.29	.....	49.08	23
4	6-25	T. C. Palmer	15.85	3.33	.....	52.80	23
5	7- 1	T. C. Palmer	27.65	2.46	.....	68.10	23
6	7-21	T. C. Palmer	31.20	2.29	.....	71.46	23
7	7-29	T. C. Palmer	34.95	2.12	.....	73.87	23
8	8-22	T. C. Palmer	43.90	1.73	.....	75.57	23
9	8-25	T. C. Palmer	40.00	1.74	.....	69.66	23
10	8-26	T. C. Palmer	39.00	1.84	.....	71.70	23
11	8-26	T. C. Palmer	37.45	2.01	.....	75.44	23
12	9- 3	T. C. Palmer	47.30	1.76	.....	83.65	23
13	9- 8	T. C. Palmer	40.00	1.94	.....	77.52	23
14	9-23	T. C. Palmer	29.40	3.20	.....	94.06	23
15	9-30	T. C. Palmer	28.90	2.80	.....	80.87	23
16	10- 8	T. C. Palmer	28.65	2.83	.....	80.98	9
17	10-17	T. C. Palmer	32.90	2.73	.....	89.82	9
18	10-29	T. C. Palmer	34.40	2.54	.....	87.38	18
19	11- 5	T. C. Palmer	32.00	2.62	.....	83.85	18

DAILY DISCHARGE, IN SECOND FEET, OF WINTER'S CREEK, ABOVE WINTER'S CREEK CANAL, FOR YEAR 1919.

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	76	67	59	51	42	43	68	74	83	81	86	84
2	76	67	59	51	44	44	68	74	84	81	86	84
3	75	66	58	51	46	45	68	74	84	81	85	84
4	75	66	58	49	48	45	69	74	84	81	85	....
5	75	66	58	49	49	47	69	74	82	81	84	....
6	75	66	58	49	49	44	69	75	81	81	84	....
7	74	65	57	48	50	48	69	75	80	81	84	....
8	73	65	57	47	52	49	70	75	78	81	84	....
9	73	65	57	46	53	49	70	75	78	82	84	....
10	73	65	57	46	55	50	70	75	79	82	84	....
11	73	65	56	46	55	50	70	75	80	84	84	....
12	73	64	56	45	57	51	70	75	81	85	84	....
13	72	64	56	44	55	51	70	75	82	86	84	....
14	72	63	55	43	51	51	71	76	84	88	84	....
15	72	63	55	43	48	51	71	76	85	89	84	....
16	72	63	55	43	44	51	71	76	87	89	84	....
17	71	63	55	42	43	52	71	76	88	90	84	....
18	71	63	54	42	42	52	71	76	89	90	84	....
19	70	62	54	41	41	52	71	76	91	90	84	....
20	70	62	54	40	40	52	71	76	92	90	84	....
21	70	62	54	40	40	52	72	76	93	90	84	....
22	70	62	53	40	40	52	72	76	94	90	84	....
23	69	62	53	39	40	52	72	75	94	90	84	....
24	69	61	52	39	40	53	73	72	94	89	84	....
25	69	61	52	39	40	54	73	70	92	88	84	....
26	68	60	52	39	40	55	74	74	90	88	84	....
27	68	59	52	40	40	58	74	75	88	88	84	....
28	67	59	51	40	41	61	74	77	86	87	74	....
29	67	....	51	41	41	65	74	79	83	87	84	....
30	67	....	51	42	41	68	74	81	81	87	84	....
31	67	....	51	....	42	....	74	82	....	86	....	....
T.	2212	1776	1700	1315	1409	1547	2221	2339	2567	2663	2526	252
M.	71.4	63.4	54.8	43.8	45.5	51.6	71.6	75.5	85.6	85.9	84.2	84
A.	4388	3396	3372	2608	2795	3068	4394	4628	5081	5271	4999	500
Ma.	76	67	59	51	57	68	74	82	94	90	86	84
Mi.	67	59	51	40	40	43	68	74	78	81	84	84

Tot. Ac. Ft., 44,500; T.—Total; M.—Mean; A.—Acre Ft.; Ma.—Maximum; Mi.—Minimum.

ACTUAL DISCHARGE MEASUREMENTS, OF WINTER'S CREEK EAST OF SUGAR FACTORY, TO RIVER, FOR YEAR 1919.

No	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5- 4	T. C. Palmer	17.70	2.81	.....	49.90	11
2	4-22	T. C. Palmer	17.15	2.32	.....	39.80	23
3	4-28	T. C. Palmer	13.93	2.86	.....	39.90	23
4	5- 6	T. C. Palmer	12.20	3.97	.....	48.51	23
5	5-12	T. C. Palmer	16.15	3.52	.....	56.89	23
6	5-20	T. C. Palmer	53.42	0.60	.....	32.22	23
7	5-28	T. C. Palmer	3.37	1.66	.....	5.61	23
8	6-10	T. C. Palmer	3.50	2.41	.....	8.45	23
9	6-25	T. C. Palmer	2.50	1.36	.....	3.40	23
10	7- 1	T. C. Palmer	3.15	1.47	.....	4.63	23
11	7-29	T. C. Palmer	5.50	3.39	.....	18.68	23
12	8-22	T. C. Palmer	4.75	0.58	.....	2.78	23
13	8-25	T. C. Palmer (4 P. M.)	5.50	3.90	.....	21.32	23
14	8-26	T. C. Palmer (7 A. M.)	12:40	1.98	.....	24.51	23
15	8-26	T. C. Palmer (7:45 A. M.)	13.70	3.09	.....	42.36	23
16	8-26	T. C. Palmer 2:45 P. M.)	11.70	2.27	0.64	26.53	23
17	8-26	T. C. Palmer (3:20 P. M.)	14.40	2.84	0.57	40.85	23
18	9- 3	T. C. Palmer	10.00	5.88	.....	58.86	23
19	9- 8	T. C. Palmer	8.50	4.59	.....	39.08	23

DAILY DISCHARGE, IN SECOND FEET, OF WINTERS CREEK AT NORTH SIDE SECTION 30-22-54, EAST SUGAR FACTORY, FOR SEASON 1920.

Day	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.
1	59	56	49	51	49	32	34	40	12	60	63
2	59	55	49	51	61	29	38	68	22	61	62
3	59	54	49	51	61	19	40	68	12	61	61
4	59	53	49	50	61	17	36	45	14	62	60
5	59	52	49	50	61	14	32	45	18	63	59
6	59	51	50	50	56	17	30	36	14	63	58
7	59	50	50	50	56	43	34	49	14	63	57
8	59	50	50	49	56	45	28	40	22	63	56
9	59	49	50	49	54	49	36	59	14	64	56
10	59	48	50	49	61	49	32	49	14	64	56
11	59	48	50	49	61	22	25	49	22	64	56
12	59	48	50	45	61	19	29	45	22	64	56
13	59	48	50	49	54	22	22	45	22	65	56
14	59	48	51	49	54	29	25	30	18	65	56
15	64	48	51	42	61	29	17	23	14	66	57
16	67	48	51	49	58	14	22	26	18	66	57
17	67	48	51	51	58	22	19	18	22	66	57
18	67	48	51	51	54	32	22	14	22	67	57
19	66	48	51	51	49	22	25	14	22	67	57
20	66	48	51	49	54	63	17	14	26	67	57
21	66	48	51	54	54	32	14	12	30	68	57
22	65	48	51	54	49	22	18	14	33	68	57
23	64	48	51	58	49	14	13	18	37	68	58
24	64	48	51	58	49	25	13	14	40	68	58
25	63	48	51	58	48	14	16	18	44	68	58
26	62	49	51	54	48	19	19	14	48	68	58
27	61	49	51	54	48	22	16	12	52	67	58
28	60	49	51	54	47	27	12	18	55	66	58
29	59	49	51	49	47	38	12	14	59	65	59
30	58	....	51	49	47	40	14	21	59	64	59
31	57	....	51	....	47	....	16	18	....	63	....
T.	1902	1434	1563	1527	1673	841	726	950	821	2014	1734
M.	61	49	50	51	54	28	23	31	27	65	58
A. F.	3773	2844	3100	3029	3318	1668	1440	1884	1628	3995	3439
Ma.	67	56	51	58	61	63	38	68	59	68	63
Mi.	57	48	49	42	47	14	12	12	12	60	56

T.—Total; M.—Mean; A. F.—Acre Feet; Ma.—Maximum; Mi.—Minimum.

Place	Locality	Hydrographer	Sec. Feet Discharge	Date
Belmont Canal	2 Miles South of Bridgeport	T. C. Palmer	162.19	8-20
Belmont Canal	2 Miles South of Atkins Yards	Baumgartner-Palmer	5.03	7-23
Criegler Ditch	50 feet below headgate	T. C. Palmer	1.16	8-14
Champion Ditch	Concrete flume No. Sec. 19	Palmer-Willis	5.97	7-19
Champion Ditch	Section 19, Town 6, Range 39	Palmer-Willis	7.84	7-19
Champion Ditch	Rating flume	Palmer-Willis	7.35	7-19
Currie Pumping P.	SW¼ SW¼ Sec. 20-23-56	T. C. Palmer	1.78	7-15
French Ditch	1st bridge below head	T. C. Palmer	13.20	7-14
French Ditch	1st bridge below head	T. C. Palmer	13.52	7-29
French Ditch	1st bridge below head	T. C. Palmer	11.87	9- 9
Frenchman Valley Ditch	Rating flume	Palmer-Willis	65.02	10-30
Gering Canal	Bad lands flume	T. C. Palmer	101.28	6-11
Gering Canal	Bad lands flume	T. C. Palmer	120.15	7-15
Gering Canal	Bad lands flume	T. C. Palmer	161.83	7-30
Gering Canal	Bad lands flume	T. C. Palmer	123.66	8-18
Gering Canal	Bad lands flume	T. C. Palmer	151.35	9-10
Gering Canal	Bad lands flume	T. C. Palmer	131.56	9-29
Gering High Line Lateral No. 2	Rating flume	T. C. Palmer	7.23	7-30
	Rating flume	T. C. Palmer	3.16	8-19
Harper Ditch	Rating flume	T. C. Palmer	3.04	7-22
Harper Ditch	Rating flume	W. F. Chaloupka	3.22	7-23
Harper Ditch	Rating flume	T. C. Palmer	2.40	8-14

Place	Locality	Hydrographer	Sec. Feet Discharge	Date
Imperial Ditch	Wagon bridge	Palmer-Willis	33.14	7-19
Imperial Ditch	At flume	Palmer-Willis	37.54	7-19
Inman Canal	Rating flume	Palmer-Willis	7.31	7-19
Last Chance Canal	Rating flume	T. C. Palmer	8.42	8-10
Last Chance Canal	Rating flume	G. K. Baumgartner	6.76	8-27
Mereditch Ditch (E.)	Bridge below head	T. C. Palmer	3.47	8-10
Mereditch Ditch (E.)	Bridge below head	T. C. Palmer	1.82	8-30
Meredith Ditch (W.)	Below head at bridge	T. C. Palmer	1.33	8-10
Meredith Ditch (W.)	Below head at bridge	T. C. Palmer	1.64	8-30
Niehus Ditch (Henry)		W. F. Chaloupka	0.31	7-23
Northport Ditch (So.)	West Line E½ Sec. 2-20-51	T. C. Palmer	1.23	6-28
Northport Ditch (So.)	West Line E½ Sec. 2-20-51	T. C. Palmer	1.86	7- 3
Northport Ditch (So.)	West Line E½ Sec. 2-20-51	Palmer-Willis	1.93	7-11
Northport Ditch (So.)	West Line E½ Sec. 2-20-51	T. C. Palmer	3.35	9- 8
Northport Ditch (So.)	West Line E½ Sec. 2-20-51	T. C. Palmer	2.36	9-14
Northport Ditch (So.)	West Line E½ Sec. 2-20-51	T. C. Palmer	1.40	8-16
Potmesil Canal	Head	Palmer-Francis	14.52	8- 2
Pioneer Ditch	Wagon bridge E. state line one mile	Palmer-Willis	5.76	10-27
Signal Bluff Canal	Wasteway	G. K. Baumgartner	2.63	8-13
Signal Bluff Canal	Wasteway	Palmer-Willis	3.49	9- 3

Place	Locality	Hydrographer	Sec. Feet Discharge	Date
Sheep Creek Lateral	500 feet above Tri-State	T. C. Palmer	53.01	5-19
Sheep Creek Lateral	500 feet above Tri-State	T. C. Palmer	50.89	6-10
Sheep Creek Lateral	500 feet above Tri-State	T. C. Palmer	31.28	6-29
Sheep Creek Lateral	500 feet above Tri-State	T. C. Palmer	46.54	7-14
Sheep Creek Lateral	500 feet above Tri-State	T. C. Palmer	64.33	7-29
Sheep Creek Lateral	500 feet above Tri-State	T. C. Palmer	65.72	7-29
Sheep Creek Lateral	500 feet above Tri-State	T. C. Palmer	60.86	8-18
Sheep Creek Lateral	500 feet above Tri-State	T. C. Palmer	55.90	8-27
Sheep Creek Lateral	500 feet above Tri-State	T. C. Palmer	56.11	9- 9
Sheep Creek Lateral	500 feet above Tri-State	T. C. Palmer	56.86	9-28
Schermerhorn Canal	Bridge ½ mile west of Degraw siding	T. C. Palmer	8.83	6-28
Schermerhorn Canal	Bridge ½ mile west of Degraw siding	T. C. Palmer	5.51	7-26
Schermerhorn Canal	Bridge ½ mile west of Degraw siding	T. C. Palmer	7.63	8-25
Schermerhorn Canal	Bridge ½ mile west of Degraw siding	T. C. Palmer	6.98	10- 1
Sheridan & Wilson Ditch	1st bridge below head	G. K. Baumgartner	2.09	8-23
Winters' Creek Canal from Winters' Creek	Winters' Creek diversion	T. C. Palmer	54.70	6-18
Winters' Creek Canal from Winters' Creek	Winters' Creek diversion	T. C. Palmer	52.95	6-29
Winters' Creek Canal from Winters' Creek	Winters' Creek diversion	T. C. Palmer	14.91	9-29

Stream Place	Locality	Hydrographer Locality	area	Velocity Hydrographer	discharge	Sec. Feet Discharge	Date
Bayard Seep No. 2	1 mile south of Bayard			T. C. Palmer		0.81	1- 2
Bayard Seep No. 3	Gaging station			T. C. Palmer		39.10	1- 2
Bayard Seep No. 3	Gaging station			T. C. Palmer		39.72	1-14
Bayard Seep No. 3	Gaging station			T. C. Palmer		34.21	2-10
Bayard Seep No. 3	Gaging station			T. C. Palmer		35.47	3- 3
Bayard Seep No. 3	Gaging station			T. C. Palmer		42.15	3-22
Bayard Seep No. 3	Gaging station			T. C. Palmer		32.49	3-31
Bayard Seep No. 3	Gaging station			Baumgartner-Palmer		48.82	4-29
Bayard Seep No. 3	Gaging station			T. C. Palmer		35.22	5-20
Bayard Seep No. 3	Gaging station			T. C. Palmer		19.45	6- 8
Bayard Seep No. 3	Gaging station			T. C. Palmer		43.88	6-17
Bayard Seep No. 3	Gaging station			T. C. Palmer		66.12	7-26
Bayard Seep No. 3	Gaging station			T. C. Palmer		64.19	8-16
Bayard Seep No. 3	Gaging station			T. C. Palmer		73.49	8-25
Bayard Seep No. 3	Gaging station			T. C. Palmer		98.03	9- 8
Bayard Seep No. 3	Gaging station			T. C. Palmer		90.79	10- 1
Bayard Seep No. 3	Gaging station			T. C. Palmer		55.96	10-23
Bayard Seep No. 3	Gaging station			T. C. Palmer		58.52	11- 8
Bayard Sugar Factory Drain	Gaging station			T. C. Palmer		37.78	1- 2
Bayard Sugar Factory Drain	Gaging station			T. C. Palmer		36.47	1-14
Bayard Sugar Factory Drain	Gaging station			T. C. Palmer		30.79	2-10
Bayard Sugar Factory Drain	Gaging station			T. C. Palmer		29.74	3- 3
Bayard Sugar Factory Drain	Gaging station			T. C. Palmer		22.23	3-22
Bayard Sugar Factory Drain	Gaging station			Baumgartner-Palmer		21.85	4- 9
Bayard Sugar Factory Drain	Gaging station			Baumgartner-Palmer		55.63	4-29
Bayard Sugar Factory Drain	Gaging station			T. C. Palmer		21.45	5-20
Bayard Sugar Factory Drain	Gaging station			T. C. Palmer		19.31	6- 8
Bayard Sugar Factory Drain	Gaging station			T. C. Palmer		23.10	6-17

Place	Locality	Hydrographer	Sec. Feet Discharge	Date
Bayard Sugar Factory Drain	Gaging station	T. C. Palmer	26.38	6-28
Bayard Sugar Factory Drain	Gaging station	T. C. Palmer	35.55	7-13
Bayard Sugar Factory Drain	Gaging station	T. C. Palmer	42.68	7-26
Bayard Sugar Factory Drain	Gaging station	T. C. Palmer	36.46	8-16
Bayard Sugar Factory Drain	Gaging station	T. C. Palmer	40.31	8-25
Bayard Sugar Factory Drain	Gaging station	T. C. Palmer	53.83	9- 8
Bayard Sugar Factory Drain	Gaging station	T. C. Palmer	39.46	9-29
Bayard Sugar Factory Drain	Gaging station	T. C. Palmer	35.07	10-23
Bayard Sugar Factory Drain	Gaging station	T. C. Palmer	35.94	11- 8
Camp Clark Seep	Gaging station	T. C. Palmer	2.67	1- 2
Camp Clark Seep	Gaging station	T. C. Palmer	2.55	1-14
Camp Clark Seep	Gaging station	T. C. Palmer	2.81	2-11
Camp Clark Seep	Gaging station	T. C. Palmer	1.92	3- 3
Camp Clark Seep	Gaging station	T. C. Palmer	1.43	3-22
Camp Clark Seep	Gaging station	T. C. Palmer	1.96	4- 9
Camp Clark Seep	Gaging station	T. C. Palmer	2.51	4-29
Camp Clark Seep	Gaging station	T. C. Palmer	1.31	5-28
Camp Clark Seep	Gaging station	T. C. Palmer	0.84	6-17
Camp Clark Seep	Gaging station	T. C. Palmer	3.22	6-28
Camp Clark Seep	Gaging station	T. C. Palmer	4.94	7-26
Camp Clark Seep	Gaging station	T. C. Palmer	14.24	8-25
Camp Clark Seep	Gaging station	T. C. Palmer	10.91	9- 8
Camp Clark Seep	Gaging station	T. C. Palmer	12.08	10- 1
Camp Clark Seep	Gaging station	T. C. Palmer	3.53	10-23
Camp Clark Seep	Gaging station	T. C. Palmer	5.90	11- 8
Fanning Seep	¼ mile E. of S.W. Cor. Sec. 20	T. C. Palmer	3.96	1- 3
Fanning Seep	¼ mile E. of S.W. Cor. Sec. 20	T. C. Palmer	5.27	1-15
Fanning Seep	¼ mile E. of S.W. Cor. Sec. 20	T. C. Palmer	3.46	2-12

Place	Locality	Hydrographer	Sec. Feet Discharge	Date
Fanning Seep	¼ mile E. of S.W. Cor. Sec. 20	T. C. Palmer	4.02	3-12
Fanning Seep	¼ mile E. of S.W. Cor. Sec. 20	T. C. Palmer	6.22	3-23
Fanning Seep	¼ mile E. of S.W. Cor. Sec. 20	T. C. Palmer	3.32	4-10
Fanning Seep	¼ mile E. of S.W. Cor. Sec. 20	Baumgartner-Palmer	8.30	4-30
Fanning Seep	¼ mile E. of S.W. Cor. Sec. 20	T. C. Palmer	11.27	5-19
Fanning Seep	¼ mile E. of S.W. Cor. Sec. 20	T. C. Palmer	5.17	6-10
Fanning Seep	¼ mile E. of S.W. Cor. Sec. 20	T. C. Palmer	5.29	6-18
Fanning Seep	¼ mile E. of S.W. Cor. Sec. 20	T. C. Palmer	5.53	6-29
Fanning Seep	¼ mile E. of S.W. Cor. Sec. 20	T. C. Palmer	3.35	7-14
Fanning Seep	¼ mile E. of S.W. Cor. Sec. 20	T. C. Palmer	3.59	7-28
Fanning Seep	¼ mile E. of S.W. Cor. Sec. 20	T. C. Palmer	7.43	8-17
Fanning Seep	¼ mile E. of S.W. Cor. Sec. 20	T. C. Palmer	3.65	8-26
Fanning Seep	¼ mile E. of S.W. Cor. Sec. 20	T. C. Palmer	5.15	9- 9
Fanning Seep	¼ mile E. of S.W. Cor. Sec. 20	T. C. Palmer	2.99	9-27
Fanning Seep	¼ mile E. of S.W. Cor. Sec. 20	T. C. Palmer	2.51	11- 9
Fairfield Seep	80 rods north Melbeta bridge	T. C. Palmer	6.30	1- 3
Fairfield Seep	80 rods north Melbeta bridge	T. C. Palmer	5.53	1-14
Fairfield Seep	80 rods north Melbeta bridge	T. C. Palmer	3.91	3-12
Fairfield Seep	80 rods north Melbeta bridge	T. C. Palmer	7.44	3-25
Fairfield Seep	80 rods north Melbeta bridge	Baumgartner-Palmer	10.30	5- 1
Fairfield Seep	80 rods north Melbeta bridge	T. C. Palmer	13.73	5-20
Fairfield Seep	80 rods north Melbeta bridge	T. C. Palmer	5.22	6-12
Fairfield Seep	80 rods north Melbeta bridge	T. C. Palmer	9.89	7- 1
Fairfield Seep	80 rods north Melbeta bridge	T. C. Palmer	5.70	7-27
Fairfield Seep	80 rods north Melbeta bridge	T. C. Palmer	3.19	9-29
Fairfield Seep	80 rods north Melbeta bridge	T. C. Palmer	5.90	10-23
Fairfield Seep	80 rods north Melbeta bridge	T. C. Palmer	5.31	11- 8
Hoth Drain	South line SE¼ Sec. 17-21-52	T. C. Palmer	7.76	1- 2

Place	Locality	Hydrographer	Sec Feet Discharge	Date
Hoth Drain	South line SE¼ Sec. 17-21-52	T. C. Palmer	6.11	1-14
Hoth Drain	South line SE¼ Sec. 17-21-52	T. C. Palmer-Kelly	5.23	2-11
Hoth Drain	South line SE¼ Sec. 17-21-52	T. C. Palmer	3.74	3-22
Hoth Drain	South line SE¼ Sec. 17-21-52	Baumgartner-Palmer	6.75	4- 9
Hoth Drain	South line SE¼ Sec. 17-21-52	Baumgartner-Palmer	10.92	5- 1
Hoth Drain	South line SE¼ Sec. 17-21-52	T. C. Palmer	19.91	6- 8
Hoth Drain	South line SE¼ Sec. 17-21-52	T. C. Palmer	13.34	6-28
Hoth Drain	South line SE¼ Sec. 17-21-52	T. C. Palmer	22.27	7-13
Hoth Drain	South line SE¼ Sec. 17-21-52	T. C. Palmer	30.37	7-27
Hoth Drain	South line SE¼ Sec. 17-21-52	T. C. Palmer	29.56	8-16
Hoth Drain	South line SE¼ Sec. 17-21-52	T. C. Palmer	21.52	9-29
Horse Creek	At Mihan bridge	T. C. Palmer	8.31	6-10
Kronberg Seep	South of highway 20′ (G. S.)	T. C. Palmer	2.12	1- 3
Kronberg Seep	South of highway 20′ (G. S.)	T. C. Palmer	2.08	1-15
Kronberg Seep	South of highway 20′ (G. S.)	Palmer-Kelly	1.70	2-12
Kronberg Seep	South of highway 20′ (G. S.)	T. C. Palmer	1.13	3-12
Kronberg Seep	South of highway 20′ (G. S.)	T. C. Palmer	1.10	3-23
Kronberg Seep	South of highway 20′ (G. S.)	Baumgartner-Palmer	1.70	4-30
Kronberg Seep	South of highway 20′ (G. S.)	T. C. Palmer	0.88	5-19
Kronberg Seep	South of highway 20′ (G. S.)	T. C. Palmer	1.71	6-10
Kronberg Seep	South of highway 20′ (G. S.)	T. C. Palmer	1.66	6-18
Kronberg Seep	South of highway 20′ (G. S.)	T. C. Palmer	2.05	6-29
Kronberg Seep	South of highway 20′ (G. S.)	T. C. Palmer	1.63	7-14
Kronberg Seep	South of highway 20′ (G. S.)	T. C. Palmer	2.22	8-17
Kronberg Seep	South of highway 20′ (G. S.)	T. C. Palmer	3.35	8-26
Kronberg Seep	South of highway 20′ (G. S.)	T. C. Palmer	2.80	9-28
Kronberg Seep	South of highway 20′ (G. S.)	T. C. Palmer	4.67	11- 9

Place	Locality	Hydrographer	Sec. Feet Discharge	Dato
Minatare Drain	Gaging station	T. C. Palmer	124.79	1- 2
Minatare Drain	Gaging station	T. C. Palmer	137.18	1-14
Minatare Drain	Gaging station	Palmer-Kelly	114.89	2-11
Minatare Drain	Gaging station	T. C. Palmer	105.54	3-12
Minatare Drain	Gaging station	T. C. Palmer	103.73	3-22
Minatare Drain	Gaging station	Baumgartner-Palmer	105.63	4- 9
Minatare Drain	Gaging station	Baumgartner-Palmer	110.37	5- 1
Minatare Drain	Gaging station	T. C. Palmer	98.71	5-20
Minatare Drain	Gaging station	T. C. Palmer	99.16	6- 9
Minatare Drain	Gaging station	T. C. Palmer	140.76	6-17
Minatare Drain	Gaging station	T. C. Palmer	157.58	6-28
Minatare Drain	Gaging station	T. C. Palmer	139.14	7-13
Minatare Drain	Gaging station	J. K. Rohrer	154.00	7-14
Minatare Drain	Gaging station	T. C. Palmer	209.58	7-27
Minatare Drain	Gaging station	T. C. Palmer	203.95	8-16
Minatare Drain	Gaging station	T. C. Palmer	203.00	8-25
Minatare Drain	Gaging station	T. C. Palmer	241.80	9- 8
Minatare Drain	Gaging station	J. K. Rohrer	186.00	9-27
Minatare Drain	Gaging station	J. K. Rohrer	192.40	9-29
Minatare Drain	Gaging station	T. C. Palmer	157.98	10-23
Minatare Drain	Gaging station	T. C. Palmer	164.67	11- 8
Melbeta Seep	100 yards south Melbeta bridge	T. C. Palmer	5.44	1- 5
Melbeta Seep	100 yards south Melbeta bridge	T. C. Palmer	5.42	3-13
Melbeta Seep	100 yards south Melbeta bridge	T. C. Palmer	1.83	3-25
Melbeta Seep	100 yards south Melbeta bridge	T. C. Palmer	4.79	5-20
O'Holloran Seep	At Nine Mile flume	Baumgartner-Palmer	1.52	5- 1
Stewart's Drain	South side ¼ Cor. Sec. 13-23-57	T. C. Palmer	9.72	1- 3

Place	Locality	Hydrographer	Sec. Feet Discharge	Date
Stewart's Drain	South side ¼ Cor. Sec. 13-23-57	T. C. Palmer	5.50	1-15
Stewart's Drain	South side ¼ Cor. Sec. 13-23-57	T. C. Palmer-Kelly	6.04	2-12
Stewart's Drain	South side ¼ Cor. Sec. 13-23-57	T. C. Palmer	3.27	3-12
Stewart's Drain	South side ¼ Cor. Sec. 13-23-57	T. C. Palmer	1.72	3-23
Stewart's Drain	South side ¼ Cor. Sec. 13-23-57	T. C. Palmer	2.53	6-10
Stewart's Drain	South side ¼ Cor. Sec. 13-23-57	T. C. Palmer	3.71	6-18
Stewart's Drain	South side ¼ Cor. Sec. 13-23-57	T. C. Palmer	1.45	7-14
Stewart's Drain	South side ¼ Cor. Sec. 13-23-57	T. C. Palmer	4.00	7-28
Stewart's Drain	South side ¼ Cor. Sec. 13-23-57	T. C. Palmer	4.08	7-29
Stewart's Drain	South side ¼ Cor. Sec. 13-23-57	T. C. Palmer	4.30	8-17
Stewart's Drain	South side ¼ Cor. Sec. 13-23-57	T. C. Palmer	6.89	8-26
Stewart's Drain	South side ¼ Cor. Sec. 13-23-57	T. C. Palmer	3.79	9- 9
Stewart's Drain	South side ¼ Cor. Sec. 13-23-57	T. C. Palmer	3.17	9-27
Stewart's Drain	South side ¼ Cor. Sec. 13-23-57	T. C. Palmer	1.89	11- 9
Scottsbluff Drain	Gaging station	T. C. Palmer	12.40	1- 5
Scottsbluff Drain	Gaging station	T. C. Palmer	12.10	1-16
Scottsbluff Drain	Gaging station	Baumgartner-Palmer	8.40	4-10
Scottsbluff Drain	Gaging station	Baumgartner-Palmer	9.70	4-30
Scottsbluff Drain	Gaging station	T. C. Palmer	9.98	5-20
Scottsbluff Drain	Gaging station	T. C. Palmer	8.11	6- 9
Scottsbluff Drain	Gaging station	T. C. Palmer	22.46	6-18
Scottsbluff Drain	Gaging station	T. C. Palmer	14.26	6-29
Scottsbluff Drain	Gaging station	T. C. Palmer	21.23	7-14
Scottsbluff Drain	Gaging station	T. C. Palmer	14.03	7-27
Scottsbluff Drain	Gaging station	T. C. Palmer	22.22	8-17
Scottsbluff Drain	Gaging station	T. C. Palmer	16.43	8-25
Scottsbluff Drain	Gaging station	T. C. Palmer	26.80	9- 8
Scottsbluff Drain	Gaging station	T. C. Palmer	20.17	9-29
Scottsbluff Drain	Gaging station	T. C. Palmer	19.95	10-23

Place	Locality	Hydrographer	Sec. Feet Discharge	Date
Scottsbluff Drain	Gaging station	T. C. Palmer	14.25	11- 8
Snell Drain	½ mile east Snell Beet Dump	T. C. Palmer	3.52	1- 2
Snell Drain	½ mile east Snell Beet Dump	T. C. Palmer	3.44	1-14
Snell Drain	½ mile east Snell Beet Dump	Palmer-Kelly	3.77	2-11
Snell Drain	½ mile east Snell Beet Dump	T. C. Palmer	2.51	3-12
Snell Drain	½ mile east Snell Beet Dump	T. C. Palmer	2.80	3-22
Snell Drain	½ mile east Snell Beet Dump	T. C. Palmer	2.62	6-17
Snell Drain	½ mile east Snell Beet Dump	T. C. Palmer	3.05	6-28
Snell Drain	½ mile east Snell Beet Dump	T. C. Palmer	4.62	7-13
Snell Drain	½ mile east Snell Beet Dump	T. C. Palmer	4.40	7-27
Snell Drain	½ mile east Snell Beet Dump	T. C. Palmer	4.98	8-16
Snell Drain	½ mile east Snell Beet Dump	T. C. Palmer	7.95	8-25
Snell Drain	½ mile east Snell Beet Dump	T. C. Palmer	9.39	9- 8
Snell Drain	½ mile east Snell Beet Dump	T. C. Palmer	6.44	9-29
Snell Drain	½ mile east Snell Beet Dump	T. C. Palmer	8.66	10-23
Snell Drain	½ mile east Snell Beet Dump	T. C. Palmer	8.61	11- 8
Tub Springs	Below Burlington railroad	T. C. Palmer	46.54	1- 3
Tub Springs	Below Burlington railroad	T. C. Palmer	41.62	1-15
Tub Springs	Below Burlington railroad	T. C. Palmer	28.29	2-13
Tub Springs	Below Burlington railroad	T. C. Palmer	32.25	3-12
Tub Springs	Below Burlington railroad	T. C. Palmer	29.43	3-23
Tub Springs	Below Burlington railroad	Baumgartner-Palmer	24.72	4-10
Tub Springs	Below Burlington railroad	Baumgartner-Palmer	28.30	4-30
Tub Springs	Below Burlington railroad	T. C. Palmer	22.25	5-19
Tub Springs	Below Burlington railroad	T. C. Palmer	22.34	6-10
Tub Springs	Below Burlington railroad	T. C. Palmer	41.00	6-18
Tub Springs	Below Burlington railroad	T. C. Palmer	43.88	6-29
Tub Springs	Below Burlington railroad	T. C. Palmer	40.70	7-14

Place	Locality	Hydrographer	Sec. Feet Discharge	Date
Tub Springs	Below Burlington railroad	T. C. Palmer	48.52	7-28
Tub Springs	Below Burlington railroad	T. C. Palmer	20.44	8-12
Tub Springs	Below Burlington railroad	T. C. Palmer	30.35	8-26
Tub Springs	Below Burlington railroad	T. C. Palmer	62.08	9-10
Tub Springs	Into Enterprise Canal	T. C. Palmer	26.66	6-10
Tub Springs	Into Enterprise Canal	T. C. Palmer	7.60	7-14
Tub Springs	Into Enterprise Canal	J. K. Rohrer	55.00	7-14
Tub Springs	Into Enterprise Canal	T. C. Palmer	0.00	7-28
Tub Springs	Into Enterprise Canal	T. C. Palmer	0.00	8-12
Tub Springs	Into Enterprise Canal	T. C. Palmer	22.63	8-17
Tub Springs	Into Enterprise Canal	T. C. Palmer	19.55	8-26
Tub Springs	Into Enterprise Canal	J. K. Rohrer	42.00	9-27
Tub Springs	Into Enterprise Canal	T. C. Palmer	41.78	11- 9
Toohey Drain	S.W. Cor. Sec. 20-23-56	T. C. Palmer	2.03	9-27
Toohey Drain	S.W. Cor. Sec. 20-23-56	T. C. Palmer	3.00	11-30
Tri-State Mitchell Waste	Rating flume, Wyo.-Nebr. line	T. C. Palmer	13.34	1- 3
Tri-State Mitchell Waste	Rating flume, Wyo.-Nebr. line	T. C. Palmer	6.92	3-13
Tri-State Mitchell Waste	Rating flume, Wyo.-Nebr. line	T. C. Palmer	2.00	4-30
Tri-State Mitchell Waste	Rating flume, Wyo.-Nebr. line	T. C. Palmer	82.95	6-10
Tri-State Mitchell Waste	Rating flume, Wyo.-Nebr. line	T. C. Palmer	84.00	6-18
Tri-State Mitchell Waste	Rating flume, Wyo.-Nebr. line	T .C. Palmer	86.77	7-14
Tri-State Mitchell Waste	Rating flume, Wyo.-Nebr. line	T. C. Palmer	114.62	7-28
Tri-State Mitchell Waste	Rating flume, Wyo.-Nebr. line	T. C. Palmer	27.45	8-17
Tri-State Mitchell Waste	Rating flume, Wyo.-Nebr. line	T. C. Palmer	20.38	8-26
Tri-State Mitchell Waste	Rating flume, Wyo.-Nebr. line	T. C. Palmer	278.34	9- 9
Tri-State Mitchell Waste	Rating flume, Wyo.-Nebr. line	T. C. Palmer	47.29	9-28

Place	Locality	Hydrographer	Sec. Feet	Date
Tri-State Toohey Waste	300 yards west beet dump	T. C. Palmer	70.90	5-19
Above Tri-State Canal	(Wet) Spotted Tail	T. C. Palmer	3.44	6-11
Above Tri-State Canal	(Wet) Spotted Tail	T .C. Palmer	11.33	6-29
Above Tri-State Canal	(Wet) Spotted Tail	T. C. Palmer	6.43	7-14
Above Tri-State Canal	(Wet) Spotted Tail	T. C. Palmer	11.69	7-28
Above Tri-State Canal	(Wet) Spotted Tail	T. C. Palmer	12.71	8-17
Above Tri-State Canal	(Wet) Spotted Tail	T. C. Palmer	16.81	8-26
Above Tri-State Canal	(Wet) Spotted Tail	T. C. Palmer	20.59	9- 9
Above Tri-State Canal	(Wet) Spotted Tail	T. C. Palmer	9.87	11- 9
Above Enterprise Canal	(Dry) Spotted Tail	T. C. Palmer	21.89	6-10
Above Enterprise Canal	(Dry) Spotted Tail	T. C. Palmer	29.18	6-18
Above Enterprise Canal	(Dry) Spotted Tail	T. C. Palmer	31.48	6-29
Above Enterprise Canal	(Dry) Spotted Tail	T. C. Palmer	32.64	7-14
Above Enterprise Canal	(Dry) Spotted Tail	T. C. Palmer	53.85	7-28
Above Enterprise Canal	(Dry) Spotted Tail	T. C. Palmer	41.19	8-17
Above Enterprise Canal	(Dry) Spotted Tail	T. C. Palmer	48.24	8-26
Above Enterprise Canal	(Dry) Spotted Tail	T. C. Palmer	48.63	9- 9
Above Enterprise Canal	(Dry) Spotted Tail	T. C. Palmer	53.41	9-27
Bridge 1 mile above dam	Wood River	G. K. Baumgartner	7.34	6-12
Gaging station	Tri-State Red Willow Waste	T. C. Palmer	114.30	5-28
Gaging station	Tri-State Red Willow Waste	T. C. Palmer	85.55	6- 8
Gaging station	Tri-State Red Willow Waste	T. C. Palmer	106.77	7-13
Gaging station	Tri-State Red Willow Waste	T. C. Palmer	120.20	7-26
Gaging station	Tri-State Red Willow Waste	T. C. Palmer	69.43	9- 8
Gaging station	Tri-State Red Willow Waste	T. C. Palmer	122.91	10- 1

ALFALFA CANAL.

Alfalfa Canal is owned by the Alfalfa Irrigation District.

The diversion of water is controlled partially with a sand dam, check and wastegate. No headgate constructed.

The check and wastegate is located about 2,000 feet below the diversion point.

Rating flume of wood is located 200 feet below the check and wastegate.

Gagings here have been very good. Gage heights were not reported for 1919, and no automatic gage has been installed as yet.

ACTUAL DISCHARGE MEASUREMENTS, OF ALFALFA CANAL AT RATING FLUME, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	8- 5	Palmer-Hartman	11.70	1.82	0.95	21.32	23
2	9-24	Earl North	3.70	1.28	0.30	4.72	10

ACTUAL DISCHARGE MEASUREMENTS, OF ALFALFA CANAL AT RATING FLUME, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-17	G. K. Baumgartner	26.00	1.84	2.00	47.82	10
2	8-13	G. K. Baumgartner	20.40	1.46	1.70	29.87	10
3	8-24	G. K. Baumgartner	12.60	0.99	0.90	12.43	10
4	9- 3	Palmer-Willis	5.10	1.05	0.40	5.37	9

DAILY DISCHARGE, IN SECOND FEET, OF ALFALFA CANAL, FOR YEAR 1919.

Day	July	August	September
1	....	....	8
2	....	32	10
3	....	42	8
4	....	48	10
5	....	48	8
6	....	....	10
7	....	....	....
8	....	....	....
9	....	....	....
10	....	11	....
11	....	12	....
12	....	13	....
13	....	10	....
14	....	8	....
15	....	10	....
16	....	10	....
17	....	8	....
18	....	8	....
19	....	....	....
20	....	....	....
21	....	....	....
22	....	....	....
23	....	....	....
24	....	....	....
25	....	....	....
26	....	....	....
27	19	....	....
28	16	....	....
29	13	....	....
30	16	....	....
31	19	10	....
Total	83	270	54
Mean	16.6	9	9
Maximum	19	48	10
Minimum	13	....	8
Acre Feet	165	536	107

ALLIANCE CANAL.

Alliance Canal diverts its original appropriation from the North Platte River, and has an optional diversion from the Red Willow Creek.

The river diversion is controlled by an old frame headgate, which has about reached its limit of usefulness. A small wooden sluice gate and wing dam is used in connection with the headgate

This diversion was used for diverting only a small portion of the water used under the Alliance Canal during the last biennium. Gaging station is very poor.

The optional diversion is made from the Red Willow Creek. This diversion is controlled by a concrete structure across the Red Willow Creek. Flood and waste waters from the Red Willow drainage area flows through this structure to the river, carrying a great deal of sediment, more or less of which is deposited in the Alliance Canal. No rating flume has been installed, and gagings have been unsatisfactory.

Automatic gage is very much needed in Alliance Canal at Red Willow to give the project a more favorable report.

ACTUAL DISCHARGE , MEASUREMENTS, FOR ALLIANCE CANAL FROM RED WILLOW, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-28	T. C. Palmer	18.30	0.81	5.35	14.80	23
2	6- 3	T. C. Palmer	16.75	1.47	5.60	24.64	23
3	6-10	T. C. Palmer	30.70	1.50	6.25	46.04	23
4	6-26	T. C. Palmer	27.90	1.19	5.85	33.13	23
5	6-30	T. C. Palmer	27.20	1.44	5.70	39.37	23
6	7-10	T. C. Palmer	23.30	1.30	5.75	30.38	23
7	7-19	T. C. Palmer	17.45	1.13	5.50	19.81	23
8	7-28	T. C. Palmer	28.40	1.29	6.25	36.83	23
9	8- 1	W. F. Chaloupka	33.50	1.18	6.15	39.74	23
10	8- 9	T. C. Palmer	33.90	1.55	6.30	52.71	23
11	8-13	T. C. Palmer	33.20	1.15	6.40	38.30	23
12	8-25	T. C. Palmer	36.50	1.46	6.30	53.13	23
13	9- 4	T. C. Palmer	35.60	0.96	6.30	34.00	23
14	9- 8	T. C. Palmer	28.40	0.82	5.90	23.22	23

ACTUAL DISCHARGE MEASUREMENTS, OF ALLIANCE CANAL FROM RIVER AT HEADGATE, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6- 3	T. C. Palmer	14.95	0.50	3.10	7.55	23
2	6-26	T. C. Palmer	27.50	0.66	1.80	18.27	23
3	6-30	T. C. Palmer	25.20	0.71	1.90	18.00	23
4	7-19	T. C. Palmer	8.80	0.45	0.85	3.93	23
5	7-22	T. C. Palmer	19.90	0.68	1.60	13.55	23
6	8- 1	W. F. Chaloupka	21.00	0.43	1.81	9.18	23
7	8- 9	T. C. Palmer	.....	.....	0.00	0.00	23
8	8-13	T. C. Palmer	.....	.....	0.00	0.00	23
9	9- 8	T. C. Palmer	.....	.....	0.30	0.00	23

DAILY DISCHARGE, IN SECOND FEET, OF ALLIANCE CANAL FROM RED WILLOW, FOR YEAR 1919.

Day	May	June	July	August	September
1	....	38	31	43	49
2	....	31	31	44	49
3	....	38	34	44	49
4	....	38	24	45	49
5	....	38	31	46	45
6	....	38	34	47	40
7	....	34	31	48	37
8	....	45	27	48	34
9	....	41	34	49	34
10	....	45	34	50	34
11	....	49	31	51	34
12	....	34	34	52	34
13	....	49	34	52	....
14	....	49	33	52	....
15	....	41	30	51	....
16	....	34	25	51	....
17	....	31	21	50	....
18	....	34	20	50	....
19	....	31	20	49	....
20	....	27	24	49	....
21	....	27	27	49	....
22	....	34	30	49	....
23	....	31	33	49	....
24	....	34	31	49	....
25	....	31	38	49	....
26	....	34	41	49	....
27	8	27	44	49	....
28	10	31	47	49	....
29	27	38	45	49	....
30	38	34	45	49	....
31	27	....	44	49	....
Total	110	1086	1014	1510	488
Mean	22	36	33	49	41
Acre Ft.	218	2143	2011	2995	968
Max.	38	49	47	52	49
Min.	8	27	20	43	34

Acres east of Red Willow....4513
Total Acre Feet.....8823
Acre Feet per Acre..... 1.95

DAILY DISCHARGE, IN SECOND FEET, OF ALLIANCE CANAL FROM RIVER AT HEADGATE, FOR YEAR 1919.

Day	May	June	July	August
1	.....	11.50	12.00	18.00
2	.....	10.00	12.00	.....
3	.....	14.00	10.00	.....
4	.....	11.50	12.00	.....
5	.....	6.50	10.00	.....
6	.....	13.00	10.00	.....
7	.....	6.50	12.00	.....
8	.....	6.00	11.00	.....
9	.....	13.00	12.00	.....
10	.....	6.00	12.00	.....
11	.....	9.00	12.00	.....
12	.....	13.00	10.00	.....
13	.....	19.00	9.00	.....
14	.....	19.00	9.00	.....
15	.....	18.00	9.00	.....
16	.....	16.50	8.00	.....
17	.....	18.00	8.00	.....
18	.....	19.00	8.00	.....
19	.....	15.25	8.00	.....
20	.....	16.50	11.00	.....
21	.....	15.25	14.00	.....
22	.....	13.00	17.00	.....
23	.....	19.00	17.00	.....
24	.....	19.00	17.00	.....
25	.....	16.50	17.00	.....
26	.....	19.00	17.00	.....
27	.....	18.00	17.00	.....
28	.....	19.00	17.00	.....
29	7.00	10.00	18.00	.....
30	7.00	11.50	18.00	.....
31	7.00	.....	18.00	.....
Total	21.00	421.00	392.00	18.00
Mean	7.00	14.00	12.60	18.00
Maximum	7.00	19.00	18.00	18.00
Minimum	7.00	6.00	8.00	18.00
Acre Feet	42.00	835.00	777.00	36.00

Total Acre Feet 1090.00
Acres West of R. W. 1684.00
Acre Feet per Acre 0.64

ACTUAL DISCHARGE MEASUREMENTS, OF ALLIANCE CANAL FROM NORTH PLATTE RIVER AT WAGON BRIDGE SOUTH OF BAYARD, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-12	T. C. Palmer	19.55	0.95	1.90	18.63	29
2	6-17	T. C. Palmer	26.80	1.20	2.65	32.18	29
3	6-28	T. C. Palmer	12.30	0.61	1.30	7.43	9
4	7-13	T. C. Palmer	17.40	0.73	1.70	12.70	9
5	7-26	T. C. Palmer	8.25	0.28	0.80	2.29	9
6	8-16	T. C. Palmer	11.50	0.70	1.30	8.05	9
7	8-25	T. C. Palmer	.....	.....	1.00	0.00	9

ACTUAL DISCHARGE MEASUREMENTS, OF ALLIANCE CANAL FROM RED WILLOW CREEK AT RED WILLOW DIVERSION, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-17	T. C. Palmer	27.45	1.05	5.75	28.88	29
2	6-28	T. C. Palmer	22.90	0.97	5.70	22.17	9
3	7-26	T. C .Palmer	33.80	1.23	6.00	41.59	9
4	8-16	T. C. Palmer	37.55	1.60	6.10	60.10	9
5	8-25	T. C. Palmer	45.30	1.26	6.65	56.73	9
6	9- 8	T. C. Palmer	25.30	0.67	5.55	16.94	9

DAILY DISCHARGE, IN SECOND FEET, OF ALLIANCE CANAL, AT RED WILLOW, FOR YEAR 1920.

Day	June	July	August
1	....	60	....
2	....	70	....
3	....	34	....
4	....	34	....
5	....	28	....
6	....	23	....
7	....	34	....
8	....	34	28
9	....	70	34
10	....	18	18
11	....	15	28
12	18	23	31
13	11	28	34
14	15	28	60
15	18	18	....
16	11	23	....
17	12	28	....
18	15	34	....
19	17	28	....
20	18	23	....
21	....	28	....
22	23	34	....
23	18	28	....
24	15	23	....
25	11	21	....
26	15	18	....
27	18	28	....
28	18	23	....
29	41	19	....
30	41	15	....
31	....	11	....
Total	335	900	235
Mean	17	29	17
Maximum	41	70	60
Minimum	....	11	....
Acre Feet	664	1785	466

Area covered by Red Willow water (acres) 3,862

Water used (acre feet) 2,915

Per acre (acre feet) 0.75

ACTUAL DISCHARGE MEASUREMENTS, ALLEN-LARNED DITCH AT DIVERSION, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-15	Bailey-Palmer	2.61	1.78	.....	4.66	23

ACTUAL DISCHARGE MEASUREMENTS, OF BARBER CANAL AT RATING FLUME, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-28	G. K. Baumgartner.....	4.40	1.47	1.10	6.46	10
2	8- 6	G. K. Baumgartner.....	3.20	1.30	0.80	4.16	10
3	8-13	G. K. Baumgartner.....	3.60	1.93	0.90	6.92	10
4	8-23	G. K. Baumgartner.....	5.00	1.07	0.95	5.37	10

NEBRASKA CORN MILLS, LITTLE BLUE RIVER, MILFORD, NEBRASKA

BELMONT CANAL.

Belmont Canal is owned by the Bridgeport Irrigation District.

The water used is diverted from the North Platte River and Cedar Creek.

The diversion works have been under construction for the past biennium.

The headgate, sluice gates and diversion dam are constructed of concrete and steel.

The headgate opening is 50 feet in the clear. The sluice gate has a clear opening of 100 feet. The overflow weir is 1,000 feet in length.

The rating flume is of concrete. Gagings made here are very good.

The Empire Canal Company draws its water through the Belmont diversion works, using about one mile of the Belmont Canal as a carrier, and then turns water into its own canal.

Gage height reports of the river diversion from the Belmont Canal have been only fair for the 1920 season, and no reports from Cedar Creek. No rating flume installed in the Cedar Creek ditch. No automatic gages used.

ACTUAL DISCHARGE MEASUREMENTS, OF BELMONT CANAL AT RATING FLUME, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-15	W. F. Chaloupka	26.28	1.65	0.96	43.42	9
2	5-22	W. F. Chaloupka	37.80	2.03	1.16	76.98	9
3	5-26	W. F. Chaloupka	48.60	2.19	1.50	106.55	9
4	6- 2	W. F. Chaloupka	55.32	2.32	1.62	128.36	9
5	6- 9	W. F. Chaloupka	52.60	2.26	1.65	119.10	9
6	6-16	W. F. Chaloupka	60.23	2.12	1.80	127.89	9
7	6-23	W. F. Chaloupka	63.67	2.27	1.93	144.26	9
8	6-30	W. F. Chaloupka	66.24	2.14	1.94	141.67	9
9	7- 7	W. F. Chaloupka	74.75	2.21	2.09	165.25	9
10	7-14	W. F. Chaloupka	37.40	1.86	1.25	69.82	9
11	7-21	W. F. Chaloupka	36.10	1.84	1.20	65.42	9
12	7-28	W. F. Chaloupka	76.81	2.35	2.24	180.46	9
13	8- 4	W. F. Chaloupka	64.70	2.12	1.87	137.19	9
14	8-11	W. F. Chaloupka	65.00	2.25	1.92	146.60	9
15	8-16	W. F. Chaloupka	69.40	2.38	2.15	164.86	9

ACTUAL DISCHARGE MEASUREMENTS, OF BELMONT CANAL BELOW CEDAR CREEK, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-10	Palmer-North	8.27	1.15	1.68	9.53	23
2	5-17	T. C. Palmer	2.73	1.06	0.90	2.90	23
3	5-24	T. C. Palmer	7.20	1.38	1.45	9.93	23
4	5-26	Earl North	4.98	1.17	1.15	5.81	10
5	5-14	Palmer- North	7.00	1.32	1.31	9.20	23
6	6-28	T. C. Palmer	20.50	1.69	2.15	34.63	23
7	7-29	T. C. Palmer	16.50	1.53	1.45	25.21	23

ACTUAL DISCHARGE MEASUREMENTS, OF BELMONT CANAL FROM CEDAR CREEK ABOVE BELMONT CANAL, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-10	Palmer-North	7.62	1.29	.....	9.80	23
2	5-17	T. C. Palmer	5.98	1.30	.....	7.78	23
3	5-24	T. C. Palmer	6.53	1.58	.....	10.30	23
4	6-14	North-Palmer	5.33	0.68	.....	3.63	23
5	6-28	T. C. Palmer	8.86	0.61	.....	5.42	23
6	9-29	T. C. Palmer	7.95	1.16	.....	9.21	23

DAILY DISCHARGE, IN SECOND FEET, OF BELMONT CANAL BELOW CEDAR CREEK, FOR YEAR 1919.

Day	May	June	July
1	.....	24.00	26.50
2	.....	9.00	32.50
3	.....	5.00	36.00
4	.....	5.00	37.50
5	.....	5.00	45.00
6	.....	5.00	24.00
7	.....	5.00	24.00
8	.....	5.00	5.00
9	.....	14.50	5.00
10	20.00	9.00	24.00
11	20.00	6.50	30.00
12	15.00	6.50	24.00
13	14.50	14.50	5.00
14	6.50	11.50	6.50
15	6.50	12.00	6.50
16	5.00	14.00	5.00
17	5.00	16.00	5.00
18	5.00	18.00	5.00
19	11.50	18.00	5.00
20	11.50	20.00	5.00
21	11.50	20.00	5.00
22	11.50	22.00	5.00
23	11.50	24.00	5.00
24	14.50	26.00	5.50
25	6.50	28.00	5.50
26	9.00	30.00	5.50
27	11.50	32.00	6.50
28	20.50	34.50	9.00
29	20.50	30.00	9.00
30	20.50	30.00	9.00
31	20.50	.....	9.00
Total	278.00	479.00	431.00
Mean	13.00	16.00	14.00
Maximum	20.50	34.50	45.00
Minimum	5.00	5.00	5.00
Acre Feet	551.00	950.00	85.50
Acre Feet from Cedar Creek	2356.00		
	29042.00		
	31098.00		

ACTUAL DISCHARGE MEASUREMENTS, OF BELMONT CANAL AT BRIDGE SOUTH OF BRIDGEPORT, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5- 9	North-Palmer	32.40	1.18	0.88	38.20	23
2	5-15	W. F. Chaloupka	33.44	1.26	0.95	40.93	9
3	5-22	W. F. Chaloupka	28.56	1.74	1.06	49.83	9
4	5-26	W. F. Chaloupka	42.57	1.92	1.40	81.87	9
5	6- 2	W. F. Chaloupka	51.09	1.62	1.40	83.02	9
6	6- 9	W. F. Chaloupka	45.90	1.59	1.32	73.00	9
7	6-16	W. F. Chaloupka	44.33	1.48	1.28	65.64	9
8	6-21	W. F. Chaloupka	65.13	1.85	1.94	120.41	9
9	6-23	W. F. Chaloupka	59.20	1.57	1.65	92.97	9
10	6-30	W. F. Chaloupka	68.95	1.88	1.91	129.43	9
11	7- 7	W. F. Chaloupka	70.87	2.01	2.06	142.34	9
12	7-14	W. F. Chaloupka	36.55	1.29	1.04	47.17	9
13	7-21	W. F. Chaloupka	33.12	0.83	0.84	27.42	9
14	7-28	W. F. Chaloupka	67.89	1.96	2.00	133.05	9
15	8- 4	W. F. Chaloupka	34.20	1.04	1.00	35.57	9
16	8-11	W. F. Chaloupka	62.79	1.57	1.76	99.03	9
17	9-20	T. C. Palmer	36.24	1.89	1.25	68.66	9

ACTUAL DISCHARGE MEASUREMENTS, OF BELMONT CANAL AT FINN BRIDGE, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-15	W. F. Chaloupka	18.75	1.62	1.30	30.38	9
2	5-22	W. F. Chaloupka	21.15	1.86	1.46	39.31	9
3	5-26	W. F. Chaloupka	25.95	2.23	1.83	58.00	9
4	6- 2	W. F. Chaloupka	29.80	2.19	2.00	65.32	9
5	6- 9	W. F. Chaloupka	25.70	2.19	1.80	56.42	9
6	6-16	W. F. Chaloupka	21.90	1.90	1.54	41.70	9
7	6-21	W. F. Chaloupka	37.68	2.34	2.50	88.37	9
8	7- 1	W. F. Chaloupka	35.40	2.35	2.40	83.52	9
9	7-14	W. F. Chaloupka	16.83	1.52	1.98	25.65	9
10	7-21	W. F. Chaloupka	11.25	1.22	0.80	13.77	9
11	7-28	W. F. Chaloupka	39.90	2.34	2.58	93.55	9
12	8- 4	W. F. Chaloupka	14.80	1.48	1.12	21.98	9
13	8-11	W. F. Chaloupka	34.40	2.27	2.27	78.20	9
14	9-20	W. F. Chaloupka	23.50	1.94	0.65	45.72	9

DAILY DISCHARGE, IN SECOND FEET, OF BELMONT CANAL AT HEAD (FROM RIVER), FOR YEAR 1919.

Day	May	June	July	August	September
1	....	132	154	65	132
2	....	98	132	65	144
3	....	110	116	65	154
4	....	104	132	87	150
5	....	109	155	87	162
6	....	109	154	98	171
7	....	105	154	132	135
8	....	110	126	132	46
9	....	110	98	132	37
10	....	110	98	132	70
11	32	110	98	132	132
12	32	110	65	65	166
13	32	110	65	65	76
14	32	120	65	66	81
15	32	120	65	66	87
16	32	132	60	66	87
17	32	154	60	77	87
18	32	154	55	89	87
19	32	166	55	99	87
20	32	173	154	110	87
21	46	166	154	98	87
22	65	165	160	82	87
23	65	180	154	120	87
24	65	166	177	126	81
25	74	166	165	132	74
26	83	166	177	116	67
27	102	144	177	110	60
28	111	146	177	115	53
29	120	132	184	160	46
30	129	132	184	132	46
31	132	.....	184	132	....
Total	1312	4009	3954	3153	2866
Mean	62.5	133.6	127.5	101.7	95.5
Acre Ft.	2586	7313	7502	6210	5424
Max.	132	180	184	160	166
Min.	32	98	55	65	46

Total A. F. 30,336
To Empire Creek 1,294

29,042 ~~To Belmont Lands~~ plus 2,356 acre feet Cedar Creek.
2,356

Acre Feet 31,398
Acres reported 14,295
Acre Feet per acre 2.19

ACTUAL DISCHARGE MEASUREMENTS, OF BELMONT CANAL AT RATING FLUME, FOR YEAR 1920.

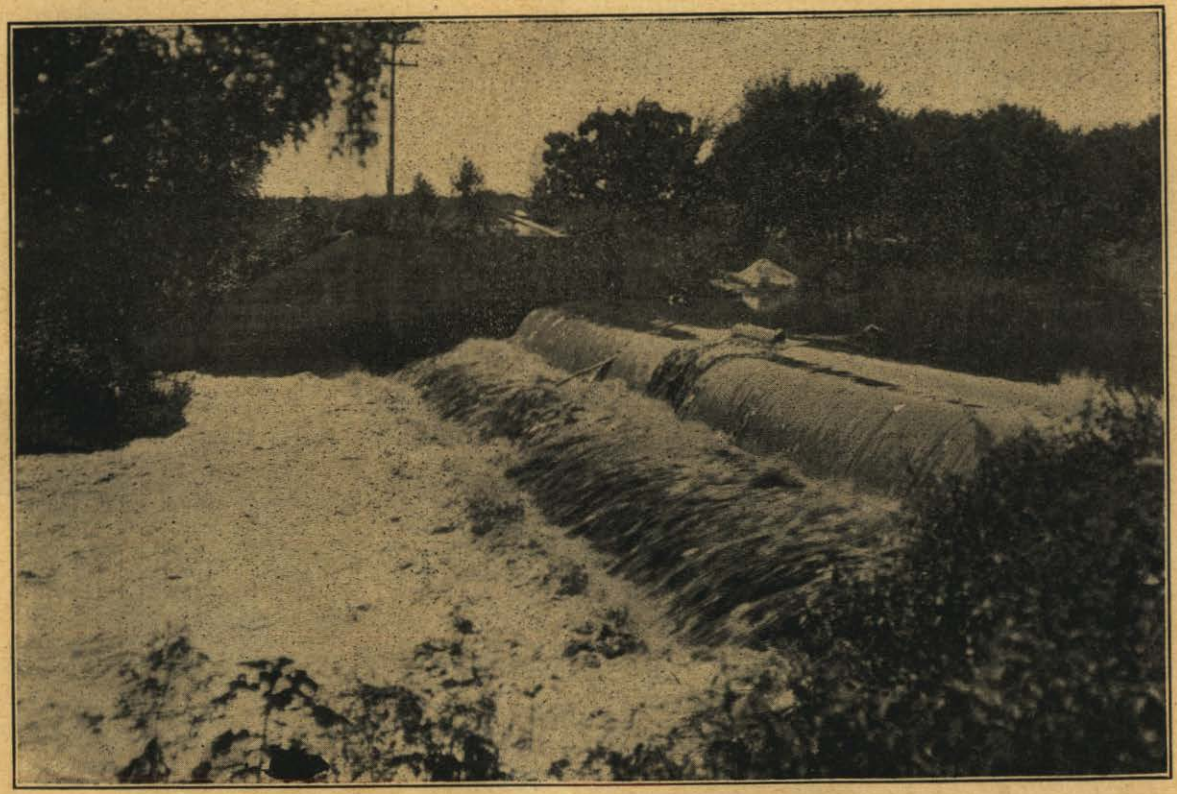
No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-15	T. C. Palmer	43.20	2.11	1.30	91.25	29
2	7- 1	T. C. Palmer	55.60	2.32	1.70	129.40	9
3	7-16	T. C. Palmer	39.07	2.17	1.30	84.65	9
4	7-30	T. C. Palmer	58.79	2.22	1.75	130.27	9
5	8-19	T. C. Palmer	71.20	2.42	2.00	172.42	9
6	9-10	T. C. Palmer	44.42	2.22	1.42	98.53	9
7	10- 4	T. C. Palmer	44.21	2.65	1.30	117.29	9
8	10- 9	T. C. Palmer	43.95	2.74	1.37	120.46	9

DAILY DISCHARGE, IN SECOND FEET, OF BELMONT CANAL, FOR YEAR 1920.

Day	June	July	August	September
1	....	150	104	....
2	....	113	136	....
3	....	160	136	....
4	....	160	136	....
5	....	140	.....	88
6	....	109	.....	85
7	....	109	100	92
8	....	95	100	130
9	....	80	....	100
10	....	78	....	100
11	....	76	....	100
12	....	79	....	113
13	....	79	....	113
14	72	85	56	130
15	85	88	88	136
16	88	88	114	136
17	114	100	136	136
18	96	92	170	104
19	66	88	150	104
20	66	92	150	114
21	60	82	136	136
22	85	70	136	112
23	82	73	150	128
24	92	74	143	114
25	92	76	143	102
26	110	78	150	102.
27	100	79	150	104
28	88	79	250	106
29	110	79	.....	108
30	160	114	.....	108
31	.....	100	.....	.....
Total	1566	2965	2834	2901
Mean	92	96	91	97
Maximum	160	160	250	136
Minimum	60	70	.....	.....
Acre Feet	3106	5881	5621	5754

Area reported (acres) 15000
Water used (acre feet) 20362*
Per Acre (acre feet) 1.35

* Empire Canal used a part of this water, amount not known.



STATION NO. 2, BLUE RIVER POWER CO. (A-1153)

BEERLINE CANAL.

This canal diverts water from the North Platte River.

The rating flume is used as a check, which gave poor gagings, and as a result cannot bt used.

Automatic gage height recorder was used during the 1920 season, and reports made, but owing to the poor gaging station, the gage heights are of no value, and daily discharge for 1920 cannot be published.

ACTUAL DISCHARGE MEASUREMENTS, OF BEERLINE CANAL AT RATING FLUME, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-14	North-Palmer	9.10	1.31	1.00	11.97	23
2	6-23	T. C. Palmer	10.91	1.56	1.15	17.02	23
3	6-24	W. F. Chaloupka	7.55	1.33	0.90	10.08	9
4	6-29	T. C. Palmer	2.70	0.85	0.40	2.29	23
5	7- 8	Earl North	6.13	1.43	0.80	8.75	10
6	8- 6	T. C. Palmer	4.42	1.00	0.65	4.41	10
7	8-27	Earl North	8.05	0.91	1.00	7.34	10
8	8-29	Earl North	8.05	0.89	1.00	7.20	23
9	9-13	Earl North	12.70	0.69	1.50	8.78	10
10	9-29	T. C. Palmer	.....	.....	0.70	0.00	23

ACTUAL DISCHARGE MEASUREMENTS, OF BEERLINE CANAL AT RATING FLUME, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7- 2	T. C. Palmer	7.65	0.59	0.80	4.47	9
2	7- 7	G. K. Baumgartner	9.80	1.41	1.50	13.86	10
3	7-23	Palmer-Baumgartner	7.90	0.88	1.20	6.99	9
4	8-10	G. K. Baumgartner	9.08	0.77	1.40	6.98	10
5	8-26	G. K. Baumgartner	9.40	0.58	1.40	5.41	10
6	9- 1	T. C. Palmer	13.40	0.60	1.90	8.09	10

DAILY DISCHARGE, IN SECOND FEET, OF BEERLINE CANAL, FOR YEAR 1919.

Day	June	July	August	September
1	.....	12.00	5.00	8.00
2	.....	12.00	5.00	8.00
3	.....	11.00	5.00	8.00
4	.....	9.00	6.00	8.00
5	.....	7.00	5.00	8.00
6	.....	7.00	4.00	8.00
7	.....	7.00	4.00	8.00
8	.....	8.00	4.00	8.00
9	.....	9.00	3.00	9.00
10	.....	9.00	3.00	9.00
11	.....	8.00	3.00	9.00
12	.....	8.00	4.00	8.00
13	.....	8.00	4.00	8.00
14	12.00	7.00	4.00	8.00
15	13.00	7.00	4.00	8.00
16	13.00	7.00	5.00	8.00
17	14.00	7.00	5.00	8.00
18	15.00	7.00	5.00	7.00
19	16.00	7.00	5.00	7.00
20	17.00	7.00	6.00	7.00
21	17.00	6.00	6.00	7.00
22	22.00	6.00	6.00	6.00
23	17.00	6.00	6.00	6.00
24	12.00	6.00	6.00	5.00
25	12.00	6.00	7.00	5.00
26	10.00	6.00	7.00	4.00
27	10.00	6.00	7.00	3.00
28	10.00	5.00	7.00	2.00
29	10.00	5.00	8.00	.....
30	12.00	5.00	8.00	.....
31	.....	5.00	8.00	.....
Total	232.00	226.00	165.00	198.00
Mean	12.60	7.20	5.30	6.60
Maximum	22.00	12.00	8.00	9.00
Minimum	10.00	5.00	3.00	.....
Acre Feet	460.00	448.00	327.00	393.00

Total Acre Feet 1628.00
Acres Reported 2080.00
Acre Feet per Acre 0.78

BIRDWOOD CANAL.

Birdwood Canal is owned by the Birdwood Irrigation District.

Water is diverted from Birdwood Creek in Section 35, Township 15 North, Range 33 West. Diversion works is a concrete structure built in the creek, and controls the entire creek flow by the aid of flashboards. The structure is ample to meet all requirements of the ditch.

Rating flume 800 feet below headgate is rotted out and has been of no use for the past three years. Gagings have been made at wagon bridge 150 feet below old rating flume. No gage height reports were made in 1919 or 1920. No automatic gage.

ACTUAL DISCHARGE MEASUREMENTS, OF BIRDWOOD CANAL AT RATING FLUME, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	9- 2	Earl North	6.30	1.23	0.90	7.74	10

ACTUAL DISCHARGE MEASUREMENTS, OF BIRDWOOD CANAL AT FIRST WAGON BRIDGE BELOW HEAD, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-12	G. K. Baumgartner	21.05	0.69	1.10	14.53	10
2	7-17	G. K. Baumgartner	13.45	0.93	1.10	12.59	10
3	7-31	G. K. Baumgartner	18.95	1.02	2.50	19.29	10
4	8- 5	G. K. Baumgartner	12.20	1.12	1.00	13.61	10
5	8-16	G. K. Baumgartner	10.55	0.93	1.00	9.80	10
6	8-20	G. K. Baumgartner	12.20	0.73	0.90	8.85	10
7	9- 6	Palmer-Willis	5.78	1.22	0.75	7.04	9

BLUE CREEK CANAL.

Blue Creek Canal is owned by the Blue Creek Irrigation District.

The water used by this canal is controlled by a rock dam across Blue Creek, and a wastegate about 1,000 feet below dam.

The wastegate structure is also used for a rating flume. Gagings made in this arrangement have been unsatisfactory. Wasting water back to creek causes eddys and cross currents.

ACTUAL DISCHARGE MEASUREMENTS, OF BLUE CREEK IRRIGATION DISTRICT CANAL AT RATING FLUME, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-28	Earl North	9.70	1.27	1.40	12.31	10
2	6-13	Earl North	19.93	1.23	2.10	24.54	10
3	6-20	Earl North	18.31	1.51	2.00	27.71	10
4	7- 8					0.00	10
5	7-15	Earl North	19.05	1.34	2.00	25.57	10
6	8- 5	Palmer-Hartman	24.20	1.41	2.24	34.12	10
7	8-25	Earl North	6.26	0.82	1.05	5.17	10
8	8-30	Earl North	18.60	1.43	1.80	26.72	10
9	9- 8	Earl North	23.60	1.51	2.40	35.75	10
10	9-15	Earl North	21.75	1.14	2.30	24.70	10
11	9-23	Earl North	16.20	1.37	1.80	22.19	10

ACTUAL DISCHARGE MEASUREMENTS, OF BLUE CREEK DISTRICT CANAL AT RATING FLUME, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-18	G. K. Baumgartner	5.90	0.84	0.85	4.95	10
2	6-24	G. K. Baumgartner	8.30	1.00	0.95	8.26	10
3	7- 9	G. K. Baumgartner	17.60	1.87	1.60	32.97	10
4	7-20	G. K. Baumgartner	12.00	1.56	1.00	18.75	10
5	7-27	G. K. Baumgartner	17.60	2.10	1.60	36.92	10
6	7-29	G. K. Baumgartner	17.60	2.00	1.60	35.24	10
7	8- 6	G. K. Baumgartner	22.00	2.15	1.80	47.46	10
8	8-12	G. K. Baumgartner	22.00	1.85	1.90	40.68	10
9	8-24	G. K. Baumgartner	11.00	1.55	1.00	17.01	10
10	9- 2	Willis-Palmer	13.78	1.86	1.35	25.64	9

DAILY DISCHARGE, IN SECOND FEET, OF BLUE CREEK DISTRICT CANAL, FOR YEAR 1919.

Day	June	July	August	September
1	.....	24.00	37.00	41.00
2	.....	25.00	37.00	35.00
3	.....	.....	37.00	35.00
4	.....	.....	37.00	35.00
5	.....	.....	35.00	35.00
6	.....	.....	35.00	35.00
7	.....	.....	35.00	35.00
8	.....	14.00	35.00	35.00
9	31.00	26.00	35.00	38.00
10	24.00	25.00	35.00	41.00
11	25.00	24.00	35.00	37.00
12	25.00	24.00	35.00	34.00
13	29.00	25.00	35.00	31.00
14	30.00	26.00	35.00	28.00
15	30.00	25.00	35.00	25.00
16	31.00	25.00	35.00	25.00
17	32.00	25.00	35.00	25.00
18	28.00	25.00	.....	25.00
19	28.00	25.00	.....	23.00
20	25.00	25.00	.....	23.00
21	24.00	25.00	.....	22.00
22	24.00	26.00	.....	22.00
23	24.00	32.00	.....	22.00
24	34.00	39.00	.....	.....
25	32.00	36.00	.....	.....
26	33.00	33.00	.....	.....
27	32.00	30.00	.....	.....
28	24.00	26.00	.....	.....
29	24.00	25.00	.....	.....
30	32.00	25.00	39.00	.....
31	.....	37.00	.....	.....
Total	621.00	697.00	642.00	707.00
Mean	28.00	22.50	20.70	30.70
Maximum	34.00	39.00	37.00	41.00
Minimum	24.00	.....	.....	22.00
Acre Feet	1232.00	1382.00	1273.00	1402.00

Total Acre Feet 5289.00
Acres Reported 2971.00
Acre Feet per Acre..... 1.77

BROWN'S CREEK CANAL.

This canal is owned by the Brown's Creek Irrigation District.

The water used is diverted from the North Platte River.

A wing dam and a fairly good frame headgate is used to control the flow.

A reasonably good concrete rating flume was in use during the past biennium, and an automatic gage height recorder was in operation during the season of 1920.

Gaging results were very satisfactory.

ACTUAL DISCHARGE MEASUREMENTS, OF BROWN'S CREEK CANAL AT RATING FLUME, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-19	T. C. Palmer	13.00	1.41	0.50	18.31	23
2	5-22	W. F. Chaloupka	20.80	2.07	0.75	43.14	9
3	5-26	T. C. Palmer	26.00	1.99	1.00	51.80	23
4	6- 6	T. C. Palmer	35.00	2.43	1.40	84.67	23
5	6-21	T. C. Palmer	.....	.....	.....	0.00	23
6	7-11	T. C. Palmer	19.48	2.38	0.76	46.34	23
7	9- 5	T. C. Palmer	20.80	2.60	0.75	54.06	23
8	9-27	T. C. Palmer	11.40	1.91	0.40	21.78	23

ACTUAL DISCHARGE MEASUREMENTS, OF BROWN'S CREEK CANAL AT RATING FLUME, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-20	T. C. Palmer	17.90	2.18	0.65	39.03	9
2	7-12	T. C. Palmer	22.60	2.75	0.82	62.06	9
3	8-10	T. C. Palmer	23.75	2.93	0.92	69.71	9
4	9-25	T. C. Palmer	14.15	2.60	0.50	36.83	9

DAILY DISCHARGE, IN SECOND FEET, OF BROWN'S CREEK CANAL, FOR YEAR 1919.

Day	May	June	July	August	September	October
1	.....	62.50	77.00	.....	40.00	14.00
2	.....	62.50	85.00	.....	40.00	14.00
3	.....	62.50	85.00	.....	33.00	14.00
4	.....	55.00	85.00	.....	33.00	.....
5	.....	85.00	85.00	.....	33.00	.....
6	.....	85.00	85.00	.....	33.00	.....
7	.....	77.00	92.00	.....	33.00	.....
8	.....	77.00	92.00	.....	33.00	.....
9	.....	77.00	.....	.....	33.00	.....
10	.....	77.00	25.00	.....	25.00	.....
11	.....	77.00	40.00	.....	33.00	.....
12	.....	77.00	55.00	.....	25.00	.....
13	.....	70.00	62.50	48.00	25.00	.....
14	.....	62.50	62.50	48.00	18.50	.....
15	.....	55.00	62.50	40.00	18.50	.....
16	.....	55.00	62.50	48.00	14.00	.....
17	.....	33.00	62.50	55.00	14.00	.....
18	.....	55.00	62.50	48.00	14.00	.....
19	18.50	55.00	62.50	48.00	14.00	.....
20	25.00	55.00	55.00	48.00	14.00	.....
21	40.00	.....	70.00	40.00	14.00	.....
22	40.00	.....	70.00	40.00	14.00	.....
23	40.00	.....	62.50	40.00	14.00	.....
24	33.00	.....	62.50	48.00	14.00	.....
25	33.00	.....	62.50	48.00	14.00	.....
26	48.00	55.00	62.50	48.00	14.00	.....
27	55.00	48.00	55.00	30.00	14.00	.....
28	62.50	48.00	77.00	40.00	14.00	.....
29	70.00	70.00	77.00	33.00	14.00	.....
30	62.50	70.00	77.00	33.00	14.00	.....
31	70.00	.....	.....	.....	.....	.....
Total	593.00	1606.00	1974.00	826.00	666.00	42.00
Mean	46.00	53.50	63.70	26.60	22.20	14.00
Maximum	70.00	85.00	92.00	55.00	40.00	14.00
Minimum	18.00	.....	.....	.....	14.00	14.00
Acre Ft.	1186.00	3186.00	3915.00	1638.00	1321.00	83.00

Total Acre Feet 11329.00
Acres reported 6323.00
Acre Feet per Acre 1.79

DAILY DISCHARGE, IN SECOND FEET, OF BROWN'S CREEK CANAL, FOR YEAR 1920.

Day	June	July	August	September
1	....	75	64	38
2	....	81	20	38
3	....	93	38	38
4	....	75	50	38
5	....	64	55	45
6	....	75	62	32
7	....	93	68	30
8	....	68	68	38
9	....	56	68	38
10	....	50	68	38
11	....	50	68	38
12	20	80	55	38
13	17	80	55	38
14	12	80	50	32
15	55	80	7	32
16	38	68	20	32
17	29	81	38	32
18	20	81	28	20
19	26	81	20	20
20	32	81	20	20
21	38	64	17	20
22	38	45	18	20
23	38	29	20	20
24	45	....	20	20
25	45	....	29	17
26	38	....	21	17
27	56	18	18	17
28	56	44	32	17
29	68	64	38	17
30	68	68	50	17
31	....	56	45	....
Total	739	1880	1230	857
Mean	37	61	40	28
Maximum	68	93	68	45
Minimum	....	....	7	17
Acre Feet	1465	3729	2440	1699

Area reported (acres) 6332
Water used (acre feet) 9333
Per Acre (acre feet) 1.47

CAPRON DITCH

This canal located on Greenwood Creek, Morril County. Diversion is a rock and dirt dam across creek with small wooden wastegate located at east end of dam. Entire flow of creek can be used through this canal.

No rating flume or automatic gage provided by this canal. Gaging is done below wastegate. Gage is nailed on wastegate. Gage height reports were made for the season of 1919, and for only one week during 1920.

ACTUAL DISCHARGE MEASUREMENTS, OF CAPRON DITCH AT DIVERSION, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-27	W. F. Chaloupka	10.80	0.45	.....	4.85	9
2	8-10	W. F. Chaloupks	6.60	0.63	.....	4.17	9
3	8-13	W. F. Chaloupka	5.93	0.59	0.50	3.53	9
4	9- 5	T. C. Palmer	8.20	0.61	0.83	5.01	9

ACTUAL DISCHARGE MEASUREMENTS, OF CAPRON DITCH 75 FEET BELOW HEAD, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-17	T. C. Palmer	6.65	0.58	0.40	3.85	9
2	8-20	T. C. Palmer	2.36	0.85	0.15	2.00	9
3	8-27	G. K. Baumgartner	1.60	0.96	.....	1.54	9
4	9-13	T. C. Palmer	4.30	0.40	0.14	1.72	9

CASTLE ROCK CANAL.

This canal is owned by the Castle Rock Irrigation District and diverts water through a new headgate from the North Platte River.

Gagings have been very good. Automatic gage was used during 1920, although reports for three weeks of gage heights are lacking. The rating flume used by this canal is the best in the valley.

ACTUAL DISCHARGE MEASUREMENTS, OF CASTLE ROCK CANAL AT RATING FLUME, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-12	T. C. Palmer	29.15	2.35	1.62	68.45	23
2	6-20	T. C. Palmer	30.60	2.55	1.75	78.18	23
3	6-25	T. C. Palmer	35.15	2.37	1.90	83.57	23
4	7-25	Palmer-Woodman	27.00	2.57	1.50	69.55	23
5	8- 7	T. C. Palmer	14.40	1.75	0.90	25.20	23
6	8-28	T. C. Palmer	29.60	2.47	1.66	73.20	23
7	9- 4	T. C. Palmer	55.60	1.74	1.90	69.31	23
8	9-11	T. C. Palmer	23.40	2.34	1.30	54.80	23
9	9-26	T. C. Palmer	7.20	1.55	0.40	11.19	23
10	10- 2	T. C. Palmer	5.40	1.20	0.30	6.46	23

ACTUAL DISCHARGE MEASUREMENTS, OF CASTLE ROCK CANAL AT RATING FLUME, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-12	T. C. Palmer	26.60	2.42	1.40	64.31	29
2	6-14	T. C. Palmer	27.80	2.34	1.44	65.18	29
3	7- 1	T. C. Palmer	36.35	2.65	1.90	96.12	9
4	7-16	T. C. Palmer	24.60	2.28	1.25	56.15	9
5	7-30	T. C. Palmer	35.25	2.54	1.76	89.68	9
6	8-19	T. C. Palmer	24.90	1.87	1.25	46.75	9
7	9-10	T. C. Palmer	28.90	2.26	1.46	65.36	9

DAILY DISCHARGE, IN SECOND FEET, OF CASTLE ROCK CANAL, FOR YEAR 1919.

Day	May	June	July	August	September	October
1	.....	30.00	70.00	91.00	70.00	7.00
2	.....	30.00	81.00	64.00	75.00	7.00
3	.....	48.00	58.00	38.00	80.00	5.50
4	.....	48.00	76.00	38.00	86.00	4.00
5	.....	48.00	79.00	38.00	80.00	2.00
6	.....	48.00	79.00	65.00	75.00	2.00
7	.....	48.00	79.00	65.00	70.00	2.00
8	.....	65.00	64.00	65.00	64.00	2.00
9	.....	70.00	64.00	65.00	58.50	2.00
10	.....	70.00	58.00	65.00	58.50	2.00
11	.....	70.00	42.00	65.00	53.00	2.00
12	.....	70.00	42.00	65.00	50.00	.....
13	.....	48.00	42.00	65.00	48.00	.....
14	.....	48.00	42.00	65.00	45.00	.....
15	.....	58.00	85.00	67.00	42.00	.....
16	.....	52.00	85.00	67.00	36.50	.....
17	.....	52.00	79.00	43.00	34.00	.....
18	.....	65.00	79.00	38.00	31.00	.....
19	.....	70.00	79.00	88.00	28.00	.....
20	.....	64.00	79.00	88.00	25.50	.....
21	.....	65.00	79.00	88.00	23.00	.....
22	.....	66.00	79.00	88.00	21.00	.....
23	.....	73.00	79.00	88.00	19.00	.....
24	.....	73.00	79.00	83.00	17.00	.....
25	.....	80.00	79.00	74.00	14.00	.....
26	.....	77.00	79.00	70.00	13.00	.....
27	.....	77.00	96.00	70.00	13.00	.....
28	.....	73.00	96.00	65.00	13.00	.....
29	.....	80.00	103.00	65.00	8.50	.....
30	30.00	81.00	104.00	65.00	7.00	.....
31	30.00	.....	97.00	65.00	.....	.....
Total	60.00	1847.00	2332.00	2066.00	1258.00	37.00
Mean	30.00	61.60	75.20	66.60	41.90	3.40
Maximum	30.00	81.00	104.00	88.00	86.00	7.00
Minimum	30.00	30.00	42.00	38.00	7.00	2.00
Acre Ft.	115.00	3543.00	4625.00	4098.00	2414.00	73.40

Total Acre Feet 14868.00
Acreage reported 6109.00
Acre Feet per Acre 2.43

DAILY DISCHARGE, IN SECOND FEET, OF CASTLE ROCK CANAL, FOR YEAR 1920.

Day	June	July	August	September
1	....	96	96	61
2	....	90	51	61
3	....	94	65	61
4	....	88	61	55
5	....	82	67	55
6	....	76	74	41
7	....	70	70	70
8	....	62	74	70
9	58	54	77	70
10	58	47	70	67
11	58	40	70	70
12	65	32	70	61
13	66	39	96	58
14	67	41	93	59
15	69	41	87	60
16	70	48	77	61
17	47	58	70	62
18	49	55	58	63
19	55	61	55	64
20	55	36	67	65
21	51	41	93	65
22	....	32	100	65
23	....	39	104	65
24	....	48	93	65
25	....	65	96	65
26	....	70	90	65
27	....	74	87	65
28	....	67	80	65
29	....	65	58	65
30	....	84	65	65
31	....	90	51	....
Total	768	1885	2365	1884
Mean	35	61	76	63
Maximum	70	96	104	70
Minimum	....	32	51	41
Acre Feet	1523	3739	4691	3737

Area reported (acres) 5887
Water used (acre feet) 13690
Per Acre (acre feet) 2.32

CENTRAL CANAL.

This canal is owned by the Central Irrigation District.

The water from the North Platte River is controlled by an old wooden headgate and sand dam. Sand dam constructed every season.

Rating flume is not a satisfactory station for gaging the flow on account of a check below the flume. The gagings made have been fairly good. Water at times is checked up against the gaging station.

ACTUAL DISCHARGE MEASUREMENTS, OF CENTRAL CANAL AT RATING FLUME, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-29	T. C. Palmer	16.00	0.81	1.60	13.01	23
2	6-10	T. C. Palmer	20.51	0.97	2.05	19.94	23
3	6-17	T. C. Palmer	22.40	1.12	2.40	25.03	23
4	6-25	T. C. Palmer	22.00	1.51	2.23	33.22	23
5	7- 2	T. C. Palmer	22.25	1.26	2.30	28.04	23
6	7-22	Woodman-Palmer	8.90	1.04	0.90	9.28	23
7	8- 7	T. C. Palmer	23.00	1.44	2.30	33.10	23
8	8-26	T. C. Palmer	9.00	1.25	0.90	11.29	23
9	9- 3	T. C. Palmer	14.25	1.54	1.52	21.94	23
10	9-11	T. C. Palmer	4.00	1.33	0.40	5.32	23
11	9-24	T. C. Palmer	.....	.....	.....	0.00	23

ACTUAL DISCHARGE MEASUREMENTS, OF CENTRAL CANAL AT RATING FLUME, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-18	T. C. Palmer	14.40	1.14	1.44	16.39	29
2	6-29	T. C. Palmer	17.60	1.38	1.80	24.39	9
3	7-14	T. C. Palmer	19.70	1.20	2.00	23.75	9
4	7-27	T. C. Palmer	16.00	1.08	1.65	17.37	9
5	8-17	T. C. Palmer	20.00	0.91	2.00	18.22	9
6	8-25	T. C. Palmer	20.00	1.21	2.00	24.23	9
7	9-29	T. C. Palmer	13.00	1.08	1.28	14.09	9

DAILY DISCHARGE, IN SECOND FEET, OF CENTRAL CANAL, FOR YEAR 1919.

Day	May	June	July	August	September
1	.....	19.00	32.00	16.00	28.00
2	.....	19.00	14.00	17.00	28.00
3	.....	19.00	14.00	15.00	28.00
4	.....	23.50	14.00	17.00	18.00
5	.....	23.50	.....	14.00	18.00
6	.....	19.00	.....	15.00	20.00
7	.....	19.00	15.00	15.00	14.00
8	.....	16.00	14.00	17.00	11.00
9	.....	19.00	15.00	18.00	10.00
10	.....	19.00	17.00	17.00	7.00
11	.....	19.00	15.00	13.00	5.00
12	.....	19.00	14.00	20.00	.....
13	.....	17.50	20.00	17.00	.....
14	.....	17.50	20.00	17.00	.....
15	.....	17.00	15.00	13.00	.....
16	.....	16.00	15.00	14.00	.....
17	.....	16.00	.....	.....	.....
18	.....	12.00	.....	.....	.....
19	.....	12.00	.....	17.00	.....
20	.....	10.00	.....	17.00	.....
21	.....	14.00	7.00	20.00	.....
22	.....	26.50	11.00	8.00	.....
23	.....	14.00	13.00	9.00	.....
24	.....	29.50	15.00	9.00	.....
25	.....	28.00	20.00	10.00	.....
26	.....	33.00	8.00	5.00	.....
27	.....	31.00	11.00	5.00	.....
28	.....	31.00	6.00	4.00	.....
29	13.00	31.00	13.00	4.00	.....
30	15.00	31.00	9.00	7.00	.....
31	17.00	.....	16.00	10.00	.....
Total	45.00	621.00	363.00	380.00	187.00
Mean	15.00	20.60	11.70	12.20	17.00
Maximum	17.00	33.00	32.00	20.00	28.00
Minimum	13.00	10.00	.....	.....	5.00
Acre Feet	90.00	1232.00	720.00	754.00	371.00

Total Acre Feet 3167
Acreage report 2300
Acre Feet per Acre 1.37

DAILY DISCHARGE, IN SECOND FEET, OF CENTRAL CANAL, FOR YEAR 1920.

Day	June	July	August
1	....	18	25
2	....	13	25
3	....	21	14
4	....	3	17
5	....	6	26
6	....	3	18
7	....	5	20
8	....	10	32
9	....	22	30
10	....	20	34
11	....	27	27
12	....	25	32
13	....	16	30
14	9	37	27
15	....	26	30
16	5	30	30
17	7	10	20
18	7	10	22
19	3	22	15
20	....	14	22
21	....	25	22
22	8	22	25
23	14	27	27
24	10	27	30
25	17	7	30
26	20	27	30
27	7	25	27
28	19	30	....
29	18	27	....
30	17	25	....
31	....	22	....
Total	161	602	687
Mean	8	19	22
Maximum	20	37	34
Minimum	00	3	00
Acre Feet	320	1194	1362

Area reported (acres) 1752
Water use (acre feet) 2876
Per acre (acre feet) 1.64

ACTUAL DISCHARGE MEASUREMENTS, OF CHAMPION DITCH D-47 AT DIVERSION, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-14	Bailey-Palmer	16.00	1.42	2.05	22.72	23

ACTUAL DISCHARGE MEASUREMENTS, OF CLEAR CREEK CANAL AT HEAD, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-12	Earl North	4.00	1.77	.....	7.09	10
2	8- 5	Palmer-Hartman	7.05	1.12	.....	7.91	23
3	9- 5	Palmer-Hartman	1.83	0.74	.....	1.36	23
4	9- 8	Earl North	1.20	0.78	0.30	0.94	10

CHIMNEY ROCK CANAL.

This canal is owned by the Chimney Rock Irrigation District.

Water is diverted from the North Platte River and is controlled by new concrete and steel check and wastegates.

The gagings have been made at a rating flume, and are very good.

Gage height reports were made for a part of the 1920 season. Gage height reports for half of the season are lacking. Automatic gage height recorder purchased but not yet installed.

ACTUAL DISCHARGE MEASUREMENTS, OF CHIMNEY ROCK CANAL AT RATING FLUME, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-30	T. C. Palmer	26.10	1.50	1.25	39.10	23
2	6-12	T. C. Palmer	35.23	1.74	1.60	61.41	23
3	6-20	T. C. Palmer	59.47	1.98	2.64	117.81	23
4	6-26	T. C. Palmer	43.65	1.49	2.00	65.28	23
5	7- 3	T. C. Palmer	41.44	1.74	1.90	71.93	23
6	7-21	T. C. Palmer	34.83	1.48	1.60	51.51	23
7	7-24	T. C. Palmer	20.92	1.43	0.91	29.92	23
8	8- 1	T. C. Palmer	33.48	1.72	1.41	57.61	23
9	8- 7	T. C. Palmer	39.60	1.59	1.80	63.00	23
10	8-28	T. C. Palmer	23.10	1.64	1.00	37.86	23
11	9-11	T. C. Palmer	22.10	1.31	0.96	28.90	23
12	9-26	T. C. Palmer	.....	.....	.....	0.00	23

DAILY DISCHARGE, IN SECOND FEET, OF CHIMNEY ROCK CANAL, FOR YEAR 1919.

Day	May	June	July	August	September
1	.....	47.00	58.00	81.00	33.00
2	.....	47.00	58.00	.....	47.00
3	.....	47.00	37.00	.....	43.00
4	.....	47.00	42.00	.....	42.00
5	.....	47.00	53.00	.....	47.00
6	.....	47.00	53.00	64.00	37.00
7	.....	53.00	47.00	53.00	37.00
8	.....	53.00	42.00	70.00	37.00
9	.....	53.00	47.00	.....	37.00
10	.....	53.00	47.00	.....	37.00
11	.....	53.00	47.00	58.00	33.00
12	.....	64.00	47.00	53.00	33.00
13	.....	64.00	47.00	58.00	33.00
14	.....	53.00	28.50	58.00	25.00
15	.....	53.00	18.00	53.00	21.00
16	.....	47.00	37.00	53.00	22.00
17	.....	70.00	64.00	39.00	22.00
18	.....	81.00	53.00	39.00	.....
19	.....	81.00	58.00	39.00	.....
20	.....	98.00	42.00	39.00	.....
21	.....	93.00	42.00	39.00	.....
22	.....	115.00	42.00	39.00	.....
23	.....	47.00	27.00	39.00	.....
24	.....	81.00	25.00	27.00	.....
25	.....	58.00	33.00	37.00	.....
26	.....	81.00	74.00	37.00	.....
27	28.50	58.00	70.00	37.00	.....
28	33.00	58.00	47.00	37.00	.....
29	33.00	58.00	37.00	37.00	.....
30	28.50	53.00	37.00	53.00	.....
31	28.50	.....	47.00	53.00	.....
Total	151.50	1860.00	1406.50	1153.00	586.00
Mean	30.00	62.00	45.30	38.40	34.00
Maximum	33.00	115.00	74.00	81.00	47.00
Minimum	28.00	47.00	18.00	.....	21.00
Acre Feet	300.50	3689.00	2789.00	2286.00	1163.00

Total Acre Feet 10227
Acres reported 5361
Acre Feet per Acre 1.91

ACTUAL DISCHARGE MEASUREMENTS, OF CHIMNEY ROCK CANAL AT RATING FLUME, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7- 1	T. C. Palmer	30.40	1.51	1.54	45.84	9
2	7-16	T. C. Palmer	58.70	1.56	2.40	92.06	9
3	7-30	T. C. Palmer	38.30	1.54	1.70	58.97	9
4	8-19	T. C. Palmer	44.40	1.76	2.00	78.23	9

DAILY DISCHARGE, IN SECOND FEET, OF CHIMNEY ROCK CANAL. FOR YEAR 1920.

Day	July	August	September
1	....	73	25
2	....	68	25
3	....	73	25
4	....	63	25
5	....	59	....
6	....	59	....
7	....	54	....
8	....	54	....
9	....	59	....
10	....	63	....
11	....	63	....
12	....	63	....
13	....	49	....
14	....	44	....
15	....	59	....
16	....	68	....
17	....	73	....
18	....	73	....
19	87	73	....
20	82	77	....
21	73	73	....
22	63	68	....
23	60	73	....
24	60	77	....
25	60	77	....
26	60	68	....
27	60	68	....
28	60	77	....
29	60	54	....
30	60	40	....
31	60	35	....
Total	845	1977	100
Mean	65	64	25
Maximum	87	77	25
Minimum	60	35	25
Acre Feet	1676	3921	198

Area reported (acres) 5250
Water used (acre feet) .....5795 Per Acre (acre feet) 1.10

CODY AND DILLON CANAL.

This Cody and Dillon Canal is owned by the Cody and Dillon Irrigation Canal Company. Head located Section 9, Township 14 North, Range 31 West. Temporary straw dam is used during irrigation season.

Control and waste structure is located one-fourth mile below head of canal, is of concrete, and well built.

Rating flume constructed in 1920, located one-fourth mile below waste structure. Automatic gage installed in 1920. Gage heights were reported for five weeks in 1919 and one week in 1920.

ACTUAL DISCHARGE MEASUREMENTS, OF CODY AND DILLON CANAL NEAR HEAD GATE, FOR YEAR, 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	8-23	Earl North	.....	.....	.....	0.00	10
2	9- 2	Earl North	18.00	1.64	1.50	29.50	10

ACTUAL DISCHARGE MEASUREMENTS, OF CODY AND DILLON DITCH AT RATING FLUME, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	8- 5	G. K. Baumgartner	33.60	1.40	1.20	46.87	10
2	8-16	G. K. Baumgartner	31.10	1.29	0.80	40.11	10
3	9- 6	G. K. Baumgartner	17.53	1.67	.....	29.25	10

DAILY DISCHARGE, IN SECOND FEET, OF CODY AND DILLON DITCH, FOR YEAR 1919.

Day	June-July	August	September
1	.....	.....	30.00
2	.....	.....	30.00
3	.....	.....	30.00
4	.....	.....	30.00
5	.....	.....	30.00
6	.....	.....	30.00
7	.....	.....	30.00
8	.....	.....	30.00
9	.....	.....	30.00
10	.....	.....	18.00
11	.....	.....	18.00
12	.....	.....	18.00
13	.....	.....	18.00
14	.....	.....	18.00
15	.....	.....	18.00
16	.....	.....	12.00
17	.....	.....	18.00
18	.....	.....	18.00
19	.....	.....	18.00
20	.....	.....	18.00
21	.....	.....	18.00
22	.....	.....	18.00
23	.....	.....	18.00
24	.....	.....	18.00
25	.....	30.00	18.00
26	.....	30.00	18.00
27	.....	30.00	18.00
28	.....	30.00	18.00
29	.....	30.00	18.00
30	.....	30.00	18.00
31	.....	30.00	.....
Total	.....	210.00	642.00
Mean	.....	30.00	21.00
Maximum	.....	30.00	30.00
Minimum	Estimated	30.00	12.00
Acre Feet	500 - 300	416.00	1273.00

Acre Feet 1689
Acres reported 1509
Acre Feet per Acre 1.11

COURT HOUSE ROCK CANAL.

This ditch is owned by the Court House Rock Canal Company, a mutual organization.

The water is diverted from Pumpkinseed Creek. A concrete dam and steel gates are used to control the flow. The diversion works are very substantial.

A fairly good rating flume of lumber is used for a gaging station. the flume is about one foot too narrow.

Automatic gage height recorder has been in use for the past three years and its use has been highly satisfactory.

ACTUAL DISCHARGE MEASUREMENTS, OF COURT HOUSE ROCK CANAL AT RATING FLUME, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-22	W. F. Chaloupka	6.14	2.69	1.31	16.61	9
2	5-26	W. F. Chaloupka	6.02	2.95	1.30	17.74	9
3	6- 2	W. F. Chaloupka	7.35	2.81	1.43	20.69	9
4	6- 9	W. F. Chaloupka	7.78	2.76	1.55	21.45	9
5	6-15	W. F. Chaloupka	5.68	2.66	1.28	15.11	9
6	6-23	W. F. Chaloupka	6.98	1.96	1.46	13.71	9
7	6-30	W. F. Chaloupka	7.85	1.43	1.60	11.29	9
8	7- 7	W. F. Chaloupka	10.03	1.19	1.89	11.98	9
9	7-14	W. F. Chalaupka	10.74	0.94	2.00	10.06	9
10	7-21	W. F. Chaloupka	.....	.....	.....	0.00	9
11	7-28	W. F. Chaloupka	6.02	2.23	1.30	13.42	9
12	8- 4	W. F. Chaloupka	5.83	2.65	1.33	15.46	9
13	8-11	W. F. Chaloupka	4.95	2.79	1.11	13.82	9
14	8-17	W. F. Chaloupka	3.07	2.40	0.80	7.38	9
15	9- 5	W. F. Chaloupka	2.80	2.76	0.30	7.73	9
16	9-13	T. C. Palmer	3.00	2.94	0.70	8.83	9
17	9-20	T. C. Palmer	3.15	3.04	0.78	9.57	9
18	9-27	T. C. Palmer	3.15	3.07	0.90	9.67	9
19	10- 4	T. C. Palmer	3.79	3.36	1.02	12.72	9
20	10-13	T. C. Palmer	5.10	3.03	1.20	15.44	9
21	10-20	T. C. Palmer	6.50	2.79	1.40	18.18	9
22	10-28	T. C. Palmer	5.80	2.58	1.28	14.95	9
23	11- 4	T. C. Palmer	5.80	2.63	1.28	15.29	9

ACTUAL DISCHARGE MEASUREMENTS, OF COURT HOUSE ROCK CANAL TWO MILES WEST HOLLOWAY SCHOOL HOUSE, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-22	W. F. Chaloupka	12.90	1.30	.....	16.75	9
2	5-26	W. F. Chaloupka	13.90	1.17	.....	16.34	9
3	6- 2	W. F. Chaloupka	15.20	1.30	.....	19.88	9
4	6- 9	W. F. Chaloupka	15.50	1.28	.....	19.91	9
5	6-16	W. F. Chaloupka	14.30	0.92	.....	13.19	9
6	6-23	W. F. Chaloupka	14.90	0.86	.....	12.43	9
7	6-30	W. F. Chaloupka	16.75	0.61	.....	10.17	9
8	7- 7	W. F. Chaloupka	18.18	0.56	.....	10.29	9
9	7-14	W. F. Chaloupka	.....	.....	.....	0.00	9
10	7-21	W. F. Chaloupka	.....	.....	.....	0.00	9
11	7-28	W. F. Chaloupka	13.25	0.85	.....	11.22	9
12	8- 4	W. F. Chaloupka	15.10	0.98	.....	14.84	9
13	8-11	W. F. Chaloupka	12.20	0.96	.....	11.73	9

ACTUAL DISCHARGE MEASUREMENTS, OF COURT HOUSE ROCK CANAL AT RATING FLUME, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-13	T. C. Palmer	9.80	3.14	1.85	30.72	29
2	6-26	T. C. Palmer	11.78	3.15	1.67	37.01	9
3	7- 3	T. C. Palmer	8.20	3.35	1.61	27.50	9
4	7-12	T. C. Palmer	8.40	2.79	1.67	23.43	9
5	7-21	T. C. Palmer	10.30	2.30	1.95	23.67	9
6	7-31	T. C. Palmer	11.40	2.03	2.10	23.11	9
7	8- 9	T. C. Palmer	12.60	1.66	2.22	20.89	9
8	8-24	T. C. Palmer	7.70	2.69	1.50	20.74	9
9	8-30	T. C. Palmer	13.30	3.00	2.05	40.26	9
10	9- 7	T. C. Palmer	10.00	2.94	1.90	29.49	9
11	9-13	T. C. Palmer	2.10	1.98	0.67	4.15	9
12	9-30	T. C. Palmer	4.20	3.01	1.00	12.63	9
13	10-12	T. C. Palmer	4.90	2.80	1.15	13.70	9
14	10-20	T. C. Palmer	8.90	3.29	1.70	29.31	9

DAILY DISCHARGE, IN SECOND FEET, OF COURT HOUSE ROCK CANAL, FOR YEAR 1919.

Day	May	June	July	August	September	October
1	.....	20.00	13.00	17.00	9.00	9.00
2	.....	19.50	12.50	16.50	9.00	9.50
3	.....	19.50	13.00	17.00	9.00	9.50
4	.....	18.50	15.00	16.00	8.00	11.00
5	.....	17.50	15.00	16.00	6.00	10.50
6	.....	17.00	12.50	15.00	6.00	10.50
7	.....	17.00	12.50	15.00	6.00	10.00
8	.....	17.50	12.50	15.00	6.00	10.00
9	.....	24.00	11.00	14.00	6.00	10.00
10	.....	20.50	11.00	14.00	6.00	10.00
11	.....	19.50	11.00	14.00	6.00	10.00
12	.....	18.00	10.00	14.00	6.00	14.00
13	.....	17.00	10.00	9.00	6.00	14.00
14	.....	17.00	10.00	8.00	6.00	14.50
15	.....	17.00	10.00	7.50	7.00	16.00
16	17.00	16.00	10.00	8.00	7.00	16.00
17	17.00	17.00	10.00	7.50	7.00	15.50
18	17.00	17.00	.....	7.50	7.00	15.00
19	17.00	17.50	.....	.....	7.00	18.50
20	16.50	20.00	.....	.....	8.00	17.00
21	16.50	14.50	10.50	.....	10.50	17.00
22	16.50	13.50	17.00	.....	10.50	16.50
23	15.00	13.60	17.50	.....	9 50	16.00
24	15.00	13.60	17 50	.....	9.50	15.00
25	16.50	13.00	17.00	.....	9.00	15.00
26	16.50	13.00	21.00	.....	9.00	15.00
27	17.00	13.50	18.00	.....	9.00	15.00
28	17.00	13.00	16.50	2.00	9.00	16.00
29	16.50	12.00	15.00	2.00	9.00	16.50
30	17.50	11.50	14.00	4.00	9.00	16.50
31	19.50	.....	.....	4.00	.....	15.00
Total	268.00	498.00	376.00	243.00	223.00	424.00
Mean	16.70	16.60	12.10	7.80	7.40	13.60
Maximum	19.50	24.00	21.00	17.00	10.50	18.50
Minimum	15.00	11.50	.....	.....	.....	9.00
Acre Ft.	532.00	988.00	757.00	493.00	453.00	852.00

Total Acre Feet 4075.00
Acres reported 1918 .....1157.00
Acre Feet per Acre 3.52

DAILY DISCHARGE, IN SECOND FEET, OF COURT HOUSE ROCK CANAL, FOR YEAR 1920.

Day	June	July	August	September	October
1	....	35	22	23	9
2	....	30	24	42	9
3	....	27	23	37	9
4	....	29	23	35	9
5	....	30	22	32	9
6	....	29	22	31	9
7	....	17	21	32	9
8	....	18	21	32	12
9	....	25	21	32	12
10	....	25	....	32	13
11	....	24	....	31	14
12	....	24	....	17	15
13	31	24	....	5	27
14	32	23	....	4	28
15	33	23	....	4	11
16	34	23	....	19	2
17	28	24	5	20	2
18	39	24	13	20	2
19	46	24	14	14	25
20	....	24	14	....	25
21	....	24	16	....	26
22	....	23	18	....	28
23	30	23	19	....	28
24	34	24	19	....	28
25	37	32	19	....	28
26	37	27	19	....	28
27	37	25	22	....	28
28	39	25	32	....	....
29	26	24	42	....	....
30	34	23	37	9	....
31	....	23	19	9	....
Total	517	775	507	480	446
Mean	28	25	16	16	16
Maximum	39	35	42	42	28
Minimum	....	17	....	....	2
Acre Feet	1025	1537	1006	952	885

Area reported (acres) 1260
Water used (acre feet) 5405
Per Acre (acre feet) 4.28

COZAD CANAL.

Cozad Canal diverts water through an old frame headgate, from the Platte River.

Gagings made of the flow have been fairly good, although no rating flume has been installed.

Automatic gage height recorder was used during the 1920 season.

A new headgate installation is planned for 1921.

The Company reported in their acreage report 29,760 acres to be irrigated in 1920. This area seems to be too great and out of proportion to the carrying capacity of the canal. See actual discharge measurements.

ACTUAL DISCHARGE MEASUREMENTS, OF COZAD CANAL AT BRIDGE EAST OF GOTHENBURG, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-25	Earl North	36.50	1.47	2.40	53.83	10
2	7-26	Earl North	34.80	1.43	2.40	49.69	10
3	7-29	Earl North	25.30	1.18	1.70	29.91	10
4	8- 6	Earl North	50.40	1.45	2.80	73.06	10
5	8- 8	Earl North	69.70	1.78	3.40	124.40	10
6	8- 9	Earl North	51.00	1.79	3.20	91.40	10
7	8-12	Earl North	49.80	2.02	3.10	100.42	10
8	8-13	Earl North	50.90	2.30	3.10	117.15	10
9	8-20	Earl North	.....	.....	0.00	0 00	10
10	9- 3	Earl North	38.15	1.85	2.50	70.77	10
11	9- 4	Earl North	32.60	1.67	2.00	54.68	10
12	9-17	Earl North	49.20	2.09	3.00	102.76	10
13	9-19	Earl North	49.20	2.15	3.00	105.92	10

ACTUAL DISCHARGE MEASUREMENTS, OF COZAD CANAL AT BRIDGE ON LINCOLN HIGHWAY, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-13	G. K. Baumgartner	27.50	1.51	1.00	41.70	10
2	7-15	G. K. Baumgartner	27.35	1.59	0.95	43.40	10
3	8- 2	G. K. Baumgartner	47.40	1.95	1.90	92.89	10
4	8- 4	G. K. Baumgartner	53.30	2.16	2.20	115.23	10
5	8-17	G. K. Baumgartner	42.70	2.11	1.80	90.12	10
6	8-19	G. K. Baumgartner	48.70	2.04	1.90	99.78	10
7	9- 4	Palmer-Willis	8.35	0.50	0.10	4.14	10

DAILY DISCHARGE, IN SECOND FEET, OF COZAD CANAL, FOR YEAR 1919.

Day	July	August	September	October
1	.....	30.00	48.00	76.00
2	.....	72.00	48.00	69.00
3	.....	57.00	38.00	69.00
4	.....	63.00	38.00	69.00
5	.....	63.00	38.00	58.00
6	.....	69.00	38.00	58.00
7	26.00	109.00	41.00	52.00
8	26.00	133.00	41.00	52.00
9	26.00	109.00	44.00	52.00
10	26.00	109.00	44.00	48.00
11	26.00	109.00	41.00	48.00
12	26.00	109.00	41.00	48.00
13	26.00	109.00	63.00	52.00
14	26.00	63.00	92.00	58.00
15	26.00	63.00	52.00	58.00
16	26.00	63.00	133.00	58.00
17	26.00	38.00	170.00	63.00
18	26.00	48.00	109.00	63.00
19	23.00	48.00	109.00	58.00
20	23.00	48.00	41.00	58.00
21	23.00	.....	41.00	58.00
22	23.00	.....	41.00	58.00
23	48.00	.....	44.00	58.00
24	48.00	.....	41.00	58.00
25	48.00	.....	41.00	58.00
26	48.00	63.00	58.00	58.00
27	23.00	63.00	48.00	52.00
28	26.00	63.00	48.00	52.00
29	25.00	63.00	52.00	52.00
30	25.00	63.00	76.00	52.00
31	23.00	58.00	.....	58.00
Total	718.00	1885.00	1715.00	1781.00
Mean	28.70	60.80	57.10	57.40
Maximum	48.00	133.00	170.00	76.00
Minimum	23.00	.....	38.00	48.00
Acre Feet	1424.00	3739.00	3402.00	3533.00

Acre Feet 11,898.00
Acres reported 21,680.00
Acre Feet per Acre 0.55

DAILY DISCHARGE, IN SECOND FEET, OF COZAD CANAL, FOR YEAR 1920.

Day	July	August
1	....	79
2	....	91
3	....	103
4	....	115
5	....	115
6	....	127
7	....	124
8	....	97
9	42	121
10	31	118
11	26	109
12	25	103
13	26	106
14	25	103
15	40	88
16	70	91
17	97	91
18	100	94
19	106	91
20	103	88
21	102	10
22	99	6
23	97	15
24	100	17
25	91	17
26	106	17
27	118	15
28	121	15
29	97	....
30	97	....
31	94	....
Total	1813	2166
Mean	79	77
Maximum	121	127
Minimum	25	6
Acre Reet	3596	4296

Area reported (acres) 29,750
Water used (acre feet) 7,892
Per Acre (acre feet) 0.26

ACTUAL DISCHARGE MEASUREMENTS, OF CRIGLER DITCH AT DIVERSION POINT, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-15	W. F. Chaloupka.....	0.59	0.83	.....	0.49	9

DAWSON COUNTY CANAL.

Dawson County Canal owned by the Dawson County Irrigation Company. Water diverted from the Platte River in Section 18, Township 10, Range 23. Diversion made by use of wing dam.

No rating flume or automatic gage has been provided by the company. Gaging is done at highway bridge about one-half mile south of Cozad. Although this is the best place available, it does not give satisfactory gagings. Gage heights were reported for the year 1919 and 1920.

ACTUAL DISCHARGE MEASUREMENTS, OF DAWSON COUNTY CANAL AT BRIDGE SOUTH OF COZAD, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7- 2	Earl North	40.85	1.75	2.20	71.74	10
2	7-17	Earl North	52.92	1.56	2.50	82.63	10
3	7-21	Earl North	52.24	1.80	2.50	94.30	10
4	7-24	Earl North	49.80	1.65	2.25	82.34	10
5	7-25	Earl North	46.92	1.52	2.05	71.25	10
6	7-26	Earl North	49.08	1.64	2.20	80.69	10
7	7-29	Earl North	28.76	1.21	1.60	34.73	10
8	7-30	Earl North	23.72	0.80	1.45	19.87	10
9	8- 6	Earl North	59.30	2.09	2.80	124.10	10
10	8- 8	Earl North	63.20	2.25	3.00	142.20	10
11	8- 9	Earl North	64.20	2.15	3.20	137.90	10
12	8-12	Earl North	69.10	2.29	3.15	158.20	10
13	8-13	Earl North	67.80	2.12	3.00	143.60	10
14	8-20	Earl North	.....	.....	1.20	0.00	10
15	9- 3	Earl North	61.44	1.91	2.90	117.10	10
16	9- 4	Earl North	60.00	1.79	2.90	107.32	10
17	9-17	Earl North	68.84	1.80	2.90	124.05	10
18	9-19	Earl North	68.84	1.80	2.90	124.00	10

ACTUAL DISCHARGE MEASUREMENTS, OF DAWSON COUNTY CANAL AT WAGON BRIDGE SOUTH OF COZAD, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-14	G. K. Baumgartner	44.80	1.56	2.40	68.97	10
2	6-30	G. K. Baumgartner	49.00	1.86	2.50	91.00	10
3	7-13	G. K. Baumgartner	76.85	2.27	3.20	174.67	10
4	7-15	G. K. Baumgartner	72.50	2.18	3.10	158.33	10
5	8- 2	G. K. Baumgartner	92.15	2.22	2.80	204.34	10
6	8- 4	G. K. Baumgartner	98.30	2.17	2.85	213.55	10
7	8-17	G. K. Baumgartner	75.00	1.88	2.90	140.89	10
8	8-19	G. K. Baumgartner	84.00	2.11	3.05	177.30	10
9	9- 4	Willis-Palmer	.....	.....	1.00	0.00	10

DAILY DISCHARGE, IN SECOND FEET, OF DAWSON COUNTY DITCH, FOR YEAR 1919.

Day	July	August	September	October
1	.....	22.00	95.00	150.00
2	62.00	70.00	120.00	160.00
3	54.00	62.00	120.00	192.00
4	95.00	80.00	112.00	200.00
5	95.00	136.00	120.00	192.00
6	95.00	126.00	104.00	168.00
7	110.00	136.00	104.00	160.00
8	95.00	136.00	104.00	168.00
9	95.00	136.00	104.00	160.00
10	95.00	144.00	120.00	144.00
11	86.00	136.00	120.00	126.00
12	80.00	148.00	120.00	136.00
13	80.00	160.00	136.00	136.00
14	80.00	144.00	150.00	120.00
15	86.00	126.00	136.00	136.00
16	110.00	144.00	125.00	120.00
17	95.00	126.00	120.00	126.00
18	86.00	126.00	160.00	120.00
19	86.00	70.00	136.00	104.00
20	80.00	70.00	144.00	86.00
21	95.00	86.00	144.00	104.00
22	95.00	95.00	150.00	110.00
23	80.00	104.00	150.00	110.00
24	70.00	136.00	144.00	110.00
25	55.00	150.00	150.00	110.00
26	46.00	120.00	150.00	110.00
27	63.00	120.00	150.00	110.00
28	55.00	112.00	136.00	80.00
29	26.00	112.00	144.00	80.00
30	15.00	112.00	144.00	55.00
31	26.00	112.00	.....	55.00
Total	2291.00	3557.00	3913.00	3938.00
Mean	74.00	115.00	130.00	127.00
Maximum	110.00	160.00	150.00	200.00
Minimum	15.00	22.00	95.00	55.00
Ace Feet	4544.00	7055.00	7761.00	7811.00

Acre Feet 27171
Acres reported 11492
Acre Feet per Acre 2.36

Water turned in June 28, 1919.

DAILY DISCHARGE, IN SECOND FEET, OF DAWSON COUNTY CANAL, FOR YEAR 1920.

Day	May	June	July	August	September
1	14	102	120	272	165
2	18	70	102	290	165
3	14	60	102	290	165
4	14	44	86	290	180
5	14	38	104	300	165
6	14	60	86	300	150
7	14	52	102	316	134
8	14	44	166	243	38
9	14	38	166	243	38
10	16	38	166	256	38
11	16	44	166	243	38
12	14	38	166	212	38
13	14	70	166	212	38
14	18	70	136	212	38
15	18	70	145	198	38
16	18	70	212	180	38
17	18	70	212	180	38
18	18	70	212	166	38
19	18	60	230	180	38
20	14	70	243	243	38
21	14	60	243	258	38
22	14	60	230	180	38
23	14	86	243	166	38
24	14	86	230	166	38
25	10	134	212	150	38
26	10	134	243	150	38
27	32	104	258	150	38
28	44	70	258	196	38
29	52	88	258	166	38
30	52	136	258	166	38
31	70	.....	272	165	....
Total	624	2136	5793	6739	1998
Mean	20	71	187	217	67
Maximum	70	136	272	316	180
Minimum	10	38	86	150	38
Acre Feet	1238	4237	11490	13367	3963

Area reported (acres) 12,017
Water used (acre feet) 34,295
Per Acre (acre feet) 2.85

EMPIRE CANAL.

Canal owned by Empire Canal Co.

This canal has no diversion of its own. Water is taken from the North Platte River and carried by the Belmont Canal to the head of the Empire Canal.

Rating flume about 500 feet below the head. • Gage heights were reported in 1919, but not in 1920.

ACTUAL DISCHARGE MEASUREMENTS, OF EMPIRE CANAL AT RATING FLUME, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-26	W. F. Chaloupka	11.30	0.97	0.93	10.94	9
2	6- 2	W. F. Chaloupka	8.22	0.97	0.74	7.98	9
3	6- 9	W. F. Chaloupka	11.60	1.15	1.12	13.38	9
4	6-16	W. F. Chaloupka	17.95	1.02	1.48	18.33	9
5	6-23	W. F. Chaloupka	9.05	1.37	1.06	12.38	9
6	6-30	W. F. Chaloupka	3.40	1.11	0.64	3.79	9
7	7- 7	W. F. Chaloupka	2.70	0.78	0.67	2.11	9
8	7-14	W. F. Chaloupka	4.25	1.16	0.74	4.93	9
9	7-21	W. F. Chaloupka	6.20	1.23	0.93	7.63	9
10	7-28	W. F. Chaloupka	3.05	0.88	0.66	2.68	9
11	8- 4	W. F. Chaloupka	.....	.....	.....	0.00	9
12	8-11	W. F. Chaloupka	8.30	1.04	1.15	8.60	9

ACTUAL DISCHARGE MEASUREMENTS, OF EMPIRE CANAL AT RATING FLUME, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7- 1	T. C. Palmer	17.55	0.84	1.00	14.76	9
2	7-16	T. C. Palmer	6.80	1.52	0.67	10.44	9
3	7-30	T. C. Palmer	6.75	1.37	0.70	9.21	9
4	8-19	T. C. Palmer	2.00	0.68	0.32	1.36	9

DAILY DISCHARGE, IN SECOND FEET, OF EMPIRE CANAL AT RATING FLUME—DIVERTED THROUGH BELMONT HEADGATE AND RATING FLUME— FOR YEAR 1919.

Day	May	June	July	August	September
1	.....	3.00	10.00	.....	3.00
2	.....	3.00	10.00	.....	7.00
3	.....	5.00	9.00	.....	7.00
4	.....	5.00	9.00	.....	8.00
5	.....	5.00	9.00	.....	9.00
6	.....	9.00	7.00	.....	10.00
7	.....	9.00	3.00	.....	7.00
8	.....	13.00	3.00	.....	19.00
9	.....	13.00	4.00	.....	19.00
10	.....	13.00	4.00	.....	17.00
11	.....	13.00	5.00	.....	9.00
12	.....	13.00	5.00	.....	11.00
13	.....	13.00	5.00	.....	.....
14	.....	16.00	5.00	.....	3.00
15	.....	14.00	5.00	.....	3.00
16	.....	19.00	6.00	.....	.....
17	.....	19.00	6.00	.....	.....
18	.....	13.00	6.00	.....	.....
19	.....	13.00	7.00	.....	.....
20	.....	13.00	3.00	.....	.....
21	.....	13.00	3.00	.....	.....
22	.....	13.00	3.00	.....	.....
23	.....	13.00	3.00	.....	.....
24	.....	12.00	3.00	.....	.....
25	.....	12.00	3.00	.....	.....
26	.....	9.00	3.00	.....	.....
27	5.00	9.00	4.00	.....	.....
28	5.00	9.00	6.00	5.00	.....
29	.....	4.00	7.00	6.00	.....
30	2.00	4.00	7.00	6.00	.....
31	2.00	.....	.....	5.00	.....
Total	14.00	322.00	163.00	22.00	132.00
Mean	2.80	10.70	5.50	5.50	8.00
Maximum	5.00	19.00	10.00	6.00	19.00
Minimum	.....	4.00	3.00	5.00	.....
Acre Feet	27.00	639.00	323.00	44.00	261.00

Total Acre Feet 1284
Acres reported 2000
Acre Feet per Acre 0.64

ENTERPRISE DITCH.

Owned by Enterprise Ditch Company. Water diverted from the North Platte River two miles south of Morrill, about 1,000 feet east of west line of Section 27, Township 23, Range 57. Diversion is made by collapsible steel dam set on concrete and piling through concrete headgate. Water is controlled by steel gates.

A wooden rating flume 1,000 feet below the head provides a fair gaging station. Automatic gage reports were furnished during the season of 1919, and for only part of the season of 1920.

Water is diverted from Stewart's Drain to the canal close to the north line of Section 24-23-57. No diversion structure used. Drain ditch empties into canal. No rating flume nor automatic gage height reports have ever been reported.

This canal also uses water from Dry Spotted Tail Creek. No diversion structure used. Water taken by same method as in use at Stewart's Drain. No automatic gage. No rating flume. No gage heights reported for 1919 and 1920.

Tub Springs is also used by this canal as an auxiliary supply. Water is diverted from this stream through a short diversion ditch (about 100 feet long) and raised to the ditch by using a substantial gate at the upper end of a concrete syphon through which the Tub Springs water passes under the canal when not wanted. No rating flume is provided at this point. No automatic gage. Gagings were made in 1919 by gaging the canal above and below the diversion. In 1920 the ditch company placed a 30-inch circular culvert in the diversion ditch and gaging was done in the culvert. No gage heights were reported in 1919 or in 1920.

ACTUAL DISCHARGE MEASUREMENTS, OF ENTERPRISE CANAL (FROM RIVER) AT RATING FLUME, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-29	T. C. Palmer	54.20	1.92	1.60	104.02	23
2	6-12	T. C. Palmer	35.60	1.77	1.05	63.23	23
3	6-18	T. C. Palmer	38.80	1.76	1.20	68.51	23
4	6-25	T. C. Palmer	50.00	2.01	1.43	100.70	23
5	7- 2	T. C. Palmer	54.70	1.97	1.50	107.70	23
6	7-24	Palmer-Woodman	25.30	1.74	0.80	43.98	23
7	7-30	Palmer-Woodman	31.65	1.69	0.96	53.79	23
8	8- 7	T. C. Palmer	37.90	1.88	1.10	71.20	23
9	8-15	T. C. Palmer	34.30	1.79	1.05	61.30	23
10	8-20	T. C. Palmer	35.25	1.81	1.02	63.75	23
11	8-28	T. C. Palmer	27.95	1.67	0.82	46.64	23
12	9- 1	T. C. Palmer	28.00	1.64	0.80	45.88	23
13	9- 8	T. C. Palmer	9.60	0.93	0.30	8.97	23

ACTUAL DISCHARGE MEASUREMENTS, OF ENTERPRISE CANAL FROM TUB SPRINGS AT DIVERSION DITCH, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-13	T. C. Palmer	6.80	1.59	.....	10.80	23
2	5-21	T. C. Palmer	9.60	0.71	.....	6.80	23
3	5-28	T. C. Palmer	20.30	0.40	.....	8.12	23
4	6-25	T. C. Palmer	.....	.....	.....	0.00	23
5	7-24	T. C. Palmer	22.10	0.66	.....	14.52	23
6	7-29	T. C. Palmer	20.25	0.97	.....	19.77	23
7	8- 8	T. C. Palmer	26.15	0.99	.....	25.88	23
8	8-21	T. C. Palmer	24.80	0.14	.....	6.54	23

ACTUAL DISCHARGE MEASUREMENT, OF ENTERPRISE CANAL AT RATING FLUME, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-11	T. C. Palmer	45.60	1.92	1.38	87.40	29
2	6-18	T. C. Palmer	23.58	1.32	0.75	31.19	29
3	6-30	T. C. Palmer	31.20	2.04	1.13	63.93	9
4	7-13	J. K. Rohrer	.....	.....	1.25	68.00	9
5	7-15	T. C. Palmer	34.80	1.79	1.30	63.45	9
6	7-28	T. C. Palmer	27.20	1.45	1.10	39.36	9
7	8-17	T. C. Palmer	25.56	1.50	1.00	38.37	9
8	8-26	T. C. Palmer	24.15	1.60	1.00	38.48	9

DAILY DISCHARGE, IN SECOND FEET, OF ENTERPRISE CANAL AT HEADGATE, FOR YEAR 1919.

Day	May	June	July	August	September
1	.....	85.00	102.00	70.00	45.00
2	.....	77.00	102.00	70.00	45.00
3	.....	70.00	102.00	62.00	45.00
4	.....	70.00	85.00	77.00	30.00
5	.....	70.00	77.00	77.00	30.00
6	.....	70.00	77.00	70.00	9.00
7	.....	70.00	77.00	54.00	9.00
8	.....	70.00	77.00	70.00	9.00
9	.....	70.00	77.00	65.00	9.00
10	.....	70.00	77.00	70.00	9.00
11	.....	70.00	77.00	70.00	9.00
12	.....	70.00	93.00	70.00	5.00
13	.....	77.00	93.00	77.00	5 00
14	.....	93.00	93.00	70.00	5.00
15	.....	93.00	93.00	70.00	.....
16	.....	85.00	.....	70.00	.....
17	.....	80.00	.....	62.00	.....
18	.....	77.00	.....	65.00	.....
19	.....	81.00	54.00	65.00	.....
20	.....	85.00	54.00	73.00	.....
21	.....	89.00	36.00	65.00	.....
22	.....	93.00	45.00	70.00	.....
23	.....	93.00	45.00	70.00	.....
24	.....	93.00	45.00	45.00	.....
25	.....	85.00	45.00	45.00	.....
26	.....	85.00	36.00	45.00	.....
27	.....	93.00	54.00	36.00	.....
28	.....	93.00	54.00	45.00	.....
29	109.00	93.00	54.00	45.00	.....
30	109.00	93.00	54.00	45.00	.....
31	109.00	.....	54.00	45.00	.....
Total	327.00	2443.00	1932.00	1933.00	264.00
Mean	109.00	74.70	62.30	62.30	18.80
Maximum	109.00	93.00	102.00	77.00	45.00
Minimum	109.00	70.00	.....	36.00	5.00
Acre Feet	650.00	4847.00	3833.00	3836.00	.....

Total Acre Feet River 13692
Total Acre Feet Tub Springs 1988
Total Acre Feet Stewart's Drain 2782
Total Acre Feet Dry Spotted Tail 6435
Acreage reported (acres).....10150
Acre Feet per Acre 2.45

DAILY DISCHARGE, IN SECOND FEET, OF ENTERPRISE CANAL FROM DRY SPOTTED TAIL, FOR YEAR 1919.

Day	June	July	August	September
1	.....	29.00	37.00	47.00
2	.....	29.00	39.00	45.00
3	.....	29.00	41.00	45.00
4	.....	29.00	43.00	45.00
5	.....	29.00	46.00	46.00
6	.....	30.00	48.00	47.00
7	.....	30.00	49.00	47.00
8	.....	30.00	50.00	48.00
9	.....	31.00	49.00	48.00
10	.....	31.00	47.00	48.00
11	.....	31.00	45.00	48.00
12	.....	32.00	43.00	48.00
13	.....	32.00	42.00	.....
14	.....	33.00	40.00	.....
15	.....	34.00	38.00	.....
16	.....	34.00	39.00	.....
17	.....	35.00	39.00	.....
18	.....	35.00	40.00	.....
19	.....	36.00	40.00	.....
20	.....	37.00	41.00	.....
21	30.00	37.00	42.00	.....
22	30.00	37.00	44.00	.....
23	30.00	38.00	45.00	.....
24	30.00	38.00	47.00	.....
25	30.00	37.00	48.00	.....
26	30.00	36.00	49.00	.....
27	29.00	35.00	51.00	.....
28	29.00	34.00	52.00	.....
29	29.00	35.00	53.00	.....
30	29.00	35.00	52.00	.....
31	.....	36.00	50.00	.....
Total	296.00	997.00	1389.00	562.00
Mean	29.60	32.00	44.80	46.00
Maximum	30.00	38.00	53.00	48.00
Minimum	29.00	29.00	37.00	45.00
Acre Feet	587.00	1978.00	2755.00	1115.00

Total Acre Feet 6435

DAILY DISCHARGE, IN SECOND FEET, OF ENTERPRISE CANAL FROM STEWART'S DRAIN, FOR YEAR 1919.

Date	June	July	August	September
1	.....	16.00	14.00	14.00
2	.....	16.00	14.00	13.00
3	.....	15.00	15.00	13.00
4	.....	15.00	16.00	12.00
5	.....	15.00	17.00	12.00
6	.....	15.00	19.00	12.00
7	.....	15.00	20.00	12.00
8	.....	15.00	20.00	12.00
9	.....	15.00	20.00	12.00
10	.....	15.00	19.00	12.00
11	.....	15.00	18.00	13.00
12	.....	15.00	17.00	13.00
13	.....	15.00	16.00	13.00
14	.....	15.00	15.00	13.00
15	.....	15.00	14.00	13.00
16	.....	15.00	13.00	13.00
17	.....	15.00	13.00	13.00
18	.....	15.00	14.00	13.00
19	.....	15.00	14.00	14.00
20	14.00	15.00	14.00	14.00
21	14.00	14.00	14.00	14.00
22	14.00	14.00	15.00	14.00
23	14.00	14.00	15.00	14.00
24	14.00	14.00	16.00	.....
25	14.00	14.00	16.00	.....
26	15.00	13.00	17.00	.....
27	15.00	13.00	18.00	.....
28	15.00	12.00	17.00	.....
29	16.00	12.00	17.00	.....
30	16.00	12.00	15.00	.....
31	.....	12.00	14.00	.....
Total	161.00	447.00	496.00	298.00
Mean	14.00	13.40	16.00	13.00
Maximum	16.00	16.00	20.00	14.00
Minimum	14.00	12.00	13.00	12.00
Acre Feet	319.00	887.00	984.00	592.00

Total Acre Feet 2782

DAILY DISCHARGE, IN SECOND FEET, OF ENTERPRISE CANAL FROM TUB SPRINGS, FOR YEAR 1919.

Date	May	June	July	August
1	.....	8.00	3.00	22.00
2	.....	7.00	4.00	22.00
3	.....	7.00	4.00	23.00
4	.....	7.00	5.00	24.00
5	.....	7.00	5.00	24.00
6	.....	6.00	6.00	25.00
7	.....	6.00	6.00	26.00
8	.....	6.00	6.00	26.00
9	.....	6.00	7.00	25.00
10	.....	6.00	7.00	24.00
11	.....	5.00	8.00	22.00
12	.....	5.00	8.00	20.00
13	11.00	5.00	8.00	19.00
14	10.00	5.00	9.00	18.00
15	9.00	5.00	10.00	15.00
16	9.00	5.00	11.00	14.00
17	8.00	5.00	11.00	12.00
18	8.00	5.00	12.00	10.00
19	7.00	4.00	12.00	8.00
20	7.00	4.00	13.00	7.00
21	7.00	3.00	13.00	6.00
22	7.00	2.00	13.00	.....
23	7.00	2.00	14.00	.....
24	7.00	1.00	14.00	.....
25	8.00	.....	16.00	.....
26	8.00	1.00	17.00	.....
27	8.00	1.00	18.00	.....
28	9.00	1.00	18.00	.....
29	8.00	2.00	19.00	.....
30	8.00	2.00	20.00	.....
31	8.00	.....	21.00	.....
Total	145.00	127.00	338.00	392.00
Mean	8.00	4.00	11.00	18.60
Maximum	11.00	8.00	21.00	26.00
Minimum	7.00	.....	3.00	6.00
Acre Feet	288.00	252.00	670.00	778.00

DAILY DISCHARGE, IN SECOND FEET, OF ENTERPRISE CANAL FROM RIVER AT RATING FLUME, FOR YEAR 1920.

Date	June	July	August
1	....	65	27
2	....	55	22
3	....	56	23
4	....	30	23
5	....	26	24
6	....	30	24
7	....	51	25
8	38	91	26
9	24	87	27
10	91	78	28
11	88	85	29
12	78	98	30
13	68	85	32
14	58	95	34
15	48	78	36
16	39	60	38
17	30	58	38
18	21	65	45
19	21	78	51
20	22	90	51
21	22	58	38
22	23	72	38
23	23	67	38
24	24	62	38
25	25	57	38
26	25	51	38
27	26	88	....
28	27	51	....
29	27	45	....
30	56	24	....
31	....	19	....
Total	904	1960	861
Mean	39	63	33
Maximum	91	95	51
Minimum	21	19	22
Acre Feet	1793	3888	1708

Area reported in 1918 (acres).....7070
Water used (acre feet) 17174
Per Acre (acre feet) 2.42

From River (acre feet) 7389
From Tub Springs (acre feet)..... 1182
From Stewarts Drain (acre feet)..... 691
From Dry Spotted Tail (A. F.)..... 7912

Total 17174

DAILY DISCHARGE, IN SECOND FEET, OF ENTERPRISE CANAL FROM DRY SPOTTED TAIL, FOR YEAR 1920.

Date	June	July	August	September
1	....	32	53	49
2	....	32	52	49
3	....	32	52	49
4	....	32	51	49
5	....	32	50	49
6	....	33	50	49
7	....	33	49	49
8	....	33	48	49
9	....	33	47	49
10	....	33	46	48
11	....	33	45	48
12	....	33	44	48
13	....	33	43	47
14	....	33	42	46
15	....	34	41	46
16	....	35	41	45
17	....	37	41	44
18	....	39	41	44
19	....	40	42	43
20	....	42	42	42
21	....	45	43	41
22	....	47	45	40
23	....	48	46	39
24	....	50	47	38
25	....	52	48	37
26	....	53	48	36
27	....	54	48	35
28	....	54	49	....
29	31	54	49	....
30	32	54	49	....
31	....	53	49	....
Total	63	1248	1441	1208
Mean	32	40	46	45
Maximum	32	54	53	49
Minimum	31	32	41	35
Acre Feet	188	2474	2856	2394

DAILY DISCHARGE, IN SECOND FEET, OF ENTERPRISE CANAL FROM TUB SPRINGS, FOR YEAR 1920.

Date	June	July	August	September
1	....	6	....	20
2	....	6	....	20
3	....	6	....	20
4	....	6	....	20
5	....	6	....	20
6	....	7	....	20
7	....	7	....	20
8	....	7	....	20
9	1	7	....	....
10	1	7	....	....
11	1	8	....	....
12	1	8	....	....
13	1	8	2	....
14	1	8	5	....
15	1	8	13	....
16	2	7	20	....
17	2	7	23	....
18	2	7	23	....
19	2	7	23	....
20	2	7	23	....
21	4	3	22	....
22	4	3	22	....
23	4	3	21	....
24	4	3	21	....
25	4	3	21	....
26	5	....	20	....
27	5	....	20	....
28	5	....	20	....
29	5	....	20	....
30	5	....	20	....
31	....	....	20	....
Total	62	155	359	160
Mean	3	5	12	20
Maximum	5	8	23	20
Minimum	1	....	....	20
Acre Feet	123	307	712	317

ACTUAL DISCHARGE MEASUREMENTS, OF FRENCH DITCH AT RATING FLUME, FOR YEAR 1919.

No	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	9-10	T. C. Palmer.....	28.70	0.60	.....	17.22	23

ACTUAL DISCHARGE MEASUREMENTS, OF FRENCHMAN VALLEY IRRIGATION DISTRICT CANAL AT BRIDGE 100 YARDS BELOW HEAD, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-15	Bailey-Palmer	67.25	1.28	3.20	86.45	23
2	10-23	Bailey-Palmer	60.55	1.11	2.60	67.14	23

ACTUAL DISCHARGE MEASUREMENTS, OF FRENCHMAN IRRIGATION CANAL AT BRIDGE BELOW HEAD, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	10-24	Palmer-Bailey	2.71	0.83	.....	2.25	18

DAILY DISCHARGE, IN SECOND FEET, OF FT. LARAMIE CANAL AT WHALEN, WYOMING, FOR YEAR 1919.

Day	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	.....	41	300	300	165	160	35	35	20
2	....	160	300	300	165	160	35	35	20
3	.....	190	308	300	165	160	35	35	20
4	.....	195	275	325	165	160	35	35	20
5	.....	169	260	325	165	160	35	35	20
6	.....	168	260	325	150	160	35	35	20
7	.....	169	260	325	150	160	35	35	20
8	.....	169	260	325	150	160	35	35	20
9	.....	169	260	325	121	135	35	35	20
10		140	260	325	150	100	35	00	20
11	.....	140	270	325	150	100	35	00	20
12	.....	140	300	325	150	100	35	00	20
13	130	140	250	325	150	100	35	35	20
14	130	125	250	325	150	100	35*	35	20
15	130	125	250	325	150	100	35	35	20
16	105	125	250	275	180	100	35	35	20
17	105	125	250	275	180	100	35	35	20
18	105	125	280	275	180	100	35	35	20
19	105	150	280	275	180	100	35	35	20
20	105	167	280	275	180	60	35	35	20
21	105	167	300	275	180	60	35	35	20
22	180	170	300	250	180	60	35	35	20
23	152	120	300	250	180	60	35	35	20
24	50	153	300	250	180	60	35	35	20
25	85	153	300	250	180	60	35	35	20
26	65	175	300	200	180	60	35	10	20
27	00	175	300	200	160	35	35	10	20
28	00	200	300	165	160	35	35	15	20
29	00	250	300	165	160	35	35	15	20
30	66	250	300	165	160	35	35	15	20
31	....	250	.....	165	160	35	35	....	20
Total	1618	4895	8403	8510	5076	2975	1085	800	620
Mean	90	158	280	274	164	99	35	26	20
A. F.	3209	9709	16667	15879	10068	5901	2152	1587	1230
Max.	180	250	308	325	180	160	35	35	20
Min.	00	41	250	165	121	35	35	10	20

DAILY DISCHARGE, IN SECOND FEET, OF FT. LARAMIE CANAL AT WHALEN, WYOMING, FOR YEAR 1920.

Day	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.
1	20	20	20	20	20	20	188	290	140	130
2	20	20	20	20	20	20	188	290	140	130
3	20	20	15	20	20	20	188	290	140	30
4	20	20	15	20	20	20	188	290	140	30
5	20	20	15	20	20	35	188	290	140	30
6	20	20	15	20	20	35	188	290	140	30
7	20	20	20	20	20	35	188	290	140	30
8	20	20	20	20	20	35	190	290	140	30
9	20	20	20	20	20	129	321	290	140	30
10	20	20	20	20	20	129	320	290	140	30
11	20	20	20	20	20	130	320	130	140	30
12	20	20	20	20	20	200	320	130	140	30
13	20	20	20	20	20	200	320	100	140	30
14	20	20	20	20	20	304	320	100	140	30
15	20	20	20	20	20	304	290	90	140	30
16	20	20	20	20	20	173	290	80	140	30
17	20	20	20	20	20	173	290	80	140	30
18	20	20	20	20	20	173	290	125	140	20
10	20	20	20	20	20	208	290	125	140	30
20	20	20	20	20	20	208	290	125	140	30
21	20	20	20	20	20	208	290	125	140	30
22	20	20	20	20	20	142	290	140	140	30
23	20	20	20	20	20	142	290	140	140	30
24	20	12	20	20	20	142	290	140	130	30
25	20	20	20	20	20	188	290	140	130	30
26	20	10	20	20	20	188	290	140	130	30
27	20	20	20	20	20	188	290	140	130	30
28	20	20	20	20	20	188	290	140	130	30
29	20	20	20	20	20	188	290	140	130	30
30	20	....	20	20	20	188	290	140	130	30
31	20	....	20	....	20	.....	290	140	.....	30
Tot.	620	472	600	600	620	4313	8357	5510	4130	1130
M.	20	16	19	20	20	144	269	177	138	36
A. F.	1229	936	1190	1190	1230	8555	16576	10929	8192	2241
Max.	20	20	20	20	20	304	320	290	140	130
Min.	20	10	15	20	20	20	188	80	120	30

DAILY DISCHARGE, IN SECOND FEET, OF FRENCHMAN VALLEY IRRIGATION DISTRICT FROM FRENCHMAN RIVER, FOR YEAR 1920.

Day	June	July	August	September	October
1	....	72	80	54	61
2	26	70	80	49	61
3	28	68	84	50	61
4	28	66	84	47	58
5	29	65	86	43	66
6	28	72	88	61	66
7	50	75	88	52	64
8	57	77	86	45	72
9	65	79	86	50	79
10	72	80	86	47	79
11	73	82	84	43	79
12	75	84	84	38	79
13	77	84	86	38	79
14	77	82	86	43	79
15	77	82	82	45	79
16	75	80	84	47	79
17	73	80	82	55	79
18	72	80	82	59	79
19	70	80	75	61	79
20	68	79	41	61	79
21	66	79	41	61	79
22	66	77	54	61	72
23	68	77	54	61	70
24	70	77	57	61	68
25	72	77	61	61	68
26	73	77	63	61	68
27	75	80	63	61	70
28	77	79	63	61	70
29	75	75	59	61	70
30	75	75	54	61	65
31	....	75	54	....	....
Total	1835	2385	2254	1598	2167
Mean	63	77	73	53	72
Maximum	77	84	88	61	79
Minimum	26	65	41	38	61
Acre Feet	3640	4731	4471	3170	4298

Area irrigated ..... 9,400 acres
Water used .....20,310 A. F.
Per acre ..... 2.16 A. F.

GERING CANAL.

Owned by the Gering Irrigation District.

Water diverted in Section 4, Township 23, Range 58 at the Nebraska-Wyoming line by means of stone and pile dam. Water is controlled by a waste and control gate about 1,000 feet below head. This structure is built of reinforced concrete with steel gates.

A frame rating flume 300 feet below the control gates gives a good gaging station. No automatic gage is provided. Gage heights were reported for the season of 1919 and part of the season of 1920.

ACTUAL DISCHARGE MEASUREMENTS, OF GERING CANAL AT RATING FLUME, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-11	T. C. Palmer	97.72	2.41	3.35	235.30	23
2	6-17	T. C. Palmer	93.35	2.55	3.20	238.30	23
3	6-24	T. C. Palmer	90.00	2.32	3.00	208.60	23
4	7- 1	T. C. Palmer	102.70	2.63	3.50	270.40	23
5	7-22	Palmer-Woodman	82.38	2.23	2.82	184.20	23
6	7-29	T. C. Palmer	81.80	1.99	2.80	162.50	23
7	8- 7	T. C. Palmer	76.70	2.08	2.60	159.50	23
8	8-14	T. C. Palmer	90.80	2.25	3.10	204.40	23
9	8-20	T. C. Palmer	78.60	2.05	2.70	161.20	23
10	8-27	T. C. Palmer	71.20	1.92	2.44	136.86	23
11	9- 1	T. C. Palmer	69.40	1.98	2.35	137.20	23
12	9-10	T. C. Palmer	66.90	1.90	2.30	127.68	23
13	9-23	T. C. Palmer	.....	.....	.....	0.00	23

ACTUAL DISCHARGE MEASUREMENTS, OF GERING CANAL (BAD LANDS) RATING FLUME, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	8-18	T. C. Palmer	79.20	1.30	2.00	103.26	23
2	8-26	T. C. Palmer	77.95	1.39	2.00	108.65	23
3	9- 3	T. C. Palmer	96.10	1.41	2.67	135.25	23

ACTUAL DISCHARGE MEASUREMENTS, GERING-MITCHELL CANAL AT FIRST BRIDGE BELOW HORSE CREEK, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	8-16	T. C. Palmer-Woodman....	89.80	1.75	.....	157.81	23
2	8-20	Palmer-Woodman	102.98	1.58	.....	162.83	23

ACTUAL DISCHARGE MEASUREMENTS, OF GERING CANAL HEAD-GATE AT RATING FLUME, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-10	T. C. Palmer.....	54.70	2.26	2.10	123.71	29
2	6-18	T. C. Palmer.....	68.05	2.07	2.40	140.84	29
3	6-29	T. C. Palmer.....	67.05	2.08	2.40	139.39	9
4	7-14	T. C. Palmer.....	59.70	2.18	2.00	129.97	9
5	7-29	T. C. Palmer.....	93.20	2.87	3.25	267.96	9
6	8-18	T. C. Palmer.....	83.00	2.59	3.10	228.02	9
7	8-27	T. C. Palmer.....	88.10	2.10	3.05	185.00	9
8	9- 3	T. C. Palmer.....	51.60	1.91	1.95	98.82	9
9	9-24	J. K. Rohrer.....	.....	.....	2.90	188.00	9
10	9-28	T. C. Palmer.....	78.05	2.29	2.70	178.68	9

DAILY DISCHARGE, IN SECOND FEET, OF GERING CANAL, FOR YEAR 1919.

Date	June	July	August	September
1	.....	270.00	118.00	130.00
2	.....	208.00	160.00	128.00
3	.....	232.00	220.00	128.00
4	.....	220.00	113.00	125.00
5	34.00	232.00	103.00	128.00
6	85.00	196.00	146.00	128.00
7	208.00	195.00	146.00	130.00
8	232.00	238.00	118.00	130.00
9	240.00	256.00	220.00	130.00
10	244.00	244.00	220.00	130.00
11	233.00	231.00	226.00	130.00
12	246.00	220.00	220.00	.....
13	244.00	220.00	220.00	.....
14	232.00	220.00	220.00	.....
15	226.00	196.00	202.00	.....
16	250.00	202.00	178.00	.....
17	244.00	196.00	171.00	.....
18	226.00	196.00	174.00	.....
19	220.00	208.00	171.00	.....
20	244.00	171.00	171.00	.....
21	220.00	178.00	171.00	.....
22	220.00	184.00	171.00	.....
23	220.00	186.00	166.00	.....
24	214.00	187.00	134.00	.....
25	214.00	184.00	134.00	.....
26	214.00	192.00	134.00	.....
27	220.00	187.00	134.00	.....
28	214.00	184.00	134.00	.....
29	220.00	184.00	134.00	.....
30	244.00	184.00	134.00	.....
31	.....	184.00	134.00	.....
Total	5608.00	6386.00	5157.00	1417.00
Mean	215.70	206.00	166.40	128.80
Maximum	250.00	270.00	226.00	130.00
Minimum	34.00	171.00	103.00	125.00
Acre Feet	11123.00	12666.00	10228.00	2810.00

Acre Feet	36,824.00
Reported	14,315.00
A. F. per acre	2.57

GOTHENBURG POWER AND IRRIGATION CANAL.

Water diverted to this canal in Section 29-12-26 by means of wing dam. Wastegate of wood located about one mile below head is used to regulate the flow of water in canal.

An automatic gage was installed in the canal on the down-stream side of this structure and gage heights were reported in 1919, but none in 1920. No rating flume is provided. Gagings were made on the down-stream side of check gates. Very poor gaging station. Water is carried by this canal to a storage reservoir just north of the city of Gothenburg, a distance of about nine miles, where water is used for power purposes and returned to the river from an outlet at the southwest corner of the lake. At the northeast corner of the lake is located the head of the irrigation canal. The latter canal is not provided with a rating flume An automatic gage is installed in this canal one-half mile down-stream from the lake in a concrete check. This is not a satisfactory gaging station. No gage heights reported for 1920.

No rating flume nor automatic gage is provided for the power waste. Gaging is done two blocks below the power plant at wagon bridge. Gage heights were reported in 1919, but none in 1920.

ACTUAL DISCHARGE MEASUREMENTS, OF GOTHENBURG DIVERSION AT RATING FLUME, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-30	Earl North	59.40	1.58	2.72	94.31	10
2	7-17	Earl North	40.80	1.08	2.45	44.21	10
3	7-30	Earl North	20.45	1.12	2.20	23.03	10
4	7- 6	Earl North	65.10	2.00	3.60	130.34	10
5	8-12	Earl North	66.30	1.94	3.50	129.03	10

ACTUAL DISCHARGE MEASUREMENTS, OF GOTHENBURG IRRIGATION CANAL AT CEMENT BRIDGE 3,000 FEET BELOW HEAD, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-21	Earl North	24.00	1.41	1.60	33.90	10
2	7-24	Earl North	.....	.....	.....	0.00	10
3	8- 8	Earl North	25.50	2.52	1.75	64.40	10
4	8, 9	Earl North	27.00	2.35	1.70	63.60	10
5	8-12	Earl North	10.00	1.89	1.75	18.95	10
6	8-13	Earl North	7.50	2.08	1.50	15.64	10
7	8-20	Earl North	.....	.....	.....	00.00	10
8	9- 3	Earl North	.....	.....	.....	00.00	10
9	9- 4	Earl North	.....	.....	.....	00.00	10
10	9-17	Earl North	25.50	2.02	1.70	51.64	10
11	9-19	Earl North	24.00	2.03	1.60	48.70	10

ACTUAL DISCHARGE MEASUREMENTS OF GOTHENBURG POWER WASTE CANAL TWO BLOCKS BELOW POWER HOUSE AT GAGING STATION, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4-15	Earl North	55.40	1.30	3.15	72.10	10
2	4-17	North-Palmer	53.50	1.46	3.35	78.18	10
3	4-30	Earl North	49.30	1.28	3.15	63.26	10
4	5- 1	Earl North	57.00	1.23	3.45	70.57	10
5	5-17	Earl North	30.90	1.36	2.80	42.16	10
6	5-20	Earl North	42.35	1.25	2.80	52.92	10
7	5-23	Earl North	43.00	1.29	2.80	55.65	10
8	6- 7	Earl North	42.40	1.32	2.90	56.14	10
9	6-30	Earl North	26.75	1.25	2.50	33.47	10
10	7- 2	Earl North	25.60	1.18	2.50	30.16	10
11	7-17	Earl North	31.00	1.32	2.40	41.10	10
12	7-21	Earl North	30.40	1.27	2.30	38.78	10
13	7-24	Earl North	33.80	1.20	2.50	40.54	10
14	7-25	Earl North	35.80	1.23	2.60	44.10	10
15	7-29	Earl North	28.50	1.41	2.00	40.24	10
16	8- 8	Earl North	46.80	1.82	2.80	85.30	10
17	8-12	Earl North	47.40	1.47	2.90	69.78	10
18	9- 3	Earl North	46.60	1.89	3.90	88.04	10
19	9- 4	Earl North	.....	.....	0.00	0.00	10
20	9-17	Earl North	49.20	1.59	3.80	78.65	10
21	9-19	Earl North	51.40	1.64	3.90	84.42	10
22	10- 9	Earl North	41.00	1.64	2.50	67.50	10
23	10-11	Earl North	41.80	1.64	2.50	68.64	10
24	10-29	Earl North	43.30	1.90	3.00	82.50	10

DAILY DISCHARGE, IN SECOND FEET, OF GOTHENBURG POWER WASTE, FOR YEAR 1919.

Day	June	July	August	September	October
1	.....	50.00	72.00	69.00	75.00
2	.....	50.00	85.00	69.00	78.00
3	.....	50.00	63.00	44.00	78.00
4	.....	35.00	85.00	28.00	78.00
5	.....	40.00	85.00	44.00	72.00
6	.....	46.00	85.00	44.00	78.00
7	.....	46.00	85.00	44.00	78.00
8	.....	46.00	85.00	53.00	78.00
9	.....	50.00	85.00	50.00	78.00
10	.....	50.00	63.00	48.00	82.00
11	.....	44.00	82.00	44.00	82.00
12	.....	40.00	82.00	44.00	72.00
13	.....	40.00	82.00	46.00	82.00
14	.....	40.00	82.00	69.00	85.00
15	17.00	40.00	80.00	75.00	82.00
16	50.00	40.00	80.00	75.00	82.00
17	50.00	40.00	63.00	69.00	82.00
18	46.00	40.00	77.00	75.00	82.00
19	46.00	40.00	80.00	75.00	78.00
20	48.00	70.00	77.00	75.00	78.00
21	50.00	70.00	77.00	69.00	82.00
22	50.00	70.00	77.00	75.00	82.00
23	50.00	72.00	77.00	75.00	82.00
24	50.00	75.00	85.00	75.00	88.00
25	50.00	72.00	88.00	78.00	92.00
26	50.00	75.00	88.00	82.00	82.00
27	50.00	72.00	92.00	69.00	82.00
28	50.00	85.00	35.00	78.00	85.00
29	50.00	44.00	75.00	78.00	88.00
30	50.00	50.00	72.00	78.00	85.00
31	.....	37.00	69.00	.....	85.00
Total	757.00	1619.00	2463.00	1897.00	2513.00
Mean	46.30	52.20	79.50	63.20	81.00
Max.	50.00	85.00	92.00	82.00	88.00
Min.	17.00	35.00	63.00	28.00	72.00
A. F.	1502.00	3211.00	4885.00	3762.00	4984.00

DAILY DISCHARGE, IN SECOND FEET, OF GOTHENBURG CANAL, FOR YEAR 1919.

Date	July	August	September	October
1	.....	00.00	13.00	62.00
2	.....	26.00	16.00	66.00
3	8.00	40.00	00.00	66.00
4	8.50	43.00	5.00	66.00
5	9.00	46.00	3.00	66.00
6	9.00	60.00	3.00	62.00
7	10.00	65.00	3.00	62.00
8	11.00	67.00	0.00	66.00
9	11.00	52.00	0.00	66.00
10	12.00	36.00	0.00	57.00
11	13.00	20.00	0.00	62.00
12	15.00	18.50	14.00	62.00
13	00.00	18.50	26.00	75.00
14	00.00	17.00	43.00	75.00
15	00.00	18.00	43.00	75.00
16	00.00	18.00	51.00	75.00
17	00.00	16.00	52.00	80.00
18	00.00	14.00	56.00	80.00
19	00.00	16.00	57.00	73.00
20	00.00	21.00	66.00	73.00
21	19.00	00.00	61.00	62.00
22	21.00	00.00	61.00	62.00
23	22.00	00.00	51.00	57.00
24	00.00	00.00	29.00	75.00
25	00.00	00.00	36.00	75.00
26	00.00	00.00	43.00	71.00
27	00.00	00.00	33.00	64.00
28	15.00	18.00	36.00	62.00
29	16.00	18.00	26.00	62.00
30	14.00	18.00	57.00	57.00
31	15.00	13.00	.....	57.00
Total	310.00	679.00	890.00	2073.00
Mean	10.70	21.90	29.70	67.00
Max.	22.00	67.00	66.00	80.00
Min.	00.00	00.00	00.00	57.00
A. F.	615.00	1347.00	1765.00	4112.00

Acre feet..... 7,839.00
Acres reported..... 14,900.00
Acre feet per acre..... 0.53

DAILY DISCHARGE, IN SECOND FEET, OF GOTHENBURG DIVERSION, FOR YEAR 1919.

Day	June	July	August	September	October
1	.....	48.00	38.00	96.00	156.00
2	.....	48.00	100.00	72.00	156.00
3	.....	64.00	125.00	72.00	156.00
4	42.00	64.00	125.00	48.00	156.00
5	48.00	64.00	136.00	36.00	168.00
6	48.00	64.00	136.00	36.00	168.00
7	42.00	64.00	136.00	36.00	168.00
8	42.00	64.00	156.00	32.00	168.00
9	52.00	64.00	156.00	32.00	168.00
10	56.00	56.00	156.00	26.00	168.00
11	56.00	42.00	136.00	26.00	168.00
12	56.00	38.00	156.00	64.00	168.00
13	56.00	38.00	156.00	156.00	168.00
14	56.00	46.00	146.00	146.00	168.00
15	48.00	48.00	146.00	151.00	168.00
16	48.00	40.00	136.00	156.00	168.00
17	48.00	34.00	106.00	170.00	168.00
18	48.00	38.00	88.00	168.00	168.00
19	48.00	60.00	116.00	156.00	156.00
20	48.00	126.00	116.00	140.00	168.00
21	36.00	126.00	60.00	136.00	168.00
22	48.00	48.00	56.00	140.00	168.00
23	48.00	48.00	48.00	110.00	168.00
24	48.00	48.00	52.00	100.00	100.00
25	48.00	48.00	40.00	88.00	156.00
26	48.00	48.00	42.00	88.00	156.00
27	48.00	38.00	56.00	106.00	156.00
28	48.00	34.00	90.00	96.00	156.00
29	48.00	28.00	110.00	126.00	156.00
30	48.00	22.00	100.00	156.00	168.00
31	.....	22.00	88.00	.....	168.00
Total	1310.00	1572.00	3308.00	2920.00	5020.00
Mean	48.50	50.70	106.70	97.30	161.90
Max.	56.00	126.00	156.00	156.00	168.00
Min.	36.00	22.00	38.00	26.00	100.00
A. F.	2598.00	3118.00	6561.00	5791.00	9957.00

ACTUAL DISCHARGE MEASUREMENTS, OF GOTHENBURG CANAL BRIDGE BELOW HEAD, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-14	G. K. Baumgartner	40.00	3.07	2.40	123.01	10
2	6-30	G. K. Baumgartner	44.90	3.40	2.60	152.63	10
3	7-13	G. K. Baumgartner	27.20	2.41	1.65	65.69	10
4	8- 2	G. K. Baumgartner	40.80	2.93	2.40	119.74	10
5	8- 4	G. K. Baumgartner	51.00	2.71	2.80	138.42	10
6	8-17	G. K. Baumgartner	42.50	2.81	2.50	119.63	10
7	8-19	G. K. Baumgartner	40.80	2.59	2.40	105.58	10
8	9- 4	Palmer-Willis	54.60	2.22	2.38	121.32	10

ACTUAL DISCHARGE MEASUREMENTS, OF GOTHENBURG POWER WASTE BRIDGE BELOW POWER HOUSE IN TAIL RACE TO RIVER, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-14	G. K. Baumgartner	45.45	1.84	2.80	85.69	10
2	6-30	G. K. Baumgartner	42.50	1.67	2.65	71.08	10
3	7-13	G. K. Baumgartner	42.95	1.75	2.70	75.44	10
4	7-15	G. K. Baumgartner	45.80	1.60	2.73	73.38	10
5	7-16	G. K. Baumgartner	39.10	2.50	2.30	97.91	10
6	8- 2	G. K. Baumgartner	38.55	1.37	2.40	52.76	10
7	8- 4	G. K. Baumgartner	41.50	1.59	2.50	66.03	10
8	8-17	G. K. Baumgartner	36.70	1.62	2.30	59.60	10
9	8-19	G. K. Baumgartner	42.50	1.47	2.45	62.44	10
10	9- 4	Palmer-Willis	38.90	1.89	2.45	73.55	9

ACTUAL DISCHARGE MEASUREMENTS, OF GOTHENBURG IRRIGATION CANAL AT FIRST BRIDGE BELOW HEAD, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-30	G. K. Baumgartner	49.95	1.39	1.84	69.51	10
2	7-13	G. K. Baumgartner	27.60	1.10	2.40	30.53	10
3	7-15	G. K. Baumgartner	29.60	0.18	1.50	5.39	10
4	8- 2	G. K. Baumgartner	52.20	1.04	2.40	54.49	10
5	8- 4	G. K. Baumgartner	57.80	1.08	2.85	62.45	10
6	8-17	G. K. Baumgartner	71.90	1.17	3.30	84.22	10
7	8-19	G. K. Baumgartner	72.80	1.12	3.60	81.92	10

GRAF DITCH.

Graf Ditch owned by the Meeker Ditch Company and diverts water from Blue Creek in Section 19, Township 16, Range 42. Diversion is made by dam across creek to canal and carried short distance to concrete waste structure, where canal flow is controlled. Ditch also has "sand trap" and second wasteway about 60 rods down-stream.

Rating flume is provided just below "sand trap". Gage height reports for this canal were furnished by the State Water Commissioner in 1919. No gage heights reported in 1920.

ACTUAL DISCHARGE MEASUREMENTS, OF GRAF DITCH AT FLUME BELOW WASTE-WAY, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-12	Earl North	8.80	1.28	1.60	11.25	10
2	5-24	Earl North	18.35	1.34	2.25	24.50	10
3	5-28	Earl North	12.13	1.06	1.70	12.81	10
4	6-13	Earl North	13.38	1.35	1.90	18.00	10
5	6-20	Earl North	13.05	1.54	1.95	20.16	10
6	7- 7	Earl North	18.15	1.30	2.30	23.61	10
7	7-15	Earl North	17.95	1.35	2.30	24.27	10
8	8- 5	Palmer-Hartman	8.99	1.67	1.90	15.00	10
9	9- 8	Earl North	25.15	1.73	2.75	43.51	10
10	9-15	Earl North	21.15	1.34	2.30	28.28	10
11	9-23	Earl North	18.15	1.38	2.30	25.18	10

ACTUAL DISCHARGE MEASUREMENTS, OF GRAF DITCH BELOW WASTEGATE, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-17	G. K. Baumgartner	12.40	0.81	1.50	9.96	10
2	6-24	G. K. Baumgartner	14.40	0.91	1.64	13.15	10
3	6-25	G. K. Baumgartner	14.70	1.08	1.75	16.29	10
4	7- 3	G. K. Baumgartner	8.65	0.75	1.20	6.47	10
5	7- 8	G. K. Baumgartner	9.00	0.72	1.15	7.47	10
6	7-19	G. K. Baumgartner	9.70	1.25	1.60	12.15	10
7	7-27	G. K. Baumgartner	4.55	0.95	1.10	4.32	10
8	7-29	G. K. Baumgartner	4.30	1.10	1.05	4.72	10
9	8- 6	G. K. Baumgartner	5.95	1.14	1.30	6.78	10
10	8-12	G. K. Baumgartner	10.30	1.16	1.80	11.99	10
11	8-24	G. K. Baumgartner	23.00	1.11	2.30	25.67	10
12	9- 2	G. K. Baumgartner	10.95	1.18	1.80	12.90	10

DAILY DISCHARGE, IN SECOND FEET, OF GRAF DITCH, FOR YEAR 1919.

Day	May	June	July	August	September
1	.....	13.00	23.00	17.00	41.00
2	.....	13.00	23.00	16.00	42.00
3	.....	14.00	23.00	16.00	43.00
4	.....	14.00	23.00	15.00	43.00
5	.....	15.00	24.00	15.00	44.00
6	.....	15.00	24.00	15.00	44.00
7	.....	16.00	24.00	16.00	44.00
8	.....	16.00	24.00	16.00	43.00
9	.....	16.00	24.00	17.00	41.00
10	.....	17.00	24.00	17.00	40.00
11	.....	17.00	24.00	18.00	35.00
12	10.00	18.00	24.00	19.00	32.00
13	11.00	18.00	24.00	20.00	30.00
14	12.00	18.00	24.00	21.00	29.00
15	13.00	19.00	24.00	22.00	28.00
16	13.00	19.00	24.00	22.00	27.00
17	14.00	19.00	24.00	.....	26.00
18	15.00	19.00	23.00	.....	26.00
19	16.00	20.00	23.00	.....	26.00
20	17.00	20.00	23.00	.....	25.00
21	18.00	20.00	23.00	.....	25.00
22	19.00	20.00	22.00	.....	25.00
23	20.00	21.00	21.00	.....	25.00
24	20.00	21.00	21.00	.....	25.00
25	19.00	21.00	20.00	.....	25.00
26	17.00	22.00	20.00	.....	25.00
27	15.00	22.00	19.00	.....	25.00
28	13.00	22.00	18.00	.....	25.00
29	13.00	22.00	18.00	.....	25.00
30	13.00	23.00	18.00	.....	25.00
31	13.00	.....	17.00	30.00	.....
Total	301.00	550.00	669.00	312.00	1159.00
Mean	15.20	18.30	21.50	18.80	38.60
Max.	20.00	23.00	24.00	22.00	44.00
Min.	10.00	13.00	17.00	15.00	25.00
A. F.	597.00	1091.00	1327.00	619.00	2298.00

Acre feet 5932.00
Acres reported 2190.00
A. F. per acre 2.70

ACTUAL DISCHARGE MEASUREMENTS OF HAIGLER DITCH, NEAR NEBRASKA - COLORADO LINE, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-15	Bailey-Palmer	17.30	1.39	.....	24.11	23

ACTUAL DISCHARGE MEASUREMENTS, OF HARPER-REDINGTON DITCH AT BRIDGE ON MAIN ROAD, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-15	W. F. Chaloupka.....	1.96	1.15	.....	2.26	....

ACTUAL DISCHARGE MEASUREMENTS, OF HARPER DITCH AT RATING FLUME, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-22	T. C. Palmer.....	1.75	1.74	0.45	3.04	9
2	7-23	W. F. Chaloupka.....	1.80	1.79	0.45	3.22	29
3	8-14	T. C. Palmer.....	1.66	1.45	0.40	2.40	9

DAILY DISCHARGE, IN SECOND FEET, OF HARPER DITCH, FOR YEAR 1920.

Day	July	August
1	.....	2.0
2	.....	2.5
3	.....	1.0
4	.....	1.0
5	.....	1.0
6	.....	.....
7	.....	.....
8	.....	.....
9	.....	.....
10	.....	.....
11	.....	.....
12	.....	.....
13	.....	.....
14	.....	.....
15	.....	.....
16	.....	.....
17	.....	.....
18	.....	.....
19	.....	.....
20	.....	.....
21	.....	.....
22	3.2	.....
23	2.0	.....
24	1.0	.....
25	0.5	.....
26	0.5	.....
27	1.5	.....
28	2.5	.....
29	2.5	.....
30	2.5	.....
31	2.5	.....
Total	18.7	7.5
Mean	2.1	1.5
Maximum	3.2	2.5
Minimum	0.5	1.0
Acre Feet	36.0	14.0

Area reported ..... 45 acres
Water used ..... 50 A. F.
Per acre ..... 1.11 A. F.

HOOPER DITCH.

Owned by the Iowa Irrigation and Improvement Co.

Diverts water from Blue Creek near the north line of Section 6, Township 16, Range 42, by means of rock and dirt dam.

Small wasteway located one-half mile down-stream gives control of canal flow. This structure is of concrete with wood gate.

Rating flume and automatic gage installed just below wasteway. Gage height reports were made in 1919 but not in 1920.

ACTUAL DISCHARGE MEASUREMENTS, OF HOOPER CANAL AT RATING FLUME, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-28	Earl North	8.00	1.06	1.60	8.48	10
2	6-13	Earl North	7.00	0.99	1.40	6.93	10
3	6-20	Earl North	5.50	0.78	1.10	4.31	10
4	7- 8	Earl North	7.35	1.24	1.50	9.12	10
5	7-15	Earl North	9.00	1.33	1.85	11.91	10
6	8- 5	Palmer-Hartman	8.00	1.18	1.60	9.47	10
7	9- 8	Earl North	8.50	0.91	1.70	7.70	10
8	9-15	Earl North	6.00	1.11	1.20	6.68	10
9	9-23	Earl North	9.00	1.13	1.70	10.15	10

ACTUAL DISCHARGE MEASUREMENTS, OF HOOPER DITCH AT RATING FLUME, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-18	G. K. Baumgartner	4.50	1.26	1.20	5.67	10
2	7 9	G. K. Baumgartner	6.30	1.03	1.50	6.49	10
3	7-20	G. K. Baumgartner	9.00	1.18	1.80	10.59	10
4	7-27	G. K. Baumgartner	8.00	0.90	1.55	7.20	10
5	7-29	G. K. Baumgartner	7.00	0.79	1.35	5.53	10
6	8- 6	G. K. Baumgartner	7.00	0.90	1.40	6.30	10
7	8-12	G. K. Baumgartner	8.00	1.10	1.60	8.83	10
8	8-24	G. K. Baumgartner	10.00	1.51	2.00	15.12	10
9	9- 2	Palmer-Willis	6.20	1.60	1.65	10.30	10

DAILY DISCHARGE, IN SECOND FEET, OF HOOPER CANAL, FOR YEAR 1919.

Day	May	June	July	August	September
1	.....	11.00	8.00	9.00	11.00
2	.....	11.00	8.00	9.00	10.00
3	.....	13.00	8.00	9.00	10.00
4	.....	13.00	8.00	9.00	10.00
5	.....	13.00	10.00	9.00	10.00
6	.....	14.00	8.00	9.00	10.00
7	.....	14.00	6.00	9.00	10.00
8	.....	16.00	6.00	9.00	10.00
9	.....	16.00	8.00	9.00	11.00
10	.....	8.00	6.00	9.00	11.00
11	.....	8.00	5.00	9.00	11.00
12	.....	8.00	13.00	9.00	11.00
13	.....	5.00	13.00	9.00	11.00
14	.....	4.00	13.00	9.00	8.00
15	.....	4.00	12.00	9.00	8.00
16	.....	4.00	12.00	9.00	7.00
17	.....	13.00	13.00	9.00	7.00
18	.....	11.00	13.00	.....	7.00
19	.....	5.00	13.00	.....	7.00
20	.....	5.00	13.00	.....	7.00
21	.....	4.00	13.00	.....	.....
22	.....	4.00	13.00	.....	.....
23	.....	3.00	13.00	.....	.....
24	.....	3.00	13.00	.....	.....
25	.....	10.00	13.00	.....	.....
26	.....	6.00	13.00	.....	.....
27	.....	5.00	13.00	.....	.....
28	.....	5.00	13.00	.....	.....
29	.....	5.00	13.00	.....	.....
30	10.00	5.00	13.00	10.00	.....
31	10.00	.....	13.00	10.00	.....
Total	20.00	246.00	339.00	164.00	180.00
Mean	10.00	8.20	10.90	9.10	9.00
Max.	10.00	16.00	13.00	10.00	11.00
Min.	10.00	3.00	5.00	9.00	7.00
A. F.	39.00	488.00	672.00	325.00	357.00

Acre feet 1881
Acres reported 930
A. F. per acre 2.02

ACTUAL DISCHARGE MEASUREMENTS, OF HORSE CREEK DITCH AT BRIDGE ON ROAD BELOW HEAD, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-15	Bailey-Palmer	0.62	0.92	.....	0.57	....

ACTUAL DISCHARGE MEASUREMENTS, OF INMAN CANAL AT HEADGATE, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-14	Palmer-Bailey	9.50	0.93	2.50	8.84	23

DAILY DISCHARGE, IN SECOND FEET, OF INMAN DITCH FROM FRENCHMAN RIVER, FOR YEAR 1920.

Day	June	July	August	September	October
1	....	3	0	2	2
2	....	3	0	2	2
3	....	3	0	2	2
4	....	3	0	2	2
5	....	4	0	2	2
6	....	4	0	2	2
7	....	4	0	2	2
8	....	4	0	2	2
9	....	4	0	2	2
10	....	4	0	2	2
11	....	4	3	2	2
12	....	4	3	2	2
13	...	5	3	2	2
14	....	5	3	2	2
15	....	6	4	2	2
16	....	7	4	2	2
17	....	8	4	2	2
18	....	8	4	2	2
19	....	8	3	2	2
20	....	8	3	2	2
21	....	8	3	2	2
22	3	8	3	2	2
23	3	8	3	2	2
24	3	8	3	2	2
25	3	8	3	2	2
26	3	8	2	2	2
27	3	8	2	2	2
28	3	8	2	2	2
29	3	8	2	2	2
30	3	8	2	2	2
31	....	8	2	....	2
Total	27	187	61	60	62
Mean	3	6	2	2	2
Max.	3	8	4	2	2
Min.	3	3	0	2	2
A. F.	53	371	121	119	119

No acreage report.
Water used, 783 A. F.

ACTUAL DISCHARGE MEASUREMENTS, OF INTERSTATE CANAL WASTE INTO RED WILLOW, ABOVE TRI-STATE.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-16	W. F. Chaloupka.....	7.80	1.73	.....	13.54	9

ACTUAL DISCHARGE MEASUREMENTS, OF INTERSTATE CANAL ONE MILE WEST OF NEBRASKA - WYOMING LINE FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-23	Palmer-Woodman	388.90	3.68	.....	1433.80	10

DAILY DISCHARGE, IN SECOND FEET, OF INTERSTATE CANAL AT WHALEN, WYOMING, FOR YEAR 1919.

Day	May	June	July	August	September	October
1	000	1580	1690	1725	1700	925
2	000	1620	1690	1725	1700	925
3	130	1620	1690	1725	1710	725
4	322	1620	1690	1725	1725	925
5	384	1620	1700	1725	1725	925
6	490	1625	1700	1725	1700	925
7	570	1630	1700	1725	1600	925
8	600	1630	1700	1725	1570	925
9	720	1630	1700	1725	1600	925
10	800	1630	1700	1725	1600	925
11	800	1630	1700	1725	1570	950
12	815	1635	1700	1725	1300	925
13	865	1635	1700	1725	1000	925
14	960	1645	1700	1725	1000	995
15	900	1645	1700	1725	1130	975
16	900	1650	1700	1725	1075	940
17	900	1650	1710	1725	1000	940
18	1000	1650	1710	1725	1000	940
19	1100	1650	1710	1725	1000	940
20	1170	1650	1710	1725	1000	920
21	1235	1530	1720	1725	1000	920
22	1300	1630	1720	1725	975	920
23	1350	1650	1720	1725	900	920
24	1525	1650	1720	1725	950	920
25	1525	1660	1720	1725	950	920
26	1480	1660	1720	1725	1000	920
27	1485	1660	1720	1725	1000	810
28	1500	1660	1725	1725	925	810
29	1525	1660	1725	1725	925	650
30	1540	.....	1725	1725	925	500
31	1570	.....	1725	1725	.....	000
Total	29461	47405	52940	53475	37255	26590
Mean	950	1580	1707	1725	1242	857
Ac. Ft.	58436	94028	105006	106068	73895	52741
Max.	1570	1660	1725	1725	1725	995
Min.	000	1530	1690	1725	900	000

DAILY DISCHARGE, IN SECOND FEET, OF INTERSTATE CANAL AT WHALEN, WYOMING, FOR YEAR 1920.

Day	May	June	July	August	September	October
1	000	1115	1400	1700	1500	800
2	000	1080	1430	1650	1550	800
3	000	1100	1470	1650	1550	800
4	000	1100	1525	1650	1550	800
5	000	1100	1540	1650	1550	800
6	000	1130	1580	1650	1500	800
7	000	1230	1580	1650	1500	800
8	000	1320	1600	1650	1500	800
9	000	1405	1625	1650	1500	800
10	000	1455	1650	1650	1500	800
11	000	1485	1650	1650	1500	800
12	000	1500	1650	1650	1400	800
13	000	1520	1650	1650	1400	800
14	000	1540	1670	1650	1350	800
15	000	1540	1690	1650	950	800
16	000	1540	1690	1650	400	800
17	000	1500	1690	1650	300	800
18	000	180	1690	1650	1300	800
19	000	920	1690	1650	1300	800
20	000	880	1690	1650	1100	800
21	000	1250	1690	1650	900	850
22	240	1350	1700	1650	1100	850
23	690	1413	1700	1650	1100	850
24	770	1430	1700	1650	1300	850
25	770	1450	1700	1650	1075	800
26	870	1400	1700	1650	1075	675
27	960	1360	1700	1700	1000	600
28	960	1325	1725	1325	900	500
29	1010	1325	1700	1400	800	300
30	1105	1325	1700	1500	800	000
31	1150	.....	1700	1500	.....	000
Total	8525	38268	50875	50375	36250	22275
Mean	852	1276	1641	1625	1169	768
Max.	1150	1540	1725	1700	1550	850
Min	000	180	1400	1325	800	000
A. F.	16909	74803	99810	98819	70802	43082

KEARNEY CANAL.

Owned by Central Light, Heat and Power Co.

Diverts water from Platte River near Elm Creek in Section 3, Township 8, Range 16. New reinforced concrete diversion structure in use by this canal.

Water used for irrigation and power purposes.

No rating flume provided.

Gaging station at bridge located 25 feet below wasteway is not a satisfactory rating station. This canal has installed an automatic gage about one-half mile up-stream from gaging station in an old canal channel known as "Blue Hole." The water from Blue Hole flows into the canal. As both the headgate and wasteway of this canal are between the rating station and the automatic gage, little if any value can be realized from the reporting of gage heights from the automatic gage. Reports were made for the irrigation season of 1919 and 1920.

ACTUAL DISCHARGE MEASUREMENTS OF KEARNEY CANAL AT GAGING STATION—FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No
1	4-16	Palmer-North	62.90	2.12	2.65	133.30	10
2	5- 1	Earl North	74.50	2.04	2.50	151.90	10
3	5-19	Earl North	79.20	2.39	2.90	189.40	10
4	6- 6	Earl North	50.00	2.02	1.70	100.96	10
5	7- 1	Earl North	65.10	2.38	2.50	154.89	10
6	7-18	Earl North	67.63	1.91	2.00	129.46	10
7	7-23	Earl North	60.00	2.24	2.10	134.49	10
8	7-26	Earl North	40.73	2.09	1.40	85.49	10
9	7-30	Earl North	18.35	1.39	0.50	25.58	10
10	8- 5	Earl North	12.00	0.72	0.40	8.63	10
11	8- 8	Earl North	14.30	1.59	0.50	22.81	10
12	8-13	Earl North	32.50	2.23	1.25	72.60	10
13	8-20	Earl North	15.00	1.08	0.50	16.16	10
14	9- 4	Earl North	12.50	1.29	0.50	16.14	10
15	9-18	Earl North	46.90	1.92	1.70	89.96	10
16	10-10	Earl North	72.45	1.87	2.90	135.50	10
17	10-30	Earl North	74.90	1.94	2.90	145.32	10

DAILY DISCHARGE, IN SECOND FEET, OF KEARNEY CANAL FOR YEAR 1919.

Day	May	June	July	August	September
1	.....	146.00	125.00	8.00	16.00
2	.....	140.00	125.00	8.00	16.00
3	.....	190.00	96.00	8.00	16.00
4	.....	140.00	96.00	8.00	16.00
5	.....	130.00	96.00	9.00	16.00
6	.....	195.00	96.00	12.00	16.00
7	.....	195.00	160.00	15.00	10.00
8	.....	190.00	146.00	23.00	10.00
9	.....	166.00	125.00	50.00	10.00
10	.....	166.00	125.00	76.00	10.00
11	.....	146.00	105.00	116.00	10.00
12	.....	195.00	105.00	112.00	10.00
13	.....	190.00	100.00	76.00	10.00
14	.....	174.00	125.00	35.00	10.00
15	.....	176.00	125.00	22.00	10.00
16	.....	174.00	125.00	20.00	10.00
17	.....	170.00	125.00	18.00	100.00
18	190.00	152.00	125.00	18.00	112.00
19	190.00	163.00	154.00	17.00	196.00
20	160.00	176.00	154.00	16.00	196.00
21	152.00	202.00	154.00	16.00	202.00
22	160.00	195.00	112.00	16.00	202.00
23	125.00	170.00	112.00	16.00	196.00
24	152.00	166.00	98.00	16.00	196.00
25	125.00	150.00	75.00	16.00	196.00
26	152.00	118.00	75.00	16.00	196.00
27	152.00	135.00	75.00	16.00	184.00
28	152.00	174.00	75.00	16.00	.....
29	152.00	152.00	75.00	16.00	.....
30	152.00	180.00	25.00	16.00	.....
31	152.00	.....	10.00	16.00	.....
Total	2166.00	5016.00	3319.00	843.00	2172.00
Mean	154.70	167.20	107.00	27.10	81.40
Max.	190.00	202.00	160.00	116.00	202.00
Min.	125.00	118.00	10.00	8.00	10.00
A. F.	4296.00	9949.00	6583.00	1672.00	4308.00

ACTUAL DISCHARGE MEASUREMENTS, OF KEARNEY CANAL AT FIRST BRIDGE BELOW HEAD, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4-16	Baumgartner-Palmer	91.95	2.69	3.20	216.00	10
2	4-27	G. K. Baumgartner.....	77.50	2.32	3.40	179.66	10
3	6-12	G. K. Baumgartner.....	77.50	2.16	2.50	167.49	10
4	6-29	G. K. Baumgartner.....	85.00	2.52	3.25	214.03	10
5	7-13	G. K. Baumgartner.....	48.10	2.53	1.90	121.65	10
6	8- 3	G. K. Baumgartner.....	65.00	2.87	2.20	186.81	10
7	8-18	G. K. Baumgartner.....	57.50	2.59	2.30	149.14	10
8	9- 5	Palmer-Willis	84.10	2.84	2.80	238.75	10

KEITH AND LINCOLN COUNTY CANAL.

Owned by Keith and Lincoln County Irrigation District.

Water diverted from North Platte river by use of a sand dam and a short wing of piling.

Wastegate one-half mile down stream is used to control the flow in canal.

No rating flume is provided in this canal. Gagings have been made for several years at a wagon bridge 600 feet below wastegate. Gage heights were reported in 1919 and for ten weeks in 1920. Has no automatic gage.

ACTUAL DISCHARGE MEASUREMENTS, OF KEITH-LINCOLN CO. CANAL BRIDGE AT L7 RANCH, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-15	Earl North	11.75	0.63	0.25	7.41	10
2	5-31	Earl North	35.50	1.61	0.75	57.29	10
3	7-16	Earl North	41.00	1.50	1.00	61.53	10
4	8-23	Earl North	.....	.....	0.00	0.00	10
5	9- 1	Earl North	58.80	1.60	1.40	94.01	10
6	9- 6	Earl North	71.40	1.64	1.20	117.17	10
7	9-16	Earl North	50.40	1.43	1.20	72.49	10
8	9-20	Earl North	25.20	1.52	0.60	38.49	10
9	10- 7	Earl North	.....	.....	0.30	0.00	10

ACTUAL DISCHARGE MEASUREMENTS, OF KEITH-LINCOLN CO. CANAL AT FIRST BRIDGE BELOW HEAD, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-16	G. K. Baumgartner	31.90	1.51	0.70	48.10	10
2	7- 2	G. K. Baumgartner	51.20	2.02	1.30	103.63	10
3	7-19	G. K. Baumgartner	49.50	1.74	1.20	86.21	10
4	7-30	G. K. Baumgartner	44.60	1.53	1.00	67.93	10
5	8-14	G. K. Baumgartner	37.80	1.48	0.75	56.13	10
6	8-23	G. K. Baumgartner	36.40	1.35	0.75	49.32	10
7	9- 3	Palmer-Willis	38.60	1.51	0.80	58.39	10

DAILY DISCHARGE, IN SECOND FEET, OF KEITH-LINCOLN CO. CANAL, FOR YEAR 1919.

Day	May	June	July	August	September
1	.....	42.00	40.00	52.00	60.00
2	.....	42.00	40.00	60.00	68.00
3	.....	30.00	50.00	52.00	80.00
4	.....	28.00	60.00	60.00	72.00
5	.....	22.00	60.00	60.00	76.00
6	.....	22.00	60.00	60.00	76.00
7	.....	28.00	28.00	76.00	.....
8	.....	28.00	28.00	76.00	.....
9	.....	28.00	30.00	76.00	.....
10	.....	26.00	32.00	72.00	.....
11	.....	22.00	60.00	72.00	.....
12	.....	22.00	52.00	60.00	.....
13	.....	12.00	52.00	52.00	.....
14	.....	12.00	52.00	72.00	.....
15	.....	14.00	52.00	76.00	.....
16	.....	17.00	56.00	72.00	.....
17	.....	17.00	50.00	60.00	.....
18	20.00	17.00	40.00	46.00	.....
19	20.00	17.00	36.00	60.00	.....
20	20.00	17.00	36.00	.....	.....
21	20.00	17.00	40.00	.....	.....
22	22.00	20.00	36.00	.....	.....
23	22.00	22.00	32.00	.....	.....
24	22.00	24.00	32.00	.....	.....
25	36.00	22.00	52.00	.....	.....
26	42.00	22.00	42.00	.....	.....
27	46.00	22.00	46.00	.....	.....
28	50.00	46.00	52.00	.....	.....
29	56.00	46.00	46.00	76.00	.....
30	60.00	38.00	46.00	76.00	.....
31	50.00	.....	60.00	72.00	.....
Total	486.00	742.00	1402.00	1438.00	432.00
Mean	36.30	24.70	45.20	65.30	72.00
Max.	60.00	46.00	60.00	76.00	80.00
Min.	20.00	12.00	32.00	46.00	60.00
A. F.	964.00	1471.00	2781.00	2852.00	857.00

Total acre feet 8925.00
Acres reported 6383.00
A. F. per acre 1.39

DAILY DISCHARGE, IN SECOND FEET, OF KEITH-LINCOLN CO. DITCH, FOR YEAR 1920.

Day	June	July	August
1	....	80	73
2	....	90	73
3	....	90	73
4	....	90	73
5	....	90	73
6	46	90	73
7	41	90	73
8	39	80	72
9	33	80	71
10	31	80	70
11	33	80	68
12	33	73	67
13	49	64	66
14	45	41	65
15	49	73	64
16	53	90	64
17	59	90	64
18	59	90	64
19	59	90	64
20	49	90	64
21	53	90	64
22	49	90	64
23	45	90	64
24	41	90	64
25	45	90	64
26	56	90	64
27	39	86	64
28	45	82	64
29	41	78	64
30	90	76	64
31	....	74	64
Total	1182	2577	2078
Mean	47	83	67
Maximum	59	90	73
Minimum	31	41	64
Acre Feet	2344	5111	4122

Area reported ..... 6470 acres
Water used ..... 11577 A. F.
Per acre ..... 1.78 A. F.

KEYSTONE CANAL.

Owned by Keystone Irrigation Company.

Diverts water from White Tail Creek in section 26, Township 15, Range 48. Diversion is controlled by frame wastegate and headgate built in White Tail Creek, whereby all of the creek water can be used if desired.

Automatic gage installed in 1920 and gage heights reported for four weeks in 1920. No gage heights reported in 1919.

ACTUAL DISCHARGE MEASUREMENTS, OF KEYSTONE CANAL AT OLD STATION, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	8-23	Earl North	.....	.....	0.00	0.00	10
2	9- 6	Earl North	15.80	1.13	3.10	17.80	10
3	9-16	Earl North	.....	.....	.....	0.00	10

ACTUAL DISCHARGE MEASUREMENTS, OF KEYSTONE CANAL AT RATING FLUME, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-30	G. K. Baumgartner	18.20	1.43	1.30	26.02	10
2	8- 6	G. K. Baumgartner	11.20	1.08	1.80	12.06	10

DAILY DISCHARGE, IN SECOND FEET, OF KEYSTONE IRRIGATION CANAL, FOR YEAR 1920.

Date	August
1	....
2	....
3	....
4	....
5	....
6	12
7	12
8	17
9	4
10	4
11	8
12	11
13	11
14	13
15	13
16	13
17	13
18	13
19	13
20	13
21	21
22	21
23	21
24	21
25	21
26	21
27	21
28	26
29	20
30	20
31	21
Total	406
Mean	16
Max.	26
Min.	4
A. F.	805

No acreage reported.

ACTUAL DISCHARGE MEASUREMENTS, OF KENT AND BURKE CANAL AT RATING FLUME, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-30	G. K. Baumgartner.....	4.14	0.48	0.90	1.98	10
2	7-16	G. K. Baumgartner.....	1.35	0.41	0.30	.0.55	10
3	8- 2	G. K. Baumgartner.....	4.05	1.16	0.90	4.68	10
4	8-17	G. K. Baumgartner.....	2.25	1.12	0.50	2.53	10

ACTUAL DISCHARGE MEASUREMENTS, OF KROTTER POWER DITCH AT FIRST BRIDGE BELOW HEAD, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-16	T. C. Palmer.....	28.30	1.75	.....	49.61	23
2	10-23	Palmer-Bailey	43.75	2.20	.....	96.39	23

ACTUAL DISCHARGE MEASUREMENTS, OF KROTTER & FOLLETT IRRIGATION CANAL AT FLUME ACROSS RIVER, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	10-23	Palmer-Bailey	9.43	1.52	.....	14.38	23

ACTUAL DISCHARGE MEASUREMENTS, OF LAST CHANCE DITCH AT RATING FLUME 100 YARDS BELOW DAM, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-21	W. F. Chaloupka.....	7.54	1.45	.....	10.92	9
2	7-28	W. F. Chaloupka.....	7.52	1.62	.....	12.15	9
3	8- 4	W. F. Chaloupka.....	.....	.....	.....	0.00	9
4	8-11	.....	.....	.....	.....	0.00	....

ACTUAL DISCHARGE MEASUREMENTS, OF LAING DITCH 50 FEET BELOW INTAKE, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7- 5	W. F. Chaloupka.....	0.46	0.70	.....	0.32	9

ACTUAL DISCHARGE MEASUREMENTS, OF LAMORE DITCH AT RATING FLUME, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-23	G. K. Baumgartner	4.40	0.80	0.90	3.57	9
2	8-10	G. K. Baumgartner	4.00	0.81	0.90	3.23	10
3	8-25	G. K. Baumgartner	2.40	0.59	0.65	1.41	10
4	9- 1	T. C. Palmer	4.75	0.92	1.16	4.37	10
5	9-14	T. C. Palmer	3.35	0.88	0.94	2.96	9

DAILY DISCHARGE, IN SECOND FEET, OF LAMORE DITCH, FOR YEAR 1920.

Day	July	August	September
1	....	3	5
2	....	4	5
3	....	5	5
4	....	5	5
5	....	2	5
6	....	2	5
7	1	2	5
8	0	2	5
9	1	2	5
10	4	2	5
11	4	2	5
12	3	2	5
13	4	2	5
14	5	2	....
15	5	2	....
16	5	2	....
17	6	2	....
18	6	2	....
19	5	2	....
20	4	2	....
21	5	2	....
22	4	2	....
23	4	2	....
24	4	2	....
25	4	2	....
26	4	2	....
27	4	2	....
28	4	2	....
29	3	6	....
30	3	5	....
31	3	5	....
Total	95	81	65
Mean	4	3	5
Max.	6	6	5
Min.	0	2	5
A. F.	188	161	129

Area reported 1,190 Acres. Water used 478 A. F. Per acre 0.40 A. F.

LISCO CANAL.

Owned by the Lisco Irrigation District.

Water diverted from North Platte river in Section 14, Township 18, Range 47, about four miles west of Lisco. No dam or headgate is used by this canal. Canal flow is controlled by concrete check and wastegate located about one-half mile from head.

No rating flume provided by this canal. Gaging is done at wastegate. Automatic gage installed at this place. Gage height records were furnished intermittently for about two months in 1919 and automatic record for nine weeks during 1920.

ACTUAL DISCHARGE MEASUREMENTS, OF LISCO CANAL AT RATING FLUME, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-16	Earl North	30.70	0.75	1.95	23.00	10
2	6-24	Earl North	34.94	0.89	2.15	31.21	10
3	7- 8	Earl North	21.75	1.66	2.00	36.21	10
4	7-11	Earl North	17.28	1.42	1.95	24.59	10
5	8- 4	Earl North	26.80	1.40	2.40	37.48	10
6	9-10	Earl North	23.80	1.40	2.05	33.37	10

ACTUAL DISCHARGE MEASUREMENTS, OF LISCO CANAL AT RATING FLUME, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7- 3	G. K. Baumgartner	32.25	0.71	2.00	22.93	10
2	7- 8	G. K. Baumgartner	26.40	0.56	1.64	14.93	10
3	7-22	G. K. Baumgartner	26.90	0.82	1.80	21.98	10
4	7-26	G. K. Baumgartner	30.35	0.80	2.00	24.39	10
5	8- 7	G. K. Baumgartner	21.30	0.60	1.40	12.85	10
6	8-12	G. K. Baumgartner	14.60	0.68	1.40	9.91	10
7	8-25	G. K. Baumgartner	25.20	0.84	1.80	21.33	10
8	9- 1	T. C. Palmer	5.88	0.67	1.25	3.94	....

DAILY DISCHARGE, IN SECOND FEET, OF LISCO CANAL, FOR YEAR 1919.

Day	May	June	July	August	September
1	.....	18.00	16.00	19.00	21.00
2	.....	19.00	17.00	25.00	22.00
3	.....	20.00	17.00	27.00	22.00
4	.....	21.00	18.00	30.00	23.00
5	.....	22.00	18.00	37.00	23.00
6	.....	23.00	19.00	37.00	24.00
7	.....	24.00	25.00	30.00	25.00
8	.....	25.00	25.00	25.00	25.00
9	.....	25.00	25.00	18.00	25.00
10	.....	25.00	24.00	10.00	25.00
11	.....	25.00	23.00	14.00	26.00
12	.....	25.00	22.00	19.00	30.00
13	.....	25.00	22.00	19.00	30.00
14	.....	24.00	22.00	18.00	.....
15	.....	24.00	22.00	16.00	.....
16	.....	24.00	22.00	15.00	.....
17	.....	22.00	25.00	13.00	.....
18	.....	20.00	21.00	14.00	.....
19	.....	17.00	13.00	14.00	.....
20	.....	14.00	16.00	15.00	.....
21	.....	14.00	19.00	15.00	.....
22	.....	14.00	18.00	16.00	.....
23	.....	15.00	16.00	16.00	.....
24	.....	15.00	15.00	17.00	.....
25	.....	15.00	14.00	17.00	.....
26	.....	15.00	14.00	18.00	.....
27	.....	15.00	14.00	18.00	.....
28	.....	15.00	13.00	19.00	.....
29	16.00	16.00	12.00	19.00	.....
30	16.00	16.00	10.00	20.00	.....
31	18.00	.....	19.00	21.00	.....
Total	50.00	592.00	576.00	611.00	321.00
Mean	16.60	19.70	18.60	19.70	23.40
Max.	18.00	25.00	25.00	37.00	30.00
Min.	16.00	14.00	10.00	13.00	21.00
A. F.	99.00	1174.00	1142.00	1212.00	637.00

Total acre feet..... 4262
Acres reported..... 1492
A. F. per acre..... 2.86

DAILY DISCHARGE, IN SECOND FEET, OF LISCO CANAL, FOR YEAR 1920.

Date	July	August	September	October
1	....	25	5	18
2	....	4	5	18
3	25	4	5	18
4	22	4	5	18
5	21	4	5	18
6	18	4	5	19
7	18	12	5	19
8	17	12	5	18
9	13	12	5	18
10	12	12	5	18
11	11	12	5	12
12	4	12	5	12
13	3	12	5	12
14	3	12	10	10
15	3	12	10	12
16	4	12	7	10
17	25	13	8	12
18	5	14	16	12
19	5	15	13	12
20	5	16	13	12
21	5	17	13	12
22	20	18	13	12
23	18	19	13	12
24	28	21	14	10
25	25	21	15	12
26	25	21	15	12
27	25	22	16	12
28	25	25	16	12
29	25	13	17	12
30	25	13	17	10
31	25	13	....	10
Total	455	418	291	424
Mean	16	13	10	14
Max.	25	25	17	19
Min.	3	4	5	10
A. F.	902	829	577	841

Area reported ..... 3010 Acres.
Water used ..... 3149 A. F.
Per acre ..... 1.04 A. F.

Bonds dated June 1st 1922 - $8,000.00

LYONS CANAL.

Owned by the Lyons Irrigation District.

Diversion located in section 30, township 17, range 44 west of Oshkosh, where water is diverted from the North Platte River by use of a temporary wing dam. Frame headgate located in ditch at river bank is used to control river flow. Wagon bridge one-half mile below head is used for rating flume. A concrete floor in canal has been placed here for the purpose of rating canal. Automatic gage installed at this point in 1920. Records of gage heights were furnished for nine weeks in 1920. None for 1919.

ACTUAL DISCHARGE MEASUREMENTS, OF LYONS CANAL AT RATING FLUME, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-26	Earl North	11.15	0.53	1.70	5.94	10
2	8- 4	Earl North	.....	0.00	.....	.....	10
3	8- 6	T. C. Palmer	.....	0.00	.....	.....	23
4	9-10	Earl North	30.50	1.37	2.80	42.00	10
5	9-13	Earl North	26.40	1.33	2.80	35.14	10
6	.....	.....	.....	.....	0.00	0.00	10

ACTUAL DISCHARGE MEASUREMENTS, OF LYONS CANAL AT RATING FLUME, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	8- 7	G. K. Baumgartner	29.70	0.41	1.55	12.18	10
2	8-12	G. K. Baumgartner	23.40	0.44	1.20	10.45	10
3	8-25	G. K. Baumgartner	22.30	0.48	1.20	10.77	10
4	9- 1	T. C. Palmer	19.60	0.79	1.80	15.61	10

DAILY DISCHARGE, IN SECOND FEET, OF LYONS CANAL, FOR YEAR 1919.

Day	July	August	September
1	.....	.....	.....
2	.....	.....	.....
3	.....	5.00	.....
4	.....	.....	.....
5	.....	.....	.....
6	.....	.....	.....
7	8.00	.....	.....
8	.....	.....	.....
9	.....	.....	.....
10	.....	.....	42.00
11	.....	.....	.....
12	.....	.....	.....
13	10.00	6.00	.....
14	.....	.....	.....
15	.....	.....	.....
16	.....	.....	.....
17	.....	.....	.....
18	.....	.....	.....
19	5.00	.....	.....
20	.....	.....	.....
21	.....	.....	.....
22	.....	.....	.....
23	.....	.....	.....
24	.....	.....	.....
25	.....	.....	.....
26	13.00	.....	.....
27	.....	.....	.....
28	.....	.....	.....
29	.....	.....	.....
30	.....	.....	.....
31	.....	.....	.....
Total	.....	.....	.....
Mean	.....	.....	.....
Max.	.....	.....	.....
Min.	.....	.....	.....
A. F.	450.00	180.00	500.00

1130 Acres.
2339 Acres.
0.48 A. F. Per Acre.

DAILY DISCHARGE, IN SECOND FEET, OF LYONS CANAL, FOR YEAR 1920.

Day	July	August	September
1	....	16	8
2	....	16	15
3	....	15	14
4	....	14	13
5	....	15	14
6	....	13	13
7	....	13	13
8	....	12	13
9	....	11	11
10	....	13	14
11	....	11	0
12	....	9	0
13	....	10	0
14	....	12	0
15	....	13	0
16	....	13	0
17	....	11	0
18	....	10	0
19	....	8	0
20	....	14	0
21	....	15	0
22	....	12	0
23	....	10	0
24	....	9	0
25	....	9	0
26	....	9	10
27	3	8	18
28	9	7	18
29	13	9	18
30	15	13	18
31	15	13	....
Total	55	363	218
Mean	11	12	7
Max.	15	16	18
Min.	3	7	0
A. F.	109	720	432

Area reported ..... 2,520 Acres.
Water used ..... 1,261 A. F.
Per acre ..... 0.50 A. F.

ACTUAL DISCHARGE MEASUREMENT, OF MARANVILLE DITCH AT RATING FLUME, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-14	Bailey-Palmer	4.94	0.52	1.30	2.57	9

ACTUAL DISCHARGE MEASUREMENT, OF MIDDLE RADCLIFFE CANAL AT DIVERSION, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-24	W. F. Chaloupka.....	2.76	1.73	.....	4.76	9

ACTUAL DISCHARGE MEASUREMENT, OF MEEKER DITCH (On Republican) AT BRIDGE BELOW HEAD, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-16	T. C. Palmer.....	24.40	1.37	1.50	33.35	23

DAILY DISCHARGE, IN SECOND FEET, OF MEEKER CANAL, OUT OF REPUBLICAN RIVER, FOR YEAR 1920.

Date	July	August	September	October
1	....	67	28	20
2	....	55	35	20
3	....	85	37	20
4	....	83	41	20
5	....	85	30	20
6	....	85	32	20
7	....	85	41	20
8	65	83	35	20
9	65	83	24	20
10	53	74	17	20
11	60	74	16	20
12	55	83	19	20
13	65	83	19	20
14	55	80	14	20
15	67	83	14	20
16	65	65	14	14
17	60	57	13	3
18	79	41	11	3
19	17	71	11	4
20	32	4	11	4
21	55	3	11	4
22	55	2	10	3
23	53	1	10	3
24	48	65	11	3
25	46	28	14	0
26	55	3	17	....
27	69	3	17	....
28	67	19	19	....
29	69	39	19	....
30	65	40	20	....
31	65	28	....	....
Total	1375	1657	630	341
Mean	57	53	21	14
Max.	79	85	50	20
Min.	17	1	10	0
A. F.	2727	3287	1250	676

Area irrigated ..... 2668 Acres.
Water used ..... 7940 A. F.
Per acre ..... 2.97 A. F.

MEGLEMRE DITCH.

Owned by C. E. Meglemre.

Headgate and diversion located in Section 10, Township 18, Range 50 on Greenwood creek. Sand dam with frame headgate regulates the flow.

Rating flume and automatic gage located short distance below headgate. Gage height reports furnished for season of 1919 and 1920.

ACTUAL DISCHARGE MEASUREMENTS, OF MEGLEMRE DITCH AT OLD DIVERSION, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-27	W. F. Chaloupka	1.33	0.72	.....	0.96	9
2	8-13	W. F. Chaloupka	0.77	0.43	.....	0.33	9

ACTUAL DISCHARGE MEASUREMENTS, OF MEGLEMRE DITCH AT RATING FLUME, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-22	T. C. Palmer	0.90	1.48	0.30	1.33	9
2	6-26	T. C. Palmer	1.20	2.00	0.40	2.39	9
3	7- 3	T. C. Palmer	1.06	1.85	0.35	1.96	9
4	8-20	T. C. Palmer	1.00	1.86	0.33	1.86	9
5	8-27	G. K. Baumgartner	0.90	1.90	0.30	1.71	9
6	9- 3	T. C. Palmer	1.65	0.29	0.55	4.74	9

DAILY DISCHARGE, IN SECOND FEET, OF MEGLEMRE DITCH, FOR YEAR 1919.

Date	August
1	....
2	....
3	....
4	....
5	....
6	....
7	....
8	....
9	....
10	....
11	....
12	....
13	.33
14	.20
15	.10
16	.30
17	.30
18	.10
19	.10
20	.10
21	.10
22	.10
23	.10
24	.60
25	.65
26	.60
27	.30
28	.30
29	.60
30	.60
31	....
Total	5.48
Mean	.31
Max.	.65
Min.	.10
A. F.	10.86

DAILY DISCHARGE, IN SECOND FEET, OF MEGLEMRE DITCH, FOR YEAR 1920.

Day	June	July	August	September
1	.....	1.5	2.0	3.5
2	.....	1.0	1.5	3.5
3	.....	2.0	1.5	3.5
4	.....	2.0	1.5	4.0
5	.....	2.0	1.5	4.0
6	.....	2.0	1.5	4.0
7	.....	3.0	1.5	4.0
8	.....	4.0	1.5	4.0
9	.....	4.0	1.5	4.0
10	.....	4.0	2.0	4.0
11	.....	0	2.0	4.0
12	.....	0	2.0	4.0
13	.....	0	2.0	4.0
14	.....	0	2.0	5.0
15	.....	0	3.0	5.0
16	.....	0	3.0	5.0
17	.....	0	2.0	6.5
18	.....	0	1.5	6.5
19	.....	0	1.5	5.0
20	.....	0	2.0	5.0
21	.....	0	2.0	.....
22	1.5	0	2.0	.....
23	3.0	0	2.0	.....
24	4.0	0	2.0	.....
25	3.5	0	2.0	.....
26	3.0	0	2.0	.....
27	3.0	0	2.0	.....
28	3.0	0	3.0	.....
29	2.0	0	3.5	.....
30	2.0	0	3.5	.....
31	.....	3.0	3.5	.....
Total	25.0	28.5	64.5	88.5
Mean	2.8	0.9	2.0	4.4
Maximum	4.0	4.0	3.5	6.5
Minimum	1.5	0.0	1.5	3.5
Acre Feet	49.6	56.0	128.0	176.0

Area reported ..... 120 acres
Water used ..... 409 A. F.
Per acre ..... 3.40 A. F.

ACTUAL DISCHARGE MEASUREMENTS, OF MEREDITH EAST SIDE CANAL ONE-FOURTH MILE BELOW DAM, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7- 1	W. F. Chaloupka	1.98	0.82	.....	1.62	9
2	7- 7	W. F. Chaloupka	.....	.....	.....	0.00	9
3	7-14	W. F. Chaloupka	.....	.....	.....	0.00	9
4	7-21	W. F. Chaloupka	0.36	0.73	.....	0.26	9
5	7-28	W. F. Chaloupka	3.86	0.95	.....	3.69	9
6	8- 4	W. F. Chaloupka	1.79	1.00	.....	1.79	9
7	8-11	W. F. Chaloupka	1.20	0.99	.....	1.19	9
8	9-21	T. C. Palmer	.....	.....	.....	0.00	9

ACTUAL DISCHARGE MEASUREMENTS, OF MEREDITH WEST SIDE CANAL ONE-FOURTH MILE BELOW GUTHRIE DAM, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6- 9	W. F. Chaloupka	8.83	0.62	.....	5.47	9
2	6-16	W. F. Chaloupka	5.08	0.84	.....	4.28	9
3	6-21	W. F. Chaloupka	9.88	1.02	.....	10.09	9
4	7- 1	W. F. Chaloupka	1.08	0.45	.....	0.49	9
5	7- 7	W. F. Chaloupka	1.13	0.77	.....	0.87	9
6	7-11	W. F. Chaloupka	1.00	0.58	.....	0.58	9
7	7-21	W. F. Chaloupka	3.03	0.79	.....	2.41	9
8	7-28	W. F. Chaloupka	11.00	0.94	.....	10.33	9
9	8- 4	W. F. Chaloupka	9.00	0.90	.....	8.10	9
10	8-11	W. F. Chaloupka	6.05	0.89	.....	5.41	9
11	8-20	W. F. Chaloupka	2.16	2.91	.....	6.28	9
12	8-20	W. F. Chaloupka	1.91	2.47	.....	4.71	9
13	9-20	W. F. Chaloupka	1.28	0.90	.....	1.15	9

MINATARE CANAL.

Owned by Minatare Mutual Canal & Irrigation Company.

Water diverted from North Platte river in Section 32, Township 22. Range 54. Good concrete headgate. Wing dam of wood and pile, supplemented by temporary sand dam at low water periods, serves as diversion dam. Concrete check and wastegate 80 rods east of headgate, is used for gaging station but is very unsatisfactory. No automatic gage and no rating flume. Gage heights were reported for only part of the 1919 season and for fourteen weeks in 1920.

ACTUAL DISCHARGE MEASUREMENTS, OF MINATARE CANAL AT GAGING STATION, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-28	T. C. Palmer	17.47	2.23	0.70	39.08	23
2	6-10	T. C. Palmer	29.50	2.03	1.15	59.93	23
3	6-25	T. C. Palmer	26.00	2.13	1.05	55.47	23
4	6-30	T. C. Palmer	19.85	2.05	0.85	40.70	23
5	7-21	T. C. Palmer	.....	.....	.....	0.00	23
6	7-25	T. C. Palmer	45.00	2.07	1.80	93.42	23
7	7-28	T. C. Palmer	40.00	2.13	1.60	85.44	23
8	9- 3	T. C. Palmer	27.50	2.06	1.10	56.63	23

ACTUAL DISCHARGE MEASUREMENTS, OF MINATARE CANAL AT BRIDGE BELOW WASTE, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6- 9	T. C. Palmer	35.15	1.25	1.00	44.16	29
2	6-28	T. C. Palmer	44.40	0.98	1.55	43.64	9
3	7-13	T. C. Palmer	52.45	1.15	1.20	60.25	9
4	7-27	T. C. Palmer	28.50	2.56	1.20	73.09	9
5	8-16	T. C. Palmer	14.70	2.00	0.60	29.48	9
6	9- 8	T. C. Palmer	16.08	2.26	0.70	36.45	9

DAILY DISCHARGE, IN SECOND FEET, OF MINATARE CANAL, DIVERTED FROM RIVER, FOR YEAR 1919.

Date	June	July	August	September
1	.....	00.00	88.00	55.00
2	.....	00.00	88.00	56.00
3	.....	00.00	78.00	57.00
4	.....	00.00	78.00	.....
5	.....	00.00	68.00	.....
6	.....	00.00	78.00	.....
7	.....	00.00	88.00	.....
8	53.00	00.00	88.00	.....
9	53.00	00.00	73.00	.....
10	53.00	00.00	78.00	.....
11	50.00	00.00	78.00	.....
12	48.00	00.00	63.00	.....
13	45.00	12.00	63.00	.....
14	42.00	12.00	63.00	.....
15	43.00	8.00	63.00	.....
16	45.00	00.00	63.00	.....
17	45.00	00.00	48.00	.....
18	46.00	00.00	42.00	.....
19	47.00	00.00	42.00	.....
20	47.00	00.00	48.00	.....
21	48.00	68.00	42.00	.....
22	49.00	78.00	38 00	.....
23	50.00	88.00	38.00	.....
24	53.00	84.00	40.00	.....
25	55.00	78.00	42.00	.....
26	53.00	78.00	44.00	.....
27	51.00	78.00	46.00	.....
28	49.00	78.00	48.00	.....
29	47.00	68.00	50.00	.....
30	45.00	78.00	52.00	.....
31	.....	88.00	54.00	.....
Total	1116.00	896.00	1954.00	1500*
Mean	48.40	64.00	63.00	50
Maximum	55.00	88.00	88.00	.....
Minimum	42.00	00.00	38.00	.....
Acre Feet	2214.00	1777.00	3876.00	2975

Total acre feet..... 10,842
Acreage report ..... 7,000 acres
A. F. per acre..... 1.55 from river
* Estimated.

DAILY DISCHARGE, IN SECOND FEET, OF MINATARE CANAL, FOR YEAR 1920.

Date	June	July	August	September
1	....	80	80	24
2	....	76	24	24
3	....	84	24	24
4	....	76	20	24
5	....	84	26	24
6	....	90	24	24
7	....	90	22	26
8	....	88	20	26
9	....	60	20	26
10	....	60	24	24
11	....	55	20	10
12	....	60	22	9
13	....	76	16	9
14	....	94	14	9
15	....	88	14	9
16	....	72	16	9
17	....	52	16	10
18	....	38	14	10
19	....	60	90	10
20	48	72	90	10
21	44	80	94	10
22	44	76	94	14
23	44	72	90	14
24	52	52	90	14
25	76	66	88	10
26	94	60	80	....
27	76	76	84	....
28	94	76	60	....
29	88	72	56	....
30	66	72	22	....
31	....	76	30	....
Total	726	2233	1384	403
Mean	66	72	45	16
Minimum	94	90	90	26
Maximum	44	38	14	9
Acre Feet	1440	4429	2745	799

Area reported in 1919..... 7,000 acres
Water used ..... 9,413 A. F.
Per acre ..... 1.34 A. F.

ACTUAL DISCHARGE MEASUREMENTS, OF MITCHELL CANAL AT RATING FLUME, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-11	T. C. Palmer	77.28	2.17	3.00	167.80	23
2	6-17	T. C. Palmer	73.20	2.28	2.90	167.16	23
3	6-24	T. C. Palmer	60.70	2.11	2.55	128.44	23
4	7- 1	T. C. Palmer	60.05	1.99	2.45	119.90	23
5	7-22	Woodman-Palmer	119.18	2.54	3.65	303.27	23
6	7-29	T. C. Palmer	109.30	2.34	3.50	255.94	23
7	8- 7	T. C. Palmer	93.10	2.21	3.30	206.12	23
8	8-14	T. C. Palmer	97.45	2.22	3.35	216.50	23
9	8-20	T. C. Palmer	64.80	2.29	2.96	148.60	23
10	8-27	T. C. Palmer	103.10	2.16	3.45	222.45	23
11	9- 1	T. C. Palmer	116.20	2.23	3.65	259.69	23
12	9-10	T. C. Palmer	81.95	2.18	3.10	178.84	23
13	9-23	T. C. Palmer	.....	.....	.....	0.00	23

ACTUAL DISCHARGE MEASUREMENTS, OF MITCHELL CANAL AT RATING FLUME, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-10	T. C. Palmer	69.75	2.13	2.20	148.83	29
2	6-18	T. C. Palmer	97.55	2.41	3.00	235.48	29
3	6-29	T. C. Palmer	109.50	2.42	3.40	265.89	9
4	7-14	T. C. Palmer	84.45	2.23	2.70	188.27	9
5	7-29	T. C. Palmer	91.45	2.53	2.90	231.54	9
6	8-18	T. C. Palmer	91.80	2.51	2.95	230.85	9
7	8-22	T. C. Palmer	82.10	2.38	2.90	195.10	9
8	9- 9	T. C. Palmer	86.75	2.50	2.90	217.34	9
9	9-24	J. K. Rohrer	.....	.....	0.95	16.00	....

DAILY DISCHARGE, SECOND FEET, OF MITCHELL CANAL, FOR YEAR 1919.

Date	June	July	August	September
1	.....	120.00	235.00	.....
2	.....	125.00	225.00	.....
3	.....	130.00	220.00	.....
4	000.00	135.00	215.00	.....
5	50.00	140.00	210.00	.....
6	100.00	145.00	208.00	.....
7	120.00	155.00	208.00	.....
8	150.00	160.00	210.00	.....
9	165.00	170.00	211.00	.....
10	172.00	180.00	212.00	.....
11	168.00	190.00	213.00	.....
12	166.00	200.00	214.00	.....
13	164.00	210.00	215.00	.....
14	162.00	225.00	216.00	.....
15	160.00	235.00	215.00	.....
16	158.00	240.00	205.00	.....
17	156.00	250.00	200.00	.....
18	150.00	260.00	185.00	.....
19	140.00	265.00	170.00	.....
20	138.00	270.00	162.00	.....
21	135.00	275.00	170.00	.....
22	132.00	275.00	180.00	.....
23	130.00	275.00	194.00	.....
24	128.00	270.00	210.00	.....
25	125.00	265.00	220.00	.....
26	122.00	265.00	230.00	.....
27	121.00	260.00	238.00	.....
28	120.00	255.00	245.00	.....
29	120.00	250.00	255.00	.....
30	120.00	245.00	275.00	.....
31	.....	240.00	295.00	.....
Total	3572.00	6680.00	6661.00	2765.00
Mean	137.00	215.40	214.80	251.30
Maximum	172.00	275.00	295.00	315.00
Minimum	50.00	120.00	162.00	180.00
Acre Feet	7085.00	13249.00	13212[illegible]1.00	5484.00

Total acre feet..... 39,031
Acres reported 13,781
Acre feet per acre..... 2.83

ACTUAL DISCHARGE MEASUREMENTS, OF MUTUAL DITCH AT DIVERSION POINT, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-24	W. F. Chaloupka.....	3.95	0.90	.....	3.56	9

ACTUAL DISCHARGE MEASUREMENTS, OF McCOOK DITCH.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	10-24	Palmer-Bailey	17.70	1.35	1.30	23.87	18

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	9- 5	T. C. Palmer.....	2.07	1.59	0.41	3.29	23

ACTUAL DISCHARGE MEASUREMENTS, OF NELSON DITCH AT RATING STATION, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	8-27	G. K. Baumgartner.....	0.53	0.23	0.50	0.12	10

ACTUAL DISCHARGE MEASUREMENTS, OF NELSON DITCH BELOW DIVERSION, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-27	W. F. Chaloupka.....	0.73	0.83	.....	0.60	9
2	8-13	W. F. Chaloupka.....	1.20	0.71	.....	0.85	9
3	.....	.....	.....	.....	.....	0.00	23

NINE-MILE CANAL.

Owned by Nine Mile Irrigation District.

Water diverted from North Platte river, one and one-half miles south of Minatare. Dirt dam, frame headgate and frame wastegates used for diversion purposes. Structure old and in poor shape. No rating flume. Gaging done at wagon bridge constructed over a concrete check, one mile below head. Automatic gage installed just below this point in 1920 but no gage height reports made in 1920. Gage heights were reported in 1919.

ACTUAL DISCHARGE MEASUREMENTS, OF NINE MILE CANAL AT FIRST BRIDGE BELOW HEAD, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-28	T. C. Palmer	29.60	1.77	0.90	51.50	23
2	6-10	T. C. Palmer	21.90	1.32	0.35	28.87	23
3	6-24	T. C. Palmer	48.43	2.08	1.25	100.69	23
4	6-30	T. C. Palmer	42.90	1.44	1.00	61.60	23
5	7-21	T. C. Palmer	13.05	1.59	0.30	20.84	23
6	7-28	T. C. Palmer	14.20	1.64	0.20	23.35	23
7	8- 9	T. C. Palmer	23.50	1.45	0.40	34.11	23
8	9- 4	T. C. Palmer	24.00	1.29	0.47	31.17	23
9	9- 8	T. C. Palmer	24.30	1.13	0.50	27.36	23
10	9-22	T. C. Palmer	.....	0.00	0.20	.....	23

ACTUAL DISCHARGE MEASUREMENTS, OF NINE MILE CANAL AT BRIDGE ONE MILE BELOW HEADGATE, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7- 1	T. C. Palmer	46.45	1.26	1.00	58.32	9
2	7-13	T. C. Palmer	21.70	1.78	0.50	38.72	9
3	7-14	J. K. Rohrer	.....	.....	0.50	54.00	....
4	7-27	T. C. Palmer	53.02	0.94	1.00	50.08	9
5	8-16	T. C. Palmer	26.10	1.34	0.40	35.02	9
6	8-25	T. C. Palmer	19.90	0.83	0.30	16.50	9
7	9- 8	T. C. Palmer	11.15	0.76	0.20	8.42	9
8	9-29	T. C. Palmer	4.30	0.65	0.10	2.78	9

DAILY DISCHARGE, IN SECOND FEET, OF NINE MILE CANAL, FOR YEAR 1919.

Day	May	June	July	August	September
1	.....	50.00	60.00	30.00	30.00
2	.....	48.00	58.00	40.00	30.00
3	.....	43.00	56.00	53.00	30.00
4	.....	40.00	54.00	40.00	30.00
5	.....	36.00	52.00	86.00	30.00
6	.....	32.00	50.00	126.00	30.00
7	.....	28.00	48.00	86.00	30.00
8	.....	24.00	46.00	53.00	30.00
9	.....	20.00	44.00	40.00	.....
10	.....	29.00	42.00	22.00	.....
11	.....	20.00	40.00	20.00	.....
12	.....	20.00	38.00	20.00	.....
13	.....	20.00	36.00	20.00	.....
14	.....	20.00	34.00	5.00	.....
15	.....	20.00	32.00	5.00	.....
16	.....	22.00	30.00	.....	.....
17	.....	22.00	28.00	.....	.....
18	.....	25.00	26.00	.....	.....
19	.....	28.00	24.00	.....	.....
20	.....	30.00	22.00	.....	.....
21	.....	37.00	21.00	.....	.....
22	.....	40.00	21.00	.....	.....
23	.....	40.00	21.00	.....	.....
24	.....	100.00	20.00	.....	.....
25	.....	25.00	20.00	.....	.....
26	.....	22.00	20.00	.....	.....
27	.....	22.00	20.00	.....	.....
28	51.00	22.00	20.00	.....	.....
29	50.00	42.00	22.00	.....	.....
30	50.00	62.00	24.00	.....	.....
31	50.00	.....	28.00	.....	.....
Total	201.00	989.00	1057.00	646.00	240.00
Mean	50.20	32.90	34.10	43.00	30.00
Max.	51.00	100.00	60.00	126.00	30.00
Min.	50.00	20.00	20.00	5.00	30.00
Acre feet	399.00	1962.00	2096.00	1281.00	476.00

Acre feet from river 5730
Acre feet from O'Holloran Seep 2164

Acre feet 7894
Acres reported 14000
Acre feet per acre 0.56

DAILY DISCHARGE, IN SECOND FEET, OF NINE MILE CANAL FROM HOTH SEEP (1 MILE N. & 1 MILE W. BAYARD), FOR YEAR 1919.

Date	May	June	July	August	September
1	.....	3.00	5.00	13.00	16.00
2	.....	3.00	5.00	13.00	16.00
3	.....	3.00	5.00	13.00	16.00
4	.....	3.00	5.00	13.00	16.00
5	.....	3.00	5.00	14.00	16.00
6	.....	4.00	6.00	14.00	20.00
7	.....	4.00	6.00	14.00	20.00
8	.....	4.00	6.00	14.00	23.00
9	.....	4.00	6.00	14.00	22.00
10	.....	4.00	6.00	14.00	22.00
11	.....	4.00	8.00	14.00	22.00
12	.....	4.00	8.00	14.00	21.00
13	.....	4.00	8.00	14.00	.....
14	.....	4.00	8.00	14.00	.....
15	.....	4.00	8.00	15.00	.....
16	.....	4.00	9.00	15.00	.....
17	.....	4.00	9.00	15.00	.....
18	.....	4.00	9.00	15.00	.....
19	.....	4.00	9.00	15.00	.....
20	.....	4.00	9.00	15.00	.....
21	.....	4.00	11.00	15.00	.....
22	.....	4.00	11.00	15.00	.....
23	.....	4.00	11.00	15.00	.....
24	.....	4.00	11.00	16.00	.....
25	3.00	4.00	11.00	16.00	.....
26	3.00	5.00	12.00	16.00	.....
27	3.00	5.00	12.00	16.00	.....
28	3.00	5.00	12.00	16.00	.....
29	3.00	5.00	12.00	16.00	.....
30	3.00	5.00	12.00	16.00	.....
31	3.00	.....	13.00	16.00	.....
Total	21.00	120.00	268.00	454.00	230.00
Mean	3.00	4.00	8.60	14.60	19.10
Maximum	3.00	5.00	13.00	16.00	23.00
Minimum	3.00	3.00	5.00	13.00	16.00
Acre Ft.	42.00	238.00	532.00	896.00	456.00

Total acre feet.....2164

NORTH PLATTE CANAL.

Owned by Platte Valley Irrigation District.

Water diverted from North Platte River in Section 13, Township 14, Range 34. Reinforced concrete dam, concrete and steel headgate used to divert water to canal. No rating flume or automatic gage in this canal. Gaging done at wagon bridge one mile below headgate. Gage height reports made in 1919 and 1920.

ACTUAL DISCHARGE MEASUREMENTS, OF NORTH PLATTE CANAL AT RATING FLUME, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5- 5	Earl North	27.00	1.20	.....	32.54	10
2	5-15	Earl North	31.50	1.16	.....	36.46	10
3	5-31	Earl North	44.00	2.64	1.70	116.16	10
4	6-21	Earl North	9.05	0.50	0.20	4.40	10
5	7-16	Earl North	36.20	2.07	1.30	74.86	10
6	8- 1	Earl North	55.00	2.57	2.30	141.44	10
7	8- 7	Earl North	55.00	2.74	2.30	150.97	10
8	8-11	Earl North	61.60	2.63	2.50	162.45	10
9	8-14	Earl North	37.40	2.12	1.50	79.15	10
10	8-23	Earl North	70.40	2.79	2.90	196.41	10
11	9- 1	Earl North	68.71	1.65	2.40	113.48	10
12	9-16	Earl North	52.80	1.93	2.10	102.05	10
13	9-16	Earl North	52.80	1.86	2.40	98.55	10
14	9-20	Earl North	.....	.....	0.00	0.00	10
15	10- 7	Earl North	.....	.....	0.30	0.00	10

ACTUAL DISCHARGE MEASUREMENTS, OF NORTH PLATTE CANAL AT RATING FLUME, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7- 1	G. K. Baumgartner	54.24	2.50	2.14	135.59	10
2	7-10	G. K. Baumgartner	51.78	2.51	2.00	129.90	10
3	7-17	G. K. Baumgartner	49.50	2.41	2.10	119.38	10
4	7-30	G. K. Baumgartner	59.40	2.65	2.70	157.87	10
5	8- 5	G. K. Baumgartner	50.60	2.57	1.95	128.85	10
6	8-16	G. K. Baumgartner	52.90	2.46	2.20	130.00	10
7	8-21	G. K. Baumgartner	64.40	2.65	2.50	170.85	10
8	9- 8	Palmer-Willis	57.40	2.24	1.92	128.89	10

DAILY DISCHARGE, IN SECOND FEET, OF NORTH PLATTE CANAL, FOR YEAR 1919.

Date	May	June	July	August	September
1	.....	120	120	141	160
2	.....	120	124	155	160
3	.....	120	128	162	142
4	.....	120	132	142	142
5	32	120	136	142	134
6	32	112	140	155	134
7	32	136	142	148	134
8	32	151	144	155	134
9	32	151	146	148	134
10	32	144	148	142	142
11	33	144	148	120	142
12	34	144	148	128	142
13	35	144	148	114	142
14	36	144	121	100	134
15	36	144	114	66	134
16	36	136	114	66	134
17	41	144	72	134	134
18	46	144	66	120	142
19	51	136	53	142	142
20	56	120	46	150	136
21	61	105	46	155	.....
22	66	112	40	182	.....
23	71	112	40	190	.....
24	76	105	32	176	.....
25	81	105	32	176	.....
26	86	105	32	168	.....
27	91	120	32	162	.....
28	97	120	40	148	.....
29	104	120	32	155	.....
30	110	120	128	155	.....
31	116	.....	128	142	.....
Total	1555	3818	2972	4439	2798
Mean	57	127	95	143	139
Maximum	116	151	148	190	160
Minimum	32	105	32	66	134
Acre Ft.	3084	7573	5895	9804	5550

Total Acre Feet..... 31906
Acres reported 12570
A. F. per Acre..... 2.54

DAILY DISCHARGE, IN SECOND FEET, OF NORTH PLATTE CANAL, FOR YEAR 1920.

Date	May	June	July	August	September
1	.....	74	154	194	130
2	.....	74	154	194	138
3	.....	74	154	194	121
4	.....	71	154	194	121
5	.....	78	154	202	121
6	.....	66	154	210	120
7	.....	66	154	210	119
8	.....	66	154	178	118
9	.....	66	146	178	117
10	.....	66	146	178	116
11	.....	66	154	186	115
12	.....	66	154	186	114
13	.....	66	154	186	114
14	.....	90	146	194	114
15	.....	90	146	146	114
16	.....	106	154	146	114
17	.....	114	154	130	121
18	.....	114	154	138	121
19	.....	114	154	138	137
20	.....	121	154	130	153
21	.....	121	154	138	170
22	.....	130	154	138	163
23	.....	138	154	138	160
24	.....	146	154	138	157
25	50	130	186	130	154
26	50	130	194	130	151
27	58	146	194	138	148
28	58	146	194	138	145
29	58	146	194	138	142
30	66	154	194	130	139
31	66	.....	194	130	.....
Total	406	3035	5014	4998	3967
Mean	58	101	162	161	132
Maximum	66	154	194	210	170
Minimum	50	66	146	130	114
Acre Ft.	805	6020	9945	9914	7868

Area reported .....12,670 acres
Water used .....34,552 A. F.
Per acre ..... 2.72 A. F.

ACTUAL DISCHARGE MEASUREMENTS, OF NORTHPORT CANAL BRIDGE ON RANGE LINE 50 AND 51, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-26	Willis & Palmer	7.38	0.99	1.25	7.34	9
2	7- 3	T. C. Palmer	16.05	1.21	1.87	19.37	9
3	7-13	T. C. Palmer	10.92	1.12	1.45	12.29	9
4	7-21	T. C. Palmer	15.75	1.39	1.87	21.84	9
5	7-26	T. C. Palmer	14.05	1.63	1.80	22.95	9
6	8-16	T. C. Palmer	7.30	2.76	1.20	2.81	9
7	8-28	T. C. Palmer	13.65	1.10	1.47	15.03	9
8	9- 8	T. C. Palmer	12.26	0.72	1.45	5.52	9
9	9-14	T. C. Palmer	11.95	0.83	1.55	9.98	9
10	9-24	T. C. Palmer	14.35	1.32	1.90	18.91	9

DAILY DISCHARGE, IN SECOND FEET, OF NORTHPORT IRRIGATION DISTRICT, FOR YEAR 1920.

Date	June	July	August	September
1	....	14	2	12
2	....	17	0	3
3	....	22	0	30
4	....	25	0	11
5	....	24	0	11
6	....	27	0	11
7	....	29	0	12
8	....	29	0	12
9	....	29	2	13
10	....	29	0	13
11	....	24	0	13
12	....	19	0	15
13	....	14	0	15
14	....	7	0	15
15	....	7	0	8
16	....	8	6	13
17	....	16	10	11
18	....	18	2	12
19	....	21	2	11
20	....	13	10	6
21	....	21	5	13
22	....	17	3	16
23	....	21	13	20
24	....	23	13	23
25	....	21	16	23
26	7	21	19	13
27	7	3	22	13
28	8	3	25	13
29	8	3	6	13
30	8	3	25	13
31	....	3	25	....
Total	38	431	207	407
Mean	7	14	7	13
Maximum	8	29	25	30
Minimum	7	3	0	3
Acre Feet	75	855	410	807

Water used: North branch .....2147 A. F.
South branch ..... 160 A. F.

Total .....2307 A. F.
Area irrigated .....1600 acres
Per acre ..... 1.44 A. F.

NOTE: Results are largely due to check below station.

ACTUAL DISCHARGE MEASUREMENTS, OF OLIVER BROTHERS CANAL AT FLUME EAST OF PLANT, FOR YEAR 1919. A-1285.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-14	Palmer-Bailey	1.98	2.09	0.90	4.14	23

ORCHARD AND ALFALFA DITCH.

Owned by South Side Irrigation Company.

Water diverted from Platte river in Section 9, Township 19, Range 24. Sand dam used for diversion. Water in canal controlled by concrete check and wastegate 80 rods below head. No rating flume. Gagings made at waste and check gate. Gage heights reported for 1919 and 1920.

ACTUAL DISCHARGE MEASUREMENTS, OF ORCHARD & ALFALFA CANAL AT BRIDGE BELOW HEAD, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-24	Earl North	.....	.....	0.00	0.00	10

ACTUAL DISCHARGE MEASUREMENTS, OF ORCHARD & ALFALFA CANAL BELOW WASTEGATE, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-30	G. K. Baumgartner.....	16.35	0.46	1.48	7.53	10
2	7-13	G. K. Baumgartner.....	43.40	0.68	2.40	29.33	10
3	7-15	G. K. Baumgartner.....	47.95	0.48	2.65	23.92	10
4	8- 4	G. K. Baumgartner.....	70.30	1.10	3.10	77.66	10
5	8-17	G. K. Baumgartner.....	45.60	0.48	2.40	22.14	10
6	8-19	G. K. Baumgartner.....	53.20	0.81	3.10	43.22	10
7	9-14	Palmer-Willis	.....	.....	1.30	0.00	10

DAILY DISCHARGE, IN SECOND FEET, OF ORCHARD AND ALFALFA CANAL, FOR YEAR 1919.

Date	July	August	September	October
1	.....	00.00	.....	59.00
2	.....	00.00	.....	64.00
3	.....	5.00	.....	61.00
4	.....	18.00	.....	61.00
5	.....	50.00	.....	67.00
6	.....	64.00	.....	67.00
7	.....	64.00	.....	64.00
8	.....	59.00	.....	64.00
9	.....	00.00	.....	59.00
10	.....	00.00	.....	56.00
11	.....	59.00	9.00	56.00
12	.....	61.00	15.00	61.00
13	.....	59.00	56.00	40.00
14	.....	18.00	56.00	40.00
15	.....	18.00	50.00	23.00
16	.....	56.00	40.00	23.00
17	.....	18.00	34.00	42.00
18	26.00	9.00	72.00	42.00
19	53.00	7.00	48.00	42.00
20	53.00	00.00	48.00	40.00
21	.....	00.00	48.00	40.00
22	.....	00.00	48.00	23.00
23	.....	00.00	48.00	34.00
24	.....	00.00	70.00	23.00
25	.....	00.00	70.00	40.00
26	.....	50.00	67.00	40.00
27	.....	64.00	64.00	45.00
28	.....	00.00	64.00	45.00
29	.....	00.00	61.00	.....
30	.....	00.00	61.00	.....
31	.....	00.00	.....	.....
Total	132.00	674.00	1029.00	1321.00
Mean	44.00	21.70	50.10	48.10
Max.	53.00	64.00	72.00	67.00
Min.	26.00	00.00	9.00	23.00
A. F.	262.00	1337.00	2041.00	2620.00

Total acre feet 6260.00
Acres reported 2405.00
Acre feet per acre..... 2.60

DAILY DISCHARGE, IN SECOND FEET, OF ORCHARD & ALFALFA CANAL, FOR YEAR 1920.

Day	June	July	August
1	....	00	40
2	....	00	40
3	....	00	53
4	....	00	60
5	....	00	60
6	....	00	60
7	....	00	68
8	....	30	68
9	....	25	40
10	....	25	46
11	....	12	30
12	....	9	15
13	....	9	15
14	....	7	40
15	....	0	40
16	15	15	35
17	30	15	30
18	40	46	25
19	30	53	53
20	30	53	00
21	35	84	....
22	30	53	....
23	30	40	....
24	35	35	....
25	40	40	....
26	40	46	....
27	22	53	....
28	25	35	....
29	22	30	....
30	00	40	....
31	....	40	....
Total	425	795	818
Mean	28	26	41
Max.	40	84	68
Min.	0	0	00
A. F.	842	1577	1623

Area reported in 1919 ..... 2380 Acres.
Water used ..... 4042 A. F.
Per acre ..... 1.69 A. F.

Bonds dated June 1st, 1922 — $8,000.00

OSHKOSH CANAL.

Owned by Oshkosh Irrigation District.

Water diverted from North Platte river by sand wing dam located in Section 33, Township 17, Range 44. Old wooden headgate used for control. Wasteway one mile below head also used to control canal flow.

Rating flume and automatic gage located 100 feet below wastegate.

Gage heights reported for 1919 and 1920.

ACTUAL DISCHARGE MEASUREMENTS, OF OSHKOSH CANAL FLUME AT HEAD, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-28	Earl North	9.35	0.90	2.05	8.41	10
2	6-16	Earl North	.....	.....	.....	0.00	10
3	8- 6	T. C. Palmer	.....	.....	.....	0.00	23
4	9-10	Earl North	13.00	1.18	.....	15.36	10
5	9-13	Earl North	6.70	1.16	.....	7.78	10
6	9-24	Earl North	.....	.....	.....	0.00	10

ACTUAL DISCHARGE MEASUREMENTS, OF OSHKOSH CANAL AT RATING FLUME, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	8- 7	G. K. Baumgartner	18.00	0.29	2.00	5.22	10
2	8-12	G. K. Baumgartner	18.00	0.62	2.00	11.26	10
3	8-25	G. K. Baumgartner	15.30	0.38	1.70	5.80	10

DAILY DISCHARGE, IN SECOND FEET, OF OSHKOSH CANAL, FOR YEAR 1919.

Day	July	August	September
1	....	....	....
2	....	....	....
3	....	....	...
4	....	....	....
5	....	....	....
6	....	....	....
7	....	....	....
8	....	....	....
9	....	....	....
10	....	....	....
11	....	....	....
12	....	....	....
13	....	....	....
14	....	....	....
15	....	....	....
16	....	....	....
17	....	....	....
18	....	....	....
19	....	....	....
20	....	....	....
21	....	....	....
22	....	....	....
23	....	....	....
24	....	....	....
25	....	....	....
26	....	....	....
27	....	....	....
28	....	....	....
29	....	....	....
30	....	....	....
31	....	....	....
Total			
A. F.	300	000	600

Total acre feet 900
Acres reported 974
A. F. per acre ..... .93

DAILY DISCHARGE, IN SECOND FEET, OF OSHKOSH CANAL, FOR YEAR 1920.

Day	July	August	September
1	....	12	16
2	....	14	4
3	....	15	1
4	....	15	....
5	....	15	....
6	....	13	....
7	....	12	....
8	....	12	....
9		12	....
10	....	12	....
11	....	12	....
12	....	12	....
13	....	11	....
14	....	11	....
15	...	11	....
16	....	11	....
17	....	11	....
18	....	10	....
19	....	7	....
20	....	8	....
21	....	9	....
22	0	9	....
23	0	7	....
24	0	7	....
25	0	7	....
26	0	7	....
27	1	7	....
28	9	10	....
29	11	11	....
30	13	14	....
31	....	14	....
Total	34	338	21
Mean	3	11	7
Max.	13	15	16
Min.	0	7	1
A. F.	67	670	42

Area reported ..... 2730 Acres.
Water used ..... 779 A. F.
Per acre ..... 0.28 A. F.

OVERLAND CANAL.

Owned by Western Land and Cattle Co.

Water diverted from North Platte river, south of Oshkosh. Dirt and brush dam used for diversion. No headgate. Canal flow controlled by concrete waste and check gates 80 rods down stream from canal head. No rating flume. No automatic gage. Gaging done at check mentioned above. Unsatisfactory station. No gage height reports made in 1919 or 1920.

ACTUAL DISCHARGE MEASUREMENTS, OF OVERLAND CANAL AT RATING FLUME, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7- 8	Earl North	13.45	0.88	1.80	11.91	10
2	8- 6	T. C. Palmer	11.65	0.70	1.55	8.12	10
3	9-10	Earl North	16.80	1.23	2.10	20.66	10
4	.....	.....	.....	.....	0.00	0.00	10

ACTUAL DISCHARGE MEASUREMENTS, OF OVERLAND CANAL BELOW WASTEWAY, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7- 8	G. K. Baumgartner	12.45	0.72	0.70	8.96	10
2	7-21	G. K. Baumgartner	9.90	0.87	0.60	8.63	10
3	7-26	G. K. Baumgartner	10.40	0.83	0.65	8.64	10
4	8- 7	G. K. Baumgartner	10.40	0.88	0.80	9.13	10
5	8-12	G. K. Baumgartner	11.90	0.95	0.70	11.23	10
6	8-25	G. K. Baumgartner	4.60	0.61	0.30	2.82	10
7	9- 1	T. C. Palmer	8.85	0.97	0.55	8.55	10

DAILY DISCHARGE, IN SECOND FEET, OF OVERLAND CANAL, FOR YEAR 1919.

Date	June	July	August	September
1	.....	.....	.....	.....
2	.....	.....	.....	.....
3	.....	.....	.....	.....
4	.....	.....	.....	.....
5	.....	.....	.....	.....
6	.....	.....	.....	.....
7	.....	.....	.....	.....
8	.....	.....	.....	.....
9	.....	.....	.....	.....
10	.....	.....	.....	.....
11	.....	.....	.....	.....
12	.....	.....	.....	.....
13	.....	.....	.....	.....
14	.....	.....	.....	.....
15	.....	.....	.....	.....
16	.....	.....	.....	.....
17	.....	.....	.....	.....
18	.....	.....	.....	.....
19	.....	.....	.....	.....
20	.....	.....	.....	.....
21	.....	.....	.....	.....
22	.....	.....	.....	.....
23	.....	.....	.....	.....
24	.....	.....	.....	.....
25	.....	.....	.....	.....
26	.....	.....	.....	.....
27	.....	.....	.....	.....
28	.....	.....	.....	.....
29	.....	.....	.....	.....
30	.....	.....	.....	.....
31	.....	.....	.....	.....
Total	.....	.....	.....	.....
Acre Feet	900	900	400	800

Total acre feet, 3000 (estimated).

ACTUAL DISCHARGE MEASUREMENTS, OF PAISLEY CANAL, RATING FLUME AT HEAD, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-24	Earl North	5.41	1.46	0.75	7.89	10
2	5-28	Earl North	9.74	1.59	1.30	15.54	10
3	6-13	Earl North	4.80	1.55	0.60	7.43	10
4	6-20	Earl North	4.53	1.76	0.50	7.96	10
5	7- 8	Earl North	7.99	1.48	1.20	11.85	10
6	7-15	Earl North	3.20	1.29	0.30	4.11	10
7	8- 5	Palmer-Hartman	2.82	1.30	0.37	3.66	10

DAILY DISCHARGE, IN SECOND FEET, OF PAISLEY CANAL, FOR YEAR 1919.

Date	May	June	July	August
1	.....	13.00	10.00	4.00
2	.....	13.00	11.00	4.00
3	.....	12.00	11.00	4.00
4	.....	11.00	12.00	4.00
5	.....	11.00	12.00	3.60
6	.....	11.00	13.00	4.00
7	.....	10.00	13.00	4.00
8	.....	10.00	13.00	4.00
9	.....	9.00	10.00	4.00
10	.....	9.00	8.00	4.00
11	.....	8.00	6.00	4.00
12	.....	7.00	6.00	4.00
13	.....	6.00	5.00	4.00
14	.....	6.00	5.00	4.00
15	.....	6.00	4.00	4.00
16	.....	6.00	4.00	.....
17	.....	6.00	4.00	.....
18	.....	5.00	4.00	.....
19	.....	5.00	4.00	.....
20	.....	5.00	4.00	.....
21	.....	5.00	4.00	.....
22	.....	5.00	4.00	.....
23	.....	5.00	4.00	.....
24	8.00	5.00	4.00	.....
25	9.00	5.00	4.00	.....
26	12.00	5.00	4.00	.....
27	13.00	6.00	4.00	.....
28	16.00	6.00	4.00	.....
29	15.00	7.00	4.00	.....
30	14.00	8.00	4.00	.....
31	13.00	.....	4.00	.....
Total	100.00	226.00	203.00	48.00
Mean	12.50	7.20	6.50	4.00
Maximum	16.00	13.00	13.00	4.00
Minimum	8.00	5.00	4.00	4.00
Acre Feet	198.00	448.00	403.00	95.00

Total acre feet, 1144.

PAXTON & HERSHEY CANAL.

Owned by Paxton & Hershey Water Co. Water diverted from North Platte river in Section 18, Township 14, Range 33.

Frame headgate and short wing wall, supplemented at low water periods by sand dam used for diversion purposes. Frame check and wastegates situated about 80 rods down stream used to regulate canal flow. Rating flume and automatic gage located 100 yards below wastegate. Gage height reports furnished in 1919 and 1920.

ACTUAL DISCHARGE MEASUREMENTS, OF PAXTON-HERSHEY CANAL AT RATING FLUME, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-16	Earl North	25.50	2.16	1.50	55.09	10
2	8- 1	Earl North	34.00	2.30	2.00	78.12	10
3	8- 7	Earl North	13.60	1.91	1.00	25.96	10
4	8-11	Earl North	23.80	2.15	1.50	51.26	10
5	8-14	Earl North	30.60	2.18	1.80	66.60	10
6	8-23	Earl North	.....	.....	0.00	0.00	10
7	9- 1	Earl North	25.50	1.82	1.50	46.57	10
8	9- 6	Earl North	30.60	1.93	1.80	59.02	10
9	9-10	Earl North	22.16	1.73	1.20	38.32	10
10	9-20	Earl North	.....	.....	0.00	0.00	10
11	10- 7	Earl North	.....	.....	0.20	0.00	10

ACTUAL DISCHARGE MEASUREMENTS, OF PAXTON & HERSHEY CANAL AT STATION ONE MILE WEST ROAD, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7- 1	G. K. Baumgartner	29.88	2.42	1.80	72.23	10
2	7-10	G. K. Baumgartner	12.60	1.80	0.90	22.76	10
3	7-17	G. K. Baumgartner	23.80	2.19	1.40	52.24	10
4	7-30	G. K. Baumgartner	20.80	2.12	1.30	44.10	10
5	8- 5	G. K. Baumgartner	41.40	2.55	2.40	105.84	10
6	8-16	G. K. Baumgartner	24.50	2.40	1.40	58.84	10
7	9- 8	Palmer-Willis	28.40	2.50	1.70	70.99	10

DAILY DISCHARGE, IN SECOND FEET, OF PAXTON-HERSHEY CANAL, FOR YEAR 1919.

Day	June	July	August	September
1	.....	13.00	78.00	56.00
2	13.00	18.00	68.00	58.00
3	12.00	20.00	58.00	60.00
4	10.00	22.00	48.00	63.00
5	10.00	24.00	38.00	65.00
6	10.00	26.00	28.00	67.00
7	10.00	28.00	26.00	63.00
8	17.00	30.00	30.00	60.00
9	13.00	32.00	40.00	56.00
10	13.00	34.00	49.00	53.00
11	13.00	36.00	56.00	50.00
12	13.00	40.00	60.00	45.00
13	13.00	44.00	63.00	43.00
14	12.00	48.00	67.00	41.00
15	11.00	52.00	65.00	39.00
16	10.00	56.00	60.00	36.00
17	15.00	57.00	.....	30.00
18	26.00	58.00	.....	25.00
19	26.00	59.00	.....	15.00
20	26.00	62.00	.....	.....
21	13.00	64.00	.....	.....
22	7.00	66.00	.....	.....
23	36.00	69.00	.....	.....
24	46.00	71.00	.....	.....
25	56.00	72.00	.....	.....
26	66.00	73.00	.....	.....
27	46.00	74.00	.....	.....
28	13.00	75.00	.....	.....
29	13.00	76.00	.....	.....
30	13.00	76.00	.....	.....
31	.....	78.00	.....	.....
Total	576.00	1553.00	834.00	925.00
Mean	19.20	50.00	52.00	48.70
Maximum	66.00	78.00	78.00	67.00
Minimum	7.00	13.00	26.00	15.00
Acre Feet	1142.00	3080.00	1654.00	1835.00

Total acre feet..... 7,711.00
Acres reported 7,834.00
A. F. per acre..... 0.98

DAILY DISCHARGE, IN SECOND FEET, OF PATXON & HERSHEY CANAL, FOR YEAR 1920.

Day	July	August	September
1	....	29	57
2	....	84	35
3	79	74	68
4	74	95	73
5	46	104	62
6	57	93	54
7	49	90	65
8	84	73	71
9	62	73	71
10	38	51	68
11	29	46	79
12	17	56	71
13	12	54	62
14	5	49	60
15	6	43	62
16	46	51	60
17	79	46	46
18	57	26	60
19	46	32	51
20	64	57	54
21	57	8	62
22	57	9	60
23	74	5	29
24	43	6	29
25	46	6	29
26	54	12	36
27	32	12	43
28	76	29	50
29	57	35	57
30	57	43	65
31	24	57	....
Total	1427	1448	1689
Mean	49	47	56
Max.	84	104	79
Min.	5	5	29
A. F.	2830	2761	3239

Area reported ..... 7840 Acres.
Water used ..... 8830 A. F.
Per acre ..... 1.12 A. F.

RAMSHORN CANAL.

Owned by Ramshorn Irrigation District.

Diverts water from north channel of North Platte river three miles west of Morrill. Frame dam across north channel with spillway at end of dam, together with frame headgate used to control flow of water in canal.

Rating flume and automatic gage located one-half mile down stream. Gage heights reported in 1919 and automatic gage installed in 1920 and record furnished for season of 1920.

ACTUAL DISCHARGE MEASUREMENTS, OF RAMSHORN CANAL AT RATING FLUME, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-11	T. C. Palmer	4.65	0.92	0.60	4.18	23
2	6-17	T. C. Palmer	9.40	1.09	1.08	10.27	23
3	6-24	T. C. Palmer	13.85	1.15	1.40	15.96	23
4	7- 1	T. C. Palmer	8.65	0.84	1.00	7.26	23
5	7-22	T. C. Palmer	9.68	0.36	1.15	3.36	23
6	8- 7	T. C. Palmer	16.20	0.84	1.70	13.56	23
7	8-14	T. C. Palmer	8.50	0.45	1.00	3.81	23
8	9-23	T. C. Palmer	.....	0.00	.....	.....	....

ACTUAL DISCHARGE MEASUREMENTS, OF RAMSHORN CANAL AT RATING FLUME, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-29	T. C. Palmer	11.20	1.82	0.80	20.38	9
2	7-13	J. K. Rohrer	.....	.....	0.60	10.00	9
3	7-14	T. C. Palmer	9.12	1.23	0.65	11.24	9
4	7-29	T. C. Palmer	12.60	1.17	0.88	14.74	9
5	8-18	T. C. Palmer	13.45	1.27	0.90	17.12	9
6	8-27	T. C. Palmer	2.25	0.37	0.30	0.82	9

DAILY DISCHARGE, IN SECOND FEET, OF RAMSHORN CANAL, FOR YEAR 1919.

Day	June	July	August
1	.....	7.40	15.20
2	.....	11.40	3.00
3	.....	9.60	3.20
4	6.80	9.90	6.40
5	13.00	10.20	8.40
6	9.70	9.80	14.30
7	9.70	3.40	7.50
8	11.30	10.80	13.50
9	11.30	9.00	13.50
10	9.70	1.20	12.00
11	8.10	1.20	12.00
12	3.50	1.00	7.60
13	3.50	1.00	7.60
14	14.50	0.50	13.50
15	13.00	1.40	3.80
16	13.00	5.00	4.50
17	11.30	3.00	4.50
18	14.50	2.60	4.50
19	14.50	3.20	4.50
20	22.40	3.10	4.50
21	13.00	4.00	4.50
22	4.40	3.40	4.50
23	16.00	2.80	4.50
24	14.00	2.90	4.50
25	18.20	3.00	4.50
26	15.00	3.10	4.50
27	14.70	8.20	4.50
28	14.40	8.60	4.50
29	11.00	9.60	4.50
30	9.00	9.80	4.50
31	.....	11.80	4.50
Total	319.00	172.00	218.00
Mean	11.80	5.50	7.00
Max.	22.00	11.80	15.20
Min.	3.50	0.50	3.00
A. F.	634.00	341.00	423.00

Total Acre Feet 1398.00
Storage Acre Feet 143.00

River Acre Feet 1255.00
Acres reported 3100
Acre Feet per acre 0.45

DAILY DISCHARGE, IN SECOND FEET, OF RAMSHORN CANAL, FOR YEAR 1920.

Day	June	July	August
1	....	7	10
2	....	9	9
3	....	11	5
4	....	7	5
5	....	5	5
6	....	2	0
7	....	0	0
8	....	0	0
9	....	0	0
10	....	0	0
11	....	0	0
12	....	0	11
13	....	7	11
14	....	11	10
15	....	13	11
16	....	11	18
17	....	7	23
18	....	2	17
19	0	7	16
20	0	7	18
21	0	0	17
22	1	0	20
23	2	0	14
24	1	0	7
25	1	0	9
26	7	0	0
27	16	0	1
28	14	0	0
29	12	17	0
30	10	11	0
31	....	 19	0
Total	64	153	237
Mean	5	5	8
Max.	16	17	23
Min.	0	0	0
A. F.	127	303	470

Area reported ..... 2450 Acres.
Water used ..... 900 A. F.
Per acre ..... 0.36 A. F.

ACTUAL DISCHARGE MEASUREMENTS, OF RANDALL BROS.' DITCH AT RATING FLUME, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-15	W. F. Chaloupka.....	4.26	0.76	.....	3.23	9

ACTUAL DISCHARGE MEASUREMENTS, OF RANDALL DITCH AT HEADGATE, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-23	W. F. Chaloupka.....	4.17	1.07	0.80	4.47	29
2	7-23	W. F. Chaloupka.....	3.10	0.91	0.50	2.80	29
3	8-14	T. C. Palmer.....	3.40	1.57	0.57	5.35	9

ACTUAL DISCHARGE MEASUREMENTS, OF RIVERSIDE CANAL AT RATING FLUME, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	10-24	Palmer-Bailey	10.58	0.95	.....	10.05	23

ACTUAL DISCHARGE MEASUREMENTS, OF RIVERSIDE CANAL AT RATING FLUME, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	10-30	Bailey-Willis-Palmer	17.30	0.63	1.55	10.90	9

DAILY DISCHARGE, IN SECOND FEET, OF RIVERSIDE CANAL, FOR YEAR 1920 .

Date	July	August	September	October
1	....	0	0	10
2	....	2	0	10
3	....	13	0	10
4	....	15	0	10
5	2	14	0	10
6	2	14	0	10
7	2	14	0	9
8	2	15	0	9
9	4	15	0	9
10	7	15	0	9
11	9	15	0	9
12	9	16	5	9
13	9	16	6	9
14	9	16	5	9
15	9	15	6	10
16	9	15	6	10
17	9	14	6	10
18	9	9	5	10
19	9	10	4	10
20	7	3	4	10
21	7	0	6	10
22	7	0	9	12
23	7	0	9	12
24	7	0	9	12
25	7	0	9	10
26	3	0	10	10
27	1	0	10	10
28	1	0	10	10
29	0	0	10	10
30	0	0	10	10
31	0	0	....	....
Total	140	246	139	288
Mean	5	8	5	10
Maximum	9	16	10	12
Minimum	0	0	0	9
Acre Feet	278	488	276	571

Area reported ..... 700 acres
Water used .....1613 A. F.
Per acre ..... 2.30 A. F.

RUSH CREEK CANAL.

Owned by Rush Creek Irrigation Canal Co.

Diverts water from North Platte River, south and east of Lisco about 4 miles. Woven wire, straw and sand dam used for diversion purposes. Canal flow regulated by concrete and frame headgate and wastegate. No rating flume. No automatic gage. No gage heights reported.

ACTUAL DISCHARGE MEASUREMENTS, OF RUSH CREEK CANAL AT RATING FLUME, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7- 8	G. K. Baumgartner	9.70	0.72	1.22	6.63	10
2	7-22	G. K. Baumgartner	7.70	0.76	0.90	5.84	10

ACTUAL DISCHARGE MEASUREMENTS, OF SCHERMERHORN CANAL AT RATING FLUME, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	8- 1	W. F. Chaloupka	3.10	1.35	0.30	4.19	9
2	9-12	Palmer-North	20.60	0.44	.....	9.14	9

ACTUAL DISCHARGE MEASUREMENTS, OF SHEEP CREEK INTO TRI-STATE CANAL, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-21	T. C. Palmer	11.67	1.23	.....	14.34	23
2	6-24	T. C. Palmer	17.18	1.69	.....	29.05	23
3	7-23	Palmer-Woodman	23.80	2.13	.....	50.60	23
4	7-29	T. C. Palmer	23.19	1.93	.....	44.73	23
5	8-15	T. C. Palmer	22.10	2.23	.....	49.40	23
6	8-20	T. C. Palmer	28.10	2.07	.....	58.12	23
7	8-27	T. C. Palmer	30.30	2.05	.....	62.13	23
8	9- 2	T. C. Palmer	26.49	2.12	.....	56.19	23
9	9-10	T. C. Palmer	20.91	1.99	.....	41.74	23
10	9-23	T. C. Palmer	.....	.....	.....	0.00	23

DAILY DISCHARGE, IN SECOND FEET, OF SCHERMERHORN CANAL FROM RIVER, FOR YEAR 1919.

Day	June	July	August
1	.....	.....	.....
2	.....	.....	.....
3	.....	.....	.....
4	.....	.....	.....
5	.....	.....	.....
6	.....	.....	.....
7	.....	.....	.....
8	.....	.....	.....
9	.....	.....	.....
10	.....	.....	.....
11	.....	.....	.....
12	.....	.....	.....
13	.....	.....	.....
14	.....	.....	.....
15	.....	.....	.....
16	.....	.....	.....
17	.....	.....	.....
18	.....	.....	.....
19	.....	.....	.....
20	.....	.....	.....
21	.....	.....	.....
22	.....	.....	.....
23	.....	.....	.....
24	.....	.....	.....
25	.....	.....	.....
26	.....	.....	.....
27	.....	.....	.....
28	.....	.....	.....
29	.....	.....	.....
30	.....	.....	.....
31	.....	.....	.....
Total	300.00*	300.00*	300.00*

*Estimated.

DAILY DISCHARGE, IN SECOND FEET, OF SCHERMERHORN CANAL FROM CAMP CLARKE SEEP, FOR YEAR 1919.

Date	June	July	August	September	October
1	.....	5.00	12.00	20.00	8.00
2	.....	5.00	12.00	21.00	8.00
3	.....	5.00	12.00	21.00	8.00
4	.....	5.00	12.00	21.00	8.00
5	.....	6.00	13.00	21.00	8.00
6	.....	6.00	14.00	21.00	7.00
7	.....	6.00	15.00	21.00	7.00
8	.....	6.00	15.00	22.00	7.00
9	.....	6.00	15.00	21.00	7.00
10	.....	7.00	15.00	21.00	7.00
11	.....	7.00	15.00	20.00	6.00
12	.....	7.00	15.00	19.00	6.00
13	.....	7.00	16.00	18.00	6.00
14	.....	7.00	16.00	17.00	6.00
15	.....	7.00	16.00	16.00	6.00
16	.....	8.00	17.00	15.00	5.00
17	.....	8.00	17.00	15.00	5.00
18	.....	8.00	17.00	14.00	5.00
19	.....	8.00	17.00	14.00	5.00
20	3.00	8.00	17.00	13.00	5.00
21	4.00	9.00	18.00	12.00	6.00
22	4.00	9.00	18.00	11.00	6.00
23	4.00	9.00	18.00	11.00	6.00
24	4.00	9.00	18.00	11.00	6.00
25	4.00	9.00	18.00	10.00	6.00
26	5.00	11.00	19.00	9.00	7.00
27	5.00	11.00	19.00	8.00	7.00
28	5.00	11.00	19.00	8.00	7.00
29	5.00	11.00	19.00	8.00	7.00
30	5.00	11.00	19.00	8.00	7.00
31	.....	11.00	20.00	.....	7.00
Total	43.00	250.00	503.00	475.00	202.00
Mean	3.90	8.10	16.20	15.80	6.50
Maximum	5.00	11.00	20.00	22.00	8.00
Minimum	3.00	5.00	12.00	8.00	5.00
Acre Ft.	85.00	496.00	998.00	942.00	401.00

Total Acre Feet.....2922.00

SHORT LINE CANAL.

Owned by Short Line Irrigation Company.

Diverts water from North Platte river in Section 25, Township 24, Range 53 north of McGrew. Dirt dam used for diversion. Concrete and steel headgate and wastegate structure used to control canal flow. Rating flume (badly needing repairs) located one-half mile downstream. No automatic gage. Gage heights reported for the season of 1920.

ACTUAL DISCHARGE MEASUREMENTS, OF SHORT LINE CANAL AT FIRST BRIDGE BELOW HEAD, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-21	T. C. Palmer	6.10	1.25	1.30	7.61	23
2	9-11	T. C. Palmer	7.40	0.82	1.10	6.03	23

ACTUAL DISCHARGE MEASUREMENT, OF SHORT LINE CANAL AT RATING FLUME, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-17	T. C. Palmer	4.02	2.14	0.65	8.59	29
2	7- 1	T. C. Palmer	5.29	2.47	0.70	13.01	9
3	7-16	T. C. Palmer	9.05	2.17	1.15	19.66	9
4	8-25	T. C. Palmer	5.29	1.21	1.00	6.43	9
5	9- 8	T. C. Palmer	6.80	1.09	0.95	7.30	9

DAILY DISCHARGE, IN SECOND FEET, OF SHORT LINE CANAL, FOR YEAR 1919.

Date	June	July	August	September
1	.....	.....	.....	.....
2	.....	.....	.....	.....
3	.....	.....	.....	.....
4	.....	.....	.....	.....
5	.....	.....	.....	.....
6	.....	.....	.....	.....
7	.....	.....	.....	.....
8	.....	.....	.....	.....
9	.....	.....	.....	.....
10	.....	.....	.....	.....
11	.....	.....	.....	.....
12	.....	.....	.....	.....
13	.....	.....	.....	.....
14	.....	.....	.....	.....
15	.....	.....	.....	.....
16	.....	.....	.....	.....
17	.....	.....	.....	.....
18	.....	.....	.....	.....
19	.....	.....	.....	.....
20	.....	.....	.....	.....
21	.....	.....	.....	.....
22	.....	.....	.....	.....
23	.....	.....	.....	.....
24	.....	.....	.....	.....
25	.....	.....	.....	.....
26	.....	.....	.....	.....
27	.....	.....	.....	.....
28	.....	.....	.....	.....
29	.....	.....	.....	.....
30	.....	.....	.....	.....
31	.....	.....	.....	.....
A. F.	500.00*	500.00*	500.00*	500.00*

Total acre feet 2,000.00*.
*Estimated.

DAILY DISCHARGE, IN SECOND FEET, OF SHORT LINE CANAL, FOR YEAR 1920.

Date	June	July	August	September
1	....	13	13	13
2	....	0	13	13
3	....	0	11	13
4	....	0	13	13
5	....	11	11	....
6	....	11	11	....
7	....	9	11	....
8	....	0	11	....
9	....	0	11	....
10	....	9	11	....
11	....	16	11	....
12	....	19	11	....
13	13	19	11	....
14	14	19	11	....
15	16	22	0	....
16	19	22	0	....
17	19	22	0	....
18	13	22	0	....
19	13	25	0	....
20	13	16	0	....
21	19	13	0	....
22	16	16	13	....
23	13	22	13	....
24	13	22	11	....
25	13	22	13	....
26	13	22	13	....
27	11	19	13	....
28	11	16	11	....
29	13	16	16	....
30	11	16	16	....
31	....	16	13	....
Total	253	446	292	52
Mean	14	14	9	13
Max.	19	25	16	13
Min.	11	0	0	13
A. F.	502	873	567	91

Area reported ..... 3,500 Acres.
Water used ..... 2,033 A. F.
Per acre ..... 1.58 A. F.

ACTUAL DISCHARGE MEASUREMENTS, OF SIGNAL BLUFF CANAL AT WASTEGATE, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-20	Earl North	13.00	1.40	1.40	18.24	10
2	7- 7	Earl North	9.53	1.21	1.10	11.50	10
3	7-15	Earl North	.....	.....	.....	0.00	10
4	9-24	Earl North	.....	.....	.....	0.00	10

DAILY DISCHARGE, IN SECOND FEET, OF SIGNAL BLUFF CANAL, FOR YEAR 1919.

Date	May	June	July	August	September
1	.....	22.00	9.00	12.00	.....
2	.....	17.00	10.00	12.00	.....
3	.....	17.00	12.00	.....	.....
4	.....	17.00	10.00	.....	.....
5	.....	17.00	17.00	.....	.....
6	.....	17.00	10.00	.....	.....
7	.....	17.00	9.00	.....	.....
8	.....	20.00	9.00	.....	.....
9	.....	25.00	9.00	.....	.....
10	.....	12.00	9.00	.....	.....
11	.....	12.00	9.00	.....	.....
12	.....	12.00	10.00	.....	.....
13	.....	9.00	10.00	.....	.....
14	.....	8.00	9.00	.....	.....
15	.....	3.00	9.00	.....	.....
16	.....	3.00	9.00	.....	.....
17	.....	7.00	9.00	.....	.....
18	.....	12.00	8.00	.....	.....
19	.....	20.00	8.00	.....	.....
20	.....	17.00	8.00	.....	.....
21	.....	17.00	8.00	.....	.....
22	.....	31.00	7.00	.....	.....
23	.....	33.00	5.00	.....	.....
24	.....	31.00	9.00	.....	.....
25	7.00	28.00	4.00	.....	.....
26	7.00	27.00	4.00	.....	.....
27	7.00	24.00	0.00	.....	.....
28	7.00	22.00	0.00	.....	.....
29	7.00	9.00	0.00	.....	.....
30	17.00	9.00	0.00	.....	.....
31	12.00	.....	0.00	.....	.....
Total	64.00	515.00	230.00	24.00	.....
Mean	9.00	17.10	7.40	12.00	.....
Maximum	17.00	33.00	17.00	12.00	.....
Minimum	7.00	3.00	0.00	12.00	.....
Acre Ft.	127.00	1021.00	456.00	47.00	.....

Total Acre Feet.....1651.00
Acreage reported.....1236.00
A. F., per acre..... 1.34

ACTUAL DISCHARGE MEASUREMENTS, OF SIX MILE CANAL AT RATING FLUME, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	8- 9	Earl North	10.80	0.86	1.10	8.66	10
2	8-23	Earl North	9.00	1.26	0.80	11.33	10
3	9- 3	Earl North	.....	.....	0.00	0.00	10
4	9- 4	Earl North	.....	.....	0.00	0.00	10
5	9-17	Earl North	9.00	1.64	0.90	14.73	10
6	9-19	Earl North	9.90	1.67	1.00	16.54	10

ACTUAL DISCHARGE MEASUREMENTS, OF SIX MILE CANAL AT FIRST BRIDGE BELOW HEAD, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-30	G. K. Baumgartner	5.90	1.79	0.50	10.53	10
2	7-13	G. K. Baumgartner	1.95	1.48	0.10	2.88	10
3	7-15	G. K. Baumgartner	0.50	1.54	0.05	0.77	10
4	8- 4	G. K. Baumgartner	9.95	1.81	1.00	18.01	10
5	8-17	G. K. Baumgartner	5.20	1.91	0.50	9.93	10
6	8-19	G. K. Baumgartner	5.85	1.61	0.40	9.44	10
7	9- 6	Palmer-Willis	3.13	1.34	0.00	4.19	10

DAILY DISCHARGE, IN SECOND FEET, OF SIX MILE CANAL, FOR YEAR 1919.

Day	June	July	August
1	28.00	.....	24.00
2	8.00	.....	24.00
3	11.00	.....	24.00
4	24.00	.....	24.00
5	24.00	.....	28.00
6	28.00	.....	24.00
7	8.00	.....	28.00
8	.....	.....	28.00
9	.....	.....	28.00
10	.....	.....	28.00
11	.....	.....	28.00
12	.....	24.00	18.00
13	.....	24.00	18.00
14	.....	24.00	11.00
15	.....	24.00	8.00
16	.....	28.00	5.00
17	.....	15.00	8.00
18	.....	15.00	8.00
19	.....	8.00	24.00
20	.....	5.00	8.00
21	.....	5.00	18.00
22	.....	18.00	.....
23	.....	11.00	.....
24	.....	15.00	.....
25	.....	4.00	.....
26	.....	15.00	.....
27	.....	15.00	.....
28	.....	11.00	.....
29	.....	4.00	.....
30	.....	18.00	.....
31	.....	18.00	.....
Total	131.00	301.00	414.00
Mean	18.00	15.00	19.70
Max.	28.00	28.00	28.00
Min	8.00	4.00	5.00
A. F.	260.00	597.00	821.00

September: 1000 acre feet for September estimated.

Total Acre Feet 2678

Acreage report 958

Acre Feet per acre 2.79

SPOHN DITCH.

Owned by Wm. Spohn.

Diverts water from North Platte river near east line of Section 13, Township 17, Range 45.

Has pile, dirt and frame dam. Frame spillway used to control flow in canal. Has concrete check gate in use. Rating flume and automatic gage located 80 rods down stream. Gage height records reported for six weeks in 1919 and for two weeks in 1920.

ACTUAL DISCHARGE MEASUREMENTS, OF SPOHN CANAL AT HEADGATE, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	8- 4	T. C. Palmer	.....	.....	.....	1.50	23
2	8- 6	T. C. Palmer	25.90	0.49	2.45	12.89	23
3	8-12	Palmer-Willis	12.55	0.42	1.17	5.25	23
4	8-12	Palmer-Willis	8.30	0.49	2.30	4.00	23
5	8-12	Palmer-Willis	10.90	0.76	2.50	8.31	23
6	9-10	Earl North	29.70	0.68	2.45	20.21	10
7	9-13	Earl North	15.00	1.37	2.50	20.57	10

ACTUAL DISCHARGE MEASUREMENTS, OF SPOHN CANAL AT RATING FLUME, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	8- 7	G. K. Baumgartner	14.40	0.64	1.60	9.30	10
2	8-12	G. K. Baumgartner	14.40	0.72	1.60	10.38	10
3	8-25	G. K. Baumgartner	15.30	0.51	1.70	7.80	10
4	9- 1	T. C. Palmer	11.53	0.34	1.30	2.93	9

DAILY DISCHARGE, IN SECOND FEET, OF SPOHN CANAL, FOR YEAR 1919.

Day	July	August	September
1	.....	.....	25.00
2	.....	.....	25.00
3	.....	.....	35.00
4	.....	1.50	20.00
5	.....	1.50	20.00
6	.....	13.00	25.00
7	.....	12.00	25.00
8	.....	11.00	25.00
9	.....	10.00	20.00
10	.....	9.00	20.00
11	.....	7.00	20.00
12	.....	5.00	20.00
13	.....	10.00	20.00
14	.....	12.00	20.00
15	.....	12.00	20.00
16	.....	13.00	.....
17	.....	x	.....
18	.....	x	.....
19	.....	x	.....
20	.....	x	.....
21	.....	x	.....
22	.....	x	.....
23	.....	x	.....
24	.....	x	.....
26	.....	x	.....
27	.....	x	.....
28	.....	x	.....
29	.....	x	.....
30	.....	20.00	.....
31	.....	20.00	.....
Total	.....	157.00	340.00
Mean	.....	10.40	22.60
Min.	.....	1.50	20.00
Max.	.....	20.00	35.00
Acre Feet	500.00*	311.4	674.40

Total acre feet..... 1486
Acres reported 883
Acre feet per acre..... 1.68
x Water shut off by Water Commissioner.
* Estimated

DAILY DISCHARGE, IN SECOND FEET, OF SPOHN DITCH, FOR YEAR 1920.

Date	August
1	....
2	....
3	....
4	....
5	....
6	....
7	9
8	9
9	9
10	9
11	9
12	9
13	9
14	9
15	9
16	9
17	9
18	7
19	6
20	6
21	11
22	....
23	....
24	....
25	....
26	....
27	....
28	....
29	....
30	....
31	....
Total	129
Mean	9
Max.	11
Min.	6
A. F.	256

Area reported ..... 840 Acres.
Water used ..... 129 A. F.
Per acre ..... .30 A. F.

STATE LINE DITCH.

Owned by estate of John Milhan, et al.

Water diverted from Horse Creek in Section 33-23-58 at the Nebraska-Wyoming State line. The Gilmore and Jackson extension ditches also take water thru this canal. Two headgates have been installed for this canal, one belonging to the State line ditch and one to the Gilmore and Jackson. During the 1920 season only the Gilmore gate was in shape for use, the State line ditch headgate being washed out, and all water used was diverted thru the Jackson and Gilmore headgate.

A rating flume was installed 500 feet below head in 1920 for the Gilmore diversion. Gage height reports made for four weeks. No reports of the Gilmore ditch were made in 1919 by either appropriator.

ACTUAL DISCHARGE MEASUREMENTS, OF STATE LINE DITCH BDG. BELOW HEAD, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-30	Palmer-Woodman	15.00	0.32	.....	4.82	23

ACTUAL DISCHARGE MEASUREMENTS, OF STATE LINE & GILMORE DITCH AT GILMORE RATING FLUME, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-29	T. C. Palmer.....	4.76	2.02	0.70	9.61	9
2	8-18	T. C. Palmer.....	4.20	1.10	0.65	4.64	9
3	9- 9	T. C. Palmer.....	3.37	1.14	0.55	3.83	9

DAILY DISCHARGE, IN SECOND FEET, OF SUBURBAN CANAL, FOR YEAR 1919.

Date	June	July	August	September
1	.....	.....	70.00	46.00
2	.....	.....	66.00	46.00
3	.....	.....	62.00	33.00
4	.....	.....	58.00	6.00
5	.....	.....	54.00	6.00
6	.....	.....	50.00	5.00
7	.....	.....	46.00	4.00
8	.....	.....	70.00	4.00
9	.....	.....	95.00	4.00
10	.....	.....	95.00	11.00
11	.....	.....	81.00	32.00
12	.....	.....	70.00	32.00
13	.....	.....	57.00	32.00
14	.....	.....	33.00	.....
15	.....	.....	12.00	.....
16	.....	.....	12.00	.....
17	.....	.....	32.00	.....
18	.....	.....	46.00	.....
19	.....	.....	48.00	.....
20	.....	.....	50.00	.....
21	.....	.....	54.00	.....
22	.....	.....	56.00	.....
23	.....	.....	59.00	.....
24	.....	.....	63.00	.....
25	.....	.....	67.00	.....
26	.....	.....	70.00	.....
27	.....	.....	57.00	.....
28	.....	.....	46.00	.....
29	.....	.....	46.00	.....
30	.....	.....	57.00	.....
31	.....	.....	57.00	.....
Total	.....	.....	1739.00	261.00
Mean	.....	.....	55.00	20.00
Max.	.....	.....	95.00	46.00
Min.	.....	.....	12.00	4.00
A. F.	2000.00*	3000.00*	3449.00	517.00

Total acre feet 8,966.00
Acres reported 7,806.00
A. F. per acre 1.15
*Estimated.

DAILY DISCHAGE, IN SECOND FEET, OF STATE LINE DITCH AND GILMORE DITCH*, FOR YEAR 1920.

Date	August
1	....
2	15
3	20
4	3
5	5
6	5
7	5
8	6
9	8
10	8
11	11
12	11
13	11
14	11
15	11
16	11
17	8
18	5
19	3
20	5
21	6
22	8
23	11
24	8
25	11
26	8
27	11
28	....
29	....
30	....
31	....
Total	225
Mean	9
Max.	20
Min.	3
A. F.	446

Area reported:
A-407 100 acres—State Line.
A-983 205 acres—Gilmore.
A-994 80 acres—State Line.

Total 385 acres.
Water used 446 A. F.
Per acre 1.15 A. F.
*Joint Ditch.

SUBURBAN CANAL.

Owned by Suburban Irrigation District.

Water diverted from North Platte river, about four miles northwest of Hershey. New reinforced concrete diversion, including wing dam waste and headgates being constructed replacing old wooden headgate and straw dam. Rating flume and automatic gage located one mile down stream from head. Gage heights reported in 1919 and 1920.

ACTUAL DISCHARGE MEASUREMENTS, OF SUBURBAN CANAL AT HEAD, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7-15	Earl North	.....	.....	.....	0.00	10
2	8- 1	Earl North	26.00	2.01	1.20	52.34	10
3	8- 7	Earl North	22.00	2.09	1.00	45.94	10
4	8-11	Earl North	18.00	1.32	0.85	23.85	10
5	8-14	Earl North	18.00	0.89	0.80	16.10	10
6	8-23	Earl North	.....	.....	0.00	0.00	10
7	9- 1	Earl North	20.00	1.72	0.90	34.46	10
8	9-16	Earl North	16.00	1.90	0.90	30.43	10
9	9-20	Earl North	20.00	1.81	0.90	36.30	10

ACTUAL DISCHARGE MEASUREMENTS, OF SUBURBAN CANAL ONE MILE BELOW HEAD, FOR YEAR 1920

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7- 1	G. K. Baumgartner	3.40	0.81	0.20	2.77	10
2	7-12	G. K. Baumgartner	3.40	0.75	0.20	2.57	10
3	7-17	G. K. Baumgartner	3.40	0.63	0.20	2.14	10
4	7-31	G. K. Baumgartner	10.20	1.86	0.55	18.98	10
5	8- 5	G. K. Baumgartner	25.50	2.18	1.50	55.61	10
6	8-16	G. K. Baumgartner	10.20	1.59	0.50	16.20	10
7	8-21	G. K. Baumgartner	6.80	1.43	0.40	9.72	10

ACTUAL DISCHARGE MEASUREMENTS, OF TRINNIER DITCH AT DIVERSION DAM, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-27	W. F. Chaloupka	3.76	1.82	.....	6.84	9
2	8-10	W. F. Chaloupka	4.75	1.82	.....	8.64	9
3	8-13	W. F. Chaloupka	6.16	1.43	0.60	8.84	9
4	8-13	W. F. Chaloupka	5.72	1.42	0.54	8.10	9
5	8-13	W. F. Chaloupka	5.05	1.35	0.45	7.14	9
6	8-13	W. F. Chaloupka	4.13	1.35	0.40	5.69	9
7	9- 5	T. C. Palmer	2.96	1.37	0.15	4.05	23

ACTUAL DISCHARGE MEASUREMENTS, OF TRINNIER DITCH SIX HUNDRED FEET BELOW HEADGATE, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-23	G. K. Baumgartner	4.08	1.85	1.40	7.51	10
2	7- 3	T. C. Palmer	5.05	1.85	1.42	9.30	10
3	7-12	T. C. Palmer	3.16	1.34	0.85	4.23	9
4	8-20	T. C. Palmer	5.09	1.56	0.82	7.94	9
5	8-27	G. K. Baumgartner	4.60	1.67	1.20	7.68	9

DAILY DISCHARGE, IN SECOND FEET, OF TRINNIER DITCH, FOR YEAR 1919.

Date	June	July	August	September
1	.....	7.00	9.00	4.00
2	.....	7.00	9.00	4.00
3	.....	7.00	9.00	4.00
4	.....	7.00	9.00	4.00
5	.....	7.00	9.00	4.00
6	.....	7.00	9.00	4.00
7	.....	7.00	9.00	4.00
8	.....	7.00	9.00	4.00
9	.....	7.00	9.00	4.00
10	.....	7.00	9.00	4.00
11	.....	7.00	9.00	4.00
12	.....	7.00	9.00	4.00
13	.....	7.00	9.00	4.00
14	.....	7.00	7.00	.....
15	.....	7.00	7.00	.....
16	.....	7.00	7.00	.....
17	.....	7.00	5.00	.....
18	.....	7.00	5.00	.....
19	.....	7.00	5.00	.....
20	.....	7.00	5.00	.....
21	.....	7.00	5.00	.....
22	.....	7.00	5.00	.....
23	.....	7.00	5.00	.....
24	.....	7.00	5.00	.....
25	.....	7.00	5.00	.....
26	.....	7.00	5.00	.....
27	7.00	7.00	5.00	.....
28	7.00	7.00	5.00	.....
29	7.00	7.00	5.00	.....
30	7.00	7.00	5.00	.....
31	.....	7.00	4.00	.....
Total	28.00	217.00	212.00	52.00
Mean	7.00	7.00	68.00	4.00
Max.	7.00	7.00	9.00	4.00
Min.	7.00	7.00	4.00	4.00
A. F.	56.00	434.00	421.00	103.00

Total acre feet 1,014.00
Acres reported 65
Acre feet per acre 1.56

DAILY DISCHARGE, IN SECOND FEET, OF TRINNIER DITCH, FOR YEAR 1920.

Day	June	July	August
1	....	9	5
2	....	9	5
3	....	9	6
4	....	9	5
5	....	9	5
6	....	9	5
7	....	9	5
8	....	9	0
9	....	9	0
10	....	9	0
11	....	9	0
12	....	9	0
13	....	0	0
14	....	0	0
15	....	0	1
16	....	0	1
17	....	0	1
18	....	0	1
19	....	0	1
20	....	0	0
21	....	3	3
22	....	3	3
23	9	5	0
24	9	5	0
25	9	5	0
26	9	5	0
27	9	5	0
28	9	0	0
29	9	0	0
30	9	0	0
31	....	0	0
Total	72	138	47
Mean	9	5	2
Minimum	9	9	6
Maximum	9	0	0
Acre Feet	142	270	90

Area reported:

Docket 849	130 acres	Water used	502 A. F.
App. 1551	116 acres	Per acre	2.04 A. F.
Total	246 acres		

TRI-STATE CANAL.

Owned by Farmers Irrigation District.

Diverts water from North Platte river in Section 3, Township 23, Range 58.

Has concrete and steel control gates with needle dam extending across main channel of North Platte river. Has three large steel waste gates and steel headgate at this point. Has large concrete waste and control gates two miles downstream where canal flow is regulated.

Has automatic gage and swinging bridge just below wasteway used for gaging purposes. Gage heights reported in 1919 and 1920. This canal also receives water from Sheep Creek, being diverted from that stream in Section 8, Township 23, Range 57, and received by the canal near the north line of Section 17, Township 23, Range 58.

Not rating flume or automatic gage provided at this point but Cippoletti wier at point of delivery to Tri-State.

No gage records reported for this diversion.

Another wastegate is provided with wasteway to river in Section 18, Township 23, Range 56. No rating flume or automatic gage. Gagings made at wagon bridge across wasteway at southwest corner of Section 18, Township 23, Range 56. Gage heights reported in 1919 and 1920. Tri-State also has wasteway one mile southeast of Mitchell in Section 26, Township 23, Range 56, with waste ditch direct to river. No automatic gage or rating flume. Gaging done at wagon bridge 1,000 feet downstream from wastegate. Gage heights reported in 1919 and 1920.

This canal also takes water from Wet Spotted Tail Creek north of Mitchell in Section 10, Township 23, Range 56. No rating flume, no gage height reports. Gagings made at wagon bridge at north line of Section 10.

Water from Tub Springs is also used by this canal, water being carried from this stream by a short diversion ditch emptying into the Tri-State near the south line of Section 27, Township 23, Range 55. Has no rating flume or automatic gage. Has Cippoletti wier at mouth of diversion ditch but no gage heights reported in 1919 or 1920. Also has a wastegate located near the south line of Section 3, Township 22, Range 51, where water is wasted into Red Willow Creek. No automatic gage or rating flume maintained here. Gagings are made at the wagon bridge on south line of section 10. Gage heights were reported in 1919 and 1920.

ACTUAL DISCHARGE MEASUREMENTS, OF TRI-STATE—TOOHEY WASTE AT GAGING STATION, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-11	T. C. Palmer	32.50	1.49	4.75	48.48	23
2	6-17	T. C. Palmer	.....	.....	.....	0.00	23
3	7- 1	T. C. Palmer	.....	.....	.....	0.00	23
4	9-23	T. C. Palmer	13.50	0.36	4.15	4.83	23

ACTUAL DISCHARGE MEASUREMENTS, OF TRI-STATE MITCHELL WASTE NO. 3 TWO MILE SOUTHEAST OF MITCHELL, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	4- 4	T. C. Palmer	20.10	0.39	.....	7.90	11
2	5-13	T. C. Palmer	51.20	1.06	4.95	54.10	11
3	5-21	T. C. Palmer	45.74	1.22	5.05	56.11	23
4	6-11	T. C. Palmer	101.40	1.52	5.70	154.79	18
5	6-17	T. C. Palmer	.....	.....	.....	0.00	18
6	7- 1	T. C. Palmer	.....	.....	.....	0.00	23
7	9-23	T. C. Palmer	38.40	0.59	4.60	26.80	23
8	10- 1	T. C. Palmer	33.92	0.77	4.60	25.00	23
9	10- 7	T. C. Palmer	32.64	0.71	4.55	23.05	9
10	11- 7	T. C. Palmer	29.67	0.72	4.55	21.30	23

ACTUAL DISCHARGE MEASUREMENTS, OF TRI-STATE CANAL AT GAGING STATION NEAR RIVER DIVERSION, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-13	T. C. Palmer	155.40	2.72	1.90	422.70	11
2	5-21	T. C. Palmer	239.70	3.08	2.82	736.20	18
3	5-29	T. C. Palmer	352.60	3.61	3.95	1272.50	18
4	6-11	T. C. Palmer	275.20	3.56	3.30	980.70	18
5	6-18	T. C. Palmer	300.70	3.49	3.75	1049.80	18
6	6-24	T. C. Palmer	298.80	3.57	3.60	1066.80	18
7	7- 1	T. C. Palmer	337.50	3.69	4.00	1247.20	18
8	7-22	Woodman-Palmer	279.20	3.57	3.50	997.90	18
9	6-10	John K. Rohrer	.....	.....	3.40	939.00	....
10	7-12	John K. Rohrer	.....	.....	4.00	1141.00	....
11	7-29	T. C. Palmer	305.30	3.53	3.60	1078.60	18
12	8- 7	T. C. Palmer	255.90	3.35	3.15	856.10	18
13	8-14	T. C. Palmer	286.50	3.48	3.50	996.50	18
14	8-20	T. C. Palmer	236.00	3.45	2.98	815.70	18
15	8-27	T. C. Palmer	249.90	3.18	2.87	795.20	18
16	9- 1	T. C. Palmer	259.90	2.99	2.87	778.80	18
17	9-10	T. C. Palmer	232.70	2.73	2.60	687.10	18
18	9-23	T. C. Palmer	.....	.....	.....	0.00	....

DAILY DISCHARGE, IN SECOND FEET, OF TRI-STATE CANAL FROM RIVER, FOR YEAR 1919.

Date	May	June	July	August	September
1	.....	1285.00	1245.00	1070.00	700.00
2	.....	1245.00	1245.00	1070.00	745.00
3	.....	1200.00	1245.00	1070.00	745.00
4	.....	1200.00	1245.00	1070.00	780.00
5	.....	940.00	1245.00	1070.00	760.00
6	.....	940.00	1245.00	895.00	745.00
7	.....	940.00	1245.00	875.00	725.00
8	.....	940.00	1245.00	875.00	720.00
9	.....	940.00	1245.00	850.00	635.00
10	.....	940.00	1245.00	940.00	635.00
11	285.00	940.00	1245.00	900.00	635.00
12	1150.00	940.00	1245.00	920.00	.....
13	1255.00	940.00	1175.00	1000.00	.....
14	1150.00	940.00	1245.00	1025.00	.....
15	990.00	980.00	1245.00	1025.00	.....
16	745.00	1025.00	1130.00	940.00	.....
17	1255.00	1110.00	1090.00	940.00	.....
18	835.00	1110.00	1070.00	940.00	.....
19	1025.00	1110.00	1070.00	940.00	.....
20	1000.00	765.00	1070.00	800.00	.....
21	1000.00	725.00	980.00	810.00	.....
22	950.00	1025.00	960.00	810.00	.....
23	950.00	1170.00	915.00	810.00	.....
24	915.00	1070.00	890.00	745.00	.....
25	1025.00	1110.00	940.00	745.00	.....
26	1025.00	1175.00	1045.00	745.00	.....
27	1070.00	1200.00	1045.00	745.00	.....
28	1175.00	1200.00	1070.00	745.00	.....
29	1245.00	1200.00	1070.00	745.00	.....
30	1245.00	1220.00	1070.00	725.00	.....
31	1245.00	.....	1070.00	700.00	.....
Total	21535.00	31465.00	35090.00	27540.00	7825.00
Mean	1025.00	1049.00	1132.00	888.00	711.00
Maximum	1255.00	1285.00	1245.00	1070.00	780.00
Minimum	285.00	725.00	890.00	700.00	635.00
Acre Ft.	42714.00	62410.00	69601.00	54625.00	15521.00

Total acre feet from river, 244,871.

ACTUAL DISCHARGE MEASUREMENTS, FOR TRI-STATE CANAL FROM TUB SPRINGS, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	9- 2	T. C. Palmer	11.40	1.87	1.00	21.35	23
2	9- 9	T. C. Palmer	8.00	2.54	.....	20.34	23

DAILY DISCHARGE, IN SECOND FEET, OF TRI-STATE CANAL FROM TUB SPRINGS, FOR YEAR 1919.

Date	May	June	July	August	September
1	.....	.....	.....	.....	.....
2	.....	.....	.....	.....	.....
3	.....	.....	.....	.....	.....
4	.....	.....	.....	.....	.....
5	.....	.....	.....	.....	.....
6	.....	.....	.....	.....	.....
7	.....	.....	.....	.....	.....
8	.....	.....	.....	.....	.....
9	.....	.....	.....	.....	.....
10	.....	.....	.....	.....	.....
11	.....	.....	.....	.....	.....
12	.....	.....	.....	.....	.....
13	.....	.....	.....	.....	.....
14	.....	.....	.....	.....	.....
15	.....	.....	.....	.....	.....
16	.....	.....	.....	.....	.....
17	.....	.....	.....	.....	.....
18	.....	.....	.....	.....	.....
19	.....	.....	.....	.....	.....
20	.....	.....	.....	.....	.....
21	.....	.....	.....	.....	.....
22	.....	.....	.....	.....	.....
23	.....	.....	.....	.....	.....
24	.....	.....	.....	.....	.....
25	.....	.....	.....	.....	.....
26	.....	.....	.....	.....	.....
27	.....	.....	.....	.....	.....
28	.....	.....	.....	.....	.....
29	.....	.....	.....	.....	.....
30	.....	.....	.....	.....	.....
31	.....	.....	.....	.....	.....
Total	.....	.....	.....	.....	.....
Mean	.....	.....	.....	.....	.....
Maximum	.....	.....	.....	.....	.....
Minimum	.....	.....	.....	.....	.....
Acre Ft.	217.00	725.00	970.00	1176.00	778.00

Total acre feet, 3,866.

ACTUAL DISCHARGE MEASUREMENTS, OF TRI-STATE WASTE INTO RED WILLOW, 100 YARDS BELOW TRI-STATE WASTE, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-16	W. F. Chaloupka.....	27.75	3.51	5.20	97.36	9
2	5-23	T. C. Palmer.....	33.40	2.94	5.70	98.40	23
3	6- 3	T. C. Palmer.....	44.10	3.86	5.90	170.03	23
4	7-10	T. C. Palmer.....	20.45	2.76	.....	56.41	23
5	7-19	T. C. Palmer.....	13.45	1.61	.....	21.65	23
6	9- 8	T. C. Palmer.....	11.60	1.59	.....	18.54	23

DAILY DISCHARGE, IN SECOND FEET, OF TRI-STATE WASTE INTO RED WILLOW, FOR YEAR 1919.

Date	May	June	July	August	September
1	.....	85.00	00.00	45.00	40.00
2	.....	117.00	00.00	50.00	16.00
3	.....	138.00	16.00	165.00	00.00
4	.....	162.00	37.00	120.00	00.00
5	.....	150.00	45.00	77.00	00.00
6	.....	62.00	51.00	77.00	00.00
7	.....	67.00	66.00	8.00	.....
8	.....	37.00	64.00	00.00	00.00
9	.....	37.00	45.00	8.00	00.00
10	.....	34.00	45.00	00.00	00.00
11	.....	32.00	82.00	00.00	00.00
12	.....	6.00	80.00	00.00	00.00
13	60.00	13.00	90.00	00.00	00.00
14	100.00	24.00	90.00	00.00	00.00
15	126.00	16.00	70.00	00.00	00.00
16	61.00	00.00	60.00	00.00	00.00
17	32.00	8.00	29.00	00.00	00.00
18	33.00	00.00	45.00	00.00	00.00
19	39.00	00.00	24.00	00.00	00.00
20	63.00	00.00	53.00	00.00	00.00
21	83.00	00.00	53.00	00.00	00.00
22	112.00	23.00	43.00	00.00	00.00
23	70.00	43.00	00.00	00.00	.....
24	53.00	21.00	00.00	21.00	.....
25	00.00	8.00	00.00	00.00	.....
26	13.00	31.00	00.00	00.00	.....
27	00.00	21.00	00.00	00.00	.....
28	13.00	00.00	34.00	00.00	.....
29	23.00	00.00	21.00	00.00	.....
30	30.00	00.00	29.00	00.00	.....
31	48.00	.....	29.00	00.00	.....
Total	959.00	1154.00	1191.00	571.00	56.00
Mean	50.00	38.50	37.70	18.60	2.50
Maximum	126.00	162.00	90.00	165.00	40.00
Minimum	00.00	00.00	00.00	00.00	00.00
Acre Ft.	1902.00	2289.00	2362.00	1132.00	111.00

Total Acre Feet, 7796.00.

DAILY DISCHARGE, IN SECOND FEET, OF TRI-STATE CANAL INTO MITCHELL WASTE (TO RIVER), FOR YEAR 1919.

Day	May	June	July
1	.....	155.00	00.00
2	.....	155.00	00.00
3	.....	155.00	00.00
4	.....	155.00	55.00
5	.....	155.00	55.00
6	.....	155.00	110.00
7	.....	155.00	110.00
8	.....	155.00	110.00
9	.....	155.00	110.00
10	.....	155.00	42.00
11	.....	155.00	42.00
12	.....	155.00	42.00
13	54.00	45.00	42.00
14	54.00	45.00	42.00
15	55.00	45.00	42.00
16	00.00	00.00	42.00
17	00.00	00.00	00.00
18	00.00	175.00	00.00
19	00.00	00.00	00.00
20	56.00	175.00	00.00
21	56.00	00.00	00.00
22	56.00	00.00	00.00
23	56.00	00.00	00.00
24	56.00	00.00	00.00
25	56.00	00.00	00.00
26	00.00	00.00	00.00
27	00.00	00.00	00.00
28	00.00	00.00	00.00
29	00.00	00.00	00.00
30	00.00	00.00	00.00
31	00.00	00.00	00.00
Total	499.00	2345.00	844.00
Mean	26.00	78.20	27.20
Maximum	56.00	175.00	110.00
Minimum	00.00	00.00	00.00
Acre Feet	989.00	4651.00	1674.00

Total acre feet, 7314.

DAILY DISCHARGE, IN SECOND FEET, OF TRI-STATE CANAL FROM SHEEP CREEK, FOR YEAR 1919.

Date	May	June	July	August	September
1	.....	19.00	35.00	47.00	57.00
2	.....	19.00	35.00	47.00	56.00
3	.....	20.00	36.00	48.00	53.00
4	.....	20.00	37.00	48.00	52.00
5	.....	21.00	37.00	49.00	51.00
6	.....	21.00	38.00	50.00	49.00
7	.....	22.00	39.00	50.00	47.00
8	.....	22.00	40.00	51.00	46.00
9	.....	23.00	41.00	51.00	44.00
10	.....	23.00	42.00	52.00	42.00
11	.....	24.00	42.00	52.00	42.00
12	.....	24.00	42.00	53.00	42.00
13	.....	25.00	43.00	54.00	.....
14	.....	25.00	44.00	54.00	.....
15	.....	25.00	45.00	55.00	.....
16	.....	26.00	46.00	56.00	.....
17	.....	26.00	46.00	56.00	.....
18	.....	27.00	47.00	57.00	.....
19	.....	27.00	48.00	57.00	.....
20	.....	28.00	49.00	58.00	.....
21	14.00	28.00	49.00	59.00	.....
22	14.00	28.00	50.00	59.00	.....
23	15.00	29.00	51.00	60.00	.....
24	15.00	29.00	50.00	60.00	.....
25	16.00	30.00	49.00	61.00	.....
26	17.00	31.00	48.00	62.00	.....
27	17.00	32.00	47.00	62.00	.....
28	18.00	33.00	46.00	61.00	.....
29	18.00	34.00	45.00	60.00	.....
30	18.00	34.00	45.00	59.00	.....
31	19.00	.....	46.00	58.00	.....
Total	181.00	775.00	1353.00	1706.00	581.00
Mean	16.50	25.80	43.80	55.00	48.40
Maximum	19.00	34.00	51.00	62.00	57.00
Minimum	14.00	19.00	35.00	47.00	42.00
Acre Ft.	359.00	1537.00	2694.00	3384.00	1152.00

Total acre feet 9126.00.

DAILY DISCHARGE, IN SECOND FEET, OF TRI-STATE CANAL FROM WET SPOTTED TAIL, FOR YEAR 1919.

Date	May	June	July	August	September
1	.....	10.00	12.00	16.00	18.00
2	.....	10.00	12.00	16.00	18.00
3	.....	10.00	12.00	16.00	19.00
4	.....	10.00	12.00	16.00	19.00
5	.....	10.00	12.00	16.00	20.00
6	.....	10.00	13.00	16.00	20.00
7	.....	10.00	13.00	16.00	20.00
8	.....	10.00	13.00	16.00	21.00
9	.....	10.00	13.00	16.00	21.00
10	.....	10.00	13.00	16.00	21.00
11	.....	10.00	14.00	15.00	22.00
12	.....	10.00	14.00	15.00	22.00
13	.....	10.00	14.00	15.00	.....
14	.....	10.00	14.00	15.00	.....
15	.....	10.00	14.00	15.00	.....
16	.....	10.00	15.00	15.00	.....
17	.....	10.00	15.00	15.00	.....
18	.....	10.00	15.00	15.00	.....
19	.....	10.00	15.00	15.00	.....
20	.....	10.00	15.00	15.00	.....
21	.....	11.00	15.00	15.00	.....
22	.....	11.00	15.00	15.00	.....
23	.....	11.00	15.00	15.00	.....
24	.....	11.00	15.00	16.00	.....
25	10.00	11.00	16.00	16.00	.....
26	10.00	11.00	16.00	16.00	.....
27	10.00	11.00	16.00	16.00	.....
28	10.00	11.00	16.00	17.00	.....
29	10.00	11.00	16.00	17.00	.....
30	10.00	11.00	16.00	17.00	.....
31	10.00	.....	16.00	18.00	.....
Total	80.00	310.00	442.00	488.00	241.00
Mean	10.00	10.40	14.20	15.70	20.80
Maximum	10.00	11.00	16.00	18.00	22.00
Minimum	10.00	10.00	12.00	15.00	18.00
Acre Ft.	159.00	615.00	877.00	968.00	478.00

Total acre feet 3,097.00.

ACTUAL DISCHARGE MEASUREMENTS, OF TRI-STATE CANAL AT RATING STATION, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-10	T. C. Palmer	229.90	3.31	3.10	759.68	18
2	6-18	T. C. Palmer	309.60	3.82	3.90	1183.16	18
3	6-29	T. C. Palmer	222.20	2.66	2.40	591.40	18
4	7-13	J. K. Rohrer	.....	.....	3.60	919.00	....
5	7-14	T. C. Palmer	303.25	3.53	3.60	1068.04	18
6	7-29	T. C. Palmer	307.60	3.43	3.65	1055.66	18
7	8-18	T. C. Palmer	326.90	2.99	3.70	977.16	18
8	8-27	T. C. Palmer	294.20	3.34	3.50	982.00	18
9	9- 9	T. C. Palmer	267.30	2.84	3.00	758.70	18
10	9-24	J. K. Rohrer	.....	.....	1.90	405.00	....

DAILY DISCHARGE, IN SECOND FEET, OF TRI-STATE CANAL, FOR SEASON OF 1920.

Date	May	June	July	August	September
1	.....	530	720	1080	1000
2	.....	530	790	630	980
3	.....	530	835	630	850
4	.....	530	910	790	870
5	.....	530	970	790	850
6	.....	580	1010	790	850
7	.....	735	1030	790	790
8	.....	735	1030	790	790
9	.....	810	1030	790	790
10	.....	835	1010	790	810
11	.....	850	1030	790	790
12	.....	870	1030	790	790
13	.....	950	1030	790	790
14	.....	1030	1030	790	790
15	.....	1030	1030	835	780
16	.....	1060	1030	850	740
17	.....	1110	1030	910	700
18	.....	1110	1030	1010	670
19	.....	1150	980	1110	700
20	.....	1060	1010	1110	670
21	.....	1050	1030	1110	680
22	.....	790	1030	1110	480
23	.....	530	1030	1110	410
24	.....	550	1030	1130	230
25	.....	560	1050	1180	255
26	.....	560	1080	1130	280
27	.....	560	1080	1010	280
28	460	560	1080	1110	280
29	530	560	1080	1110	280
30	530	610	1080	1110	.....
31	530	.....	1080	1110	.....
Total	2050	22895	31215	29075	19175
A. F. div'rt'd from River	4066	45412	62915	58670	39033
From Sp't'd Tail	.....	391	466	853	1069
From Sheep Ck.	1353	2251	3033	3612	3110
Tot. Amt. diverted	5419	48054	66414	63135	43212
Amount Wasted	742	8043	8848	6418	12773
Amt. used by (*)	0	75	855	410	807
D'd't from Tot. D'v'd	742	8118	9703	6828	13580
Amt. used by Tri-St.	4677	39936	56711	56307	29632

Acre feet used.....187,263 Per acre ..... 2.92 A. F.
Area irrigated ..... 63,994 acres (*)Northport Irrigation District.

DAILY DISCHARGE, IN SECOND FEET, OF TRI-STATE RED WILLOW WASTE, FOR YEAR 1920.

Date	May	June	July	August	September
1	....	91	25	....	26
2	....	90	15	40	10
3	....	89	5	40	30
4	....	88	5	40	30
5	....	87	5	168	50
6	....	86	24	115	80
7	....	85	5	90	64
8	....	115	50	100	10
9	....	115	90	110	5
10	....	80	80	40	5
11	....	80	65	23	8
12	....	80	108	18	0
13	....	80	100	14	0
14	....	80	65	12	0
15	....	80	45	10	0
16	....	80	26	10	0
17	....	80	26	8	0
18	....	168	31	6	0
19	....	186	36	4	0
20	....	124	40	2	0
21	....	160	45	10	0
22	....	150	30	26	0
23	....	75	30	18	0
24	....	30	37	17	0
25	....	75	45	16	0
26	....	75	100	15	0
27	....	65	115	14	0
28	95	55	115	13	0
29	94	45	115	12	0
30	93	35	50	10	0
31	92	....	50	75	0
Total	374	2729	1578	1076	318
Mean	93	91	51	35	11
Max.	95	186	115	168	80
Min.	92	35	5	2	0
A. F.	742	5413	3130	2134	631

Deducted from amount diverted by Tri-State Canal 12,050 A. F.

DAILY DISCHARGE, IN SECOND FEET, OF TRI-STATE MITCHELL WASTE, FOR YEAR 1920.

Date	June	July	August	September
1	0	0	0	280
2	0	0	0	280
3	0	0	0	280
4	0	0	0	280
5	0	0	184	280
6	115	0	0	280
7	48	0	0	280
8	48	0	180	280
9	65	4	180	280
10	90	98	180	280
11	80	90	114	280
12	218	90	114	280
13	106	90	64	280
14	160	90	170	280
15	160	160	26	280
16	73	90	26	280
17	73	123	26	265
18	90	115	26	265
19	0	115	18	265
20	0	115	18	265
21	0	115	18	265
22	0	115	18	265
23	0	73	18	0
24	0	106	18	0
25	0	148	18	0
26	0	148	18	0
27	0	160	26	0
28	0	208	0	52
29	0	216	210	0
30	0	184	210	0
31	....	230	280	...
Total	1326	2883	2160	6122
Mean	44	93	70	204
Max.	218	230	280	280
Min.	0	0	0	0
A. F.	2630	5718	4284	12142

Deducted from amount diverted by Tri-State Canal 24,774 A. F.

UNION DITCH.

Owned by Union Irrigation and Water Power Co.

Diverts water from Blue Creek in Section 18, Township 16, Range 42. Has stone and earth dam with concrete headgate. Has concrete wastegate about 200 feet below where gagings were made in 1920. Rating flume 500 feet below head in 1919 and gage heights were reported for 1919 by State Water Commissioner. No automatic gage and no gage heights reported in 1920.

ACTUAL DISCHARGE MEASUREMENTS, UNION CANAL AT RATING FLUME, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-29	Earl North	4.35	3.11	0.90	13.52	10
2	6-13	Earl North	3.38	3.49	1.00	11.81	10
3	6-20	Earl North	3.60	3.96	1.00	14.26	10
4	6-20	Earl North	4.57	4.20	1.15	19.10	10
5	7- 8	Earl North	3.78	3.81	1.00	14.39	10
6	7-15	Earl North	3.26	2.62	0.85	8.53	10
7	8- 5	Palmer-Hartman	3.00	3.94	0.88	11.82	23
8	9-15	Earl North	3.97	4.03	0.90	15.98	10
9	9-23	Earl North	2.98	3.77	0.80	11.24	10

ACTUAL DISCHARGE MEASUREMENTS, OF UNION DITCH AT RATING FLUME, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	7- 9	G. K. Baumgartner	16.00	0.73	1.61	11.67	10
2	7-20	G. K. Baumgartner	20.20	1.30	2.10	26.32	10
3	7-27	G. K. Baumgartner	13.40	0.78	1.55	10.42	10
4	8- 7	G. K. Baumgartner	18.00	1.02	1.80	18.36	10
5	8-12	G. K. Baumgartner	17.80	0.73	1.95	12.98	10
6	8-24	G. K. Baumgartner	9.50	0.44	1.30	4.23	10
7	9- 2	Palmer-Willis	9.57	0.46	1.25	4.40	10

DAILY DISCHARGE, IN SECOND FEET, OF UNION DITCH, FOR YEAR 1919.

Date	May	June	July	August	September	October
1	.....	11.00	11.00	15.00	12.00	8.00
2	.....	11.00	11.00	15.00	12.00	6.00
3	.....	13.00	11.00	15.00	12.00	6.00
4	.....	13.00	11.00	12.00	12.00	.....
5	.....	11.00	11.00	12.00	12.00	.....
6	.....	14.00	14.00	12.00	12.00	.....
7	.....	14.00	14.00	12.00	16.00	.....
8	.....	14.00	14.00	12.00	14.00	.....
9	.....	14.00	14.00	12.00	14.00	.....
10	.....	15.00	15.00	13.00	14.00	.....
11	.....	15.00	15.00	13.00	14.00	.....
12	.....	15.00	15.00	13.00	13.00	.....
13	.....	15.00	15.00	13.00	13.00	.....
14	.....	11.00	11.00	13.00	14.00	.....
15	.....	11.00	11.00	13.00	14.00	.....
16	.....	11.00	11.00	14.00	14.00	.....
17	.....	12.00	12.00	.....	14.00	.....
18	.....	11.00	12.00	.....	14.00	.....
19	.....	12.00	12.00	.....	16.00	.....
20	.....	12.00	12.00	.....	15.00	.....
21	.....	12.00	12.00	.....	16.00	.....
22	19.00	11.00	11.00	.....	15.00	.....
23	18.00	11.00	11.00	.....	15.00	.....
24	18.00	18.00	13.00	.....	15.00	.....
25	19.00	18.00	16.00	.....	14.00	.....
26	18.00	18.00	13.00	.....	14.00	.....
27	15.00	15.00	11.00	.....	14.00	.....
28	16.00	16.00	11.00	.....	14.00	.....
29	13.00	11.00	11.00	11.00	7.00	.....
30	11.00	11.00	13.00	11.00	8.00	.....
31	14.00	.....	15.00	11.00	.....	.....
Total	161.00	396.00	389.00	242.00	417.00	20.00
Mean	16.10	13.20	12.50	12.70	13.90	6.30
Max.	19.00	18.00	16.00	15.00	16.00	8.00
Min.	11.00	11.00	11.00	12.00	7.00	6.00
A. F.	319.00	785.00	772.00	480.00	827.00	39.00

Total acre feet 3222.

WESTERN IRRIGATION DITCH.

Owned by Western Irrigation District.

Diverts water from South Platte River in Section 29, Township 13, Range 41, ten miles southwest of Big Springs. Has good pile and frame diversion works with earth dam. Has concrete and steel wasteway one-half mile from head. Has automatic gage 200 feet below wasteway. No rating flume. Gaging done at wagon bridge 50 feet below wasteway. Gage height records furnished in 1919 and 1920.

ACTUAL DISCHARGE MEASUREMENTS, OF WESTERN IRRIGATION CANAL AT RATING FLUME, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-29	Earl North	47.60	0.76	0.80	36.13	10
2	6-17	Earl North	46.95	0.79	0.90	36.93	10
3	7-12	Earl North	.....	.....	.....	0.00	10
4	8-25	Earl North	.....	.....	.....	0.00	10
5	9- 9	Earl North	49.50	1.91	1.35	94.53	10
6	10-11	T. C. Palmer	99.70	2.07	2.15	206.85	10

ACTUAL DISCHARGE MEASUREMENTS, OF WESTERN IRRIGATION CANAL AT BRIDGE ONE-HALF MILE BELOW HEAD, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-13	Baumgartner-Palmer	49.10	0.86	0.65	42.36	10
2	5-23	G. K. Baumgartner	41.80	0.89	0.70	37.51	10
3	6- 9	G. K. Baumgartner	141.85	0.66	3.40	93.44	10
4	6-26	G. K. Baumgartner	65.30	1.24	1.00	81.32	10
5	7-10	G. K. Baumgartner	142.50	0.40	3.30	57.08	10
6	7-30	G. K. Baumgartner	42.95	0.54	0.60	23.38	10
7	8- 6	Palmer-Willis	49.80	0.91	0.79	45.26	10

DAILY DISCHARGE, IN SECOND FEET, OF WESTERN IRRIGATION DISTRICT CANAL, FOR YEAR 1919.

Date	May	June	July	August	September	October
1	.....	24.00	7.00	.....	7.00	1.00
2	.....	24.00	7.00	.....	7.00	5.00
3	.....	30.00	7.00	.....	102.00	1.00
4	.....	35.00	7.00	.....	75.00	17.00
5	.....	48.00	7.00	.....	48.00	17.00
6	195.00	47.00	7.00	.....	48.00	17.00
7	155.00	46.00	7.00	.....	60.00	17.00
8	142.00	45.00	7.00	.....	60.00	17.00
9	128.00	45.00	.....	.....	95.00	17.00
10	15.00	45.00	.....	.....	81.00	17.00
11	18.00	44.00	.....	.....	75.00	206.00
12	21.00	43.00	.....	.....	68.00	155.00
13	24.00	42.00	.....	.....	88.00	128.00
14	27.00	41.00	.....	.....	88.00	95.00
15	30.00	40.00	.....	.....	80.00	88.00
16	33.00	39.00	.....	.....	75.00	60.00
17	36.00	38.00	.....	.....	75.00	43.00
18	39.00	24.00	.....	.....	81.00	55.00
19	42.00	24.00	.....	.....	75.00	75.00
20	45.00	24.00	.....	.....	81.00	81.00
21	48.00	24.00	.....	.....	88.00	81.00
22	38.00	24.00	.....	.....	75.00	76.00
23	36.00	19.00	.....	.....	37.00	76.00
24	34.00	19.00	.....	.....	22.00	81.00
25	32.00	15.00	.....	.....	17.00	55.00
26	30.00	15.00	.....	.....	15.00	55.00
27	30.00	19.00	.....	.....	12.00	48.00
28	30.00	15.00	.....	.....	9.00	48.00
29	30.00	15.00	.....	.....	7.00	48.00
30	24.00	15.00	.....	.....	5.00	47.00
31	24.00	.....	.....	7.00	.....	48.00
Total	1306.00	928.00	56.00	7.00	1536.00	1775.00
Mean	50.20	35.60	7.00	7.00	51.20	57.20
Max.	195.00	48.00	7.00	7.00	102.00	206.00
Min.	15.00	15.00	7.00	7.00	5.00	1.00
A. F.	2590.00	1841.00	111.00	14.00	3047.00	3521.00

Total acre feet..... 11,124
Acres reported..... 14,311
A. F. per acre..... .78

DAILY DISCHARGE, IN SECOND FEET, OF WESTERN IRRIGATION CANAL, FOR YEAR 1920.

Date	May	June	July	August	September	October
1	....	42	50	25	60	140
2	....	81	80	60	42	140
3	....	81	65	66	50	140
4	....	81	81	50	42	140
5	....	25	265	35	35	133
6	....	35	150	50	50	140
7	....	26	150	66	60	165
8	....	70	150	66	60	172
9	20	70	200	66	60	230
10	25	45	125	66	42	230
11	50	35	57	50	42	240
12	20	35	35	35	42	222
13	140	60	35	45	45	203
14	75	30	42	150	45	230
15	62	25	42	125	45	255
16	35	25	50	81	45	290
17	20	35	50	85	45	290
18	30	150	42	81	45	285
19	35	290	50	42	50	290
20	30	195	140	25	50	280
21	60	93	140	25	50	285
22	50	50	125	25	50	260
23	35	60	30	25	66	255
24	35	75	25	25	50	255
25	50	66	25	25	66	260
26	35	81	25	25	66	245
27	115	115	25	35	50	255
28	35	65	30	65	50	40
29	35	65	25	81	50	150
30	50	65	25	81	81	200
31	50	....	25	60	....	.....
Total	1092	2171	2324	1741	1534	6420
Mean	47	72	75	56	51	214
Max.	140	290	265	150	81	290
Min.	20	25	25	25	35	40
A. F.	2166	4306	4610	3453	3042	12734

Area reported ..... 14,311 Acres.
Water used ..... 30,311 A. F.
Per acre ..... 2.12 A. F.

WINTERS CREEK CANAL.

Owned by Winters Creek Irrigation Co.

Diverts water from North Platte river in Section 17, Township 22, Range 55. Has wier dam for diversion and extension diversion works. Has rating flume 300 feet below head. No automatic gage. Gage heights were reported in 1919 and 1920.

Winters Creek Canal also takes water from Winters Creek thru the use of a check placed in the creek where it is crossed by the canal near the center of Section 19, Township 22, Range 53. No method of gaging the water taken from the creek is provided for. Amount of water taken is arrived at by gaging creek above and below canal.

ACTUAL DISCHARGE MEASUREMENTS, OF WINTERS CREEK CANAL FROM WINTERS CREEK, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-20	.....	.....	.....	.....	7.80	....
2	5-28	.....	.....	.....	.....	35.07	....
3	6-10	.....	.....	.....	.....	40.53	....
4	6-25	.....	.....	.....	.....	49.40	....
5	7- 1	.....	.....	.....	.....	63.47	....
6	7-29	.....	.....	.....	.....	55.19	....
7	8-22	.....	.....	.....	.....	72.79	....
8	8-25	.....	.....	.....	.....	48.34	....
9	8-26	.....	.....	.....	.....	40.13	....
10	9- 3	.....	.....	.....	.....	24.79	....
11	9- 8	.....	.....	.....	.....	38.44	....

ACTUAL DISCHARGE MEASUREMENTS, OF WINTERS CREEK CANAL FROM NORTH PLATTE RIVER, AT RATING FLUME, FOR YEAR 1919.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	5-21	T. C. Palmer	20.80	1.19	0.83	24.90	23
2	5-28	T. C. Palmer	27.40	1.16	1.00	31.90	23
3	6-11	T. C. Palmer	28.68	1.04	0.90	29.70	23
4	6-17	T. C. Palmer	19.20	1.32	0.90	25.32	23
5	6-25	T. C. Palmer	17.10	1.09	0.80	18.60	23
6	7- 1	T. C. Palmer	18.30	1.22	0.90	22.43	23
7	7-24	T. C. Palmer	16.00	1.16	0.85	18.65	23
8	7-29	T. C. Palmer	22.05	1.28	1.00	28.27	23
9	8- 8	T. C. Palmer	24.30	1.36	1.10	33.14	23
10	8-21	T. C. Palmer	20.60	1.13	0.90	23.20	23
11	8-27	T. C. Palmer	21.70	1.30	0.90	28.27	23
12	9- 9	T. C. Palmer	24.10	1.31	1.00	31.61	23

ACTUAL DISCHARGE MEASUREMENTS, OF WINTERS CREEK CANAL AT RATING FLUME, FOR YEAR 1920.

No.	Date	Made by	Area of Section	Mean Velocity	Gage Height	Discharge Sec. Ft.	Meter No.
1	6-10	T. C. Palmer	17.50	1.29	0.85	22.61	29
2	6-18	T. C. Palmer	35.95	1.62	1.40	58.25	29
3	6-29	T. C. Palmer	19.05	1.43	0.95	27.27	9
4	7-28	T. C. Palmer	15.10	1.21	1.04	18.31	9
5	8-17	T. C. Palmer	12.75	0.98	0.95	12.51	9
6	8-26	T. C. Palmer	21.05	1.49	1.08	31.40	9
7	9-10	T. C. Palmer	11.25	0.99	0.80	11.10	....

DAILY DISCHARGE, IN SECOND FEET, OF WINTERS CREEK CANAL FROM RIVER, FOR YEAR 1919.

Date	May	June	July	August	September
1	.....	29.00	26.00	30.00	27.00
2	.....	29.00	26.00	31.00	27.00
3	.....	29.00	26.00	31.00	27.00
4	.....	31.00	25.00	31.00	28.00
5	.....	31.00	25.00	30.00	28.00
6	.....	29.00	25.00	32.00	28.00
7	.....	30.00	25.00	31.00	29.00
8	.....	28.00	24.00	31.00	29.00
9	.....	27.00	24.00	00.00	30.00
10	.....	28.00	24.00	00.00	30.00
11	.....	29.00	24.00	00.00	30.00
12	.....	28.00	23.00	30.00	30.00
13	.....	28.00	23.00	30.00	.....
14	.....	30.00	23.00	30.00	.....
15	.....	29.00	23.00	30.00	.....
16	.....	31.00	22.00	30.00	.....
17	.....	27.00	22.00	30.00	.....
18	.....	39.00	22.00	30.00	.....
19	.....	34.00	22.00	30.00	.....
20	.....	32.00	22.00	30.00	.....
21	26.00	30.00	21.00	30.00	.....
22	27.00	28.00	21.00	30.00	.....
23	28.00	22.00	21.00	26.00	.....
24	28.00	22.00	20.00	26.00	.....
25	31.00	22.00	21.00	26.00	.....
26	32.00	22.00	25.00	26.00	.....
27	28.00	22.00	28.00	26.00	.....
28	31.00	30.00	29.00	26.00	.....
29	31.00	28.00	30.00	26.00	.....
30	27.00	27.00	30.00	26.00	.....
31	29.00	.....	30.00	26.00	.....
Total	318.00	851.00	752.00	811.00	343.00
Mean	28.90	28.30	24.20	26.00	28.50
Max.	32.00	39.00	30.00	32.00	30.00
Min.	26.00	22.00	21.00	00.00	27.00
A. F.	631.00	1688.00	1492.00	1609.00	680.00

Total acre feet from river..... 6,100
Total acre feet from Winters creek.... 10,959

Total acre feet..... 17,059
Acres reported..... 3,242
A. F. per acre..... 5.26

DAILY DISCHARGE, IN SECOND FEET, OF WINTERS CREEK CANAL FROM WINTERS CREEK, FOR YEAR 1919.

Date	May	June	July	August	September
1	.....	36.00	64.00	56.00	27.00
2	.....	36.00	63.00	57.00	26.00
3	.....	37.00	63.00	58.00	25.00
4	.....	37.00	63.00	59.00	26.00
5	.....	38.00	62.00	60.00	28.00
6	.....	38.00	61.00	60.00	32.00
7	.....	38.00	61.00	61.00	34.00
8	.....	39.00	61.00	62.00	37.00
9	.....	39.00	61.00	63.00	39.00
10	.....	40.00	61.00	64.00	39.00
11	.....	40.00	60.00	64.00	39.00
12	.....	41.00	60.00	65.00	39.00
13	.....	41.00	60.00	67.00	.....
14	.....	42.00	60.00	67.00	.....
15	.....	42.00	60.00	68.00	.....
16	.....	43.00	58.00	69.00	.....
17	.....	43.00	58.00	70.00	.....
18	.....	44.00	58.00	71.00	.....
19	.....	45.00	58.00	72.00	.....
20	.....	46.00	58.00	73.00	.....
21	.....	46.00	57.00	75.00	.....
22	.....	47.00	57.00	70.00	.....
23	.....	48.00	57.00	65.00	.....
24	.....	49.00	57.00	55.00	.....
25	.....	51.00	56.00	43.00	.....
26	.....	52.00	55.00	40.00	.....
27	35.00	55.00	55.00	37.00	.....
28	35.00	60.00	55.00	35.00	.....
29	35.00	62.00	55.00	32.00	.....
30	35.00	63.00	55.00	30.00	.....
31	36.00	.....	56.00	29.00	.....
Total	176.00	1338.00	1825.00	1795.00	391.00
Mean	35.00	44.10	59.00	58.00	32.60
Max.	36.00	63.00	64.00	73.00	39.00
Min.	35.00	36.00	55.00	29.00	25.00
A. F.	349.00	2654.00	3620.00	3560.00	776.00

Total acres feet 10,959.

DAILY DISCHARGE, IN SECOND FEET, OF WINTERS CREEK CANAL FROM RIVER, FOR YEAR 1920.

Day	June	July	August
1	.....	.....	0
2	.....	.....	0
3	.....	.....	0
4	.....	.....	0
5	.....	.....	0
6	1	.....	0
7	6	.....	25
8	2	.....	.....
9	8	.....	.....
10	15	.....	.....
11	28	25	.....
12	67	25	.....
13	47	25	.....
14	44	25	.....
15	57	25	.....
16	.....	25	.....
17	67	25	.....
18	62	25	.....
19	71	25	.....
20	.....	25	.....
21	.....	25	.....
22	.....	25	.....
23	.....	25	.....
24	.....	25	.....
25	.....	25	.....
26	.....	25	.....
27	.....	25	.....
28	.....	25	.....
29	.....	25	.....
30	.....	25	.....
31	.....	25	.....
Total	574	525	25
Mean	41	25	4
Maximum	67	25	25
Minimum	1	25	0
Acre Feet	1139	1041	49

Area reported in 1919..... 3290 acres
Water used from river..... 2229 A. F.
Water used from Winters' Creek..10911 A. F.

Total.....13140 A. F.
Per acre ..... 4.00 A. F.

DAILY DISCHARGE, IN SECOND FEET, OF WINTERS CREEK CANAL AT WINTERS CREEK, FOR YEAR 1920.

Date	June	July	August	September
1	....	51	64	46
2	....	50	64	45
3	....	50	64	45
4	....	49	65	44
5	....	48	65	44
6	....	48	65	43
7	....	47	65	42
8	....	46	65	41
9	42	46	65	40
10	44	45	66	38
11	45	44	66	37
12	46	44	66	35
13	48	43	66	34
14	49	44	66	33
15	50	46	67	31
16	52	47	67	30
17	53	49	65	29
18	55	50	63	28
19	54	51	61	27
20	54	53	59	26
21	54	54	57	24
22	54	56	55	23
23	54	57	53	22
24	54	59	52	20
25	53	60	50	19
26	53	62	50	18
27	53	63	49	16
28	53	63	48	15
29	53	63	47	14
30	52	64	47	14
31	....	64	46	....
Total	1125	1606	1848	923
Mean	51	51	59	33
Max.	55	64	67	46
Min.	42	43	46	14
A. F.	2231	3185	3665	1830

See Winters Creek Canal from River.

MONTHLY MEAN TEMPERATURES FOR THE IRRIGATION SEASON OF 1919—DIV. 1-A. DIV. 1-E.

Station	April	May	June	July	August	Sept.	Mean Annual
Alliance	.....	.....	.....	.....	.....	.....	.....
Bridgeport	47.2	56.9	68.6	75.2	71.8	64.6	49.0
Gothenburg	49.2	59.4	70.4	78.1	75.0	70.0	49.9
Hillside	.....	.....	.....	.....	.....	.....	.....
Kearney	48.6	57.4	70.6	76.9	71.8	67.4	49.0
Kimball	44.4	54.8	66.4	73.6	71.5	63.8	47.4
Lexington	48.4	56.8	69.8	78.0	74.9	69.6	50.0
Mitchell	44.4	55.3	66.4	75.3	72.4	64.4	49.1
North Platte	47.5	58.2	69.3	77.2	73.0	67.8	47.9
Scottsbluff	46.6	57.3	69.0	75.8	72.3	64.6	48.3

MONTHLY AND ANNUAL PRECIPITATION FOR IRRIGATION SEASON OF 1919—DIV. 1-A. DIV. 1-E.

Station	April	May	June	July	August	Sept.	Annual
Alliance	.....	1.33	2.14	3.94	0.28	1.90	11.23*
Bridgeport	0.87	1.21	1.97	1.64	0.40	1.91	12.42
Gothenburg	2.90	2.16	4.10	2.65	0.73	1.00	21.58
Kearney	4.53	2.61	7.58	5.25	1.17	1.96	31.12
Kimball	1.90	1.29	4.87	1.25	1.79	2.80	19.49
Lexington	2.77	2.33	5.37	2.57	3.44	0.86	27.07
North Platte	2.21	2.33	4.15	4.98	0.76	1.56	22.47
Sidney	2.40	1.65	2.43	1.70	1.42	2.43	16.99
Mitchell	0.84	1.61	1.03	0.68	0.47	3.90	10.91*
Melbeta	.....	.....	0.71	0.00	0.44	7.38	13.55*
Scottsbluff	0.83	0.89	1.99	1.16	0.08	2.91	12.33
Oshkosh	1.46	1.20	3.54	2.81	0.64	1.38	17.48

* Record not complete.

MONTHLY AND ANNUAL PRECIPITATION FOR IRRIGATION SEASON 1919—DIV. 1-B.

Station	April	May	June	July	August	Sept.	Annual
Alma	4.63	2.91	3.53	4.69	0.50	5.52	30.87
Beaver City	3.90	2.21	3.60	5.13	0.42	2.28	24.07
Culbertson	2.25	1.20	5.07	1.38	0.78	0.73	19.80
Guide Rock	.....	3.04	6.12	0.27	0.66	6.89	25.74
Hayes Center	2.95	0.81	5.62	3.71	1.37	1.82	22.45
Imperial	1.97	0.80	13.73	2.16	0.73	2.78	29.94
McCook	1.26	1.03	3.45	1.92	2.11	0.45	14.61
Red Cloud	5.71	4.20	4.73	0.60	0.32	8.41	34.18
Wauneta	2.72	1.22	5.80	2.38	0.67	1.25	19.67

MONTHLY MEAN TEMPERATURES FOR IRRIGATION SEASON OF 1919—1-B.

Station	April	May	June	July	August	Sept.	Mean Annual
Alma	49.9	59.7	72.0	78.2	75.2	69.8	50.6
Beaver City	49.6	60.2	69.8	78.8	75.3	70.8	51.1
Cambridge	.....	.....	.....	.....	.....	.....	.....
Culbertson	50.0	59.2	71.4	78.1	75.9	70.4	49.5
Hayes Center	47.6	57.4	69.8	77.8	73.8	68.6	48.6
Imperial	49.8	58.4	67.5	76.0	74.0	68.8	50.0
McCook	49.8	59.4	71.4	79.3	76.1	71.6	50.6
Red Cloud	50.4	60.1	72.0	80.5	76.8	71.0	52.2

MONTHLY AND ANNUAL PRECIPITATION FOR IRRIGATION SEASON OF 1919—DIV. 2-C.

Station	April	May	June	July	August	Sept.	Annual
Gordon	2.27	1.29	0.92	1.98	0.33	1.39	14.21
Kirkwood	2.56	3.44	4.87	4.87	0.24	3.42	18.52
Merriman	1.55	4.83	1.95	5.99	0.66	1.65	24.18
Nenzel	1.49	2.18	5.06	0.59	1.41	0.84	18.27
Valentine	1.67	2.14	2.17	1.34	1.60	1.04	15.29

MONTHLY AND ANNUAL PRECIPITATION FOR IRRIGATION SEASON OF 1920.—DIV. 1-A. DIV. 1-E.

Station	April	May	June	July	August	Sept.	Annual
Alliance	.....	.....	.....	.....	.....	.....	.....
Bridgeport	4.42	4.36	1.34	1.96	3.31	0.33	.....
Gothenburg	5.25	1.90	1.75	2.12	5.50	0.23	.....
Kearney	4.53	1.72	3.29	1.71	3.71	0.62	.....
Kimball	4.61	1.44	1.51	0.18	3 56	0.84	.....
Lexington	5.72	1.85	1.34	1.78	4.82	1.01	.....
North Platte	3.42	3.31	2.35	1.62	4.73	0.83	.....
Sidney	6.15	2.92	2.75	0.71	2.61	0.97	.....
Mitchell	4.20	1.80	1.39	1.30	1.93	0.33	.....
Melbeta	3.72	2.24	2.78	0.95	3.43	1.32	.....
Scottsbluff	4.01	3.23	1.29	1.81	2.62	0.72	.....
Oshkosh	6.87	2.53	2.12	1.86	2.26	1.39	.....

MONTHLY MEAN TEMPERATURES FOR THE IRRIGATION SEASON OF 1920.—DIV. 1-A. DIV. 1-E.

Station	April	May	June	July	August	Sept.	Mean Annual
Alliance	.....	.....	.....	.....	.....	.....	.....
Bridgeport	37.7	57.0	65.9	.....	68.2	61.8	.....
Gothenburg	42.5	58.8	69.4	76.2	71.0	66.4	.....
Hillside	.....	.....	.....	.....	.....	.....	.....
Kearney	41.3	58.9	70.9	74.4	69.1	64.6	.....
Kimball	35.2	55.2	64.9	70.9	66.9	61.7	.....
Lexington	44.2	59.9	70.3	76.2	71.8	66.2	.....
Mitchell	36.6	53.6	64.6	72.6	68.0	61.9	.....
North Platte	40.5	57.8	68.4	74.8	70.0	64.2	.....
Scottsbluff	38.2	57.3	66.3	73.3	69.2	61.8	.....

MONTHLY AND ANNUAL PRECIPITATION FOR IRRIGATION SEASON 1920.—DIV. 1-B.

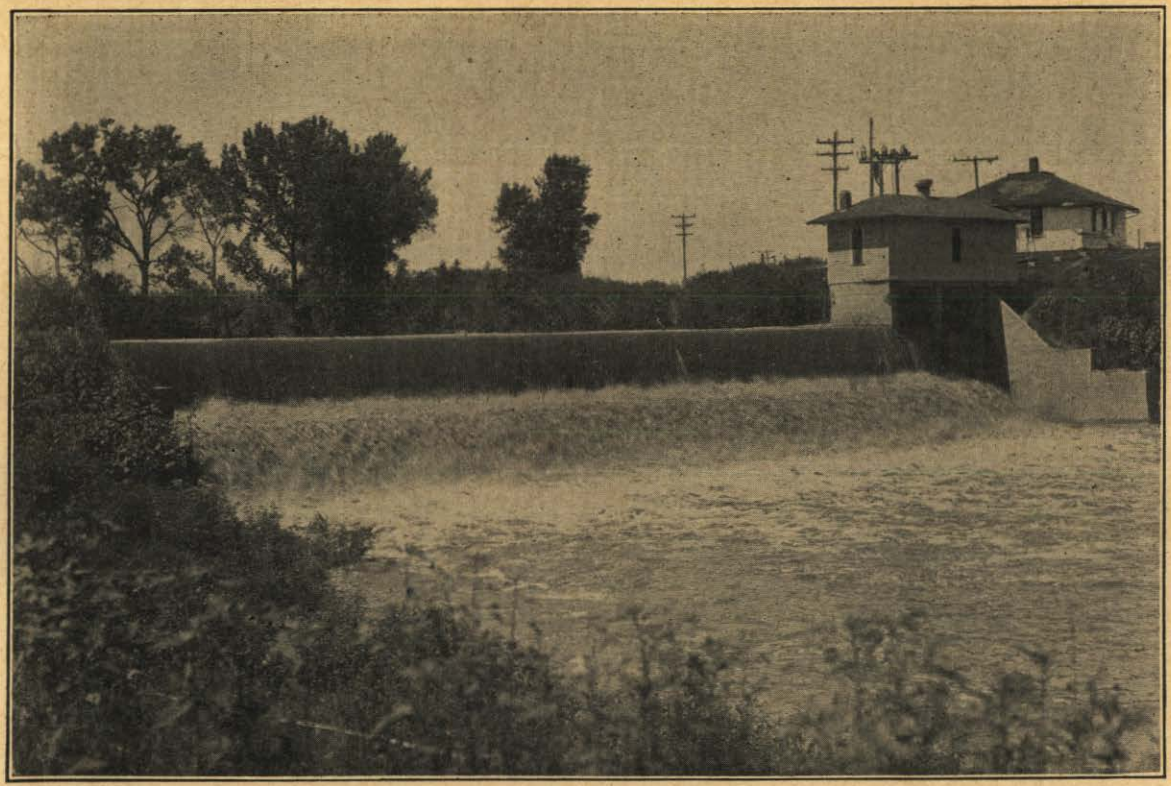
Station	April	May	June	July	August	Sept.	Annual
Alma	3.61	2.44	2.00	2.40	4.30	2.55	.....
Beaver City	.....	2.36	2.39	2.13	6.09	2.02	.....
Culbertson	4.60	1.94	2.05	1.04	5.15	0.52	.....
Guide Rock	4.53	1.60	1.63	2.68	4.44	3.40	.....
Hayes Center	6.25	3.28	1.98	1.50	4.40	0.20	.....
Imperial	4.68	4.46	3.72	1.58	4.19	0.60	.....
McCook	4.48	2.08	1.76	1.17	3.20	1.02	.....
Red Cloud	4.63	2.19	1.17	1.41	5.02	2.26	.....
Wauneta	2.89	2.42	2.36	0.65	2.73	0.66	.....

MONTHLY MEAN TEMPERATURES FOR IRRIGATION SEASON 1920.—1-B.

Station	April	May	June	July	August	Sept.	Mean Annual
Alma	44.4	59.8	70.6	76.7	70.2	66.7	.....
Beaver City	.....	60.5	72.3	77.3	71.8	67.0	.....
Cambridge	.....	.....	.....	.....	.....	.....	.....
Culbertson	41.3	58.6	70.0	75.6	69.8	65.1	.....
Hayes Center	38.2	56.1	67.2	73.6	68.4	67.2	.....
Imperial	38.8	54.6	.....	71.8	69.7	65.0	.....
McCook	44.3	59.2	71.0	77.7	73.0	69.1	.....
Red Cloud	44.6	60.2	72.0	77.3	71.9	68.0	.....

MONTHLY AND ANNUAL PRECIPITATION FOR IRRIGATION SEASON OF 1920.—DIV. 2-C.

Station	April	May	June	July	August	Sept.	Annual
Gordon	4.89	4.40	4.73	1.90	2.08	0.54	.....
Kirkwood	.....	.....	.....	.....	.....	.....	.....
Merriman	5.52	5.29	4.38	1.58	3.18	0.82	.....
Nenzel	5.43	6.24	5.38	1.85	2.67	0.91	.....
Valentine	4.45	8.18	3.48	1.14	1.73	2.33	.....



STATION NO. 3, BLUE RIVER POWER COMPANY (A-1265)

BUREAU OF

Roads and Bridges

1919—1920

LIST OF EXECUTIVES AND CHIEFS OF DIVISIONS

Bureau of Roads and Bridges

Geo. E. Johnson.....Secretary
Geo. K. Leonard.....Assistant Secretary
E. H. Morey.....Chief of Bureau
A. S. Mirick.....Division Engineer 1st Division
F. E. Hayes.....Assistant Division Engineer
M. F. Black.....Division Engineer 2nd Division
M. E. Burr.....Assistant Division Engineer
C. E. Wright.....Division Engineer 3rd Division
W. J. B. Porter.....Assistant Division Engineer
R. L. Cochran.....Division Engineer 4th Division
F. C. Rolls.....Assistant Division Engineer
A. M. Gaddis.....Division Engineer 5th Division
A. C. Tilley.....Assistant Division Engineer
M. C. Noble.....Division Engineer 6th Division
A. T. Lobdell.....Assistant Division Engineer
W. D. Kimmel.....Division Engineer 7th Division
D. J. Young.....Assistant Division Engineer
Dr. Geo. E. Condra.....Chief, Surveys of Road Building Materials
Clark E. Mickey.....Chief, Tests of Road Building Materials
W. T. Hole.....Office Engineer
A. W. Moffitt.....Superintendent of Equipment
R. O. Green.....Superintendent of State Construction
B. L. Schultz.....Chief Clerk Accounts and Records
Mable Tracy.....Chief Clerk Motor Vehicle Registration
G. B. Bedell.....Cost Accountant

(June 15, 1921)

To His Excellency, November 30, 1920.
SAMUEL R. McKELVIE,
Governor of Nebraska.

Sir: Since the present Motor Vehicle law requires the County Treasurers to send to the State Treasurer three-fourths of the money collected, and it is necessary to return ninety-five per cent to each County, I recommend that the Motor Vehicle law be so amended that all money collected for motor vehicle taxes remain in the County treasury, except five per cent, which should be sent to the State Treasurer for administration of the Motor Vehicle Division of this Department, for the supervision and maintenance of the State Highways, and for furnishing motor vehicle number plates and containers for certificates to the County Treasurer.

I also recommend that the State Highway law be amended requiring a representative of this Department to meet with the County Board of each County before March first of each year and go over in detail with the County Board, the maintenance work to be done on the State Highways for the season. Within ten days after such meeting, we should be required to file a budget estimate covering the funds necessary for the maintenance work.

Immediately upon the filing of this budget estimate, the balance of the money remaining in the County Treasury from the motor vehicle fees should be turned over to the County Road Dragging Fund. If these recommendations are followed, the County will be allowed to use immediately, all money in excess of that required to maintain the State Highways for the maintenance of their County roads. Such procedure would also lessen the demand for additional State Highways.

There is great danger, under the law as it exists at the present time, of the demand for additional highways becoming so great, that the State Highway System will be extended to the point when it will be impossible to secure funds for proper maintenance. If this condition should ever exist, it would defeat entirely the purpose of a State Highway System, and the State would lose the greater part of the money it has invested in construction.

After the 1919 Session of the Legislature had adjourned, we received one and one-half million dollars worth of equipment from the War Department, through the Agriculture Department. A large portion of this equipment had been used, and it was necessary to replace some of the parts of each piece of equipment before same could be placed in service. In most cases we were furnished these parts by the War Department. However, handling this equipment and placing same in service entailed considerable expense. About one-half of the equipment has been turned over to the County for the expense the Department has had in handling same. We have invested the remainder, $300,000 in equipment. I recommend that the greater part of this equipment be retained by the Department, and a fund of $300,000 be set aside from the State Aid Road Fund which would act as a revolving fund, said fund covering the amount invested in equipment and gravel

lands, at this time, and the Department be required to place a value on each piece of equipment and promulgate a set of rates, on a per diem basis for the use of this equipment, these rates to be sufficient to cover the cost of operation, depreciation and upkeep, and that the amount covered for depreciation remain in the fund to replace the equipment as same is used. If these recommendations are followed, the Department will always have the same value of equipment on hand, and will be in position to control prices on contract work.

I also recommend that the law authorizing the Department to purchase gravel lands to produce gravel for road building materials, be extended, so that all surplus we may have may be used in the construction of the State Capitol building.

Since it will take $2,700,000 to enable us to carry out our present Federal Aid Road program, and to meet Federal Aid appropriations, I recommend that this appropriation be made by the 1921 Legislature. If the above recommendation is not carried out, we will lose our Federal money for the reason that the present Federal Aid must be met with State appropriations and this Department have contracts signed with the Federal Government for same, before June 30th, 1921.

I also recommend that a law be enacted, requiring the Department of Public Works to advertise in the official County paper in the County, where construction projects are proposed before contracts are let or also before the State proceeds with the construction of a project where contracts are not let, before any money is expended on a project from the State Aid Road Fund. The present law does not require these projects to be advertised in the County, and does not require any bid to be received before the State proceeds with the construction work which the Department desires to handle on an actual cost basis. If the Department is not required to advertise and receive bids on this work, eventually the Department may be forced to use incompetent labor, thereby increasing the cost considerable above the cost that would be necessary if the work was awarded to a contractor. This recommendation is based upon experience of other States, and the experience I have had in handling municipal and County work. If the Department is required to advertise and receive bids, and then if they see fit to take over and handle the work, they are required to do the work below the lowest responsible bidder; then all work so handled will be done at a financial advantage to the State. Otherwise, the Department would be in a position to force certain classes of contractors out of business, and eventually pay salaries for labor and supervision that would be certain to bring disaster to the Department.

I also recommend that the recommendation of the Chief of the Bureau of Roads and Bridges, and the Chief of the Bureau of Irrigation, Waterpower and Drainage be carried into effect.

Respectfully submitted,

(Signed) GEO. E. JOHNSON,

Secretary.

REPORT

CHIEF, BUREAU OF ROADS AND BRIDGES.

Lincoln, Nebraska, November 30, 1920.

George E. Johnson, Secretary,
Department of Public Works,
Lincoln, Nebraska.

Dear Sir:—

I have the honor to submit the following report covering the work of the Bureau of Roads and Bridges for the past two years.

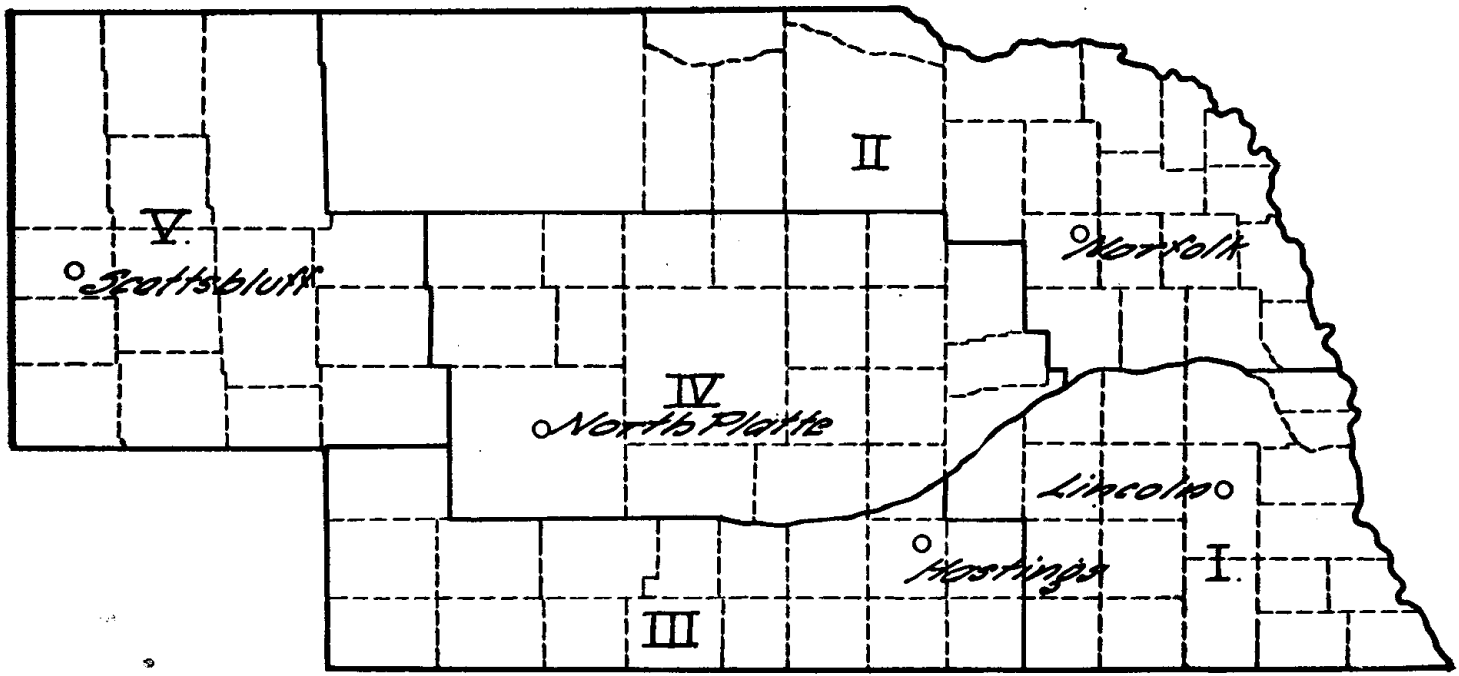
It is the intention of this report to cover the construction work of State Highways during the past biennium. In order to do this, it has become necessary to limit the report to such matters of prime importance which are required in carrying out a program of this nature. Types of work have been divided, grouped and designated under certain division and sub-division headings; a brief summary follows, placing the various types of work administered by this bureau.

In addition, reports are included of the Division of Tests and Testing Materials, the Conservation and Soil Survey Division of the State University, also important laws which govern the administrative power and authority of the Bureau of Roads and Bridges, functioning as a unit of the Department of Public Works.

The bureau has at all times endeavored to co-operate with the County and local officials, serving the public to the best of its ability at all times.

Respectfully submitted,

E. H. MOREY,
Chief, Bureau of Roads and Bridges.



MAP SHOWING HEADQUARTERS AND RESPECTIVE COUNTIES OF THE FIVE DIVISIONS OF THE STATE

In order that those reading the thirteenth biennial report of the Department of Public Works may familiarize themselves with the laws and rules under which the Department was organized, and is now functioning, the following summary of the Civil Administrative Code, together with a brief statement of the work of each of the sub-divisions of the department is given.

The Thirty-seventh Session of the Nebraska Legislature of 1919 enacted a bill, the Civil Administrative Code Bill, which created a cabinet form of government for the State, putting into effect a financial and accounting system, whereby a vigorous and effective audit over the financial expenditures of the State was established, and provided for the consolidation of boards, institutions, commissions and different departments and agencies of the government. Although the new bill contained over 500 pages, only 20 pages consisted of new legislation, providing for the present system of administration. The remainder of the bill consisted of legislation that had been previously enacted and was included in this bill in order to bring it under the Code.

The Civil Administrative Code eliminated seven boards and commissions and ten other sub-divisions of the departments. It created the following six administrative departments:

Agriculture	Trade and Commerce
Public Works	Finance
Public Welfare	Labor

These departments are administered by Secretaries appointed by the Governor with the consent of the Senate. The six departments are sub-divided into sub-divisions and bureaus, the head of each being designated as Chief. The six Secretaries are responsible to the Governor, the Chiefs of the bureaus and divisions are responsible to the Secretary, and the minor employees are responsible directly to their Chiefs. Thus, responsibility is fixed, and the commonly recognized practice of business administration established.

The most important division of the Department of Public Works is the Bureau of Roads and Bridges. This Bureau, under the direction of the Chief, Mr. E. H. Morey, has charge of the construction of all State and Federal Aid roads and the building of all State bridges. It is again divided into three sub-divisions, namely: Maps and Plans, Road Construction, and Road Equipment.

The Division of Maps and Plans.—This subdivision is in charge of the Office Engineer, Mr. W. T. Hole, with the following assistants: assistant office engineer, four senior engineering draftsmen, senior engineering draftsmen, engineering draftsmen, draftsmen and junior draftsmen. The blue print operators and preliminary and location engineers, together with rodmen and chainmen are also in this division.

This division has in general the making of preliminary field investigations and surveys connected with the first work required in the

planning for a State and Federal Aid road. Plans and estimates are prepared for all road and bridge work, and in addition special designs are made for equipment, such as derricks, drags, camp buildings and wagons.

The Division of Road Construction.—The Chief of the Bureau of Roads and Bridges has complete supervision of this division, and with the assistance of five Division Engineers directs and oversees the actual building and maintenance of all Federal and State Aid roads, and in addition all State Highways not constructed by Federal and State funds. The offices of the Division Engineers are located as follows:

Division No. 1—Mr. A. S. Mirick.....Lincoln
Division No. 2—Mr. M. F. Black.....Norfolk
Division No. 3—Mr. C. E. Wright.....Hastings
Division No. 4—Mr. R. L. Cochran.....North Platte
Division No. 5—Mr. J. C. McLean.....Scottsbluff

Duties of a Division Engineer.—In general, each of the Five Division Engineers has entire charge of the work in his immediate division, each division including an average of twenty counties.

Construction:

First. It is the duty of the Division Engineer to assist in the original location of all roads, and supervise the construction of same from the time the road is first surveyed until it is finally accepted by the Federal Government. Thus, he makes recommendations for all improvements effected during construction and maintenance of the projects under his supervision.

Second. The Division Engineer is responsible for the engineering parties that are required in the construction progress. These parties consist of a project engineer, an instrument man, rodman and chainman. The project engineer is responsible to the Division Engineer for the work under his supervision.

Third. The approval of all plans, estimates, payrolls, correspondence and field parties on the projects within the counties of the division is under the jurisdiction of the Division Engineer and his assistant.

Fourth. In the construction of drainage structures and paving the matter of testing the proper materials necessary is referred by the Division Engineer to the Testing Engineer.

Fifth. The matter of issuing permits for the erection of signs on the State System is cared for by the Division Engineer; also, the marking of the State Highways with the proper signs is arranged by him, and ship-

ments made upon his recommendation to the County Highway Commissioner.

Sixth. Frequent inspections are made by the Division Engineer, oftentimes in company with the Federal District Engineers, at which time the progress of the work is noted and recommendations with regard to methods, alignment, grades, and drainage structures made.

Maintenance:

Seventh. The Division Engineer acts in cooperation with the Highway Commissioner of each County with regard to the maintenance of all roads located on the State Highway System. Changes in the method and results of such maintenance matters are recommended by him.

Eighth. All claims arising from the maintenance of such roads, and presented by the counties, are taken care of and checked by the Division Engineer.

Ninth. Logging of the State Highway System is carried on under his supervision. Maps of sections patrolled, type of patrols, number of patrolmen and miles in each county are kept and checked, from the daily report forms sent in by the patrolmen. This data is used for cost keeping.

Tenth. Arrangements are made through the Division Engineer for work on the State Highways by the heavy gang maintenance crews. All reports and payrolls in connection with same are checked and allowed by the Division Engineer. Reports of the labor and costs of work in the various graveling camps are kept by him.

NOTE—For a complete description of the work of each of the five Divisions and the statistical summaries of the work accomplished, turn to the Section designated **Division No. 1, 2, 3, 4, 5,** respectively.

Testing Engineer.—The testing engineer, Clark E. Mickey, has charge of the tests that are made for the materials used in the construction of State and Federal Aid roads: Mechanical analysis of all gravel; cement and brick tests; compression strength tests on concrete cylinders; concrete and corrugated pipe tests; steel for reinforcement of headwalls and bridges. In addition, recommendations are made as to the advisability of using such materials; reports made to the Chief of the Bureau of Roads and Bridges, who in turn rejects or approves the result of the tests by a report to the Federal District office. No materials are used that do not meet the requirements of the Standard Specifications of the Federal Government.

NOTE—For complete description of this work and results accomplished to date, see the Section designated "TESTING".

Project Engineer.—The Project Engineer is in immediate charge of one or more projects, and is responsible for the construction work to the Division Engineer. His duties are many; briefly, he gives instructions to the contractor, sets stakes for grades (with the aid of his party), and makes the monthly and final estimates. He is rightly termed "the man on the job". He is immediately responsible for everything that is carried on while the project is under his direction.

Division of Road Equipment, Repairs and Maintenance.—The Superintendent of the road equipment division, A. W. Moffitt, is in charge of all equipment and repairs handled by the State in fitting out counties, heavy gang crews, and gravelling camps with the equipment needed in working on state roads. State trucks, tractors, small equipment, repairs, etc., are shipped out under the direction of this division. Construction superintendents, tractor operators, mechanics, truck drivers, and storekeepers assist in the work. In addition the Superintendent has charge of four graveling camps, two claying camps, and one surfacing camp, his duty being to see that these camps are adequately equipped.

In addition to the three divisions under the supervision of the Chief, Bureau of Roads and Bridges, a third sub-division, Clerical and Records Division, cares for such matters as correspondence, payrolls, expense vouchers, requisitions, warrants, financial reports, construction estimates and cost data.

The Chief Clerk is in charge with sub-divisions: Accounting records, senior clerk bookkeeper, stenographer, junior clerk, bookkeeper, junior clerk, stenographer, junior clerk and typist.

A sub-division of the Motor Vehicle registration records is in charge of a clerk and junior clerks.

Payrolls.—Monthly payrolls are made from:

(a) Daily report sheet signed by employees of the office.
(b) Daily report cards sent in by the preliminary engineers and helpers.
(c) Weekly report sheets of division engineers and assistants.
(d) Weekly reports of division engineers and helpers.

Expense Vouchers.—Vouchers are carefully checked in this division and entered for payment through the proper sources. This requires considerable time, especially during construction season, when there are from 200 to 250 men in the field.

Requisitions and Vouchers for Equipment and Supplies.—All requisitions for equipment and supplies are made through the division, checked and sent to the purchasing agent of the Finance Department; vouchers covering such supplies and expense connected therewith are made and checked by this division and entered for payment.

Estimates of Construction Work.—State vouchers for construction work are made from the project engineer's monthly estimate after the

estimate has been carefully checked. Some projects require as many as five vouchers each month. Federal vouchers are made monthly and sent to the government for reimbursement. Attached to these vouchers are three copies of the expense sheet of each project engineer and helper, all of which involves considerable typing.

Warrants.—All warrants issued on such vouchers are mailed by this division.

Entries.—Entries of all vouchers and warrants must be made on the voucher journal, distribution ledger, final ledger, monthly statement for office and state auditor.

Financial Reports.—Financial reports are required of the State Aid Road fund monthly, showing itemized statement of each voucher paid; amount apportioned to each county, previous and present expenditures, and balance; the same is required of each district's apportionment, expenditures, and balance. A similar financial report is made of the State Highway fund. (Motor Vehicle fees.)

Projects.—Copies of project statements sent to the government are made by this division, also the necessary copies of preliminary estimates and detailed information necessary is forwarded to the government on each particular project before approval.

Contracts.—All contracts are checked by the division, also tabulation of bids, and necessary copies of each made for distribution. Ten copies are made of each contract that is let.

Correspondence.—Stenographic work is taken care of by the division.

Filing.—The filing of correspondence and records is done by the division.

Cost Data Work.—Cost records are kept on each project under construction. This, of course, involves detail work.

Motor Vehicle Records.—In addition to this, records are kept of all Motor Vehicle Registrations. Two registration cards for each registrant are received from the County Treasurer, with the name of the party, address, Treasurer's receipt number, registration number, make of car, engine number, weight and fee. These cards are given to the Junior Clerks, who check them for address, receipt number and registration number, which must correspond on both cards.

The cards are divided, one for numerical file, the other for alphabetical file. A junior clerk takes the cards from the numerical file and checks weight and fee, and if not found correct returns them to the Treasurer for correction. After these cards are checked for fee and weight and "O. K'd" they are given to junior clerks to run registration numerically and file. Cards upon which are printed the receipt numbers for every county and the registration is placed opposite the corresponding receipt number. The card in alphabetical file is cut in half, the

upper part of card filed alphabetically, the lower half filed numerically by engine number and alphabetically by cars. The mailing clerk mails all plates and supplies to County Treasurers and keeps a record of all outgoing and incoming freight and express. Another clerk in charge of the cards gives information to County Treasurers and to the public with regard to the work of the office, also corrections on cards. The junior typist has charge of all mail for correction, and at the end of each month makes a typewritten list of each new registration made during the month. A stenographer answers all correspondence from County Treasurers.

Bridge Inspectors.—A Bridge Inspector is in charge during bridge construction, his duties being to locate elevations, center line, piers, keep records of pile driving, materials, make estimates and cost of the entire work. Under his supervision the work is carried on according to specifications and plans, and he reports weekly the progress of the construction.

The Monthly Bulletin.—Approximately 4,000 Highway reports are sent out monthly by the Department. This publication (required by H. R. 298, section 7) is sent to the County Clerk in each county, and contains a complete Financial Statement of the Federal and State Funds apportioned under the Federal and State Aid Road Act, for the years 1917-18-19-20 and 21, inclusive. The counties of the State are divided into districts, and figures showing the total appropriation, the amount expended previously, amount expended each month, total expended and balance given. In addition, the list of vouchers paid during the preceding month and chargeable to the counties are listed in itemized form.

This report also gives general information to the public, such as explanation of road laws, comparative reports, features of certain road projects, and interesting pictures.

Maps and Plans

The chief activities of the Division of Maps and Plans, have been the preparation of Federal Aid Road plans, State Standard Bridge plans, State Aid Bridge plans, State Institution Paving plans, Special Bridge and Culvert plans for Federal Aid Roads, and special bridge plans for the various counties.

Federal Aid Road Plans.

The preparation of the different stages of Federal Aid Road plans requires a vast amount of work, and these may be enumerated as follows: Federal Aid Project Statements submitted and their subsequent approval by the Secretary of Agriculture; preliminary survey; reduction and check of survey notes; plotting alignment profile and cross-sections from the survey notes; laying tentative grade line; plan-in-hand field inspection by a Division Engineer in company with a Federal representative and local Highway officials; revision of tentative plans and completion of estimates covering all road construction items.

The project statement includes a general statement of the existing conditions of the original road with respect to soil conditions, traffic and surface requirements; existing drainage structures, together with necessary new structures, and an estimated cost of the improvements. This statement is accompanied by a sketch map showing the location of the road with relation to towns, rural post routes, railroads, rivers and section lines, as well as other land division lines.

The preliminary survey is made for the purpose of determining the existing alignment, profile, and drainage structures of the road which is to be improved, in order that this data may be used as a basis for constructing the new road. Accurate chaining, level and topographical notes are necessary to assure a reliable estimate. Level rod readings show the true cross-section of the road at each 100-foot station, and at all necessary intermediate points. Bench marks are carefully established at convenient intervals for reference by the construction party.

The reduction of survey notes from level rod readings as taken in the field to actual elevations with respect to standard or assumed datum, is handled in the office by the aid of a calculating machine. This eliminates errors which might occur if such reductions were made by the field party; such reductions are made before the plotting of notes.

Plotting of alignment, profile and cross-section is carried on in the office, the first two being plotted on the same sheet, which is of standard size and design, as adopted by the U. S. Bureau of Public Roads, for use on all Federal Aid road work. These sheets show alignment, profiile, bridges, culverts, fence and telephone lines, intersecting roads and driveways, railroad crossings, streams, trees, and buildings in the immediate vicinity of the road. Drainage notes are entered on the sheets, and are adopted or changed at the time of the plan-in-hand inspection. The cross sections are plotted on separate sheets, so designed that they may be used later in computing excavation quantities.

Tentative grade lines are placed on the profile in such a manner as to make the excavation and adjacent embankment quantities balance approximately to avoid wasting of excavation or excess of embankment which would require borrow pits. This can be done quite readily in a rolling country, but in low, flat bottoms, and in level country, it is generally necessary that the grades be raised to such an extent that borrow pits are essential in order to obtain sufficient material. Maximum grades are established, and all existing grades in excess of the maximum are cut down to conform. Slightly rolling or short, choppy grades are eliminated when the extra cost is not excessive. All railroad crossings, road intersections, adequate permanent bridges and culverts are taken into consideration in the establishment of the tentative grade line. The grade line is shown in pencil only on the plans, so as to readily permit changes as recommended at the time of the plan-in-hand field inspection. Blue prints of the alignment and profile sheets are made in rolls and furnished to the Division Engineers, who arrange for the inspection.

The plan-in-hand field inspection is made by the Division Engineer, in whose territory the road is located, in company with a representative of the District Office, of the U. S. Bureau of Public Roads. The County Highway Commissioner and any or all members of the County Board are requested to be present at this inspection. Adjustments of alignment, grades, drainage structures, road surfacing or the type of the section of the road, as agreed upon by the members of the inspection party, are noted on the blue print plans, which furnish information to the office engineers for completing the plans for Federal approval.

The revision of the tentative plan is made immediately after the plan-in-hand field inspection, and these plans are completed and submitted for Federal approval.

The grade line is adjusted as recommended by the field inspection and the area of excavation and embankment is determined at each cross section, as taken on the preliminary survey from which the volume of excavation and embankment is computed between each cross-section, and totaled for the entire length of the project. Cuts and corresponding fills are divided into what is commonly known as balances, and are shown as such on the computation sheets. These are also placed on the profile for the guidance of the engineer and contractor at time of construction. The quantities are checked before plans are considered complete. All necessary borrow is indicated. Curves at road angles and turns are shown and additional right-of-way for such are indicated on plans. Proposed changes in location of bridges and stream channel changes which will benefit the road location are properly indicated. When the plans are complete, all existing conditions are shown in black drawing ink, and all proposed changes, including the entire grade line, are shown in red ink. Recommended changes, extensions or repairs of present bridges and culverts are shown on the plans. If it is required that the county make such repairs, same are noted on the plans. State standard bridge and culvert plans governing the repairs, extensions and new work are referred to by number in the plan notations. All bridge and culvert work is noted on the plans, and if it is to be taken care of by the county, it is indicated. Complete computation sheets for excavation, embankment, borrow, overhaul and drainage structures, together with other miscellaneous structures, are made and checked, and are forwarded to the Federal District Engineer's office, along with an assembled estimate of all items entering into the construction of the project. Unit prices for estimates are based upon an analysis of the probable construction cost. This has been a difficult task under the general labor and financial conditions immediately following the war. An estimate is made by listing the quantities of the various items of construction at the unit prices estimated for each and totaling the estimate of the items; to this total is added an amount equal to 10 per cent of the estimate to cover engineering costs during construction, and for contingencies. The grand total is known as the estimated cost of the project, and is

the basis upon which Federal Aid is requested, and granted when plans have been approved.

The following information is submitted to the Federal District Engineers' office for their review and check: One copy of the detailed estimate, showing total estimated cost, the length in miles, average cost per mile, donations from county or other sources, and the amount of Federal Aid requested for the completion of the project. In addition, three complete blue print sets showing alignment and profile, and one complete blue print set of cross-section sheets, together with three prints of any special design, and the blue prints with notes thereon, which were made from the plan-in-hand field inspection, also accompany the detailed estimate. For further convenience of revision in the District office, the complete computation sheets are also forwarded, with the understanding that they be returned as soon as their review and check are completed.

After submitting complete plans to the Federal District Engineers' office it is sometimes necessary that they be returned to this office for minor corrections, explanations, notations, etc., before the plans are finally approved.

The advertising for bids and the awarding of contracts follows immediately upon the approval of the plans by the Federal District Engineer. This completes the work of the Maps and Plans Division, on what is termed preliminary plans.

It quite frequently occurs, due to unforseen conditions, such as soil, weather, drainage and in some cases financial and traffic conditions, that certain revision of plans are desirable during the progress of construction. Information is furnished to this office by the Project Engineer, or the Division Engineer, and the changes in alignment, grades, type of the section of the road, type of surface, channel changes, or drainage structures, whichever the case may be, are made in the office and are forwarded to the Federal District Engineers' office, with a revised estimate, showing the original estimated quantities and the increases or decreases as they are affected by the desired changes. Modifications of the original request for Federal Aid are based upon this assembled estimate. Such changes receive Federal approval before work is started in order that they obtain Federal Aid.

Final plans of the project as actually constructed are made after the completion of all work on the project, and are submitted to the Federal District Engineers' office, serving as a basis for the check of the final Federal voucher previous to the passage for payment of this voucher. These plans also are a definite record of the completed work. On the final plans the following information is shown, i. e. the alignment as constructed, the profile of the original ground on the center line of the project, the actual grade line as constructed, and notations of all drainage structures that are in place when the project is completed, in addition to previous information which was shown on the

preliminary plans. The cross-section sheets show both preliminary and final sections as constructed, from which the calculation of earth work is made prior to final settlement with the contractor.

While it was intended that the Maps and Plans Division should be required only to check the final estimate and plans as submitted by the Project Engineers, it has developed that few of the Project Engineers have been able to maintain the field work, and further have time to complete the final calculations of final estimates by the time the contractor has completed the work. This has necessitated considerable work and has now taken, or will take the time of the entire office force several months to complete.

The final plans and estimate are, therefore, to be made and checked in this office in practically the same manner as has been described for the preliminary plans, with the exception of the tentative grade line and plan-in-hand field inspection.

For the complete work of the Division of Maps and Plans, note the six tabulated sheets showing, by project numbers, counties and years, the work of the preparation of preliminary, revised and final plans, as described above, from the beginning of the Federal Aid road work to the present time.

Explanation of Tabulated Sheets.

In order that the various headings of the following sheets may be comprehensible, the following explanation is given:

The headings under Project Statement are self-explanatory, as are those also under Surveys.

Under the heading Preliminary Plans, the sub-head **Tentative** indicates that plans have been completed up to the plan-in-nand field inspection. The sub-head **Complete** indicates that plans have been completed and approved by the Federal Government. The sub-head **Construction** indicates the type of construction, together with lengths, as is provided in the completed plans. The sub-head **Estimated Cost** indicates the estimated cost of the construction work as shown by original estimates, approved by the Federal government, and divided into the portions which are to be paid for by Federal Aid, by State Aid and by County, other funds such as donations, township or city appropriations, and special assessments.

The heading Final Plan refers to the plans after construction work is completed, which are made and forwarded to the Federal District Engineers' office, serving as a basis for final payment of Federal Aid. The sub-head **Partially Complete** indicates those projects or portions of projects upon which construction work has recently been completed, and upon which the final plans are in the course of completion in this office. The sub-head **Complete** indicates that the final plans for these projects or portions of projects have been completed and accepted by the Federal Government, or are ready to be forwarded for Federal

approval. The heading Remarks is a numerical index of the various projects or sub-divisions of projects which continue throughout the sheets. The remark following the number indicates that this project, or portion of project, has been revised during construction and the data concerning such a revision is found on the numerical index line thus referred to.

Lines No. 251 to 300, inclusive of sheet No. 6, indicate the projects, or portions of projects, which have been revised after construction was started.

The heading Re-Surveys indicates that the revised plans were based on re-survey notes for such a length as is indicated in this column. The sub-head **Revised** under Preliminary Plans indicates the length and year of the revision. Where no length is given, it means that only minor revisions of price or drainage structures were made, which did not require appreciable change in plans. The sub-head **Length** covers changes in length as affected by revision. The sub-head **Construction** indicates the type of construction affected by revision. The sub-head **Estimated Increase** indicates the amount of increase in estimated cost against Federal Aid, State Aid, County, etc., as affected by the revision. Sub-head **Estimated Decrease** covers the revision which resulted in a decrease of estimated cost.

DEPARTMENT OF PUBLIC WORKS
DIVISION OF MAPS AND PLANS

TABULATION OF SURVEYS, PLANS AND ESTIMATES — JANUARY 1ST 1921

PROJECT STATEMENT					SURVEYS		PRELIMINARY PLANS											FINAL PLANS				REMARKS
							TENTATIVE		COMPLETE		CONSTRUCTION				ESTIMATED COST			PARTIALLY COMPLETE		COMPLETE		
No	Name	County	App.	Length	Year	Length	Year	Length	Year	Length	Type	Length	Type	Length	Federal	State	County	Year	Length	Year	Length	
1	Lincoln-Emerald	Lancaster	1917	5.44	1917	5.44	1918	5.44	1918	5.44			Brick	5.44	54400.00		162,594.75			1919	5.44	1
2	Falls City-Nebr. City	Otoe	1917	10.03	1917	10.03	1918	10.03	1918	10.03	Earth	10.03			7162.87	7162.87		1920	10.03			2. See 255
		Nemaha	1917	21.23	1917	21.23	1918	21.23	1918	21.23	Earth	21.23			14,114.65	14,114.65		1920	21.23			3. See 252
		Richardson	1917	24.14	1917	24.14	1918	24.14	1918	24.14	Earth	24.14			19,938.66	19,938.66		1920	24.14			4. See 251
3	Hall County	Hall	1918	32.25	1917	32.25	1918	32.26	1918	32.25	Earth	28.85	Sand Clay	3.40	19924.08	19924.08						5. See 256
4	Cedar-Wayne	Cedar	1918	26.30	1917	26.30	1918	26.30	1918	26.30	Earth	26.30			40,519.41	40,519.41		1920	26.30			6. See 258
		Wayne	1918	10.00	1917	10.00	1918	10.00	1918	10.00	Earth	10.00			18,520.65	18,520.65				1920	10.00	7. See 259
5	Norfolk-Columbus	Madison	1918	21.97	1917	21.97	1918	21.97	1918	21.97	Earth	13.97	Sand Clay	8.00	29,538.76	29,538.77				1920	21.97	8. See 261
		Platte	1918	26.12	1917	26.12	1918	26.12	1918	26.12	Earth	26.12			28,219.84	28,219.84				1920	26.12	9. See 262
7	Superior-Harvard-Minden	Nuckolls	1918	22.40	1917	22.40	1918	22.40	1918	22.40	Earth	22.40			18,681.69	18,681.70						10. See 263
		Clay	1918	32.50	1917	32.50	1918	32.50	1918	32.50	Earth	32.50			20763.91	20763.92	12,510.24					11. See 264
		Adams	1918	21.20	1917	21.20	1918	21.20	1918	21.20	Earth	21.20			16,570.90	16,570.91		1920	21.20			12. See 265
		Kearney	1918	16.25	1917	16.25	1918	16.25	1918	16.25	Earth	16.25			13,325.02	13,325.03		1920	16.25			13. See 266
10	North Platte-Sutherland	Lincoln	1918	19.10	1918	19.10	1918	19.10	1919	19.10	Earth	16.10	Gravel	3.00	23,646.69	23,646.69						14. See 268
11	Smithfield-Elwood	Gosper	1918	7.05	1917	7.05	1919	7.05	1919	7.05	Earth	7.05			19407.72	19407.72						15
		Phelps																				16
12	Stapleton-Ringgold	Logan	1918	14.64	1918	14.64	1918	14.64	1918	11.12	Earth	3.52	Sand Clay	7.60	17453.97	17453.98						17
		McPherson	1918	9.78	1918	9.78	1918	5.98	1918	5.98	Earth	3.80	Sand Clay	2.18	8,090.04	8,090.04						18
14	O'Neill-Butte	Holt	1919	25.19	1918	25.19	1919	25.19	1920	19.92	Earth	19.92			61,600.93	61600.93						19
		Boyd	1919	16.17	1918	16.17	1919	16.17														20
16	Kimball-Harrisburg	Kimball	1918	12.63	1919	12.63	1919	12.63	1919	12.63	Earth	12.63			18898.23	18898.23						21
		Banner	1918	14.01	1919	14.01	1919	14.01	1919	14.01	Earth	14.01			32043.52	32043.52						22
17	Havelock-Waverly	Lancaster	1918	9.99	1918	9.99	1918	9.99	1918	9.99	Earth	9.99			20077.50	20077.50				1920	9.99	23
18	Lincoln-Beatrice	Lancaster	1919	17.95	1918	17.95	1918	17.95	1919	17.95	Earth	17.95			26,740.56	26,740.56	1078.88			1920	17.95	24
		Gage	1919	19.01	1917	19.01	1918	19.01	1919	19.01	Earth	19.01			30,248.72	30,248.73				1920	19.01	25 See 267
19	West Emerald	Lancaster	1918	3.98	1918	3.98	1918	3.98	1918	3.98	Earth	3.98			11,000.00	11,000.00				1920	3.98	26
20	Lincoln Highway	Douglas	1919	15.04	1918	15.04	1918	15.04	1919	15.04	Earth	15.04			24,932.88	24,932.88		1920	15.04			27. See 270
21	Alliance-Antioch	Box Butte	1918	8.62	1918	8.62	1918	8.62	1919	8.62	Earth	5.99	Gravel Clay	2.63	12,857.16	12,857.16						28. See 271
		Sheridan	1918	6.20	1918	6.20	1918	6.20	1919	6.20			Gravel Clay	6.20	25,818.51	25,818.51						29. See 272
22	Broken Bow East	Custer	1918	31.87	1917	31.87	1918	31.87	1919	31.87	Earth	28.37	Sand Clay	3.50	100980.45	100980.45	52,819.12					30. See 273
23	Blair-Oakland	Washington	1918	11.27	1917	11.27	1918	11.27	1919	11.27	Earth	11.27			12,805.25	12,805.26				1920	11.27	31. See 275
		Burt	1918	22.04	1917	22.04	1919	22.04	1919	22.04	Earth	22.04			41,091.07	41,091.07				1920	22.04	32. See 276
25	Beatrice-Fairbury	Gage	1919	10.66	1917	10.66	1918	10.66	1919	10.66	Earth	10.66			13087.47	13087.47				1920	10.66	33. See 277
		Jefferson	1919	19.06	1917	19.06	1918	19.06	1919	19.06	Earth	19.06			23332.47	23332.48		1920	19.06			34. See 278
26	Hamlet-Imperial	Chase	1919	10.85	1917	10.85	1919	10.85	1919	9.92	Earth	9.92			14,996.05	14,996.05				1920	10.85	35
		Hayes	1919	6.05	1917	6.05	1919	6.05	1919	6.05	Earth	6.05			12,229.94	12,229.94				1920	6.05	36
27	Fremont-Ceresco	Dodge	1919	1.21	1918	1.21	1918	1.21	1919	1.21	Earth	1.21			605.00	605.00				1920	0.60	37. See 281
		Saunders	1919	29.12	1918	29.12	1918	29.12	1919	29.12	Earth	29.12			31460.00	31460.00	8482.32			1920	29.12	38. See 279
28	Neb. City-Plattsmouth	Otoe	1919	9.76	1917	9.76	1918	9.76	1919	9.76	Earth	9.76			11717.09	11717.09				1920	9.76	39. See 284
		Cass	1919	16.69	1917	16.69	1918	16.69	1919	16.69	Earth	16.69			23917.41	23917.41				1920	16.69	40. See 283
29	Osceola-David City	Polk	1919	8.74	1918	8.74	1918	8.74	1919	8.74	Earth	8.74			10076.00	10076.00		1920	8.74			41
		Butler	1919	28.94	1918	28.97	1918	28.97	1919	28.97	Earth	28.12	Concrete	0.85	48245.58	48245.58	4000.00	1920	28.97			42. See 286
30	Beaver City-Arapahoe	Furnas	1919	22.20	1918	22.20	1919	22.20	1919	12.42	Earth	12.30	Concrete	0.12	43996.60	43996.61						43
31	Allen-Ponca	Dixon	1919	16.93	1918	16.93	1918	16.93	1919	16.93	Earth	16.93			30,344.53	30,344.53						44. See 287
32	Red Cloud-Ayr	Adams	1919	6.25	1918	6.25	1919	6.25	1919	6.25	Earth	6.25			15,720.62	15720.63		1920	6.25			45
		Webster	1919	21.06	1918	21.06	1919	21.06	1919	21.06	Earth	21.06			49553.13	49553.13				1920	21.06	46
33	Center-Creighton	Knox	1919	11.41	1918	11.41	1919	11.41	1920	11.41	Earth	10.09	Concrete Sand Clay	0.12 1.20	46,191.06	46,191.06		1920	11.41			47. See 285
34	Burwell-Deverre	Garfield	1920	9.76	1918	9.76	1919	9.76	1920	5.94	Earth	2.78	Sand Clay	3.16	24,260.90	24,260.91		1920	5.94			48
35	O.L.D.	Douglas	1919	4.65	1918	4.65	1919	4.65	1920	4.65				4.65	7241.69	7241.70	2747.64	1920	1.90			49. See 289
37	Rockville-Loup City	Sherman	1919	12.05	1918	12.05	1919	12.05	1919	12.05	Earth	12.05			41,792.72	41,792.72						50
	TOTALS		1917	60.84		434.44							[illegible]									
	TOTALS		1918	380.17		318.98		574.59		300.98		279.26		26.62	358595.92	304125.99	175404.97					
	TOTALS		1919	328.99		26.64		601.37		400.64		384.35		16.30	740545.38	740545.47	66399.51				5.44	
	TOTALS		1920	9.76						41.92		57.79		2.19	143294.58	143294.59	2747.64		216.46		247.08	

Project Statement: No.	Name	County	Appr. Year	Appr. Length	Surveys: Year	Surveys: Length	Preliminary Plans – Tentative: Year	Tentative: Length	Complete: Year	Complete: Length	Construction: Type	Length	Type	Length	Estimated Cost: Federal	State	County	Final Plans – Partially Complete: Year	Length	Complete: Year	Length	Remarks
38	Curtis-Stockville	Frontier	1919	12.04	1913	12.08	1919	12.08	1919	12.08	Earth	12.08			18280.72	18280.72				1920	12.08	51
39	Overton-Cozad	Dawson	1919	23.46	1918	23.46	1919	23.46	1919	27.47	Earth	25.90	Sand Clay	1.57	55069.87	55069.87		1920	25.90			52
40	Hebron-Belvidere	Thayer	1919	7.27	1918	7.27	1919	7.27	1919	7.87	Earth	7.27			20273.50	20273.50						53
41	Max-Doane	Dundy	1919	12.72	1918	12.72	1919	12.72	1919	12.72	Earth	9.37	Sand Clay	3.35	30051.89	30051.89				1920	12.72	54
42	Sargent-Harrop	Custer	1919	6.87	1918	6.87	1920	6.87	1920	4.82	Earth	4.82			27831.64	27831.64						55
		Loup	1919	15.68	1918	15.68	1920	15.68	1920	1.11	Earth	1.11			6777.12	6777.12						56
43	Tecumseh-Crab Orchard	Johnson	1919	13.86	1919	13.86	1920	13.86	1920	13.86	Earth	13.86			43281.96	43281.96						57
44	Litchfield West	Sherman		3.97	1917	3.97	1920	3.97	1920	3.97	Earth	3.97					17876.60					58
45	Harrison East	Sioux	1919	9.30	1918	9.30	1919	9.30	1920	9.30	Earth	2.49	Oil Treated	6.81	39907.36	39987.57						59
46	McCook-Bartley	Red Willow	1919	17.14	1918	17.14	1919	17.14	1919	17.14	Earth	16.76	Concrete	0.38	53655.06	53655.06	910.80					60
49	Dakota-So. Sioux City	Dakota	1919	20.10	1919	20.10	1920	20.10	1920	3.42	Earth	3.42			15118.84	15118.84						61
		Burt	1919	12.94	1919	12.94	1920	12.94	1920	4.02	Earth	4.02			13087.09	13087.09						62
		Thurston	1919	21.23	1919	21.23	1920	21.23	1920	7.83	Earth	7.83			35412.70	35412.70						63
50	Central City-Belgrade	Merrick	1919	12.79	1919	12.79	1919	12.79	1919	7.55	Earth	2.86	Sand Clay	0.30	25817.67	25817.67				1920	7.56	64
		Nance	1919	17.70	1919	17.70	1919	17.70	1919	12.14	Earth	11.12	Sand Clay	1.02	30261.98	30261.98						65
51	Minden-Franklin	Kearney	1919	11.01	1918	11.01	1919	11.01	1919	11.01	Earth	11.01			20036.76	20036.76						66
		Franklin	1919	19.09	1918	19.09	1919	19.09	1919	5.18	Earth	5.18			10591.52	10591.52						67
52	Holdrege-Platte River	Phelps	1919	17.11	1919	17.11	1920	17.11	1920	9.98	Earth	7.00	Sand Clay	2.98	31512.98	31512.99						68
53	Genoa-Albion	Nance	1919	8.14	1918	8.14	1919	8.14	1919	8.14	Earth	8.04	Sand Clay	0.10	12436.75	12436.75		1920	8.14			69 See 290
		Boone	1919	13.27	1918	13.27	1919	13.27	1919	13.27	Earth	13.27			22251.67	22251.68		1920	13.27			70 See 291
54	Chappel-Big Springs	Deuel	1919	18.0	1919	15.34	1919	15.34	1919	10.96	Earth	10.96			21186.66	21186.66		1920	10.96			71
55	Dorchester-Fairmont	Saline	1920	11.0	1919	15.98	1920	15.98	1920	1.05	Earth	1.05			4902.06	4902.06						72
		Fillmore			1918	17.64																73 Cancelled
56	Seward-Aurora	Seward	1919	13.46	1918	13.46	1919	13.46	1919	13.46	Earth	13.46			30716.68	30716.68		1920	13.46			74
		York	1919	25.87	1918	25.87	1919	25.87	1919	25.87	Earth	25.87			37393.15	37393.15		1920	25.37			75 See 292
		Hamilton	1919	9.57	1918	9.57	1919	9.57	1919	9.57	Earth	9.57			15825.79	15825.79		1920	9.57			76 See 293
57	Wakefield-Allen	Dixon	1919	10.99	1918	10.99	1920	10.99	1920	3.93	Earth	3.93			15316.99	15317.00						77
58	Schuyler-Platte River	Colfax	1920	17.75	1918	17.75	1919	17.75	1919	7.95	Earth	6.53	Concrete	1.42	45231.41	45231.41	18421.65	1920	1.42			78
59	Bartlett Road	Wheeler	1919	8.00	1919	8.00	1919	8.00														79 Cancelled
60	Cushing-Grand Island	Howard	1919	23.20	1919	23.20	1919	23.20	1919	7.58	Earth	2.32	Sand Clay	5.29	26575.84	26575.84						80
		Hall	1919	2.00	1919	2.00	1919	2.00														81
61	Dunning-Brewster	Blaine	1919	9.10	1919	16.82																82 Cancelled
62	Thedford Co Line	Thomas	1919	4.80	1919	4.80																83 Cancelled
63	Elsie-Hayes Center	Perkins	1919	12.35	1918	12.35	1919	12.35														84
		Hayes	1919	29.15	1918	29.15	1919	29.15														85
64	Pierce Project	Pierce	1919	9.61	1919	9.61	1919	9.61	1920	9.61	Earth	9.61			32152.75	32152.76						86 See 294
65	Greeley Center-Spalding	Greeley	1919	17.61	1919	17.61																87
66	Valentine-Sparks	Cherry	1919	24.56	1918	24.56	1919	24.56	1920	24.56	Earth	12.65	Sand Clay	11.91	116625.80	116625.21						88
67	Oxford-Bartley	Furnas	1919	29.80	1918	29.80	1919	29.80	1919	4.57	Earth	4.52	Concrete	0.05	12862.40	12862.40						89
		Red Willow	1919	6.82	1918	6.82	1919	6.82														90
68	Trenton-McCook	Red Willow	1919	7.89	1918	7.89	1919	7.89														91
		Hitchcock	1919	15.71	1918	15.71	1919	15.71	1920	4.46	Earth	4.33	Concrete	0.13	31291.78	31291.78						92
69	Harrisburg-Scottsbluff	Banner	1919	14.73	1919	14.73	1920	1.03	1920	1.03	Earth	1.03										93 County
		Scottsbluff	1919	10.25	1919	10.25	1920	1.70	1920	1.70	Earth	1.70					29610.07					94
70	Stanton-Wisner-Wayne	Stanton	1919	12.59	1919	12.59																95
		Cuming	1919	14.29	1919	14.29																96
		Wayne	1919	12.26	1919	12.26																97
71	Orleans-Franklin	Harlan	1919	10.85	1918	10.85	1918	10.85	1919	10.85	Earth	10.37	Concrete Sand Gravel	0.04 0.44	47780.08	47780.08						98
		Franklin	1919	13.42	1918	13.42	1919	13.42	1919	13.42	Earth	13.27	Concrete	0.15	49197.44	49197.45						99
72	Hartington-Vaughton	Cedar	1919	10.45	1917	10.45	1920	10.45	1920	10.45	Earth	10.45			31501.71	31501.72						100
	TOTAL		1917			14.42							Surfacing									
	TOTAL		1918			406.86																
	TOTAL		1919	652.32		293.21		447.05		233.21		224.10		14.11	625434.20	625434.22	19332.45					
	TOTAL		1920	24.75				151.91		115.10		93.27		21.83	404862.82	404862.87	46886.67		108.05		32.36	

Project Statement					Surveys		Preliminary Plans											Final Plans				Remarks
							Tentative		Complete		Construction				Estimated Cost			Partially Complete		Complete		
No.	Name	County	App.	Length	Year	Length	Year	Length	Year	Length	Type	Length	Type	Length	Federal	State	County	Year	Length	Year	Length	
73	Kearney-Pleasanton	Buffalo	1919	20.4	1917	20.4	1919	20.4	1919	20.40	Earth	19.12	Sand Clay	1.28	39715.80	39715.80				1920	20.80	101
74	Doade-Haigler	Dundy	1920	17.13	1917	17.13	1919	17.13	1919	4.49	Earth	4.41	Concrete	0.08	13913.02	13913.02						102
75	Geneva-Belvidere	Fillmore	1919	12.53	1918	12.53	1919	12.53	1919	12.53	Earth	12.53			33814.66	33814.62						103
		Thayer	1919	5.34	1918	5.34	1919	5.34	1919	5.34	Earth	5.34			11449.97	11449.97						104
76	Alliance-Chadron	Dawes	1919	29.20	1919	29.20	1920	29.20	1920	14.53	Earth	14.53			57626.82	57626.82						105
		Box Butte	1919	26.83	1919	26.83																106
77	Hastings-Ayr	Adams	1919	11.28	1918	11.28	1919	11.28	1919	11.28	Earth	10.87	Concrete Gravel	0.06 0.35	30396.65	30396.65						107
78	Center Street	Douglas	1919	12.83	1918	12.83	1919	12.83	1919	12.83	Earth	12.83			44071.12	44071.13						108
79	Bayard-Broadwater	Morrill	1919	34.30	1919	34.30	1920	34.30	1920	13.39	Earth	13.07	Sand Clay	0.32	31022.20	31022.20						109
80	Hyannis-Whitman	Grant	1919	13.06	1918	13.06	1918	13.06														110 Cancelled
81	Fremont-Ames	Dodge	1919	5.94	1918	5.94	1919	5.94	1919	5.94			Concrete	5.94	60221.17	60221.17	78928.00			1920	5.94	111
82	Broadwater-Oshkosh	Garden	1919	18.93	1918	18.93	1919	18.93	1920	8.67	Earth	2.86	Sand Clay	5.81	50401.19	50401.20						112
		Morrill	1919	13.07	1918	13.07	1919	13.07														113
83	Neligh-Albion	Antelope	1919	16.79	1919	16.79	1920	16.79														114
		Boone	1919	16.64	1919	16.64																116
84	Greeley Center-Wolbach	Greeley	1920	16.64	1919	16.64	1919	16.64	1919	6.60	Earth	4.89	Sand Clay	1.71	23829.35	23829.34				1920	13.31	116
85	Burwell-Scotia	Garfield	1919	4.20	1919	4.20	1919	4.20														117
		Greeley	1919	4.34	1919	4.34	1919	4.34														118
		Valley	1919	33.58	1919	33.58	1919	33.58	1920	13.31	Earth	13.31			43320.89	43320.90		1920	13.31			119
86	Shelby-Platte River	Polk	1919	17.00	1919	17.00	1920	17.00														120
87	Norfolk-Stanton	Madison	1919	2.50	1917	2.50	1920	2.50	1920	2.50			Gravel	2.50	6210.80	6210.81						121
		Stanton	1919	8.64	1917	8.64	1920	8.64	1920	8.64			Gravel	8.64	18392.58	18392.59						122
88	Oakland-Crowell	Burt	1919	4.27	1919	4.27	1920	4.27														123
		Cuming	1919	13.75	1919	13.75	1920	13.75	1920	3.34			Sand Gumbo	3.34	22545.00	22545.01						124
		Dodge	1919	3.17	1919	3.17	1920	3.71	1920	1.01			Sand Gumbo	1.01	4900.48	4900.48						125
89	Ainsworth-Harrop	Brown																				126 Cancelled
		Loup																				127 Cancelled
		Rock																				128 Cancelled
90	Central City-Palmer	Merrick	1919	22.00																		129
91	Florence-Blair	Washington	1920	13.12	1917	13.12	1919	13.12	1920	5.97	Earth	5.97			35147.22	35147.22						130
		Douglas		3.38	1917	3.38	1919	3.38														131 Withdrawn
92	Litchfield-Pleasanton	Sherman	1919	11.75																		132
		Buffalo	1919	3.25																		133
94	Arthur-Roscoe	Arthur	1919	15.30	1919	15.30	1920	15.30														134
		Keith	1919	12.5																		135
95	Chase-Imperial	Chase	1919	24.30																		136
96	Arnold-Stapleton	Logan	1919	21.55	1919	21.55	1919															137
		Custer	1919	13.47	1919	13.47	1919															138
97	Table Rock-Lewiston	Pawnee	1919	30.60	1919	30.60	1920	30.60	1920	15.70	Earth	15.70			43643.85	43643.85						139
98	Crete-Wilber	Saline	1919	21.34	1919	21.34	1920	21.34	1920	11.92	Earth	11.92			23252.76	23252.76						140
	Dorchester	Lancaster	1919	11.96	1919	11.96	1920	11.96	1920	11.96	Earth	11.96			37901.12	37901.13						141
99	Thedford-Brewer	Thomas	1919	14.80	1919	14.80																142 Cancelled
100	"Q" Street Road	Douglas	1919	10.29	1918	10.29	1919	10.29	1919	10.29	Earth	10.29			35376.87	35376.88						143 See 295
101	Scottsbluff-Minatare	Scottsbluff	1919	6.25	1919	6.25	1919	6.25	1919	6.25	Earth	6.25					22522.98					144
102	Harrison-Whitney	Sioux	1919	16.51	1918	16.51	1920	12.16														145
		Dawes	1919	14.51	1918	14.51																146
103	Scottsbluff-Gering	Scottsbluff	1919	0.52	1919	0.52	1919	0.52	1919	0.52			[illegible] Bridge	approx.	75041.85	75041.85						147
104	Grand Island N.E.	Hall	1919	3.01	1919	3.01	1919	3.01	1919	3.01	Earth	3.01			5895.55	5895.56						148
105	Cozad-Gothenburg	Dawson	1919	13.45	1918	13.45	1919	13.45	1919	13.45	Earth	13.45			29014.42	29014.43						149
106	Beatrice-Institute	Gage	1919	1.15	1919	1.15	1919	1.15	1919	1.15			Brick	1.15	23000.00	37868.74				1920	1.15	150
	Totals		1917			65.17																
	Totals		1918			147.74		13.06														
	Totals		1919	597.11		360.66		222.36		114.08		102.99		11.09	425740.57	440604.16	101520.95					
	Totals		1920	46.83				221.56		110.94		89.32		21.62	374354.91	374354.97			13.31		40.80	

PROJECT STATEMENT					SURVEYS		PRELIMINARY PLANS											FINAL PLANS				REMARKS
							TENTATIVE		COMPLETE		CONSTRUCTION				ESTIMATED COST			PARTIALLY COMPLETE		COMPLETE		
No	Name	County	App.	Length	Year	Length	Year	Length	Year	Length	Type	Length	Type	Length	Federal	State	County	Year	Length	Year	Length	
107	Broomwood-Chalco	Cass	1920	9.04	1919	9.04	1920	8.85	1920	8.85	Earth	8.85			22689.88	22689.89						151
		Sarpy	1920	18.41	1919	18.41																152
		Saunders	1920	6.86	1919	6.86																153
108	Hay Springs-Merriman	Cherry	1920	26.82	1919	25.88	1920	25.88														154
		Sheridan	1920	34.32	1919	34.32	1920	34.32														155
109	Valentine-Merriman	Cherry		68.70	1919	68.70																156 Cancelled
110	Niobrara-Spencer	Knox	1919	21.34	1919	21.34	1919	21.34														157
		Boyd	1919	19.36	1919	19.36	1919	19.36														158
111	Tryon-Ringgold	McPherson	1920	8.80	1920	8.80	1920	8.80	1920	4.09	Earth	1.06	Sand Clay	3.03	20838.58	20838.59						159
112	Millard-Elkhorn Highway	Douglas	1919	16.69	1919	16.69	1920	16.69	1920	16.69	Earth	16.69			43470.98	43470.99						160
113	Center-Niobrara	Knox	1919	16.90	1918	24.11	1920	24.11	1920	6.74	Earth	6.74			47585.74	47585.75						161
114	Trenton-Max	Hitchcock	1919	16.74	1918	16.74																162
		Dundy	1919	4.62	1918	4.62	1920	4.62														163
115	Barrens Creek	Platte	1919	3.00	1919	3.00	1920	2.59	1920	2.59			Concrete	2.59	51800.00	50136.76	32875.00					164 See 236
116	Tecumseh-Auburn	Johnson	1919	8.82	1918	8.82	1920	8.82														165
		Nemaha	1919	12.18	1919	12.18	1920	12.18														166
117	Lewellen-Oshkosh	Garden	1920	12.85	1919	12.85																167
118	Hebron-Fairbury	Thayer	1919	14.89	1919	14.89	1920	14.89														168
		Jefferson	1919	10.46	1919	10.46	1920	10.46														169
119	Arthur South	Arthur																				170 Cancelled
120	Plattsmouth-Omaha	Sarpy																				171 Cancelled
121	Grant-Elsie	Perkins	1919	17.80	1919	18.36	1920	18.36	1920	8.93	Earth	5.65	Sand Clay	3.28	25357.09	25357.10						172
122	Beatrice-Cook-Lewiston	Gage	1919	27.71	1919	27.71	1920	27.71														173
	Lewiston	Johnson	1919	2.64	1919	2.64	1920	2.64														174
		Pawnee	1919	3.21	1919	3.21	1920	3.81														175
123	Falls City South	Richardson	1919	1.48	1920	1.48	1920	1.48	1920	1.48	Earth	1.48			35551.69	35551.69						176
124	Hay Springs-Whitney	Sheridan	1919	6.61																		177
		Dawes	1919	27.79																		178
125	Long Pine-Johnstown	Brown	1919	20.26	1919	20.25	1920	20.25	1920	7.76	Earth	6.77	Sand Clay	0.99	37242.21	37242.22						179
126	Culbertson-Hayes	Hitchcock	1920	10.51	1918	10.51																180
	Center	Hayes	1920	17.70	1918	17.70																181
127	Ansley-Sargent	Custer	1919	20.31	1919	20.31																182
128	Seward-Lincoln	Seward	1919	16.48	1919	16.48	1920	16.48	1920	7.18	Earth	7.18			31897.89	31897.90						183
		Lancaster	1919	12.62																		184
129	Hamlet-Wauneta	Chase																				185 Cancelled
130	Sidney-Dalton	Cheyenne	1919	33.80	1919	33.80	1920	33.80	1920	12.04	Earth	12.04			36025.95	36025.95						186
131	Table Rock-Verdon	Pawnee	1919	4.28	1919	4.28	1920	4.28														187
		Richardson	1919	19.85	1919	19.85	1920	19.85														188
132	Atkinson-Bartlett	Holt	1920	38.81	1919	6.94																189 See 237
		Wheeler	1920	11.01																		190
133	Nebr. City-Lincoln	Otoe	1919	38.59	1919	38.59	1920	38.59														191
		Cass	1919	3.97	1919	3.97	1920	3.97														192
		Lancaster	1919	12.38	1920	12.38																193
134	O.L.D.	Seward	1919	18.13	1918	18.13	1919	18.18	1920	18.12	Earth	18.12			49151.87	49151.87						194
135	Central City-Chapman	Merrick	1920	16.47	1919	16.47	1920	16.47	1920	9.53			Gravel	9.53	23813.65	23813.64						195
136	Pierce-Plainview	Pierce	1920	33.30	1919	33.33	1920	33.33	1920	2.11	Earth	0.33	Sand Clay	2.56 0.22	16537.95	16537.95						196
137	Springview-Bassett	Keya Paha	1920	14.27	1919	14.27	1920	14.27	1920	3.04			Sand Clay	3.04		57057.50						197
		Rock	1920	12.01	1919	12.01	1920	11.70														198
138	La Platte-Omaha	Sarpy	1920	8.46	1920	8.46	1920	8.46	1920	8.46	Earth	8.46			29165.75	29165.75						199
																						200
		TOTALS	1917										Surfacing									
		TOTALS	1918			101.65																
		TOTALS	1919	453.66		565.15		53.84														
		TOTALS	1920	277.44		18.14		457.51		116.79		92.75		24.04	478130.17	527523.51	32875.00					

Project Statement					Surveys		Preliminary Plans											Final Plans				Remarks
							Tentative		Complete		Construction				Estimated Cost			Partially Complete		Complete		
No.	Name	County	App.	Length	Year	Length	Year	Length	Year	Length	Type	Length	Type	Length	Federal	State	County	Year	Length	Year	Length	
139	Norfolk-Ewing	Madison	1920	28.80	1919	28.80	1920	28.80	1920	3.22			Gravel	3.22	12463.04	12463.04						201
		Antelope	1920	25.47	1919	25.47	1920	13.47														202
		Holt	1920	8.65	1919	8.65	1920	8.65														203
140	Broken Bow-Merna	Custer	1920	11.80																		204
141	Bassett-Long Pine	Rock	1920	10.84	1919	10.84																205
		Brown	1920	1.02	1919	1.02																206
142	Belgrade-Spaulding	Nance		1.00																		207 See 298
		Greeley		5.50																		208
143	Fairmont-Osceola	Polk	1920	10.13	1920	10.13																209
		Fillmore	1920	4.03	1920	4.03																210
		York	1920	23.82	1920	23.82																211
144	Bayard-Minatare	Morrill	1920	5.4																		212
		Scottsbluff	1920	11.00																		213
145	Oxford-Holdrege	Harlan	1920	15.3																		214
		Phelps	1920	10.6	1920	10.6	1920	10.60														215
146	Ogallala-Belmar	Keith	1920	21.02	1919	21.02	1920	21.02	1920	13.64	Earth	11.75	Clay	1.89	37828.13	37828.13						216
147	Kimball-Potter	Cheyenne		3.11																		217
		Kimball		14.89																		218
148	Elwood-Stockville	Gosper	1920	11.74	1920	11.74																219
		Frontier	1920	25.06																		220
149	Lodge Pole-Potter	Cheyenne	1920	36.51																		221
150	Brady-Gothenburg	Lincoln	1920	8.95	1920	8.95	1920	8.95														222
		Dawson	1920	3.85																		223
151	Havelock Paving	Lancaster	1920	0.60	1920	0.60	1920	0.60	1920	0.60			Brick	0.60	10977.34		31312.63					224
152	Shelton-Elm Creek	Buffalo	1920	36.50																		225
153	Eagle-Murray	Cass	1920	34.00	1920	14.02	1920	14.02														226
154	Grand Island & Hastings	Hall		16.90	1919	16.90	1919	16.90														227 Cancelled
		Adams		6.66	1919	6.65	1919	6.66														228 Cancelled
155	Havelock-Ceresco	Lancaster	1920	13.08																		229
		Saunders	1920	0.12																		230
156	Central City-Eldorado	Merrick	1920	1.68	1920	1.68																231
		Hamilton	1920	26.62	1920	26.62																232
157	David City-Seward	Butler	1920	15.06	1920	15.06	1920	15.06														233
		Seward	1920	9.74																		234
158	Atkinson-O'Neill	Holt		17.0	1920	19.41	1920	19.41														235
159	Fairmont-Geneva	Fillmore	1920	6.36	1920	6.36																236
160	Long Pine-McLane's Bdg.	Brown	1920	14.52	1920	14.52	1920	14.52														237
161	Wilber-Western	Saline	1920																			238
162	Waterloo-Center St.	Douglas		3.63	1920	3.63																239
163	Spring View-McLane's Bridge	Keya Paha	1920	9.27	1920	9.27	1920	14.02														240
164	Hebron-Nelson	Thayer		14.08	1920	14.02																241
		Nuckolls		15.06	1920	15.06																242
165	Bridge #1-H'way 41	Adams																				243 Cancelled
166	Bridge #2 H'way 41	Adams																				244 Cancelled
167	Bridge #3 H'way 41	Adams																				245 Cancelled
168	Stuart-Bassett	Holt		5.93	1920	4.00																246
		Rock		15.67	1920	16.67																247
																						248
																						249
																						250
	Totals		1917										Surfacing									
	Totals		1918																			
	Totals		1919			102.46																
	Totals		1920	458.94		230.19		192.66		17.46		11.75		5.71	61268.51	50891.17	31312.63					

Project Statement			Resurvey		Preliminary Plans														Remarks
					Revised		Length		Construction				Estimated Increase			Estimated Decrease			
No	Name	County	Year	Length	Year	Length	Increase	Decrease	Type	Length	Type	Length	Federal	State	County	Federal	State	County	
2	Falls City-Neb. City	Richardson			1919	24.14			Earth	24.14			16857.50	16857.50					251 See 253
		Nemaha			1919	21.23			Earth	21.23			13158.75	13158.75					252 See 254
		Richardson	1919	24.14	1920	24.14			Earth	24.14			14717.98	14717.99					253
		Nemaha	1919	21.16	1920	21.16		0.07	Earth	21.16			15813.47	15813.48					254
		Otoe			1920	10.09			Earth	10.09			3790.37	3790.38					255
3	Hall County	Hall			1919	21.22					Gravel	21.22	42131.48	42131.48					256 See 257
		Hall			1920						Gravel	-6.81				7126.92	7126.92		257
4	Cedar-Wayne	Cedar			1920								5135.61	5135.62					258
		Wayne			1920											614.40	614.41		259
		Dixon			1920								3265.76	3265.76					260
5	Norfolk-Columbus	Madison			1919								1100.55	1100.55					261
		Platte	1919	19.50	1919	19.50			Earth	19.50			5112.05	5112.05					262
7	Superior-Harvard-Minden	Nuckolls																	263 See 267
		Clay																	264
		Adams																	265
		Kearney																	266
		Nuckolls			1920	10.06					Gravel	10.06	23337.35	23337.35					267
10	North Platte-Sutherland	Lincoln			1919	16.10					Gravel	16.10	23193.86	23193.86					268
18	Lincoln-Beatrice	Gage			1920								4695.61	4695.61					269
20	Lincoln Highway	Douglas									Brick								270
21	Alliance-Antioch	Box Butte			1919	7.67		0.95	Earth	5.99	Gravel Clay	1.68				2822.75	2822.75		271
		Sheridan			1919	6.89	0.69		Earth		Gravel Clay	6.89	2568.15	2568.16					272
22	Broken Bow	Custer	1920	1.50	1920	1.50			Earth	1.50			775.50	775.50	98.01				273 See 274
		Custer			1920														274
23	Blair-Oakland	Washington			1920								1398.72	1398.72					275
		Burt			1920								6016.81	6016.81					276
25	Beatrice-Fairbury	Gage	1920	10.66	1920	10.66			Earth	10.66			1653.08	1653.08					277
		Jefferson	1920	19.03	1920	19.03				19.03			8019.34	8019.33					278
27	Fremont-Ceresco	Saunders	1919	29.12	1919	29.12			Earth	5.94	Gravel	23.18	47025.19	47025.19					279 See 280
		Saunders			1920	28.62		0.50	Earth	28.62			10829.29	10829.29	1762.01				280 See 282
		Dodge			1920	1.96	0.75		Earth	+1.96					25362.87	52.94	52.94		281
		Saunders			1920						Gravel	-11.25				28097.38	28097.38		282
28	Nebraska City-Plattsmouth	Cass	1919	1.75	1919	1.75		0.50	Earth	1.75			356.95	356.95					283 See 285
		Otoe	1919	9.76	1920	9.76			Earth	9.76									284
		Cass			1920	15.95			Earth	15.95									285
29	Osceola-David City	Butler	1919	3.00	1919	3.00			Earth	3.00						240.43	240.43		286
31	Allen-Ponca	Dixon																	287
33	Center-Creighton	Knox			1920								4801.44	4801.44					288
35	O.L.D.	Douglas	1920	1.90	1920	1.90			Earth	1.90			1453.24	1453.23					289
53	Genoa-Albion	Nance																	290
		Boone																	291
56	Seward-Aurora	York	1919	25.37	1919											731.92	731.92		292
		Hamilton	1919	5.57	1919	4.6			Earth	4.0						2258.99	2258.97		293
64	Pierce Project				1920								1577.01	1577.00					294
100	Q Street Road	Douglas			1920								3436.15	3436.15	1387.00				295
115	Burrows Creek	Platte			1920	1.79		0.80			Concrete	1.79			1228.13	15940.00	22744.94		296
132	Atkinson-Bartlett	Holt					24.95												297
142	Belgrade-Spaulding	Boone					22.50												298
																			299
																			300

Following is a summary of all Federal and State Aid road work by years:

(Miles) Nature of Work	1917	1918	1919	1920	Total
Project Statements Approved	60.84	380.17	2,012.07	821.78	3,274.86
Surveys Made	514.23	975.21	1,348.12	248.33	3,085.89
Tentative Plans	0	587.63	935.63	1,003.66	2,526.92
Plans Complete	0	300.90	752.97	402.21	1,456.08
Earth Road Construction	0	274.28	711.47	319.88	1,305.63
Surface Road Construction	0	26.62	41.50	82.33	150.45
Re-Surveys	0	0	143.37	33.09	176.46
Plans Revised (Number)	0	0	18	24	42
Plans Revised (Miles)	0	0	154.62	156.56	311.18
Increased Length (Due to Revision)	0	0	0.69	0.75	1.44
Decreased Length (Due to Revision)	0	0	1.45	1.37	2.82
Earth Road Construction Plans Revised	0	0	85.55	144.71	230.26
Surface Road Construction Plans Revised	0	0	69.07	11.85	80.92
Increase Due to Revision Earth Roads	0	0	0	18.31	18.31
Decrease Due to Revision Earth Roads	0	0	61.0	10.93	71.93
Increase Due to Revision Surface Roads	0	0	60.50	10.06	70.56
Decrease Due to Revision Surface Roads	0	0	0.26	18.06	18.32

Nature of Work	1917	1918	1919	1920	Total
Total Estimated Federal Aid (Plans Complete)	0	$ 358,595.92	$1,791,719.95	$1,455,910.99	$3,606,226.86
Total Estimated State Aid (Plans Complete)	0	304,195.99	1,806,583.80	1,500,327.11	3,611,106.90
Total Estimated Other Funds (Plans Complete)	0	175,404.99	187,252.89	113,821.44	476,479.82
Total Federal Aid Estimated Increase (Plans Revised)	0	0	151,504.48	110,716.73	262,221.21
Total State Aid Estimated Increase (Plans Revised)	0	0	151,504.49	110,716.74	262,221.23
Total Other Funds Estimated Increase (Plans Revised)	0	0	0	29,839.02	29,839.02
Total Federal Aid Estimated Decrease (Revised Plans)	0	0	6,054.09	51,831.64	57,885.73
Total State Aid Estimated Decrease (Revised Plans)	0	0	6,054.09	58,636.59	64,690.68
Total Other Funds Estimated Decrease (Revised Plans)	0	0	0	0	0
Total Federal Aid Estimated (Completed and Revised Plans)	0	358,595.92	1,937,170.34	1,514,796.08	3,810,562.34
Total State Aid Estimated (Completed and Revised Plans)	0	304,195.99	1,952,034.20	1,552,407.26	3,808,637.45
Total Other Funds Estimated (Completed and Revised Plans)	0	175,404.99	187,252.89	143,660.96	506,318.84
Final Plans Partially Complete	....	.....	.....	337.86 mi.	.....
Final Plans Completed	....	.....	5.44 mi.	327.38 mi.	332.82 mi.
Complete or Partially Complete	....	.....	.....	.....	670.68 mi.

State Standard Bridge Plans.

The State laws require that the bridges in the various counties be built according to plans as provided by the State Department. This provision is made to insure that bridges of uniform and satisfactory design will be constructed in all counties. Previous to the passage of this law the various bridge contractors submitted their own plans with their bids and it was, therefore, left to the County Boards to decide on the design to be used. The result of this practice was that the County Boards were unable to determine which were the best designs, and consequently many poor designs were accepted. As no two bridge contractors bid on the same plans, it was impossible to make an intelligent comparison of bids, and many poor designs were accepted at prices far too high.

Several years ago, State Standard Plans were prepared for the various types of bridges, from a four-foot span concrete arch culvert to 120 foot span steel truss bridges. These were designed to carry as a live load a fifteen ton engine, which was designated as a twenty ton bridge. The maximum width of roadway was 16 feet. Plans were made for the two main types of Pratt truss steel bridges, with either wooden or concrete floors. This required four designs for each loading of any given length of span. For instance, if a twenty ton bridge with 60 foot span were desired, designs of the following are available: Pin Connected truss with wood floors; Rivet Connected truss with wood floors; Rivet Connected truss concrete floor.

It has been considered advisable on account of the evolution of traffic to provide increased width of roadway on all new bridges on main roads. In accordance therewith this office did, during the year 1919, revise all twenty ton bridge designs to provide for a roadway of 20 feet. The fifteen ton bridges were not revised, as they are to be used only on less important roads, where the 16 foot roadway meets traffic conditions quite satisfactorily.

This office also checks detailed shop drawings against State Standard plans for the various bridge companies before fabrication of the bridge is started. This insures that the bridges, when fabricated and erected, will conform to the standard requirements.

To provide standard designs for practically all conditions, this office has been re-designing the old standard plans to provide for roadways of 16, 18, and 20 feet. This will eliminate many extras on bridge contracts now required to cover roadways which are not shown on Standard Plans. Improved practice in designs and details are being incorporated in our new plans. Provision is also being made for the addition of bituminous wearing surface to a depth of two inches at any future date when it may be desired. This provision is as recommended by the Bridge Department of the U. S. Bureau of Public Roads on Federal Aid Bridges.

Calculation of stresses and sizes of various members for the new Standard Plans is practically completed and some of the new plans have already been completed.

State Aid Bridge Plans.

The plans for the various State Aid Bridges are prepared in this office. These are each special designs, as our Standard Plans are not intended for these large river bridges. Plans were made during 1919 and 1920 for seven concrete arch bridges, four of these being across the North Platte River in Scotts Bluff County at Scottsbluffs, Morrill, Minatare and Henry. The remaining three were for bridges across the Platte River at Shelton, Grand Island, and Central City. Each of these bridges consisted of a series of concrete arches, each 50 feet in length, extending across the main portion or portions of the river channel.

State Institution Paving Plans.

State Institution Paving Plans were prepared for 1.15 miles of brick paving connecting the State Institution for the Feeble Minded with the City of Beatrice, and for approximately 1.5 miles connecting the Peru State Normal with the railroad depot at that place.

Special Bridge and Culvert Plans for Federal Aid Roads.

It quite frequently develops that our Standard Bridge Plans and our Standard Culvert Plans for Federal Aid Roads will not meet special conditions which are encountered, and special designs are necessary to handle these conditions. Many special plans were made for headwalls, drop inlets, drop outlets, curved floors for culverts and for extensions and repairs to existing bridges and culverts. These must be approved individually by the Federal Bureau of Public Roads.

Special Bridge Plans for Counties.

When it is found that our Standard Bridge and Culvert Plans cannot be properly adjusted or modified to suit existing conditions in County Bridge work, it is quite frequent that the necessary information is furnished to this office and a special design prepared for each special condition. This is usually done at the request of the County Board or County Highway Commissioner. This cooperation between the Counties and the Department is of great benefit in getting the best results and in saving of County Funds. This Department encourages such cooperation from the Counties.

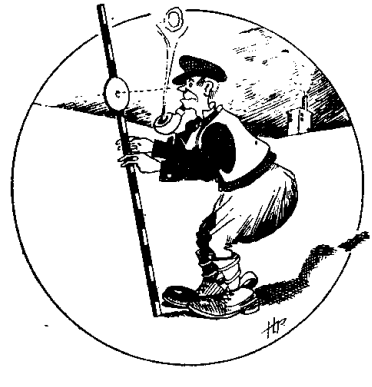
Specifications.

For the use of the State on State Aid Bridges, or for Federal and State Aid Bridges and culverts and for the use of the various County authorities, this Department prepares and distributes Standard Specifications, published in 1917. These have become somewhat out of date, and were never officially approved for Federal Aid Bridge work. This necessitated some extra work in making special specifications for indi-

vidual cases of Federal Aid Bridge work. During this year a complete revision of these specifications has been made. Specifications as prepared by the various other states were requested, and were used as reference in making up our new specification. Federal comment on certain provisions was requested and received due consideration in this work. These new specifications are now complete and have been submitted to the U. S. Bureau of Public Roads for their approval for use on Federal Aid Bridge work. As soon as this approval is received, they will be published, and will supercede the issue of 1917.

Below is listed a tabulation of the main items of Bridge work handled by this office during the years 1919 and 1920.

Standard Bridge Plans Revised	48
Detailed Shop Drawings checked	52
New Standard Plans completed	11
Calculations completed for Standard Plans	96
State Aid Bridge Plans made	7
Plans for Repairs and Protection Work, State Aid Bridges	12
Special Bridge and Culvert Plans for Federal Aid Roads	54
Special County Bridge Plans completed	25
Special County Bridge Plans checked	27
Bridge Specifications Revised and Compiled	1 set



State Aid Bridges.

On November 1, 1920, there were on file twenty-three applications for State Aid in the construction of long bridges. Several of the counties who have made application for aid do not have sufficient money in their own bridge fund to meet the State's share. In most cases, however, they are very anxious for work to commence. Following is the list of applications on file. It is interesting to note that if the State Aid Bridge Fund remains the same, it would take the appropriation six years to complete the list:

STATE AID BRIDGE APPLICATIONS ON FILE IN THE ORDER OF FILING.

Name of Bridge	Date Filed	River	Counties
Prairie Island	Mar. 7, 1912	Platte River	Merrick County
Valley	Mar. 19, 1913	Elkhorn River	Douglas County
Willow Island	Feb. 11, 1914	Platte River	Dawson County
Yutan	Dec. 31, 1914	Platte River	Douglas and Saunders Counties
Cozad	May 10, 1915	Platte River	Dawson County
Ewing	July 2, 1915	Elkhorn River	Holt County
Trenton	Dec. 21, 1915	Republican River	Hitchcock County
Greeley	Jan. 20, 1916	North Loup	Greeley County
McLain	Mar. 28, 1916	Niobrara	Brown County
Silver Creek	July 6, 1916	Platte River	Polk County
Oshkosh	July 22, 1916	North Platte River	Garden County
Brady	April 14, 1917	Platte River	Lincoln County
Plattsmouth	Aug. 6, 1917	Platte River	Cass County
Burwell	June 25, 1918	Loup River	Garfield County
Columbus	Sept. 26, 1918	Loup River	Platte County
Duncan	Nov. 21, 1918	Platte River	Platte and Polk Counties
Palmer	Nov. 24, 1918	Loup River	Nance County
Stanton	May 8, 1919	Elkhorn River	Stanton County
Clarks	Nov. 20, 1919	Platte River	Polk County
Sargent	Jan. 23, 1920	Middle Loup River	Custer County
McCook	Feb. 4, 1920	Republican River	Red Willow County
Lisco	April 15, 1920	North Platte River	Garden County
Tilden	May 28, 1920	Elkhorn River	Madison County

STATE AID BRIDGES CONTRACTED FOR IN 1918 AND FINISHED IN 1919.

Bridge	Contract Let	Counties	Total Cost	State's Share
Mitchell	Jan. 21, 1918	Scotts Bluff	$59,442.04	$30,675.19
Mitchell Valley	Jan. 21, 1918	Scotts Bluff	67,751.03	34,716.26
West Point	Jan. 25, 1918	Cuming	4,566.21	2,405.51
Verdigre	Jan. 24, 1918	Knox	24,596.58	17,167.37
Bartley	Jan. 28, 1918	Red Willow	32,144.73	16,203.71
North Platte	Feb. 27, 1918	Lincoln	58,900.23	31,495.30

For bids submitted, see Report for 1917-1918.

Fairbury State Aid Bridge.

This bridge was constructed for Jefferson County in 1916 and 1917 by the Standard Bridge Company of Omaha, Nebraska. Application for State Aid had previously been made by the County on September 9, 1915, but owing to the dangerous condition of the old bridge, the new one was built before it was granted. In April, 1919, the construction of the bridge was approved and the County reimbursed for one-half the cost.

Ashland State Aid Bridge.

This bridge was built in 1911 for the Ashland-Platte River Bridge Company by the Omaha Structural Steel Works. It was used as a toll bridge until August 1, 1919, at which time it was taken over as a State Aid Bridge. Saunders and Sarpy Counties each paid one-fourth and the State one-half of the purchase price.

EXPENDITURES TO NOVEMBER 1, 1920, STATE AID BRIDGE FUND.

Estimated Appropriation, $218,717.63, for Biennium.

Bridge	Nature of Work	Amount
Fairbury	Half total cost	$27,608.01
Ashland	Half total cost	11,500.00
Ashland	Repair	2,092.59
Monroe	Repair	1,604.91
Grand Island	Construction	23,426.71
Schuyler	Repair	1,015.85
Verdigre	Final Estimate	7,725.67
Mitchell	Final Estimate	4,955.19
North Bend	Protection	10,425.77
Red Bird	Protection	8,221.85
Central City	Construction	9,007.72
Minatare	Construction	7,759.40

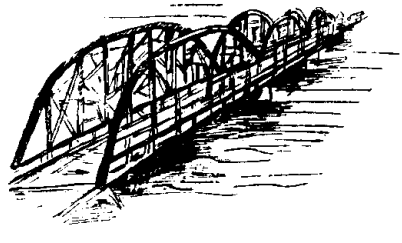
Morrill	Construction	7,032.19
Henry	Construction	3,570.57
Mitchell Valley	Final Estimate	13,222.30
Meadville	Engineering	55.61
Shelton	Engineering	1,135.32
Lexington	Repair	92.00
Carns	Repair	3,238.44
Genoa	Repair	3,378.75
	Total Expenditures	$147,069.57
	Balance	71,648.06

which will be spent approximately as follows:

Grand Island	$24,510.94
Central City	40,000.00
Morrill	1,637.12
Henry	5,000.00
Shelton	500.00
Total	$71,648.06

The following claims have been filed for repair work, which must be paid by the State from the next appropriation:

Bridge	County	Amount
Superior	Nuckolls	$3,772.82
Schuyler	Colfax and Butler	365.40
Bridgeport	Morrill	100.30
Monroe	Platte	226.17
		$4,464.69



Following, a summary of the work contracted for in 1919 is shown:

CENTRAL CITY STATE AID BRIDGE.

Location.—Two and one-half miles south of Central City.

Description.—Sixteen 50-foot concrete arches on wood piles, sand fills, surfacing and protection work.

Counties.—Merrick and Hamilton.

Estimated Cost.—$98,990.00.

Bids received at Aurora, Nebr., September 17, 1919.

Contract awarded to Western Bridge and Construction Co.. Omaha, Nebr.

SUMMARY OF BIDS.

	Monarch Engineering Co., Falls City, Nebr.	Allied Contractors, Omaha, Nebr.	Tom Gass, Elm Creek, Nebr.	Central Bridge & Const. Co., Wahoo, Nebr.	N. W. Stark & Co. Des Moines, Iowa	Western Bridge & Const. Co. Omaha, Nebr.
State Aid Concrete Bridge	$87,775.00	$87,600.00	.....	$92,200.00	$92,250.00	$83,990.00
Earthwork in Fills, per cubic yard	.48	.44	.38	.44	.42	.38
Surfacing on Fills, and Bridge, per cubic yards	2.50	1.70	1.65	2.00	1.75	1.65
Extra Plain Concrete, per cu. yd. in place	61.00	58.00	.....	59.00	58.00	58.00
Extra Reinforcing Steel, per lb. in place	.08¾	.07¾	.....	.08½	.08	.08
Extra Wakefield Piling per lin. ft. in place	.98	1.00	.....	1.40	1.00	.75
Extra Round Piling, per lin. ft. in place	1.30	1.15	.....	.90	1.25	1.10

GRAND ISLAND STATE AID BRIDGE.

Location.—Six miles southeast of Grand Island.

Description.—Sixteen 50-foot concrete arches on wood piles; sand fills, surfacing and protection work.

Counties.—Hall and Hamilton.

Estimated Cost.—$99,975.00.

Bids received at Grand Island, September 17, 1919.

Contract awarded to Western Bridge and Construction Co., Omaha, Nebr

SUMMARY OF BIDS.

	Monarch Engineering Co. Falls City, Neb.	Allied Contractors Omaha, Neb.	Tom Gass, Elm Creek, Neb.	Central Bridge & Const. Co. Wahoo, Neb.	N. M. Stark Co. Des Moines, Ia.	Western Bridge & Const. Co. Omaha, Neb.
Bridge Complete	$91,178.00	$89,200.00	.....	$92,200.00	$95,325.00	$84,975.00
Sand Fills, per cu. yd	.48	.44	.44	.44	.42	.38
Surfacing on Fills and Bridge, per cu. yd	2.50	1.70	1.65	2.00	1.75	1.65
Extra Concrete per cu. yd	61.00	58.00	.....	59.00	58.00	58.00
Extra Reinforcing per pound	.08¾	.07¾	.....	.08½	.08	.08
Extra Wakefield Piling, per lin. ft	.98	1.00	.....	1.40	1.00	.75
Extra Round Piling per lin. ft	1.30	1.15	.....	.90	1.25	1.10
Protection Work	.....	.....	3.00 Per sq. yd.	.....	.....	.....

SHELTON STATE AID BRIDGE.

Location.—Five miles south of Shelton, Nebr.

Description.—Eighteen 50-foot concrete arches, on wood piles, together with sand fills and approaches.

County.—Buffalo.

Estimated Cost.—$100,400.00.

Bids received at Kearney, Nebr.

Contract awarded to General Contracting Company, who later assigned it to C. T. Whalen, North Platte Nebr.

Contract for fills awarded to Thos. Gass, Elm Creek, Nebr.

SUMMARY OF BIDS.

	Western Bridge & Const. Co. Omaha, Neb.	N. M. Stark & Co. Des Moines, Ia.	Allied Contractors Inc. Omaha, Neb.	Thos. Gass, Elm Creek, Neb.	General Contracting Co. Minneapolis, Minn.
Bridge Complete	$91,400.00	$88,760.00	$89,000.00	....	$79,700.00
Earthwork in Fills per cu. yd	.42	.38	.40	.38	.38
Surfacing on Fills and Bridge per cu. yd	2.00	1.65	1.80	1.65	1.65
Extra Plain Concrete per cu. yd	60.00	58.00	58.00	.....	51.00
Extra Reinforcing per pound	.09	.08	.0775	.....	.07
Extra Wakefield Piling per lin. ft	1.95	1.10	1.70	.....	.85
Extra Round Piling per lin. ft	1.10	1.10	1.00	.....	1.25
Protection Work				3.00 Per sq. yd.	

MORRILL STATE AID BRIDGE.

Location.—Two miles south of Morrill, Nebr.

Description.—Twelve, 50-foot concrete arches, on wood piles, sand fills, surfacing, and protection work.

County.—Scotts Bluff.

Estimated Cost.—$68,071.00.

Bids received at Gering, Nebr., September 16, 1919.

Contract awarded to Allied Contractors, Inc., Omaha, Nebr.

SUMMARY OF BIDS.

	Western Bridge Co. Omaha.	Allied Contractors Omaha Neb.	Monarch Engineering Co. Falls City, Neb.	N. M. Stark, Des Moines, Ia.	C. G. Sheely, Denver, Colo.	Central Bridge & Const. Co.
State Aid Concrete Bridge	$58,900.00	$57,950.00	$61,558.00	.....	$59,900.00	$61,970.00
Earthwork in Fills per cu. yd	.40	.38	.40	.....	.42	.45
Surfacing on fills and Bridge, per cu. yd	2.00	1.65	1.65	.....	1.75	1.69
Extra Plain Concrete per cu. yd. in place	57.50	57.60	58.00	.....	60.00	59.00
Extra Reinforcing Steel, per pound in place	.085	.08	.08	.....	.0825	.08
Extra Wakefield Piling, per lin. ft. in place	2.00	1.25	1.50	.....	1.40	1.50
Extra Round Piling per lin. ft. in place	1.20	.85	.95	.....	.92	1.00

MINATARE STATE AID BRIDGE.

Location.—Two miles south of Minatare, Nebr.

Description.—Twelve, 50-foot concrete arches, on wood piles, with sand fills, surfacing, and protection work.

County.—Scotts Bluff.

Estimated Cost.—$63,620.00.

Bids received at Gering, Nebr., September 16, 1919.

Contract awarded to Allied Contractors, Inc., Omaha, Nebr.

SUMMARY OF BIDS.

	Western Bridge Co. Omaha.	Allied Contractors, Omaha.	N. M. Stark, Des Moines, Ia.	Central Bridge & Const. Co.
State Aid Concrete Bridge	$58,400.00	$57,000.00	$59,000.00	$61,000.00
Earthwork in Fills per cu. yd	.40	.38	.48	.45
Surfacing on Fills and Bridge, per cu. yd	2.00	1.65	1.75	1.69
Extra Plain Concrete per cu. yd. in place	57.50	57.00	60.00	59.00
Extra Reinforcing Steel, per pound in place	.085	.08	.08	.08
Extra Wakefield Piling, per lin. ft. in place	2.00	1.25	1.80	1.50
Extra Round Piling, per lin. ft. in place	1.20	.85	1.10	1.00

HENRY STATE AID BRIDGE.

Location.—Two miles south of Henry, Nebr.

Description.—Twelve, 50-foot arches, on wood piles, together with sand fills, surfacing, and protection work.

County.—Scotts Bluff.

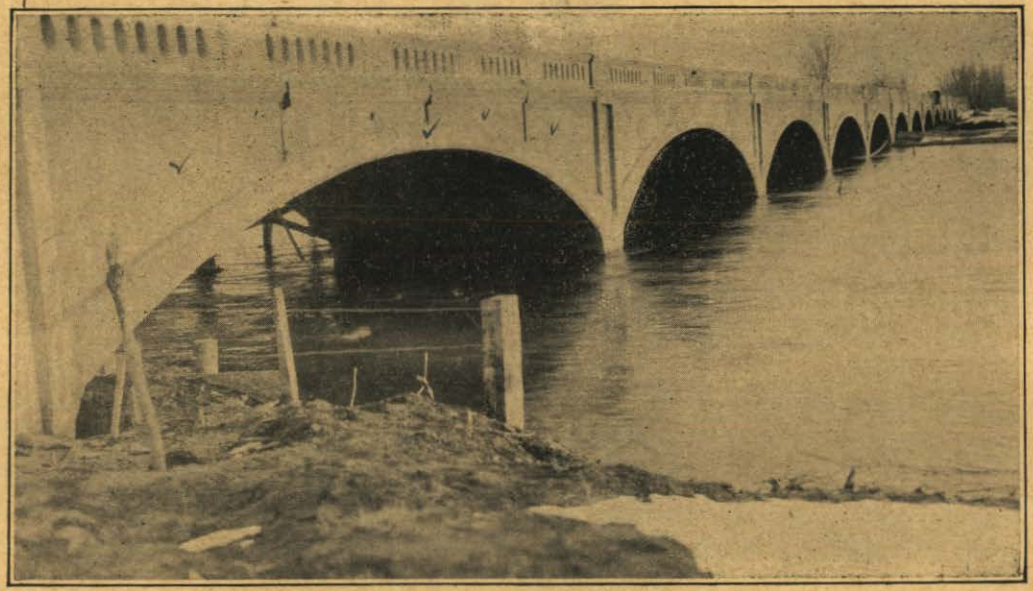
Estimated Cost.—$73,515.00.

Bids received at Gering, Nebr., September 16, 1919.

Contract awarded to Allied Contractors, Inc., Omaha, Nebr.

SUMMARY OF BIDS.

	Western Bridge Co. Omaha	Allied Contractors Omaha	Monarch Engineering Co. Falls City, Neb.	C. E. Sheely Denver	Central Bridge & Const. Co.
State Aid Bridge	$66,550.00	$65,925.00	$69,250.00	$67,700.00	$68,760.00
Earthwork in Fills per cu. yd.	.40	.38	.40	.42	.45
Surfacing on Fills and Bridge per cu. yd.	2.00	1.65	1.65	1.75	1.69
Extra Plain Concrete per cu. yd. in place	57.50	57.00	58.00	60.00	59.00
Extra Reinforcing Steel, per pound, in place	.085	.08	.08	.0825	.08
Extra Wakefield Piling, per lin. ft. in place	2.00	1.25	1.50	1.40	1.50
Extra Round Piling per lin. ft. in place	1.20	.85	.95	.92	1.00



VIEW OF MORRILL STATE AID BRIDGE

MEADVILLE STATE AID BRIDGE.

Location.—Fifteen miles north of Ainsworth, Niobrara River.

Description.—Two standard 15-ton steel trusses, 100-foot span, 16-foot Ry Conc. floor, 2 concrete abutments, tube pier, steel piles.

Counties.—Brown and Keya Paha.

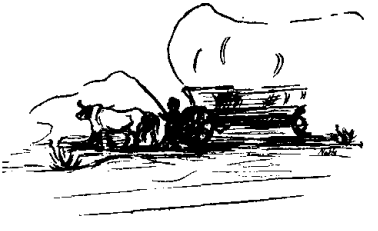
Estimated Cost.—$27,860.00.

Bids received at Ainsworth December 16, 1919.

Contract awarded to Western Bridge and Construction Co., Omaha, Nebr. An injunction was filed against the County and contractor on account of the location and no work has been done.

SUMMARY OF BIDS.

	Midland Bridge Co.	Western Bridge & Const. Co.	Central Bridge & Const. Co.
State Aid Bridge	$29,975.00	$27,860.00	$28,410.00
Extra Plain Concrete per cu. yd. in pl...	38.00	32.00	35.00
Extra Reinforcing Steel, per lb. in pl.....	.10	.08	.095
Extra 8" Beth H Piles per lin. ft. in pl..	3.00	3.95	4.00....
Extra round wood piling, per lin. ft., pl.	1.10	1.15	1.25
Extra Steel Sheet piling per sq. ft. in pl.	4.00	3.90	3.85

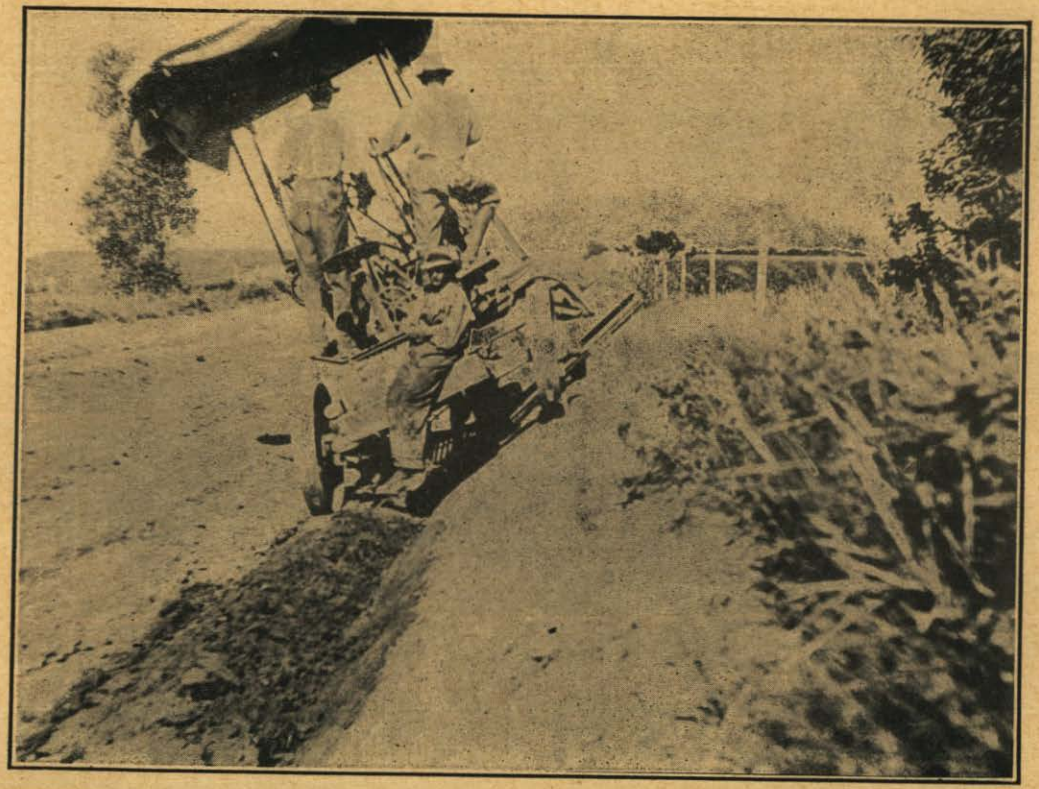


DIVISION NUMBER 1

A. S. MIRICK, Division Engineer

COUNTIES

Butler	Otoe
Cass	Pawnee
Douglas	Polk
Fillmore	Richardson
Gage	Saline
Hamilton	Sarpy
Jefferson	Saunders
Johnson	Seward
Lancaster	Thayer
Nemaha	York



CUTTING BACK SLOPES WITH BLADE GRADER, FEDERAL AID PROJECT NO. 7C, ADAMS COUNTY

BUTLER COUNTY.

In general, the co-operation of the County Board and the people has been excellent. The topography of Butler County is rolling, though in many places lagoons occur. It is necessary to cut down excessive grades on the hills and raise the grades through low places to such an elevation as will prevent overflow in the spring.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$131,140.63
Total Expended to December 1, 1920	
Balance	46,377.92
Number Miles State Roads	44.41
Number Miles Constructed by Contract	28.97
Number Miles Surfaced (overflow concrete pavement)	.85
Number Miles Constructed by Heavy Gang Crew	15.00
Total Miles State Roads Constructed	43.97
Total Miles Contract Work Accepted	28.97
Number Projects in the County	One

Federal Aid Road Project No. 29—Osceola-David City, Butler County.

Osceola-David City Federal Aid Road	Project 29
Length	28.97
Percentage Complete	100.00
Project Started	July, 1919
Type (Overflow concrete pavement)	.85
Earth	28.12
Estimated Cost	$100,010.30
Federal Aid	48,005.15
State Aid	48,005.15
Other Funds (Township donation)	4,000.00
Total Feet Corrugated Culverts	None
Total Feet Concrete Pipe Culverts	1488.00
Total Cubic Yards Concrete in Box Culverts	104.60

Osceola-David City Road.

The Osceola-David City road is located in both Butler and Polk counties, the total mileage being 37.71 miles, of which 28.97 miles are in Butler County, and 8.74 miles in Polk County. See Polk County for the remainder of the work of this project.

The excavation has been rather light and was delayed considerably due to the fact that several stretches were constructed in very dry weather. After grading was completed, .85 of a mile of concrete overflow pavement was laid on the low stretches across the Platte Valley near the Schuyler bridge. The maximum grade of the project is 5.5%.

CASS COUNTY.

The topography in the southwestern part of this County is rolling, while the region near the Platte River in the northern part will necessarily require considerable work, in order to secure good roads, and will be expensive as well. In the southern part the construction has been of the ordinary type, cutting hills and grading.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$143,333.03
Total Expended to December 1, 1920	61,546.84
Balance	81,786.19
Number Miles State Roads	68.00
Number Miles Constructed by Contract	15.95
Number Miles Surfaced	None
Number Miles Constructed by Heavy Gang Crew	25.00
Total Miles State Roads Constructed	40.95
Total Miles Contract Work Accepted	15.95
Number Projects in the County	One

Federal Aid Road Proj. No. 28—Nebraska City-Plattsmouth, Cass County.

Nebraska City-Plattsmouth Federal Aid Road	Project 28
Length	15.95
Percentage Complete	100.00
Project Started	June, 1919
Type	Earth
Estimated Cost	$48,548.72
Federal Aid	24,274.36
State Aid	24,274.36
Other Funds	None
Total Feet Corrugated Culverts	None
Total Feet Concrete Pipe Culverts	1202.00
Total Number Box Culverts	6
Total Cubic Yards in Box Culverts (concrete)	104.68
Bridges over 36 square feet Waterway	4

Nebraska City-Plattsmouth Road.

This road connects with Otoe County section on the south County line, runs north through Union to Plattsmouth. The soil makes an excellent surface under the proper maintenance; 15.91 miles of the project lie in Cass County and the remainder in Otoe County.

DOUGLAS COUNTY.

In August of 1919 Douglas County voted a $3,000,000.00 bond issue, which was to be spent in paving those roads outlined by the County Commissioners. Four Federal and State Aid Projects have been built in this County.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$582,302.93
Total Expended to December 1, 1920	165,492.58
Balance	416,810.35
Number Miles State Roads	84.00
Number Miles Constructed by Contract	40.06
Number Miles Surfaced—(brick overflow pavement)	5.75
Macadam	28.75
Number Miles Constructed by Heavy Gang Crew	3.38
Total Miles State Roads Constructed	43.44
Total Miles Contract Work Accepted	40.06
Number Projects in County	Four

Federal Aid Road Project No. 20—Lincoln Highway, Douglas County.

Lincoln Highway Federal Aid Road	Project 20
Length	15.04
Percentage Complete	100.00
Project Started	Aug., 1919
Type	Earth
Estimated Cost	$49,865.76
Federal Aid	24,932.88
State Aid	24,932.88
Other Funds	2,409.75
Total Feet Concrete Pipe Culverts	1024.00
Bridges over 36 square feet Waterway	9

LINCOLN HIGHWAY.

Project No. 20 is a part of the Lincoln Highway and extends from the end of the paving on Dodge Street to the Saunders County line. The grading has been very heavy, a number of hills having been cut down to a maximum grade of six per cent. After the grading was finished a contract for paving this road was let to be paid for from the Douglas County bond issue, and was to be of sheet asphalt on a concrete base.

Federal Aid Road Project No. 35-A—(D. L. D.) Millard-County Line, Douglas County.

(D. L. D.) Millard-County Line	Proj. 35-A
Length	1.9
Percentage Complete	100.00
Project Started	July, 1919

Type	Earth
Estimated Cost	$17,389.86
Federal Aid	8,694.93
State Aid	8,694.93
Other Funds	2,747.64
Total Feet Concrete Pipe Culverts	272.00
Bridges over 36 square feet Waterway	1

(D. L. D.) Millard - County Line.

Project 35-A extends from the south line of Douglas County to Millard, and although a short one it required considerable excavation. Near Millard a high fill, for a distance of 1,000 feet, was made in order to put the road above high water. The work was completed in November, 1920.

Federal Aid Road Project No. 78—Center Street, Douglas County.

Center Street Federal Aid Road	Project 78
Length	12.83
Percentage Complete	100.00
Project Started	May, 1920
Type	Earth
Estimated Cost	$88,142.25
Federal Aid	44,071.12
State Aid	44,071.13
Total Feet Concrete Pipe Culverts	1220.
Number of Box Culverts	1
Total Cubic Yards Concrete in Box Culverts	139.00
Bridges over 36 square feet Waterway	7

Center Street—Extension.

Project No. 78 begins at the west Douglas County line and extends east on Center Street. Heavy excavation was necessary and grades have been reduced to a maximum of seven per cent. As the soil in the hills is composed of loess it washes badly and makes maintenance extremely difficult. Although all of the rough grading has been completed, the project will not be finished this year.

Federal Aid Road Project No. 100—"Q" Street, Douglas County.

"Q" Street Federal Aid Road	Proj. 100
Length	10.29
Percentage Complete	100.00
Project Started	July, 1920
Type	Earth
Estimated Cost	$77,626.05
Federal Aid	38,813.02
State Aid	38,813.03
Other Funds	1,387.00

Total Feet Concrete Pipe Culverts	1019.00
Total Number Box Culverts	5
Total Cubic Yards Concrete in Box Culverts	237.09
Bridges over 36 square feet Waterway	3

"Q" Street Road.

Project No. 100 begins at the north Sarpy County line and extends north a mile and then east along "Q" Street, where it joins Project No. 35-A. It begins again east of Millard and runs five miles east. The topography is hilly and the grades have been reduced to a maximum of seven per cent. A portion west of Millard has been completed, and the contractor is now working on the east section.

FILLMORE COUNTY.

Fillmore County, as well as the County Board, have given splendid co-operation with regard to road improvement, and the results are satisfactory. The raising of fills through lagoons, and cutting down hills constitutes the work of road improvement.

1918-1920 State and Federal Aid Road Construction.

Total appropriation, less 5%	$137,076.30
Total Expended to Dec. 1st, 1920	51,141.87
Balance	85,934.43
Number Miles State Roads	31
Number Miles Constructed by Contract	12.53
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	15.25
Total Miles State Roads Constructed	27.78
Total Miles Contract Work Accepted	12.53
Number Projects in the County	1

Federal Aid Road Project No. 75—Geneva-Belvidere, Fillmore County.

Geneva-Belvidere Federal Aid Road	Proj. 75
Length	12.53
Percentage Complete	100
Project Started	May 1920
Type	Earth
Estimated Cost	$67,629.24
Federal Aid	33,814.62
State Aid	33,814.62
Other Funds	None
Total Feet Corrugated Culverts	None
Total Feet Concrete Pipe Culverts	924
Total Number Culverts (Box)	2
Total Cubic Yards in Box Culverts (Concrete)	19.28
Bridges Over 36 Sq. Ft. Waterway	4

Geneva-Belvidere.

The work of this project calls for many alignment changes, including five right-angle turns to be cut off, and two 60 degree curves to be straightened. Approximately 150,100 cubic yards per 100 foot overhaul is called for, owing to the extreme lowness of the land in the county. Equipment consists of a 60 H. P. tractor, pulling an elevator grader; eight dump wagons, fifteen teams, a blade grader, mormon and plow slips. South of Strang, there is a 65 foot span wooden bridge, which was removed and a new channel cut across the road 1,000 feet to the south, a steel concrete 36 foot span standard bridge being replaced.

The Geneva-Belvidere road is located in Fillmore and Thayer Counties, a total of 17.87 miles in length of which 12.53 miles are in Fillmore County and 5.34 miles in Thayer County. She Thayer County for the remainder of the work on this project.

GAGE COUNTY.

The Gage County people have shown an interest from the very first, in the road improvement movement, and have maintained the state roads in excellent shape, besides taking care of the County roads, no small part of which has been due to the efforts of the County Board and the County Highway Commissioner. The land is generally rolling, and it is necessary to make considerable grade reductions.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation less 5%	$227,885.91
Total Expended to December 1st, 1920	107,477.51
Balance	120,408.40
Number Miles State Roads	79
Number Miles Constructed by Contract	30.82
Number Miles Surfaced ..... V'k Brick	1.15
Number Miles Constructed by Heavy Gang Crew	25.37
Total Miles State Roads Constructed	56.19
Total Miles Contract Work Accepted	30.82
Number of Projects in the County	3

Federal Aid Road Project No. 25—Beatrice-Fairbury, Gage County.

Beatrice-Fairbury Federal Aid Road	Proj. 25
Length	10.66
Percentage Complete	100.00
Project Started	June 1919
Type	Earth
Estimated Cost	$29,481.00
Federal Aid	14,740.55
State Aid	14,740.55
Other Funds	None
Total Feet Corrugated Culverts	None

Total Feet Concrete Pipe Culverts	1000
Total Number of Box Culverts	None
Total Cubic Yards Concrete in Box Culverts	None
Bridges Over 36 Square Feet Waterway	3

Beatrice-Fairbury Road.

The Beatrice-Fairbury road is located in two Counties, 10.66 miles being in Gage County, and 19.03 miles in Jefferson County. The work is completed in Gage County. See Jefferson County for the remainder of the work on this project. (Total cost of the entire project, $71,586.05.)

Federal Aid Road Project No. 18—Lincoln-Beatrice, Gage County.

Lincoln-Beatrice Federal Aid Road	Project 18
Length	19.01
Percentage Complete	100
Project Started	June 1919
Type	Earth
Estimated Cost	$69,888.67
Federal Aid	34,944.33
State Aid	34,944.34
Other Funds	None
Total Feet Corrugated Culverts	None
Total Feet Concrete Pipe Culverts	2,256
Total Number Box Culverts	5
Total Cubic Yards Concrete in Box Culverts	117.98
Bridges Over 36 Square Feet Waterway	5

Lincoln-Beatrice Road.

This road connects with that section lying in Lancaster County and runs south through Cortland, near Pickerell to Beatrice. Grades have been reduced to seven per cent and considerable heavy work done. Channel changes and new alignment have been made near Beatrice. Grading work is completed and the culvert work nearly completed.

Federal Aid Road Project No. 106—Beatrice-State Institute, Gage County.

Beatrice-State Institute Federal Aid Road	Proj. 106
Length	1.15
Percentage Complete	100.00
Project Started	May 1920
Type	V'k Brick
Estimated Cost	$60,863.74
Federal Aid	23,000.00
State Aid Paving Fund	37,863.74
Total Feet Corrugated Culverts	None
Total Feet Concrete Pipe Culverts	168
Total Number Box Culverts	None
Bridges Over 36 Square Feet Waterway	None

Beatrice-State Institute Road.

This road connects the city of Beatrice with the State Institute for Feeble Minded. The road is built of vitrified brick on a concrete pavement, and contains 10,962 square yards of brick pavement. No particular engineering features were encountered, as the alignment runs through a rather flat section of Gage County.

HAMILTON COUNTY.

The co-operation of the County Board and the people of the County has in general been satisfactory. The topography is generally flat and it is necessary to construct high fills in order to insure drainage of low lagoons.

There has been but one Federal and State Aid Project, the excavation of which has been light. The road is completed.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$127,111.35
Total Expended to December 1st, 1919	18,537.46
Balance	108,573.89
Number Miles State Roads	61
Number Miles Constructed by Contract	9.57
Number Miles Surfaced	None
Number Miles Constructed by Heavy Gang Crew	22
Total Miles State Roads Constructed	31.57
Total Miles Contract Work Accepted	9.57
Number of Projects in County	1

Federal Aid Road Project No. 56—Seward-York-Aurora, Hamilton County.

Seward-York-Aurora (S. Y. A.) Federal Aid Road	Project 56
Length	9.57
Percentage Complete	100
Project Started	June 20, 1919
Type	Earth
Estimated Cost	$27,113.60
Federal Aid	13,556.80
State Aid	13,556.80
Other Funds	None
Total Feet Corrugated Culverts	22
Total Feet Concrete Pipe Culverts	436
Total Number Box Culverts	None
Total Cubic Yards Concrete in Box Culverts	None
Bridges over 36 Square Feet Waterway	2

Seward-York-Aurora Road.

The Seward-York-Aurora road extends through Seward, York and Hamilton Counties with the following mileage respectively: 13.46, 25.87 and 9.57. The road runs from the east line of York County to Aurora and is one of the longest projects in the State. For the remainder of the work see Seward and York Counties.

JEFFERSON COUNTY.

In general the response of the County Board in regard to road improvement has been favorable. The country is slightly rolling and grades have been materially reduced. The soil is an excellent loam, and constitutes the basis of a standard highway.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$139,353.81
Total Expended to December 1st, 1920	52,994.79
Balance	86,359.02
Number Miles State Roads	42
Number Miles Constructed by Contract	19.06
Number Miles Surfaced	None
Number Miles Constructed by Heavy Gang Crew	1.75
Total Miles State Roads Constructed	20.81
Total Miles Contract Work Accepted	19.06
Number of Projects in County	1

Federal Aid Road Project No. 25—Beatrice-Fairbury, Jefferson County.

Beatrice-Fairbury Federal Aid Road	Project 25
Length	19.06
Percentage Complete	100
Project Started	June 15, 1919
Type	Earth
Estimated Cost	$62,703.62
Federal Aid	31,351.81
State Aid	31,351.81
Other Funds	None
Total Feet Corrugated Culverts	None
Total Feet Concrete Pipe Culverts	1,388
Total Number Box Culverts	None
Total Cubic Yards Concrete in Box Culverts	None
Bridges Over 36 Square Feet Waterway	None

Beatrice-Fairbury Road.

The Beatrice-Fairbury road extends across two counties, 19.06 miles in Jefferson County, and 10.66 miles in Gage County. The project starts at the west county line of Gage County and runs south and east along the Goldenrod Highway to Fairbury. This road was finally accepted by the Government November 23rd, 1920.

JOHNSON COUNTY.

The Federal Aid Project in this County was built by convict labor. It was decided early in April of 1920, because of the high bids upon grading work, to construct several of these roads with such labor, using state equipment. Bids on those projects, built by convict labor, run from 63½ cents to 64.9 cents per cubic yard. The department contracted to do the work at the estimated price which was 50 cents per cubic yard.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation less 5%	$94,558.87
Total Expended to December 1st, 1920	70,970.59
Balance	23,588.28
Number Miles State Roads	27
Number Miles Constructed by Contract	11.1
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	12.87
Total Miles State Roads Constructed	23.97
Total Miles Contract Work Accepted	11.1
Number of Projects in the County	1

Federal Aid Road Project No. 43—Tecumseh-Crab Orchard, Johnson Co.

Tecumseh-Crab Orchard Federal Aid Road	Project 43
Length	13.86
Percentage Complete	80
Project Started	May 1920
Type	Earth
Estimated Cost	$86,563.92
Federal Aid	43,281.96
State Aid	43,281.96
Other Funds	None
Total Feet Corrugated Culverts	None
Total Feet Concrete Pipe Culverts	2,074
Total Number of Box Culverts	2
Total Cubic Yards Concrete in Box Culverts	29.5
Bridges Over 36 Square Feet Waterway	9

Tecumseh-Crab Orchard Road.

The Tecumseh-Crab Orchard road calls for 115,700 cubic yards of excavation. The equipment used by the State consisted of three Holt caterpillar tractors, two elevating graders, dump wagons, one 12-foot blade, scarifier and one 12-foot tractor Fresno. For complete description of the work on this project see Convict Labor Division.

LANCASTER COUNTY.

The road work in this County has been excellent both with regard to construction and maintenance. Four Federal and State Aid Projects have been built and completed to date; one of these consists of three-inch vertical fibre brick paving, 5.44 miles long. The County built all culverts.

1918-1920 State and Federal Aid Construction.

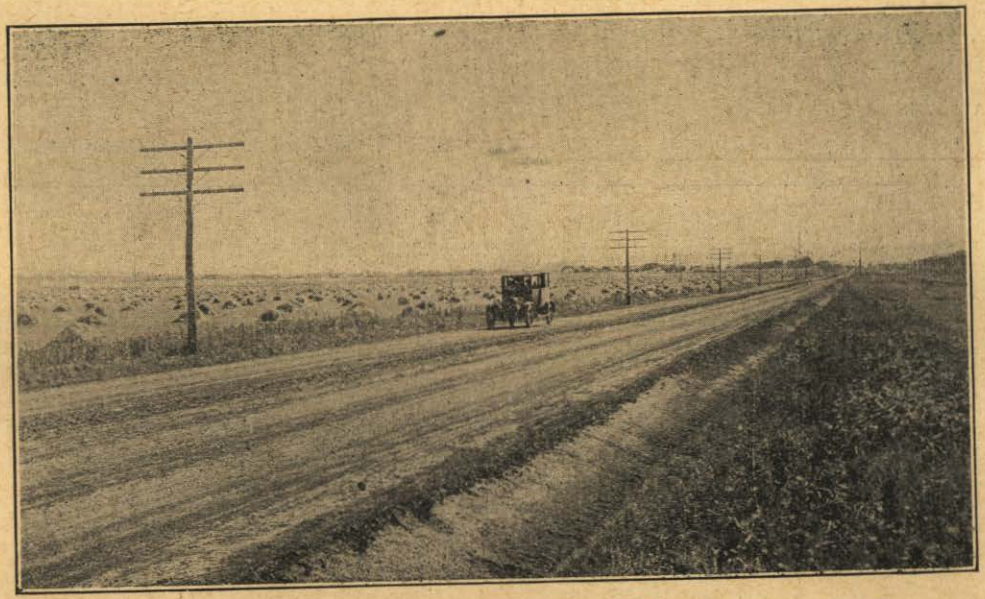
Total Appropriation, less 5%	$355,866.91
Total Expended to December 1st, 1920	128,494.56
Balance	227,372.35
Number Miles State Roads	78
Number Miles Constructed by Contract	37.36
Number Miles Surfaced	5.44
Number Miles Constructed Heavy Gang Crew	0
Total Miles State Roads Constructed	37.36
Total Miles Contract Work Accepted	37.36
Number of Projects in County	4

Federal Aid Project No. 1—Lincoln-Emerald, Lancaster County.

Lincoln-Emerald Federal Aid Road	Project 1
Length	5.44
Percentage Complete	100
Project Started	July 1918
Type	3" V.F.B'k
Estimated Cost	$217,294.75
Federal Aid	54,400.00
State Aid	0
Other Funds	162,894.75
Total Feet Corrugated Culverts	0
Total Feet Concrete Pipe Culverts	544
Total Number of Box Culverts	5
Total Cubic Yards Concrete in Box Culverts	0
Bridges Over 36 Sq. Ft. Waterway	3

Lincoln-Emerald Road.

The Lincoln-Emerald Road was the first Federal Aid Project built in the State and was started in July, 1918. As a special provision against accidents under the Burlington railroad overhead crossing the roadway is widened to thirty-two feet for a distance of two hundred thirty-five feet.



VIEW OF HAVELOCK-WAVERLY FEDERAL AND STATE AID PROJECT NO. 17

Federal Aid Road Project No. 17—Havelock-Waverly, Lancaster County.

Havelock-Waverly Federal Aid Road	Project 17
Length	9.99
Percentage Complete	100
Project Started	Oct. 15, 1918
Type	Earth
Estimated Cost	$40,155.00
Federal Aid	20,077.50
State Aid	20,077.50
Other Funds	County built bridges
Total Feet Corrugated Culverts	0
Total Number of Box Culverts	19
Total Feet Concrete Pipe Culverts	288
Total Cubic Yards Concrete in Box Culverts	0
Bridges Over 36 Square Feet Waterway	2

Havelock-Waverly Road.

The Havelock-Waverly Federal Aid Road is considered one of the best roads in the State and has been maintained in excellent condition by the County since its completion. It runs from the County line to Havelock and is built of loam.

Federal Aid Project No. 18—Lincoln-Beatrice, Lancaster County.

Lincoln-Beatrice Federal Aid Road	Project 18
Length	17.95
Percentage Complete	100
Project Started	June 20, 1919
Type	Earth
Estimated Cost	$53,481.12
Federal Aid	26,740.56
State Aid	26,740.56
Other Funds (Lancaster County)	1,078.88
Total Feet Corrugated Culverts	0
Total Feet Concrete Pipe Culverts	898
Total Number of Box Culverts	25
Bridges Over 36 Square Feet Waterway	10

Lincoln-Beatrice Road.

This project runs south from Lincoln to the north line of Gage County. Grades have been reduced to a maximum of seven per cent. Fills of considerable magnitude have been made across the low bottoms and a thirty foot roadway maintaind throughout the entire project. The project was recently accepted by the Government. See Gage County for the remainder of the work on this project.

Federal Aid Road Project No. 19—Emerald West, Lancaster County.

Emerald West (to the County line) Federal Aid Road	Project 19
Length	3.98

Percentage Complete	100
Project Started	July, 1919
Type	Earth
Estimated Cost	$22,000.00
Federal Aid	11,000.00
State Aid	11,000.00
Other Funds	0
Total Feet Corrugated Culverts	0
Total Feet Concrete Pipe Culverts	280
Total Number of Box Culverts	2
Total Cubic Yards Concrete in Box Culverts	0
Bridges Over 36 Square Feet Waterway	4

Emerald Road West.

The Emerald West Road starts at the west end of Project No. 1, Lincoln-Emerald, and covers the O.L.D. to the west line of Lancaster County. This road is constructed with a thirty-six foot roadway through a hilly country, grades being reduced to seven per cent and alignments straightened. The road was but a trail before improvement.

NEMAHA COUNTY.

Nemaha County has been fortunate in having no unusual features of construction to handicap the progress of the road work nor add to the cost, unless perhaps it might be considered a large amount of clearing and grubbing and hedge fences which border the roads in this particular section of the county. A dominant feature of the work was the splendid co-operation which existed between the contractor, County Commissioners and Project Engineer.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$103,771.16
Total Expended to December 1st, 1920	76,873.37
Balance	26,897.79
Number Miles State Roads	35
Number Miles Constructed by Contract	21.23
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	30.50
Total Miles State Roads Constructed	51.73
Total Miles Contract Work Accepted	21.23
Number of Projects in County	1
State Aid Project	1

Federal Aid Road Project No. 2—Falls City-Nebraska City, Nemaha Co.

State Line-Falls City-Nebraska City Federal Aid Road	Project 2
Length	21.23
Percentage Complete	100
Project Started	June 1, 1919

Type	Earth
Estimated Cost	$86,173.74
Federal Aid	43,586.87
State Aid	43,586.87
Other Funds	0
Total Feet Corrugated Culverts	0
Total Feet Concrete Pipe Culverts	464
Total Number of Box Culverts	1
Total Cubic Yards Concrete in Box Culverts	108.16
Bridges Over 36 Square Feet Waterway	21

State Line-Falls City-Nebraska City Road.

This road is 55.4 miles long, of which 10.03 miles is in Nemaha County, 21.23 in Otoe County and 24.14 in Richardson County. The excavation work has been heavy and the improvement is now completed, all of which show an excelent quality of work.

OTOE COUNTY.

The co-operation and response of the County Board as well as the County has been excellent with regard to road improvement. As a result of the State and Federal Aid road work, the County roads are much improved. The cutting down of hills and reducing grades to a maximum of seven percent together with providing adequate drainage structures is the necessary work in building standard sections of road.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation less 5%	$152,966.86
Total Expended to December 1st, 1920	47,517.09
Balance	105,449.77
Number Miles State Roads	59
Number Miles Constructed by Contract	19.79
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	0
Total Miles State Roads Constructed	19.79
Total Miles Contract Work Accepted	19.79
Number of Projects in the County	2

Federal Aid Road Project No. 2—Falls City-Nebraska City, Otoe County.

State Line-Falls City-Nebraska City Federal Aid Road	Project 2
Length	10.03
Percentage Complete	100
Project Started	June, 1919
Type	Earth
Estimated Cost	$ 21,906.49
Federal Aid	10,953.24
State Aid	10,953.25
Other Funds	

Total Feet Corrugated Culverts	..
Total Feet Concrete Pipe Culverts	56
Total Number of Box Culverts	0
Total Cu. yds. Concrete in Box Culverts	0
Bridges over 36 sq. ft. Waterway	4

State Line-Falls City-Nebraska City Road.

This project runs south from Nebraska City to the north line of Nemaha County. The original road was steep and in many instances grades have been reduced one-half. A dangerous curve was eliminated five miles south of Nebraska City and the road is considered one of the best in the State. The entire project is 56.4 miles long of which 10.03 are located in Otoe County, 21.23 miles in Nemaha County and 24.14 miles in Richardson County. See Nemaha and Richardson Counties.

Federal Aid Road Project No. 28 Nebraska City-Plattsmouth, Otoe County.

Nebraska City-Plattsmouth Federal Aid Road	Project 28
Length	9.76
Percentage Complete	100
Project Started	June 1, 1919
Type	Earth
Estimated cost	$ 23,434.18
Federal Aid	11,717.09
State Aid	11,717.09
Other Funds	.....
Total Feet Corrugated Culverts	0
Total Feet Concrete Pipe Culverts	472
Total Number Box Culverts	..
Total Cu. yds. Concrete in Box Culverts	..
Bridges over 36 sq. ft. Waterway	3

Nebraska City-Plattsmouth Road.

Nebraska City-Plattsmouth Federal Aid Road runs from Nebraska City north to the south line of Cass County. The soil is such that it makes an excellent road surface when well maintained. The project is 25.71 miles of which 9.76 miles are located in Otoe and 15.96 miles in Cass County. See Cass County for the remainder of the work of this project.

PAWNEE COUNTY.

Like Johnson County the Federal Aid Road Project in this County was built by Convict Labor because of the excessively high bids received in April of 1920. The Department decided to construct several road projects using state equipment and convict labor. The State contracted to do this work at the estimated price of 50 cents per cubic yard.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation less 5%	$ 99,998.06
Total Expended to December 1, 1920	61,299.69

Balance	38,698.37
Number Miles State Roads	38
Number Miles Constructed by Contract	9.4
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	0
Total Miles State Roads Constructed	9.4
Total Miles Contract Work Accepted	9.4
Number of Projects in County	1

Federal Aid Road Project No. 97-A—Table Rock-Pawnee City-Lewiston, Pawnee County.

Table Rock-Pawnee City-Lewiston Federal Aid Road	Proj. 97-A
Length	15.7
Percentage Complete	60
Project Started	May 10, '20
Type	Earth
Estimated Cost	$ 87,287.90
Federal Aid	43,643.85
State Aid	43,643.85
Other Funds	.....
Total Feet Corrugated Culverts	1,348
Total Feet Concrete Pipe Culverts	0
Total Number of Box Culverts	..
Total Cu. Yds. Concrete in Box Culverts	87.62
Bridges over 36 sq. ft. Waterway	..

Table Rock-Pawnee City-Lewiston Road.

This road calls for a total excavation of 109,100 cubic yards of earth excavation in the 15.7 miles. Equipment similar to that used on the Johnson County Convict Labor road work was used on this project. For complete description see Convict Labor Division.

POLK COUNTY.

Polk County has taken an intense interest in the work of improving roads outside of those on the State Highway System, thus the co-operation between the County Board and the Department has at all times been satisfactory.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation less 5%	$103,524.18
Total Expended to December 1, 1920	18,561.70
Balance	84,962.48
Number Miles State Roads	52
Number Miles Constructed by Contract	8.74
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	39.75
Total Miles State Roads Constructed	48.49
Total Miles Contract Work Accepted	48.49
Number of Projects in County	1

Federal Aid Road Project No. 29 Osceola-David City, Polk County.

Osceola-David City Federal Aid Road	Project 29
Length	8.74
Percentage Complete	100
Project Started (Culvert Contract)	July, 1919
Type	Earth
Estimated Cost	$ 20,152.00
Federal Aid	10,076.00
State Aid	10,076.00
Other Funds	0
Total Feet Corrugated Culverts	0
Total Feet Concrete Pipe Culverts	260
Total Number of Box Culverts	0
Total Cu. yds. Concrete in Box Culverts	..
Bridges over 36 sq. ft. Waterway	..

Osceola-David City Road.

But 8.74 miles of the total 37.71 of this project is located in Polk County. See Butler for the remainder of the work of this project.

RICHARDSON COUNTY.

Road activities have been stimulated during the past year and considerable work has been done by the County on roads outside of the State Highway System.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation less 5%	$148,920.40
Total Expended to December 1, 1920	78,834.34
Balance	70,086.06
Number Miles State Roads	48
Number Miles Constructed by Contract	25.62
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	0
Total Miles State Roads Constructed	25.62
Total Miles Contract Work Accepted	25.62
Number of Projects in County	2

Federal Aid Road Project No. 2—Falls City-Nebraska City, Richardson County.

Falls City-Nebraska City Federal Aid Road	Project 2
Length	24.14
Percentage Complete	100
Project Started	June, 1919
Type	Earth
Estimated cost	$103,016.28
Federal Aid	51,508.14
State Aid	51,508.14

Other Funds	.....
Total Feet Corrugated Culverts	0
Total Feet Concrete Pipe Culverts	850
Total Number of Box Culverts	0
Total Cu. yds. Concrete in Box Culverts	0
Bridges over 36 sq. yds. Waterway	12

Falls City-Nebraska City Road.

But 24.14 miles of the entire 55.4 miles of this project are included in Richardson County. See Nemaha and Otoe Counties for the remainder of the work of this project.

Federal Aid Road Project No. 123, Falls City South, Richardson County.

Falls City South Federal Aid Road	Proj. 123
Length	1.48
Percentage Complete	100
Project Started	August,'20
Type (Bridge Approach)	Earth
Estimated Cost	$ 71,103.38
Federal Aid	35,551.69
State Aid	35,551.69
Other Funds	.....
Total Feet Corrugated Culverts	..
Total Feet Concrete Pipe Culverts	200
Total Number of Box Culverts	..
Total Cu. Yds. Concrete in Box Culverts	..
Bridges over 36 sq. ft. Waterway	1-100' low truss
	1- 60' low truss

Falls City South Road.

This road was constructed on a new location through a very hilly country which made excavation work heavy. Fills more than thirty feet high have been built, requiring long drainage structures. Two bridges were also built as a part of the work on the project.

SALINE COUNTY.

The County Board and the County have shown considerable interest in road improvement. Co-operation of the Board and the County Highway Commissioner has been excellent. The O. L. D. runs through the north part of the County and was in fair condition for maintenance, without much extra work. The State Highway connecting Fairbury in Jefferson County with Wilbur and Crete passing through Western, was in poor condition at the beginning of the season. This road has been widened and many drainage structures built, and is now in good condition.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation less 5%	$145,455.45
Total Expended to December 1, 1920	21,837.74

Balance	123,617.71
Number Miles State Roads	61
Number Miles Constructed by Contract	8.3
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	12.5
Total Miles State Roads Constructed	20.8
Total Miles Contract Work Accepted	8.3
Number of Projects in County	1

Federal Aid Road Project No. 98-B—Crete-Wilber, Saline County.

Crete-Wilber Federal Aid Road	Proj. 98-B
Length	11.92
Percentage Complete	70
Project Started	June, 1920
Type	Earth
Estimated Cost	$ 46,505.52
Federal Aid	23,252.76
State Aid	23,252.76
Other Funds	.....
Total Feet Corrugated Culverts	0
Total Feet Concrete Pipe Culverts	712
Total Number of Box Culverts	2
Total Cu. yds Concrete in Box Culverts	58.6
Bridges over 36 sq. ft. Waterway	7

Crete-Wilber Road.

This road runs from Wilber north to Crete, thence east to the Lancaster line thence north one mile where it joins the L. C. D. highway in Lancaster County. South of Crete, the country is very flat and the work necessary consists in raising grades to provide a well drained road over flat lagoons. East of Crete the country is hilly and considerable heavy excavation encountered.

SARPY COUNTY.

The people of the County as well as the County Board have shown considerable interest with regard to improving the roads throughout the County. They have been hampered through lack of funds, but have been able to improve the roads so that many favorable comments were heard from tourists passing through the County.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation less 5%	$ 65,368.71
Total Expended to December 1, 1920	.....
Balance	.....
Number Miles State Roads	44
Number Miles Constructed by Contract	0
Number Miles Surfaced	0

Number Miles Constructed by Heavy Gang Crews	34
Total Miles State Roads Constructed	34
Total Miles Contract Work Accepted	0
Number of Projects in the County	0

There are no Federal and State Aid Road Projects in this County.

Wherever possible the O. L. D. was graded to a width of 40 feet by the heavy gang maintenance crews, which aided in taking care of the heavy traffic passing over the road. Many problems are presented on the roads in this County, due to the low bottom lands near the Platte river, the steep hills east of Melia on the D. L. D. and the crossing of many streams on the Washington Highway. Several railroad grade crossings are particularly dangerous. During the past season assistance in maintenance has been given by Douglas County in patrolling the D. L. D. north of Chalco and by Saunders County, in patroling between Melia and the Ashland Bridge. During the next season Sarpy County will be able to patrol all roads with their own patrols.

SAUNDERS COUNTY.

The County Board has taken great interest in road improvement, more especially is this true of some of the small towns in the County. The Fremont-Ceresco Road which passes through the County has been termed one of the best roads in the State, and the people in the County are proud of it.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation less 5%	$177,731.17
Total Expended to December 1, 1920	88,757.48
Balance	88,973.69
Number Miles State Roads	38
Number Miles Constructed by Contract	30.58
Number Miles Surfaced (Gravel 4" thick)	10.5
Number Miles Constructed by Heavy Gang Crew	0
Total Miles State Roads Constructed	30.58
Total Miles Contract Work Accepted	30.58
Number of Projects in County	1

Federal Aid Road Project No. 27 Fremont-Ceresco, Saunders County.

Fremont-Ceresco Federal Aid Road	Project 27
Length	30.58
Percentage Complete	100
Project Started	June, 1919
Type	Earth & Gravel
Estimated Cost	$132,668.53
Federal Aid	61,217.10
State Aid	61,217.10
Other Funds (Saunders County)	10,234.33
Total Feet Corrugated Culverts	0

Total Feet Concrete Pipe Culverts	96
Total Number of Box Culverts	1
Total Cu. yds. Concrete in Box Culverts	241
Bridges over 36 sq. ft. Waterway	9

Fremont-Ceresco Road.

This project begins at the north line of Saunders County and runs through Ceresco, Swedeburg, Wahoo and to the Platte River bridge south of Fremont. The country is rolling and grades have been reduced to eight percent. The construction work on the north end of the project was extremely heavy; one fill fifty-four feet in height was built and a cut one hundred wide and three hundred feet long was made in order to provide a high fill across the Platte River bottom. Gravel surface has been laid from Swedeburg to Colon and has proven very satisfactory. See Dodge County for the remainder of the work of this project.

SEWARD COUNTY.

Considerable road work has been carried on in this County, three Federal Aid Road Projects having been constructed. It is probable that the three projects will be completed this year and maintained.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation less 5%	$138,086.86
Total Expended to December 1, 1920	100,104.28
Balance	37,982.58
Number Miles State Roads	60
Number Miles Constructed by Contract	25.49
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	13.39
Total Miles State Roads Constructed	38.88
Total Miles Contract Work Accepted	25.49
Number of Projects in the County	3

Federal Aid Road Project No. 56 Seward-Aurora, Seward County.

Seward-Aurora Federal Aid Road	Project 56
Length	13.46
Percentage Completed	100
Project Started	June 20,'19
Type	Earth
Estimated Cost	$ 61,433.36
Federal Aid	30,716.68
State Aid	30,716.68
Other Funds	.....
Total Feet Corrugated Culverts	0
Total Feet Concrete Pipe Culverts	402
Total Number of Box Culverts	0
Total Cu. yds. Concrete in Box Culverts	0
Bridges over 36 sq. ft. Waterway	1

Seward-Aurora Road.

This project starts at the west line of Seward County and runs east along the S. Y. A. Highway to Seward. The country is flat and the principal work consists of raising the fills through low places. The entire project is 48.9 miles long of which 9.57 miles are in Hamilton County, 13.46 in Seward County and 25.87 miles in York County. See Hamilton and York Counties for the remainder of the work of this project.

Federal Aid Road Project No. 128-A—Seward-Lincoln (S. Y. A.), Seward County.

Seward-Lincoln (S. Y. A.) Federal Aid Road	Proj. 128-A
Length	7.18
Percentage Complete	70
Project Started	May 1920
Type	Earth
Estimated Cost	$65,795.79
Federal Aid	32,897.89
State Aid	32,897.90
Other Funds	0
Total Feet Corrugated Culverts	0
Total Feet Concrete Pipe Culverts	684
Total Number of Box Culverts	0
Total Cubic Yards Concrete in Box Culverts	102.71
Bridges over 36 Square Feet Waterway	0

Seward-Lincoln (S. Y. A.)

This road extends from Seward east on the S. Y. A. Highway to the Lancaster line. The level portions of the road were graded with tractor and blade graders, while 6.88 miles requiring 84,200 cubic yards of earth excavation was constructed by convict labor. Equipment used on this project was similar to that used in Johnson County except that one channel change was made by using a one-half yard dragline.

Federal Aid Road Project No. 134-A— O. L. D., Seward County.

O. L. D. Seward County Federal Aid Road	Proj. 134-A
Length	9.72
Percentage Complete	72
Project Started	Aug., 1920
Type	Earth
Estimated Cost	$62,846.02
Federal Aid	31,423.01
State Aid	31,423.01
Other Funds	0
Total Feet Corrugated Culverts	0
Total Feet Concrete Pipe Culverts	996
Total Number of Box Culverts	1
Total Cubic Yards Concrete in Box Culverts	22.19
Bridges Over 36 Square Feet Waterway	7

O. L. D. Road.

The O. L. D. road runs from Milford along the O. L. D. to the Lancaster County line. Grading work and culverts have been finished to within three miles of the County line. As the ground is generally hilly, the excavation was heavy, grades being reduced to a maximum of seven per cent. The road was built by convict labor, using State equipment.

THAYER COUNTY.

The people of Thayer County have shown considerable activity and interest in building roads other than those on the State Highway System. Co-operation of the County Board has aided such improvement work.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$132,397.07
Total Expended to December 1st, 1920	22,944.26
Balance	109,452.81
Number Miles State Roads	56
Number Miles Constructed by Contract	10.08
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	24.22
Total Miles State Roads Constructed	34.3
Total Miles Contract Work Accepted	10.08
Number of Projects in County	2

Federal Aid Road Project No. 40—Hebron-Belvidere, Thayer County.

Hebron-Belvidere Federal Aid Road	Project 40
Length	7.27
Percentage Complete	80
Project Started	June, 1920
Type	Earth
Estimated Cost	$40,547.00
Federal Aid	20,273.50
State Aid	20,273.50
Other Funds	0
Total Feet Corrugated Culverts	1,994
Total Feet Concrete Pipe Culverts	0
Total Number of Box Culverts	1
Arches	4
Total Cubic Yards Concrete in Box Culverts	55.86
Bridges Over 36 Square Feet Waterway	1

Hebron-Belvidere Road.

This road extends from one mile north of Belvidere, south to the town limits of Hebron, a distance of 7.27 miles. The excavation calls for approximately 48,100 cubic yards, and there are a number of alignment changes; one is a right-angle cut-off, and two curves are to be straightened.

Federal Aid Road Project No. 75—Geneva-Belvidere, Thayer County.

Geneva-Belvidere Federal Aid Road	Project 75
Length	5.34
Percentage Complete	
Project Started	May, 1920
Type	Earth
Estimated Cost	$22,899.94
Federal Aid	11,449.97
State Aid	11,449.97
Other Funds	
Total Feet Corrugated Culverts	298
Total Feet Concrete Pipe Culverts	0
Total Number Box Culverts	
Total Cubic Yards Concrete in Box Culverts	49.39
Bridges Over 36 Square Feet Waterway	0

Geneva-Belvidere.

This road extends from the city limits of Geneva through the town of Strang, the County line, through Bruning to within one mile north of Belvidere. See Fillmore County.

YORK COUNTY.

The response of the County and County Board to road improvement has been excellent. All the roads of the County have received attention, and are certainly an improvement over the old roads.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$151,652.94
Total Expended to December 1st, 1920	56,369.17
Balance	95,283.77
Number Miles State Roads	50
Number Miles Constructed by Contract	25.87
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	23
Total Miles State Roads Constructed	25.87
Total Miles Contract Work Accepted	All
Number of Projects in County	1

Federal Aid Road Project No. 56—Seward-York-Aurora, York County.

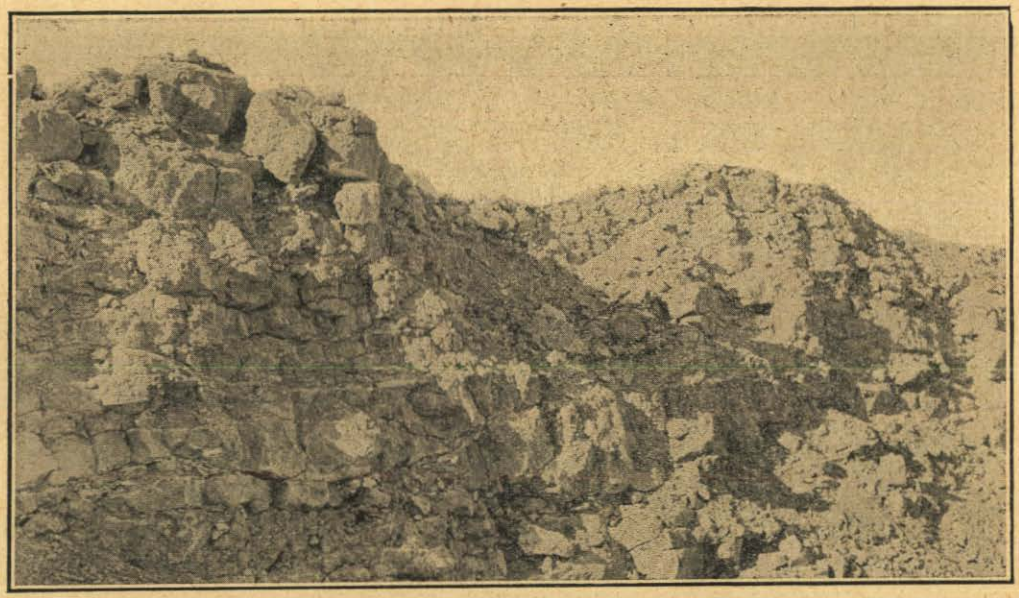
Seward-York-Aurora Federal Aid Road	Project 56
Length	25.87
Percentage Complete	100
Project Started	June 20, 1919
Type	Earth
Estimated Cost	$73,322.46
Federal Aid	36,661.23
State Aid	36,661.23

Other Funds	
Total Feet Corrugated Culverts	0
Total Feet Concrete Pipe Culverts	1,192
Total Number of Box Culverts	0
Total Cubic Yards Concrete in Box Culverts	
Bridges Over 36 Square Feet Waterway	

Seward-York-Aurora.

This project extends from the west line of York County along the S. Y. A. road to the east line of the County. As the country is generally low and flat, it has been necessary to raise the grade through the low lagoons.

BLASTING BRULE CLAY, PROJECT NO. 66, VALENTINE-SPARKS FEDERAL AND STATE AID ROAD



VIEW OF BRULE CLAY AFTER BLASTING—PROJECT NO. 66

DIVISION NUMBER 2

M. F. BLACK, Division Engineer

COUNTIES

Antelope	Holt
Boyd	Keya Paha
Brown	Knox
Burt	Madison
Cedar	Pierce
Cherry	Platte
Colfax	Rock
Cuming	Stanton
Dakota	Thurston
Dixon	Washington
Dodge	Wayne

ANTELOPE COUNTY.

The County Board has worked in harmony with the Department and as a result a united effort has been made to better the road conditions by expenditures from the various funds. Gravel deposits contiguous to the State roads have been found and with available funds a considerable amount of gravel surfacing will be placed.

The State highways included in the County maintenance program consist of that part of Highways Nos. 46, 47 and 49 which, owing to the floods in the spring of 1920, required reconstruction. These roads which lie in the valley of the Elkhorn River were covered from one to five feet of water and were heavily silted. Thus the soil conditions due to the floods, changed from a heavy gumbo to soft sand requiring an expenditure for reconstruction of nearly 60 per cent of the entire maintenance fund. By constant patrol and aid of extra teams the roads have been in fair shape. No doubt Antelope county will be one of the first in the matter of road improvement and maintenance during 1921. Truck patrols aided by teams form the nucleus of the maintenance program.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$145,256.79
Total Expended to December 1st, 1920	
Balance	145,256.79
Number Miles State Roads	57
Number Miles Constructed by Contract	0
Number Miles Surfaced—Clay	2
Hay	8
Number Miles Constructed by Heavy Gang Crew	11
Total Miles State Roads Constructed	21
Total Miles Contract Work Accepted	0
Number of Projects in County	0

This County has no Federal and State Aid Road Projects.

BOYD COUNTY.

The relations of the County Board have been in harmony with the State Department and the various County road organizations have revived, each demanding a road in each district of the same type and quality as the State roads. The State roads under maintenance include that portion of State Highways Nos. 49 and 50 lying within the County.

Highway Nos. 49 and 50, extending from Jamison to Monowi, was constructed by heavy gang maintenance crew and represents varied soils, from light sand, gumbo, to gravel on the hills. Highway No. 49 passes almost entirely through sand and clay hills to the Niobrara River and steep grades are a feature of the road. Limited automobile tax funds have hindered the maintenance of roads in the County. At no time in 1920 were the roads impassable which, in comparison with former years, shows economy of well maintained and well constructed roads. Fully equipped truck partols have taken care of the maintenance program.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$83,753.85
Total Expended to December 1st, 1920	
Balance	83,753.85
Number Miles State Roads	61
Number Miles Constructed by Contract	0
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	50
Total Miles State Roads Constructed	50
Total Miles Contract Work Accepted	0
Number of Projects in County	0

This County has no Federal and State Aid Road Projects.

BROWN COUNTY.

The roads comprising the maintenance program consist of that part of No. 65 from the Rock County line east of Long Pine west and north to the Niobrara River. The soil on the entire road is sand and gravel glacial deposit and in the future when more funds are available it may be used for surfacing. Truck and team patrol crews have accomplished fairly satisfactory work during 1920. The heavy gang maintenance crew together with a rented County outfit has been used on the road west of Ainsworth and Federal Aid funds are being expended on the road between Long Pine and Ainsworth. Co-operation from the County Board has been satisfactory.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$104,338.41
Total Expended to December 1st, 1920	33,858.36
Balance	70,480.05
Number Miles State Roads	53
Number Miles Constructed by Contract	6.21
Number Miles Surfaced—Clay	1
Hay	8
Number Miles Constructed by Heavy Gang Crew	0
Total Miles State Roads Constructed	15.21
Total Miles Contract Work Accepted	6.21
Number of Projects in County	1

Federal Aid Road Project No. 125-A—Long-Pine-Johnstown, Brown County.

Long Pine-Johnstown Federal Aid Road	Proj. 125-A
Length	7.76
Percentage Complete	80
Project Started	July, 1920
Type—Earth	6.77
S-Clay	.99
Estimated Cost	$74,484.43
Federal Aid	37,242.21
State Aid	37,242.21
Total Feet Concrete Pipe Culverts	720

Total Number Box Culverts	2
Total Cubic Yards Concrete in Box Culverts	39.86
Bridges Over 36 Square Feet Waterway	2

Long Pine-Johnstown Road.

This road is the only east and west Federal Aid project under construction along the main traveled way from Omaha to Cherry County. The transportation problem encountered of the almost impassible gravel hills across Pine and Willow Creeks, is solved by the construction of a clay surfacing, and by using long easy curves. Two large and beautiful concrete bridges over the two creeks will soon be completed.

BURT COUNTY.

Burt County is one of the counties in the Second Division having first class constructed and maintained roads. The soil throughout is loess, typical of the Missouri River valley, with occasional deposits of gravel which may later be used for surfacing. The State roads included in the County's maintenance program are those parts of Highway Number 12 (known as the Washington Highway), Highway Number 13 and Number 37. Number 12 extends from the Washington County line south of Tekamah to the Thurston County line north of Lyons; Number 13 extends from the Dodge County line north of Hooper to Oakland; No. 37 extends west from Oakland to the Cuming County line. Heavy gang maintenance crews maintained Highway Number 13 during 1920, and County maintenance equipment was used on Highway Number 12. The entire work has been satisfactory.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$108,634.69
Total Expended to December 1st, 1920	85,286.14
Balance	23,348.55
Number Miles State Roads	53
Number Miles Constructed by Contract	21.82
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	7
Total Miles State Roads Constructed	28.82
Total Miles Contract Work Accepted	21.82
Number Projects in County	1

Federal Aid Project No. 23—Blair-Oakland, Burt County.

Blair-Oakland Federal Aid Road	Project 23
Length	22.04
Percentage Complete	99
Project Started	July, 1919
Type	Earth
Estimated Cost	$94,215.76
Federal Aid	47,107.88
State Aid	47,107.88

Total Feet Corrugated Culverts	16
Total Feet Concrete Pipe Culverts	1,240
Total Number Box Culverts	2
Total Cubic Yards Concrete in Box Culverts	23.1
Bridges Over 36 Square Feet Waterway	15....

Blair-Oakland Road.

This road, which is now completed, comprises that part of the Washington Highway from Blair, Washington County, to Oakland, Burt County. Heavy drainage structures were required and were partly paid for by the counties. Owing to inclement weather and labor shortage the culvert contractor was unable to complete his work within the specified time. Traffic has increased over this road so that at present 80 per cent of the tourists prefer this to the route on the east side of the Missouri River. See Washington County.

CEDAR COUNTY.

State Highway No. 17 represents the entire maintenance program of this County and extends from the Wayne County line south of Laurel to the Missouri River south of Yankton in South Dakota. State and Federal Aid road construction has been carried on during 1920 from the County line south of Laurel to Hartington. The soil varies from a heavy black gumbo in the valleys to loess, gravel and chalk rock in the hills. Most of the work of the patrol men has been spent on construction rather than maintenance owing to heavy rains and creek erosions. With normal weather conditions in 1921 a greater degree of success may be expected in the maintenance program.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$142,988.87
Total Expended to December 1st, 1920	63,530.02
Balance	79,458.85
Number Miles State Roads	54
Number Miles Constructed by Contract	26.03
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	0
Total Miles State Roads Constructed	26.03
Total Miles Contract Work Accepted	26.03
Number Projects in County	1

Federal Aid Road Project No. 4—Cedar-Wayne, Cedar County.

Cedar-Wayne Federal Aid Road	Project 4
Length	26.30
Percentage Complete	99
Project Started	May, 1919
Type	Earth
Estimated Cost	$91,310.05
Federal Aid	45,655.02
State Aid	45,655.03
Total Feet Corrugated Culverts	42

Total Feet Concrete Pipe Culverts	1,323
Bridges Over 36 Square Feet Waterway	18

Cedar-Wayne Road.

The Cedar-Wayne project is practically completed. That portion of this highway lying within Cedar County should develop into one of the finest roads in this part of the State, owing to the excellent gravel deposits close at hand which offer unlimited possibilities toward proper maintenance. Long lines of guard rails are constructed on all high fills. See Cedar County.

CHERRY COUNTY

The hearty response of the County in all matters pertaining to road improvement for this County should be commended.

Very little maintenance has been given to any part of the State road due to the type of soil encountered. From the Keya Paha County line to the Niobrara River the soil varies from heavy black loam to Brule Clay, while from Niobrara to Valentine it is composed mostly of fine sand with occasional Brule Clay hills extending above the general level of the surrounding country. The Valentine-Sparks project in this County will be maintained by truck outfit, which will work during the winter months keeping the snow from the highway.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$388,840.66
Total Expended to December 1st, 1920	92,671.32
Balance	296,169.34
Number Miles State Roads	125
Number Miles Constructed by Contract	15.74
Number Miles Surfaced—Clay	5
Number Miles Constructed by Heavy Gang Crew	0
Total Miles State Roads Constructed	15.74
Total Miles Contract Work Accepted	5
Number Projects in County	1

Federal Aid Road Project No. 66—Valentine-Sparks, Cherry County.

Valentine-Sparks Federal Aid Road	Project 66
Length—Earth	12.65
S-Clay	11.91
Percentage Complete	60
Project Started	May, 1920
Type	Earth & S-C
Estimated Cost	$233,250.41
Federal Aid	16,625.20
State Aid	16,625.21
Total Feet Corrugated Culverts	1,700
Total Number Box Culverts	1
Total Cubic Yards Concrete in Box Culverts	31.12
Bridges Over 36 Square Feet Waterway	2

SOME OF THE EQUIPMENT USED IN CONSTRUCTING FEDERAL AND STATE AID PROJECT NO. 66, VALENTINE-SPARKS ROAD

Valentine-Sparks Road.

This project includes that part of the State Highway from Keya Paha County line to Valentine in Cherry County. The original grades were in places from 25 to 35 percent, but with considerable re-location these have been reduced to a possible 10 per cent. The traffic on completed portion has increased approximately 80 percent. Keya Paha County to the east is building a road to meet with this and State Aid contracts have been let on the road from Springview to Bassett.

COLFAX COUNTY.

Considering that definite results in the matter of road improvement have not as yet materialized the co-operation of the County Board has been fairly satisfactory. The State roads in this County include part of State Highway No. 38 and 28, commonly known as the Lincoln Highway and part of No. 27 and 35. Highways No. 38, 28 and 37 are located in the Platte River bottom, while Highway No. 35 is located in the loess hills on the north side of the Platte River, the latter having exceptionally steep grades and requiring special care in maintenance. A claying program for the valley roads has been formulated and will be carried on in the spring. Heavy gang maintenance crews have worked the entire road system of the County and with the same maintenance expense next year may boast of completed State Highway System.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$94,853.97
Total Expended to December 1st, 1920	72,629.98
Balance	22,223.99
Number Miles State Roads	40
Number Miles Constructed by Contract	7.95
Number Miles Surfaced	1.42
Number Miles Constructed by Heavy Gang Crew	30
Total Miles State Roads Constructed	37.95
Total Miles Contract Work Accepted	1.42
Number Projects in County	1

Federal Aid Project No. 58-A—Schuyler-Platte River, Colfax County.

Schuyler-Platte River	Proj. 58-A
Length	1.42
Percentage Complete	100
Project Started	April, 1920
Type—Concrete	1.42
Earth	6.53
Estimated Cost	$90,462.82
Federal Aid	45,231.41
State Aid	45,231.41
Other Funds (County)	18,421.65
Total Feet Concrete Pipe Culverts	176
Bridges Over 36 Square Feet Waterway	36

Schuyler-Platte Road.

The project consists of surfacing with concrete the highway from Schuyler, south to the State Aid Bridge. The road lies in the Platte valley and is subject to over-flow water being almost impassable for many months of the year. Silt covered the entire roadway after each of these floods and necessitated heavy maintenance expenditure without definite results. In the spring of 1920 plans were completed and the contract let for construction, and on September 25th the road was opened for traffic. Part of the coarse aggregate used was pumped on the property contiguous to the project, but later the aggregate was found to contain too much silt, and the plant was abandoned.

Gravel of proper grading was found in the vicinity of Columbus, shipped in cars, and hauled to the work in wagons. The finishing and tamping was done by machinery and test cylinders of daily mixtures were taken by the testing engineer. These sometimes equalled or exceeded the Standard Potomac River gravel concrete. Some delay due to shortage of labor and cement was experienced.

The traffic has increased to such an extent that 90 percent of the travel of the south side of the river traverses the pavement.

CUMING COUNTY.

The County Board and the County Highway Commissioner have at all times co-operated with the Department and maintenance of the roads has been satisfactory. The State roads included in the maintenance program consist of part of State Highways Nos. 16, 17, 23 and 37, lying within the County, each representing a varied type of soil. Heavy gang maintenance crews have been used to advantage on the roads with the exception of No. 37. The valley roads at all times are subject to floods of the Elkhorn River and have presented a difficult problem both with regard to drainage and maintenance. Considerable Federal and State Aid work is contemplated for the County during 1921, and with the drainage properly and systematically cared for the County may expect gratifying results.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$126,857.08
Total Expended to December 1st, 1920	
Balance	126,857.08
Number Miles State Roads	60
Number Miles Constructed by Contract	0
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	47
Total Miles State Roads Constructed	47
Total Miles Contract Work Accepted	0
Number of Projects in County	0

There are no Federal and State Aid Road Projects in this County.

DAKOTA COUNTY.

This County has been unfortunate with regard to carrying on a road improvement program due to excessive rains during the late part of the summer which destroyed nearly all of the roads on the bottom land. However, by constant patroling and extra help, together with the expenditure of considerable maintenance funds for culverts, bridges, etc., these difficulties were fairly overcome. The co-operation of the County Board was a great factor in accomplishing the splendid results under such adverse circumstances.

The State Highway No. 13 traverses the County from north to south connecting northern Iowa and Dakota with Kansas and Missouri. A portion of the road is through the loess hills of the Missouri River to the sandy bottom lands. Fully equipped truck and tractor patrols furnished the means for satisfactory maintenance.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$55,422.83
Total Expended to December 1st, 1920	0
Balance	55,422.83
Number Miles State Roads	15
Number Miles Constructed by Contract	0
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	0
Total Miles State Roads Constructed	0
Total Miles State Roads Accepted for Maintenance	0
Number of Projects in County	0

There are no Federal and State Aid Road Projects in this County.

DIXON COUNTY.

The maintenance program of this County constitutes the work on State Highways Nos. 23 and 17 lying within the County. Contracts have been awarded and will be completed during 1920. The soil on Highway No. 23 is a heavy black gumbo with light sand and loess on the hills with occasional outcrops of loose rock. The soil on Highway No. 17 is entirely loess which is easily maintained. Owing to the length of the patrol on No. 17 Wayne County has assumed the responsibility of maintaining the constructed part. That part of Highway No. 23 which is not under construction has been maintained satisfactorily. It is necessary because of this type of road that it be surfaced with sand and proper drainage structures sufficient in size to carry the flood waters of Logan Creek.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$97.850.57
Total Expended to December 1st, 1920	43,006.77
Balance	54,843.80
Number Miles State Roads	28
Number Miles Constructed by Contract	13.54

Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	0
Total Miles State Roads Constructed	13.54
Total Miles Contract Work Accepted	8
Number of Projects in County	1

Federal Aid Road Project No. 31—Allen-Ponca, Dixon County.

Allen-Ponca Federal Aid Road	Project 31
Length	16.93
Percentage Complete	80
Project Started	July, 1919
Type	Earth
Estimated Cost	60,689.06
Federal Aid	30,344.53
State Aid	30,344.53
Total Feet Concrete Pipe Culverts	858
Total Number Box Culverts	8
Total Cubic Yards Concrete in Box Culverts	183.99
Bridges Over 36 Square Feet Waterway	18

Allen-Ponca Road.

This project consists of improving the road between Allen and Ponca, a distance of 16.93 miles. The alignment is irregular and follows the stream bed of Ponca Creek and is subject to overflow from the creek. From present indications it would seem that this road will afford an excellent outlet to northeastern Nebraska and will serve as a market road from railroad points for the farmers in this area.

GRAVELING FREMONT-CERESCO FEDERAL AND STATE AID ROAD, PROJECT 27

DODGE COUNTY.

Excellent co-operation from the County Board of Supervisors, the County Highway Commissioner and the people of Dodge County has made good roads possible in a relatively short time. The State roads included in the maintenance program are the Lincoln Highway No. 38, six miles of which was paved this year; parts of Highways No. 15 and 16; part of Highways No. 13, 36 and 22. Heavy gang maintenance crews have been used on most of the roads in the valleys. A gravelling project to cover a newly constructed earth road from Fremont to Ceresco is now in progress. Truck and tractor patrols with occasional team work has provided a well maintained road system. The soil varies from heavy gumbo in the Elkhorn valley to sandy loam in the Platte valley and loess hills in the Platte valley and loess hills in the northwestern part of the county.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$138,488.65
Total Expended to December 1st, 1920	142,217.50
Balance	O. D. 3,718.85
Number Miles State Roads	68
Number Miles Constructed by Contract	5.94
Number Miles Surfaced—Concrete	5.94
Number Miles Constructed by Heavy Gang Crew	30
Total Miles State Roads Constructed	35.94
Total Miles Contract Work Accepted	5.94
Number of Projects in County	2

Federal Aid Road Project No. 81—Fremont-Ames, Dodge County.

Fremont-Ames Federal Aid Road	Project 81
Length	5.94
Percentage Complete	100
Project Started	Aug. 1919
Type	Concrete
Estimated Cost	$199,440.34
Federal Aid	60,221.17
State Aid	60,221.17
Other Funds (Dodge County)	78,998.00
Total Feet Concrete Pipe Culverts	256
Bridges Over 36 Square Feet Waterway	1

Fremont-Ames Road.

This concrete surfaced road lies between Fremont and Ames on the Lincoln Highway. The soil being composed of humus and sand made travel difficult, unless weather conditions were ideal, thus the Dodge County Board formed a paving district and the completed road is said to be the best concrete paving in the State. The entire work was handled by men, machinery and a few teams, the latter being employed for grading only. The coarse aggregate for the concrete was pumped from the pits south of the project, screened, loaded into Fords equipped with Lee dump bodies, and hauled with the proper portion of tested cement

to the mixer. Tamping and finishing were done entirely by machinery and as a result a concrete was obtained which passed a higher crushing strength than the Potomac gravel concrete, the government's standard. The work was carried on in a scientific and economic manner. Traffic has increased more than 100 per cent due to the hard surface.

Federal Aid Road Project No. 27—Fremont-Ceresco, Dodge County.

Fremont-Ceresco Federal Aid Road	Project 27
Length	1.96
Percentage Complete	0
Project Started	
Type	Earth
Estimated Cost	$1,104.13
Federal Aid	552.06
State Aid	552.06
Other Funds (County)	25,369.87
Bridges Over 36 Square Feet Waterway	3

Fremont-Ceresco Road.

Three-fourths of a mile of the Fremont-Ceresco road is located in Dodge County, the remainder of the project being in Saunders County. Construction has not yet started on this part of the road lying in Dodge County. See Saunders County in Division No. 1 for the remainder of the work on this project.

HOLT COUNTY.

"More and Better Roads" is Holt County's slogan. The State roads included in the maintenance program are those parts of Highways Nos. 48, 49 and 65 lying within the County boundaries. Highway No. 48 extends from Atkinson south and consists partly of sand which requires clay or heavy soil covering. It extends along the Elkhorn valley to the sandhills to south County line. Highway No. 49 varies in soil from loose sand to coarse gravel with occasional deposits of heavy soil in the valleys. The soil of Highway No. 65 varies from sand to gravel outcroppings of which may be used for surfacing. The entire road between Antelope County line and O'Neill has been graded by the heavy gang maintenance crew, and covered with straw to prevent the sand from blowing.

Maintenance equipment consists of truck patrols which have been successful considering the various types of soil encountered.

1918-1919 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$242,562.34
Total Expended to December 1st, 1920	898.78
Balance	241,663.56
Number Miles State Roads	134
Number Miles Constructed by Contract	2
Number Miles Surfaced—Hay	30
Number Miles Constructed by Heavy Gang Crew	37

Total Miles State Roads Constructed	69
Total Miles Contract Work Accepted	0
Number Projects in County	1

Federal Aid Road Project No. 14-A—O'Neill-Butte, Holt County.

O'Neill-Butte Federal Aid Road	Proj. 14-A
Length	19.92
Percentage Complete	10
Project Started	Sept., 1920
Type	Earth
Estimated Cost	$123,201.86
Federal Aid	61,600.93
State Aid	61,600.93
Total Feet Corrugated Culverts	1,840
Total Number Box Culverts	7
Total Cubic Yards Concrete in Box Culverts	235.62
Bridges Over 36 Square Feet Waterway	4

O'Neill-Butte Road.

From an irregular winding trail this road is being converted into a standard highway on which all grades have been reduced over 10 per cent. Many gravel outcrops occur on the hills and from careful surveys it appears that no better road building material can be found in the State. Nearly five miles have been completed to date, and owing to type of soil and a dry condition work will continue during the winter months.

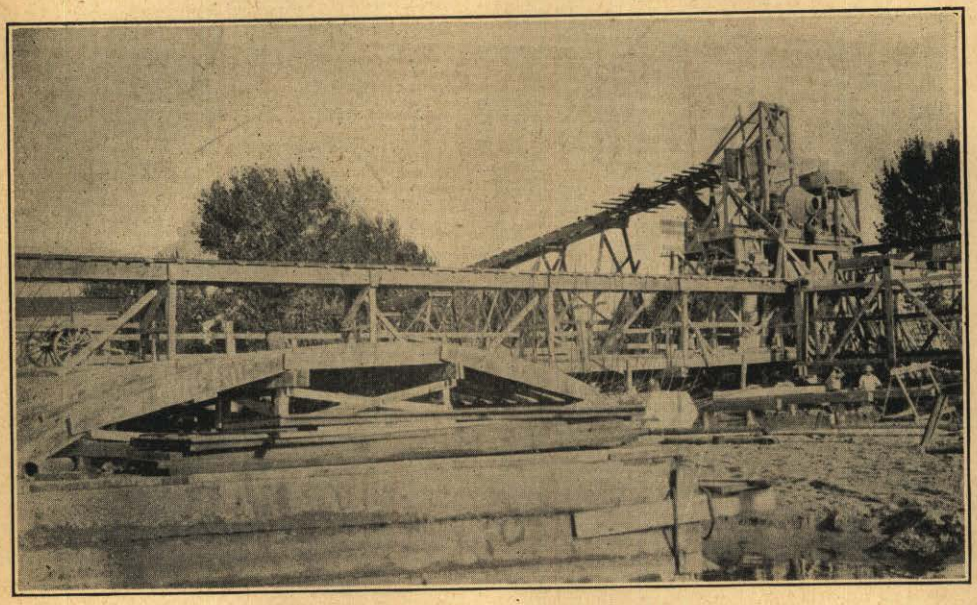
KEYA PAHA COUNTY.

The roads comprising the State's maintenance program in this County are roads Nos. 65 and 66. Considerable rivalry exists between the adjoining counties in regard to the outlet of the road to the railroad. Three towns vie with each other as to which one shall be the teminus. The maintenance in the County is limited to the County automobile tax, and while not extensive provides a much better method than the old system of periodic dragging. One truck outfit with blade grader and drags constitutes the maintenance equipment. The soil varies from a sandy loam and silt in the Niobrara valley to gravel and Brule Clay in the hills. Construction by the Department was started on an outlet toward Bassett, Rock County and Long Pine, Brown County. Both Counties are about to spend their funds in opening the road to the respective counties.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$59,506.72
Total Expended to December 1st, 1920	391.38
Balance	59,115.34
Number Miles State Roads	34
Number Miles Constructed by Contract	3
Number Miles Surfaced—Clay	1
Number Miles Constructed by Heavy Gang Crew	4

Total Miles State Roads Constructed	5.3
Total Miles Contract Work Accepted	0
Number Projects in County (State Aid)	1



VIEW DURING CONSTRUCTION MORRILL STATE AID BRIDGE

Federal Aid Road Project No. 137-B—Springview-Basset, Keya Paha Co.

Springview-Bassett Federal Aid Road	Proj. 137-B
Length—S-Clay	3.04
Percentage Complete	10
Project Started	Oct., 1920
Type	Earth-S Clay
Estimated Cost	$57,057.50
Federal Aid	28,528.75
State Aid	28,528.75
Bridges Over 36 Square Feet Waterway	2

Springview-Basset Road.

This road includes that part of the State Highway between Springview in Keya Paha County and Bassett in Rock County. On the north side of the Niobrara River the soil is sand and gravel on the table lands and brule clay near the river; on the south side a sand plane shifting from place to place makes the alignment of the road vary according to weather conditions. Outcrops of clay and gravel are found along this road and with funds available approximately twelve miles might be improved.

KNOX COUNTY.

State Highways Nos. 29 and 50 constitute the maintenance program in Knox County. The soil on Highway No. 29 is a sand and sandy loam with gravel and shale in the hills and varies to heavy black soil in the valleys. Glacial drifts composed of gravel are found near Creighton and Center, which will eventually be used for surfacing the entire road. The soil of Highway No. 50 is a glacial deposit and contains gravel, while in the valleys it is difficult to maintain as it is of a rather heavy type. That part of Highway No. 29 north of Creighton is being constructed by State and Federal Aid funds. The drainage problems on Highway No. 29 are complicated due entirely to the steep slopes. Tractor, trucks and team patrol maintains these roads.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$185,085.49
Total Expended to December 1st, 1920	100,242.41
Balance	84,843.08
Number Miles State Roads	68
Number Miles Constructed by Contract	14.41
Number Miles Surfaced—Gravel	1
Clay	1
Number Miles Constructed by Heavy Gang Crew	0
Total Miles State Roads Constructed	14.41
Total Miles Contract Work Accepted	14
Number Projects in County	2

Federal Aid Road Project No. 33-A—Center-Creighton, Knox County.

Center-Creighton Federal Aid Road	Proj. 33-A
Length	11.41
Percentage Complete	85
Project Started	May, 1920
Type—Concrete	.12
S. Clay	1.2
Earth	10.09
Estimated Cost	$101,985.00
Federal Aid	50,992.50
State Aid	50,992.50
Total Feet Corrugated Culverts	712
Bridges Over 36 Square Feet Waterway	18

Center-Creighton Road.

This project consists of the improvement of part of State Highway No. 29 by grading between Creighton and Center. The topography contiguous to the project consists of high bluffs, gravel and heavy shale formation. The road follows Brazile Creek which is normally from 50 to 75 feet, but during heavy rains it is increased to a half mile in width. Fourteen of the total eighteen bridges vary in length from 50 to 120 feet.

Federal Aid Road Project No. 113-A—Center-Niobrara, Knox County.

Center-Niobrara Federal Aid Road	Proj. 113-A
Length	6.74
Percentage Complete	70
Project Started	May, 1920
Type	Earth
Estimated Cost	$95,171.49
Federal Aid	47,585.74
State Aid	47,585.75
Other Funds	0
Total Feet Corrugated Culverts	972
Total Number Box Culverts	1
Total Cubic Yards Concrete in Box Culverts	29.3
Bridges Over 36 Square Feet Waterway	9

Center-Niobrara Road.

This project includes that part of State Highway No. 29 lying north of Center and extending northwest toward Niobrara. The present constructed road runs through hills and intersects many glacial deposits laden with clay and gravel, the latter is desirable for surfacing. The new road will carry the entire traffic of the County toward the west and northwest and provide a much cheaper hauling rate for freight to the inland towns and reservations. The maximum grade is seven per cent. All drainage pipes have been placed and only small concrete headwalls and box culverts remain to be finished.

MADISON COUNTY.

Flood conditions in the early spring and summer have retarded the progress of the maintenance program in this County. The State roads included are Nos. 28, 29, 37 and 27. Highway No. 27 is loess sand and loam which makes a desirable road only during favorable weather. Highway No. 28 has been bladed and shaped by the heavy gang maintenance crews and was converted from an impassible trail to an excellent road. Highway No. 29 was constructed during 1919-20 with Federal Aid funds. Highway No. 37 lies in the Elkhorn valley and is subject to overflow, which makes it impassible for many weeks during the rainy season.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$136,105.32
Total Expended to December 1st, 1920	60,771.01
Balance	75,334.31
Number Miles State Roads	80
Number Miles Constructed by Contract	21.75
Number Miles Surfaced—Clay	6
Number Miles Constructed by Heavy Gang Crew	23
Total Miles State Roads Constructed	49.75
Total Miles Contract Work Accepted	21.75
Number of Projects in County	1

Federal Aid Road Project No. 5—Norfolk-Columbus, Madison County.

Norfolk-Columbus Federal Aid Road	Project 5
Length	21.97
Percentage Complete	99
Project Started	May, 1920
Type—Earth	13.97
S-Clay	8.00
Estimated Cost	$61,878.62
Federal Aid	30,939.31
State Aid	30,939.31
Total Feet Corrugated Culverts	36
Total Feet Concrete Pipe Culverts	366
Total Number Box Culverts	1
Total Cubic Yards Concrete in Box Culverts	22.63
Bridges Over 36 Square Feet Waterway	14

Norfolk-Columbus Road.

The project consists entirely of earth road and sand clay surfacing and comprises that part of the Meridian Highway from Columbus in Platte County to Norfolk in Madison County, 52 miles in length. There are five varieties of soil included in the project, viz: clay, heavy and light sand, humus and gumbo. Grades have been reduced to a minimum of 8 per cent, whereas 12 to 15 per cent grades were common. As this is a transcontinental road the tourist traffic is heavy. See Platte County.

PIERCE COUNTY.

The maintenance of a part of State Highway No. 29 represents the program for this County. Some heavy gang maintenance crew work has been carried on in the County, but generally speaking maintenance has been neglected except on those parts contiguous to the towns. Two Federal Aid road projects are included in the construction—one from Pierce to Plainview and the other from Pierce south.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation less 5%	$ 97,385.98
Total Expended to December 1, 1920	43,537.86
Balance	53,848.12
Number Miles State Roads	28
Number Miles Constructed by Contract	7.94
Number Miles Surfaced (Clay)	1
Number Miles Constructed by Heavy Gang Crew	0
Total Miles State Roads Constructed	7.94
Total Miles Contract Work Accepted	5
Number Projects in County	2

Federal Aid Road Project No. 136-A—Pierce-Plainview, Pierce County.

Pierce-Plainview Federal Aid Road	Proj. 136-A
Length	2.11
Percentage Complete	35

Project Started	July, 1920
Type (Earth)	.33
S-Clay	1.78
Estimated Cost	$ 33,075.90
Federal Aid	16,537.95
State Aid	16,537.95
Total Feet Concrete Pipe Culverts	24
Total Number Box Culverts	2
Total Cu. yds. Concrete in Box Culverts	70.32
Bridges Over 36 sq. ft. Waterway	4

Pierce-Plainview.

The road is located in the Elkhorn valley and is that part of the State Highway three miles north of Pierce. The contract was let in the summer of 1920 and the road will probably be finished this year. Nearly all heavy drainage structures are completed. A portion of the road will require a covering of sand.

Federal Aid Road Project No. 64-A—Pierce-South, Pierce County.

Pierce-South Federal Aid Road	Proj. 64-A
Length	9.61
Percentage Complete	75
Project Started	June, 1920
Type	Earth
Estimated Cost	$ 67,459.52
Federal Aid	33,729.76
State Aid	33,729.76
Total Feet Concrete Pipe Culverts	1,200
Total Number Box Culverts	5
Total Cu. yds. Concrete in Box Culverts	88.43
Bridges over 36 sq. ft. Waterway	5

Pierce-South Road.

This project represents that part of the State Highway between the Madison and Pierce County Line to Pierce, transversing the north fork of the Elkhorn. Owing to wet weather and poor soil, considerable time has been lost in construction. A careful survey of drainage conditions provided adequate structures which will care for unusual conditions Spillways have been provided for excessive overflows from the Elkhorn and equalizing culverts placed at all points where there is danger of floods.

PLATTE COUNTY.

The State roads in the County included in the maintenance program are those parts of Highways No. 28, 43 and 45. The roads in the valley have been well maintained during the past year but owing to the loose sand found in various places throughout the County travel and maintenance have been difficult. Highway No. 28 has been constructed and completed by Federal Aid Funds during 1920. Heavy gang maintenance crews have bladed the roads east and west from Columbus, and with

continual patrol maintenance a superior grade has been developed. Considerable claying and graveling has been contemplated on the valley roads during the coming season.

1918-1920 State and Federal Aid Road Construction:

Total Appropriation less 5%	$148,609.05
Total Expended to December 1, 1920	68,435.99
Balance	80,173.06
Number Miles State Roads	69
Number Miles Constructed by Contract	26.12
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	14
Total Miles State Roads Constructed	40.12
Total Miles Contract Work Accepted	25.85
Number Projects in County	2

Federal Aid Road Project No. 5—Norfolk-Columbus, Platte County.

Norfolk-Columbus Federal Aid Road	Project 5
Length	26.12
Percentage Complete	99
Project Started	May, 1919
Type	Earth
Estimated Cost	$ 66,663.78
Federal Aid	33,331.89
State Aid	33,331.89
Total Feet Corrugated Culverts	96
Total Feet Concrete Pipe Culverts	6.88
Total Number Box Culverts	2
Total Cu. yds. Concrete in Box Culverts	59.49
Bridges over 36 sq. ft. Waterway	10

Norfolk-Columbus Road.

For Statement of this Road Project see Madison County.

Federal Aid Road Project No. 115—Barnum Creek, Platte County.

Barnum Creek Federal Aid Road	Proj. 115
Length	1.78
Percentage Complete	15
Project Started	May, 1920
Type	Concrete
Estimated Cost	$ 97,355.95
Federal Aid	35,860.00
State Aid	27,391.82
Other Funds (County)	34,104.13
Total Feet Concrete Pipe Culverts	128
Total Number Box Culverts	3
Total Cu. Yds. Concrete in Box Culverts	29.54
Bridges over 36 sq. ft. Waterway	2

Barnum Creek Road.

This project includes that part of the Lincoln Highway lying south of Columbus between the Platte and Loup Rivers. The soil a light and sand variety easily shifted by wind makes work difficult in extremely dry seasons. The overflow due to ice gorges during the spring has closed the road entirely for weeks at a time and a considerable amount of maintenance funds have been spent yearly without satisfactory results. Because of the unsatisfactory condition of the road it was decided to improve it by surfacing the road by concrete overflow paving, Federal Aid being used to pay one-half the cost. The material for the coarse aggregate is screened from the wash of the Platte River and compares favorably with Fremont gravel. When the road is completed it will eliminate one of the impassable stretches on the Lincoln Highway.

ROCK COUNTY.

The Rock County Board has co-operated with the Department satisfactorily and maintenance of State roads while not intensive, owing to the great length of patrol sections has nevertheless been effective. The roads included in the maintenance program are State Highways No. 64, 65 and 66 lying within the County. The soil on Highway No. 64 is almost entirely of sand, which is impassable in dry weather—the soil on Highway No. 65 is chiefly sand with occasional stretches of heavy soil through hay meadows and swamps, while the soil on Highway No. 66 from Bassett to within one mile of the Niobrara River is loose sand with occasional outcrops of clay and gravel, which are located one and one-half miles to the west of the road. Brule Clay bluffs are also found near the river. Heavy Gang Maintenance Crews have bladed Highway No. 65 from the Holt County line westward to Bassett. Although construction will be started in 1921 only a limited amount can be finished due to lack of funds.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation less 5%	$ 84,572.51
Total Expended to December 1, 1920	.....
Balance	84,572.51
Number Miles State Roads	74
Number Miles Constructed by Contract	0
Number Miles Surfaced (Hayed)	10
Number Miles Constructed by Heavy Gang Crew	5
Total Miles State Roads Constructed	15
Total Miles Contract Work Accepted	0
Number Projects in County	0

There are no Federal and State Aid Projects in this County.

STANTON COUNTY.

Tributaries to the Elkhorn river overflowed during the spring of 1920 and a considerable part of the road together with drainage

structures were damages making reconstruction necessary. The maintenance program includes part of State Highways No. 35 and 37. The former transverses the loess hills between the Platte and Elkhorn valleys, and until 1920 was but a trail. However maintenance by light patrol equipment formed a passable road. Highway No. 37 transverses the Elkhorn valley paralleling the C. & N. W. Railroad near the foot of steep hills and owing to its particular position presents varied and difficult drainage problems. Actual construction together with proper drainage structures will be necessary on the State roads in the near future in order to insure passable roads at all times. Although maintenance has been fairly satisfactory under trying circumstances it is hoped that the coming year will bring better results.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation less 5%	$ 68,727.07
Total Expended to December 1, 1920	.....
Balance	68,727.07
Number Miles State Roads	39
Number Miles Constructed by Contract	0
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	0
Total Miles State Roads Constructed	0
Total Miles Contract Work Accepted	0
Number Projects in County	0

There are no Federal and State Aid Projects in this County.

THURSTON COUNTY.

A cloudburst affecting the entire County necessitated the re-building of all State Highways and bridges thereon during the late summer of 1920. The County offered the use of their heavy maintenance County outfits and by intensive patrols accomplished more than any County in northeastern Nebraska. Although the roads were not put into excellent condition, the effort and co-operation of the Board and Highway Commissioner may be commended. The entire system of State roads lies in the loess hills of the Missouri river valley thus presenting intricate drainage problems. Highway No. 13 traverses the County from south of Rosalie to the Dakota County line. Highway No. 23 runs from the Cuming County line south of Pender to the Wayne County line west of Pender and affords an outlet for tourists from Dakota and the northwest by the way of Yankton. Federal and State Aid funds will be used on Highway No. 13 in the spring of 1921.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation less 5%	$ 70,851.79
Total Expended to December 1, 1920	.....
Balance	70,851.79
Number Miles State Roads	32
Number Miles Constructed by Contract	0

Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	7
Total Miles State Roads Constructed	7
Total Miles Contract Work Accepted	0
Number of Projects in County	0

There are no Federal and State Aid Road Projects in this County.

WASHINGTON COUNTY.

The roads included in the maintenance program are Highways No. 36 extending from the Dodge County line northeast to Blair and Highway No. 12, Coffman to the County line north and west of Herman. Highway No. 36 lies in the loess valley of the Missouri River and in the sand and gumbo valley of the Elkhorn River. Heavy Gang Maintenance Crews were in operation on the entire road from the Dodge County line to Blair and the finished road presents a uniform alignment and an excellent riding surface. Constant patrol and maintenance of this road has made it the most traveled road east and wet through Washington County. Highway No. 12 from Coffman to Blair has been patroled by light equipment. This road lies along the loess hills of the Missouri valley and is subject to erosion because of the light soil. The construction on the Blair to Florence road will be started next spring. From Blair north and west Federal and State Aid Funds were used in construction of both minor drainage structures and grading. Truck and team patrols fully equipped, maintained this road and it has been equal to a paved road.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation less 5%	$ 95,959.83
Total Expended to December 1, 1920	28,159.23
Balance	67,800.60
Number Miles State Roads	41
Number Miles Constructed by Contract	10.06
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crews	16
Total Miles State Roads Constructed	26.06
Total Miles Contract Work Accepted	10.06
Number Projects in County	1

Federal Aid Road Project No. 23—Blair-Oakland, Washington County.

Blair-Oakland Federal Aid Road	Project 23
Length	11.27
Percentage Complete	99
Project Started	Nov. 1919
Type	Earth
Estimated Cost	$ 28,407.95
Federal Aid	14,203.97
State Aid	14,203.98
Total Feet Concrete Pipe Culverts	248
Bridges over 36 sq. ft. Waterway	6

Blair-Oakland Road.

This project comprises that part of the Washington Highway from Blair to Oakland and passes through the wooded loess bluffs prevalent in the Missouri river valley. Drainage structures, in most cases heavy types, were paid for partly by the County. It has been said that eighty percent of the interstate tourists prefer this route to that on the east side of the river. See Burt County.

WAYNE COUNTY.

The maintenance of the State Highways in this County has been the best of the Division and favorable comment has been received from the traveling public as well as the Federal officials. The hearty co-operation from the County Board has been very satisfactory. The roads included in the maintenance program are State Highways No. 17 and 23. The soil on Highway No. 17 varies from heavy black gumbo in the valleys to loess in the hills. While on Highway No. 23 a heavy gumbo difficult to maintain is encountered. Heavy gang maintenance crew has worked on Highway No. 23 and a part of No. 17 lying south of Wayne. Federal and State funds have been spent on No. 17 northwest of Wayne and extending to the Cedar County line. Light patrols consisting of truck and tractor with occasional team work has kept the roads in satisfactory condition.

1918-1920 State and Federal Aid Road Construction.

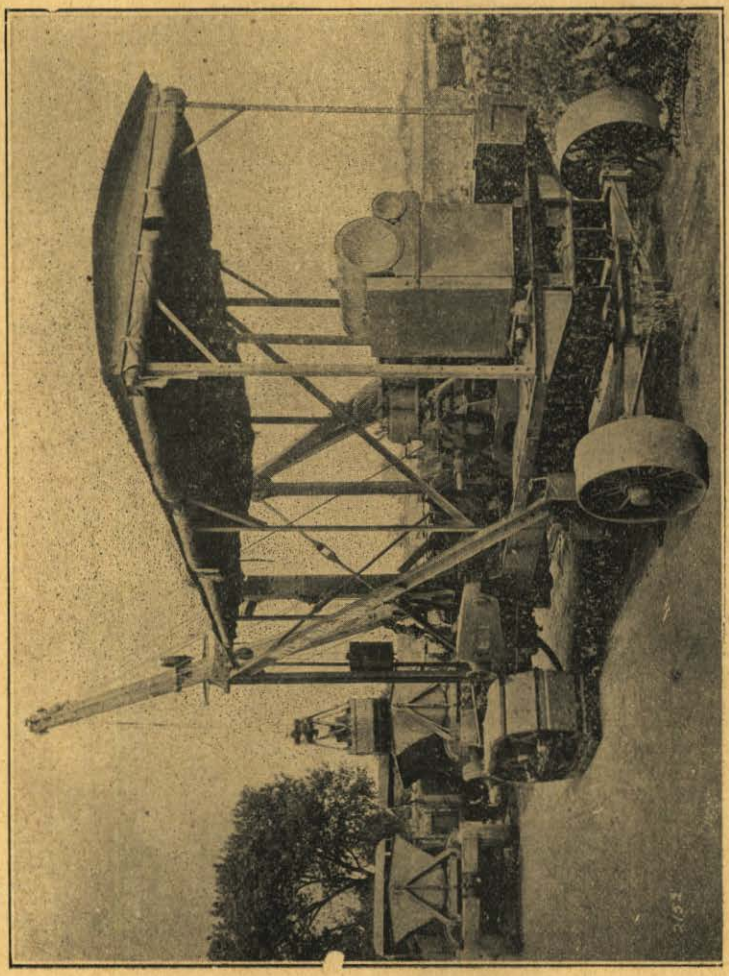
Total Appropriation less 5%	$ 90,057.79
Total Expended to December 1, 1920	34,622.80
Balance	55,434.99
Number Miles State Roads	34
Number Miles Constructed by Contract	9.9
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	12
Total Miles State Roads Constructed	21.9..
Total Miles Contract Work Accepted	9.9
Number of Projects in County	1

Federal Aid Road Project No. 4—Cedar-Wayne, Wayne County.

Cedar-Wayne Federal Aid Road	Project 4
Length	10
Percentage Complete	99
Project Started	May, 1919
Type	Earth
Estimated Cost	$ 35,812.44
Federal Aid	17,906.22
State Aid	17,906.22
Total Feet Corrugated Culverts	26
Total Feet Concrete Pipe Culverts	324
Bridges over 36 sq. ft. Waterway	4

Cedar-Wayne Road.

That part of the Cedar-Wayne road within Wayne County has been the object of many favorable remarks, due to the excellent maintenance employed on the road. The road is 36.30 miles in length, 10 miles of which is in Wayne County and the remainder in Cedar County. See Cedar County.



BYERS' CRANE EQUIPPED WITH THREE-QUARTER YARD BUCKET

DIVISION NUMBER 3

R. O. GREEN, Division Engineer

COUNTIES

Adams
Chase
Clay
Dundy
Franklin
Frontier
Furnas
Gosper
Harlan
Hayes
Hitchcock
Kearney
Nuckolls
Perkins
Phelps
Red Willow
Webster

PRELIMINARY SURVEY PARTY, SURVEYING ROAD, THE INITIAL STEP OF CONSTRUCTION

ADAMS COUNTY.

Adams County holds place as one of four counties in the southwest Division having all its State roads graded during the 1920 season, either by contract or by heavy gang maintenance crews.

Three Federal Aid projects, all under construction this season, covering all except six miles of the State Highway System in the County, have been completed. The six miles have been graded by the heavy gang maintenance crews, and are in such good condition that they have been reported equal to those constructed by contract.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation less 5%	$150,850.24
Total Expended to December 1, 1920	71,691.91
Balance	79,158.33
Number Miles State Roads	45.96
Number Miles Constructed by Contract	38.17
Number Miles Surfaced (Clay)	.3
Number of Miles Constructed by Heavy Gang Crew	11.37
Total Miles State Roads Constructed	49.54
Total Miles Contract Work Accepted	38.17
Number of Projects in County	3

Federal Aid Road Project No. 7-C—Superior-Minden, Adams County.

Superior-Minden Federal Aid Road	Proj. 7-C
Length	21.2
Percentage Complete	100
Project Started	May, 1918
Type	Earth
Estimated Cost	$34,989.46
Federal Aid	17,494.73
State Aid	17,494.73
Total Feet Corrugated Culverts	0
Total Feet Concrete Pipe Culverts	900
Bridges over 36 sq. ft. Waterway	3

Superior-Minden Road.

Federal Aid Project No. 7—Superior-Harvard-Minden Road starts at Superior and passes through Nelson in Nuckolls County, Clay Center and Harvard in Clay County, Hastings and Juniata in Adams County, near Hartwell and terminates at Minden in Kearney County. Because there are four counties involved in this Project it has been divided into sections and the section within Adams County is designated 7-C. The road is 22.16 miles and has an average of 3,630 cubic yards of earth grading per mile.

That portion of the Project lying west of Hastings has been completed and turned over to the County for maintenance, while 4.5 miles east of Hastings were taken over from the contractor early in 1920 and proposed for construction by the State. The greater part was completed

by the heavy gang maintenance crew in May, and the remainder completed by team work. (Note: Clay, Nuckolls and Kearney Counties.)

Federal Aid Road Project No. 77—Hastings-Ayr, Adams County.

Hastings-Ayr Federal Aid Road	Project 77
Length	11.28
Percentage Complete	95 ..
Project Started	May, 1920
Type	10.85 Earth
(Of this mileage .06 is concrete and .35 gravel.	
Estimated Cost	$ 60,793.30
Federal Aid	30,396.65
State Aid	30,396.65
Total Feet Corrugated Culverts	632
Total Number of Box Culverts	20
Total Cu. yds. Concrete in Box Culverts	282.10
Bridges over 36 sq. ft. Waterway	2

Hastings-Ayr Road.

Federal Aid Project No. 77 begins at the south limits of Hastings and extends south and west to within one mile of Ayr, a distance of 11.28 miles. There are 325 feet of concrete paving and .35 miles of gravel surfacing. The preliminary estimate called for 88,089 cubic yards of earth. Twenty concrete box culverts were placed in advance of the grading.

On the north side of the river the soil is mostly sand and the grade was constructed of it, the material being hauled from the hill south of the river to surface the sand for the wearing coat. Guard rail and two stretches of concrete over-flow pavement must be constructed before final acceptance.

Federal Aid Road Project No. 32—Ayr-Red Cloud Road, Adams County.

Ayr-Red Cloud Federal Aid Road	Project 32
Length	6.25
Percentage Complete	100
Project Started	October'19
Type	Earth
Estimated Cost	$ 31,441.25
Federal Aid	15,720.62
State Aid	15,720.63
Total Feet Corrugated Culverts	932
Total Number of Box Culverts	5
Total Cu. yds. Concrete in Box Culverts	123.18

Ayr-Red Cloud Road.

Federal Aid Project No. 32 comprises that portion of Nebraska State Highway No. 41, between the south County line and Ayr, thereby forming the connection between Project No. 77 north of Hastings and Project No. 32, Webster County south of Red Cloud. The construction involved 45,500 cubic yards of earth. Practically all of the 1.200 feet

of guard rail has been placed. (See Webster County for the remainder of the work on this project.)

CHASE COUNTY.

Only ordinary results have been obtained in the road program of this County, owing to the fact that it lies in a more or less arid region bordering Colorado on the east boundary; thus a small amount of moisture was available and road construction not entirely satisfactory. The State road traverses the County east and west over a comparatively flat prairie land.

Co-operation from the County Board was immediate and positive as machinery was purchased and a patrol crew put into operation. In addition careful supervision of the expenditure of funds was taken care of by the County. The Federal Project in this County has had the best consistent maintenance of any in the division. Ten miles of Federal and State Aid roads have been turned over to the County for maintenance. In addition ten miles have been shaped by county graders and with careful maintenance afford a perfect road from Imperial to Wauneta. From Imperial west to Lamar, 30 miles of prairie remain to be converted into roads. Blade graded roads may be constructed satisfactorily in this portion of the State and need only few applications of clay and sand surfacing.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$75,692.30
Total Expended to December 1st, 1920	22,364.00
Balance	53,328.30
Number Miles State Road	43.31
Number Miles Constructed by Contract	9.92
Number Miles Surfaced	0
Number Miles Constructed Heavy Gang Crew	0
Total Miles State Roads Constructed	9.92
Total Miles Contract Work Accepted	9.92
Number of Projects in County	1

Federal Aid Road Project No. 26—Hamlet-Imperial, Chase County.

Hamlet-Imperial Federal Aid Road	Project 26
Length	9.92
Percentage Complete	100
Project Started	July, 1919
Type	Earth
Estimated Cost	$29,992.10
Federal Aid	14,996.05
State Aid	14,996.05
Total Feet Concrete Pipe Culvert	500

Hamlet-Imperial Road.

Project No. 26 is 15.97 miles long and extends from Hamlet in Hayes County west to Wauneta in Chase County and northwest to a point 9.92

miles from Wauneta. The original road consisted of a winding trail partially obscured by dense undergrowth. In Chase County 41,896 cubic yards of earth were handled or approximately 4,060 cubic yards per mile. See Hayes County for the remainder of the work of this project.

CLAY COUNTY.

Clay County is one of the counties in this division having State road connections to all major towns. The support of the State's road building and maintenance program by the County Board has been noteworthy and helpful. After the Highway Commissioner was appointed three patrol maintenance crews, fully equipped, were set to work. However, owing to the fact that construction progress was carried on at disconnected points on the Federal Aid project the maintenance work was rather disjointed. Twelve miles of D. L. D. or the Nebraska Highway No. 40 from the County line east of Sutton to the junction of Highway No. 39 have been graded and completed by the heavy gang maintenance crew. The balance of this road and all of Highway No. 39 are included in project No. 7-B.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$139,855.52
Total Expended to December 1st, 1920	26,448.67
Balance	113,406.85
Number Miles State Road	44.3
Number Miles Constructed by Contract	27.62
Number Miles Surfaced	0
Number Miles Constructed Heavy Gang Crew	12
Total Miles State Roads Constructed	39.62
Total Miles Contract Work Accepted	19.72
Number of Projects in County	1

Federal Aid Road Project No. 7-B—Superior-Minden, Clay County.

Superior-Minden Federal Aid Road	Proj. 7-B
Length	32.5
Percentage Complete	85
Project Started	Summer 1918
Type	Earth
Estimated Cost	$67,692.86
Federal Aid	27,591.31
State Aid	27,591.31
Other Funds	12,510.24
Total Feet Concrete Pipe Culverts	1,340
Bridges Over 36 Square Feet Waterway	6

Superior-Minden Road.

Federal Aid Project No. 7-B is 32.5 miles in length with an average of 4080 cubic yards of earth per mile. At the time of contract letting in 1918 the County determined to construct the road at a lower cost than the lowest bid price, and accordingly attempted to do so with County

equipment, the procedure being to use farm teams whenever available and to complete the work with the County 12-foot blade grader and engine. As a result, when the farm industries were at their best the roads were almost impassible and progress was poor. Only 8 miles have been accepted for maintenance in three years' work. Considerable difficulty was experienced as the soil retained the water within the ditches. See Adams, Nuckolls and Kearney Counties.

DUNDY COUNTY.

Dundy County in the southwest corner of the State boasts of 38.57 miles of State highways; 12:75 miles of State Highway No. 70 from Max to Doane is covered by Federal Aid Project No. 41 and was completed in 1920. Of the remaining 24.5 miles 15.6 were built by heavy gang maintenance crews. The County Board is enthusiastic for road improvement and especially the Highway Commissioner is an active booster. Great difficulty was found in procuring the necessary right-of-way for the old location occupied railroad right-of-way over the greater share of the distance. The new road lies entirely away from the old location, due to the unceasing efforts of the active Board. But one crew operated on the entire length of this road, however, more equipment has been purchased for the coming season. Patrolmen are subject to call for necessary road work during the winter.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$84,711.60
Total Expended to December 1st, 1920	53,119.17
Balance	31,592.43
Number Miles State Road	38.57
Number Miles Constructed by Contract	12.72
Number Miles Surfaced—S-Clay	3.05
Number Miles Constructed Heavy Gang Crew	15.6
Total Miles State Roads Constructed	28.32
Total Miles Contract Work Accepted	12.72
Number of Projects in the County	1

Federal Aid Road Project No. 41—Max-Doane, Dundy County.

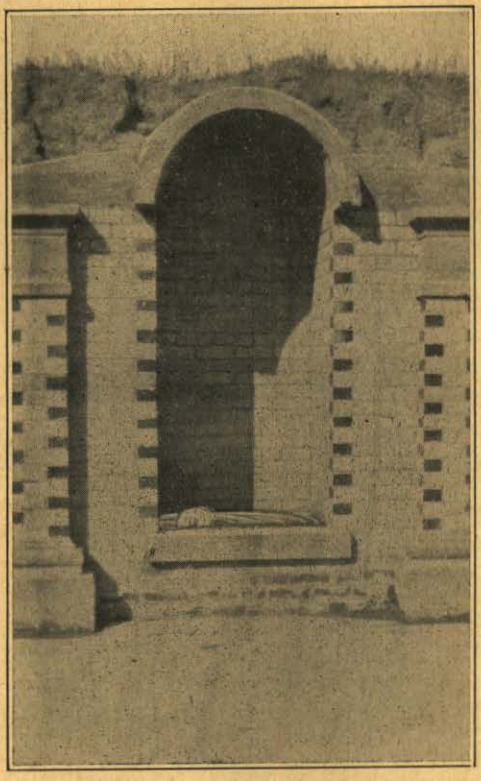
Max-Doane Federal Aid Road	Project 41
Length	12.72
Percentage Complete	100
Project Started	July, 1919
Type—Earth	9.37
S-Clay	3.35
Estimated Cost	$60,103.78
Federal Aid	30,051.89
State Aid	30,051.89
Total Feet Concrete Pipe Culverts	540
Total Number Box Culverts	2
Total Cubic Yards Concrete in Box Culverts	71.05

Max-Doane Road.

Federal Aid Project No. 41 extends from Max through Benkelman to Doane and is 12.72 miles long. Plans call for moving 96,842 cubic yards of earth.

Approximately 16,100 lineal feet of the project were surfaced with clay from barrow pits in the lagoons of the roadway. 12.17 lineal feet of guard rail are required to be placed before final acceptance by the Government.

The project was constructed with slips and frenos and the finished results are an excellent example of this type of construction.



View of Spring House built by the town of Benkelman on Project No. 41, Max-Doane Federal and State Aid Road. Perpetually flowing stream—note lower left corner of grotto.

FRANKLIN COUNTY.

Franklin County records 43.68 miles of State highways. State Highway No. 52 traverses the County from the east County line near Riverton

through Franklin to the west County line near Naponee, a distance of 24 miles. State Highway No. 54 begins at Franklin, runs north through Macon, passes Upland, to the Franklin-Phelps County line—19.6 miles. That part of Highway No. 52 from Franklin to the County line west—12 miles—is covered by Section 1 of Federal Aid Project No. 71 and was completed in 1920. Highway No. 54 was graded and completed by the heavy gang maintenance crews.

Two patrol crews equipped with trucks, drags and maintainer have provided excellent maintenance on the State Highway System. A third crew is recommended to handle the mileage for 1921.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$100,664.31
Total Expended to December 1st, 1920	55,794.86
Balance	44,869.45
Number Miles State Roads	43.68
Number Miles Constructed by Contract	12.72
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	19.6
Total Miles State Roads Constructed	32.32
Total Miles Contract Work Accepted	12
Number of Projects in County	1

Federal Aid Project No. 71—Franklin-Orleans, Franklin County.

Franklin-Orleans Federal Aid Road	Project 71
Length	13.42
Percentage Complete	95
Project Started	April, 1920
Type—Earth	13.37
Concrete	.04
S-Clay	.44
Estimated Cost	$98,294.89
Federal Aid	49,147.44
State Aid	49,147.45
Total Feet of Corrugated Culverts	66
Total Feet Concrete Pipe Culverts	356
Total Number of Box Culverts	22
Total Cubic Yards Concrete in Box Culverts	317.26
Bridges Over 36 Square Feet Waterway	6

Franklin-Orleans Road.

Federal Aid Project No. 71 extends from Franklin through Alma to Orleans in Harlan County, a total distance of 24.27 miles. Preliminary plans call for moving an average of 8,700 cubic yards of earth per mile. Final inspection was made by the State Engineer October 19, 1920, and the road turned over for maintenance. A re-location at the site of a new 8-foot by 6-foot concrete box culvert, built by the County, and heavy grading near the C., B. & Q. R. R. tracks are the important features of the road. See Harlan County for the remainder of the work.

FRONTIER COUNTY.

The maintenance program for this County has been more than successful. A light tractor and an 8-foot grader and maintainer kept the flat stretches of road in good condition. In this manner sixteen miles of formerly impassable roads have been improved. Lack of moisture and extremely hot weather have contributed in delaying the work of the County road program, but under the direction of a willing Board and an active Highway Commissioner excellent work has been accomplished. The State Highway running east and west from the east line of the County of Stockville continually crosses alternating ridges and canyons, which present deep narrow cuts, and soggy wet canyon bottoms. With the meager funds available no attempt was made toward improvement, but efforts were concentrated on making the highway passable. The Federal Aid Road between Stockville and Curtis is now completed.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$113,905.04
Total Expended to December 1st, 1920	26,616.95
Balance	87,288.09
Number Miles State Roads	35.83
Number Miles Constructed by Contract	12.08
Number Miles Surfaced	
Number Miles Constructed by Heavy Gang Crew	0
Total Miles State Roads Constructed	12.08
Total Miles Contract Work Accepted	12.08
Number of Projects in County	1

Federal Aid Road Project No. 38—Curtis-Stockville, Frontier County.

Curtis-Stockville Federal Aid Road	Project 38
Length	12.08
Percentage Complete	100
Project Started	Sept., 1919
Type	Earth
Estimated Cost	$36,561.44
Federal Aid	18,280.72
State Aid	18,280.72
Total Feet Corrugated Culverts	740

Curtis-Stockville Road.

Federal Aid Project No. 38 in Frontier County extends from Curtis to Stockville and follows the section line where possible but makes turns and detours in order to obtain easier grades and a minimum excavation. The exctvation is uniform throughout, averaging 6,200 cubic yards to the mile. This project is the only one in the Division on which the pipe culverts were extended to come out beyond the toe of the slope, thereby eliminating the building of head walls. Heavy traffic is resulting since this is a connecting road.

FURNAS COUNTY.

Road construction in this County has been unusually satisfactory, but maintenance has not kept pace accordingly, and as a result many miles of graded roads have suffered through lack of proper attention. The D. L. D. Highway traverses the County from the east line near Oxford to Edison, Arapahoe, Holbrook and to the County line west of Cambridge—30.5 miles. Nearly all of this mileage was improved by the heavy gang maintenance crew during 1920. The County undertook the construction of Federal Aid Project No. 30 from Arapahoe to Beaver City and the County Highway Commissioner's attention to road matters was confined almost entirely to this work. Heavy tourist traffic and poor maintenance were effective in breaking down the road. Nearly 13.2 miles of State Highway from Oxford southwest to join Federal Aid Project No. 30, 6 miles east of Beaver City, have been graded and maintained by a light tractor and 8-foot blade grader.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$120,552.36
Total Expended to December 1st, 1920	39,967.77
Balance	80,584.59
Number Miles State Roads	65.7
Number Miles Constructed by Contract	12.82
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	27.1
Total Miles State Roads Constructed	39.92
Total Miles Contract Work Accepted	12.0
Number of Projects in County	2

Federal Aid Road Project No. 30—Beaver City-Arapahoe, Furnas County.

Beaver City-Arapahoe Federal Aid Road	Project 30
Length	19.42
Percentage Complete	65
Project Started	Sept., 1919
Type—Earth	19.30
Concrete	.12
Estimated Cost	$87,993.21
Federal Aid	43,996.60
State Aid	43,996.61
Total Feet Corrugated Culverts	962
Total Number Box Culverts	12
Total Cubic Yards Concrete in Box Culverts	255.68
Bridges Over 36 Square Feet Waterway	6

Beaver City-Arapahoe Road.

Federal Aid Project No. 30 begins 6 miles east of Beaver City and runs west, omits the part of the road within the city limits of Beaver City, continues 3 miles west of Beaver City, thence north and terminates near Arapahoe—19.42 miles. Three stretches of overflow pavement of

approximately 450 lineal feet, together with an average of 7,640 cubic yards of excavation per mile, constitute the work. The County contracted for the work and farm teams have been relied upon almost entirely, the finishing work being done with a County engine and 12-foot blade graders.

Federal Aid Road Project No. 67—Oxford-Bartley, Furnas County.

Oxford-Bartley Federal Aid Road	Project 67
Length	4.57
Percentage Complete	No Constr.
Type—Earth	4.52
Concrete	.05
Estimated Cost	$25,724.80
Federal Aid	12,862.40
State Aid	12,862.40

Oxford-Bartley Road.

Federal Aid Road Project No. 67 extends west from Cambridge a distance of 4.57 miles. The earth excavation averages 8,000 cubic yards per mile. The contract was let in September, 1919, to Furnas County for the grading at 44 cents per cubic yard and to the Western Bridge and Construction Company for culverts and pavement. All corrugated pipe culverts have been delivered and test samples taken, but none have been placed. Assurance from the Furnas County Board states that a large crew will start on the road in 1921 and all haste will be made to finish the work before the farming season opens.

GOSPER COUNTY.

Co-operation has been the keynote between the officers of the County and the Department in all matters pertaining to road construction and maintenance. Resolutions for construction by the heavy gang maintenance crews were passed, a Highway Commissioner appointed, machinery purchased, and the work started at an early date. An efficient patrol crew operating throughout the season, consisted of a light tractor, maintainer, drags and Federal truck, while an 8-foot blade and a second truck were purchased late in the season to augment this equipment for 1921. State Highway No. 57 enters the County at the east County line near Bertrand, passes through Smithfield to Elwood towards Stockville and to the west County line—25 miles. Federal Aid Project No. 11 covers the distance of 7.05 miles between Smithfield and Elwood and as no grading by heavy gang crews was done until late in the season a small amount of maintenance was required to keep the prairie trails in condition. The greatest effort was concentrated upon the hills southwest of Elwood. The heavy gang maintenance crew started work southwest of Elwood in September, 1920, and completed 3.1 miles then 2.8 miles east from Smithfield. An active Highway Commissioner has placed the results of this County's endeavors among the foremost of the Division.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$69,596.12
Total Expended to December 1st, 1920	23,669.12
Balance	45,927.00
Number Miles State Roads	25.19
Number Miles Constructed by Contract	5.9
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	7.9
Total Miles State Roads Constructed	13.8
Total Miles Contract Work Accepted	5.9
Number of Projects in County	1

Federal Aid Road Project No. 11—Smithfield-Elwood, Gosper County.

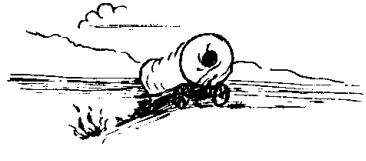
Smithfield-Elwood Federal Aid Road	Project 11
Length	7.05
Percentage Complete	98
Project Started	April, 1920
Type	Earth
Estimated Cost	$38,815.54
Federal Aid	19,407.72
State Aid	19,407.72
Total Feet Corrugated Culverts	932

Smithfield-Elwood Road.

Federal Aid Project No. 11, known as the Smithfield-Elwood road, begins at the west town limits of Smithfield and extends to Elwood—7.05 miles. The project will be ready for final inspection before the close of the construction season of 1920. There is an average of 10,300 cubic yards of excavation per mile.

Two unusual features mark the construction of this project; one is the building of a subway crossing under the C., B. & Q. R. R. tracks thereby eliminating an undesirable and dangerous grade crossing. Sufficient earth was excavated for the subway through ridges and heavy fills, and a 6 per cent grade obtained on each side of the subway. The second feature is a bridge replacement and change of gradient at Dead Man's Hill.

The finished road is in excellent shape, due to the painstaking care of the contractor with regard to ditch and shoulder finishing.



HARLAN COUNTY.

Harlan County ranks fourth in the Division with 50 miles of State highways. Highway No. 52 follows the Republican River on the southern edge of the County, entering at the east County line between Naponee and Republican City and ending at Orleans. Clay is the predominating soil except between Alma and Orleans where a heavy black loam is encountered. This portion of the State highway comprises the part of Federal Aid Road Project No. 71 lying within Harlan County, all of which was under construction during 1920. Heavy expenditures for bridges from County funds have been a drain on the County bridge resources but have been promptly met by an enthusiastic County Board. Highway No. 55 from Alma to the Phelps County line—22.75 miles—was all graded with heavy gang crew during 1920. Highway No. 56, from the Phelps County line near Atlanta to Oxford—11.5 miles—was graded early in the spring and has had two County grading crews maintaining it during this summer. Harlan County's treatment of maintenance is rather unique, as two tractor units are employed. The one opens the ditches and trims back slopes, and the other dresses up the shoulder slopes and cares for the surface. Trucks and drags operate as independent units. Maintenance has been prompt, thorough, well-organized and excellent results obtained.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$96,016.63
Total Expended to December 1st, 1920	20,017.14
Balance	75,999.49
Number Miles State Roads	50
Number Miles Constructed by Contract	10.1
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	33.75
Total Miles State Roads Constructed	43.85
Total Miles Contract Work Accepted	10.0
Number of Projects in County	1

Federal Aid Road Project No. 71—Franklin-Orleans, Harlan County.

Franklin-Orleans Federal Aid Road	Project 71
Length	10.85
Percentage Complete	93
Project Started	May, 1920
Type—Earth	10.37
Concrete	.04
S-Clay	.44
Estimated Cost	$95,560.16
Federal Aid	47,780.08
State Aid	47,780.08
Total Feet Concrete Pipe Culverts	468
Total Number Box Culverts	17
Total Cubic Yards Concrete in Box Culverts	371.48
Bridges Over 36 Square Feet Waterway	5

Franklin-Orleans Road.

Harlan County's portion of Project No. 71 comprises 10.85 miles and the construction calls for an average of 7,300 cubic yards of earth. From the east County line to Naponee the country is flat and the work consists mostly of casting in with but very little drifting. From Naponee west to the Republican River the grading is heavy.

A re-location between Republican City and Alma requires that the County build a new bridge, thereby eliminating three dangerous short turns. All culverts have been placed by the contractor but three bridges remain to be placed by the County before final approval of the Government. See Franklin County for the remainder of the work on this project.

HAYES COUNTY.

Meager funds, rough sandy country, and a large mileage have combined to make road construction and maintainance difficult in this County. Nebraska Highway No. 69 (D.L.D.) crosses the southwest corner of the County from Palisade to Wauneta—14.75 miles; six miles of this road constitute Federal Aid Road Project No. 26. Highway No. 68 crosses the south County line 12 miles north of Culbertson and runs north and west through Hayes Center to the Perkins County line north—44.25 miles. A Federal project 12 miles long from Hayes Center south to the County line is proposed for 1921 construction. Co-operation from the County Board has been satisfactory. A light tractor and an 8-foot blade grader constitute the equipment used for maintenance by the Highway Commissioner. Lack of funds and interest have resulted in poor maintenance.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$59,513.26
Total Expended to December 1st, 1920	18,860.36
Balance	40,652.90
Number Miles State Roads	59
Number Miles Constructed by Contract	6.05
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	0
Total Miles State Roads Constructed	6.05
Total Miles Contract Work Accepted	6.05
Number of Projects in County	1

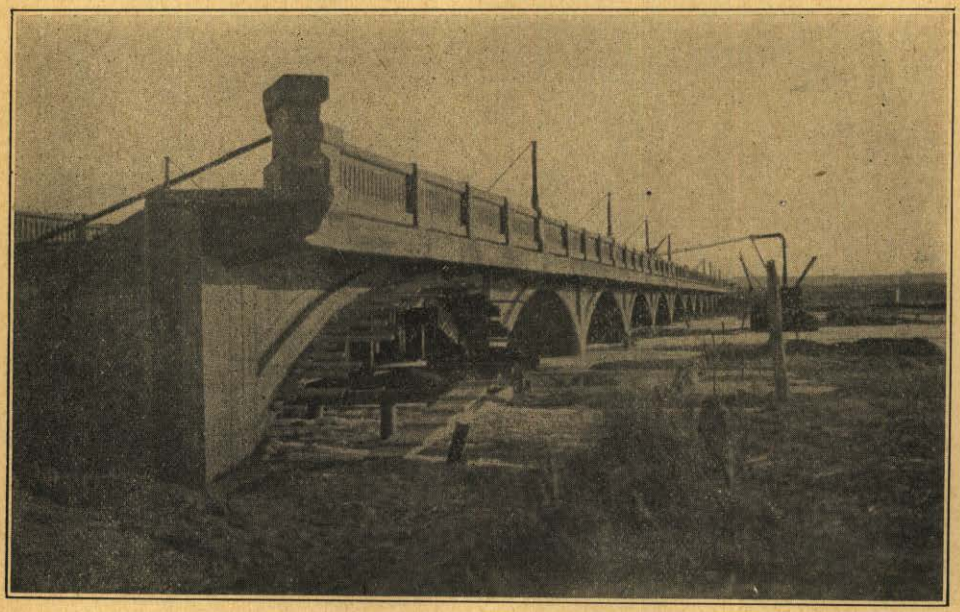
Federal Aid Road Project No. 26—Hamlet-Imperial, Hayes County.

Hamlet-Imperial Federal Aid Road	Project 26
Length	6.05
Percentage Complete	100
Project Started	July, 1919
Type	Earth
Estimated Cost	$24,459.88
Federal Aid	12,229.94

State Aid	12,229.94
Total Feet Concrete Pipe Culverts	368
Bridges Over 36 Square Feet Waterway	1

Hamlet-Imperial Road.

For Federal Aid Project No. 26 see Chase County.



SCOTTSBLUFF STATE AID BRIDGE, SHOWING OVERHANGING WALK

HITCHCOCK COUNTY.

Lack of funds in this County has produced negligible results for maintenance. The County Board at once voted to pay for maintenance labor with County funds, but as County funds were small few miles could be worked, and thus no extensive maintenance program possible. Highway No. 70 (Burlington) starts at Culbertson and follows 3 miles of the D. L. D. west, passes through hills and canyons through Trenton and Stratton to the west County line. Three miles were built with County outfits, while 4.46 miles were built as Federal Aid Project No. 68 during 1920. Unfinished pavement and culverts wil be left until 1921 and heavy work will be required on the remaining 13.75 miles in order to produce a connected highway. Highway No. 69 starts at Culbertson and runs through Beverly to Palisade in the southwest corner of Hayes County. No construction and practically no maintenance due to lack of funds have been expended on this road. Highway No. 68 originates at

Culbertson and runs north to the County line 12 miles, no maintenance nor construction has been possible on this road. Highway No. 67 enters the County on the east and ends at Culbertson—4.1 miles; this was constructed by heavy gang crews under difficult conditions.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$74,256.46
Total Expended to December 1st, 1920	26,084.31
Balance	48,172.15
Number Miles State Roads	62
Number Miles Constructed by Contract	3.78
Number Miles Surfaced—Concrete	.13
Number Miles Constructed by Heavy Gang Crew	9.91
Total Miles State Roads Constructed	13.69
Total Miles Construction Work Accepted	3.05
Number of Projects in County	1

Federal Aid Road Project No. 68—McCook-Trenton, Hitchcock County.

McCook-Trenton Federal Aid Road	Project 68
Length	4.46
Percentage Complete	85
Project Started	May, 1920
Type—Earth	3.33
Concrete	.13
Estimated Cost	$62,583.56
Federal Aid	31,291.78
State Aid	31,291.78
Total Feet Corrugated Culverts	52
Total Number Box Culverts	7
Total Cubic Yards Concrete in Box Culverts	159.14
Bridges Over 36 Square Feet Waterway	1

McCook-Trenton Road.

Federal Aid Project No. 66 was sub-divided because of a lack of funds to construct the entire project, and section "A" let for construction. This section extends from the top of the hill at Lingrim's canyon 8 miles west of Culbertson to the east limits of Trenton. There are two distinct types of country, one very hilly and the other flat, each embodying excellent types of construction. For a length of 1.6 miles the road is constructed by heavy gang crew and is in a credible condition.

The finishing work on this project is un-excelled by any other project in the state. Extraordinary care in trimming back slopes and general finishing work makes this a highly commendable piece of work.

KEARNEY COUNTY.

Kearney County has 40.1 miles of State highways all of which have been graded as either Federal Aid road contracts or by heavy gang crew. Maintenance has been thorough and this County is one in the division

that may be considered excellent in this regard. Two maintenance crews have been working the entire season and due to the efforts of an active Highway Commissioner the organizations have secured almost perfect results.

Highway No. 53 enters at the east line of the County near Hartwell and runs west and south through Minden and Axtell and to the west County line near Funk; 16.2 miles of this Highway from the County line were constructed as Federal Aid Project No. 7 section "D"; the balance was built by heavy gang crew. Highway No. 54 beginning at Franklin enters the County at the south line near Upton and extends north to join No. 53 at Minden; 11.50 miles have been graded by the heavy gang crew and an excellent road provided. The County Board and the community are boosters for improved highways.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$95,280.02
Total Expended to December 1st, 1920	22,966.69
Balance	72,313.33
Number Miles State Roads	40.1
Number Miles Constructed by Contract	16.25
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	24.02
Total Miles State Roads Constructed	40.27
Total Miles Contract Work Accepted	16.25
Number of Projects in County	1

Federal Aid Project No. 7 (Section D)—Superior-Minden, Kearney County.

Superior-Minden Federal Aid Road	Project 7D
Length	16.25
Percentage Complete	100
Project Started	Summer 1918
Type	Earth
Estimated Cost	$28,557.76
Federal Aid	14,278.88
State Aid	14,278.88
Total Feet Concrete Pipe Culverts	1,070

Superior-Minden Road (Sec. D).

Superior-Minden Federal Aid Road Project No. 7-D lies within Kearney County and extends from the east line near Hartwell 7 miles west, 1 mile south, 4.8 miles west and 3.25 miles south to city limits of Minden. The construction required an average of 3,500 cubic yards of earth excavation per mile. The project was entirely casting in work with very little drifting; the greatest delay was caused by water remaining in old ditches for long periods during hot weather. See Clay, Nuckolls and Adams Counties.

NUCKOLLS COUNTY.

This County's State Highways—24.3 miles extend directly north and south through the center of the County from the south line through Superior and Nelson to the north line. Of this 22.4 miles of road is covered by Federal Aid Project No. 7 section "A".

Maintenance of these portions of road during 1920 was turned over to the County and two crews organized with tractors, drags and maintainers in order to keep such sections in good condition. The co-operation from the County Board and an industrious Highway Commissioner have resulted in commendable road improvement work.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$117,025.75
Total Expended to December 1st, 1920	23,265.52
Balance	93,760.23
Number Miles State Roads	24.3
Number Miles Constructed by Contract	15.9
Number Miles Surfaced	
Number Miles Constructed by Heavy Gang Crew	0
Total Miles State Roads Constructed	15.9
Total Miles Contract Work Accepted	15.9
Number of Projects in County	1

Federal Aid Road Project No. 7 Sec. "A"—Superior-Minden, Nuckolls County.

Superior-Minden Federal Aid Road	Proj. 7-A
Length	22.4
Percentage Complete	71
Project Started	Summer 1918
Type—Earth	11.94
Gravel	10.06
Estimated Cost	$85,574.74
Federal Aid	42,787.37
State Aid	42,787.37
Total Feet Concrete Pipe Culverts	1,140
Bridges Over 36 Square Feet Waterway	5

Superior-Minden Road.

Federal Aid Project No. 7-A, 22.4 miles long, extends from Superior north through Nelson to the Clay-Nuckolls County line. The preliminary estimate calls for 94,300 yards of earth grading, and one thousand one hundred and forty feet of culverts on the average of 5 culverts per mile. Clay County signed a contract to do the work with County equipment, but after two years but 12 miles have been turned over for maintenance. Recourse to the use of farm teams has been the cause of slow progress. The 12 miles now completed is satisfactory and equivalent to any under contract.

PERKINS COUNTY.

Very little progress has been made in this County with regard to road construction and maintenance. State Highway No. 68 enters from Hayes County near the southeast corner and extends to Elsie; thence west to its terminus at Grant—31 miles. That section from Elsie to Grant—18 miles—is covered by Federal Aid Project No. 121 proposed for 1921 construction. The balance—13 miles—will probably be built by heavy gang maintenance crew—3 miles of which will require surfacing. One patrol outfit was organized and employed intermittently. The County Board and the County Highway Commissioner have been active and progressive and may be depended upon for the best when time demands.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$54,412.75
Total Expended to December 1st, 1920	
Balance	54,412.75
Number Miles State Roads	31
Number Miles Constructed by Contract	0
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	0
Total Miles State Roads Constructed	0
Total Miles Contract Work Accepted	0
Number of Projects in County	(No construction started)

Federal Aid Project No. 121—Grand-Elsie, Perkins County.

Grant Elsie Federal Aid Road—8.93 miles in length, of which 5.65 miles is earth and 3.28 is sand clay, will probably be constructed in 1921.

PHELPS COUNTY.

Only fair co-operation has been experienced from this County with regard to construction and maintenance. Construction started with County graders augmented with a slip plow and fresno outfit. Maintenance on the completed portions has been satisfactory. One Federal Aid Project has been under construction during 1920 on 10 miles of high way north from Holdrege to the Platte River, and will be completed early in 1921.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$102,779.29
Total Expended to December 1st, 1920	18,108.36
Balance	84.671.23
Number Miles State Roads	62.3
Number Miles Constructed by Contract	3.98
Number Miles Surfaced—Gravel	2.98
Number Miles Constructed by Heavy Gang Crew	0
Total Miles State Roads Constructed	3.98
Total Miles Contract Work Accepted	3.98
Number of Projects in County	1

Federal Aid Road Project No. 52-A—Holdrege-Platte River, Phelps County.

Holdrege-Platte River Federal Aid Road	Proj. 52-A
Length	9.98
Percentage Complete	40
Project Started	April 1920
Type—Earth	7
Gravel	2.98
Estimated Cost	$63,025.97
Federal Aid	31,512.98
State Aid	31,512.99
Total Feet Concrete Pipe Culverts	736

Holdrege-Platte River Road.

Federal Aid Project No. 52-A comprises 9.98 miles at the north end of the road which runs north from Holdrege to the Platte River. The project includes only the worst part of the road; 3 miles will require clay surfacing and the remaining 6 miles from the beginning of the project to Holdrege may be put into shape by the County outfits. This project was re-let in July and by November approximately 39 per cent of the contract was completed. The project involved 65,399 cubic yards of earth excavation and can be easily finished early in 1921.

RED WILLOW COUNTY.

The entire mileage of State highways in Red Willow County have been graded during 1920. Highway No. 67 enters the County at the east line, extends through Bartley, Indianola, near Red Willow, through McCook and Perry to the west County line, a distance of 30.64 miles; of this 17.4 miles are included in Federal Aid Project No. 46, on which construction was completed in 1920. From Bartley east to the County line the heavy gang maintenance crews have completed 6 miles; from McCook west to the County line heavy gang maintenance crews have completed 7.5 miles. Considerable side hill work retarded progress. Two patrol crews organized and equipped have kept the road in fairly good condition. Two tractors were recently purchased to aid the trucks in road maintenance.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$119,099.87
Total Expended to December 1st, 1920	44,379.41
Balance	74,720.46
Number Miles State Roads	30.64
Number Miles Constructed by Contract	17.14
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	13.5
Total Miles State Roads Constructed	30.64
Total Miles Contract Work Accepted	17.14
Number of Projects in County	1

Federal Aid Road Project No. 46—Bartley-McCook, Red Willow County.

Bartley-McCook Federal Aid Road	Project 46
Length	17.14
Percentage Complete	100
Project Started	Sept., 1919
Type—Earth	16.76
Concrete	.38
Estimated Cost	$107,310.12
Federal Aid	53,655.06
State Aid	53,655.06
Other Funds (Red Willow County)	910.80
Total Feet of Concrete Pipe Culverts	604
Total Number of Box Culverts	12
Total Cubic Yards Concrete in Box Culverts	137
Bridges Over 36 Square Feet Waterway	1

Bartley-McCook Road.

Federal Aid Project No. 46 begins at the west limit of Bartley and runs west through Indianola to the east limits of McCook—17.14 miles. The road follows a rolling country and calls for heavy excavation,—a total of 138,953 cubic yards. Construction started in 1919 and 3 miles were graded before the winter season. Considerable difficulty in finishing the road was experienced by the contractor due to excessively dry weather. Many miles of work were cast in from ditches and left in ridges along the center line in a very powdery form for weeks at a time waiting for moisture to make it possible to properly blade and finish the fills.

WEBSTER COUNTY.

Excellent co-operation has been secured from the Webster County Board and due to an efficient Highway Commissioner high class maintenance on State Roads was maintained during the 1920 season. The County has been active in grading and maintaining those County roads which lead away from the Federal Aid road, and without exception the neighboring community has boosted and aided in every way. Of the 32.3 miles of State roads in the County 21.4 miles are included in Federal Aid Project No. 32, the grading of which was finished in August; the remaining 10.9 miles which constitutes the Golden Rod Highway west from Red Cloud were proposed for heavy gang maintenance crew work. Because of excellent maintenance on this stretch of road it was decided to omit the heavy gang work and leave the road in the present condition until it might be included in a Federal Aid Project, at which time the necessary heavy grading might be taken care of. Two patrol teams have cared for the total 32 miles of State maintenance.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$102,586.90
Total Expended to December 1st, 1920	76,889.75

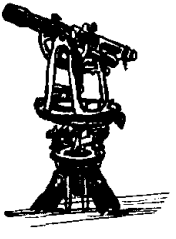
Balance	25,697.15
Number Miles State Roads	32.3
Number Miles Constructed by Contract	21.06
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	0
Total Miles State Roads Constructed	21.06
Total Miles Contract Work Accepted	21.06
Number of Projects in County	1

Federal Aid Road Project No. 32—Ayr-Red Cloud, Webster County.

Ayre-Red Cloud Federal Aid Road	Project 32
Length	21.06
Percentage Complete	100
Project Started	Sept., 1919
Type	Earth
Estimated Cost	$99,106.26
Federal Aid	49,553.13
State Aid	49,553.13
Total Feet Corrugated Culverts	1,664
Total Number Box Culverts	9
Total Cubic Yards Concrete in Box Culverts	304.10
Bridges Over 36 Square Feet Waterway	6

Ayr-Red Cloud Road.

Federal Aid Project No. 32 extends from the north line of the County south through Blue Hills to Cowles; thence west 4 miles and then south into Red Cloud. One grading crew started in September, 1919, working south from the County line and 5 miles were rough graded. In the Spring of 1920 this stretch of road was finished and three crews took up construction. Inclement weather and varying soil conditions hindered the progress of the work. All grading was completed and the road approved for County maintenance in August, 1920; a total of 165,969 cubic yards of excavation were moved. With several weeks of reasonable weather it is expected to have the project in shape for Federal acceptance. See Adams County for the remainder of the work.



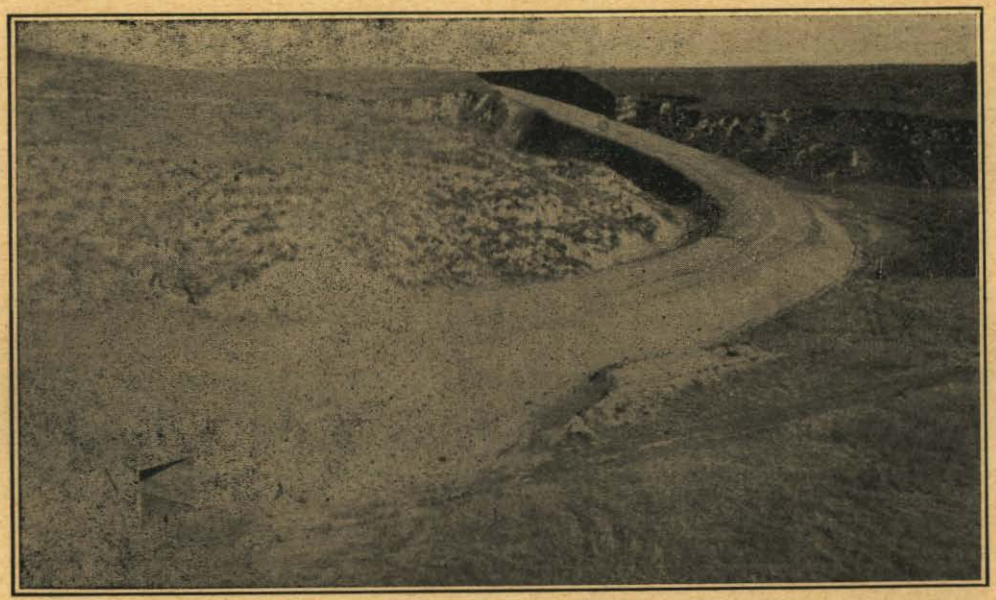
FINAL ACCEPTANCE OF A FEDERAL AND STATE AID ROAD PROJECT AFTER COMPLETION

DIVISION NUMBER 4

R. L. COCHRAN, Division Engineer

COUNTIES

Blaine
Boone
Buffalo
Custer
Dawson
Garfield
Hall
Hooker
Howard
Lincoln
Logan
Loup
Merrick
McPherson
Nance
Sherman
Thomas
Valley
Wheeler



View Showing Grade Reduced from Fifteen to Seven Per Cent. Grade Across a Canyon, Near the East End of Federal and State Aid Project No. 68-A, McCook-Trenton, Hitchcock County

BLAINE COUNTY.

Blaine County is one of the four Counties known in the State as the "Sand Hill Group" in which there are no Federal and State Aid projects. Twenty thousand dollars of State money was turned over to the County to be expended during 1920 under the direction of the County Highway Commissioner, County Board and a representative of the Department for road improvement.

The total appropriation of the Federal and State funds for the five year period 1917-21 amounts to $50,316.38. The balance of these funds will be turned over to the County at a later date and will be used entirely on roads of the State Highway System.

(Note: See Thomas County for further explanation.)

1918-1920 State and Federal Aid Road Construction

Funds Available:

Total Appropriated, less 5%	$50,316.38
Total Expended to December 1st, 1920	13,958.63
Balance	36,357.75
Number Miles State Roads	33
Number Miles Constructed by Contract	0
Number Miles Surfaced—Hayed	17½
Clayed	1½
Number Miles Constructed by Heavy Gang Crew	0
Total Miles of State Roads Constructed	19
Total Miles Contract Work Accepted	0
Number of Projects in the County	0

The general response of the County and the County Board to road improvement has been satisfactory. The grading of sand hills and surfacing them with clay, gumbo or hay constitutes the general type of work.

BOONE COUNTY.

Some division of sentiment has occurred in this County, but in general the County may be depended upon to work out its road problems successfully. The soil is of a good type, and grading provides a satisfactory road. Many new drainage structures are necessary on all the State roads not covered by contract work.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$125,330.96
Total Expended to December 1st, 1920	34,668.19
Balance	90,662.77
Number Miles State Roads	44
Number Miles Constructed by Contract	13.27
Number Miles Surfaced—S-Clay	.5
Number Miles Constructed by Heavy Gang Crew	17.8
Total Miles State Roads Constructed	31.07
Total Miles Contract Work Accepted	13.27
Number Projects in County	1

Federal Aid Road Project No. 53—Genoa-Albion, Boone County.

Genoa-Albion Federal Aid Road	Project 53
Length	13.27
Percentage Complete	100
Project Started	July, 1919
Type	Earth
Estimated Cost	$47,086.32
Federal Aid	23,543.16
State Aid	23,543.16
Other Funds	
Total Feet Corrugated Culverts	
Total Feet Concrete Pipe Culverts	494
Total Number of Box Culverts	2
Total Cubic Yards Concrete in Box Culverts	71.07
Bridges Over 36 Square Feet Waterway	2

Genoa-Albion Road.

This project which was completed last spring was delayed last year because of an early winter. Maintenance was extremely difficult for the first part of the present season due to the excessive and frequent rains falling before the grade was packed. From such experience it has been found necessary to supply a few additional culverts to care for such drainage water.

BUFFALO COUNTY.

Response of the County Board and the Kearney Chamber of Commerce to road improvement has been especially gratifying. The County Board however have not co-operated so well with regard to having culverts constructed on Project No. 73 north of Kearney, wherein the townships agreed to build culverts; nevertheless, the County has made a fair showing in regard to building bridges on this improved road. Blade work in the valleys and machine work on the hills constitutes the general type of work needed. Gravel is recommended for all highways.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation less 5%	$183,117.90
Total Expended to December 1, 1920	61,534.36
Balance	121,583.54
Number Miles State Roads Constructed	83
Number Miles Constructed by Contract	20.4
Number Miles Surfaced—S. Clay	1.28
Number Miles Constructed by Heavy Gang Crew	37.5
Total Miles State Roads Constructed	57.9
Total Miles Accepted	20.4
Number Projects in the County	1

Federal Aid Road Project No. 73—Kearney-Pleasanton, Buffalo County.

Kearney-Pleasanton Federal Aid Road	Project 73
Length	20.4

Percentage Complete	100
Project Started	July, 1919
Type—S-Clay	1.28
Earth Grading	19.12
Estimated Cost	$ 79,431.60
Federal Aid	39,715.80
State Aid	39,715.80
Other Funds	.....
Total Feet Corrugated Culverts	1,806
Total Feet Concrete Pipe Culverts	..
Total Number Box Culverts	7
Total Cubic Yds. Concrete in Box Culverts	282.64
Bridges over 36 sq. ft. Waterway	6

Kearney-Pleasanton Road.

This project is one of the heaviest in the State for the average yardage moved per mile throughout its entire length is over 8,000 yards. A marked improvement is shown not only in a reduction of grades and widening of the road bed but the installation of culverts also, which carry the water under the road instead of over and across it are indeed an asset, as previously the water washed a gulley in each drainage area. Considerable guard rail has been constructed to protect traffic from the danger of high fills.

The grading contractor finished work in the middle of the summer. Most of the bridges have been built by the County, but the progress on culvert work has been very slow. This work was contracted for and to be paid for by the townships through which the road passed. Judging from this project it would seem a very poor system, as the State and County have no control whatever over the contractor and the townships, due to lack of interest, will not press the contractor to finish his work. At the present time the pipes are all laid but less than half of the head walls are constructed.

CUSTER COUNTY.

This county has been another astonishing surprise in the development of road sentiment. The work of the County Highway Commissioners and the co-operation of the County Board has at all times been excellent. The type of construction varies from blade grader work to very heavy cutting of hills. Many new drainage structures have been placed on the State highways not covered by contract. A minor portion of the State highways are sandy and will need to be surfaced.

1918-1920 State and Federal Aid Road Construction.

Funds Available:

Total Appropriation less 5%	**$312,039.25**
Total Expended to December 1, 1920	**115,445.75**
Balance	**196,593.50**

Number Miles State Roads	162
Number Miles Constructed by Contract	29.16
Number Miles Surfaced	3.5
Number Miles Constructed by Heavy Gang Crew	81.0
Total Miles State Roads Constructed	110.16
Total Miles Contract Work Accepted	25
Number Projects in County	2

Federal Aid Road Project No. 22—Broken Bow to County Line, Custer County.

Broken Bow Federal Aid Road	Project 22
Length	31.87
Percentage Complete	90
Project Started	May, 1920
Type—S-Clay	3.5
Earth	28.37
Estimated Cost	$203,511.90
Federal Aid	101,755.95
State Aid	101,755.95
Other Funds (County)	52,917.13
Total Feet Corrugated Culverts	..
Total Feet Concrete Pipe Culverts	1,798
Total Number Box Culverts	35
Total Cu. yds. Concrete in Box Culverts	766.07
Bridges over 36 sq. ft. Waterway	12

Broken Bow to the County Line Road.

This contract has progressed better than any other in the Fourth Division, both with regard to grading and drainage structures. Excellent co-operation has been had from the county in clearing right-of-way. Many stumps were removed and blown out to permit construction. Desirable co-operation was received from the Telephone Companies in removing telephone poles from right-of-way. Recently, difficulty has been experienced in obtaining clean gravel of the proper proportions for concrete work and especially for overflow pavements. The excavation is generally quite heavy, approximately 235,000 yards in the 32 miles. One of the noticeable features of this project which has served to make it expensive under the existing high prices, was the many complex drainage problems encountered in construction.

Federal Aid Road Project No. 42-A—Sargent-Taylor, Custer County.

Sargent-Taylor Federal Aid Road	Proj. 42-A
Length	4.82
Percentage Complete	10
Project Started	Oct. 1920
Type	Earth
Estimated Cost	$ 55,763.28
Federal Aid	27,881.64
State Aid	27,881.64

Other Funds	.....
Total Feet Corrugated Culverts	880
Total Feet Concrete Pipe Culverts	..
Total Number Box Culverts	6
Total Cubic Yards Concrete in Box Culverts	138.32
Bridges over 36 sq. ft. Waterway	0

The Sargent-Taylor Federal Aid Road is 5.93 miles long, of which 4.83 miles is in Custer County and 1.11 miles in Loup County. See Loup County for work on the Sargent-Taylor road.

DAWSON COUNTY.

The response of the County Board to road improvement has been noticably favorable. It has been difficult to get right-of-way in a few cases, as the property owners did not see the benefits of the improvement. The first half of the season the maintenance was excellent but some difficulty has been experienced in having the roads kept up to standard the last half of the season.

Irrigation companies do not feel inclined to build drainage structures where Federal Aid roads cross ditches.

1918-1920 State and Federal Aid Road Construction.

Funds Available:

Total Appropriation less 5%	$151,005.69
Total Expended to December 1, 1920	62,611.13
Balance	88,394.56
Number Miles of State Roads	55
Number Miles Constructed by Contract	26.09
Number Miles Surfaced	1.57
Number Miles Constructed by Heavy Gang Crew	29.75
Total Miles State Roads Constructed	56.44
Total Miles Contract Work Accepted	18
Number of Projects in County	1

Federal Aid Road Project No. 39—Overton-Cozad, Dawson County.

Overton-Cozad Federal Aid Road	Project 39
Length	27.47
Percentage Complete	95
Project Started	Oct. 1919
Type—S-Clay	1.57
Earth	25.9
Estimated Cost	$110,139.74
Federal Aid	55,069.87
State Aid	55,069.87
Other Funds	.....
Total Feet Corrugated Culverts	2,269
Total Feet Concrete Pipe Culverts	..
Total Cu. yds. Concrete in Box Culverts	108
Total Number Box Culverts	3
Bridges Over 36 sq. ft. Waterway	8

Overton-Cozad Road.

Work started on this road in October of 1919 but was delayed by early winter as well as by a very wet spring and early summer, the condition being worse because of the low flat lay of the land. More recently delay has been occasioned by the contractor for the earth work splitting his equipment in order to build another project. The culvert contract has progressed very well during the first half of the season, but was retarded materially on account of the contractor being unable to obtain cement.

GARFIELD COUNTY.

The County Board has given satisfactory response to road improvements and the maintenance obtained has varied from fair to very good. Improvement of the State highways in this County calls for grading and sand clay surfacing in about equal proportion.

1918-1920 State and Federal Aid Road Construction.

Funds Available:

Total Appropriation less 5%	$ 57,279.29
Total Expended to December 1, 1920	34,974.46
Balance	22,304.83
Number Miles State Roads	45
Number of Miles Constructed by Contract	5.94
Number Miles Surfaced—S-Clay	3.16
Number Miles Constructed by Heavy Gang Crew	10
Total Miles State Roads Constructed	15.94
Total Miles Contract Work Accepted	5.94
Number Projects in County	1

Federal Aid Road Project No. 34-A—Burwell-Deverre, Garfield County.

Burwell-Deverre Federal Aid Road	Proj. 34-A
Length	5.94
Percentage Complete	100
Project Started	May, 1920
Type—S-Clay	3.16
Earth	2.73
Estimated Cost	$ 56,521.80
Federal Aid	28,260.90
State Aid	28,260.90
Other Funds	.....
Total Feet Corrugated Culverts	356
Total Feet Concrete Pipe Culverts	..
Total Number Box Culverts	4
Total Cu. Yds. Concrete in Box Culverts	111.27
Bridges Over 36 sq. yds. Waterway	1

Burwell-Deverre Road.

Building a road through a canyon in which there are differences in elevation between the mouth and the head of 160 feet in some cases, is

the important feature on the Burwell-Deverre road. In travelling 4,800 feet, an elevation of 160 feet is made, working the hill with a maximum grade of six and one-half per cent. Curves for 4,800 feet through the canyon are encountered, yet they are of sufficient length to give a clear view ahead at all times.

GREELEY COUNTY.

The County as a whole does not seem to appreciate the importance of maintaining State roads and those not on the State Highway System. The response of the County has been fair. In general the work consists of grading hills and providing adequate drainage structures. A small percentage of the mileage will be surfaced with sand and clay.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation less 5%	$ 77,688.04
Total Expended to December 1, 1920	28,239.20
Balance	49,448.84
Number Miles State Roads	60
Number Miles Constructed by Contract	5.94
Number Miles Surfaced	1.71
Number Miles Constructed by Heavy Gang Crew	8
Total Miles State Roads Constructed	14.6
Total Miles Contract Work Accepted	5
Number of Projects in County	1

Federal Aid Road Project No. 84-A—Greeley Center-Wolbach, Greeley County.

Greeley Center-Wolbach Federal Aid Road	Proj. 84-A
Length	6.6
Percentage Complete	90
Project Started	June, 1920
Type—S-Clay	1.71
Earth	4.89
Estimated Cost	$ 47,658.67
Federal Aid	23,829.33
State Aid	23,829.34
Other Funds	.....
Total Feet Corrugated Culverts	348
Total Feet Concrete Pipe Culverts	
Total Number of Box Culverts	..
Cubic Yards Concrete in Box Culverts	23.10
Bridges Over 36 sq. ft. Waterway	1

Greeley Center to Wolbach Road.

Grading hills and surfacing a small portion of the mileage with clay constitutes the general work necessary in building the road. The culvert contract was taken by the County and has just been well started due to the lack of organization on the part of the County to handle the work.

VIEW OF A COMPLETE EARTH GRADED ROAD WITH GUARD RAIL, NEAR WOOD RIVER BRIDGE

HALL COUNTY.

The response of the County Board and especially that of the Grand Island Chamber of Commerce to road improvement has been satisfactory. Proper maintenance has been given in many places, but as a whole the county authorities do not seem to place the proper importance upon systematic maintenance. Sand-clay surfacing is required as a very minor part of the work, and gravel surface is recommended wherever it is possible to obtain it together with binding material within a reasonable length of haul. Blade grading will improve a large mileage of the County roads.

1918-1920 State and Federal Aid Road Construction.

Funds Available:

Total Appropriated less 5%	$138,927.44
Total Expended to December 1, 1920	89,237.57
Balance	49,689.87

Mileage:

Number Miles State Roads	73
Number Miles Constructed by Contract	35.25
Number Miles Surfaced	15.4
14.4 Gravel; 1 Sand Clay	
Number Miles Constructed by Heavy Gang Crew	13
Total Miles State Roads Constructed	48.25
Total Miles Contract Work Accepted	32.25
Number of Projects in Hall County	2

Federal Aid Project No. 3, Hall County.

Hall County Federal Aid Road	Project 3
Length	32.25
Percentage Complete (Gravel)	95
(Earth)	100
Project Started	1918
Type—Gravel	6.8
S-Clay	3.4
Earth	22.04
Estimated Cost	$109,857.28
Federal Aid	54,928.64
State Aid	54,928.64
Other Funds	.....
Total Feet Corrugated Culverts	0
Total Feet Concrete Pipe Culverts	10.76
Number of Box Culverts	0
Cubic Yards Concrete in Box Culverts	0
Bridges over 36 sq. ft. Waterway	7

Hall County, Road Project No. 3.

Construction work on this project has been done for the most part with blade graders supplemented by elevator graders and scrapers. Due

to the flatness of the country one of the chief difficulties encountered was that of drainage and in addition it has been difficult to obtain suitable binding material in combination with gravel for surfacing purposes. In some cases it was found necessary to haul the material from points not on the State highways.

Federal Aid Project No. 104—Grand Island-Northeast, Hall County.

Grand Island-Northeast Federal Aid Road	Proj. 104
Length	3.01
Percentage Complete	60
Project Started	August '20
Type	Earth
Estimated Cost	$ 11,791.11
Federal Aid	5,895.55
State Aid	5,895.56
Other Funds	.....
Total Feet Corrugated Culverts	0
Total Feet Concrete Pipe Culverts	192
Number of Box Culverts	0
Cubic Yards Concrete in Box Culverts	0
Bridges over 36 sq. ft. Waterway	0

In general the conditions are the same on this project as those on Project No. 3. The project included four old 24 foot span bridges, which instead of being replaced by new ones were eliminated by making channel changes, which kept the creek entirely away from the road. Formerly it crossed and recrossed the road several times.

HOOKER COUNTY.

Hooker County is one of the five Counties known in the State as the "Sand Hill Group" in which there are no Federal and State Aid road projects. Twenty thousand dollars of State money was turned over to the County to be expended during 1920 under the direction of the County Highway Commissioner, County Board and a representative of the department for road improvement.

The total appropriation of Federal and State Funds for the five year period 1917-21 amounts to $49,564.90. The balance of these funds will be turned over to the County at a later date and will be used entirely on roads of the State Highway System. See Thomas County for further explanation.

1918-1920 State and Federal Aid Road Construction.

Funds Available:

Total Appropriation less 5%	$ 49,564.90
Total Expended to December 1, 1920	12,945.55
Balance	36,619.35
Number Miles State Road	30
Number Miles Constructed by Contract	0
Number Miles Surfaced—Hayed	10

Number Miles Constructed by Heavy Gang Crew	0
Total Miles State Roads Constructed	10
Total Miles Contract Work Accepted	0
Number of Projects in County	0

Gratifying results have been obtained, generally, through the co-operation of the County and the County Board for road improvement. Grading down sand hills and surfacing with heavier soil or hay constitutes the general type of work in this County.

HOWARD COUNTY.

The general type of work necessary for improving the State highways in Howard County consists in grading hills and providing adequate drainage structures; particularly is this true from St. Paul west to the County line. From St. Paul to St. Libory sand clay surfacing is necessary and blade grading required on a small amount of the clay surfacing from St. Libory to the south County line. The County and the County Board have given satisfactory co-operation, but maintenance is still quite a problem on the majority of roads.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation less 5%	$ 90,803.29
Total Expended to December 1, 1920	10,818.69
Balance	79,984.60
Number Miles State Roads	34
Number Miles Constructed by Contract	2.17
Number Miles Surfaced—S-Clay	1.60
Number Miles Constructed by Heavy Gang Crew	3.5
Total Miles State Roads Constructed	5.67
Total Miles Contract Work Accepted	0
Number of Projects in Howard County	1

Federal Aid Road Project No. 60-A—Cushing-Grand Island, Howard County.

Cushing-Grand Island Federal Aid Road	Project 60
Length	7.58
Percentage Complete	30
Project Started	August, '20
Type—S-Clay	5.29
Earth	2.29
Estimated Cost	$ 53,151.68
Federal Aid	26,575.84
State Aid	26,575.84
Other Funds	.....
Total Feet Corrugated Culverts	..
Total Feet Concrete Pipe Culverts	72
Total Number of Box Culverts	..
Cubic Yards Concrete in Box Culverts	39
Bridges over 36 sq. ft. Waterway	1

Cushing-Grand Island Road.

The greater portion of this project is to be surfaced with clay. The clay is loaded into three and one-half yard trailers, which are pulled by Holt Caterpiller tractors. The grading work is done with Power fresnos drawn by a 72 H. P. tractor. The entire road will be built with aid of motor equipment.

LINCOLN COUNTY.

The response and co-operation of the County Board of Lincoln County with the Department with regard to the County improvement work has been especially good at all times. The type of soil on State roads in this County is so varied and of such materials as to make construction expensive and extremely difficult. The soil varies from loose blow sand in the eastern portion and as far west as Brady. A dependable soil for a distance of three miles is found west of Brady and from this point six miles to Maxwell. It consists of an alkali gumbo which although graded with great difficulty, makes an excellent binder for gravel surfacing, but is found to be unsatisfactorily maintained, unless gravel is added. From Maxwell west approximately 40 per cent of the soil makes a good road; 30 per cent is a sandy loam and makes a fairly good loam and 30 per cent is a loose sand very poor for such purposes. Improvements are being made along the entire road. From North Platte west the soil is low and a swampy type making construction difficult and requiring a gravel surface. From Sutherland to the west county line the soil contains encugh gravel to make a splendid road.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation less 5%	$230,141.84
Total Expended to December 1, 1920	46,589.00
Balance	183,552.84
Number Miles State Roads	61
Number Miles Constructed by Contract	19.1
Number Miles Surfaced—Gravel	16.1
Number Miles Constructed by Heavy Gang Crew	30
Total Miles State Roads Constructed	49.1
Total Miles Contract Work Accepted	19.1
Number of Projects in County	1

Federal Aid Road Project No. 10—North Platte-Sutherland, Lincoln County.

North Platte-Sutherland Federal Aid Road	Project 10
Length	19.1
Percentage Complete	100
Project Started	June, 1919
Type—Gravel	16.1
Earth	3.0
Estimated Cost	$ 93,681.10
Federal Aid	46,840.55
State Aid	46,840.55
Other Funds	.....

Total Feet Corrugated Culverts	..
Total Feet Concrete Pipe Culverts	364
Total Number of Box Culverts	..
Bridges over 36 sq. ft. Waterway	1

North Platte-Sutherland Road.

The construction of this road is, for the most part, across low wet bottom land, and for that reason, construction was delayed, due to the fact that parts could only be built during the dry seasons of the year. The soil is a heavy gumbo, but very good binding material for gravel.

LOGAN COUNTY.

The County and the County Board have co-operated satisfactorily with the Department in the road improvement work. Grading earth hills and surfacing with clay, hay or sand constitutes the greater part of the work, while a small amount of the roads in the County may be improved with blade graders.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation less 5%	$ 42,254.95
Total Expended to December 1, 1920	25,651.70
Balance	16,603.25
Number Miles of State Roads	30
Number Miles Constructed by Contract	10.56
Number Miles Surfaced—S-Clay	7.22
Number Miles Constructed by Heavy Gang Crew	0
Total Miles State Roads Constructed	10.56
Total Miles Contract Work Accepted	5
Number of Projects in Logan County	1

(See McPherson County as this project extends across the two counties.)

Federal Aid Road Project No. 12—Stapleton-Ringgold, Logan County.

Stapleton-Ringgold Federal Aid Road	Project 12
Length	11.12
Percentage Complete	95
Project Started	June, 1919
Type—S-Clay	7.6
Earth	3.52
Estimated Cost	$ 34,907.95
Federal Aid	17,453.97
State Aid	17,453.98
Other Funds	.....
Total Feet Corrugated Culverts	450
Total Feet Concrete Pipe Culverts	..
Number of Box Culverts	..
Cubic Yards Concrete in Box Culverts	64
Bridges over 36 sq. ft. Waterway	..

Stapleton to Ringgold.

The Stapleton-Ringgold Federal Aid road is 17.1 miles in length and is divided, 11.12 miles being in Logan County and 5.98 in McPherson County. The chief difficulty was found to be in obtaining surfacing material within reasonable distance—this naturally increased the cost somewhat which however was balanced in a measure by the elimination of culverts originally planned and found to be unnecessary because of the sandy soil. Delay on the work was due to the inexperience of the contractors with the result that the work was given inferior supervision.

LOUP COUNTY.

Very heavy construction work was necessary to get the road now under contract to the nearest railroad. The types of work necessary to improve the State highways vary from ideal blade grader work to very heavy excavation required to reduce grades and surface with sand and clay. A long haul is necessary to place the surfacing materials.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation less 5%	$ 49,266.90
Total Expended to December 1, 1920	.....
Balance	49,266.90
Number Miles State Roads	39
Number Miles Constructed by Contract	0
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	9.25
Total Miles State Roads Constructed	9.25
Total Miles Contract Work Accepted	0
Number Projects in County	1

Federal Aid Road Project No. 42-A—Sargent-Taylor, Loup County.

Sargent-Taylor Federal Aid Road	Proj. 42-A
Length	1.11
Percentage Complete	0
Project Started	Oct., 1920
Type	Earth
Estimated Cost	$ 13,554.24
Federal Aid	6,777.12
State Aid	6,777.12
Other Funds	0
Total Feet Corrugated Culverts	140
Total Feet Concrete Pipe Culverts	..
Total Number Box Culverts	1
Total Cu. Yds. Concrete in Box Culverts	43
Bridges Over 36 sq. ft. Waterway	1

Sargent-Taylor Road.

This project on which construction was recently started, is one of the heaviest pieces of work per mile in the State, portions averaging nearly 20,000 yards a mile. The road connects, for the first time, the

north and central Loup valleys as well as connecting Taylor, and providing all of Loup County with an outlet to the nearest railroad. There are many complex drainage problems on this project due to canyons and pockets found along the road.

The entire road is 5.93 miles long, 1.11 miles in Loup County and 4.83 miles in Custer County. See Custer County.

MERRICK COUNTY.

The County and the County Board have been very favorable to road improvement, and considering the large mileage, the maintenance has been satisfactory.

The work in general consists of blade grading the roads on the Lincoln Highway. Dragline work is necessary on the road north of Central City, because of the swampy condition of the soil. Sand clay surfacing is necessary in the north part of the County, and along the Lincoln Highway in a few places. Gravel is available for the greater part of the distance along the Lincoln Highway, and may be had by digging out the road ditches.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation less 5%	$ 99,300.60
Total Expended to December 1, 1920	30,929.75
Balance	68,370.85
Number Miles State Roads	59
Number Miles Constructed by Contract	7.56
Number Miles Surfaced—S-Clay	.30
Number Miles Constructed by Heavy Gang Crew	42.5
Total Miles State Roads Constructed	50.06
Total Miles Contract Work Accepted	7.56
Number of Projects in County	1

Federal Aid Road Project No. 50-A—Central City-Belgrade, Merrick County.

Central City-Belgrade Federal Aid Road	Proj. 50-A
Length	7.56
Percentage Complete	100
Project Started	March, '20
Type—S-Clay	.3
Earth	7.26
Estimated Cost	$ 51,635.34
Federal Aid	25,817.67
State Aid	25,817.67
Other Funds	.....
Total Feet Corrugated Culverts	..
Total Feet Concrete Pipe Culverts	456
Total Number of Box Culverts	2
Bridges over 36 sq. ft. Waterway	3
Total Cu. Yds. Concrete in Box Culverts	122.17

Central City-Belgrade.

The road runs north from Central City eight miles, and passes through a low flat country. It was found by the contractor that construction could not be carried on as ordinarily, so a gasoline operated caterpillar dragline was used. A high grade was built by excavating a wide deep ditch on the up-stream side of the road. The ditch is adequate to care for all drainage waters, and has proven beneficial for the adjacent farms and hay meadows. The only objection to this type of construction is that it is uneven in settling, due to the unequal dumping from the dragline bucket and the subsequent packing before finishing. It will take considerable maintenance to correct this condition. It is recommended that dragline work be finished as soon as possible after excavation.

McPHERSON COUNTY.

The County Board has responded very well with regard to road improvement work. The reduction of sand hills by cutting and surfacing them with heavier soil in some instances and with hay, constitutes the general type of work in McPherson County.

1918-1920 State Federal Aid Road Construction.

Total Appropriation less 5%	$ 58,901.81
Total Expended to December 1, 1920	9,705.48
Balance	49,196.33
Number Miles State Roads	18
Number Miles Constructed by Contract	5.98
Number Miles Surfaced—S-Clay	2.18
Number Miles Constructed by Heavy Gang Crew	0
Total Miles State Roads Constructed	5.98
Total Miles Contract Work Accepted	5.98
Number of Projects in McPherson County	1

(Note: See Logan County as this Project extends across two Counties.)

Federal Aid Road Project No. 12—Stapleton-Ringgold, McPherson County.

Stapleton-Ringgold Federal Aid Road	Project 12
Length	5.98
Percentage Complete	100
Project Started	May, 1920
Type—S-Clay	2.18
Earth	3.80
Estimated Cost	$ 16,180.08
Federal Aid	8,090.04
State Aid	8,090.04
Other Funds	.....
Total Feet Corrugated Culverts	58
Total Feet Concrete Pipe Culverts	..
Number of Box Culverts	..
Cubic Yards Concrete in Box Culverts	37
Bridges over 36 sq. ft. Waterway	..

Stapleton to Ringgold.

A total of 5.98 miles of the Stapleton-Ringgold road is included in McPherson County.

NANCE COUNTY.

A decided improvement has been noticeable in the sentiment of the County and the County Board in Nance County. However, some difficulty has been experienced in securing the proper maintenance. The type of work varies from earth grading by blade graders to heavy excavation. A small portion of the mileage requires sand-clay surfacing, but as a whole, the road soil is of a good quality. Many new drainage structures were necessary, and were covered by contract on all State highways.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation less 5%	$ 79,868.89
Total Expended to December 1, 1920	27,319.89
Balance	52,549.00
Number Miles State Roads	63
Number Miles Constructed by Contract	9.35
Number Miles Surfaced—S-Clay	.2
Number Miles Constructed by Heavy Gang Crew	35
Total Miles State Roads Constructed	44.35
Total Miles Contract Work Accepted	8.05
Number Projects in County	2

Federal Aid Road Project No. 53—Genoa-Albion, Nance County.

Genoa-Albion Federal Aid Road	Project 53
Length	8.14
Percentage Complete	100
Project Started	July 19, '19
Type—S-Clay	.1
Earth	8.04
Estimated Cost	$ 26,111.88
Federal Aid	13,055.94
State Aid	13,055.94
Other Funds	.....
Total Feet Corrugated Culverts	..
Total Feet Concrete Pipe Culverts	412
Total Number of Box Culverts	3
Total Cubic Yards Concrete in Box Culverts	50.20
Bridges over 36 sq. ft. Waterway	2

Genoa-Albion Road.

The Genoa-Albion road is 21.41 miles long of which 8.14 miles are located in Nance County and 13.27 miles in Boone County. (Note: See Boone County for the work on the Genoa-Albion Federal Aid Road.)

Federal Aid Road Project No. 50-B—Central City-Belgrade, Nance County.

Central City-Belgrade Federal Aid Road	Proj. 50-B
Length	12.14

Percentage Complete	10
Project Started	Sept., 1920
Type—S-Clay	1.02
Earth	11.12
Estimated Cost	$ 60,523.96
Federal Aid	30,261.98
State Aid	30,261.98
Other Funds	.....
Total Feet Corrugated Culverts	..
Total Feet Concrete Pipe Culverts	500
Total Number Box Culverts	3
Total Cu. Yds. Concrete in Box Culverts	61.18
Bridges over 36 sq. yds. Waterway	5

Central City-Belgrade Road.

Ordinary earth grading work was required on this project. The work progressed very well with an outfit at each end of the project, working toward each other. Culverts and bridges are completed.

SHERMAN COUNTY.

The road soil in Sherman County is of such a type that it renders construction comparatively easy. A small per cent, however, of the soil is sand, and will require surfacing but grading will provide a desirable road. The County is desirous of securing better roads and is co-operating to that end.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation less 5%	$ 88,213.85
Total Expended to December 1, 1920	17,663.72
Balance	70.550.13
Number Miles of State Roads	57
Number Miles Constructed by Contract	9.03
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	0
Total Miles State Roads Constructed	12.53
Total Miles Contract Work Accepted	0
Number of Projects in County	1 Fed. State 1 Co. State

(3.5 miles constructed by County, Litchfield west to the County line.)

Federal Aid Road Project No. 37—Rockville-Loup City, Sherman County.

Rockville-Loup City Federal Aid Road	Project 37
Length	12.05
Percentage Complete	75
Project Started	June, 1920
Type	Earth
Estimated Cost	$ 83,585.44
Federal Aid	41,792.72

State Aid	41,792.72
Other Funds	.....
Total Feet Corrugated Culverts	4
Total Feet Concrete Pipe Culverts	304
Total Cu. Yds. Concrete in Box Culverts	54.13
Total Number Box Culverts	4
Bridges over 36 sq. ft. Waterway	..

Rockville-Loup City Road.

In many places where sand-clay is called for on this road, sufficient heavy material was found in the ditches adjacent to the road, thereby eliminating the necessity of hauling clay any long distance as was originally planned. The contractor for the drainage structures experienced some delay due to the inabiltiy to get cement and in meeting the requirements for gravel. Grading has progressed slowly as the work was re-let to several sub-contractors who, in several instances quit work before completing their share of the project.

THOMAS COUNTY.

Thomas County along with four other Counties in the State, known as the "Sand Hill Group" have no Federal and State Aid road projects. It was thought best, after taking into consideration the variety of soils encountered on the State roads in these respective Counties, to turn over for 1920, a definite sum of State money to be expended under the direction of the County Board, the County Highway Commissioner, and a representative of the Department.

The total appropriation of Federal and State Funds for the five year period, 1917-1921, amounts to $44,080.14. State money to the amount of $20,000 was appropriated for road work in this county for 1920 and the balance will be turned over at a later date. The entire appropriation would be inadequate for the construction of any but small sections of the Federal approved type of road, owing to the peculiar condition of the soil. Thus, in some cases, a mile might require clay surfacing, the next two miles need no surfacing, but considerable grading, while the fourth mile might require a surfacing of hay. For this reason, such projects cannot be incorporated into a Federal Aid project, and thus the State money has been granted.

Grant, Hooker, Blaine and Wheeler Counties have similar conditions and their road work on the State Highway System is built in some such manner.

1918-1920 State and Federal Aid Road Construction.

Total Appropriated less 5%	$ 44,080.14
Total Expended to November 1, 1920	20,335.63
Balance	23,744.51
Number Miles State Roads	35
Number Miles Constructed by Contract	0

Number Miles Surfaced—Hayed	16
Number Miles Constructed by Heavy Gang Crew	0
Total Miles of State Roads Constructed	16
Total Miles Contract Work Accepted	0
Number of Projects in County	0

VALLEY COUNTY.

Remarkable and successful work has been accomplished in Valley County, no small portion of which is due to the splendid response of the County generally, and the County Board in particular. The maintenance has been excellent, and drainage structures have all been built by the County.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$95,938.79
Total Expended to December 1st, 1920	53,933.57
Balance	42,005.22
Number Miles State Roads	34
Number Miles Constructed by Contract	13.31
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	20
Total Miles State Roads Constructed	33.31
Total Miles Contract Work Accepted	13.31
Number Projects in County	1

Federal Aid Road Project No. 85-A—Scotia-Burwell, Valley County.

Scotia-Burwell Federal Aid Road	Proj. 85-A
Length	13.31
Percentage Complete	100
Project Started	May, 1920
Type	Earth
Estimated Cost	$86,641.79
Federal Aid	43,320.89
State Aid	43,320.90
Other Funds	
Total Feet Corrugated Culverts	
Total Feet Concrete Pipe Culverts	612
Total Number Box Culverts	3
Total Cubic Yards Concrete in Box Culverts	55.40
Bridges Over 36 Square Feet Waterway	4

Scotia-Burwell Road.

The principal features of this project is represented by the improved location, the better alignment, and the eliminated railroad crossings. Grades have been reduced along the foothills and adequate drainage structures provided. A fairly high grade, together with ditches have been constructed, in an effort to alleviate a condition caused by snow. Grading and drainage structures of all kinds were completed between May and September of the present year.

WHEELER COUNTY.

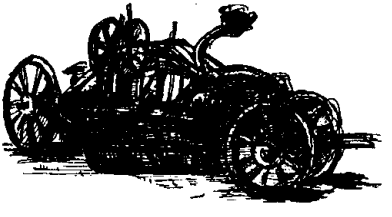
Wheeler County is one of the five Counties known in the State as the "Sand Hill Group" in which there are no Federal and State Aid road projects. Twenty thousand dollars of State Funds were turned over to the County for 1920 to be expended under the direction of the County Highway Commissioner, the County Board, and a representative of the department for road improvement.

The total appropriation of Federal and State funds for the five year period 1917-21 amounts to $49,156.58. The balance of these funds will be turned over at a later date and will be used entirely on roads of the State highway system. See Thomas County for further explanation.

1918-1920 State and Federal Aid Road Construction.

Total Appropriated, less 5%	$49,156.58
Total Expended to December 1st, 1920	5,391.98
Balance	43,764.60
Number Miles State Roads	31
Number Miles Constructed by Contract	0
Number Miles Surfaced—Hayed	13
Number Miles Constructed by Heavy Gang Crew	0
Total Miles of State Roads Constructed	13
Total Miles Contract Work Accepted	0
Number of Projects in County	0

The general response of the County Board in Wheeler County has been fair. Sand clay or hay surfacing is generally the type of work required, although a considerable mileage might well be put in shape with blade graders.



TRUCK RECEIVED BY THE STATE FOR USE ON STATE ROADS FROM GOVERMENT SURPLUS WAR EQUIPMENT

DIVISION NUMBER 5

J. C. McLEAN, Division Engineer

COUNTIES

Arthur	Grant
Banner	Keith
Box Butte	Kimball
Cheyenne	Morrill
Dawes	Sheridan
Deuel	Scotts Bluff
Garden	Sioux

BERRY HILL APPROACH ON THE VALENTINE-SPARKS FEDERAL AID PROJECT NO. 66.
Decreased Grade and View Ahead Provided By the Improvement. Note Width of Roadway and Depth of Cut.

ARTHUR COUNTY.

Like Grant County on the north, the State road in Arthur County is composed almost entirely of blow sand, with the exception of those points where it crosses meadows, a sandy loam is found. Surfacing material which can be used for a blanket is found in the meadows in the vicinity of the road, but unfortunately their location is such that the haul in some instances will be excessive.

A team patrol has been maintaining the road from Arthur south to the County line throughout the season, covering a distance of 16 miles. All of the worst sandy stretches of this mileage have been strawed, and considerable has been accomplished in the way of widening narrow cuts and fills.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$56,526.03
Total Expended to Dec. 1st, 1920	
Balance	56,526.03
Number Miles State Roads	16
Number Miles Constructed by Contract	0
Number of Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	0
Total Miles State Roads Constructed (Hayed by County)	8
Total Miles Contract Work Accepted	0
Number of Projects in County	0

Federal Aid Road Project No. 94—Arthur-Roscoe, Arthur County.

Project No. 94 Arthur-Roscoe road, on which construction will begin in the spring, extends from Arthur south to the County line, on the route to Keystone. Practically all of it is blow sand and will require surfacing throughout. In some of the deeper cuts on the road, fences will be placed in much the same manner as a snow fence is placed, to keep the sand from blowing over the finished surface of the roadway. From an economic point of view, an excellent road south will mean much to Arthur County as it is the county seat and depends entirely upon trucks and team haulage for furnishing supplies.

BANNER COUNTY.

North of Harrisburg the soil consists of a light sandy loam, which although light seems to pack fairly well under traffic. To the south, sandy strips are encountered which are being surfaced under Project No. 16-A, Kimball-Harrisburg, now under construction. Continuing south after the table land is reached, the soil is a light loam which makes excellent road building material.

Using a County outfit, the State road has been graded during the season from Harrisburg north to the County line. The Commissioners offered the use of the County equipment for this work, and with the exception of a few hills requiring team work, a fairly good grade has

been secured. A truck and team patrol operating intermittently has been used to maintain the highway throughout the season. Due to a shortage of funds, the County has been seriously handicapped in carrying on the work.

Between Harrisburg and Gering at the County line, there is a very steep range of hills over which the State Highway passes, and efforts have been made from time to time by the citizens of both counties to raise money enough to build a passable road through these hills. Early in the season Scotts Bluff County let the contract for a road through the hills as far south as the County line, which left about seven-tenths of a mile to be built by Banner County in order to complete the project. Through the efforts of the Commissioners, and local citizens Banner County raised the necessary funds to complete the work, and the new road will provide a splendid outlet to the north of the County.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$56,396.52
Total Expended to December 1st, 1920	32,059.58
Balance	24,336.94
Number Miles State Roads	26.6
Number Miles Constructed by Contract	11.21
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	0
Total Miles State Roads Constructed	26.0
Total Miles Contract Work Accepted	10
Number of projects in County—State-Federal	1
County	1

Federal Aid Road Project No. 16-A—Kimball-Harrisburg, Banner County.

Kimball-Harrisburg Federal Aid Road	Proj. 16-A
Length	14.01
Percentage Complete	80
Project Started	Oct., 1919
Type	Earth
Estimated Cost	$64,087.04
Federal Aid	32,043.52
State Aid	32,043.52
Other Funds	
Total Feet Corrugated Culverts	788
Total Feet Concrete Pipe Culverts	0
Total Number Box Culverts	3
Total Cubic Yards Concrete in Box Culverts	43.21
Bridges Over 36 Square Feet Waterway	3

Kimball-Harrisburg Road.

The Kimball-Harrisburg Federal Aid Road is 26.64 miles long, of which 14.01 miles are in Banner County, and 12.62 miles in Kimball County. It extends from Kimball to Harrisburg, and that part located in

Banner County will soon be completed. The work involves no unusual construction difficulties, with the exception of a mile south of the County seat, where the road winds through a canyon. It is necessary here to blast the road out of rock, and make special provision for the drainage, as a number of steep draws drain into the road which in the past has caused drainage trouble. See Kimball County.

County Road Construction Harrisburg-North, Banner County.

Harrisburg North Road	County Work
Length	.70
Percentage Complete	10
Work Started	Oct., 1920
Type	Earth
Estimated Cost	$5,000.00
No Federal or State Aid Funds (See explanation under Banner County).	
Total Feet Corrugated Culverts	120

Harrisburg North Road.

Banner County is building this road and it provides a connecting link between the roads in Scotts Bluff and in Banner County. See Scotts Bluff County for complete explanation.

BOX BUTTE COUNTY.

The sentiment in the County appears to be strong for good roads, and the Commissioners have ordered two new trucks to be used with maintainers on the County road system. Splendid co-operation has been gained from local officials and Commercial Clubs in carrying out the season's program.

North of Alliance the soil to the County line consists, for the most part, of a sandy loam, with occasionally a sandy strip requiring surface treatment. It is not difficult to maintain and when smooth, forms a very good wearing surface. East of the town the same conditions obtain, with the exception of the last mile and a half which is light blow sand, and is being surfaced as Project No. 21.

Beginning at Alliance, the State road has been graded north to the County line for a distance of 27 miles with the heavy gang maintenance crew. Two truck patrols have been provided for maintaining the system, one operating from Alliance east to the County line and north nine miles; the other from a point nine miles north of Alliance to the Dawes County line. The latter patrol passes through no towns, and the problem presents itself of securing housing facilities for the men. A portable bunk house has been made to serve the purpose.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$85,167.62
Total Expended to December 1st, 1920	21,886.11
Balance	63,281.51

Number Miles State Roads	35.2
Number Miles Constructed by Contract	8.62
Number Miles Surfaced	1.8
Number Miles Constructed by Heavy Gang Crew	26.5
Total Miles State Roads Constructed	35.12
Total Miles Contract Work Accepted	8.62
Number of Projects in County	1

Federal Aid Road Project No. 21—Alliance-Antioch, Box Butte County.

Alliance-Antioch Federal Aid Road	Project 21
Length	8.62
Percentage Complete	100
Project Started	June, 1919
Type—Earth	6.94
S-Clay	1.68
Estimated Cost	$20,068.82
Federal Aid	10,034.41
State Aid	10,034.41
Other Funds	0
Total Feet Corrugated Culverts	0
Total Feet Concrete Pipe Culverts	220
Total Number Box Culverts	0
Total Cubic Yards Concrete in Box Culverts	0
Bridges Over 36 Square Feet Waterway	0

Alliance-Antioch Road.

The Alliance-Antioch road extends east from Alliance to Antioch with a total mileage of 14.82 miles; 8.62 miles is in Box Butte County and 6.2 miles in Sheridan County. Six miles is of earth construction and the balance, 1.8 miles, is blow sand with an alkali blanket and gravel wearing surface, all in Box Butte County. Difficulty was experienced at the beginning of construction in securing borrow pits from which to take the earth for the 'blanket' but through the efforts of the Commissioners and the Commercial Club, satisfactory arrangements were completed, so that the material was secured. See Sheridan County for the remainder of the work of this project.

CHEYENNE COUNTY.

It would be difficult to find a county in which the soil is better adapted to the building of roads than Cheyenne County. On the Lincoln Highway it is composed largely of a loam with enough gravel for a good wearing surface. The Lincoln Highway from Sidney to Lodgepole thence east to the County line, covering a distance of twenty-miles, has been graded by the heavy gang maintenance crew during the season. The grades along this route are light and the soil compacts well. Maintenance of the roads has been done by two truck patrols, the one operating from Sidney west through Potter to the County line, and the other east through Lodgepole. Good results have been secured in this manner, and the County is now using tractor patrols in maintaining the more

important sections of the County roads. A survey has been made of the drainage structures through the County and corrugated pipe ordered, which is now being placed in the various locations. No project has been built in this county to date, but construction will start in the spring on No. 130-A from Sidney to Dalton.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$90,676.27
Total Expended to December 1st, 1920	
Balance	90,676.27
Number Miles State Roads	42.2
Number Miles Constructed by Contract	0
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	42.2
Heavy Gang Crew on County Roads	12.8
Total Miles State Roads Constructed	42.2
Total Miles Contract Work Accepted	0
Number of Projects in County	0

Federal Aid Road Project No. 130-A—Sidney-Dalton, Cheyenne County.

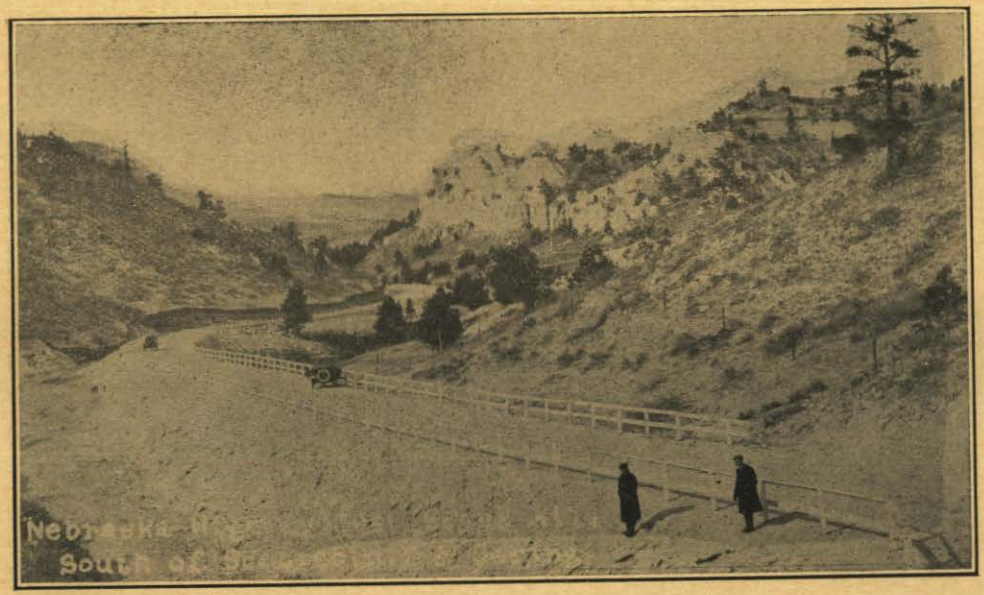
The Federal Aid Road from Sidney to Dalton is not yet under construction, but work will start in the spring. The road passes through one of the largest wheat producing sections of western Nebraska. The highway parallels the Burlington the entire distance and when completed will form an important link in a comprehensive system of roads which the Commissioners have laid out with a view of facilitating the hauling of the wheat crop to market.

DAWES COUNTY.

In the matter of amount of funds for the proper maintenance of the State highways, the County has been seriously handicapped. The County Commissioners realizing this have very generously contributed work at various places, and together with equipment, have in no small degree made possible the successful carrying out of the road work in the County.

With the exception of a few miles of graded roads in the vicinity of Chadron and Crawford, the State highway through Dawes County until the present year consisted of a mere trail with scarcely any drainage. This season 42 miles have been graded with State equipment, from Crawford to Chadron, and east to the County line. Much of the work was heavy, involving in addition considerable team work.

Two truck patrols have been operating in the County since April. The mileage covered has been too large to justify good work, but in another year the funds should permit the addition of a third patrol. Early last spring the County suffered heavily from floods on the White river and Chadron creek, necessitating the replacement of many of the larger wooden bridges. Most of these have been taken care of and the damage repaired. Corrugated pipe has been ordered for the drainage on the work built by the heavy gang maintenance crews.



NEBRASKA HIGHWAY OVER STAGE HILL, SOUTH OF SCOTTSBLUFF AND GERING

1918-1920 State and Federal Aid Road Construction

Total Appropriation, less 5%	$115,442.62
Total Expended to December 1st, 1920	293.15
Balance	115,149.47
Number Miles State Roads	81.8
Number Miles Constructed by Contract	.72
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	42
Total Miles State Roads Constructed	42.72
Total Miles Contract Work Accepted	0
Number of Projects in County	1

Federal Aid Road Project No. 76-A—Chadron-Alliance, Dawes County.

Chadron-Alliance Federal Aid Road	Proj. 76-A
Length	14.53
Percentage Complete	5
Project Started	Oct., 1920
Type	Earth
Estimated Cost	$115,253.64
Federal Aid	57,626.82
State Aid	57,626.82
Other Funds	
Total Feet Corrugated Culverts	532
Total Feet Concrete Pipe Culverts	0
Total Number Box Culverts	
Total Cubic Yards Concrete in Box Culverts	47.09
Bridges Over 36 Square Feet Waterway	6

Chadron-Alliance Road.

The Chadron-Alliance road, on which construction has started, extends from Chadron for 15 miles through the picturesque pine ridge. Ten miles of the route is quite heavily timbered. Plans are being made by citizens of Chadron to arrange for the completion of this road to the Box Butte County line.

DEUEL COUNTY.

The experience in the county this season indicated the ease with which a good gravel surface can be maintained, as compared with other sections of the road on which surfacing material has been placed. The graveled strip west of Chappel during the dry and rainy season as well has been in excellent shape throughout, while the other sections of the road to the east, due to dust and mud, have been almost impassable.

The County Commissioners are placing patrol maintenance on the County roads, and have purchased a truck for the next season's work. Under heavy maintenance the Lincoln Highway has been graded from Chappel west to the County line, a distance of approximately seven miles, and from the east County line through Big Springs west towards

Chappel a distance of 14 miles. One truck patrol has been operating continuously over the highway throughout the season, and satisfactory maintenance has been secured. An extra team patrol has been working intermittently on those portions of the Federal Aid No. 54 east of Chappel, which have been approved and turned over to the County for maintenance.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$40,805.87
Total Expended to December 1st, 1920	30,547.39
Balance	10,258.48
Number Miles State Roads	32.4
Number Miles Constructed by Contract	10.96
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	20
Total Miles State Roads Constructed	30.96
Total Miles Contract Work Accepted	10.96
Number of Projects in the County	1

Federal Aid Road Project No. 54—Chappel-Big Springs, Deuel County.

Chappel-Big Springs Federal Aid Road	Project 54
Length	10.96
Percentage Complete	100
Project Started	April, 1920
Type	Earth
Estimated Cost	$42,373.32
Federal Aid	21,186.66
State Aid	21,186.66
Other Funds	
Total Feet Corrugated Culverts	0
Total Feet Concrete Pipe Culverts	768
Total Number Box Culverts	0
Total Cubic Yards Concrete in Box Culverts	0
Bridges Over 36 Square Feet Waterway	2

Chappel-Big Springs Road.

The Chappel-Big Springs Federal Aid Road, Project No. 54, east from Chappel 11 miles has now been completed and turned over to the County for maintenance.

GARDEN COUNTY.

With the exception of a strip of sand, about two miles east of Oshkosh, and an eight mile strip on the west, the soil on the State highway consists principally of a light loam which grades well and makes excellent road building material. The State road in the County has been maintained throughout the season with truck patrol operating east and west out of Oshkosh. This work has been supplemented with teams at intervals, strawing the sandy portion, and caring for the kind of work

not handled by the truck outfit. Six miles of road were built by the heavy gang maintenance crew from Lisco east, and seventeen miles from Oshkosh through Lewellen to the County line. This includes all of the road that can be built in the County with this class of equipment. The balance is sandy and will require surfacing.

1918-1920 State and Federal Aid Road Construction:

Total Appropriation, less 5%	$106,110.64
Total Expended to December 1st, 1920	21,020.31
Balance	85,090.33
Number Miles State Roads	37.3
Number Miles Constructed by Contract	5.63
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	22
Total Miles State Roads Constructed	27.63
Total Miles Contract Work Accepted	0
Number of Projects in County	1

Federal Aid Road Project No. 82-A—Broadwater-Oshkosh, Garden County.

Broadwater-Oshkosh Federal Aid Road	Proj. 82-A
Length	8.67
Percentage Complete	65
Project Started	June, 1920
Type—Earth	2.86
S-Clay	5.81
Estimated Cost	$100,802.38
Federal Aid	50,401.19
State Aid	50,401.19
Other Funds	
Total Feet Corrugated Culverts	280
Total Feet Concrete Pipe Culverts	
Total Number Box Culverts	0
Total Cubic Yards Concrete in Box Culverts	
Bridges Over 36 Square Feet Waterway	1

Broadwater-Oshkosh Road.

Construction was started on this road from Oshkosh west early in the summer, and it is expected to finish the grading this fall. Five miles of the road is sandy and is being surfaced with State equipment by use of the caterpillar tractor and trailers.

GRANT COUNTY.

Grant County is one of the Counties known as the "Sand Hill Group" in which there are no Federal and State Aid road projects. Ten thousand, seven hundred dollars of State funds were turned over to the County for 1920 to be expended under the direction of the County Highway Commissioner, the County Board, and a representative of the Department for road improvement. Under an agreement with the Depart-

ment the County is now engaged in building various sections of the Potash Highway. This work includes grading and surfacing, with alkali mud, the more hilly sections of the road, providing necessary drainage structures, straightening the alignment, and raising the low places.

Team patrol maintenance has been used in the County throughout the season, the patrolmen working east and west from Hyannis to the County line.

1918-1920 State and Federal Aid Road Construction

Total Appropriation, less 5%	$49,185.81
Total Expended to Dec. 1st, 1920	
Balance	49,185.81
Number Miles State Roads	31.4
Number Miles Constructed by Contract	0
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	0
Total Miles State Roads Constructed	0
Total Miles Contract Work Accepted	0
Number of Projects in County (County Project, Using County Equipment)	1

County Road Project—Hyannis East and West, Grand County.

This road is being built with county equipment, and is a part of the Potash Highway.

KEITH COUNTY.

On the Lincoln Highway through Keith County the soil is a loam with sufficient gravel to make an excellent road building material. On the North Platte Valley Highway, light sandy loam, gumbo and pure sand are found, making road construction very difficult. During the season the Lincoln Highway east and west has been graded. On the North Platte Valley Highway the heavy gang maintenance crew graded the road from the west County line to Belmar, where a County outfit took the work and carried it on to Le Moyne and Keystone.

Two truck patrols have been operating for the season on the Lincoln Highway from Keystone west. Team work has been used in conjunction with the patrols at various points on the system. Strawing of the sandy stretches by team work has accomplished much on the lower parts of the road along the river.

A much needed improvement on the line from Ogalalla to Martin has been made by the County Commissioners this season, in shortening the Martin bridge 1,400 feet, putting in the sand fill and surfacing it. The old structure was dangerous and necessitated a continual bill for repair.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation, less 5%	$75,966.02
Total Expended to December 1st, 1920	
Balance	75,966.02

Number Miles State Roads	96.4
Number Miles Constructed by Contract	0
Number Miles Constructed by Heavy Gang Crew	42.6
Total Miles State Roads Constructed	42.6
Total Miles Contract Work Accepted	0
Number of Projects in County	0

Federal Aid Road Project No. 146—Ogalalla-Belmar, Keith County.

Project No. 146 from Ogalalla to Belmar consists, for the most part, of earth construction. Construction has not started.

East of Belmar, a high sandy range of hills are encountered and it did not seem practical to make a re-location. Surfacing material will have to be hauled from the valley below, which, in view of the height of the hills, will prove to be expensive.

This project when completed will serve as a connecting link between the Lincoln and North Platte Valley Highways, and will give tourists the opportunity of going by the way of the Platte Valley and returning to the Lincoln Highway at Kimball if they so desire.

KIMBALL COUNTY.

The County has been seriously hampered throughout the season with a large mileage of State roads to maintain, and limited funds with which to do it. One truck patrol has been at work continually since April on the whole sytsem, supplemented with a team patrol which has been working north intermittently on those portions of the Federal Aid Project No. 16-A, Kimball-Harrisburg, which has been turned over to the County for maintenance.

On the Lincoln Highway through Kimball County for the most part the soil is well adapted to road building. West of town a good gravel is to be secured at several points which will work in well with any surfacing program that may be adopted in the future.

The County Commissioners are using the partol system for maintenance on the more important County roads, and have secured a truck from the Department for this work. Under heavy maintenance the State highway has been graded from Kimball to the State line, and east four miles, making 25 miles of this class of work. County crews are now at work finishing the grading to the east County line, which will complete the grading of the Lincoln Highway across the County.

1918-1920 State and Federal Aid Road Construction

Total Appropriation, less 5%	$70,557.04
Total Expended to December 1st, 1920	26,592.16
Balance	43,964.88
Number Miles State Roads	49.9
Number Miles Constructed by Contract	0
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	25

Total Miles State Roads Constructed	25
Total Miles Contract Work Accepted	0
Number of Projects in County	1

Federal Aid Road Project No. 16-A—Kimball-Harrisburg, Kimball County.

The Kimball-Harrisburg Federal Aid road is 26.64 miles in length of which 14.01 miles are in Banner County and 16.62 miles in Kimball County. See Banner County for statement of the type of construction.

MORRILL COUNTY.

The soil found on the State highway through Morrill County varies from gumbo to a light sandy loam, and to pure sand. No effort has been made this season to surface the sandy strips, but it is probable that something will be done along this line in another year.

Twenty-two miles of grading work has been made in Morrill County by the heavy gang maintenance crews, extending from the west county line east through Bayard, Bridgeport and Broadwater. Two truck patrols have been used to maintain the system, one with headquarters at Bayard handling the work from that point west to the County line and east to Bridgeport, the other located at Bridgeport and working from there east to the County line through Broadwater. Next season it is planned to put on a third patrol operating out of Broadwater as the mileage of State roads in the County is too great to be handled properly with two. Corrugated pipe is being placed on all of the work built by the heavy gang maintenance crews. A team outfit is being used in conjunction with the heavy gang in placing of pipe, widening narrow fills and cuts, and such other work as is necessary to complete the work.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation less 5%	$101,969.30
Total Expended to December 1, 1920	35,472.19
Balance	66,497.11
Number Miles State Roads	52.6
Number Miles Constructed by Contract	11.37
Number Miles Surfaced	..
Number Miles Constructed by Heavy Gang Crew	25.3
Total Miles State Roads Constructed	36.67
Total Miles Contract Work Accepted	9
Number of Projects in County	1

Federal Aid Road Project No. 79-A—Bayard-Broadwater, Morrill County.

Bayard-Broadwater Federal Aid Road	Proj. 79-A
Length	13.39
Percentage Complete	85
Project Started	May, 1920
Type—Earth	13.07
S-Clay	.32
Estimated Cost	$ 62,044.40
Federal Aid	31,022.20

State Aid	31,022.20
Other Funds	.....
Total Feet Corrugated Culverts	60
Total Feet Concrete Pipe Culverts	8
Total Number Box Culverts	2
Total Cu. Yds. Concrete in Box Culverts	..
Bridges Over 36 sq. ft. Waterway	4

Bayard-Broadwater Road.

The Bayard-Broadwater Federal Aid road extending east and west of Bridgeport is nearly completed. West of Northport considerable difficulty was experienced in building the road through what proved to be a swamp. The entire length of one mile is composed of pure gumbo, which makes the road progress slow and costly. There are four bridges to be built on the work by the County.

SHERIDAN COUNTY.

The "Potash Highway" passes through the lower part of Sheridan County and consists very largely of blow sand covered with sparse vegetation. Along the route are frequent small alkali lakes containing mud which, if care is used in selecting, may be used as a blanket for the sand. A fairly satisfactory surface may be secured by placing this alkali mud on the road, but the initial cost is high and subsequent maintenance heavy.

Under heavy maintenance the road has been graded from the west County line, through Hayes Springs to Rushville and east four miles, a total distance of twenty-four miles. One truck patrol has been operating the entire season from Rushville west to the County line and a second patrol to the line east through Garden; on the south a team patrol has been working intermittently from Lakeside west to the County line. A team outfit followed by a heavy gang maintenance crew through the County takes care of road intersections, approaches, culvert openings, etc. On the Potash Highway between Lakeside and Antioch five miles were worked over by filling in the low swampy places and surfacing the sandy stretches. Next season is planned to complete the work east through Gordon to the Cherry County line.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation less 5%	$188,966.78
Total Expended to December 1, 1920	24,114.28
Balance	164,852.50
Number Miles State Roads	85.4
Number Miles Constructed by Contract	3.45
Number Miles Surfaced—S-Clay	3.45
Number Miles Constructed by Heavy Gang Crews	22.5
Total Miles State Roads Constructed	25.95
Total Miles Contract Work Accepted	0
Number of Projects in the County	1

Federal Aid Road Project No. 21—Alliance-Antioch, Sheridan County.

Alliance-Antioch Federal Aid Road	Project 21
Length	6.2
Percentage Complete	50
Project Started	June, 1920
Type	S-Clay
Estimated Cost	$ 56,773.33
Federal Aid	28,386.66
State Aid	28,386.67
Other Funds	.....
Total Feet Corrugated Culverts	0
Total Feet Concrete Pipe Culverts	220
Total Number Box Culverts	..
Total Cu. Yds. Concrete in Box Culverts	..
Bridges Over 36 sq. ft. Waterway	..

Alliance-Antioch Road.

The Alliance-Antioch Federal Aid Road is 15.51 miles in length, of which 6.89 miles are located in Sheridan County, the remainder in Box Butte County. The project commencing at Alliance enters Sheridan County a little west of Hoffland and continues east to Antioch; nine miles of the project consists of blow sand upon which is being placed an alkali blanket procured from the lakes adjacent to the road.

A satisfactory grade of pit-run gravel to use on the wearing surface has been rather difficult to procure as the pits from which it is now being taken are not substantial and do not have satisfactory grading and loading devises. See Box Butte County for the remainder of the work of this project.

SCOTTS BLUFF COUNTY.

Early in the season the County entered into a contract for a team fresno outfit to be used along the highway to handle such work as might be properly done by the heavy gang maintenance crew. Under this contract the road south from Mitchell through the river flat has been raised for a distance of a half mile. West of town three miles of roads were built through sandy and seepy ground that could not be handled by the grading crew. Other team outfits had been used periodically throughout the season on a similar kind of work.

East of Minatare by the courtesy of the Reclamation Service the use of their drag line aided in building a mile and a half of State highway through the flats.

The North Platte Valley highway has been graded by heavy gang maintenance crews from Scotts Bluff west through Mitchell to Morrill and from Scotts Bluff east through Minatare to the County line. On the south the road has been graded between the bluffs and Gering and to the hills on the County line, a total distance of thirty-two miles.

Three truck patrols have been continuously in operation; one from Scotts Bluff east to the County line; another from Scotts Bluff south through Gering to the County line, and from the bluffs west eight miles; the third from Mitchell south to meet with the second outfit and then west to the State line. One team patrol has been working since the beet hauling season started on the road from Scotts Bluff east six miles, supplementing the work of the truck patrol on that section.

1918-1920 State and Federal Aid Road Construction.

Total Appropriation less 5%	$ 98,924.90
Total Expended to December 1, 1920	73,833.14
Balance	25,091.76
Number Miles State Roads	58.4
Number Miles Constructed by Contract	0
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	32
Total Miles State Roads Constructed	39.65
Total Miles Contract Work Accepted	0
Number of Projects in County	2-County 1-State Fed.

Federal Aid Road Project No. 101—Scotts Bluff-Minatare (east), Scotts Bluff County.

Scottsbluff-Minatare (east) County road work	Proj. 101
Length	6.25
Percentage Complete	100
Project Started	Oct. 1919
Type	Earth
Estimated Cost	County Work
Total Feet Corrugated Culverts	412
Total Feet Concrete Pipe Culverts	..
Total Number Box Culverts	..
Total Cu. Yds. Concrete in Box Culverts	..
Bridges over 36 sq. ft. Waterway	..

Scottsbluff-Minatare (East) Road

The Scottsbluff-East project extending from Scottsbluff east six miles has been completed and turned over to the County for maintenance. It consists of earth construction which, in view of the heavy beet hauling over it in the fall of the year, will require considerable maintenance for its upkeep. Plans are now under discussion for surfacing this strip of road in the spring with gravel which may be obtained in close proximity to the road.

Federal Aid Road Project No. 69—Harrisburg-Scottsbluff, (South):

Harrisburg-Scottsbluff (South) County Road Work	Project 69
Length	1.7
Percentage Complete	80
Project Started	June, 1920

Type	Earth
Estimated Cost	County Work
Total Feet Corrugated Culverts	..
Total Feet Concrete Pipe Culverts	88
Total Number Box Culverts	..
Total Cu. Yds. Concrete in Box Culverts	..
Bridges over 36 sq. ft. Waterway	0

Harrisburg-Scottsbluff (South) Road.

The Scottsbluff-South project extending through the hills to the Banner County line is nearly completed. Most of the work is very heavy involving blasting of large amounts of rock and Brule Clay. See Banner County.

Under the supervision of the Department contracts have been let and construction work started on four new river bridges in the County at Minatare, Scottsbluff, Morrill and Henry. The Minatare bridge is now completed and has been open to traffic. The Scottsbluff and Morrill bridges should be completed by the first of the year and the construction of the Henry bridge is well under way. Federal Aid Project No. 103, Scottsbluff-Gering is a bridge 644 feet long, the sand clay fill is .4 of a mile making the total length of the bridge and approaches .52 of a mile.

Federal Aid Road Project No. 103—Scottsbluff-Gering (Bridge).

Scottsbluff-Gering	(Bridge) No. 103
Length	.52 of a mile
	(Bridge 644 ft., S-Clay .4 mile)
Percentage Complete	40
Estimated Cost	$150,083.71
Federal Aid	75,041.85
State Aid	75,041.86

SIOUX COUNTY.

Considerable blasting has been accomplished on the hills at different points on the State highway during the season, and the construction difficulties in this County in the building of roads are numerous. West of the County seat to the State line the soil is a sandy loam a large part of which will require surfacing. Smiley Canyon through which the highway passes at the east County line will involve heavy construction and from a scenic point of view can hardly be surpassed. The need of good roads in Sioux County is quite generally recognized, and local officials together with Commercial Clubs have done much to aid in road construction.

The heavy gang maintenance crews have built the State road from the County seat west through the County line nine and one-half miles and from Harrison east four miles. Next year it is planned to continue this work east to connect with the Smiley Canyon project which will then be under construction.

A truck patrol has been in operation supplemented with team work over the State road for the entire season. In general teams have assisted the heavy gang maintenance crew at various points. No large bridges have been required this season and only such pipe has been placed as was necessary because of the work accomplished by the heavy gang maintenance crews.

1918-1920 State and Federal Aid Road Construction.

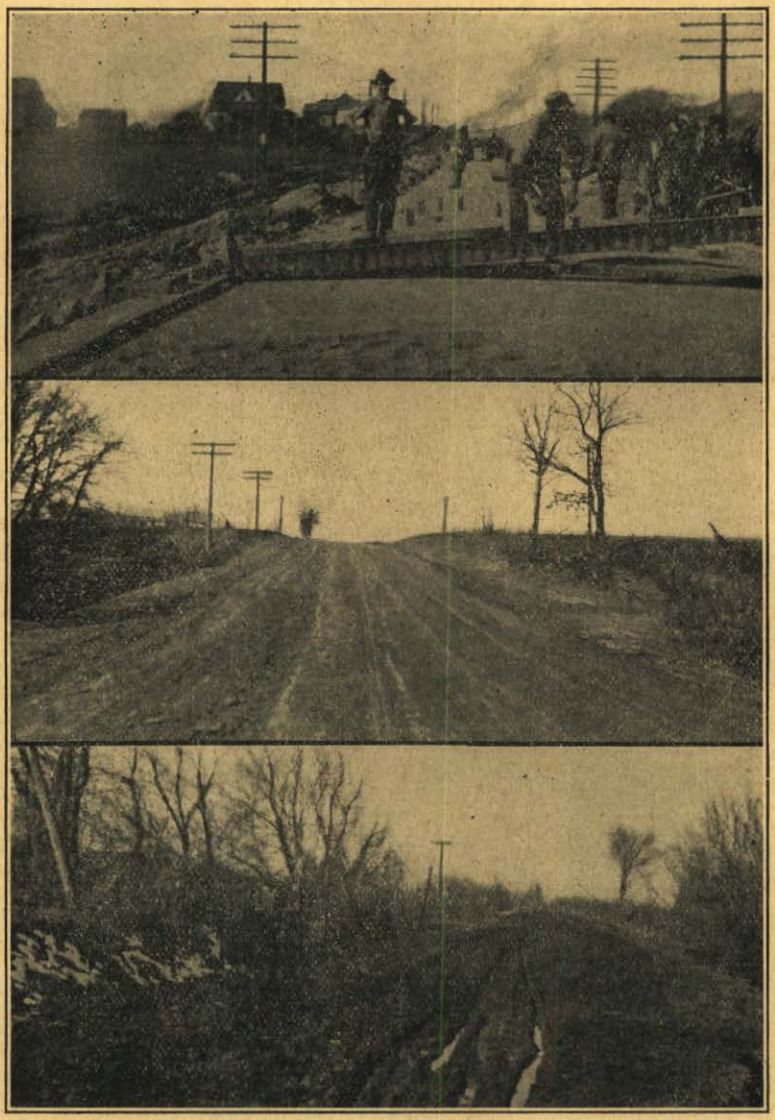
Total Appropriation less 5%	$135,173.19
Total Expended to December 1, 1920	1,747.65
Balance	133,425.54
Number Miles State Roads	31.5
Number Miles Constructed by Contract	0
Number Miles Surfaced	0
Number Miles Constructed by Heavy Gang Crew	18.0
Total Miles State Roads Constructed	18.0
Total Miles Contract Work Accepted	0
Number of Projects in County	0

Federal Aid Road Project No. 102—Harrisburg-Whitney, Sioux County.

On this road through Smiley Canyon perhaps the most unusual construction difficulties encountered on any road will be met with. Many deep gullies requiring drainage structures of various kinds together with a road way which for the most part will have to be blasted out of the sides of the canyon make up the unusual features of this project.

Fifty thousand pounds of explosives have been delivered and stored at the east approach of the canyon to be used on the work when construction starts in the spring.

TRAILERS HAULED BY TRACTOR GRAVELLING STATE AND FEDERAL AID ROAD IN HALL COUNTY



THREE STEPS OF ROAD IMPROVEMENT

RELOCATION OF ROADS

A very important factor and oft-times the most problematic in road construction is that of the relocation of roads. In this State particularly, relocation is recommended after the preliminary survey has been completed, as a more careful study has shown additional improvements may be affected by considering carefully such points as channel change, railroad crossings, steep contours and dangerous curves.

In this State, a grade of from six to seven per cent may be considered a maximum ruling grade for the average road. Taking into consideration the varying conditions present on all roads, the most economical grade is the ruling grade. For this reason, it is economical to increase the length of the road or make similar apparently expensive changes if a reduction of grade will result.

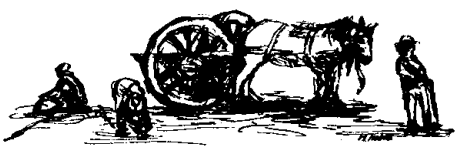
The Federal Aid road from O'Neill to Butte in Holt County will illustrate the above point. The original location had a grade of eight per cent for a distance of 1,900 feet. The original line was located on the present road which runs straight down the face of the bluff. The re-location was run slightly to the west, supporting down the hill, with a maximum grade of 7.3 per cent for a distance of 1,200 feet. The length increased 595 feet but excavation decreased 8,659 cubic yards. The saving, figured on the basis of the yardage decrease, was $5,628.35. Naturally, the advantage in the increased length of the road resulted in the reduced grade. Power required to mount the grade on the road increased proportionally to the per cent of the grade.

In Harlan County, on the Franklin to Orleans Federal Aid road No. 71, the original location made dangerous detours for a distance of 1,400 feet to meet an old bridge which was to be repaired by the County. A re-location was recommended which straightened the alignment and improved the line of vision, making it necessary for the County to build a new 50-foot steel span bridge. The project was shortened 105 feet and the possibility of overflow was entirely eliminated while the excavation was increased 164 cubic yards, thereby increasing the cost $105.00, exclusive of the cost of the new bridge which was to be built by the County, at an approximate cost of $5,000. The new bridge is to be standard twenty ton to meet the Federal requirements. The cost increased but a permanent improvement affected.

In Antelope County, on the Neligh-Albion Federal Aid road, project No. 83, a re-location affected a saving of approximately $1,000.00. At the southeast corner of Section 18, Township 24, north, Range 6 west, the Chicago and North Western Railroad crosses the east section line

300 feet north of the corner and the south section line, 1,400 feet west of the line. This necessitated two railroad crossings within 1,700 feet of each other as laid out by the preliminary survey, one crossing was considered very dangerous as it was located in a deep cut. It is proposed to re-locate the road parelling the railroad on the north side and thereby eliminating two grade crossings. This change made, will improve the grade, shorten the project 600 feet and reduce the cost $1,000.

These are but a few of the relatively important changes recommended after the preliminary survey has been made. It can be readily seen from the foregoing projects that considerable time can be profitably spent on the original location by the preliminary survey party, not only from an economical standpoint but that of a permanent and actual improvement.



CONVICT LABOR ON STATE HIGHWAYS.

During the season of 1920, convict labor was used to construct State highways in Seward, Johnson and Pawnee counties. This is the second time such labor has been used for road building in Nebraska.

Convict labor for road improvement in Nebraska was first used in 1915, at which time the preceding session of the Legislature appropriated the sum of $35,000 to pay for the State's share of paving along the south and east sides of the State Agricultural School at Lincoln, the appropriation carrying with it the provision that the Governor might employ convict labor or let the work to a contractor.

When the 1918 session of the Legislature inaugurated the present progressive program of road improvement for Nebraska, they made provision that "the Department of Public Works acquire land and equipment for road building materials," and in connection with same that "for the purposes provided in this section, said Department may enter into contract with the Board of Commissioners of State Institutions, for the employment of convict labor."

During the week of April fifth to ninth, 1920, the Department of Public Works decided, because of the excessively high prices bid on earth excavation, to reject all bids on Federal and State Aid road projects numbered 128-A in Seward County, 43-A in Johnson County, and 97-A in Pawnee County and do the grading with State or rented equipment and convict labor. The lowest prices bid on the above projects ranged from 63½ cents to 64.9 cents per cubic yard, and the Department contracted to do the same work at the estimated price, which was 50 cents per cubic yard on two of the projects and 55 cents on the other project. As a direct result of this action, the bid prices for earth excavation became more reasonable at subsequent lettings, settling at an average of 58 cents per cubic yard. The net profit gained by the State on account of this influence over the prices for all the State during the remainder of the season was greater than will be the profit gained by the use of convict labor on the three projects when completed.

The prisoners were carefully selected for the camps by the Board of Commissioners of the State Institution, upon the recommendations of the warden of the Penitentiary. The majority of those chosen were convicted for minor offenses and are serving short terms. However, a few are serving long terms. The Department of Public Works paid the State Institution $2.25 per day for each man; seventy-five cents of which was for the Institution and the remainder for the man, but held in trust for him by the Institution.

The camps were conducted upon the honor system, using only one day and one night guard in each camp, with assured confidence in the men that they would make good in camp and be returned at the end of the season with good records. When a man failed to live up to his trust, he was returned to the Institution. A total of ninety men were

VIEW OF PRISON LABOR CAMP NEAR TECUMSEH

placed in the three camps and 85 per cent returned at the end of the season having made good. Two escaped early in the season, but one was recovered before the end of the season. Several of the men were returned from time to time during the season for breaking the rules of the camp.

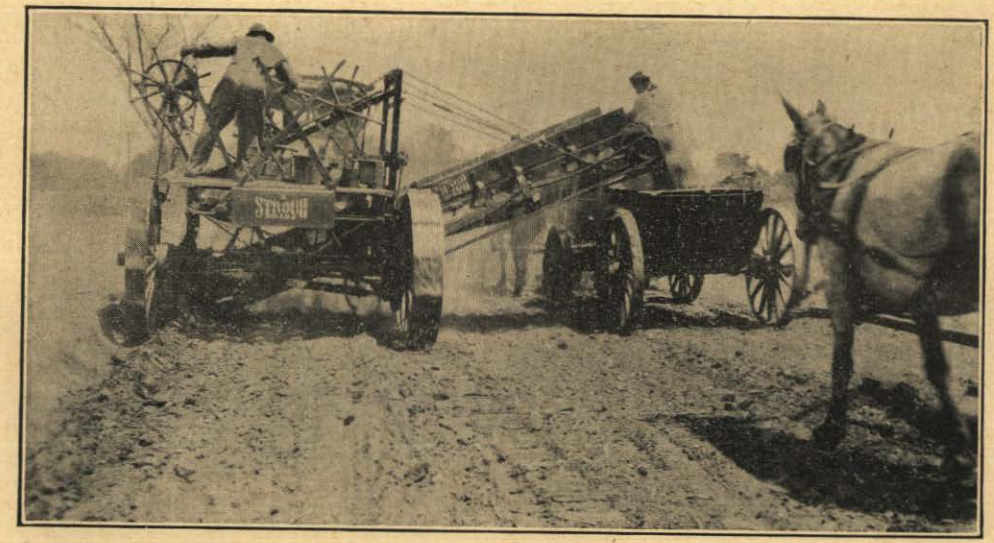
The Johnson County project extends from Tecumseh to Crab Orchard, a distance of 13.86 miles, and called for 115,700 cu. yds. excavation. The culvert and bridge work was done by private contractors. The equipment used by the State consisted of three Holt Caterpillar tractors, two elevating graders, dump wagons, twelve-foot blade, scarifier and twelve-foot tractor fresno for finishing road surface. The equipment listed belonged to the State and in addition twenty teams were rented together with other necessary barn and camp equipment to make a complete outfit. The men were housed and fed in bunk cars.

The Pawnee County project extends from Table Rock through Pawnee City towards Lewiston, a total distance of 15.7 miles requiring 109,100 cu. yds. of earth excavation. The colored prisoners were assigned to this camp for use as labor on the grading. The culverts and bridges were built by private contractors. In this camp the same equipment as listed for the Johnson County project minus the scarifier, twelve-foot fresno and one Holt tractor, were used.

The Seward County project extends from Seward east on the S. Y. A. highway to the Lancaster County line. The flat or more level portions of this road were graded with a tractor and blade graders without Federal and State Aid. The portion graded by the use of convict labor is 6.68 miles and required 84,200 cu. yds. earth excavation. The project was originally laid out to include 7.18 miles with 90,400 cu. yds. excavation, but was later reduced after petition from the Seward County Board. The equipment used on this project was the same as on the Johnson County project except that for one of the channel changes a small one-half yard dragline was employed to advantgae.

As the season advanced the men became more efficient with their work. In fact, at the end of the season eight of the prisoners were being employed as elevating grader operators and dump men, and three as tractor operators. Those employed as skilled laborers were paid one-half the rate paid free labor for the same work.

In addition to the work outlined above, thirteen colored prisoners were assigned to work in the Department's Garage and Equipment yards at Sixth and South Streets in Lincoln. They were kept out two weeks, during which time they placed the concrete floor in the new State garage and also dug the trenches for the water supply for the yards. During this period, one prisoner endeavored to leave the works but was captured before he had gone a mile.



PRISON LABOR BUILDING ROAD FROM TECUMSEH-CRAB ORCHARD

MAINTAINANCE OF STATE AND COUNTY ROADS.

Nebraska has entered into the largest campaign of its history. The State will have expended State and Federal Aid funds to the amount of nearly $11,000,000.00 for road construction at the close of 1921. This large expenditure may be said to be the largest business the State and County officials have to handle. No sane person should condemn a policy which tends to conserve such an investment, passing it on to posterity intact. Organized maintenance is a means to such an end.

By organized maintenance is meant a system of maintenance which functions and co-ordinates in such a manner that responsibility may be placed upon the proper party. The system of maintaining highways by old pathmaster methods is inadequate.

Two years ago legislation was enacted which provided means for the maintenance of the State Highway System. The majority are familiar with the provision of the law and its operation. Prior to that time maintenance was but a theory—not a condition. Today, speaking from experience, the theory may be discarded. The highways have been maintained this year according to definite plans, and the results are credible. The result has appealed to the automobile owner to such an extent that his license tax is an asset—not a liability.

The greatest problem that Nebraska has to deal with is the maintenance of earth roads. Many and varied types of soil within the borders necessitates consideration of maintenance methods depending upon the character of the soil.

To successfully maintain an earth road necessitates having the road first constructed according to standard—a 24-foot road with the crown one-half inch to the foot, with suitable side ditches. About 1,225 miles of roads on the State Highway System have been built by Federal and State Aid. It was therefore necessary to have the remaining mileage conform to a uniform cross-section and grade.

As a result it was decided to organize crews, equipped with one 20 Ton tractor and two heavy 12-foot grade bladers. Skilled operators were put in charge of such outfits and provided with the necessary camp equipment and sent into the various counties to grade roads which were not improved by State and Federal Aid. Thirty of these outfits were assigned and excellent results obtained. After the roads were shaped by these heavy maintenance crews, patrol work was at once started on the surface, and after a few days work with a maintainer, drag or plane the surface was kept in race track condition throughout the summer. Nearly 1,400 miles were built by these outfits during the season at an approximate cost of less than $100 per mile, which of course did not include equipment depreciation.

The patroling of State roads may be divided into two types, namely, team and truck or tractor. The team patrols, of which there are nearly

THIS HEAVY GANG MAINTENANCE CREW GRADES ROADS ON WHICH IT IS NOT NECESSARY TO MAKE HEAVY CUTS OR FILLS

one hundred in the state, patrol approximately six hundred miles of State highways. These patrolmen are hired by contract and are required to furnish a team out of their monthly salary, and give their entire time to the care of the road. Not only does this require looking after surface maintenance, but repairing ditches, opening culverts, emergency repair of bridges and guard rail, maintaining all official road signs, etc.

Some states have written specifications covering the type of man necessary for this work. These specifications put forth a man with the executive genius of a Nepolean, the courtesy of a Chesterfield, the strength of a Sandow, and the inventive genius of an Edison. Nebraska's standard may have fallen short of such a superman, but generally speaking satisfactory results have been secured. Wherever they have failed to produce satisfactory results the personal equasion was not the principle factor.

The remaining roads of the State Highway System are maintained by patrolmen equipped with trucks or tractors. Nearly seven hundred ninety miles are being worked with tractors as motive power. The truck is used on nearly two thousand five hundred miles of State highway. Throughout the State the preference seems to be given the truck as motive power. The reasons assigned may be as follows:

1. As a large number of army trucks were available it was possible to assign them to counties at a low first cost.

2. As the speed rate of a truck is higher, a greater mileage may be covered in a given length of time than with a tractor.

3. When not engaged in repairing surfaces the truck may be used for hauling materials to the road and provides a quicker method of transporting the patrolman and his helper to the required spot where the emergency repairs are necessary.

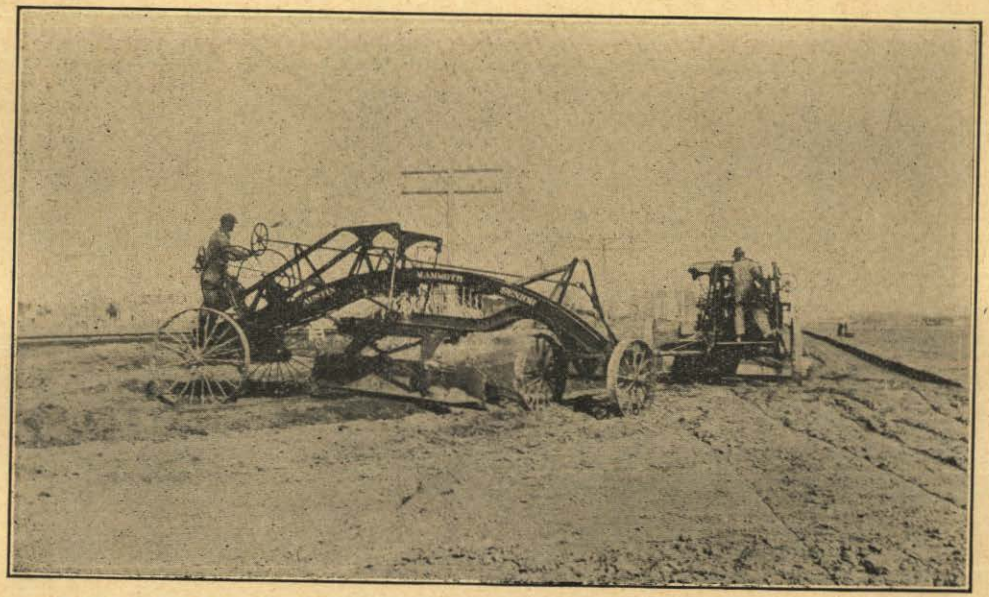
The tractor of course has an advantage if there is considerable blade grader work as slow speed in this case is desirable.

The comparative costs of patroling roads used by the different types of motive power are given under the heading "Patrol Maintanance" elsewhere in this report. This analysis gives an average cost of tractor patrol for three months on a fourteen mile section based upon five patrols as $1.38 per mile per day.

The total maintenance cost of a truck patrol for the three month period of a seventeen mile patrol section based upon eleven patrols amounted to $.94 per mile per day.

In comparison the cost of a team patrol for the same period based upon ten patrols of a six mile average section shows a cost of $1.38 per mile per day, the same as the average cost of a tractor patrol.

A motor patrol requires two men—one for operating the motor and the patrolman proper who operates the various devices used for planing and repairing the roads. Nearly all motor patrols are equipped with a



TWO TWELVE-FOOT BLADE GRADERS PULLED BY HOLT TRACTOR,—EQUIPMENT KNOWN AS HEAVY GANG MAINTENANCE CREW

maintainer of the flexible blade type, a drag or plane and small tools. He should also have, at his disposal, a small blade grader. The same duties as outlined for a team patrolman are applicable to a motor patrolman and should the State hold strictly to the specifications of a patrolman as has been previously mentioned the same type of superman would be required for this work also.

The team patrol has many advantages. The patrol section is shorter and the patrolman can give the road closer attention. It is very easy for him to stop when defects are noted, whereas the motor patrolman passes over them rapidly and as a result defects are more liable to escape his notice. The great fault found with team patrol in the eastern part of the state where the soil is heavy has been that a team has not sufficient power to haul a drag or even a Wisconsin plane, and conditions must be just right to haul even a small blade. This means that the surface is neglected when dragging is most needed —directly after a rain. A patrolman has to wait until he can borrow another team or haul a light tool over the road, which fails to level ruts. Two horses to a patrolman in the eastern part of the State is power enough just to be useless.

The motor patrol has sufficient power to haul various planing devices, and generally keeps the surface as smooth as a billiard ball. The disadvantage of this patrol is, that in planing the road the patrolman is ever alert for the bump, rut or hollow ahead of him and he does not pay much attention to the ditches or shoulders or other parts of the road outside of the 24-foot road surface. It is inconvenient for him to stop and this part of the road is often neglected.

To equalize matters, the motor patrol should be shortened so that the patrolman can attend to these duties, and the team patrol should be required to furnish more power when dragging operations are needed. One of the greatest troubles experienced during the past year has been the neglect of ditches and shoulders. It is a question whether or not it is good practice to seed road shoulders. Where vegetation is allowed to grow, the weeds and grass encroach on the roadway. The road plane, avoiding grass, weeds, etc., results in a narrowed roadway with a ridge of sod on the outside which prevents the surface water from passing freely to the ditches. Aside from this fact the road presents an unsightly appearance.

During the entire summer's season the surface dirt is being carried to the ditches by both water and wind. This dirt must be brought back to the road over the shoulders, by use of a blade maintainer and grader. Best results are accomplished where the shoulder line of the 24-foot roadway is kept well defined both on cut and fill sections. This may be accomplished by marking out the shoulder lines with a flexible blade maintainer, and then smoothing the shoulder with a small blade.

Ditches should be protected from wash, and some sort of check provided on hills where the soil washes badly. The patrolman should

be ever ready to provide some sort of temporary ditch check when wash starts, and to make this permanent as soon as possible. It is believed advisable to shape all of the roads with a heavy blade outfit at least once in every three years, in order to restore the road section to standard.

Various hard surfaced types of road require particular attention. A brick pavement will need no surface repairs for at least twenty years, if it has been properly designed and constructed, however the shoulders and ditches will require attention of the same type as those on an earth road, and therefore patroling will be necessary. A concrete pavement needs ditch maintenance. Very few concrete roads have been built which did not crack, and the surface repairs consist of filling these cracks with asphalt or tar. A macadam road needs constant patroling. If the road is laid with a bituminous binder the patrolman's best bet is a supply of cold patch emulsion for small depressions, and a portable heater with a supply of small sized stone, together with material for the larger holes. A macadam should have a surface treatment of light cold oil every two or three years and a new top course after the first five years. This of course depends upon the quality of the stone. A patrolman equipped with a single horse and wagon together with small tools and heater, etc., with materials for repair distributed not more than a mile apart will probably maintain nearly four miles of macadam road.

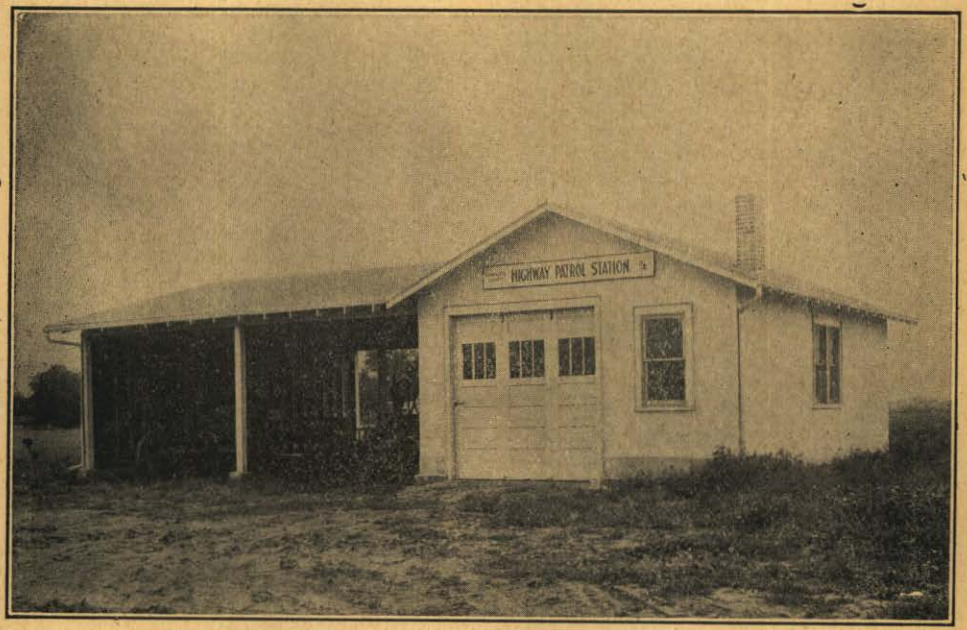
Gravel roads are maintained in nearly the same manner as earth roads, materials being available at short intervals for the patching process, the road can be smoothed readily with a Wisconsin plane, and new material added together with a binder, as the holes appear. Gravel in this state is of a very fine texture and makes excellent roads when not spread too thick, and splendid results may be obtained with one or two inches of gravel spread over heavy soils.

State roads are the arterial line of communication—the county roads the feeder. The latter may be maintained exactly in the same manner with but a few modifications. Such roads should first be laid out and public opinion regarding the location obtained first. They should then be graded in a systematic way, the County Highway Commissioner constructing, each year, as funds will allow. The work should be cared for section by section without fear or favor until the entire system is completed. Then the roads may be maintained by the County. Crews are assigned to certain districts to care for. This is applicable to the eastern counties. The western counties have an individual problem for their funds are not nearly commensurate with their mileage. The funds should be concentrated and not spread, thereby doing as much work as possible each year making this work worth while.

A subject which requires reasonable and practical consideration is that of snow removal. Snow to a depth of two feet or more has no tendency to drift and being fairly light can be cheaply handled with a

blade attached to the front of a truck. If the snowfall is less than two feet it has been demonstrated that a truck can draw a maintainer or blade grader and keep the road in excellent condition. In case of drifts a skimmer or rotary is practical. Each County should build portable snow fences and place them at cuts where the wind has a full sweep. Snow rollers and packers are used in the east, but they would be useless in this State generally, although a packer might be used advantageously in some parts of the State. The old fashioned "V" snow plow is effective if it can be hauled or pushed through the drifts.

In conclusion it might be said that the condition of all roads will be directly proportional to the energy of the patrolman, and roads will be kept in best condition where there is a spirit of co-operation between County and State officials.



ONE OF LANCASTER COUNTY'S WELL EQUIPPED PATROL STATIONS

PATROL MAINTENANCE REPORT OF THE FIVE DIVISIONS IN THE STATE.

PATROL MAINTENANCE REPORT—DIVISION NO. 1.

Counties	Total Miles State Roads	Miles State Roads Constructed by Contract	Miles Grading Work Heavy Gang	Number of Patrolmen	Miles Patroled as to type			Remarks
					Team	Tract	Trk	
Butler	44.41	43.97	15	6	12	14	18	
Cass	68	15.95	25	8	18	....	40	One team patrol added in June.
Douglas	84	41.07	3.38	10	27	....	32	One team patrols 2 miles in Sarpy County.
Fillmore	31	13	15.25	7	20.2	12.5	14.2	
Gage	79	30.65	25.37	10	27.8	10.7	41	
Hamilton	61	10	22	6	22.5	....	13	Tractor used part time place of truck.
Jefferson	42	19	1.75	6	12.5	16.5	13.5	
Johnson	27	12	12.87	5	25.0	....	25.0	Truck covers all 4 team patrols.
Lancaster	27	12	12.87	5	....	....	73.5	
Nemaha	35	21.16	30.50	7	12.5	....	22.0	
Otoe	59	19.77	.....	7	6	....	53.0	Originally 6 trucks and 1 tractor.
Pawnee	38	7.5	.....	5	18.0	....	20.0	
Polk	52	6.77	39.75	7	25.5	....	5.5	No Patrolman, 1 team patrol sec. not counted.
Richardson	48	23.55	.....	7	33.0	....	16.0	
Saline	61	11.92	12.5	8	31.5	....	20.5	1 team patrol not counted, no Patrolman.
Sarpy	44	.....	34	4	....	18.5	8.6	2 miles patroled by team of Douglas County.
Saunders	38	30.33	.....	6	.....	12.0	30.33	Tractor patrols 3 miles Sarpy County.
Seward	60	24.41	13.39	8	12	.....	29.5	S. Y. A. 12 miles, O. L. D. 11 miles.
Thayer	56	6.0	24.22	6	39.5	.....	.....	
York	50	26	23.0	8	38.0	11.3	.....	
Totals	1055.41	400.96	297.98	145	381.0	95.50	475.63	

PATROL MAINTENANCE REPORT—DIVISION NO. 2.

Counties	Total Miles State Roads	Miles Federal Roads Constructed By Contract	Miles Grading Work Heavy Gang	Number of Patrolmen	Miles Patroled as to type			Remarks
					Team	Tract	Trk	
Antelope	57	.....	11	6	....	29	28	
Boyd	61	.....	50	4	....	....	61	Truck patrols assisted by teams.
Brown	53	6.21	....	4	....	....	53	Some sand light maintenance.
Burt	53	21.82	7	8	53	....	....	Team patrols assisted by 2 tractors.
Cedar	54	26.03	....	5	14	....	40	
Cherry	125	15.74	....	....	....	....	....	Patrols not established.
Colfax	40	7.95	30	6	....	12	28	
Cuming	60	.....	47	6	....	12	48	
Dakota	15	.....	....	2	....	....	15	
Dixon	28	13.54	....	4	....	....	28	
Dodge	68	5.94	30	10	.	29	39	
Holt	134	2	37	8	....	....	134	Considerable sand light maintenance.
Keya Paha	34	.3	4	3	15	..	19	
Knox	68	14.41	....	9	44	..	24	
Madison	80	21.75	23	9	7	40	33	
Pierce	28	7.94	....	4	....	...	28	
Platte	69	26.12	14	8	..	55	14	
Rock	74	.....	5	2	....	....	74	Sandy soil, insufficient funds.
Stanton	39	.....	....	4	....	..	39	
Thurston	32	.....	7	3	9	....	23	
Washington	41	10.06	16	4	....	..	41	
Wayne	34	9.9	12	6	....	12	22	
Total	1247	216.30	293	117	142	189	791	

PATROL MAINTENANCE REPORT—DIVISION NO. 3.

Counties	Total Miles State Roads	Miles Federal Roads Constructed By Contract	Miles Grading Work Heavy Gang	Number of Patrolmen	Miles Patroled as to type			Remarks
					Team	Tract	Trk	
Adams	45.96	38.17	11.37	4	11	18	....	22 miles heavy traffic; maintenance poor.
Chase	43.31	9.92	.....	2	....	....	48	Meager funds, insufficient equipment.
Clay	44.3	27.62	12	6	....	14	30	Maintenance good.
Dundy	38.57	12.72	15.6	2	....	....	37	Meager funds, insufficient equipment.
Franklin	43.68	12.72	19.6	4	....	....	44	Maintenance ordinary.
Frontier	35.83	12.08	.....	4	....	18	18	Meager funds, lack organization.
Furnas	65.7	12.82	27.1	6	....	54	....	Maintenance ordinary.
Gosper	25.19	5.9	7.9	2	....	12	13	Maintenance excellent.
Harlan	50	10.1	33.75	4	....	38	....	Maintenance ordinary.
Hayes	59	6.05	.....	2	....	57	....	Rough county, insufficient funds.
Hitchcock	62	3.78	9.91	....	....	60	....	No funds, no co-operation, maintenance poor.
Kearney	40.1	16.25	24.02	4	....	20	20	Maintenance good.
Nuckolls	24.3	15.9	.....	4	....	15	....	Maintenance good.
Perkins	31	0	.....	1	....	....	31	Maintainence excellent.
Phelps	62.3	3.98	0	....	....	....	....	Maintenance fair.
Red Willow	30.64	17.14	13.5	4	....	15	16	Maintenance excellent.
Webster	32.3	21.06	.....	4	....	32	....	
Total	744.18	226.21	150.75	53	11	353	257	

PATROL MAINTENANCE REPORT—DIVISION NO. 4.

Counties	Total Miles State Roads	Miles Federal Roads Constructed By Contract	Miles Grading Work Heavy Gang	Number of Patrolmen	Miles Patroled as to type			Remarks
					Team	Tract	Trk	
Blaine	33	0	.....	T'mp'ry	....	....	....	
Boone	44	13.27	17.8	4	....	18	20	
Buffalo	83	20.4	37.5	8	....	18	54	
Custer	162	29.16	81.0	8	....	20	70	
Dawson	55	26.09	29.75	4	....	16	36	
Garfield	45	5.94	10	T'mp'ry	....	....	....	
Greeley	60	5.94	8	T'mp'ry	....	....	....	
Howard	34	2.17	3.5	T'mp'ry	....	....	....	
Hall	73	35.25	13.0	8	....	55	11	
Hooker	30	0	.....	T'mp'ry	....	....	....	
Lincoln	61	19.1	30	4	....	....	60	
Logan	30	10.56	.....	T'mp'ry	....	....	....	
Loup	39	0	9.25	T'mp'ry	....	....	....	
Merrick	59	7.56	42.5	5	8	....	44	
McPherson	18	5.98	.....	T'mp'ry	....	....	....	
Nance	63	9.35	35	35	....	26	20	
Sherman	57	9.03	0	T'mp'ry	....	....	....	
Thomas	35	0	.....	T'mp'ry	....	....	....	
Valley	34	13.31	20	4	....	....	34	
Wheeler	31	13	.....	T'mp'ry	....	....	....	
Total	1046	226.11	337.30	49	8	153	349	

PATROL MAINTENANCE REPORT—DIVISION NO. 5.

Counties	Total Miles State Roads	Miles Federal Roads Constructed By Contract	Miles Grading Work Heavy Gang	Number of Patrolmen	Miles Patroled as to type		Remarks
					Team	Trk	
Arthur	16.0	0	.....	1	16.0	....	
Banner	26.6	11.21	0	1	....	26.6	
Box Butte	35.2	8.62	26.5	2	....	35.2	
Cheyenne	42.2	0	55.00	2	....	42.2	
Dawes	81.8	.72	42.00	2	....	46.2	15 miles south of Chadron being maintained intermittently
Deuel	32.4	10.96	20.0	1	....	32.4	
Garden	37.3	5.63	22.0	1	....	37.3	
Grant	31.4	0	.....	1	31.4	....	
Keith	96.4	0	42.6	2	....	54.2	42.2 miles on North Platte Valley Highway maintained intermittently.
Kimball	49.9	0	25.00	2	10.0	39.9	Patrol commenced work Sept. 1st, 1920.
Morrill	52.6	11.37	25.3	3	8.00	44.6	
Scotts Bluff	58.4	0	32.0	4	6.00*	52.4	Patrol commenced work Sept. 15, 1920.
Sheridan	85.4	3.45	22.5	2	16.5 *	44.8	16.5 miles of intermittent team maintenance on Potash Highway.
Sioux	31.5	0	18.0	1	....	25.0	
Totals	677.1	51.96	330.9	25	87.9	480.8	73.7 miles of Intermittent Patrol Maintenance.

THE PATROL MAINTENANCE SYSTEM IN NEBRASKA

The Patrol Maintenance System, organized in the State the first of April, 1920, has been in operation a little over four months, and although late in starting, it has covered a fairly good mileage, and offers a rather interesting and representative report.

At the beginning of the season, each of the five Division Engineers, who each have direct charge of the highway work on the State System of an average of eighteen counties, held meetings with the County Boards of each county, in which they took up the matter of highway maintenance of the roads in that county, together with the matter of funds available for such maintenance, and methods to be adopted. In nearly every county, there were funds left over from the 1919 Automobile license tax, which had not been expended, and this amount, added to the minimum amount which the County Board and the County Treasurer stipulated would, in all probability be collected in that county for 1920 automobile tax, constituted the total available fund for the maintenance expenditures on the State roads of each county.

There are three methods of maintaining these roads—namely, by team, truck or tractor. The team patrol consists of one man, who furnishes his own team and equipment, and who is paid an average of $175 per month. It can be seen that there is no expense to the State nor the County by this method, as there is no depreciation costs, no feed costs, nor interest on teams to take into consideration when figuring the cost per mile for such maintenance. The equipment necessary may be listed as follows:

Equipment for Team Patrol.

1 Six-Foot Blader	1 Scraper or Fresno	6 Miles—Average
1 Farm Wagon	1 Plow	Team Patrol Section
1 Planer	Small Tools	

Two men are required for the truck patrol method, and are paid $120 per month; the gas and oil is furnished by the County Boards who are in turn, reimbursed by the State. This method is used where there is a large mileage to cover. The trucks used are a part of the equipment turned over to the State by the War Department, for use on State roads. The price of these trucks to the Counties was the amount of freight and expense put on by the State, and averaged nearly $1,000 varying according to the type of body. The average price of the truck, were the county to purchase them market value, would average from $3,500 to $5,000 a piece. This would necessarily increase the cost of maintenance accordingly. The equipment usually found may be listed as follows:

Equipment for Truck Patrol.

1 Truck	2 Planers	17 Miles—Average
1 Scraper	Small Tools	Truck Patrol Section
1 Maintainer	1 Plow	

The tractor patrol method also calls for two men, and is used in counties where such equipment was already on hand at the beginning of 1920, the County having purchased it for county work, or preferring it to the other methods used. The equipment necessary for such a maintenance patrol may be listed as follows:

Equipment for Tractor Patrol.

2 Highway Maintainers	Wisconsin Planer	14 Miles—Average
2 Small Tractors	Buck Scraper	Tractor Patrol
Plow	Shovels	Section.

In order to determine the best methods of maintenance, twenty-two different States were visited and the methods used investigated, and the results obtained. We concluded that the State of Wisconsin had conditions most similar to those in Nebraska, and that that State was getting a great deal more benefit from the money expended than any of the twenty-two visited. We requested the Chief of the Bureau of Roads to spend two weeks studying the methods of the Wisconsin Highway Department. The results of his investigation were explained to the County officials before any definite system of maintenance was adopted. As is stated elsewhere, it was necessary to consider, before completing a maintenance system, that the State had in its possession over 200 army trucks which were available for use on State roads. This fact made it necessary that a plan for patrol maintenance of this type be advised to counties having a large mileage to cover. Also, in some of the counties, in which portions of State and Federal Aid projects were partially completed during 1919, we urged last fall, that these counties do something toward the maintaining of the finished portion of these projects. As at that time teams were hard to find, and the army trucks not yet available, it was recommended that the counties purchase light farm tractors with which to pull the highway maintainers. Thus the three types of maintaining State roads developed and were put in operation April 1, 1920.

Now after four months of continuous operation, it is possible to make a comparative analysis of the three methods used. In making the comparison, a three month period of operation has been taken—April, May and June. However, we have not taken into consideration the conditions of the soils of the various roads maintained, nor the weather conditions, upon which the condition of all roads is dependent. This factor naturally enters into the costs, and either increases, or lowers them, according to the existing conditions.

The following cost figures are quoted as an average, representative of the cost of the three kinds of patrol maintenance, per day, per mile, on roads which are a part of the State Highway System. We would call

attention to the fact that it was necessary for a large part of the small equipment to be bought, as well as the machinery. Nevertheless, the counties taken, show a representative amount and kind of work. It was necessary to figure in depreciation costs on all State owned equipment, as well as that owned by the County, in order to arrive at the actual cost per mile for the different types of maintenance.

Average Cost of Tractor Patrol for Three Month Period—April, May, June. 14 Mile Patrol Section, Based on Five Tractor Patrols.

Total Maintenance Cost of Five Counties for Three Month Period, Plus Depreciation on Equipment	$7,532.15
Total Maintenance Cost of One County for 3 Month Period, Plus Depreciation on Equipment	1,506.43
Cost of One Patrol for One Month	502.14
Cost of One Patrol for One Day	19.31
Cost of One Patrol Per Mile Per Day	1.38

Total Maintenance Cost of Truck Patrol for Three Month Period—April, May, June. 17 Miles Average Patrol Section. Based on 11 Truck Patrols.

Total Maintenance Cost of 11 Truck Patrols for Three Month Period, Plus Depreciation on Equipment, 17 Mile Sections	$13,692.64
Total Maintenance Cost of One Truck Patrol Three Month Period	1,244.79
Cost of One Patrol Per Month	414.94
Cost of One Patrol Per Month	15.96
Cost of One Patrol Per Mile Per Day	.94

Total Maintenance Cost of Team Patrol for Three Month Period—April, May, June. 6 Miles Average Patrol Section. Based on 10 Team Patrols.

Total Maintenance Cost of Ten Team Patrol for Three Month Period (Several Team Patrols from One County)	$6,493.26
Total Maintenance Cost of One Team Patrol for Three Months	649.32
Cost of One Patrol for One Month	216.44
Cost of One Patrol Per Day Per Mile	8.32
Cost of One Patrol Per Mile Per Day	1.38

From the figures shown above, it can be seen that the average cost of maintaining one mile per day by the tractor is $1.38. However, one must take into consideration that this figure is based on a 14 mile patrol section; while the average cost of maintaining one mile per day by team is $1.38, it is based on a 6 mile patrol section. It would seem from the figures that the tractor patrol covered twice the mileage covered by the team patrol, and at the same unit rate. However, this is not the case, as the cost of the team patrol per day is $8.32, and the section covered is six miles. Now in order to find the cost of the team patrol for fourteen miles, it would be necessary to consider the same mileage. This means that the cost of one and one-third team patrols would be added to the cost of one team patrol (6 miles) in order that the

mileage covered would be fourteen—thus, $11.29 added to $8.28 will bring the cost of the team patrol for fourteen miles to nearly the same figure as the tractor patrol cost for fourteen miles, or $19.41 (a difference of $.10). The cost of the team and tractor patrol for a fourteen mile section is practically the same.

In this connection it might be stated that for an all-round careful patrol, the team cannot be excelled, as it is much easier to stop and fix ruts, small chuck-holes and the like, when driving a team, than when driving a tractor or a truck. In so far as the amount of work accomplished is concerned, this factor is entirely dependent upon the care of the patrolman, for a conscientious patrolman will work diligently, doing the most careful work possible in the shortest length of time. This is one reason why the Wisconsin State Highway Department favors the team patrol. However, in this State where there is a large mileage to cover, we have found that the truck is perhaps the most economical and best type of patrol.

The costs quoted, are, as stated before, an average, and are based on the average patrol sections. The cost per day per mile does not actually mean that one mile is gone over but once for the cost quoted, but as many times as necessary.

Here again enters the subject of weather and soil conditions. The condition of the road will regulate the number of times the road will have to be gone over. The figures, on face value, would indicate that the truck and maintainer method is the most desirable in all cases—however here enters the matter of the reliability of machinery against that of the teams. For instance, on a newly constructed grade, with deep fills, it is evident that the larger part of a patrolman's time will be spent in using the slip, if the patrol is team, while on a more level road a truck and highway maintainer would take care of ninety per cent of the work.

There is one more thing that should be taken into consideration with regard to the cost per mile per day for the different kinds of patrol maintenance—that is,that the cost of each patrol section will materially decrease if the road is kept in first class condition the greater part of each season. The back slopes, especially, in the cuts will soon become grass covered, and thus will require little maintenance, as they do not wash. At the present time, the new cuts have a tendency to wash, and unless there is some kind of ditch check, the slope will be worn in a short time. The patrolman should be vigilant in noting any tendency of this nature, and immediately place brush to protect the ditch washing, until such a time as he can construct a more suitable protection. Later a more permanent check may be provided, and installed.

In conclusion, it may be said that the cost of patrol maintenance is a factor that is almost entirely under the control of the patrolman, for after the road is completed, the problem of drainage and road surface belong entirely to him, and he must render the invaluable service of keeping it in first class condition for the traveling public.

DIVISION OF TESTS.

The Testing Engineer, Mr. Clark E. Mickey,has charge of the analysis and tests of all the materials used in the construction of State and Federal Aid roads and bridges. This includes portland cement, sand, sand-gravel, gravel, crushed rock, concrete, steel reinforcing bars, concrete and corrugated pipe tests, oils, asphalts, tars, and paving materials. In addition to analyzing and testing, recommendations are made as to the advisability of using such materials and inspections of the actual work in progress is made for the purpose of aiding the Project Engineer in securing the best possible results. Reports are made to the Chief of the Bureau of Roads and Bridges who in turn rejects or approves and reports the results to the Federal District Engineer's office. No materials are used that do not meet the requirements of the Standard Specifications of the Federal Government.

Testing.

The principle object in view in the testing and analyzing of materials used, or proposed to be used in the construction of State and Federal Aid roads and bridges is for the purpose of determining their suitability for this use. The specifications for the various kinds of work state specifically the specifications for the materials to be used, and as far as possible the materials are tested to determine whether or not they meet with the specified requirements.

The methods used for conducting all of the tests and analysis of materials are as provided by the American Society for Testing Materials.

On account of the lack of a sufficient quantity of good commercial crushed rock to be used as concrete aggregate, it has been necessary to design a concrete made of sand-gravel aggregate. Nebraska has a large number of deposits of this material, which when of the right analysis, makes an excellent aggregate for concrete. A large number of tests have been made on the sand-gravel aggregate. This determines those particular characteristics which it must have in order to make the best concrete. These tests will be continued for another year.

In parallel with the sand-gravel tests, two concrete cylinders six inches in diameter and twelve inches long are moulded in cyl-o-con paper moulds for each day's run of concrete pavement, concrete pavement base, concrete curb and gutter mixtures, and concrete bridges. Records are kept of the compressive strength of these concrete cylinders at the seven day age and the twenty-eight day age. Together with these tests are recorded the complete physical test for the portland cement and sand-gravel aggregate used in the mixture on the job from which the concrete cylinders are taken.

All of the laboratory testing and analyzing is made in the engineering laboratories at the University of Nebraska, except when certain projects have a large number of materials to be tested. In such cases a temporary laboratory is set up for that purpose near the work.

TESTING LABORATORY, WHERE TESTS AND ANALYSES ARE MADE OF MATERIALS FOR STATE AND FEDERAL AID ROADS

NUMBER AND KINDS OF TESTS MADE ON FEDERAL AND STATE AID PROJECTS.

Proj. No.	Name of Road	County	Sand Gravel	Portland Cement	Concrete Cylinders	Paving Brick	Asphalt Filler	Spelter Test for Galv. Iron Pipe	Steel Reinforcing Bars
1	Nebraska State Aid, Peru	Nemaha	63	8	48	25	....	1	....
3	Hall County	Hall	1	....	....	....	....	....	....
10	North Platte-Sutherland	Lincoln	8	....	....	....	....	....	....
10	Douglas County-Lincoln Highway	Douglas	47	39	53	279	2	....	....
27	Fremont-Ceresco	Saunders	3	....	....	....	....	....	....
29	Osceola-David City	Butler	....	24	76	....	....	....	....
30	Beaver City-Holbrook	Furnas	2	2	....	....	....	....	....
37	Loup City-Stockville	Sherman	3	3	....	....	....	....	....
39	Overton-Cozad	Dawson	3	....	....	....	....	....	....
40	Hebron-Belvidere	Thayer	1	....	....	....	....	....	....
42a	Sargent-Taylor	Custer	1	....	....	....	....	....	....
46	Bartley-McCook	Red Willow	9	14	19	....	....	....	....
50b	Central City-Belgrade	Merrick	2	....	....	....	....	....	....
58a	Schuyler-Platte River	Colfax	....	23	48	....	....	....	....
66	Valentine-Sparks	Cherry	3	....	....	....	....	....	....
68a	McCook-Trenton	Hitchcock	1	4	....	....	....	3	....
71	Orleans-Franklin	Franklin	11	5	....	....	....	....	....
77	Hastings-Ayr	Adams	3	2	....	....	....	....	....
81	Fremont-Ames	Dodge	17	....	102	....	....	....	....
98a	Saline County	Saline	6	....	....	....	....	....	1
103	Scottsbluff-Gering	Scotts Bluff	13	17	56	....	....	....	....
160	Beatrice State Institute	Gage	29	6	35	33	....	....	....
115	Barnum Creek	Platte	6	35	10	....	....	....	....
123	Falls City South	Richardson	....	2	....	....	....	....	....
Total	24 Projects	24 Counties	231	185	447	338	2	4	1

DIVISION OF ROAD EQUIPMENT.

On February 28th, 1918, Congress passed an amendment to the original Federal Aid Road Bill designated Section Seven which provided for the transfer by the Secretary of War of all surplus war equipment materials and supplies not needed by the War Department, but suitable for use in the improvement of highways, to the highway departments of the several states, to be used on roads constructed entirely or in part with Federal Aid Funds; such distribution to be made upon a value basis, the same as provided for by the Federal Aid Road Act.

The Department, realizing the importance of such equipment in building and maintaining the roads, immediately gave definite instructions to the War Department for shipment of Nebraska's share, and at the same time organized an equipment division which should have direct control and supervision of such materials.

Nebraska's first allotment was received in June, 1919, and the equipment division organized at that time. The Superintendent of the Division, Mr. A. W. Moffitt, is in charge and with his assistants supervises the entire work of the division, which, because it includes so many different types of work may be divided for convenience into the following heads, viz:

(1) Care of road equipment.
(2) Establishment and equipment of gravel camps.
(3) Organization and equipment of heavy gang maintenance crews.
(4) State road construction.

CARE OF ROAD EQUIPMENT.

The equipment division's store room, garage, and general equipment yard is located at Sixth and South Street, Lincoln, Nebr., where all supplies are stored, issued, and shipped. The yard, covering eleven acres, is fenced and a spur of railroad track, used for loading, runs the full length of one side. A large "A"-frame derrick which facilitates greatly the loading of cars stands on this track.

Approximately twenty-five men are employed to keep the equipment in repair and see that it is in first class condition before issuing it to the counties. The mechanics prepare the state trucks and other equipment for sale, while the yard men do the general work, such as loading, shipping, and general maintenance of the yard.

The store room in which all parts are kept is located in the garage building. Doors are locked except when storekeeper is shipping or receiving supplies. As equipment parts are received they are placed in bins or on shelves, with quantity, description and location entered upon store record cards, which give detailed information of each article. A system of duplicate receiving and shipping tickets has been installed as a check upon all supplies on hand. Shipments are checked in on the receiving sheets, the duplicate being kept by the storekeeper and the orig-

inal filed in the office. The shipping tickets show the consignee, quantity, and description of the article, and just how the shipment is made. The duplicate of this form is sent to the consignee, but the original is filed.

Before securing a piece of equipment, a requisition must be made to the storekeeper on a standard requisition form; the classes of requisitions are: (1) The shop for repair and overhaul; (2) From the yard for gas and oil; (3) From the office for state or office use. After filing a requisition, the storekeeper changes the store record card to agree with the parts sent out. By this method a perpetual invoice is kept and may be had at all times from the store record cards.

During 1920 gas was bought under contract at dealers' discount and delivered in three to four hundred gallon lots, this year, however, it was bought in carload lots at a saving of several cents on the gallon and delivered into the ten thousand gallon storage tank in the general equipment yard. Eight cars of lubricating oil and transmission grease were bought and delivered during the year. This was not only a great saving because of the quantity purchased but also provided a high grade oil for use on all state equipment. The oil was stored and shipped out as needed to the heavy gang maintenance crews, and to the State Camps. (See list of miscellaneous equipment, materials, and supplies at the end.)

Hardware needed in the upkeep of buildings and in the equipment of any outfit is bought by the State Purchasing Agent on standard State requisition forms. Units of repair parts for Holt tractors, Quad. and Velie trucks, Hudson cars and Ford cars were received from the Government. These are also stored and are requisitioned in the following manner: (1) by the shop for repairs, (2) by the office for sale, (3) by the office for state use. Numerous new parts were bought at dealers' discount in Lincoln, while many repair parts were bought from factories.

Touring Cars.

Some of the equipment received from the Government was in very poor condition, and it was necessary in many instances to overhaul, repair and provide new parts in order to property prepare them in first class mechanical shape. Approximately seventy-four touring cars were received from the Government, and are grouped as follows:

61 Fords { 31 Touring cars; 13 Ambulances; 17 Delivery Wagons

Of this number, twenty-six are used for engineering purposes and twenty-five are used for construction. There are:

4 Hudson Touring Cars.....Used for Engineers
1 White Touring Car.....Used for Engineers
1 Studebaker Touring Car.....Used for Engineers
1 Studebaker Bus .....Used for Construction
1 Hupmobile Touring Car.....Used for Engineers

Trucks.

The trucks received from the Government were practically stripped of equipment, and it was necessary that they be re-equipped as completely as possible from the limited supply received with them. Some difficulty was encountered in overhauling, since some of the manufacturers had discontinued the parts, and due to the slowness of delivery of those parts which could be had.

A total of four hundred seven trucks have been received from the Government to November 1st. Of this number two hundred fifty-one have been sold. The price of these trucks to the Counties varies from $350 to $950, depending upon the type of body desired. The actual market value averages from $3,500 to $4,000. Fifty-three trucks were rented, sixteen are being used on State work, forty-three are in the yard, and forty-four are in such shape that it will be impossible to repair them.

(See list of trucks, number, tonnage and type on page 724.)

Tractors.

Tractors were received from the Government, and after being overhauled and properly equipped, were sent along with graders to various part of the State for use on State roads by the heavy gang maintenance crews.

(See Organization and Equipment of the heavy gang maintenance crews.)

It can be readily seen by the above summary that a large amount of equipment and machinery is handled through this division. It has been the policy of those in charge to see that all equipment is put in first class condition before it is sent out, and during the winter months mechanics are kept busy repairing and overhauling the machinery which is stored at the garage during the season, so that work may begin as early as the season will permit. As has been stated before, some of the trucks have been sold to the Counties, as well as various small equipment. When a piece of machinery is rented, a per diem rate is charged, and an agreement made whereby the contractor or the renter must keep the equipment in first class mechanical shape, and in addition be responsible for its proper return to the Department. Fifteen dollars per working day is charged for rented tractors; nine dollars for trucks, and three dollars for touring cars.

Each piece of machinery is stenciled with a State number, the serials starting anew for each different type of equipment. A daily time record is kept for each man, and the time spent in improving each separate piece of machinery is noted, all labor, costs, gas and oil being charged directly to the repaired car, truck or tractor.

Four tractor inspectors are employed to inspect all tractors used, and to make emergency adjustments. In addition to duties of inspection, they observe closely the general management of the machinery, and suggest changes which might tend towards greater efficiency.

Establishment and Equipment of Gravel Camps.

As a usable quality of gravel for the surfacing of roads was found to be available along many of the State Roads, the Department, early in the Spring of 1919, established Gravel Camps at the following places: Wahoo, Sutherland, Grand Island and Wood River. Claying Camps were also established at St. Paul and Oshkosh.

Various equipment is used on each of the projects listed above but in general the equipment for the work is the same. From eight to ten Troy trailers, with capacity of four yards each carries the gravel from the pit to the road, the motive power being furnished by tractors. The list of the equipment for the various camps is given below:

WAHOO

10 Troy Trailers
6 Lee Trailers
3 Holt Tractors
1 Western Blade Grader No. 10
1 Bunkhouse
1 Byers Crane, ½-yard bucket.
1 Gas Wagon

SUTHERLAND

18 Eagle Trailers
3 Tractors
1 Austin Grader
1 Scarifier
1 Byers Crane
1 Water Tank
1 Bunkhouse
1 Truck

WOOD RIVER

2 Tractors
12 Eagle Trailers
1 Truck
1 Power Pump, 6-inch Dredge
3 K. D. Bunkhouses
1 Gas Wagon
2 Barber Green Loaders
1 Sand Bin
1 Austin Grader
1 Scarifier
1 Ford

GRAND ISLAND

1 Ford
8 Trucks
1 Gas Wagon
1 Dredge Pump
1 Barber Green Conveyor
3 K. D. Bunkhouses

The bunkhouses used at Grand Island and Wood River were large knock-down type of houses, which were taken down upon finishing work at that place, and sent to the camps at St. Paul and Oshkosh.

Macadam Maintenance Camp—Douglas County.

On the Lincoln Highway in Douglas County at the east end of the recently completed brick pavement east of Elkhorn there was a gap of one and eight-tenths miles of old badly worn macadam road. The State Department placed an outfit on this road composed of the following:

1 Scarifier
1 Hoisting Engine
1 Clam Shell Bucket
1 Roller
12 Federal Trucks
6 F. W. D. Trucks
2 Ford Cars
2 Bunkhouses

The entire project was scarified and on the eight-tenths mile a three-inch layer of coarse rock was laid and covered with tarvia, the proportion being one gallon of tarvia, grade B, per square yard. A coating of chips was laid and rolled and this received another coating of tarvia, one-half gallon per square yard. This was covered with a one-half inch layer of gravel and thoroughly rolled. Owing to poor railroad transportation and an unavoidable accident at the quarries, rock could not be shipped to finish the one mile strip so this was graded with a blade grader pulled by a tractor and left throughout the winter season.

The equipment for this camp was furnished from the State's supply of war equipment.

The six camps are under the control of a camp foreman, and average fifteen men in each. Forty-eight bunkhouses were built by the Department. They are wooden, eight feet wide, seven feet high and twenty feet long. Each cost unequipped $411.00. They are portable and are drawn on low wheeled wagon beds, and were sent to the various gravel and clay camps also the convict labor camps maintained by the State Department. Several were sent out with the heavy gang maintenance crews. For complete equipment of a bunkhouse see itemized list at the end. On November 1st, seven of these houses were located at the Seward Convict Labor Camp, seven at Tecumseh, and six at Pawnee. Throughout the winter season the equipment of these camps will be repaired, overhauled and stored until spring.

Organization and Equipment of the Heavy Gang Maintenance Crews.

As a large part of the State Highway System was practically level, it was necessary to provide some economical means for the construction of such roads, grading them where it was not necessary to make cuts or fills. Thirty-one outfits of State equipment have been doing this work during the past season, these outfits being known as the heavy gang maintenance crews. The entire outfit is operated by three men and the equipment consists of one 120 H. P. Holt army tractor and two 12-foot blade graders and a bunkhouse sufficient in size for the men to cook, eat and sleep in. The foreman supervises the care and upkeep of the equipment orders, materials and supplies, makes report to the superintendent and gives information to the Tractor Inspector who is assigned to that territory. The working force consists of tractor operator, two men and blade graders, a cook and the foreman. Such crews can complete approximately one mile per day of ten hours work on the average road. A total of 1,433.93 miles has been completed by the heavy gang crews to December 1st, 1920. The following list gives the place to which each of the thirty-one outfits was originally sent, and the County, together with the number of miles completed by such work:

Crew No.	Place Crew Shipped	Counties in Which Crew Worked	Number of Miles Completed in Each County
1.	Overton	Dawson	5.50
		Buffalo	37.50
		Hall	13.00
2.	Papillion	Sarpy	34.00
3.	Plattsmouth	Cass	25.00
4.	York	York	11.25
		Hamilton	22.00
		Polk	39.75
5.	York	York	11.75
		Clay	12.00
		Fillmore	15.25
6.	Beatrice	Gage	25.37
		Johnson	12.87
		Nemaha	30.50
7.	Oakland (Burt County)	Dodge	30.00
		Washington	16.00
		Douglas	3.38
8.	Scottsbluff	Scotts Bluff	32.00
		Morrill	25.30
9.	Oxford	Furnas	27.10
		Gosper	7.90
		Red Willow	6.00
10.	Broken Bow	Custer	81.00
11.	Alma	Harlan	33.75
		Franklin	19.60
		Kearney	24.02
12.	Central City	Merrick	42.50
13.	Madison	Madison	23.00
		Boone	17.80
14.	Sutherland	Lincoln	8.00
		Keith	42.60
		Deuel	10.00
15.	Chester	Thayer	24.22
		Saline	12.50
		Jefferson	1.75
16.	David City	Butler	15.00
		Seward	13.39
17.	Ord	Valley	20.00
		Garfield	10.00
		Loup	9.25

Crew No.	Place Crew Shipped	Counties in Which Crew Worked	Number of Miles Completed in Each County
19.	Haigler	Dundy	15.60
		Hitchcock	9.91
		Red Willow	7.50
20.	Alliance	Box Butte	26.50
		Sioux	18.00
22.	Oshkosh	Garden	22.00
		Kimball	25.00
		Howard	3.50
23.	Hastings	Adams	11.37
		Antelope	11.00
		Holt	37.00
		Rock	5.00
24.	Springview	Keya Paha	4.00
25.	Schuyler	Colfax	30.00
		Platte	14.00
26.	Wakefield	Dixon	
		Burt	7.00
		Cuming	47.00
		Thurston	7.00
		Wayne	12.00
27.	Crawford	Dawes	42.00
		Sheridan	22.50
30.	Anoka	Boyd	50.00
31.	Genoa	Nance	35.00
		Greeley	8.00
32.	Cozad	Dawson	24.25
		Lincoln	22.00
33.	Chappell	Deuel	10.00
		Cheyenne	55.00

As a result of the work accomplished by these crews the Counties have made a tremendous effort to bring the majority of the County roads into good condition in order to make continuous highways for travel thrughout the State.

In addition to maintaining and providing for the gravel, clay, macadam, and heavy gang maintenance crews, the equipment division has provided for the entire equipment of the State Convict Labor Camps throughout the season. (See Division of Convict Labor.)

In conclusion it might be stated that the surplus War Equipment received from the Government has been of inestimable value to Nebraska in constructing and maintaining roads. Following is a complete list of the equipment received from the Government together with all equipment bought by the State for use on State Roads:

Trucks Received From the Government.

28—3	Ton Garfords	3—2	Ton Darts
12—3	Ton Seldons	20—3	Ton Packards
2—3½	Ton Darts	7—2	Ton Pierce Arrow
1— ½	Ton Republic	16—3½	Ton Federal
1— ¾	Ton Republic	57—3	Ton Velie
60—3	Ton F.W.D.	177—2	Ton Nash Quad.
1— 3	Ton Peerless	3—1½	Ton International
18—5	Ton Federal	1—5	Ton Hulbert

Miscellaneous Equipment.

50—20 Ton Holt Tractors
1—Novo Pump, 6 H. P. Engine
1—Worthington Steam Pump, 3-inch
16—3 H. P. Fairbanks-Morse Gas Engine Pumps
2—9x10-inch 3-Drum Hoisting Engines
1—Road Grader
1—Austin Motor Roller
14—Steel frame Lee Trailers
6—Steam Locomotives and Tenders
3—5-ton Derricks
1—15-ton Locomotive Crane, Browning
1—10-ton Osgood Locomotive Crane
1—Road Plow
2—Steam Hoist and Swinging Engines, 7x10 American
2—Steam Hoist and Swinging Engines, 9x10 American
1—93 H. P. Minneapolis Engine
1—25 H. P. Vertical Boiler
10—2-wheel Wagon Carts
14—Steel Shelters
8—Hand Winches
9—36-inch Gauge Flat Cars
5—100-foot Steel Tapes
6—No. 2 Scoops
4—Levels
100—No. 2 Shovels
40—Portable Forges
3—450-gallon Sprinkling Wagons
3—480-gallon Tanks, K. D.
26—165-gallon Tanks, K. D.
1—Western Road Grader, No. 10

4—½-yard Lakewood Clamshell Buckets
16—¾-yard Orange Peel Buckets
8—Sprinkling Wagons
2—Worthington Steam Pumps, 8-inch
1—14-inch Tractor Plow
2—Stone Forks
10—Wheelbarrows
13—Cleveland Motorcycles
134—Galvanized Folding Lanterns
28—Box Compasses
36—Hydraulic Jacks
6—Double Action Hand Pumps
1—36-inch Gauge Platform
1—36-inch Narrow Truck
3—¾ K. W. Delco Generator Set
3—32 H. P. Electric Motors
64—Hand Pumps
1—Austin Elevator Grader
8—Dump Wagons, complete
15—Bundles Hex Tool Steel
5—Concrete Buggies
75—Army Cooking Ranges
3—Folding Tables
234—Escort Wagons
100—Sets Double Harness with Cable Traces
218—Railroad Lanterns
5—Carbide Flare Lights
70—Entrenching Axes

Material and Supplies.

111—Wood Bows for Quad. tops
2—Units Quad. Parts
4—Cars T. N. T.
7—Set Stanley Hook Skid Chains
6760—Angle Fence Posts
800—No. 8 Detonators for T. N. T. Explosive
12—Nash Frame Assembly
51975 lbs. Black Powder
1—Crate Nash Tops and Curtains
1—Case F. W. D. Tops and Brackets
2—Units Spare Ford Parts
4900-feet—2-inch W. I. Pipe
20—40x6-inch Stanley Skid Chains
125—Sets Spare Parts for Escort Wagons
2—Lots Spare Parts for 20-ton Holt Tractor
500-lbs.—Carbide Cake
14—Trench Shelters

1—Car Black Barbed Wire
1681—Sheets Metal Roofing
88—Nash Springs
9—Ford Delivery Bodies with Tops and Fenders
2—Lots Studebaker Parts
329—Stable Brooms
1—Lot Solid Tires
1—Lot Pneumatic Tires
1—Lot Garford Parts
2—Car Loads Quad. Parts
2000-feet—8-inch Steel Pipe
8100-feet—Rope
980-feet—Manila Rope
3900—Sash Cords
9—Kegs Finishing Nails
1—Lot Velie Parts

Equipment for Bunkhouses.

2—Double Bunks
4—Matresses
8—Blankets
4—Pillows
4—Pillow Slips
2—Granite Stew Pans
8—Knives
8—Forks
8—Teaspoons
4—Tablespons
2—Steel Skillets
1—5-gallon Kerosene Can
1—Coffee Pot
1—Water Pail
1—Teakettle
1—Wash Basin
1—Oil Stove
1—Oil Stove Oven
2—Tin Cups
2—Dippers
1—Meat Saw
1—Gasoline Lamp
1—Bracket Kerosene Lamp
1—Porceline Platter
8—Porceline Plates
3—Porceline Table Dishes
1—Porceline Pitcher
8—Poreline Pie Plates
8—Porceline Cups and Saucers

8—Porceline Sauce Dishes
10—Porceline Soup Bowls
1—Set Salt and Pepper Shakers

Equipment Bought for Use On State Roads.

50—Eagle Trailers
10—Troy Trailers
1—Adams Grader
74—Austin Graders
3—Byers Cranes
1—Austin Drag Line
48—Bunkhouses
3—Bucket Loaders and Engines
1—1-yard Clamshell Bucket
1—R. & L. Sand Pump and Engine
1—Clamshell Crane and Bucket
2—Road Rippers
1—L.-H. Sand Pump and Engine

ROAD EQUIPMENT DIVISION—JULY 1ST, 1919-DECEMBER 1ST, 1920.

	Trucks	Tractors	Touring Cars	Misc. Equipment	Total
VALUATION—					
Estimated Value of Government Equipment Allotted to Counties	$517,127.95	$ 12,000.00	$	$ 19,666.50	$ 529,916.01
Estimated Value of Government Equipment on Hand	287,985.61	288,000.00	24,750.00	162,847.32	782,461.37
Estimated Value of Government Equipment Received	805,113.56	300,000.00	24,750.00	182,513.82	1,312,377.38
ALLOTMENT—					
Amount Received from Allotment of Equipment	180,800.00	3,000.00	.....	12,709.00	196,509.00
Amount Outstanding for Allotment of Equipment	5,052.00	11,500.00	.....	3,335.00	19,887.00
Amount Invoiced for Allotment of Equipment	185,852.00	14,500.00	.....	16,044.00	216,396.00
RENTAL—					
Amount Received for Rental of Equipment	8,966.60	.....	28,844.20	1,849.50	39,660.30
Amount Outstanding for Rental of Equipment	23,408.40	4,500.00	93.00	885.20	28,886.60
Amount Invoiced for Rental of Equipment	32,375.00	4,500.00	28,937.20	2,734.70	68,546.90

	Freight	Loading & Unloading	Labor	Materials & Supplies	Contract Repairs	Demurrage	Total
STATE EXPENSE ON EQUIPMENT—							
Trucks	$39,190.66	$ 3,065.40	$39,825.80	$22,532.59	$ 2.00	$ 43.50	$104,659.95
Touring Cars	4,313.35	147.14	3,203.57	8,898.24	400.90	6.00	16,969.20
Tractors	5,969.73	3,500.00	14.44	6,295.00	7.00	.....	15,786.17
Miscellaneous Equipment	23,916.16	1,119.98	330.76	124.94	117.94	284.00	25,893.78
Equipment Purchased	2,689.90	.....	24.00	110.20	7.00	.....	2,831.10
Total	$76,079.80	$ 7,832.52	$43,398.75	$37,960.97	$ 534.84	$ 333.50	$166,140.20
Overhead Expense, including cost of buildings, yard, shop, tools and rent paid exclusively for handling equipment							$45,459.98
Total							**$211,600.18**

SUMMARY OF FEDERAL AID PROJECTS
DISTRICT NO. 5, OMAHA
December 1, 1920

	Iowa	Kansas	Missouri	Nebraska	Total
Number of projects approved by Secretary of Agriculture	103	62	163	135	463
Estimated cost	$19,569,167.19	$27,948,652.55	$17,366,879.89	$12,716,800.56	$77,601,500.19
Federal aid	7,881,917.35	7,898,091.80	7,972,057.41	6,148,900.00	29,900,966.56
Total Federal aid allotments	7,939,343.14	7,895,309.07	9,322,075.71	5,866,761.66	31,023,439.58
Project agreements executed	72	53	64	92	281
Estimated cost	14,043,714.70	14,752,900.15	9,362,747.70	7,674,326.67	45,833,689.22
Federal aid	5,692,512.50	4,568,420.41	4,050,013.03	3,627,698.29	17,938,644.23
Projects under construction	72	50	48	78	248
Estimated cost	12,880,272.45	13,166,205.12	7,025,792.79	6,269,415.50	39,341,685.56
Federal aid	5,126,898.70	4,631,728.01	2,959,386.40	9,046,703.72	15,764,717.73
Projects completed	1	2	1	2	6
Total cost	92,472.36	77,325.50	35,113.18	213,212.20	418,123.24
Federal aid	22,453.35	24,141.50	17,556.59	62,236.10	126,387.54
Total Federal aid paid to date	227,809.44	679,795.71	102,478.65	1,416,368.64	2,516,452.44

FEDERAL AID PROJECT NO. 2, STATE LINE-FALLS CITY-NEBRASKA CITY.

FINANCIAL STATEMENT

Federal and State funds appropriated under Federal Aid Road Act and under amendment thereto for the years 1917, 1918, 1919, 1920, 1921, and House Rolls 722 and 300:

	Total Appropriation Less 5%	Total Expended Dec. 1, 1920	Balance Dec. 1, 1920
District "A"			
Johnson	$94,558.87	$70,970.59	$23,588.28
Nemaha	103,771.16	76,873.37	26,897.79
Otoe	152,966.86	47,517.09	105,449.77
Pawnee	99,998.06	61,299.69	38,698.37
Richardson	148,920.40	78,834.34	70,086.06
District "B"			
Butler	131,140.63	84,762.71	46,377.92
Cass	143,333.02	61,546.84	81,786.19
Douglas	582,302.93	165,492.58	416,810.35
Sarpy	65,368.71	.....	65,368.71
Saunders	177,731.17	88,757.48	88,973.69
District "C"			
Burt	108,634.69	85,286.14	23,348.55
Colfax	94,853.97	72,629.98	22,223.99
Cuming	126,857.08	.....	126,857.08
Dodge	138,488.65	142,217.50	O.D. 3,728.85
Washington	95,959.83	28,159.23	67,800.60
District "D"			
Cedar	142,988.87	63,530.02	79,458.85
Dakota	55,422.83	.....	55,422.83
Dixon	97,850.57	43,006.77	54,843.80
Thurston	70,851.79	.....	70,851.79
Wayne	90,057.79	34,622.80	55,434.99
District "E"			
Antelope	145,256.79	.....	145,256.79
Knox	185,085.49	100,242.41	84,843.08
Madison	136,105.32	60,771.01	75,334.31
Pierce	97,385.98	43,537.86	53,848.12
Stanton	68,727.07	.....	68,727.07
District "F"			
Boone	125,330.96	34,668.19	90,662.77
Merrick	99,300.60	30,929.75	68,370.85
Nance	79,868.89	27,319.89	52,549.00
Platte	148,609.05	68,435.99	80,173.06
Polk	103,524.18	18,561.70	84,962.48
District "G"			
Gage	227,885.91	107,477.51	120,408.40
Jefferson	139,353.81	52,994.79	86,359.02
Lancaster	355,866.91	128,494.56	227,372.35
Saline	145,455.45	21,837.74	123,617.71
Seward	138,086.86	100,104.28	37,982.58

	Total Appropriation Less 5%	Total Expended Dec. 1, 1920	Balance Dec. 1, 1920
District "H"			
Clay	139,855.52	26,448.67	113,406.85
Fillmore	137,076.30	51,141.87	85,934.43
Nuckolls	117,025.75	23,265.52	93,760,23
Thayer	132,397.07	22,944.26	109,452.81
York	151,652.94	56,369.17	95,283.77
District "I"			
Adams	150,850.24	71,691.91	79,158.33
Franklin	100,664.31	55,794.86	44,869.45
Webster	102,586.90	76,889.75	25,697.15
Kearney	95,280.02	22,966.69	72,313.33
District "J"			
Greeley	77,688.04	28,239.20	49,448.84
Hall	138,927.44	89,237.57	49,689.87
Hamilton	127,111.35	18,537.46	108,573.89
Howard	90,803.29	10,818.69	79,984.60
Sherman	88,213.85	17,663.72	70,550.13
District "K"			
Custer	312,039.25	115,445.75	196,593.50
Garfield	57,279.29	34,974.46	22,304.83
Loup	49,266.90	.....	49,266.90
Valley	95,938.79	53,933.57	42,005.22
Wheeler	49,156.58	5,391.98	43,764.60
District "L"			
Boyd	$83,753.85	$.....	$83,753.85
Brown	104,338.41	33,858.36	70,480.05
Holt	242,562.34	898.78	241,663.56
Keya Paha	59,506,72	391.38	59,115.34
Rock	84,572.51	.....	84,572.51
District "M"			
Cherry	388,840.66	92,671.32	296,169.34
Dawes	115,442.62	293.15	115,149.47
Sheridan	188,966.78	24,114.28	164,852.50
Sioux	135,173.19	1,747.65	133,425.54
District "N"			
Banner	56,396.52	32,059.58	24,336.94
Cheyenne	90,676.27	.....	90,676.27
Deuel	40,805.87	30,547.39	10,258.48
Kimball	70,557.04	26,592.16	43,964.88
Scotts Bluff	98,924.90	73,833.14	25,091.76
District "O"			
Arthur	56,526.03	.....	56,526.03
Box Butte	85,167.62	21,886.11	63,281.51
Garden	106,110.64	21,020.31	85,090.33
Grant	49,185.81	.....	49,185.81
Morrill	101,969.30	35,472.19	66,497.11

	Total Appropriation Less 5%	Total Expended Dec. 1, 1920	Balance Dec. 1, 1920
District "P"			
Blaine	50,316.38	13,958.63	36,357.75
Hooker	49,564.90	12,945.55	36,619.35
Logan	42,254.95	25,651.70	16,603.25
McPherson	58,901.81	9,705.48	49,196.33
Thomas	44,080.14	20,335.63	23,744.51
District "Q"			
Buffalo	183,117.90	61,534.36	121,583.54
Dawson	151,005.69	62,611.13	88,394.56
Keith	75,966.02	.....	75,966.02
Lincoln	230,141.84	46,589.00	183,552.84
Perkins	54,412.75	.....	54,412.75
District "R"			
Chase	75,692.30	22,364.00	53,328.30
Dundy	84,711.60	53,119.17	31,592.43
Hayes	59,513.26	18,860.36	40,652.90
Hitchcock	74,256.46	26,084.31	48,172.15
Red Willow	119,099.87	44,379.41	74,720.46
District "S"			
Frontier	113,905.04	26,616.95	87,288.09
Furnas	120,552.36	39,967.77	80,584.59
Gosper	69,596.12	23,669.12	45,927.00
Harlan	96,016.63	20,017.14	75,999.49
Phelps	102,779.29	18,108.06	84,671.23
	$11,147,077.38	$3,724,541.48	$7,422,535.90

Many inquiries have been made of the Department as to the manner of arriving at the appropriations shown in the tabulated page under the title "Financial Statements By Districts."

There is quoted herewith Section 13, of Article 2, House Roll 298, which provides that Project Districts shall be designated, which shall include not more than five counties, the counties included in each district are as shown in the Financial Statement under the letters "A", "B", "C", etc. The total appropriations, both State and Federal, less 10 per cent, for the years 1917, 1918, 1919, 1920 and 1921 for each county is given opposite that County in the Financial Statement. Each County will eventually receive its total appropriation, a part of which is not yet available.

The Financial Statement by Districts gives the total appropriations now available for all of the counties in each District. This available fund is considered as a unit as mentioned in the quoted section of the House Roll.

One or more projects may be constructed in each District, with a cost amounting to the amount available in the District, provided that no County be granted a greater appropriation for such project than the total appropriation for the several years.

The reason for this is that for the first years the available funds for each County, taken separately would not be sufficient to enable the undertaking of constructing projects of desirable length. Short stretches might have been built, but this would have provided disconnected stretches of improved roads. It would therefore be necessary to postpone such construction until additional funds became available in such Counties, and this in turn, would result in so large an amount of construction work during the last or final years of the appropriations, that it would be extremely difficult to handle, if not entirely impossible.

Project Districts.

The Department of Public Works shall divide the state into project districts, not exceeding five counties in any one district, in such manner as in its judgment will best utilize the State Aid Road Fund available each year as well as the money apportioned to the State from the Federal Government under the Federal Aid Road Act of July 11, 1916. Before submitting any project statement to the Secretary of Agriculture, as provided for in the Federal Aid Road Act, the same shall have received the approval of the county board of each county within the project district. The funds available for all of the counties in each project district shall be considered as a unit for such district, and the work of construction or improvement of roads for each district shall be begun in any part or parts of such district at the place or places designated by the Department of Public Works. Whenever the work in any project district is completed, the amount of the funds apportioned to each county shall have been expended in the construction or improvement of roads and bridge within said county, or in the event that all of the apportionment for each county is not used in the construction or improvement of the roads utilized in the project district plans for such county, the unused funds shall be used in the construction or in the improvement of such other roads within the county as the County Board and the Department of Public Works may agree upon and which receives the approval of the Secretary of Agriculture.

PAVING TO STATE INSTITUTIONS.

An appropriation from the General Fund, amounting to the sum of $100,000, was made for the purpose of assisting municipalities or Counties to pave roads connecting railroad unloading tracks with State Institutions.

Under this act the following petitions have been filed:

	Town	Institution	Date
1.	Peru	Peru Normal	May 2, 1919
4.	Beatrice	State Institution for Feeble-Minded	June 4, 1919
2.	Lincoln	State Hospital	May 19, 1919
3.	Grand Island	Old Soldiers' Home	May 22, 1919
5.	Wayne	Wayne State Normal	June 5, 1920

Disbursements on November 1, 1920, were as follows:

Peru	$22,242.98
Beatrice	26,000.55
Lancaster	32,000.04
Grand Island	18,000.00
Total	$98,243.57

Of the above, the work at Beatrice and Grand Island has been completed and paid for. The payment to Lancaster County is a partial one on the assessment of $87,657.86, against the State Hospital for the Insane, and the State Penitentiary.

The Peru work is estimated to cost $24,000.00.

FEES PAID FOR SIGNS ON STATE HIGHWAY SYSTEM.

L. T.Cumming, Howe, Nebr.—One sign on Washington Highway road No. 10 on west end of mile 33-34, Nemaha County, Nebraska, Auto sign size 16x24 inches, 3 feet..... $1.50

G. D. Parker, Johnson, Nebr.—Two Garage signs 3x3 feet on Golden Rod Highway No. 19, mile No. 10 in Nemaha County, Nebraska, @ $4.50 each..... 9.00

Sawyer Barclay & Co., Pawnee City.—Ten signs at the following described location:

1 on the N.E. Cor. SE ¼, Sec. 29, T. 2, N. R. 12 E.

1 on the S.E. Cor. NE ¼, Sec. 30, T. 2, N. R. 12 E.

1 on the S.W. Cor. NW¼, Sec. 30, T. 2, N. R. 12 E.

1 on the N.W. Cor. SW¼, Sec. 28, T. 2, N. R. 11 E.

1 on the N.W. Cor. SW¼, Sec. 29, T. 2, N. R. 11 E.

1 on the N.W. Cor. SW¼, Sec. 25, T. 2, N. R. 10 E.

1 on the N.W. Cor. SW¼, Sec. 26, T. 2, N. R. 10 E.

1 on the S.W. Cor. NW¼, Sec. 28, T. 2, N. R. 10 E.

1 on the S.E. Cor. NE ¼, Sec. 30, T. 2, N. R. 10 E.

1 on the N.W. Cor. SW¼, Sec. 30, T. 2, N. R. 10 E.

Ten signs, size 24x30 inch, 5 square feet, @ $.50, $2.50 each.. $25.00

National Sign Co., Ottawa, Kans.—Along State Highway System running through Dakota, Sarpy, Thurston, Lancaster, Washington, Dodge and Douglas Counties..... 150.00

This fee has been deposited to show good faith in erection of signs per rules and regulations of this Department, the correct amount of fee to be determined after all signs have been placed.

A. M. Kingdon, Gretna, Nebr.—Two signs 1x4 feet, at Southwest corner of Section 31, Township 14, Range 11, Sarpy County, Nebraska, Tax Lot D-1 in Section 36, Township 14, Range 10, Gretna, Nebr. 4.00

AUTOMOBILE DIVISION OF REGISTRATION.

The Automobile Department was organized in 1913 with a registration of 25,617 cars. The past seven years the Department has grown until this year there are registered a total of 221,950 cars, including 19,000 trucks, 2,200 motorcycles, 750 trailers and 200,000 touring cars.

Every owner of a motor vehicle shall apply to the County Treasurer of the County in which he resides for license, the fee being based upon weight and kind of vehicle. For the registration of each motor vehicle a minimum of $10.00, and 50 cents for each additional one hundred pounds in weight of such cars in excess of 2,000 pounds. The fee for trucks is based upon the weight of the truck when loaded to capacity, and in estimating the capacity of cars equipped for carrying more than seven passengers the weight of such passenger shall be estimated at one hundred fifty pounds. Owners of touring cars converted into light delivery vehicles shall pay for the published weight of the vehicle plus minimum carrying capacity of five hundred pounds.

The registration fee for a motorcycle and two-wheel truck or trailer weighing less than one thousand pounds is $5.00. Each dealer in motor vehicles shall register one motor vehicle of each class dealt in by him and the classes of cars are as follows:

(1) Electrically driven motor vehicles

(2) Those propelled by steam

(3) Those propelled by gasoline, explosive type engine

(4) Trucks or cars having a carrying capacity of more than four thousand pounds.

Where a dealer deals both in cars and trucks and the truck has a carrying capacity of less than four thousand pounds he may take one dealer's license by registering weight of heaviest truck. Duplicate dealer plates will be furnished at $1.00 each, and these plates used for demonstrating only and are not transferable or for use on individually owned cars.

Owners losing plate will be supplied with lost plate carrying letter "L" by applying to the County Treasurer and paying a fee of $1.00. The registration fee herein provided for shall be deemed to be an annual occupation tax. All registration fees are paid to the County Treasurer of the County in which the applicant for registration resides; twenty-five per cent to be credited to the County to be used on the roads; the remaining sum so collected shall be sent to the State Treasurer to be known as th State Highway Fund. Said State Highway Fund shall be used on the State Highway System in such manner that each County shall receive the benefit of all money paid into said fund from such County.

The following are exempt from paying registration fees—those owned by any city or village of this state for the use of the police, fire

or other departments and cars used by School District, County, State or United States Government.

Transfer of ownership. Upon the transfer of ownership of any motor vehicle its registration shall expire. The transferer may transfer his plate to another car by paying $1.00 transfer fee and fifty cents per hundred pounds additional weight provided application for transfer is made within ten days. In case the transfer of motor vehicle within a period of ninety days from the time of payment of fees the transferor may by returning the registration certificate, the number plate and seal to the County Treasurer receive a refund of one-half the amount of such fee. In transferring a registered car the transferor must endorse the certificate to the transferee and he in turn must present the original certificate to the County Treasurer who shall issue him a new receipt with such additional fee as the law requires, and promptly send the original certificate attached to the duplicate receipt to the State Deparment.

FOREIGN CARS.

Foreign cars coming into the State may retain their foreign license for a period of thirty days provided they have a proper certificate for the current year from the State from which they came. After thirty days cars brought to this State from another State may be licensed by the County Treasurer if he is convinced that the owner holds the car in good faith.

DUTIES OF THE AUTOMOBILE DEPARTMENT.

The duties of the automobile department are to keep a record of all motor vehicles operated in the State. The records are kept by card index showing registration number filed numerically, the ownership of cars are filed alphabetically, engine numbers are filed numerically by cars. All plates except "Lost" and "Dealer" are furnished by the State to the County Treasurer who in turn issue them to the applicants.

Motor vehicles on the public highways shall be equipped with suitable horn, bell or other signal and with one or more white lights at night visible a reasonable distance from the direction in which the vehicle is proceeding and a red light visible from the reverse direction. Motor vehicles approaching dangerous places, bridges or corners where the vision is obstructed shall sound a warning.

Vehicles traveling in opposite directions shall pass to the right. Vehicles going in the same direction and one wishing to travel faster shall sound a warning when approaching the slower moving vehicle which shall immediately turn to the right allowing the swifter moving vehicle to pass on the left.

REPORT OF STATE HIGHWAY FUND—NOVEMBER 1, 1920.

County	Remitted to State Treasurer	Expenditures			Total	Balance
		Plates	Maintenance	5% Fund		
Adams	$36,074.84	$1,190.63	$14,881.30	$1,803.74	$17,875.67	$18,199.17
Antelope	30,646.81	984.69	23,727.97	1,532.34	26,244.94	4,401.87
Arthur	2,543.59	64.07	711.56	127.18	902.81	1,640.78
Banner	4,944.66	123.81	2,473.89	247.23	2,844.93	2,099.73
Blaine	3,030.49	88.54	1,419.63	151.52	1,659.69	1,370.80
Boone	29,979.59	1,002.90	11,954.54	1,498.97	14,456.41	15,523.18
Box Butte	14,371.06	422.21	9,375.52	718.55	10,516.28	3,854.78
Boyd	14,313.20	446.92	11,408.88	715.66	12,571.46	1,741.74
Brown	10,637.47	323.26	8,407.45	531.87	9,262.58	1,374.89
Buffalo	41,696.51	1,372.44	21,503.79	2,084.82	24,961.05	16,735.46
Burt	26,930.25	870.29	19,139.63	1,346.51	21,356.43	5,573.82
Butler	28,905.19	1,074.27	13,295.68	1,445.26	15,815.21	13,080.98
Cass	31,948.93	1,057.06	15,963.42	1,597.44	18,617.92	13,331.01
Cedar	37,402.40	1,277.10	11,133.82	1,870.12	14,281.04	23,121.36
Chase	11,325.50	331.65	7,834.56	566.27	8,732.48	2,593.02
Cherry	13,835.26	352.18	3,148.49	691.75	4,192.42	9,642.84
Cheyenne	27,422.55	778.96	7,005.96	1,371.13	9,156.05	18,266.50
Clay	24,542.67	992.10	11,149.07	1,227.13	13,368.30	11,174.37
Colfax	21,975.07	731.72	14,872.71	1,098.75	16,703.18	5,271.89
Cuming	32,860.10	1,104.80	15,465.25	1,643.02	18,213.07	14,647.03
Custer	30,541.35	1,743.17	27,896.85	1,527.07	31,167.09	*625.74
Dakota	12,354.37	422.57	4,921.65	617.71	5,961.93	6,392.44
Dawes	14,038.43	376.26	8,676.06	701.92	9,754.24	4,284.19
Dawson	33,821.87	1,177.01	20,322.63	1,691.09	23,190.73	10,631.14
Deuel	8,687.35	346.13	4,482.71	434.36	5,263.20	3,424.15
Dixon	25,563.09	839.87	6,893.19	1,278.15	9,011.21	16,551.88
Dodge	49,042.62	1,679.97	31,529.84	2,452.14	35,661.95	13,380.67

* Overdrawn.

REPORT OF STATE HIGHWAY FUND—NOVEMBER 1, 1920—(Continued).

County	Remitted to State Treasurer	Expenditures			Total	Balance
		Plates	Maintenance	5% Fund		
Douglas	257,464.14	6,521.71	118,803.34	12,873.21	138,288.26	119,175.88
Dundy	10,262.22	343.48	6,641.80	513.11	7,498.39	2,763.83
Fillmore	26,920.77	962.58	22,028.78	1,346.04	24,337.40	2,583.37
Franklin	18,068.91	711.49	7,083.35	903.44	8,698.28	9,370.63
Frontier	16,567.07	559.94	4,993.66	828.36	6,381.96	10,185.11
Furnas	23,058.35	825.88	16,249.27	1,152.92	18,228.07	4,830.28
Gage	47,621.59	1,692.65	19,267.22	2,381.08	23,340.95	24,280.64
Garden	9,845.08	298.01	4,439.70	492.25	5,229.96	4,615.12
Garfield	5,544.85	193.44	2,783.44	277.24	3,254.12	2,290.73
Gosper	10,276.95	411.15	4,696.45	513.85	5,621.45	4,655.50
Grant	2,781.57	74.27	692.90	139.08	906.25	1,875.32
Greeley	14,082.27	504.83	6,287.57	704.12	7,496.52	6,585.75
Hall	27,542.83	1,482.62	16,549.78	1,377.14	19,409.54	8,133.29
Hamilton	27,147.21	974.30	15,363.22	1,357.35	17,694.87	9,452.34
Harlan	16,140.08	626.57	13,777.89	807.01	15,211.47	928.61
Hayes	8,216.15	228.04	5,205.38	410.81	5,844.23	2,371.92
Hitchcock	11,500.18	433.27	7,669.34	575.00	8,677.61	2,822.57
Holt	25,045.62	816.85	14,707.10	1,252.29	16,776.24	8,269.38
Hooker	2,250.77	47.69	2,105.09	112.54	2,265.32	*14.55
Howard	19,044.29	731.26	4,287.82	952.21	5,971.29	13,073.00
Jefferson	23,983.32	966.02	16,721.32	1,199.16	18,886.50	5,096.82
Johnson	17,576.39	655.52	12,137.03	878.82	13,671.37	3,905.02
Kearney	16,574.65	630.59	7,314.75	828.73	8,774.07	7,800.58
Keith	13,697.80	428.96	5,543.01	684.90	6,656.87	7,040.93
Keya Paha	6,143.56	196.77	2,717.38	307.18	3,221.33	2,922.23
Kimball	12,459.22	335.46	5,488.54	622.95	6,446.95	6,012.27
Knox	42,133.04	1,376.40	18,353.14	2,106.65	21,836.19	20,296.85

* Overdrawn.

REPORT OF STATE HIGHWAY FUND—NOVEMBER 1, 1920—(Continued).

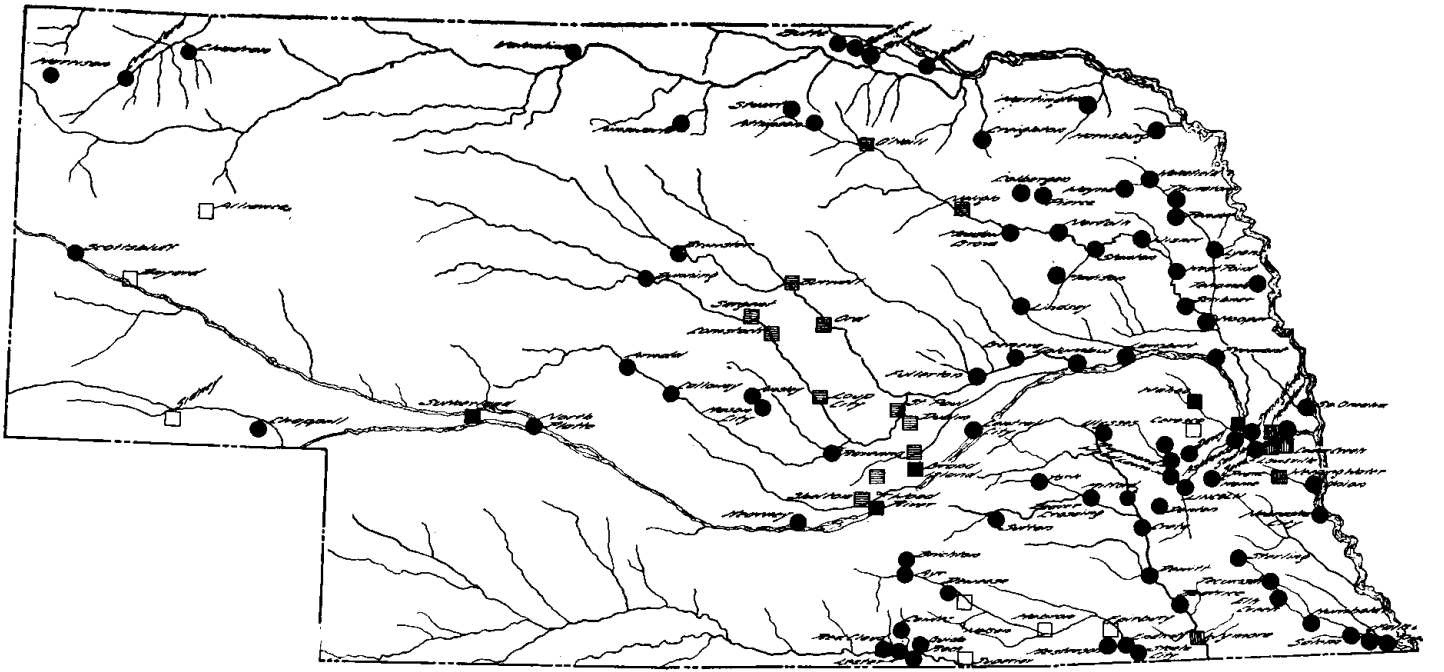
County	Remitted to State Treasurer	Expenditures			Total	Balance
		Plates	Maintenance	5% Fund		
Lancaster	131,796.64	4,214.81	68,355.86	6,589.83	79,160.50	52,636.14
Lincoln	30,888.20	1,257.18	21,368.25	1,544.41	24,169.84	6,718.36
*Logan	3,433.71	95.19	2,047.38	171.68	2,314.25	1,119.46
Madison	44,945.90	1,592.11	26,952.74	2,247.29	30,792.14	14,153.76
McPherson	2,329.62	73.38	95.87	116.49	285.74	2,048.88
Merrick	20,331.39	741.30	8,328.84	1,016.56	10,086.70	10,244.69
Morrill	13,624.15	453.72	7,752.15	681.21	8,887.08	4,737.07
Nance	17,482.99	621.41	11,698.75	874.15	13,194.31	4,288.68
Nemaha	21,553.60	825.55	9,790.03	1,077.68	11,693.26	9,860.34
Nuckolls	22,859.98	862.11	7,313.31	1,142.99	9,318.41	13,541.57
Otoe	36,332.73	1,413.48	16,705.54	1,816.63	19,935.65	16,397.08
Pawnee	17,064.20	661.84	9,264.89	853.21	10,779.94	6,284.26
Perkins	11,107.19	362.34	1,394.07	555.36	2,311.77	8,795.42
Phelps	23,478.48	949.37	12,228.97	1,173.92	14,352.26	9,126.22
Pierce	25,068.41	857.13	11,607.48	1,253.42	13,718.03	11,350.38
Platte	38,181.04	1,362.50	27,032.12	1,909.05	30,303.67	7,877.37
Polk	23,016.00	914.62	12,701.43	1,150.80	14,766.85	8,249.15
*Loup	2,863.95	107.91	1,202.34	143.19	1,453.44	1,410.51
Red Willow	19,853.89	670.89	8,320.57	992.68	9,984.15	9,869.75
Richardson	29,266.53	1,157.94	11,883.85	1,463.32	14,505.11	14,761.42
Rock	7,025.57	195.19	3,682.79	351.29	4,229.27	2,796.30
Saline	29,514.35	1,172.80	19,187.15	1,475.72	21,835.67	7,678.68
Sarpy	15,643.56	564.72	12,399.56	782.17	13,746.45	1,897.11
Saunders	41,313.50	1,269.22	21,522.14	2,065.66	24,857.02	16,456.48
Scotts Bluff	30,685.90	1,057.38	19,762.65	1,534.30	22,354.33	8,331.57
Seward	31,451.80	1,218.28	9,278.02	1,572.59	12,068.89	19,382.91
Sheridan	18,531.07	551.25	7,217.22	926.55	8,695.02	9,836.05

* Overdrawn.

REPORT OF STATE HIGHWAY FUND—NOVEMBER 1, 1920—(Concluded).

County	Remitted to State Treasurer	Expenditures			Total	Balance
		Plates	Maintenance	5% Fund		
Sherman	14,739.62	555.15	5,837.03	736.98	7,129.16	7,610.46
Sioux	6,823.20	235.63	3,335.69	341.16	3,912.48	2,910.72
Stanton	20,235.00	638.58	12,518.80	1,011.76	14,169.14	6,065.86
Thayer	24,950.59	967.22	13,028.50	1,247.53	15,243.25	9,707.34
Thomas	2,508.26	67.11	2,020.30	125.41	2,212.82	295.44
Thurston	18,588.95	569.03	2,649.69	929.45	4,148.17	14,440.78
Valley	18,749.31	731.24	12,840.88	937.47	14,509.59	4,239.72
Washington	25,022.55	921.34	15,642.94	1,251.12	17,815.40	7,207.15
Wayne	30,873.64	1,000.72	19,548.09	1,543.68	22,092.49	8,781.15
Webster	16,420.39	701.87	12,408.48	821.02	13,931.37	2,489.02
Wheeler	4,317.75	163.59	961.70	215.89	1,341.18	2,976.57
York	26,218.25	1,272.13	20,530.89	1,310.91	23,113.93	3,104.32
Total	$2,250,475.96	$77,251.56	$1,182,011.22	$112,523.67	$1,371,786.45	$878,689.51

The Survey of Road Materials in Nebraska



WHERE ROAD MATERIALS ARE PRODUCED IN NEBRASKA

THE SURVEY OF ROAD MATERIALS IN NEBRASKA.

The survey of road materials in Nebraska consists of a detailed investigation of the occurrence of suitable road building material with relation to the road on which it is to be used. This investigation not only necessitates an extensive use of geologic and geographic knowledge of the state but also consideration of the economic problems involved in the production of these materials.

Road materials used by the Highway Department must comply with certain specifications, must be suitably located with respect to the roads on which they are used, and must exist under conditions suitable to economic production.

Sand and Gravel.

Most of Nebraska's sand and gravel is produced from mantle rock deposits. But a small portion is derived from the bedrock formations. These sources of gravel in Nebraska range in geologic time from the Pennsylvanian Beds to the Dakota Formation, the Arikaree Formation, the Ogalalla Formation, an unnamed tertiary formation, glacio-fluvial deposits, glacial drift and alluvium. Among these the most important are the alluvium of the Platte River, the Aftonian Sand Plain and gravel bodies occurring at the base of the Dakota Formation.

Pennsylvanian Formation.

The Pennsylvanian Beds outcrop in the southeastern counties of the state. Sand is found only in a few strata such as those outcroppings at Peru and south of Falls City. Here the sand is too fine to be of value as a road material.

Dakota Formation.

The Dakota Formation consists mainly of a buff to a rusty brown sand stone heavily stained with iron. At the base of the formation lying unconformably on the Pennsylvanian rocks are lenticular beds of sand and fine gravel. The sand is too fine for construction work but the gravel is very good for road surfacing. These deposits occure quite extensively in the vicinity of Louisville. The gravel ranges from 10 to 20 feet in thickness and contains a great many clay balls, large boulders and often a small body of fire clay. There is also in this same vicinity a buried gravel body which is glacio-fluvial or a stream deposit of cretaceous time. The deposit extends in a generally southeasterly direction from Cedar Creek to south of Richfield and is about 10 miles in length. Sand is produced from this at several places.

Arikaree Formation.

The Arikaree Formation outcrops over a large area in northwestern Nebraska. The sands are grayish and generally of fine texture. In a few places it contains deposits of coarse gravel suitable for construction work.

Ogallala Formation.

This formation is the bedrock in a large portion of the southwestern counties of Nebraska. It outcrops along the Republican River from below Franklin westward to the state line, and in the Lodgepole and North Platte Valleys. It contains a vast amount of sand and gravel some of which occurs as a friable sand stone conglomerate. The particles are made up of rounded grains of material loosely cemented by a calcareous cement.

Sand of the Late Tertiary Age.

Beneath the loess of much of central Nebraska and extending eastward under the western edge of glacial deposits is an unnamed tertiary formation which carries vast quantities of sand interstratified with layers of clay and silt. This formation forms nearly a continuous sand plain from 25 to 100 feet thick, outcropping along the Missouri River in northeastern Nebraska as in Knox and Cedar Counties and in the valleys along the Republican River in the southwestern counties. The extent of this sand plain is not known nor what its geologic relation to the drift sheet may be. Much of the sand is too fine for use but a portion of it may be utilized as a surfacing material for roads. It is too dirty for concrete work, containing not only clay and silt but also an iron cement.

The Glacio-Fluvial or Aftonian Sand Plain.

This plain lies between the Nebraska and Kansas drift sheets and has a thickness of from 10 to 70 feet. The sand varies from dirty to clean and from fine sand to coarse gravel. It contains boulders, cobbles and large clay balls which were undoubtedly carried to their present positions from the north, by streams, during the glacial time. Just what caused these streams to drop their heavy load in eastern and central Nebraska is not known. This sand plain extends through much of the upland of the loess hill and drift areas of Nebraska and is reported also in southwestern Iowa, northwestern Missouri and northeastern Kansas.

Sand is produced commercially from this source at Fairbury, DeWitt, Ulysses and Wahoo and operation will soon be started by the state at Superior, Nelson and Hebron from the same horizon. As a surfacing material this gravel is the best in the state. It is of suitable size and quality and has a good binder of clay and iron oxide. When this gravel is laid upon a road and subjected to the impact of traffic it forms a surface which is extremely hard and durable in either wet or dry weather. There will undoubtedly be a great many miles of road surfaced with gravel from this source in the future.

Glacial Drift.

The drift of the Kansas sheet covers approximately the tier of the eastern four counties of Nebraska. It is evidenced on the surface by large four counties of Nebraska. It is evidenced on the surface by large boulders of many kinds of material, by rounded pebbles in the soil or by a heavy red clay. The deposits occur in pockets which contain material

grading from extremely fine sand to large boulders. At the base of these deposits the material is usually clean but is badly stained with iron, making it a poor aggregate.

Either for construction work or surfacing material drift sands are poor at best, and the supply is so limited that at the present time it seems inadvisable to utilize it.

Dune Sand.

Dune Sand is the prevailing surface formation of the well-known sand hill region. It is too fine for any road use and offers a serious problem to road construction wherever it exists.

Alluvium.

The alluvial deposits of sand and gravel in the state are by far the most important source of road material. These deposits occur in the valleys of the Platte, Loup, Elkhorn, Blue, Republican and Missouri rivers. The alluvium of the Platte is very coarse in the western part of the state, becoming finer toward the east, due of course to the action of the water upon the material. That of the Loup and Elkhorn rivers is almost too fine for road use. The Big and Little Blue carry material derived from the Aftonian Sand Plain, tertiary sand and glacial drift. Much of the sand is used commercially. The alluvium of the Republican Valley varies a great deal in size and quality depending upon the region. That of the Missouri grades from very fine sand to clay and is seldom used.

In the alluvium of the Platte Nebraska has an unlimited source of road material. This alluvium ranges from 25 to 100 feet in thickness and extends the full width of the Platte Valley througout its course. It grades from fine sand to coarse gravel and is very hard and durable.

Detailed Description of State Owned Gravel Pits.

Grand Island: The state pit at Grand Island is located by contract at the west end of Koehler Lake. This lake is located in an old channel of the Platte River about 150 yards wide and extending from Central City to a point about 10 miles west of Grand Island. The material in this channel is a great deal coarser than that in the present channel, about 40 per cent of the sand being retained on a No. 10 screen.

The chief drawback to production in this channel is the large number of clay balls encountered. There is also a thin stratum of clay at about 17 feet below the surface, which occurs intermittently along the channel. The state is producing from the west end of the lake where a slightly better grade of gravel occurs than in any other portion. All the fine sand screened from the gravel by the owners of the pit for many years has been sluiced back into the lake at the east end making production there inadvisable.

Fifty thousand yards of gravel was contracted for at the rate of 13 cents per cubic yard. The state was to produce the gravel from any

part of the lake. This gravel is being used to surface a portion of the Grand Island-St. Paul and Grand Island-Wood River Federal Aid Roads.

Wood River: The Platte Valley in the vicinity of Wood River is approximately 12 miles wide. The river itself is divided into four channels. This is evidence of the fact that the velocity of the Platte River at this point is much slower than in places where the valley is narrower or the river has not meandered to such an extent. The velocity of the river being slower, finer material has been deposited there than in other places. Because of these facts it was impossible to locate in the immediate vicinity of Wood River a gravel pit which would produce gravel of suitable size. Therefore the state secured a camp site on the river and are pumping from the main channel at the present time. The river itself is carrying 25 per cent coarser material than is deposited any place in the valley.

Approximately 6,000 yards of gravel has been produced to date which is used for the surfacing of the Lincoln Highway from the county line west of Wood River to a point six miles north on this road.

Ashland: The gravel land at Ashland purchased by the state in May, 1920 is located in Sections 30 and 31 of Township 13 North, Range 10 East, Saunders County. It is on the main line of the C., B. & Q. railroad between Lincoln and Omaha.

There are a great many reasons which enter into the fact that Platte Valley land in the vicinity of Ashland is almost ideal for gravel production. The Platte valley is but 1½ miles in width at this point so the river has neither had a chance to change its coarse appreciably nor has it lost any of its velocity. There are no tributary streams flowing into the Platte which might carry finer material immediately above this location and the river has not meandered enough to appreciably change the alluvium, as originally deposited, below a depth of about ten feet.

There are 62.8 acres of deed land in the tract purchased. With this the state received title to 34 acres of accretion land. The tract has 2,100 feet of frontage on the river and 2,300 feet of trackage on the main line of the C., B. & Q. It is possible to produce from this land approximately 500,000 cubic yards of gravel and the supply from the river is unlimited. The land is protected on the south from overflow by the grade of the C., B. & Q. railroad and on the east along the river front by a dike thrown up by the railroad company which facts are indeed an advantage.

The gravel on this tract, when analyzed, tested from 40 to 46 per cent retained on a No. 10 screen with the exception of a small area of about 27 acres which has about 15 feet of fine sand deposited on the surface. The state is indeed fortunate to procure such a gravel site close to Lincoln for the production of sand and gravel for the new capitol building and any general road work.

Wahoo: The pit from which the state procured gravel at Wahoo for the Cornhusker Highway from Swedeburg to Colon is located in blocks

211 and 212 in the county addition to the city of Wahoo. It was the old Mills pit which has been in operation for many years. Gravel is produced here from a buried gravel body, of which there are three in Saunders County extending in a generally northwesterly and southeasterly direction. These deposits may be traced across the county easily by outcrops such as at Wahoo, Ithaca, northeast of Ceresco and southwest of Swedeburg. These locations are the chief ones in the county from which gravel can be economically produced but on account of their location quite a distance from railroad or the Cornhusker Highway none are accessible except that at Wahoo.

The gravel in the Wahoo pit is like the material of the Aftonian sand plain in general characteristics, except that there is present more binder than is usually the case. The gravel does not need to be mixed with clay to make a perfect road surface.

The state has produced from this pit approximately 20,000 yards of gravel. Future production will necessitate the removal of heavy overburden or the dredging of the gravel below the water level.

COMPLETED GRAVEL ROAD, FREMONT-CERESCO, FEDERAL AND STATE AID PROJECT NO. 27

Proposed State Gravel Pits.

Nelson: On the Little Blue River north of Nelson are situated several outcrops of glacio-fluvial gravel. The river has cut into this sand plain in a great many places throughout its course. There are within this vicinity several thousand yards of usable gravel. The over-burden varies from 0 to 15 feet. depending upon the topography. The stratum of sand is a great deal thinner than is the case in the northern counties where the sand plain outcrops.

A vertical section is as follows: An average two feet of overburden; 2 to 15 feet, sand and fine gravel; 15 to 22 feet fine sand. In this plain about 65 to 72 per cent of the material is retained on a No. 10 screen. It is much cleaner than that in the sand plain in the northern counties, is more constant in size and occurrence and contains fewer clay balls.

Fairbury: Gravel for the Federal Aid Roads in the vicinity of Fairbury will be procured from several burried gravel bodies or gravel trains.

A great deal of sand and gravel has been produced here in the past by the railroads and private concerns. However, there is a vast amount of material, that is as yet untouched. It is all fairly clean, approximately 65 per cent being retained on a No. 10 screen.

The gravel land provisionally located here will produce approximately 40,000 yards.

Superior: Sand and gravel has been produced at Superior for many years from the sand plain in the uplands. The plain is about 75 feet thick and contains gravel of good size and quality. About 60 per cent is retained on a No. 10 screen.

The state will produce here about 12,000 yards for use on the Nuckolls County Federal Aid roads.

Norfolk: The most likely source of production in the vicinity of Norfolk is the Aftonian Sand Plain. This sand plain outcrops in the uplands along the valley of the Elkhorn river. The material like most of that occurring in this sand plain is fairly clean and of suitable size. It may be worked to a depth of approximately 45 feet, depending directly upon the region.

There are in this area many small pockets of glacial gravel. These are all too small in extent to consider as a possible source of production.

Sidney: In the Lodgepole and North Platte Valleys are a large number of sites suitable for bank pits. The gravel occurs in alluvial fans, sand draws, and the erroded and weathered surface of the Ogalalla formation which is exposed in much of the slope land. The location at Sidney will produce gravel of good quality for surfacing and is well situated with respect to the Lincoln Highway and tributary roads.

Valley: At Valley a great deal of sand for commercial use has already been produced. Dredging has taken place to depths ranging

from 40 to 60 feet. The sand is finer than in most places along the Platte Valley.

There are several locations here that will produce sand for use on the Lincoln Highway. The land has very little over-burden and is favorably situated with respect to removal for shipping or hauling.

Survey Methods.

The survey of road materials in Nebraska has been conducted for several years by the State Conservation and Soil Survey. However, when the Federal Aid program was enacted a more detailed survey of certain areas became necessary.

The most important road materials surveyed are deposits of sand, gravel, clay and stone suitable for road construction. For the benefit of county officials and others interested in general road work a few general statements will be made regarding methods used.

The problem of testing sand deposits is divided into two distinct phases, first that of testing alluvial deposits, and second that of testing bank deposits. These will be treated separately as follows:

Alluvial Sand Testing.

The economic side of the production of gravel enters so thoroughly into the situation that the quality of gravel possible to produce is often necessarily disregarded because of economic features. A site must be chosen not only with regard to the possibility of producing gravel of good quality, but also with regard to the distance to the road upon which it is to be used, with regard to shipping facilities, and the purchase price of the land.

Having decided upon a plot of land which is suitably located the detailed examination of that particular deposit is made.

All alluvial gravel lies either practically at or below the water line, therefore it is necessary to procure such equipment as will work under these conditions. A caseing four or six inches in diameter is sunk and the sand is removed from within this casing by either a sand bucket, a sand pump or a trap auger. The pump is oftentimes mechanically inefficient, and the sand bucket gives a false impression as to the exact deposition of the sand. The trap auger is the most certain and effective tool for this work. It removes the gravel exactly as it occurs in the ground, taking out the fine and coarse materials in their exact relationship. It is much slower than either of the methods mentioned above but one may be certain of the results obtained.

After several test holes have been put down evenly distributed over the plot of ground and samples have been obtained at different depths in these holes, the results are averaged and the quality of gravel possible to produce from the certain plot of ground determined.

Next quantities of material present must be figured. An easy way of doing this in the field is to figure the area of usable ground in square

yards, multiply this by the depth to which the "gravel" may be worked and divide this quantity by four. This will give approximately the number of yards of gravel in a given area on the Platte River.

It then becomes necessary to map the ground as to the best possible locations for trackage, driveways. buildings and the pits so as to give the largest areas possible to gravel production. Classify the ground then as to the number of trees or stumps to be pulled, the amount of stripping to be done and the nature of the material to be stripped, and evaluate the land to be purchased.

Bank Pits.

The location of a dry land pit is much more complicated and uncertain as to results than is that of the alluvial pit. The material in these bank pits is derived from the sand plains, from two unnamed tertiary deposits and glacial pockets and because of the manner of their deposition great care must be taken in their survey. These deposits are not consistent as to thickness, quantity, quality or geologic relation to other formations, making deductions very uncertain.

If seeking to locate a pit in an area where only bank pits will be possible, trace up the drainage ways of the vicinity looking for a stream or intermittent drainage which carry gravel. If such a stream is found follow this until the gravel body is located. Then determine the elevation of this layer of gravel and trace it by the use of a level and surface indications until a suitable location for production is found. Proceed by putting down test holes and by the methods stated previously, determine the exact quantities of gravel present, map the ground for buildings and trackage and compute the costs.

Clay.

Clay as treated here is used as a surfacing material on sandy roads and as a binding material on sand-clay and gravel-clay roads. In most places in the state where gravel roads are constructed the road soil has sufficient cementing quality to bind the gravel together into a hard wearing surface, but in some vicinities this is not true.

When such conditions exist a deposit of clay must be found and the clay removed and hauled onto the road to be mixed with the gravel in the proper proportions. Usually sufficient clay may be found at a shallow depth in the sub-soil beside the road. Occasionally, however, it is necessary to haul it for several miles.

Clay is also used in the sandhill regions as a surfacing material where it not only binds together the fine particles of sand but also forms a hard crust-like surface that will stand the wear of the traffic.

Clay pits have been located for these two kinds of work as follows:

Grand Island: The Grand Island-Wood River Federal Aid road is located in the Platte Valley and in a distance of 17 miles crosses 13 distinct soil types, only one of which contains sufficient clay to serve as a binding material for a gravel road. This type is the Hall silt loam.

The Hall silt loam is uniformly a dark brown friable soil high in organic matter, to a depth of 8 to 12 inches underlain by 6 to 24 inches of stiff plastic clay. This soil is found in isolated areas, in the ditches along the course of this road and is being used as a binder for the gravel.

Wherever the Hall silt loam occurs as mapped on the Soil Survey maps it may be regarded as a suitable binder for road surfacing.

Dublin: The Grand Island-St. Paul road from St. Libory to St. Paul crosses several soils such as Dune sand and Valentine sand. Wherever these occur it is necessary to use some sort of a binder or surface material. The only immediate source in this sandhill region is at Dublin. This deposit is not a clay but is a silt that was laid down in the bottom of some small sandhill lake. It varies from 1 to 4 feet in thickness and has Dune sand above and below. The silt has a high sand content but has very good binding qualities for this type of material. A very extensive supply may be obtained with but little stripping. It is exposed in an open cut along the right of way of the Union Pacific railroad for a distance of about three-eighths of a mile.

St. Paul: At St. Paul binding material is found in either of two areas. The first of these in the vicinity of the County Fair Grounds is Hall fine sandy loam which has a subsoil of tough plastic clay about 14 inches thick. The second, just west of St. Paul, is Hall silt loam which has a heavy clay subsoil. These are the only two areas which may produce usable material in the vicinity.

Wahoo: The soil types which the Cornhusker Highway in Saunders County crosses are principally the Waukeshaw silt loam, the Scott silt loam and the Marshall silt loam. These soils possess excellent binding qualities and makes a very good road surface when mixed with gravel.

In contrast of the condition of the road soils in this loess hill area to the condition of the road soils in the sandhill area and conditions existing where any road is constructed across valley soils, these heavy soils in Saunders County when mixed with gravel form a perfect road surface.

The gravel in the construction of these Saunders County roads is merely hauled onto the road and spread out evenly, allowing the impact of traffic to work the gravel into the subsoil. Wherever such conditions exist, gravel roads may be built and maintained successfully with a small cost.

Survey Methods.

The problems involved in the location of suitable deposits of clay for either binding or surfacing material are fewer than those of a location of gravel deposits because of the fact that most of the counties of the state have been thoroughly surveyed with respect to the soils existing. This work has been done by the U. S. Bureau of Soils and the Nebraska Conservation and Soil Survey.

When seeking a suitable deposit of clay the soil survey maps are consulted and the location for clay made with respect to the road on which the material is to be used. However, due to the many grades and kinds of heavy soils which may be used an important problem is that of determining the proportion of clay to be used with the gravel at hand. Methods used in the determination of these proportions are stated below.

A sand clay or gravel clay road is constructed most effectively when the sand and clay are mixed in proper proportions. These proportions are not purely arbitrary but are determined by definite tests of the material to be used.

A gravel road may be constructed but it will only serve the public in the best possible manner when these chief constituents are properly mixed. This is not to state that a road cannot be built that is passable and usable by merely dumping the sand and clay upon the road and spreading it out. But it does state that this road is far from perfect until these materials have been thoroughly mixed in the proportions that the particular size of gravel and the particular clay used work best together. These proportions are determined in the field by tests known as the slacking and flouring tests.

A sample of the clay to be used is dried and sieved through a 100 mesh sieve. This clay is then mixed with the gravel in many different proportions, a little water added and the mixture molded into briquettes and allowed to dry. These briquettes are then given the slacking and flouring tests and the best proportion used on the road.

For Platte River gravel and soil of the loess hills region the best proportioned will be about 40 per cent clay and 60 per cent gravel. However, these will vary to as much as a 70 per cent clay content depending upon the percentage of voids of the sand or gravel.

Stone.

In the fall of 1919 considerable work was done on the location of a stone quarry for the state. Many stone ledges outcropping at various places in southeastern Nebraska were examined and these facts together with those already gathered by the Conservation and Soil Survey Department were tabulated. A site was chosen and estimates on the cost of production made. However, this site has not been purchased as yet.

This paper was prepared to give the scope of the activities of the co-operative work of the Department of Public Works and the Conservation and Soil Survey Division of the University during the biennium ending December 1st, 1920.

DIVISION OF LAWS.

TITLE VII.

DEPARTMENT OF PUBLIC WORKS

ARTICLE I.

GENERAL POWERS.

Section 1. **Department of Public Works take the place of State Board of Irrigation, Highways and Drainage.**—The Department of Public Works shall exercise the powers and perform the duties now consigned to the State Board of Irrigation, Highways and Drainage.

Sec. 2. **State Engineer.**—The Department of Public Works shall appoint a State Engineer and the State Engineer acting when this act takes effect shall continue as State Engineer until his successor is appointed and qualified.

Sec. 3. **Department of Public Works to be superintendent of construction.**—The Department of Public Works shall supervise all of the State's building or construction work which is not vested in any other department and shall superintend the construction of highways, bridges, and other public improvements for which any money is appropriated by the State.

ARTICLE II.

STATE HIGHWAYS.

Section 1. **Highways established.**—A system of state highways is hereby established which are to be improved and maintained by the Department of Public Works as hereinafter provided. The highways comprising said system of state highways are to be known as State Highways and are described and set forth herewith as follows:

Highway 10. Commencing at southern boundary line of Richardson County south of Falls City, running near or through Falls City, Shubert, Stella, Howe, Auburn to Nebraska City.

Highway 11. Commencing at Nebraska City, running near or through Union, Plattsmouth, Ft. Crook, Bellevue, to Omaha.

Highway 12. Commencing at Omaha, running near or through Ft. Calhoun, Blair, Herman, Tekamah, Craig, to Oakland.

Highway 13. Commencing at Hooper, running near or through Oakland, Lyons, Rosalie, Walthill, Winnebago, Homer, to Dakota City to Missouri River bridge, South Sioux City.

Highway 14. Commencing at State line, south of Wymore, running near or through Wymore, Blue Springs, Beatrice, Courtland, Princeton to Lincoln.

Highway 15. Commencing at Havelock, running near or through Ceresco, Swedeburg, Wahoo, Colon, Cedar Bluffs, to Fremont.

Highway 16. Commencing at Fremont, running near or through Hooper, Scribner, Crowell.

Highway 17. Comencing at Wisner, running near or through Altona, Wayne, Coleridge, Hartington, Fordyce, to Missouri River, south to Yankton.

Highway 18. Comencing near Verdun on Road No. 10, running near or through Humboldt, Pawnee, Burchard, Lewiston, Virginia to Beatrice.

Highway 19. Commencing at Auburn, running near or through Johnson, Tecumseh, Vesta, Crab Orchard, Filley to Road No. 18, west to Filley.

Highway 20. Commencing at Nebraska City, running near or through Dunbar, Syracuse, Unadilla, Palmyra to Lincoln.

Highway 21. Commencing at Havelock, running near or through Waverly, Greenwood, Ashland, Melia, Gretna, Chalco, Millard to Omaha.

Highway 22. Commencing at Omaha, running near or through Elkhorn, Waterloo, Valley to Fermont.

Highway 23. Commencing at West Point, running near or through Pender, Wakefield, Allen, Martinsburg to Ponca.

Highway 24. Commencing at Road No. 11, running near or through Murray, near Murdock, Elmwood, connecting with Road No. 20 near Eagle.

Highway 25. Commencing at Southern boundary of Thayer County near Chester, running near or through Stoddard, Hebron, Belvidere, Bruning, Strang, Geneva to Fairmont.

Highway 26. Comencing at Fairmont, running through York, near or through Benedict to Stromsburg.

Highway 27. Commencing at Stromsburg, running near or through Osceola, Shelby, Millerton, David City, to Schuyler.

Highway 28. Commencing at Schuyler, running near or through Richland, Columbus, Platte Center, Tarnov, Humphrey, Madison, Newman Grove to Albion.

Highway 29. Commencing at Madison, running near or through Norfolk, Pierce, Creighton, Center to Niobrara.

Highway 30. Commencing at Beatrice, running near or through Ellis, Harbine, Jansen, Fairbury, Gilead to Hebron.

Highway 31. Commencing at road No. 30, north of Fairbury, running near or through Western, Wilber to Crete.

Highway 32. Comencing at Road No. 14, north of Princeton, running near or through Crete, Dorchester, Friend, Exeter, to Fairmont.

Highway 33. Commencing at Lincoln, running near or through Emerald, Seward, Tamora, Utica, Waco to York.

Highway 34. Commencing at Seward, running to David City.

Highway 35. Commencing Schuyler, running to Pilger.

Highway 36. Commencing at Blair, running near or through Kennard, Arlington, to Fremont.

Highway. 37. Commencing at Norfolk, running near or through Stanton, Pilger, Wisner, West Point to Oakland.

Highway 38. Commencing at Fremont, running near or through Ames, North Bend, Roger to Schuyler.

Highway 39. Commencing at the Nebraska-Kansas State line, south of Superior, running near or through Superior, Nelson, Clay Center, to Road No. 40, near Harvard.

Highway 40. Commencing at Fairmont, running near or through Grafton, Sutton, Harvard to Hastings.

Highway. 41. Commencing at Red Cloud, running near or through Cowles, Hastings, Doniphan to Grand Island.

Highway 42. Comencing at York, running near or through Bradshaw, Hampton, Aurora, to Road No. 41, south of Grand Island.

Highway 43. Commencing at Grand Island, running near or through Chapman, Central City, Clarks, Silver Creek, Duncan, Columbus, to Highway 27.

Highway 44. Commencing at Stromsberg, running near or through Polk to Central City.

Highway 45. Commencing on Road No. 28, west of Columbus, running near or through Genoa, Fullerton, Wolbach, Brayton to Greeley.

Highway 46. Commencing at Genoa, running near or through Albion, Petersburg, Elgin to Neligh.

Highway 47. Commencing at Norfolk, running near or through Battle Creet, Tilden, Oakdale to Neligh.

Highway 48. Commencing at Greeley, running near or through Spalding, Bartlett, Sheridan, Ballagh, to Atkinson.

Highway 49. Commencing at Neligh, running through Clearwater, Ewing, Page, O'Neill, to Spencer.

Highway 50. Commencing at Niobrara, running through or near Verdel, Monowi, Lynch, Bristow, Spencer, Butte, Naper to Nebraska-South Dakota line.

Highway 51. Commencing at Greeley, running near or through Horace, Scotia, North Loup, Ord, Elyria, Burwell to Deverre.

Highway 52. Commencing at Red Cloud, running near or through Inavale, Riverton, Franklin, Bloomington, Republican City, Alma to Orleans.

Highway 53. Commencing at Hastings, running near or through Juniata, Hartwell, Minden, Axtell, Funk, to Holdrege.

Highway 54. Commencing at Franklin, running near or through Upland to Minden.

Highway 55. Commencing at Alma, running to Holdrege.

Highway 56. Commencing at Holdrege, running near or through Atlanta, Oxford, Edison, to Arapahoe.

Highway 57. Commencing at Road No. 56, west of Holdrege, running near or through Loomis, Bertrand, Smithfield, Elwood, Orafino, Stockville, to Curtis.

Highway 58. Commencing at Grand Island, running near or through Wood River, Shelton, Gibbon, Kearney, Odessa, Elm Creek, Overton, to Lexington.

Highway 59. Commencing at Road No. 58, north of Wood River, running near or through Ravenna, Hazard, Litchfield, Mason City, Ansley, Berwyn, Broken Bow, Ormsby, to Merna.

Highway 60. Commencing at Kearney, running near or through Pleasanton, to Hazard.

Highway 61. Commencing at Ravenna, running near or through Rockville to Loup City.

Highway 62. Commencing at Road No. 43, north of Grand Island, running near or through St. Libory, St. Paul, Farwell, to Road No. 61, southeast of Loup City.

Highway 63. Commencing at Ansley, running near or through Sargent, Taylor to Burwell.

Highway 64. Commencing at Taylor, running near or through Harrop to Bassett.

Highway 65. Commencing at O'Neill, running near or through Atkinson, Stuart, Bassett, Long Pine, Ainsworth, Johnston, Norden, Sparks, to Valentine.

Highway 66. Commencing at Springview, and connecting with Highway No. 65.

Highway 67. Commencing at Oxford, running near or through Beaver City, Arapahoe, Holbrook, Cambridge, Bartley, Indianola, Red Willow, McCook, to Culbertson.

Highway 68. Commencing at Culbertson, running near or through Hope, Hayes Center, Rain, Stricland, Elsie, Madrid, Grant.

Highway 69. Commencing at Culbertson, running near or through Beverly, Palisade, Hamlet, Wauneta, Imperial, Chase, Lamar, to the Nebraska-Colorado State line west of Lamar.

Highway 70. Commencing at Culbertson, running near or through Trenton, Stratton, Max, Benkelman, Doane, Parke, Colfer, Haigler, Sanborn, to the Nebraska-Colorado State line.

Highway 71. Commencing at Lexington, running near or through Cozad, Willow Island, Gothenburg, to North Platte.

Highway 72. Commencing at Merna, running near or through Arnold, Gandy, Stapleton, Ringgold, to Tryon.

Highway 73. Commencing at Merna, running to Dunning.

Highway 74. Commencing at Brewster, running near or through Dunning, Thedford, to Mullen.

Highway 75. Commencing at Mullen, running near or through Whitman, to Hyannis.

Highway 76. Commencing at Hyannis, running near or through Lakeside, Antioch, Hoffland, to Alliance.

Highway 77. Commencing at Hyannis, running near or through Cody to Merriman.

Highway 78. Commencing at Merriman, running near or through Bayonne, Gordon, Clinton, Rushville, to Hay Springs.

Highway 79. Commencing at Hay Springs, running near or through Bordeau, Chadron, Whitney, Crawford, Harrison, west to Nebraska-Wyoming State line.

Highway 80. Commencing at Alliance, running to Chadron.

Highway 81. Beginning at Highway No. 21, running through Papillion and connecting with Highway No. 11.

Highway 82. Commencing at North Platte, running near or through Hershey, Sutherland, Roscoe, to Ogallala.

Highway 83. Commencing at Ogallala, running near or through Big Springs, Chappell, Perdue, to Sidney.

Highway 84. Commencing at Sidney, running near or through Kimbill, to the Nebraska-Wyoming line.

Highway 85. Comencing at Arthur and connecting with Highway No. 82.

Highway 86. Commencing at Keystone, running near or through Lewellen, Lutherville, Oshkosh, Penn, Lytle, Lisco to Broadwater.

Highway 87. Commencing at Broadwater, running near or through Bridgeport, Schermenhorn, Bayard, Minatare, Scottsbluff, Mitchell, Morrill, to the Nebraska-Wyoming State line.

Highway 88. Commencing at Kimball, running near or through Harrisburg, Gering to Scottsbluff.

PROVIDED, that on or before January 1, 1920, the State Engineer shall file in the office of the County Clerk of each County in the State, a map drawn to a scale of one inch to the mile, which shall indicate and show all State highways located within such county as herein provided and the Department of Public Works is hereby empowered to use all or any part of each county's apportionment of the State Aid Road Fund to construct the State Highway System in each County. PROVIDED FURTHER: That when any highway in the State is constructed with State and Federal money, the Department of Public Works shall file with the County Clerk of the county having jurisdiction over such highways, a map as herein provided for state highways; and all highways so constructed shall become a part of the State Highway System and be maintained in the same manner as all other state highways provided for in this Article.

Section 2. **Deviations and changes to be made by Department of Public Works.** The line or actual location of a state highway may deviate from the location of the public highway, as actually traveled at the time said highway was by law designated as a state highway, as may be deemed expedient by the Department of Public Works in order to shorten distances, to eliminate steep grades or sharp turns, to widen or narrow or otherwise to promote public convenience and safety. Such portions of a state highway as may be abandoned, because of the change therein described, shall no longer be considered as a state highway or a portion of a state highway, but shall be abandoned as a public highway, unless on petition of the

County Board of the county in which such abandoned sections may be located, to the Department of Public Works, that the County Board desires to maintain such portion of the public highways, in which case it will be maintained as other public roads as provided by law.

Section 3. **Relocation, alteration and widening.** Any public highway or portion of a public highway designated by law as a state highway, may be relocated, altered or widened, when in the opinion of the department of public works, such is necessary for the public convenience and safety, and for such purposes, power is hereby conferred upon the county board of the county in which the land is situated, to take, hold and appropriate so much real estate as may be necessary and convenient in the manner provided for appropriation of real estate for county buildings as prescribed by Sections 1092 to 1096, inclusive of the Revised Statutes for 1913.

Section 4. **Improvements to be made by Counties.** On and after January 1, 1920, each County shall adequately maintain the whole of the state highway system lying within the county in accordance with the directions, specifications and regulations made for such maintenance by the Department of Public Works. Such maintenance shall include improvements to the existing surface of said highways, to bridges, culverts, and other structures thereon, as well as the erection and maintenance of suitable markers as may be deemed necessary for the convenience and safety of the traveling public. Provided, that portions of the highway lying within incorporated cities and villages having a population of more than fourteen hundred (1,400) inhabitants shall be maintained solely by said city or village.

Section 5. **Procedure when County fails to improve.** If any county shall fail to adequately maintain any portion of the state highway system within the County, the Department of Public Works may so determine and shall notify the County Clerk of said County in writing. If such County shall not within thirty (30) days of such notice take due steps, to perform such maintenance, the Department of Public Works shall immediately cause the required maintenance to be performed and the cost of same to be paid out of the State Highway Fund and charged against the amount available for maintenance of said County. To permit the Department of Public Works to perform the duties herein impcsed, it may purchase or rent all necessary machinery and equipment.

Section 6. **Payments to County for satisfactory maintenance.** When and County shall adequately maintain, to the satisfaction of the Department of Public Works, the portion of the state highway system within its limits there shall be paid into the county treasury, out of the State Highway Fund, the actual cost of such maintenance, plus an allowance for the use of county machinery agreed upon in advance by the County Board and the Department of Public Works; said payments shall be made

up to the amount available in the State Highway Fund for the maintenance in such county, upon the presentation by the county clerk of properly itemized voucher statements supporting the account, which statement shall be filed between the first and the fifteenth of each month and be approved by the Department of Public Works before payment is made.

Section 7. **Certified statements to be filed with County Clerks.** On the fifteenth day of each month the Department of Public Works shall file with the County Clerk of each County a certified statement showing the total amount of money received, the total claims allowed and the amount of money available in the State Highway Fund for the maintenance of the State Highway System in each County.

Section 8. **Close highways to traffic for repairs.** The county board shall have authority to close temporarily to traffic, any portion of a state highway for the purpose of repairing or making improvements thereon and due notice shall be given to the public that a certain portion of a state highway is closed to traffic by placing at the roadside suitable signs stating that the road is closed to travel by order of the county board. It shall be unlawful for any person to remove or pass such signs without permission, and any person so doing shall be guilty of a misdemeanor and shall upon conviction, be subject to a fine not exceeding one hundred ($100.00) dollars or imprisonment not exceeding thirty (30) days, or both.

Section 9. **Detours.** Whenever practicable the county board is authorized to arrange detours around the portion of a state highway closed for repairs, as it may deem expedient for this purpose. The department shall secure a right-of-way through private land if satisfactory arrangements for temporary right-of-way can be made with the owner of the land. If the department cannot secure a right-of-way by agreement to enter upon such lands for a temporary right-of-way, similar proceedings may be had for the securing of a right-of-way on private land as herein provided by Section 3.

Section 10. **State Highway fund-how comprised.** The State Highway Fund shall be derived from such revenue as may by law be provided. In addition, the Department of Public Works may accept donations from whatever source, whether public or private, made for the purpose of constructing or improving any portion of the State Highway System; provided, that the said department need not accept any such donations, whether public or private, if in its opinion the best interest of the State will not be subserved.

Section 11. **Same for what purposes available.** The State Highway Fund shall be available to pay for the cost of maintenance of the state highway system, all motor vehicle number plates, and seals, the engineering, supervision and administration of this article by the Department of Public Wrks; PROVIDED, however, that the cost of engineering,

supervision and administration by the Department of Public Works shall not exceed the actual cost of said plates and seals plus 5 per cent of the total amount of money received in said State Highway Fund.

Section 12. **Emergency cash trust fund.** For the purpose of enabling the employment and discharge of labor and the prompt payment of emergency items of less than one hundred ($100.00) dollars value, five thousand ($5,000.00) dollars of the State Highway Fund shall be deposited in a bank to be designated by the Department of Public Works, to the credit of the State Engineer, as an emergency cash trust fund, against which the State Engineer may draw his official checks for the payment of small emergency claims, including labor, and employment claims where the same are payable oftener than once each month. Such Emergency Cash Trust Fund shall be provided by the Secretary of the Department of Public Works, drawing a proper voucher against the State Highway Fund and proper warrants issues therefor, which warrants shall not at anytime exceed the amount actually expended from said fund, as evidenced by receipts approved by the Department of Public Works showing the payments made from said fund, the proceeds of which shall be deposited in the designated bank to the credit of the State Engineer, and for the purpose as aforesaid. Additional vouchers and warrants shall be drawn and issued, from time to time, to keep the said fund to the amount of five thousand ($5,000.00) dollars as nearly as practicable: PROVIDED, that before any checks are drawn on said Emergency Cash Trust Fund, the State Engineer shall file an approved surety bond with the Department of Public Works in the sum of Ten Thousand ($10,000.00) dollars, for the faithful performance of his duties under this article.

Section 13. **Project district.** The Department of Public Works shall divide the State into project districts, not exceeding five counties in any one district, in such a manner as in its judgment will best utilize the State Aid Road Fund available each year as well as the money apportioned to the state from the Federal Government under the Federal Aid Road Act of July 11, 1916. Before submitting any project statement to the Secretary of Agriculture, as provided for in the Federal Aid Road Act, the same shall have received the approval of the county board of each County within the project district. The funds available for all of the counties in each project district shall be considered as a unit for such district, and the work of construction or improvement of roads for each district shall be begun in any part or parts of such district at the place or places designated by the Department of Public Works. Whenever the work in any project district is completed, the amount of the funds apportioned to each County shall have been expended in the construction or improvement of roads and bridges within said County, or in the event that all of the apportionment for each County is not used in the construction or improvement of the roads utilized in the project district plans for such county, the unused funds shall be used in the construction or in the improvement of such other roads within the

County as the County Board and the Department of Public Works may agree upon and which receives the approval of the Secretary of Agriculture.

Section 14. **Unlawful motor vehicles on highways—penalty.** No motor vehicle in excess of seven and one-half (7½) feet in width or twelve (12) feet in height shall be operated on the system of state highways; nor shall any motor vehicle be so operated in which the limit of load per inch width of tire exceeds six hundred (600) pounds. No motor vehicle of which the weight of truck and load combined exceeds seven thousand (7,000) pounds on any one wheel shall be operated on the system of State Highways without the special permission of the Department of Public Works.

Any person violating any of the provisions of this section shall be deemed guilty of a misdemeanor and subject to a fine of not less than Fifty ($50.00) dollars, nor more than Five Hundred ($500.00) Dollars for each offense.

Section 15. **Rules and regulations for use of highways to be made by department.** In order to promote public safety and to preserve and protect State Highways and prevent immoderate and destructive use of the same the Department of Public Works may formulate such rules and regulations in regard to the use of and travel upon the state highways, not inconsistent with the provisions of this article, as said department may deem proper. Such rules and regulations shall be published and issued in pamphlet form by said department and designated as the official state highway rules and regulations of the Department of Public Works, and shall be available upon request to the general public free of charge.

Section 16. **Careless operation of motor vehicle—penalty.** Any person or persons who shall operate a vehicle upon a state highway in such a manner as to endanger the safety of others or to cause immoderate wear or damage to a state highway shall, upon conviction, be deemed guilty of a misdemeanor and be subject to a fine not to exceed One Hundred ($100.00) Dollars nor less than Twenty-five ($25.00) Dollars, or imprisonment in the county jail for thirty days, or both fine and imprisonment, at the discretion of the court, and shall be held prima facie evidence that a person has operated a vehicle over a state highway in a manner to endanger the safety of others or so as to cause imoderate use or damage to a state highway, if he has operated such vehicle in a manner contrary to the duly published rules and regulations of the Department of Public Works governing the use of state highways.

Section 17. **Advertising signs on state highways—permit required.** No advertising signs shall be placed along or upon a state highway without a written permit from the Department of Public Works. Permits to be issued shall be numbered serially and each sign shall bear upon it the permit number thus: State Permit No. ——. The Department of

Public Works is authorized to remove all advertising signs for which permits have not been duly obtained, and is authorized to charge a fee for such permits, such fee to be not less than twenty-five (25c) cents, nor to exceed five ($5.00) dollars for each individual sign. The Department of Public Works may, without any cause, revoke the permit for any sign along a state highway and remove the same, provided if the sign so removed shall have been erected less than three (3) months at the time of such removal, the amount of the permit fee shall be returned to the owner of the sign. PROVIDED, no permit shall be issued for any sign of more than ten (10) square feet surface; provided, further, printed sale bills shall not be deemed a sign within the meaning of this section.

Section 18. **Road materials—how purchased—condemnation.** For the purpose of obtaining road materials to be used in the construction and maintenance of state highways built or maintained under the supervision of the Department of Public Works, said department is hereby empowered, on behalf of the State, to acquire lands and appurtenances thereto, either by purchase or by condemnation proceedings, in the manner provided by law. Said department may also purchase all necessary equipment and employ the necessary labor to remove such materials from said land; to prepare such materials for use and to manufacture such materials into road making products, and may sell any surplus of such materials or products to any County or Counties, or to any municipality of the State or to any contractor at actual cost for building and maintaining roads, streets and alleys only; and the funds received therefr shall be, by said department, paid into the State Treasury and credited to the State Aid Road Fund. The cost of acquiring said lands and appurtenances, the purchasing of equipment, and the use of such equipment as provided for in this section shall be paid out of the State Aid Road Fund. For the purposes provided in this section, said department may enter into contract with the board of commissioners of state institutions, for the employment of convict labor.

ARTICLE III.

State Aid Bridges.

Section 1. **General supervision.** The Department of Public Works is hereby declared to have supervision of bridges to be located and constructed or purchased under state aid, as provided by law.

Section 2. **(2977) County board apply for aid.** The county board of any County may make application, in writing, to the Department of Public Works for state aid in the construction of any bridge, or for such aid in the purchase of any private bridge already constructed across any stream, of the width of one hundred seventy-five feet or more, under the jurisdiction of such County Board or Boards. The application shall contain a description of the proposed bridge, with a preliminary estimate of cost of construction or purchase thereof, and a certified

copy of the resolution of said board pledging such county to furnish one-half of the cost of construction of such bridges. The State shall not be liable for any money in excess of the appropriation made for that purpose. If the application is for the purchase of a private bridge already built the County Board or Boards acting jointly with the Department of Public Works shall submit and negotiate offers to purchase to the owners of such bridge. If a reasonable sum is agreed upon the said department, the board, and the owners of the bridge may enter into a contract for such purchase. If terms cannot be agreed upon, the County Board, together with the Department of Public Works may appropriate the said bridge for public use by the exercise of the power of eminent domain. If the bridge proposed to be purchased shall extend into two or more counties the condemnation proceedings may be instituted in either of said Counties.

If more than one County is concerned in the purchase or construction of such bridge each of said counties shall bear its proportionate share of the cost and expense thereof, and either County may vote and issue bridge bonds therefor.

Section 3. (2978) **Same—order on Department for construction.** The Department of Public Works shall, on the first Monday of January, April, July and October of each year, consider such applications, and upon recommendation of the secretary, make an order for a grant of one-half of the cost of construction of any such bridge or bridges as shall be designated.

Section 4. (2979) **Contract—Notice—bids.** Before any contract shall be let as aforesaid, the County Board having jurisdiction, together with the Department of Public Works, shall cause a notice calling for bids to be published for four consecutive weeks in a newspaper, which notice shall state the general character of the work, the number and kind of bridges to be built, their proposed location, the time within which, and the place for filing and opening such bids. No bid shall be considered unless accompanied by a certified check or cash, equal to five per cent of the bid payable to the county clerk of the county with whom the bids are filed, to be forfeited to the State or County in proportion to the interest of each, in case the bidder refuses to enter into any contract.

Section 5. (2980) **Contract—how let.** All contracts for the erection and construction of such bridge or bridges, and for furnishing the materials in connection with the same, shall be let to the lowest responsible bidder. All bids must be deposited with the County Clerk of the County making such application, or, if more than one County, bids shall be deposited with the County Clerk of the County first named in the application. Bids shall be opened by the County Clerk in the presence of the County Board having jurisdiction and the Department of Public Works. The Department of Public Works may be represented

at any of the transactions named in this section by the State Engineer upon his being duly authorized to act in such capacity by the department.

Section 6. (2981) **Bridge plans—disputes.** The plans and specifications of the proposed bridge or bridges shall be furnished by the State Engineer, and construction shall be under the joint supervision of the Department of Public Works, and the County Board, and when completed shall be accepted by the Department of Public Works and the County Board before final payment therefor. In all cases of disagreement in regard to the location of a bridge, where more than one County is concerned, each County shall be entitled to one vote upon the matter in dispute, and the Department of Public Works shall be entitled to one vote, which shall be cast by the State Engineer, and a majority of all votes thus defined shall determine the matter in controversy.

Section 7. **(Sec. 3, Ch. 57, Laws 1915.) Bridges—Maintenance, cost, inspection.** After the completion or purchase of said bridge or bridges and the acceptance thereof by the Department of Public Works, the County or Counties having jurisdiction thereof shall bear the cost of maintenance where it is not over one hundred dollars per year; and in case it exceeds one hundred dollars per year, such cost shall be borne equally by the State and the County or Counties. The Department of Public Works shall make an annual inspection of each of the bridges built under this article and shall recommend to the County Board or Boards the necessary repairs, which repairs shall be made by the County Board or Boards under the direction of the Department of Public Works.

Section 8. **(Sec. 4, Ch. 57, Laws 1915.) Physical valuation by Railway Commission.** No bridge shall be purchased as herein provided unless a physical valuation of such bridge be made by the State Railway Commissioners.

ARTICLE IV.

MOTOR VEHICLES.

Section 1. (2043) **Definition of terms.** The words and phrases used in this article shall, for the purpose of the same only, be construed as follows: "Motor Vehicles" shall include motorcycles and all vehicles propelled by any power, other than muscular power, excepting however, traction engines,road rollers, and any vehicles which run only on rails or tracks. "Highways" shall include public streets, roads, turnpikes, parks, parkways, drives, alleys, and other public ways used for the passage of road vehicles. "Trucks" shall include motor vehicles equipped or used to carry anything other than passengers.

Section 2. **Application for registration—counties.** Every owner of a motor vehicle which shall be operated or driven upon the public highways, shall, for each motor vehicle owned, except as herein otherwise expressly provided, cause to be filed by mail or otherwise with the Department of Public Works, an application for registration on a blank

to be furnished by the Department of Public Works for that purpose containing, in addition to such other particulars as may be required by the Department of Public Works, a statement of the name and postoffice address of the applicant, a description of the motor vehicle, including the name of the maker, the number, if any, affixed to the motor or engine by the maker, the character of the motive power, the diameter of the cylinder bore and the number of cylinders, the seating capacity, the published weight of vehicle, the year model or letter denoted by the manufacturers, if any; and with such application the applicant shall deposit the proper registration fee receipt as provided in section 15 of this article.

Section 3. **Registration.** The Department of Public Works shall alphabetically and also numerically register such motor vehicle with the name and post office address of the owner, together with the facts stated in such application, in a book or on index cards to be kept for the purpose, under a distinctive number assigned to such motor vehicle, which book or index cards shall be open to inspection to the public during reasonable business hours.

Section 4. **Record of registration.** The Department of Public Works shall keep a record of the cars registered, of each make or kind, both numerically and according to the engine number, with cross reference in each instance to the registration number assigned to such motor vehicle.

Section 5. **Numbering.** Upon the filing of such application and the registration fee receipt provided in this article, the Department of Public Works, shall upon registration, assign to such motor vehicle a distinctive registration number. Such number so assigned shall be the number assigned to such motor vehicle at each succeeding registration thereof, so long as such motor vehicle shall be owned by the owner to whom the original assignment was made, and upon sale or transfer of any such motor vehicle, said number may be cancelled or may be re-assigned as an original assignment, to the same or another motor vehicle, at the option of the Department of Public Works subject to the provisions hereinafter contained.

Section 6. **Renewal of registration.** Such registration may be renewed annually in the same manner and upon payment of the same fee as provided for the original registration, such renewal to take effect on the first day of January, each year. The seal and certificates of registration furnished by the Department of Public Works as provided hereinafter, shall be valid during the calendar year only, in which they are furnished or issued.

Section 7. **Number plates furnished—specifications.** The Department of Public Works shall furnish to every person whose motor vehicle shall be registered as aforesaid, on original registration, one number plate, upon which shall be displayed the registration number assigned to such motor vehicle, in figures not less than four inches in height.

The letters and figures for motorcycle plates may be one-half the size of those required herein for motor vehicles, and shall have space provided thereon, to which may be attached each year, the registration seal to be furnished by the Department of Public Works, as hereinafter provided; PROVIDED, however, on number plates issued to a manufacturer or dealer there shall be displayed, in addition to the registration number, the letter "D" and on number plates issued for trucks, trailers, or motor vehicles carrying more than seven passengers there shall be displayed, in addition to the registration number, the letter "T" said letters to be the same height as the figures of the registration number.

Section 8. **Registration seals furnished.** The Department of Public Works shall furnish with each number plate, and at each annual renewal of registration, a registration seal, together with screws or other means of attachment to the number plate, the form and character of which seal shall be uniform for any one calendar year, such seal to be changed by the Department of Public Works, as to color each year, and to be not less than four inches square and have displayed thereon the letters "N E B," and the figures of the calendar year in which the seal is issued.

Section 9. **Certificate of registration furnished.** The Department of Public Works shall furnish with each number plate, and on each annual renewal by registration, a certificate of registration which shall contain upon the face thereof, the following data: The name of the registered owner of the motor vehicle, his post office address, and a description of the vehicle as set forth in the application for registration. Such certificate shall contain a blank space for the signature of the registered owner. The reverse side of such certificate shall contain forms, first, for a notice to the Department of Public Works, by the registered owner, in case of transfer of ownership, as hereinafter required; and, second, for application to the Department of Public Works, by the transferee, in case of transfer of said motor vehicle, for registration thereof in his name, said application to be the form of a joint statement, to be signed by both transferor and transferee, and to contain, in addition to such other particulars as may be required by the Department of Public Works, a statement of the post office address of the transferee so applying for registration. Such certificate shall contain the identical registration number denoted on the number plate, in connection with which such certificate shall be issued, and it shall be valid only for the calendar year in which it is issued.

Section 10. **Certificate—how enclosed and installed on vehicle.** Said certificate shall be inclosed in a suitable container, to be furnished by the Department of Public Works, said container to have a frame of aluminum or other material and to have a case of isinglass or other transparent material through which said certificate can be easily inspected, and with such container the Department of Public Works shall furnish screws or other suitable means of attachment to the motor vehicle. Said number plates, seals, certificates and containers shall be

furnished by the Department of Public Works, without further charge than the fees specified in Section 15 of this article, with transportation prepaid, and shall be of substantial character and of suitable form and design to be determined by the Department of Public Works.

Section 11. **Registration—how affected by transfer of ownership.** Upon the transfer of ownership of any motor vehicle, its registration shall expire, and the person in whose name such vehicle is registered, and the person to whom ownership of such vehicle is to be transferred, shall forthwith join in a statement of said transfer, indorse upon the reverse side of the certificate of registration of said motor vehicle, in the space provided for said purpose, which statement shall be signed by the transferor in the manner and form of his signature, contained on the face of said certificate, and which statement shall likewise be signed by the transferee, who shall also set forth, below his signature, his post office address. Said statement shall include an application by the transferee and registration of said vehicle in his name. Said certificate so indorsed and bearing upon the reverse side thereof the signature of th transferor and transferee, shall be forwarded by the transferee to the Department of Public Works together with a receipt for the proper fee for registration required in Section 15 of this article, and the registration number plate, transportation prepaid, to the Department of Public Works. The Department of Public Works shall file said certificate so jointly indorsed by transferor and transferee, and upon receipt of the proper receipt fee, as above provided, the Department of Public Works, if satisfied of the genuineness and regularity of said transfer, shall register said motor vehicle in the name of said transferee, and shall cancel the former registration number or assign the same to the same or another motor vehicle, at the option of the Department of Public Works, subject to the other provisions of this article.

Section 12. **Assignment of registration to replacement motor vehicles.** In case of such transfer of ownership of any motor vehicle or in case of loss of possession thereof, the registered owner, provided he applies to the department within ten days after such transfer or loss of possession, they have assigned to another motor vehicle the registration number of the motor vehicle so transfered or lost; Provided, that in such case of transfer and application for reassignment to another motor vehicle the number plates and seal may be retained for a period of ten days after such transfer, and if application for such reassignment shall have been made within said period they may be further retained until the Department of Public Works has either duly reassigned said number in accordance with said application or has refused said application for reassignment, and has cancelled said number and demanded surrender of said plates and seal. PROVIDED FURTHER, that in case of transfer of motor vehicle within a period of ninety days from the time of payments of fee as provided in Section 15, the transferor may be returning the registration certificate, the number plate and seal and upon application receive a refund of one-half of the amount of such fee.

Section 13. **Registration certificate for replacement motor vehicles.** Upon such registration the Department of Public Works shall issue the forward to the applicant, without further charge than is provided in Section 15 of this act, a new registration certificate, in the manner and form as hereinbefore provided for original registration. Until said transferee has received said certificate of registration, and has written his name upon the face thereof, in the blank space provided for said purpose by the Department of Public Works, delivery of said motor vehicle shall be deemed not to have been made, and title thereto shall be deemed not to have passed and said intended transfer shall be deemed to be incomplete and not to be valid or effective for any purpose. PROVIDED, that where such transfer is made to a manufacturer or dealer, who has complied with the provisions of this act, and who intends to re-sell or otherwise re-transfer said vehicle, a certificate of registration shall be furnished without charge to him; whereupon such manufacturer or dealer shall be entitled to display upon such vehicle, number plate, and seal, assigned to him by the Department of Public Works, but upon sale or transfer of said vehicle by such manufacturer or dealers, each and every provision herein contained, relative to the return of such certificate to said Department of Public Works with the joint statement of transferor and transferee endorsed thereon as well as other provisions applicable upon transfer of motor vehicles, shall be complied with. In case of a transfer of a motor vehicle to such manufacturer or dealer, without the removal therefrom by the transferor of the number plate and seal, the manufacturer or dealer shall forthwith deliver to the Department of Public Works, transportation prepaid, said number plate and seal.

Section 14. **Notice of transfer by operation of law.** In case of transfer of ownership of a motor vehicle, registered under the provisions of this act, by operation of law, as upon inheritance, devise or bequest, order in bankruptcy, or insolvency, execution sale, repossession upon default in performance of the terms of a lease or executory sales contract, or otherwise than by the voluntary act of the registered owner, the notice of transfer, as well as the joint statement hereinabove provided for, shall be signed by the executor, administrator, receiver, trustee, sheriff or other representative or successor in interest of the registered owner in lieu of such owner, and the transferee's application for registration shall be accompanied by a statement of the special facts in the premises: Provided, that the Department of Public Works may in its discretion require from the transferee, before registering such motor vehicle, such additional information respecting such involuntary loss of ownership by the former registered owner as may be satisfactory to said Department of Public Works.

Section 15. **Registration fees.** The following fee shall be paid upon the registration of each motor vehicle, in accordance with the provisions of this act, and the receipt therefor shall accompany the application hereinbefore provided for; for the registration of every motor vehicle

and every two wheel truck weighing less than one thousand pounds $5.00; for the registration of each motor vehicle a minimum of $10.00 and 50 cents additional for each 100 pounds in weight of such cars, in excess of 2,000 pounds; PROVIDED, for trucks, and for cars equipped to carry more than seven passengers, the amount of fee shall be based upon the weight of such trucks and cars when loaded to capacity, and in estimating the capacity of cars carrying more than seven passengers, the weight of each passenger shall be taken to be 150 pounds. The registration fees herein provided for shall be deemed an annual occupation tax: PROVIDED, no registration fee shall be charged for any motor vehicle owned by any city, or village of this state, for the use of the Police, Fire or other Department, nor for any motor vehicle owned and used by any school district, county, state or the United States Government. PROVIDED, FURTHER, that the official registration year shall extend in each case from January 1st to December 31st, inclusive, of the calendar year in which registration is had, but if payment of said registration fee is paid after July 1st for registration of the balance of said year the fee shall be one-half of the annual fee provided in this section.

Section 16. **Same—Payment and disposition.** All registration fees provided for in this article shall be paid to the County Treasurer of the County in which the applicant for registration resides, and such treasurer shall credit twenty-five (25%) per centum of all fees so paid to the road dragging fund of the County and it shall be used by the County Board of said County for road dragging, and equipment for road dragging, for strawing, claying or stable littering the roads and for no other purpose. The County Treasurer shall immediately transmit the remaining sum of any registration fees so collected by him to the State Treasurer to be placed in a fund to be known as the "State Highway Fund," and all money remaining in the motor vehicle fund on March 31, 1919, and all money paid into said fund after March 31, 1919, shall be immediately transferred to the State Highway Fund. The State Treasurer and State Auditor shall each keep in his books, a separate account with each county showing the amount receiver and the amount expended therefrom under this act.

Section 17. **Same—Duty of County Treasurers.** The County Treasurer shall issue receipts for all fees received under this act in duplicate to the applicant for registration, one copy of such receipt to be retained by the applicant and the other to be forwarded to the Department of Public Works, as provided in this article. It shall be the duty of the County Treasurers to keep a record of all motor vehicle owners in their respective Counties. It shall be the duty of the County Treasurer to send notices to the owners of motor vehicles of the time of the expiration of their paid registration period and the fact that they may lose their registration number if not renewed. Said notice shall be sent not more than ten days before the expiration of such period.

Section 18. **State Highway Fund appropriation—how expended.** Said State Highway Fund shall be used on the State Highway System in such manner that each County shall receive the benefit of all money paid into said fund from such County; and there is hereby appropriated to be expended as provided by law under the direction of the Department of Public Works, for and during the biennium ending March 31, 1921, all the money now in the State Highway Fund or that may come into said fund at any time during the said biennium and immediately upon the taking effect of this Article, the Secretary of State shall transfer to the Department of Public Works, all records, books, blanks, reports, motor vehicle numbers, and all other appurtenances and property pertaining to motor vehicles.

Section 19. **Registration by manufacturers or dealers in motor vehicles.** Each manufacturer of, or dealer in, motor vehicles, doing business in this State, may register one motor vehicle of each class manufactured by or dealt in by him, and if a number, to be furnished by the Department of Public Works, corresponding to the registration number issued to such manufacturer or dealer, is displayed, as provided in Section 22, of this act, on every vehicle in the class for which it is issued, while such vehicle is being operated on the highways by such manufacturer or dealer, or his agents or representatives, it shall be deemed a sufficient compliance with this article. PROVIDED, that duplicate numbers may be secured at a charge of $1.00 each. PROVIDED, HOWEVER, that the purchaser of a new vehicle may act as the agent of the dealer from whom such vehicle was purchased and carry such dealer's registration number for a period not exceeding ten days; and Provided Further, nothing in this Section shall be construed to apply to a motor vehicle operated by a manufacturer or dealer for his private use or for hire.

Section 20. **Same—Classification for registration purposes.** In construing the provisions of the last preceding section, electrically driven motor vehicles shall constitute a class, those propelled by steam, a class; those propelled by gasoline explosive type engines, a class, and those truck or cars having a carrying capacity of more than 4,000 pounds, a class; PROVIDED, such manufacturer or dealer shall comply in all other respects with the provisions of this article.

Section 21. **Same—Separate registrations required for branches or sub-agencies.** Whenever a manufacturer or dealer shall maintain a branch or sub-agency, he shall apply for a separate registration for such branch or sub-agency, and shall pay therefor the fees provided in Section 15, of this article, for the registration of motor vehicles owned by, or under the control of, a manufacturer or dealer, and the determination of the Department of Public Works upon the question whether any establishment constitutes a branch or sub-agency, within the intent of this articles shall be conclusive. Provided further, that no manufacturer or dealer or any employee of such manufacturer or dealer, shall cause or permit the display or other use of any number plates, seal or certificates

of registration, which may have been issued to such manufacturer or dealer, hereinbefore provided for, excepting upon motor vehicles owned by such manufacturer or dealer within the meaning and intent of this act.

Section 22. **Unlawful to operate motor vehicle without plate attached.** Except as in this act otherwise provided, no person shall operate or drive, or cause to be operated or driven, a motor vehicle on the public highways, unless such vehicle shall at all times have displayed the number plate on the back thereof, furnished for it as hereinbefore provided, together with registration seal furnished by the Department of Public Works, and said registration seal shall be securely attached to the number plate in the space provided thereon for that purpose; in all cases such number plate shall be securely fastened to the motor vehicle so as to prevent such plate from swinging, and at a minimum distance of 16 inches from the ground. No person shall attach to or display on such motor vehicle, any number plate or registration seal or certificate, other than as assigned to it for the current year, or a fictitious or altered number plate, seal or registration certificate, or a number plate or registration certificate that shall have been canceled by the Department of Public Works.

Section 23. **Identification marks to be kept clear and distinct—duplicates.** All letters, numbers, seals, printing, writing and other identification marks, upon such plate, seal and certificate, shall be kept clear and distinct and free from grease, dust or other blurring matter, so that they shall be plainly visible at all times during daylight and under artificial light in the night time; PROVIDED that in case any such plate, seal or certificate of registration shall be lost, mutilated, or shall have become illegible, the person to whom such plate, seal and certificate shall have been furnished, shall immediately apply to the Department of Public Works for a duplicate thereof, accompanying his application with a fee of $1.00.

Section 24. **Unlawful to operate motor vehicles without registration.** No person shall operate or drive a motor vehicle on the public highways unless such vehicle shall at all times carry in or upon it, subject to inspection by any peace officer, the registration certificate furnished for it as hereinbefore provided, which in the case of an automobile shall be fixed in the container furnished by the Department of Public Works, in plain sight in the driver's compartment, and which in the case of a motorcycle shall be carried either in plain sight, affixed to said motorcycle, or in a tool bag or some convenient receptacle attached to said motorcycle.

Section 25. **County Treasurers to be agents for registration purposes.** The Department of Public Works, shall designate and appoint the treasurers of the various counties to be agents of the said board in such counties, for the purpose of registering motor vehicles, and for the granting of licenses to applicants, subject to the requirements of

this article, and in accordance with such rules and regulations as shall be imposed by the Department of Public Works: PROVIDED, upon the transfer of ownership of any motor vehicle the title thereto shall not pass until the certificate of registration properly executed by the transferor and by the transferee, shall be filed in the Department of Public Works as required in this act.

Section 26. **Power of local authorities to regulate use and operation of motor vehicles.** Nothing contained in the provisions of this act shall be construed to limit the power of local authorities to make, enforce, and maintain any ordinances, rules or regulations, in addition to the provisions affecting motor vehicles.

Section 27. **Minor under sixteen or intoxicated person—not operate.** It shall be unlawful for any person under sixteen years of age, or for any intoxicated person to operate a motor vehicle, and any owner, dealer, or manufacturer of motor vehicles who permits a person under sixteen years of age or any intoxicated person to operate a motor vehicle shall be deemed guilty of a misdemeanor and shall be punished as hereinafter provided for violation of the provisions of this article.

Section 28. **Speed rate.** No person shall operate a motor vehicle on anyhighway outside of a city or village at a rate of speed greater than is reasonable and proper, having regard for the traffic and use of the road and the condition of the road, nor at a rate of speed such as to endanger the life or limb of any person, nor in any case at a rate of speed exceeding thirty-five miles per hour; and within any city or village no motor vehicle shall be operated at a rate of speed greater than is reasonable and proper having regard of the traffic and use of the road and the condition of the road, nor at a rate of speed such as to endanger the life or limb of any person. Upon approaching any intersection of highways or a bridge, or a sharp curve, or a steep descent, or another vehicle, or an animal, or person, outside of any village or city, the person operating a motor vehicle shall reduce the speed of such vehicle to a rate not exceeding fifteen miles an hour and shall not exceed such speed until entirely past such intersection, bridge, curve, descent, vehicle, animal or person. Upon approaching any place where passengers are getting on or off street cars every person operating a motor vehicle shall bring such vehicle to a full stop and shall not again start until said street cars have started. Provided, in cities or villages where provisions shall have been made by ordinances for safety zones where street cars stop, and when such zones are distinctly marked on the street, persons operating motor vehicles may pass outside such safety zone without stopping; and Provided further, the speed limit in this section shall not apply to physicians, or surgeons, or police, or fire vehicles, or ambulances when answering emergency calls demanding excessive speed.

Section 29. **Stop and aid driver of horse.** Any person operating a motor vehicle shall at request, or on signal by putting up the hand

from a person riding or driving a restive horse or other draught or domestic animal, bring such motor vehicle immediately to a stop, and if traveling in the opposite direction, remain stationary so long as may be reasonable to allow such horse or animal to pass, and if traveling in the same direction use reasonable caution in passing such horse, or animals; and the operator or occupant of any motor vehicle shall render necessary assistance to the party having in charge such horse, or other draught animal in so passing. Whenever any person traveling with any vehicle or conveyance on any road in this state shall overtake another vehicle or conveyance traveling in the same direction and shall by sound or call indicate to the driver thereof his or her desire to pass, it shall be the duty of the driver of the vehicle or conveyance in front, if the nature of the ground or the condition of his load will permit, to promptly turn to the right of the center of the road, and the driver of the vehicle or conveyance behind shall then turn to the left of the center of the road and pass without interfering or interrupting, and the driver of said vehicle or conveyance passing shall not return to the center of the road until at least thirty feet ahead of the vehicle or conveyance passed.

Section 30. **Collision—duty of persons causing.** Whenever an automobile, motorcycle, or other motor vehicle regardless of the power by which the same may be drawn or propelled, strikes any person, or collides with a vehicle containing a person, the driver of, and all persons in such automobile, motorcycle, or other motor vehicle, who have or assume authority over such driver, shall immediately cause such autmobile, motorcycle, or other motor vehicle, to stop and shall render to the person, or to the occupants of the vehicle collided with, all necessary assistance, including the carrying of such persons or occupants to a physician or surgeon or hospital for medical or surgical treatment if required, or if such carrying is requested by the person struck, or any occupant of the vehicle struck, and such driver and person having or assuming authority over such driver, shall further give to the occupants of such vehicle or person struck the number of such automobile, motorcycle or other motor vehicle, also the name of the owner thereof and the names of the passengers or occupants in such automobile, motorcycle or other motor vehicle at the time of such striking or collision.

Section 31. **Have good brakes and lights.** Every motor vehicle while in use on public highways shall be provided with good and sufficient brakes and also with a suitable bell, horn or other signal, and shall have exhibited during the period from one hour after sunset to one hour befre sunrise one or more lamps showing white lights visible within a reasonable distance from the direction in which such vehicle is proceeding, and a red light visible from the reverse direction; provided further, it shall be unlawful to use on a vehicle of any kind operated on the public highways of this state any lighting device of over four candle-power equipped with a reflector, unless the same

be so designed, deflected, or arranged that no portion of the beam of reflected light, when measured 75 feet or more ahead of the lamps, shall rise above 42 inches from the level surface on which the vehicle stands under all conditions of the load. Spot lights shall not be used except when projecting their rays directly on the ground and at a distance not exceeding 30 feet in front of the vehicle.

Section 32. **Violation—penalty.** The violation of any of the provisions of this article shall be deemed a misdemeanor punishable by a fine of not exceeding fifty dollars for the first offense, and punishable by a fine of not less than fifty dollars nor more than one hundred dollars, or imprisonment not exceeding sixty days in the county jail for each subsequent offense, or both fine and imprisonment; PROVIDED, however, if any person operating a motor vehicle in violation of the provisions of this article shall by so doing seriously main or disfigure any person, or cause the death of any person or persons, he shall upon conviction thereof be fined not less than two hundred dollars nor more than five hundred dollars, or be imprisoned in the penitentiary for not less than one year or more than ten years.

Section 33. **Exceptions.** The provisions of this article so far as they relate to registration and fees shall not apply to motor vehicles registered prior to the taking effect of this article for the year 1919, except upon the transfer of ownership of such motor vehicle or motor vehicles, owned and operated, for a period not exceeding thirty days at a time, by non-residents of this state: PROVIDED, the owners thereof have complied with any law requiring the registration of owners of motor vehicles in the State, territory or federal districts of their residence; and provided the registration number and the initials of such state, territory or federal district shall be displayed on such vehicles substantially as provided in this act.

Section 34. **Publication of certificates of registration.** The department shall publish in pamphlet form, the second week in each calendar month in each year a complete list of all certificates of registration of motor vehicles issued during the prior month, showing the addresses of owners of motor vehicles with manufacturers name of motor vehicle abbreviated, the registration number assigned and any other information the department may deem of public interest. The first pamphlet of certificates of registration published in the year 1919 shall include all certificates of registration issued during the previous months in said year. Copies of such pamphlet shall be furnished free of charge to county attorneys, sheriffs, constables and police officers in any incorporated city or village applying therefor. Other copies shall be furnished on application at a price of ten ($10.00) dollars per year, provided that the original list furnished to other than public officials shall be furnished at a price of twenty-five ($25.00) dollars per copy.

HOUSE ROLL NO. 7617.

An Act to provide, that the United States shall aid the States in the construction of rural post roads, and for other purposes.

BE IT ENACTED BY THE SENATE AND HOUSE OF REPRESENTATIVES OF THE UNITED STATES OF AMERICA IN CONGRESS ASSEMBLED.

That the Secretary of Agriculture is authorized to co-operate with the States, through their respective State Highways Departments in the construction of rural post roads; but no money apportioned under this act to any State shall be expended therein until its legislature shall have assented to the provisions of this Act, except that until the final adjournment of the first regular session of the legislature held after the passage of this Act, the assent of the Governor of the State shall be sufficient. The Secretary of Agriculture and the State Highway Department of each State shall agree upon the roads to be constructed therein and the character and method of construction: PROVIDED, That all roads constructed under the provisions of this Act shall be free from tolls of all kinds.

Section 2. That for the purpose of this Act, the term "Rural post road" shall be construed to mean any public road over which the United States mails now are or may hereafter be transported, excluding every street and road in a place having a population, as shown by the latest available Federal census, of two thousand five hundred or more, except that portion of any such street or road along which the houses average more than two hundred feet apart; the term "State Highway Department" shall be construed to include any department of another name, or commission, or official or officials, of a State empowered, under its laws, to exercise the functions ordinarily exercised by a State Highway Department; the term "construction" shall be construed to include reconstruction and improvement of roads; "properly maintained" as used herein, shall be construed to mean the making of needed repairs and the preservation of a reasonably smooth surface considering the type of the road; but shall not be held to include extraordinary repairs, nor reconstruction; necessary bridges and culverts shall be deemed parts of the respective roads covered by the provisions of this Act.

Section 3. That for the purpose of carrying out the provisions of this Act, there is hereby appropriated, out of any money in the Treasury not otherwise appropriated for the fiscal year ending June thirtieth, nineteen hundred and seventeen, the sum of $5,000,000; for the fiscal year ending June thirtieth, nineteen hundred and eighteen, the sum of $10,000,000; for the fiscal year ending June thirtieth, nineteen hundred and nineteen, the sum of $15,000,000; for the fiscal year ending June thirtieth, nineteen hundred and twenty, the sum of $20,000,000; and for the year ending June thirtieth, nineteen hundred and twenty-one, $25,000,000. So much of the appropriated to any State for any fiscal

year as remains unexpended at the close thereof shall be available for the expenditure in that State until the close of the succeeding fiscal year, except that amounts apportioned for any fiscal year to any State which has not a State Highway Department shall be available for expenditure in that state until the close of the third fiscal year succeeding the close of the fiscal year for which such apportionment was made. Any amount apportioned under the provisions of this Act unexpended at the end of the period during which it is available for expenditure under the terms of the section shall be reapportioned within sixty days thereafter, to all the states in the same manner and on the same basis, and certified to the Secretary of the Treasury and to the State Highway Department and to the Governors of the States, having no State Highway Act for the first time; Provided, That in States where the constitution prohibits the state from engaging in any work of internal improvements, then the amount of the appropriation under this Act opportioned to any such State shall be turned over to the State Highway Department of the State or to the Governor of said State to be expended under the provisions of this Act under the rules and regulations of the Department of Agriculture, when any number of counties in any such State shall appropriate or provide the proportion or share needed to be raised in order to entitle such State to its part of the appropriation apportioned under this Act.

Section 4. That so much, not to exceed three per centum, of the appropriation for any fiscal year made by or under this Act as the Secretary of Agriculture may estimate to be necessary for administering the provisions of this Act shall be deducted for that purpose, available until expended. Within sixty days after the close of each fiscal year the Secretary of Agriculture shall determine what part, if any, of the sums theretofore deducted for administering the provisions of this Act will not be needed for that purpose and apportion such part, if any, for the fiscal year then current in the same manner and on the same basis, and certify it to the Secretary of the Treasury, and to the State Highway Departments and to the Governors of States having no State Highway Departments, in the same way as other amounts authorized by this Act to be apportioned among all the States for such current fiscal year. The Secretary of Agriculture, after making the deduction authorized by this section, shall apportion the remainder of the appropriation for each fiscal year among the several states in the following manner: One-third in he ratio which the area of each State bears to the total area of all the States; one-third in the ratio which the population of each state bears to the total population of all the States, as shown by the latest available Federal census; one-third in the ratio which the mileage of rural delivery routes and star routes in each state bears to the total mileage of rural delivery routes and star routes in all the States, at the close of the next preceding fiscal year as shown by the certificate of the Postmaster General, which he is directed to make and furnish annually to the Secretary of Agriculture.

Section 5. That within sixty days after the approval of this Act, the Secretary of Agriculture shall certify to the Secretary of the Treasury and to each State Highway Department and to the Governor of each State having no State Highway Department the sum which he has estimated to be deducted for administering the provisions of this Act and the sum which he has apportioned to each state for the fiscal year ending June thirtieth,, nineteen hundred and seventeen, and on or before January twentieth next preceding the commencement of each succeeding fiscal year shall make like certificates for such fiscal year.

Section 6. That any state desiring to avail itself of the benefits of this Act, shall by its State Highway Departments submit to the Secretary of Agriculture, project statements setting forth proposed consruction of any rural post road or roads therein. If the Secretary of Agriculture approves a project, the State Highway Department shall furnish to him such surveys, plans, specifications and estimates therefor as he may require; Provided, however, That the Secretary of Agriculture shall approve only such projects as may be substantial in character and the expenditure of funds authorized shall be applied only to such improvements. Items included for engineering, inspection, and unforseen contingencies shall not exceed ten per centum of the total estimated cost of the work. If the Secretary of Agriculture approve the plans, specifications and estimates, he shall notify the State Highway Department and immediately certify the fact to the Secreary of he Treasury. The Secretary of the Treasury shall thereupon set aside the shares of the United States payable under this Act on account of such project, which shall not exceed fifty per centum of the total estimated cost thereof. No payment of any money apportioned under this Act shall be made on any project until such statements of the project, and the plans, specifications, and estimates therefor, shall have been submitted to, and approved by the Secretary of Agriculture.

When the Secretary of Agriculture shall find that any project so approved by him has been constructed in compliance with said plans and specifications, he shall cause to be paid to the proper authority of said State the amount set aside for said project: Provided, That the Secretary of Agriculture may, at his discretion, from time to time make payments on said construction as the same progresses, but these payments including previous payments, if any, shall not be more than the United States pro ratio part of the value of the labor and materials which have been actually put into said construction in conformity to said plans and specifications; nor shall any such payment be in excess of $10,000 per mile, exclusive of the cost of bridges of more than twenty feet clear span. The construction work and labor in each state shall be done in accordance with its laws and under the direct provision of the State Highway Departments, subject to the inspection and approval of the Secretary of Agriculture and in accordance with the rules and regulations made pursuant to this Act.

The Secretary of Agriculture and the State Highway Department of each state may jointly determine at what times, and in what amounts, payments, as work progresses, shall be made under this Act. Such payments shall be made by the Secretary of the Treasury on warrants drawn by the Secretary of Agriculture, to such official or officials, or depository, as may be designated by the State Highway Department and authorized under the laws of the State to receive public funds of the state or county.

Section 7. To maintain the roads constructed under the provisions of this Act shall be the duty of the State, or their civil subdivisions, according to the laws of the several states. If at any time the Secretary of Agriculture shall find that any road in any state constructed under the provisions of this Act is not being properly maintained he shall give notice of such fact to the Highway Department of such State and if within four months from the receipt of said notice said road has not been put in a proper condition of maintenance then the Secretary of Agriculture shall thereafter refuse to approve any project for road construction in said state, or the civil subdivision thereof, as the fact may be, whose duty it is to maintain said road, until it has been put in a condition of proper maintenance.

Section 8. That there is hereby appropriated and made available until expended, out of any moneys in the National Treasury not otherwise appropriated the sum of $1,000,000 for the fiscal year ending June thirtieth, nineteen hundred and seventeen, and each fiscal year thereafter, up to and including the fiscal year ending June thirtieth, nineteen hundred and twenty-six, in all $10,000,000 to be available until expended under the supervision of the Secretary of Agriculture, upon request from the proper officers of the State, Territory or County for the survey, construction, and maintenance of roads and trails within or only partly within the national forests, when necessary for the use and development of resources upon which communities within and adjacent to the national forests are dependent; PROVIDED, That the State, Territory, or County shall enter in to a co-operative agreement with the Secretary of Agriculture for the survey, construction, and maintenance of such roads or trails upon a basis equitable to both the State, Territory, or County, and the United States; And Provided also, that the aggregate expenditures in any State, Territory, or County shall not exceed ten per centum of the value, as determined by the Secretary of Agriculture, of the timber and forage resources which are or will be available for income upon the national forest lands within the respective county or counties wherein the roads or trails will be constructed; and the Secretary of Agriculture shall make annual report to Congress of the amounts expended hereunder.

That immediately upon the execution of any co-operative agreement hereunder the Secretary of Agriculture shall notify the Secretary of the Treasury of the amount to be expended by the United States within

or adjacent to any national forest thereunder, and beginning with the next fiscal year and each fiscal year thereafter the Secretary of the Treasury shall apply from any and all revenues from such forests ten per centum thereof to reimburse the United States for expenditures made under such agreement until the whole amount advanced under such agreement shall have been returned, from the receipts from such national forest.

Section 9. That out of the appropriation made by or under this Act, the Secretary of Agriculture is authorized to employ such assistants, clerks and other persons in the city of Washington, and elsewhere to be taken from the eligible lists of the Civil Service Commission, to rent buildings outside of the city of Washington, to purchase such supplies, materials, equipment, office fixtures, and apparatus, and to incur such travel and other expense as he may deem necessary for carrying out the purposes of this Act.

Section 10. That the Secretary of Agriculture is authorized to make rules and regulations for carrying out the provisions of this Act.

Section 11. That this Act shall be in force from the date of its passage.

Approved July 11, 1916.

Public No. 156, 64th Congress.

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Bond issue 1919 ?

" " 1921 ?

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Broadcasting News

Ashkosh Garden County News.

North Platte Tribune

Morrill Mail

Keith Publishing Co. Ogallala

Lewellen Optimist

North Platte Telegraph

Kimball

Western Farmer

Bridgeport News Blade

Bridgeport Herald

Bayard Transcript

Bayard Farmers Exchange

Minatare Free Press

Mining Camera

Mining [illegible]

Scottsbluff [illegible]

" Star Herald

Mitchell [illegible]