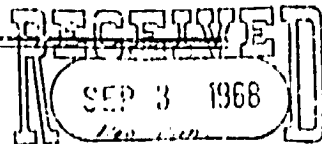


976.2

1. Considered 12.4 ^{MAY 9 1968} 1968
2. Name of Applicant CITY OF COLOMBE
3. Post Office Address _____
4. Amount of water claimed 1.0
5. Source of water supply GROUND WATER
6. Water to be used for ENTIRE MUNICIPALITY
- Acres to be irrigated _____
7. Water to be diverted and used in TRIPP county
about 3E 2S miles _____ of COLOMBE
8. Proof of Publication Received _____
Not received 1st
9. Application Approved _____
Subject to _____
Not Approved _____
Action deferr _____
10. Remarks:



No. 976-2
 Water Division No. 2 WHITE RIVER District
 (Blanks to be Filled by the Engineer for the W. R. C.)

STATE WATER RESOURCES COMM.
 PIERRE, SOUTH DAKOTA

APPLICATION FOR PERMIT

To Appropriate Water within the State of South Dakota

(NOTE—Draw a line through items not applicable.)

1. Name of applicant City of Colome
 Postoffice address Colome, County Tripp, State South Dakota

I. If a corporation Municipal

(a) Name of same City of Colome

(b) Date and place of incorporation

(c) Amount of capital stock

(d) Amount paid in

(e) Names and addresses of directors

(NOTE—A certified copy of articles of incorporation must accompany the application.)

II. Method of accomplishing the work and financial resources of the applicant:

(a) Method of accomplishing work (Whether by contract, employment of others, or by direct labor)

(b) Cash on hand, \$

(c) Treasury stock, \$

(d) Bonds to be issued, \$

(e) Other resources, \$

2. Name of diversion work City Wells

3. Amount of water claimed One cubic feet per second 150 GPM 646,560 gallons per day

4. Source of water supply Underground aquifer

5. Location of point of diversion S. 1/2 Sec. 1; S. 1/2 Sec. 2; N. 1/2 Sec. 11; N. 1/2 Sec. 12; Township 97 N., Range 76 W. on Tripp County.

6. Annual period or periods during which water is to be used year around

7. To be used for:

I. Irrigation or domestic use: Gravity, overhead sprinkling or combination system?

(a) Number of acres to be irrigated acres.

(b) Legal subdivisions to be irrigated

(NOTE—A list of lands to be irrigated, giving each subdivision and fraction with acreage thereof, should be written here, or may be appended as a part of this application. Same must also be shown on accompanying map.)

(c) Statement as to domestic use (giving location, etc.) All municipal uses for City of

Colome for present and future use.

II. Stockwatering, mining, milling, power, fish culture, fire protection and public recreation:

(a) Nature of use
 Name any of the above uses claimed

(b) Amount of power to be generated horse power.

Amount claimed for engine cooling

(c) Location of plant

(d) Method of developing power

(e) Point where water will be returned to stream

MAP No 844-2

8. Estimated cost of work:

(a) Head Gates, \$.....

(b) Pumping plant, \$.....

(c) Fluming, \$.....

(d) Canal-earth, \$.....

Rock, \$.....

(e) Other structures \$.....

Total, \$.....

9. Description of diversion works:

I. Nature of works: (Reservoir, dam, ditch, flume, pumping plant, etc.)

II. Dimensions of works:

(a) Dam: Height feet; length at bottom feet; length at top

..... feet; thickness at bottom feet; thickness at top

feet; slope at front water face; slope at back face

material used in construction.

(b) Reservoir: Capacity when filled acre feet. Surface area at highwater mark acres.

DEPTH AT OUTLET-Feet	SURFACE AREA AT EACH DEPTH AT OUTLET--ACRES	FEET	ACRE-Feet CAPACITY

(c)* Head gate: Width feet; height

Material

(d) Canal: Total length miles.

LOCATION BELOW HEADGATE	DEPTH	BOTTOM WIDTH	WIDTH AT WATER-LINE	GRADE PER MILE
At Mile	 feet	 feet	 feet	 feet
At Mile	 feet	 feet	 feet	 feet
At Mile	 feet	 feet	 feet	 feet
At Mile	 feet	 feet	 feet	 feet
At Mile	 feet	 feet	 feet	 feet
At Mile	 feet	 feet	 feet	 feet

(Give dimensions where reductions in size are made.)

10. Time required for completion of work 5 years.

11. Time required for complete application of water to the proposed beneficial use 5 years.

12. Choice of newspaper for publication of notice of intention to appropriate

Winner Advocate, Winner, South Dakota

STATE OF SOUTH DAKOTA

County of
 I, E. E. Johnson, Mayor of Winner, being first duly sworn
 on my oath depose and say: That my relation to the above described undertaking is that of owner, that I have
 read the above foregoing statement, examined the map accompanying the same, and that I know of my own
 personal knowledge that the matters therein stated and shown are true.

Signed

Subscribed and sworn to before me this day of 1923

Notary Public, (or other qualified officer.)

R 76 W

R 75 W

T 98 N



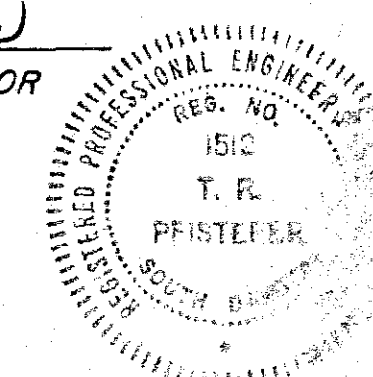
T 97 N

SURVEYOR'S CERTIFICATESTATE OF SOUTH DAKOTA SS
COUNTY OF PENNINGTON SS

I, T. R. PFISTERER, A REGISTERED LAND SURVEYOR WITHIN THE STATE OF SOUTH DAKOTA DO HEREBY CERTIFY THAT AT THE REQUEST OF THE CITY OF COLOME I DID SURVEY THE TRACTS OF LAND WITHIN THE OWNERSHIP BOUNDARIES FOR WHICH APPLICATION FOR A FUTURE WATER RIGHT TO WITHDRAW UNDERGROUND WATERS FROM UNDER THESE TRACTS FOR MUNICIPAL PURPOSES AND THAT THIS MAP IS A TRUE REPRESENTATION THEREOF.

IN WITNESS WHEREOF, I HAVE HEREUNTO SET MY HAND AND SEAL THIS 30 DAY OF August, A.D., 1968

T. R. Pfisterer
REGISTERED LAND SURVEYOR

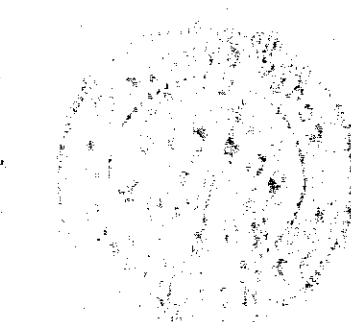
ACKNOWLEDGMENT OF SURVEYORSTATE OF SOUTH DAKOTA SS
COUNTY OF PENNINGTON SS

ON THIS DAY, BEFORE ME, THE UNDERSIGNED, A NOTARY PUBLIC WITHIN AND FOR THE STATE AND COUNTY AFORESAID, PERSONALLY APPEAR T. R. PFISTERER, KNOWN TO ME TO BE THE PERSON WHO EXECUTED THE FOREGOING SURVEYOR'S CERTIFICATE AND ACKNOWLEDGED TO ME THAT HE EXECUTED THE SAME.

WITNESS MY HAND AND SEAL THIS 30 DAY OF AUGUST 1968.

Loipe Cordes
NOTARY PUBLIC

MY COMMISSION EXPIRES
NOVEMBER 30, 1968



REV.	DATE	DESCRIPTION	MADE	APPR.
J. T. BANNER & ASSOCIATES, INC. CONSULTING ENGINEERS SOUTH CITY, SOUTH DAKOTA				
WATER RIGHTS MAP CITY OF COLOME SOUTH DAKOTA				
DRAWN: B. A. D.		APPROVED: _____ DATE: _____		
DESIGNED:		APPROVED: _____ DATE: _____		
CHECKED: T. R. P.		APPROVED: _____ DATE: _____ FOR J. T. BANNER & ASSOC., INC.		
DATE: 30 AUG 68		SCALE: SHEET _____ OF _____		DRAWING NUMBER

Remarks by State Water Resources Commission: 1. THIS PERMIT AUTHORIZES THE CONSTRUCTION

AND DIVERSION OF WATER FROM A SHALLOW GROUNDWATER WELL LOCATED N54°36'E,
1,214.9 FEET FROM THE SW CORNER SECTION 1, T97N, R16W; 2. THIS PERMIT AUTHORIZES
THE CONSTRUCTION AND DIVERSION OF WATER FROM A STAFFED WELL, TO BE LOCATED
APPROXIMATELY 100 FEET SOUTH OF ABOVE MENTIONED WELL; 3. THIS PERMIT AUTHORIZES
FUTURE CONSTRUCTION OF A WELL INTO THE SAME AQUIFER, AFTER PROPER ARRANGEMENTS HAVE
BEEN MADE WITH THE OWNER OF THE LAND ON WHICH SUCH WELL WOULD BE LOCATED;
4. THE TOTAL OF THE DIVERSION RATE AUTHORIZED UNDER THIS PERMIT IS 976-2
IS 1/2 C.F.S. (50 G.P.M.) OF WATER.

STATE OF SOUTH DAKOTA

County of

HUGHES

ss.

Pierre, South Dakota

MAY 29, 1969

This is to certify that the foregoing application was received by the Commission at 1:00 o'clock

P.m. upon the 3RD day of SEPTEMBER, 1968

State Water Resources Commission

By:

Burton Jones
for Chief Engineer, Executive Officer

Number of permit 976-2

Date of first receipt of application SEPTEMBER 3, 1968

Date of return to applicant for correction, amendments or changes required as follows: _____, 19____

Date of receipt of corrected application _____, 19____

Date from which applicant may claim right SEPTEMBER 3, 1968

Approved MAY 7, 1969 Recorded in Book 11 Page 9

This is to certify that we have examined the foregoing application for a permit to appropriate water of the State of South Dakota and we hereby grant the same as stated herein, subject, however, to the following limitations and conditions:

1st. The equivalent of at least one-fifth of the work above specified is to be completed on or before

NOVEMBER 7, 1971

2nd. The whole of said work is to be completed on or before MAY 7, 1974

3rd. The limit of time for proof of beneficial use of water appropriated in accordance herewith is

MAY 7, 1974

4th. The water appropriated shall be used for the purpose of MUNICIPAL

5th. The prior right of all persons who, by compliance with the laws of the State of South Dakota, have acquired a right to the use of water must not be injuriously affected by this appropriation.

6th. The amount of the appropriation herein granted shall not exceed 0.33 cubic feet per second; neither shall it exceed the capacity of the above described system of diversion works, nor the least amount of water that experience may hereafter indicate as necessary for the production of crops in the exercise of the best husbandry and further, said appropriation must be limited to not more than one-seventieth (1/70) of one cubic foot of water per second of time for each acre of land to which water is actually

USED FOR MUNICIPAL PURPOSES

and beneficially applied for irrigation on or before MAY 7, 1974; said water to be used during the following described annual period:

CONTINUOUSLY

Witness my hand this

29TH

day of

MAY

1969

State Water Resources Commission

By:

James G. Jones

Chief Engineer, Executive Officer

Certificate of Construction Issued _____, 19____

Water License Issued _____, 19____

WATER LICENSE NO. 976-2.

(1) WHEREAS, On the 2nd day of September A. D. 1968
City of Colome
 made Water Right Application No. 976-2 for a permit to use .33 cubic feet per second of the waters
 of Ground Water
 County of Tripp State of South Dakota, for Municipal

purposes; and

(2) WHEREAS, On the 29th day of May A. D. 1969
 Permit No. 976-2 with a date of priority of September 3, 1968
 was issued to said applicant for the diversion of said water, and provided for the completion of construction of the water
 supply system therein described on or before the 7th day of May A. D. 1974 and for the
 application to beneficial use of said water on or before the 7th day of May A. D. 1974

and;

(3) WHEREAS, It is hereby certified that the applicant has complied with the provisions of the laws of the State of South Dakota
 relating to completion of the construction of the water supply system and is entitled to divert .33 cubic feet
 per second of water for beneficial use and,

(4) WHEREAS, It is hereby certified that the applicant has complied with the provisions of the laws of the State of South Dakota
 relating to the application of water to beneficial use of the following extent,

to be used for municipal purposes for the City of Colome

(5) NOW, THEREFORE, By the virtue of the authority vested in us by the laws of the State of South Dakota, We hereby grant and confirm to City of Colome

_____ of _____
the holder _____ and owner _____ of said permit No. 976-2 a water right, dating from September 3, 1961
to use of .33 cubic feet per second of the waters
of Groundwater

In the County of Tripp and State of South Dakota, or so much thereof as may be necessary for the
purposes hereinafter mentioned, to be diverted at _____

Two wells, #1 - 1140' East & 840' North of SW Corner; Well #2 - 1000' East
& 470' North of SW Corner, both in Section 1-T97N-R76W

and ~~conveyance~~ conducted thru the Municipal water system

for the purpose of Municipal use for City of Colome

Subject to any limitations listed in Water Right Permit No. 976-2 and subject to the laws of the State of South Dakota.

WITNESS, My hand and seal of our office at Pierre, South Dakota

this 2 day of May A. D.

Nineteen Hundred and Seventy-eight

WATER RIGHTS COMMISSION

By:

John Hatch
Chief Engineer, Executive Officer John Hatch

Form 15.

Permit No. 976-2

Water Diversion No. 2 White River Water District

CERTIFICATE OF CONSTRUCTION

This is to Certify, That City of Colome

_____ the holder _____ of
Permit No. 976-2, issued upon Application No. 976-2, bearing date of priority of September 3,
1968 authorizing the diversion of .33 cu. ft. per second of the waters of _____
Groundwater County of Tripp, State of South Dakota at _____
Two wells, #1 - 1140' East & 640' North of SW Corner; Well #2 -
1000' East & 470' North of SW Corner, both in section 1-T97N-R76W
_____ for municipal

_____ purposes, he ^B complied with the provisions of the laws of the State of South Dakota relating to proof of
completion of the works of diversion set out and described in said Permit; that said works are found in satisfactory
condition for diverting and conveying to the place of intended use .22 cu. ft. per second of water.

Date May 2, 1978

By: WATER RIGHTS COMMISSION
John Hatch
JOHN HATCH, Chief Engineer

on or before November 7, 1968
(First Publication)

APPROPRIATION OF WATER

Office of State Water Resources Commission,

Pierre, S. Dak., October 1, 1968

Notice is hereby given that the City of Colome whose postoffice address is Colome S. Dak., has made an application in accordance with the provisions of the water laws of South Dakota for a permit to appropriate for future use 1.00 cubic feet of water per second of time from ~~any~~ ground water through the city wells ~~area~~ the point of diversion of water is to be ~~anywhere~~ the 34 Section 1, N4, Section 2, N4, Section 11 and N4, Section 12, ~~XXXXXXXXXXXX~~ In the ~~XXXXXX~~ ~~XXXXXXXXXX~~ Twp. 97N Range 76W Said water to be used for the purpose of providing ~~XXXXXXXXXXXX~~ ~~XXXXXXXXXXXX~~ supplies for future development by the City of Colome.

~~XXXXXX~~ ~~XXXXXXXXXX~~

This application will be taken up by the State Water Resources Commission at their office at Pierre for consideration upon the 4th day of December, 1968, at 2:00 P. M. All interested persons may appear and be heard.

Appropriate action will be taken by the Water Resources Commission after suitable time has elapsed for the consideration of any or all information presented.

cc: City of Colome

State Water Resources Commission

By:

Chief-Engineer, Executive-Officer
Burton F. Jones
Water Rights Specialist

AFFIDAVIT OF PUBLICATION

STATE OF SOUTH DAKOTA, County of Tripp--ss.

D. L. JOHANNSEN

of said county being first duly sworn, on oath says that he is the publisher of the

WINNER ADVOCATE

a weekly newspaper printed and published in Winner, said county of Tripp, and has full and personal knowledge of all the facts herein stated that said newspaper is a legal newspaper and has a bona fide circulation of at least two hundred copies weekly and has been published within said County for fifty-two successive weeks prior to the publication of the notice herein mentioned, and was printed wholly or in part in an office maintained at said place of publication;

that the Appropriation of
Water Resources

a printed copy of which, taken from the paper in which the same was published, is attached to this sheet, and is made a part of this affidavit, was published in said newspaper at least once in each week

for four successive weeks, on the day of each week on which said newspaper was regularly published, to-wit:

<u>Oct. 3 1968</u>	<u>100</u>
<u>Oct. 10 1968</u>	<u>100</u>
<u>Oct. 17 1968</u>	<u>100</u>
<u>Oct. 24 1968</u>	<u>100</u>
<u>190</u>	<u>100</u>
<u>190</u>	<u>100</u>

That the full amount of the fees for the publication

of the annexed notice is \$ 15.50

D. L. Johannsen

Subscribed and sworn to before me this 21

day of October, 1968

Altona Bluff
Notary Public.

County of Tripp, South Dakota

No. 073-2
APPROPRIATION OF WATER
Office of State Water Resources
Commission
Pierre, S. Dak., October 1, 1968
Notice is hereby given that the City of Colome, whose postoffice address is Colome, S. Dak., has made an application in accordance with the provisions of the water laws of South Dakota for a permit to appropriate for future use 1.00 cubic feet of water per second of time from ground water through the city wells in the area of diversion is to be the S1/2 Section 1, S1/2 Section 2, N1/2 Section 11 and N1/2 Section 12 in the Twp. 97N, Range 70W. Said water to be used for the purpose of providing supplies for future development by the City of Colome, S. Dak.
This application will be taken up by the State Water Resources Commission at their office at Pierre for consideration upon the 4th day of December, 1968, at 2:00 P.M. All interested persons may appear and be heard.
Appropriate action will be taken by the Water Resources Commission after suitable time has elapsed for the consideration of any or all information presented.
State Water Resources Commission
By: Burton F. Jones
Water Rights Specialist (40-13)

P E T I T I O N

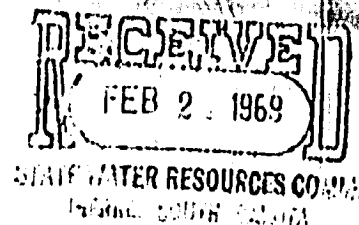
We the undersigned freehold land owners of Tripp County South Dakota, hereby object to the appropriation of the City of Colome, South Dakota, for a permit to appropriate for future use, 1.00 cubic feet of water per second in the area described as the South Half of Section One, the South Half of Section Two, the North Half of Section Eleven and the North Half of Section Twelve in Township 97, North Range 76, West Tripp County, South Dakota:

NAME	ADDRESS	DATE
Mike Mantley	Colome S. Dak	Nov 21, 1968
Lloyd McCabe	Winnipeg S. D.	Nov 22, 1968
William Kern	Colome S. D.	Nov 26, 1968
Robert Clenden	Colome, S. Dak	Nov 29, 1968
Helmer Herman	Colome, S. Dak.	Nov 28, 1968
Francis Sand	Colome S. Dak.	Nov 30, 1968
W. A. Herman	Canton, S. Dak.	Nov 30, 1968
Margella Herman	Canton, S. Dak.	Nov 30, 1968
Albert Herman	Colome S. D.	Nov 30, 1968
James H. H.		
James H. H.	Colome S. Dak.	Nov 30, 1968
Richard E. H.	Colome, S. D.	Nov 30, 1968
Stanley Ewing	Winnipeg S. D.	Dec 3, 1968

CITY OF COLOME
COLOME, SOUTH DAKOTA

February 21, 1969

Mr. J. W. Grimes
Chief Engineer & Executive Officer
Water Resources Commission
Pierre, South Dakota 57501



Dear Mr. Grimes:

I am enclosing a map of McNeely Township, Tripp County, South Dakota, locating on said map the new well that has been developed in September of 1968 for the Town of Colome to furnish an adequate water supply for the residents of Colome. I am also outlining the area which we feel would be most appropriate for water rights to supply the amount of water needed for the Colome project.

You received recently a letter from Mr. Lynn S. Hedges, Research Geologist for the University of South Dakota, recommending 240 acres for water rights. Mr. Hedges' reason for recommending an additional 80 acres is that it would extend the water rights to a more adequate water supply in the aquifer where our well is now located.

I would appreciate very much your considering the additional 80 acres, and sincerely hope that you can extend the water rights to include a portion further South and more centrally located in the aquifer. In so doing, the entire amount of water rights would be located on the individual's land from which we purchased the land and on which the present well is located.

Very sincerely yours,

A handwritten signature in dark ink, appearing to read "K. E. Johnson".

K. E. Johnson - Mayor
CITY OF COLOME

KEJ/jm

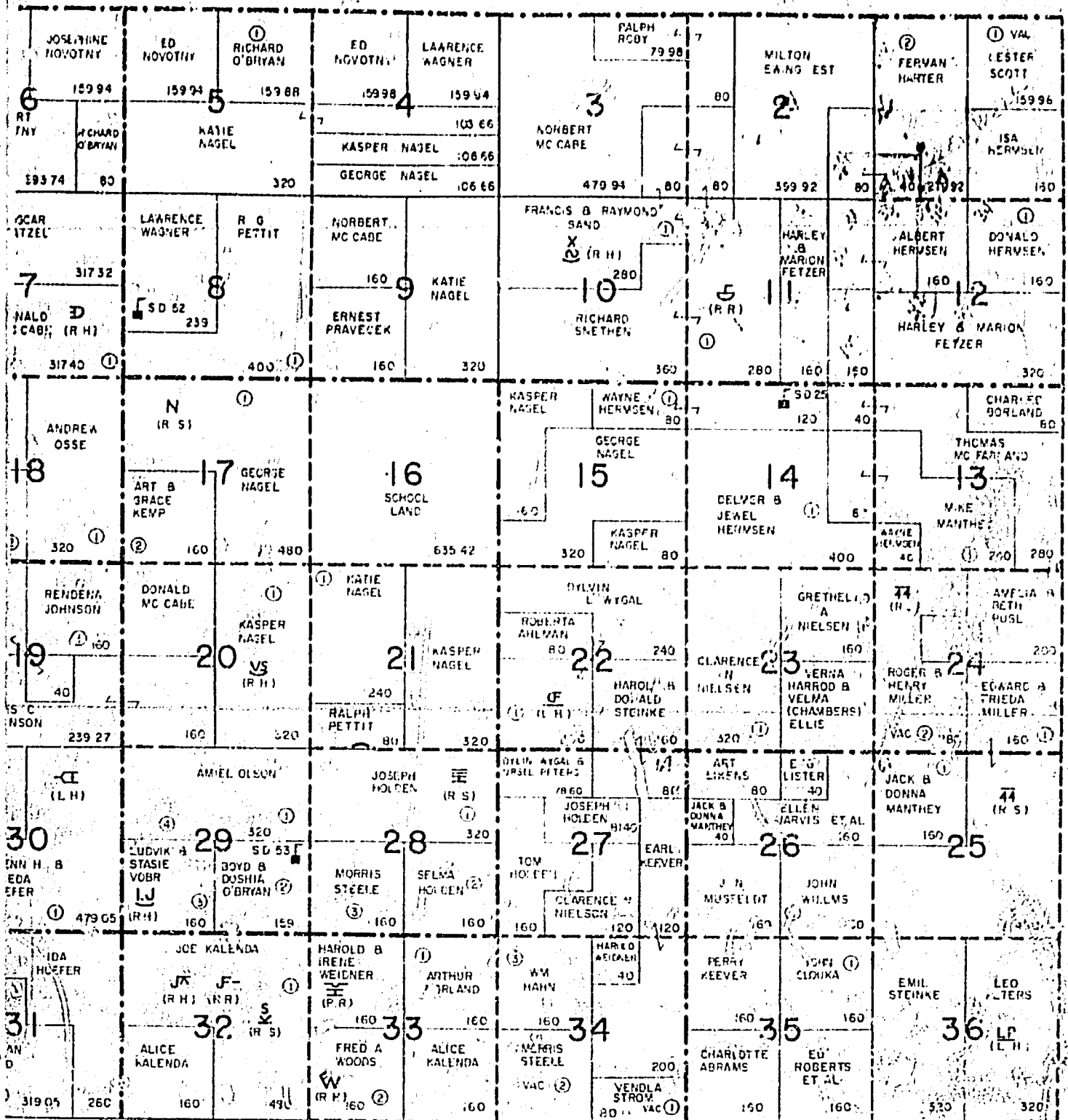
Enc. (1)

MC NEELY
CODE-Q

NSHIP 97 NORTH

RANGE 76 WEST

WILSON 1A2



LAKE 1A2



SOUTH DAKOTA GEOLOGICAL SURVEY

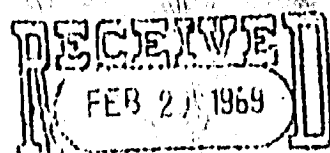
Science Center, University

Vermillion, South Dakota 57069

624-4471

February 19, 1969

Mr. J. W. Grimes
Chief Engineer and Executive Officer
Water Resources Commission
Pierre, South Dakota 57501



STATE WATER RESOURCES COMMISSION
PIERRE, S.D.

Dear Mr. Grimes:

Mr. Ken Johnson, Mayor of Colome, South Dakota, has contacted me with regard to applying for water-rights for the new well field west of Colome.

As you know, the town has installed a new well in the area. For practical reasons the new well was drilled about one-half mile north of the best part of the aquifer in an area fairly close to the margin of the aquifer.

Mr. Johnson informs me that you advised securing water rights on a 160-acre plot. Mr. Johnson has consulted with us about the location of the 160-acre plot and we concur with his choice. From your point of view, I am wondering about the possibility of securing water rights for an additional 80 acres adjoining the southwest corner of the 160-acre plot. This would raise the request for water rights to a 240-acre tract instead of 180 acres. With the additional 80 acres the City would then have water rights for part of the area which contains the best part of the aquifer and should fully protect them in the event their well field has to be expanded to the southwest to take advantage of the better part of the aquifer.

Mr. Johnson would appreciate your ideas on the feasibility of securing water rights on the 240-acre tract as indicated above.

Sincerely yours,

Lynn S. Hedges
Research Geologist
For the State Geologist

LSH:mlk

cc: Mr. Ken Johnson

976-2

COMMISSION

John M. Garhart, Spearfish
Lester Bruce Parker
Carl Cronin, Gettysburg
Lawson A. Davis, Belle Fourche
Milton E. Fisher, Milbank
Richard Lommen, Hot Springs
Clarence D. Mortenson, Hayes
Dick Fisher, Cieshard

WATER RESOURCES COMMISSION

State Office Building

PIERRE, SOUTH DAKOTA 57501

1. W. GRIFFIN

Chief Engineer
and
Executive Director

PHONE
224-5911 Ext. 343
Area Code 605

February 24, 1969

Mr. Lynn S. Hedges
Research Geologist
State Geological Survey
Science Center, University
Vermillion, S.D. 57069

Dear Mr. Hedges:

Reference is made to your letter of February 19, 1969 discussing the possibility of the City of Colome securing water rights on a 240 acre tract of land.

On September 3, 1968 the City of Colome made a "Future Use" Water Right Application No. 976-2 requesting that a water supply of 1.0 (450 gpm) cubic feet per second be reserved for the cities future use. The City of Colome proposed that an area of two square miles be reserved to furnish the requested 1 c.f.s. of water.

On December 4th 1968 a public hearing was held by the Water Resources Commission in Pierre to consider the Water Right Application No. 976-2 of the City of Colome. Some of the owners of the proposed reserved land were present to express their concern.

At the public hearing the following items of information were considered,

1. The existing water supply of colome, from several wells was limited to about 17 g.p.m. due to the poor capacities of the wells.

Mr. Lynn S. Hedges

Page 2.

February 24, 1969

2. A new well had been drilled with an indicated capacity of about 30 g.p.m.
3. Another well should be drilled as the City of Colome would need a total capacity of about 50 g.p.m.
4. Under the existing policy of the Water Resources Commission the City of Colome could obtain water rights for up to 150 g.p.m. Fifty gallon per minute for actual use plus a reserve of 100 g.p.m.
5. There was some indication that wells located on one 20 acre tract could supply the required 150 g.p.m.

The Water Resources Commission deferred action on Water Right Application 976-2 pending investigation by the Commission Staff. We will check this in the field when weather conditions improve.

Sincerely,

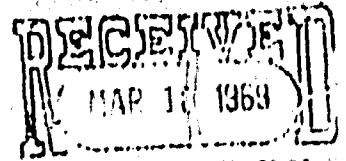
JWG/DD/bw

cc: Mr. Ken Johnson, Mayor, City of Colome, S.D.

CITY OF COLOME

COLOME, SOUTH DAKOTA

March 7, 1969



SOUTH DAKOTA WATER RESOURCES COMMISSION
PIERRE, SOUTH DAKOTA

Mr. J. W. Grimes
Chief Engineer & Executive Officer
South Dakota Water Resources Commission
State Office Building
Pierre, South Dakota 57501

Dear Mr. Grimes:

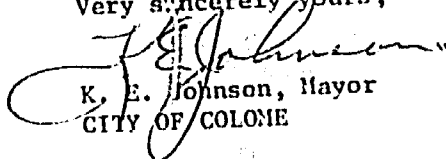
I am aware of your hesitating to grant water rights for the Town of Colome prior to an investigation, due to the objection which was evidenced by individuals being present at the hearing; however, I can assure you that many who signed the Petition and some who appeared in person did not have a full understanding of the situation before they signed the Petition or before they appeared in person at the hearing.

I have visited with two of the individuals who were at the hearing, and they indicated that they did not know both sides of the situation, and that they are not now against the granting of water rights to the Town of Colome. I feel certain that those appearing and those signing the Petition did not have a full knowledge of the situation, or they would not have signed the Petition and would not have appeared in person at the hearing.

I will be glad to work with your investigating committee and assist them in obtaining the full facts and information, as well as the true feeling of those who appeared at the hearing and signed the Petition. I sincerely hope that we can obtain in the very near future the water rights which are necessary for us to obtain, as we are voting on the bond issue the latter part of this month, and the failure to have the water rights could influence the vote on the bonds.

Please feel free to contact me if there is any information which you desire concerning the granting of the water rights.

Very sincerely yours,


K. E. Johnson, Mayor
CITY OF COLOME

KEJ/jm

976-2

2/12/76

City of Columbia, Iowa

New Road in charge of water

976-2

2/12/76

City of Columbia, Iowa
 Well #2 Water level 2 ft below the
 water level.
 Motor: U.S. Electrical Motor
 Yellow Shaft. 3 H.P.
 Model 5F1-15 Serial # P4246875
 115/230 volts.
 Pump: Floway -
 Size 6. ; Type JOL1
 Serial # 69-5716-1 - 3 H.P.
 50 GPM - 1750 RPM -
 H.P. 115.
 Pipes: Asbestos Cement 6" dia to 10'
 well field. Gal. Iron from 10' to 15' city
 6" dia.

Well #1. Water level 2.0 ft below
 water level.

Motor: Linear Well #2
 Serial # P42446872
 Pump: Linear #2
 Serial # 69 5716 - 2.

2 wells dug at same time
 one is 50' deep setting on shale
 one is 55' deep setting on shale

8" steel casing
 Turbine Pumps
 One pump set at 30 gpm
 one pump set at 40 gpm
 pumps alternate running
 Total of two is 70 gpm. Both will
 shut down when water pump down 15 ft
 Thorpe Drillers - Cedar Rapids & Sioux
 City Iowa.

Station. Steel suggested pipe 28 ft/well
 8" diameter.

Permit No. 976-2Water Division 2 White River Water DistrictREPORT OF EXAMINATION OF WORKS
AND/OR APPLICATION OF WATER TO BENEFICIAL USE

TO: Water Resources Commission, State Office Building No. 2, Pierre, South Dakota 57501

I have this day made a thorough examination of the water use system constructed by City of
Colome of Colome, S. Dak. holder
of Permit No. 9762, bearing date of priority of September 3, 1968
authorizing the diversion of .33 cu. ft. per second of the waters of Ground Waters
for Municipal purposes, in Tripp County.

I have to report on the condition of the same as follows:

The Water Use System consists of,

A. Works used to divert the water: Well #1. Pump - Floway, size 6, Type JOLB,
Serial # 69 5716-2, 3 HP, 50 GPM, 1750 RPM, H.D. 115,
Motor 115-Electrical, Helix shaft, 3 HP Model SF 115, Serial # P4246572
Well #2. Pump - same as on well #1, Serial # 69 5716-1,
Motor - same as on well #1 Serial # P4246575

B. Works used to transport water to place of use,
Pipes - 6 inch dia. Asbestos Cement to old well field, then
6 inch dia cast iron pipe from old field to city water
tower.

C. Works used to apply water to beneficial use.
Municipal Water System

The system is in the following condition: Good

The point of diversion is located Well #1 located 1140 ft. East and 840 ft North
of the SW corner of section 1, T47N, R76W. Well #2 located
1000 ft East and 470 ft North of SW corner of section 1, T47N, R76W

The works are capable of diverting and conveying to the place of use .22
cu. ft. per second of water which is to be used for Municipal purposes for City of Colome.

Water has been put to beneficial use to the maximum extent as follows:

comprising a total of _____ acres of land.

Well #1 55 ft deep setting on shaleWell #2 50 ft deep setting on shale

Both wells have 8 inch dia casing - 28 ft of 8" dia.
perforated stainless steel screen.

Date March 8, 1976

Leroy J. Mernau
(Signature)

April 16, 1969

Mr. K.E. Johnson, Mayor
City of Colome
Colome, South Dakota 57528

Dear Mayor Johnson:

Enclosed for your information is a copy of the report of the Commission Staff pertaining to Water Right Application No. 976-2 - City of Colome.

If I do not receive any comments from you about this report by April 21, 1969, I will send copies to the following persons:

Stanley Ewing	Winner, South Dakota
Albert Hermesen	Colome, South Dakota
Donald Hermesen	Colome, South Dakota
Francis Sand	Colome, South Dakota
Richard Snethen	Colome, South Dakota
Ferman Harter	Colome, South Dakota

Reconsideration of this Water Right Application No. 976-2 by the Water Resources Commission would then be scheduled for 3:00 P.M., D.S.T., on May 7, 1969, at the Commission's Office in Pierre, South Dakota.

Sincerely,

J.W. GRIMES

Encl: As stated
JWG/LD/bw

At their December 1968 meeting the Commission considered Water Right Application 976-2 of the City of Colome. This application proposed the diversion of up to 1.0 cubic feet per second of water (450 gallons per minute) for the present and future use of the City of Colome. The application proposed that the water supply be developed from wells in a specified two square mile area, being the S $\frac{1}{2}$ of Sections 1 and 2 and N $\frac{1}{2}$ of Sections 11 and 12, all in T97N, R76W. (See Yellow on attached sketch map.) The area under consideration is located about four miles southwest of Colome.

Six people appeared before the Commission in opposition to approval of Water Right Application No. 976-2. They expressed their concern that such approval could tie up the land for the City of Colome and might prevent later private groundwater development on the land.

The Mayor of Colome, Mr. K.E. Johnson stated that at the present time, Colome is only able to pump a maximum of 17 gallons per minute from six existing wells. He further stated that Colome was operating on a reduced water use basis and for present demand, needed a water supply of at least 50 gallons per minute.

The Mayor stated that a test well had been drilled in the area under consideration and test pumping had indicated this well would produce up to 50 g.p.m. of water. The Mayor said they were negotiating for ownership of land containing the test well.

The Commission deferred action pending investigation by the Commission Staff.

A sketch map has been assembled and is attached to show the items and area discussed.

The test well is 43 feet deep and is cased with a eight inch diameter steel pipe with a 14 foot long screen attached to the bottom of the casing. The City of Colome intends to use this well as their main producing well. The City of Colome in its agreement with the Farm Home Administration has agreed to construct a standby well and plan to place this well about 400 feet south of the present test well.

Water Right Application 976-2 (Page 2., Continued)
City of Colome

The City of Colome has purchased a ten acre plot of land containing the existing well and the site of the proposed standby well. This is the E $\frac{1}{4}$ of the SW $\frac{1}{4}$ SW $\frac{1}{4}$, Section 1, T97N, R76W. (See light red on attached sketch.)

Commission policy has been that present and future water right rates for municipalities should not exceed three times the existing capability to divert or the existing needs of a municipality.

Future use water rights when approved do not reserve all of the ground water supply of an aquifer, or within a stated area, for a municipality. Future use rights relate to a prescribed amount of water from an aquifer. Water Rights for groundwater development from the same aquifer may be obtained by private individuals or groups.

After a future use water right is obtained, Commission procedures require that when a municipality is ready to use water under its future use right, it is first necessary for the municipality to advertise its intent to use the water and to follow the same procedure required in making new water right applications. One reason for such procedure is to protect private water right holders who have obtained their water right after a municipal future use water right has been approved.

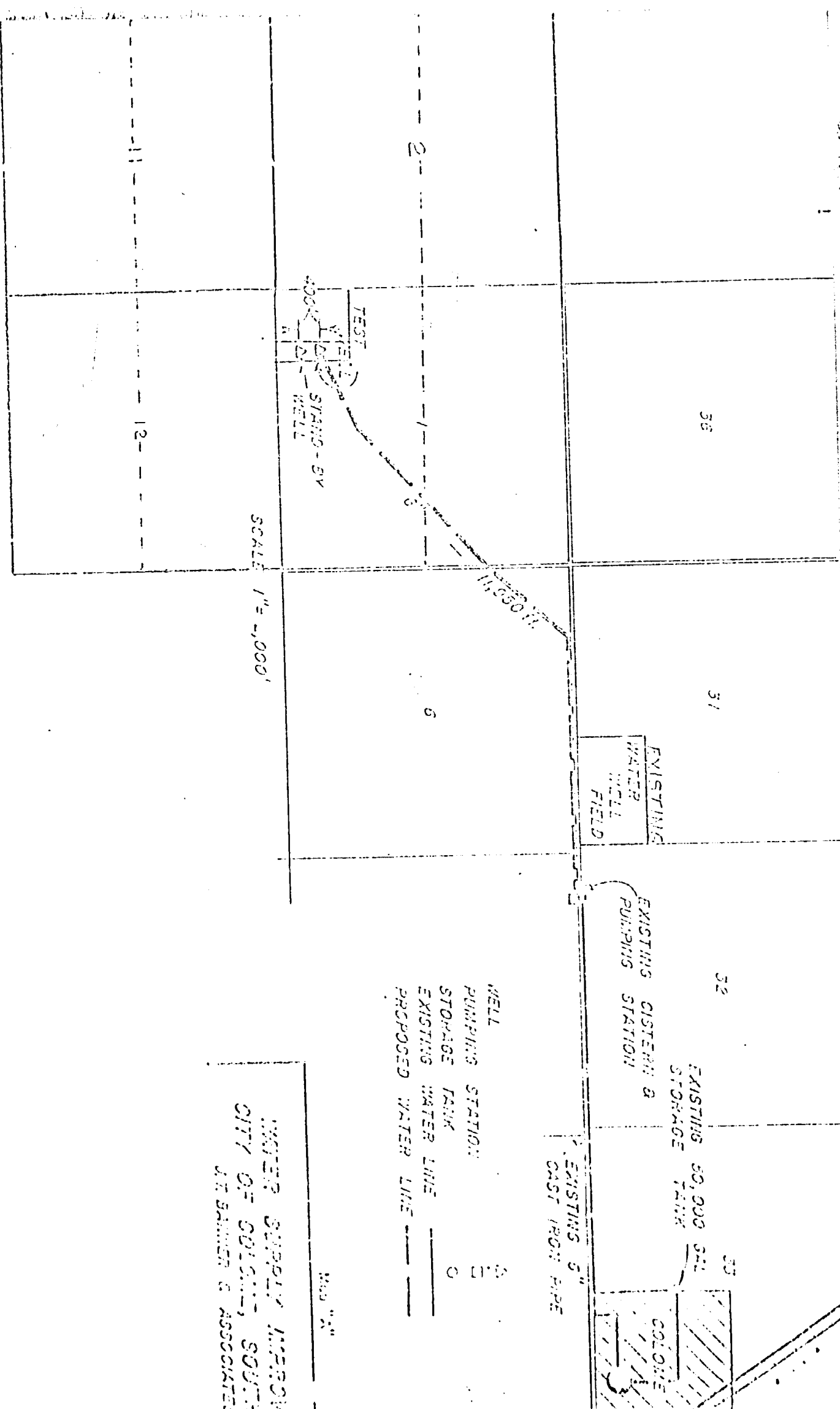
As indicated, the Commission Staff believes the total authorized diversion rates for the City of Colome should not exceed 1/3 c.f.s. (150 g.p.m.) rather than the 1.0 c.f.s. (450 g.p.m.) requested. Regarding the two sections of land proposed for possible municipal groundwater development, it is highly speculative if the City of Colome, in the foreseeable future, will develop additional groundwater sources other than on land already under its ownership and the Commission Staff does not believe there should be a land location specified for future use development.

Recommendation:

The Commission Staff recommends that the Commission approve Water Right Application 976-2 of the City of Colome with the following stipulations:

1. This permit authorizes the construction and diversion of water from a shallow groundwater well located N. 54° 30' E., 1,374.9 feet from the SW corner of Section 1, T97N, R76W;
2. This permit authorizes the construction and diversion of water from a standby well, to be located approximately 400 feet south of above mentioned well;
3. This permit authorizes future construction of a well into the same aquifer, after proper arrangements have been made with the owner of the land on which such well would be located;
4. The total of the diversion rate authorized under this Permit No. 976-2 is $1/3$ c.f.s. (150 g.p.m.) of water.

37195



WELL
PUMPING STATION
STORAGE TANK
EXISTING WATER LINE
PROPOSED WATER LINE

SCALE 1" = 1,000'

WATER SUPPLY AGENCY
CITY OF COLONIA, SOUTH
J. BARNER & ASSOCIATES

Map "A"

PRELIMINARY REPORT
on
WATER SUPPLY FACILITIES
for
CITY OF COLONE, SOUTH DAKOTA

Prepared For
CITY COUNCIL
COLONE, SOUTH DAKOTA

K. E. Johnson, Mayor

Dale Peterson, Councilman

Tony Cervenka, Councilman

Donald Ring, Councilman

Henry J. Vavra, Councilman

Marlyn Hauf, Councilman

Larry Moyer, Councilman

Judy Smith, City Treasurer
Shirley Briggs, City Auditor
Ruben Maulis, City Attorney

Prepared By
J. T. BANNER & ASSOCIATES, INC.
Consulting Engineers
2040 West Main Street
Rapid City, South Dakota

OCTOBER - 1968

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J. A. SHELDON



CONSULTING ENGINEERS
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BANNER & ASSOCIATES, Inc.

LARAMIE, WYOMING • BROOKINGS, SOUTH DAKOTA
RAPID CITY, SOUTH DAKOTA • CHEYENNE, WYOMING
FT. COLLINS, COLORADO

919 MAIN STREET
TELEPHONE (605) 343-0222
P. O. BOX 1072
RAPID CITY, SOUTH DAKOTA 57701

October 15, 1968

Honorable Mayor and the City Council
City of Colome, South Dakota

Gentlemen:

We are submitting herewith our Preliminary Report on water supply facilities and proposed improvements for the City of Colome, South Dakota, in accordance with our Contract dated August 5, 1968.

This investigation and report of water supply facilities for the City includes: a review and analysis of the existing system, a study of future water requirements, recommendations for improvements of the facilities along with cost estimates for each proposed improvement. This report is divided into eight sections each of which deal with a particular phase of the investigation and study. The summary of our findings and recommendations are outlined in Section VIII of the report. The appendices to the report are also attached. These appendices include particular data in support of the findings made and the proposed improvements which have been made.

Respectfully submitted,

J. T. BANNER & ASSOCIATES, INC.

Ted Pfisterer
Vice President

TP/jic

I. INTRODUCTION

A. AUTHORITY:

This Preliminary Study and Report on water supply facilities for the City of Colome, South Dakota, was prepared at the request of the City Council under a Contract dated August 5, 1968.

B. SCOPE OF WORK:

This Preliminary Study and Report includes: (1) A study of present and future water requirements of the City; (2) A study of the water source available to the City as recommended by the State Geological Survey including the necessary test drilling, pumping test and laboratory analysis to determine quantity and quality of supply available from the source; (3) Preparation of recommendations for development of the water source in accordance with present and future requirements of the City with estimated costs of each step of the development; (4) Correlation of all data, findings and determinations with exhibits and layouts incorporated in a Preliminary Report to be presented to the City Council of Colome.

C. GENERAL DESCRIPTION:

The City of Colome is located in Tripp County about 11 miles southeast of Winner. The topography of the area is gently rolling to rolling. The location and vicinity map for Colome is shown in Figure No. 1.

The transportation requirements of the City are served by the Chicago and Northwestern Railway and U. S. Highways 18 and 183.

D. POPULATION:

The population of the City of Colome at the time of each regular United States Census beginning in 1930, together with average fluctuations for the various periods, is shown in Table No. 1.

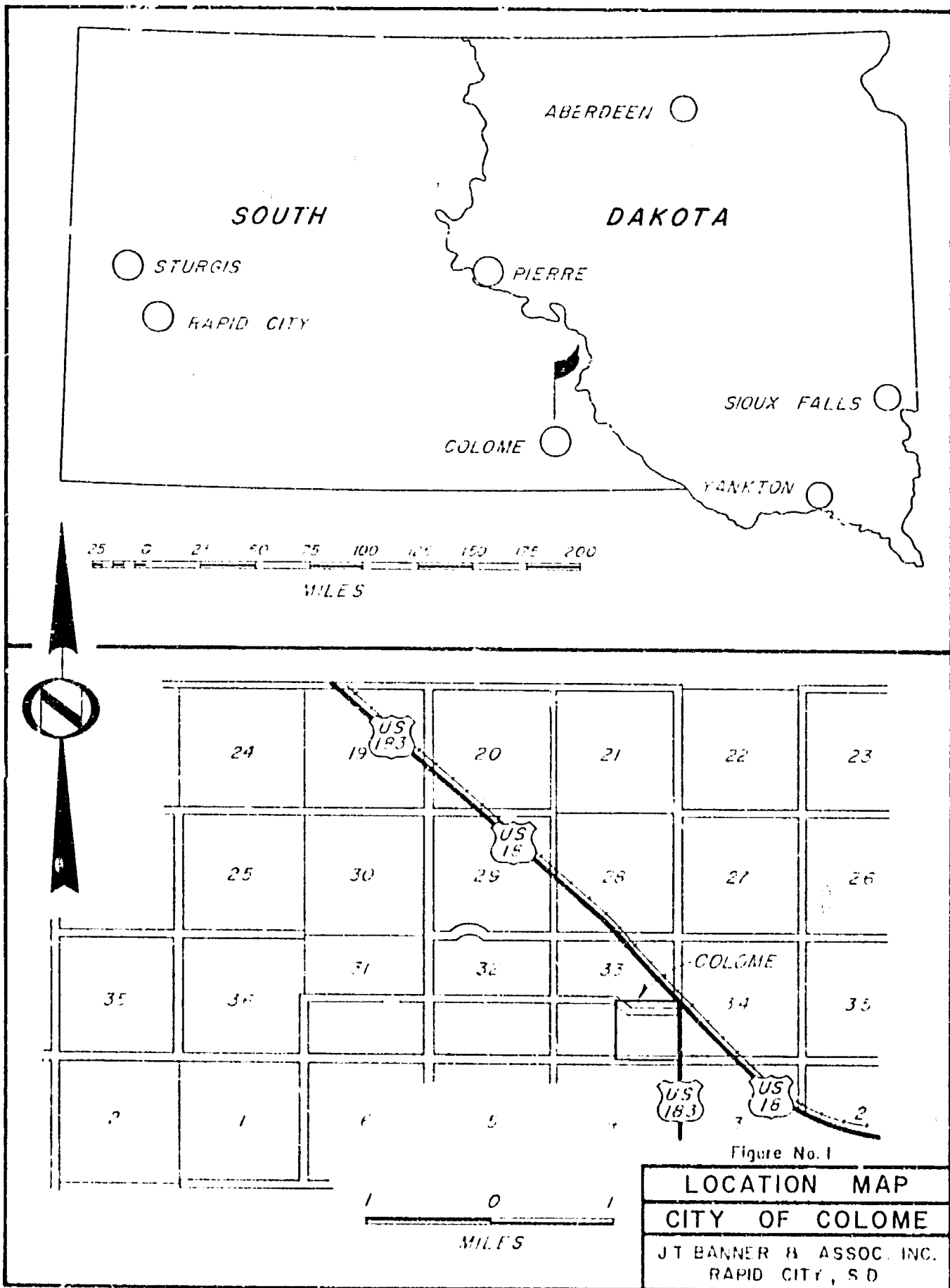


TABLE NO. 1 -- POPULATION -- COLOME, SOUTH DAKOTA

Year	Population	Average Increase or Decrease	Percentage of Change
1930	595	-----	-----
1940	509	- 90	15.0
1950	451	- 58	12.9
1960	398	- 53	13.3

The above Table shows that the population of the City of Colome has been declining during the period from 1930 to 1960. A check of the number of water users during the period from January, 1967, to July, 1968, shows an increase of 21 users. By virtue of this, a stable population can be expected to continue into the future, and design population of 400 persons can be anticipated.

E. ACKNOWLEDGEMENTS:

We wish to express our appreciation and thanks for the excellent cooperation and assistance afforded by the City of Colome officials and employees and the South Dakota Geological Survey during the investigation and preparation of this Report.

II. EXISTING WATER SUPPLY FACILITIES

A. GENERAL:

The City of Colome is served by a municipal water supply system. Basically, the system consists of six water wells, a 25,000 gallon cistern, pumping station, a 50,000 gallon elevated storage reservoir and a water distribution system providing for domestic water needs.

B. SOURCE OF SUPPLY:

The present water supply for the City is obtained from six wells located two miles west of the City. These wells range in depth from 35 feet to 50 feet and are 2 inches and 3 inches in diameter. These wells can only produce a combined flow of 17 gallons per minute. This well water is pumped to a 25,000 gallon cistern located one-quarter of a mile east of the well field by two lines, one of 2 inches in diameter and the other at 3 inches in diameter.

C. WATER QUALITY:

The results of an analysis of samples from existing wells are presented in Table No. 2. This data was obtained from laboratory tests conducted by the South Dakota Department of Health. The raw water from the wells is compared here with the recommended limits established by the U. S. Public Health Service.

It is noted from Table No. 2 that the quality of water is below the recommended limits for all chemical concentrations except for the iron content which is only slightly high.

D. TREATMENT:

At the present time, there is no treatment of any kind.

E. TRANSMISSION SYSTEM:

The water is pumped into the city system by one 100 gallons per minute pump located at the cistern. The water is carried by a 6 inch cast iron pipe to the City. At the present time, the booster pump located at the cistern is either shut off or pinched down by valving to allow the well field to produce sufficient water quantity in the cistern to allow pumping to the City to continue.

TABLE NO. 2 -- CHEMICAL ANALYSIS OF EXISTING WATER SUPPLY -- COLOME, SOUTH DAKOTA

Determination	All Wells ppm	*Drinking Water Standards
ph - Units	8.4	-----
Alkalinity	332	-----
Total Hardness CaCO_3	299	-----
Calcium Ca	89	-----
Magnesium Mg	18	-----
Bicarbonate HCO_3	405	-----
Sulfate SO_4	22	250
Iron Fe	0.4	0.3
Manganese Mn	0.0	0.05
Sodium Na	26	-----
Potassium K	7.8	-----
Chlorine Cl	0.0	250
Fluoride F	0.9	0.9 - 1.7
Nitrate NO_3	0.5	45
Total Solids	391	500 - 1,000

* Recommended maximum concentrations based on Public Health Service Drinking Water Standards, 1962.

F. DISTRIBUTION SYSTEM:

The existing distribution system consists of the various sizes and lengths of pipes as shown in Table No. 3.

Water Mains less than 6 inches in diameter are considered inadequate for proper fire protection. At the present time, 11 fire hydrants are connected to 4 inch diameter pipe.

G. STORAGE FACILITIES:

The present storage facilities consist of a 50,000 gallon elevated storage tank. The tank was inspected in September, 1966, and found to be in good condition. It was last cleaned and coated and painted in 1966. The next inspection should be conducted prior to 1970.

TABLE NO. 3 -- INVENTORY -- WATER DISTRIBUTION SYSTEM -- COLOME, SOUTH DAKOTA

Main Size	Quantity (Lin.Ft.)	Percent of Total	Fire Hydrants
8"	730	6.14	2
6"	3,710	31.20	9
4"	6,100	51.30	11
2"	320	2.69	----
1½"	1,030	8.67	----
TOTALS	11,890	100.00	22

III. WATER REQUIREMENTS

A. GENERAL:

Water usage is metered quarterly and records of consumption are maintained. These records show the average winter usage is about 12,000 gallons per day and the average summer usage is about 17,000 gallons per day.

Major factors affecting water demand includes population, quality of water, distribution pressure, sewer facilities, climate, and use of meters and cost. An evaluation of these factors considering the type of community and the degree of commercial or industrial water use allows the assignment of water consumption rates.

B. WATER CONSUMPTION:

The City of Colome is primarily a residential area, serving a farming and ranching community with small commercial businesses not requiring any abnormally high usage of water.

Considering this, along with other factors affecting water use in a community of this nature, the water consumption rates as shown in Table No. 4 can be expected.

TABLE NO. 4 -- UNIT WATER CONSUMPTION RATES -- COLONE, SOUTH DAKOTA

Annual Average	100 gallons per capita per day
Maximum Month	200 gallons per capita per day
Maximum Week	250 gallons per capita per day
Maximum Day	300 gallons per capita per day

A tabulation of the water usage records is shown in Table No. 5. These records run from July, 1965, to July, 1968.

Table No. 5 shows a total consumption of 15,802,600 gallons within the City of Colome, in addition to this, 503,000 gallons were consumed by people living outside of the City during the three year period of July, 1965, to July, 1968.

TABLE NO. 5 -- WATER CONSUMPTION -- COLOME, SOUTH DAKOTA (July, 1965, to July, 1968)

Period Month	Year	Number of Water Meters	Total Consumption Gallons	Average Use-Gallons Per Day Per Meter
July-October	1965	162	1,514,411	101
October-January	1966	151	1,100,490	79
January-April	1966	156	1,245,820	83
April-July	1966	153	1,392,900	100
July-October	1966	159	1,670,120	114
October-January	1967	156	1,103,264	77
January-April	1967	150	1,160,940	86
April-July	1967	179	1,237,220	76
July-October	1967	156	1,502,335	105
October-January	1967	155	1,147,560	80
January-April	1968	162	1,202,960	83
April-July	1968	171	1,524,580	98

Table No. 5 shows a trend toward low water consumption even during the summer months. This is due to the inability of the present well field to produce a flow to meet all the demands of the City.

On the basis of design population and the estimated water consumption rates outlined in Table No. 4, the water requirements in gallons per minute and total gallons per day for the City of Colome for various critical periods throughout the year, based on a design population of 400, are tabulated in Table No. 6.

TABLE NO. 6 -- ESTIMATED WATER REQUIREMENTS -- COLOME, SOUTH DAKOTA

Period	Requirements	
	gpd	gpm
Annual Average	40,000	28
Maximum Month	80,000	56
Maximum Week	100,000	70
Maximum Day	120,000	84

gpm = gallons per minute

gpd = gallons per day

It can be readily seen in Table No. 6 that the estimated requirements far exceeds the production from the existing well field.

IV. WATER SUPPLY SOURCES

A. GENERAL:

As previously noted in Section II of this Report, the existing water supply for the City of Colome, South Dakota, is obtained from wells located two miles west of the City.

B. WATER SUPPLY INVESTIGATION:

The South Dakota Geological Survey conducted an investigation of ground water supplies around the City of Colome. These tests were conducted in an attempt to locate additional ground water supply sources available for the City which would produce an adequate quantity of water to meet present and future demands.

After completion of the testing program conducted by the South Dakota Geological Survey, the Southwest Quarter of Section 1, Township 97 North, Range 76 West was selected for further testing and development. The saturated sands in this area are approximately 35 ± feet in depth. Although tests show other areas with deeper sands, the distance from Colome and the total water requirements for the City dictated the economy of developing the area selected.

A production pumping test was conducted at the location shown on Figure 1 in Appendix A of this report. The results of this test are shown in Appendix A. The pumping test indicated that each well developed in this area will produce about 50 gpm with a well spacing of 400 feet.

V. PROPOSED IMPROVEMENTS

The proposed improvements to the City water supply production are shown on Map "A".

A. WATER PRODUCTION FACILITIES:

The water supply investigation shows that the most economical supply for the City can be obtained in adequate quantity from wells located in the Southwest Quarter of Section 1, Township 97 North, Range 76 West.

The existing water supply wells are inadequate to maintain a sufficient supply to meet the present demands of the City. It is recommended that additional production capacity be developed as soon as possible to provide an increased production of 50 gallons per minute. This would require the further development of the test well to bring it into its production capacity. It would also require the construction of a stand-by well that would alternate with the test well in producing the water supply to the City.

B. TRANSMISSION PIPELINE:

A transmission pipeline of about 11,950 lineal feet would be required to transport the water from the new wells to the existing pipeline that now supplies the City. A new 6 inch diameter pipe would provide 50 gallons per minute with a head loss of 5.4 feet from the new wells to the existing pipeline. The head loss in the existing pipeline at 50 gallons per minute would be about 7.3 feet. For normal operation, this rate will provide sufficient capacity to satisfy demand requirements.

C. AUTOMATIC CONTROLS:

It is proposed that the well pumps be operated by the use of basic automatic controls in order to maintain full supply available to the City at all times and provide maximum efficiency of the facilities.

The controls shall be able to alternate the pumping cycle between the two wells. The controls would be operated by using telephone cables to transmit the signal to operate the controls.

D. TREATMENT FACILITIES:

It is recommended that chlorination equipment be installed to provide disinfectant to the water supply.

VI. ESTIMATED COSTS

A. CAPITAL IMPROVEMENTS:

This Section summarizes the costs of the improvements and new facilities required to provide an adequate water supply facility for the City of Colome.

1. Construction:

Develop test well, construct and test pumping of the stand-by well	\$ 8,000.00
Pumps and Appurtenances	\$ 4,000.00
Automatic Controls and Cable	\$ 3,000.00
Housing for Pumps	\$ 3,000.00
Chlorinator	\$ 500.00
Transmission Pipeline	\$ 54,000.00
Valves, Meter and Appurtenances	\$ 3,500.00
Land and Easements	\$ 1,750.00
Total Estimated Construction Cost	\$ 77,750.00

2. Other Costs:

Engineering	
Preliminary Report and Field Engineer for Test Well	\$ 3,000.00
Basic Fee	\$ 6,750.00
Resident Services	\$ 2,000.00
State Geological Survey	\$ 2,000.00
Legal and Fiscal Fees	\$ 3,000.00
Construction Contingency 5%	\$ 3,900.00
Project Contingency 2%	\$ 2,000.00
Total Other Costs	\$ 22,650.00
TOTAL ESTIMATED PROJECT COST	\$ 100,400.00

B. OPERATION AND MAINTENANCE COSTS:

This Section summarizes the costs of operating and maintaining the water system of the City of Colome.

1. Existing Operation and Maintenance Cost:

The average annual cost to the City of Colome is approximately \$4,800.00 per year. \$1,100.00 of this amount is used for the purchase of electrical power.

2. Future Estimated Operation and Maintenance Cost:

It is estimated that electrical power cost of the new water facilities will run about \$100.00 per year less than the present facilities. The other operation and maintenance cost will remain about the same. There will be some additional operation and maintenance connected with the new facilities. These costs are shown below.

<u>OPERATION AND MAINTENANCE COST</u>	
	<u>Annual Cost</u>
Existing Operation and Maintenance	\$ 3,700.00
Power Cost	\$ 1,000.00
Telephone Cable - Rent	\$ 240.00
Maintenance - New Facilities	\$ 500.00
TOTAL OPERATION AND MAINTENANCE COST	<u>\$ 5,440.00</u>

VII. FINANCING

The total estimated capital cost to provide an adequate water supply facilities to serve the City of Colome, South Dakota, is \$100,400.00. Based on a five percent interest factor for a 40 year repayment period, the annual payment required to amortize \$100,400.00 is \$58.28 per \$1,000.00 or \$5,851.31.

Annual Cost.

Capital Improvements	\$ 5,851.31
Operation and Maintenance	<u>\$ 5,440.00</u>
Total Annual Cost	\$11,291.31

It is estimated that the annual consumption rate will be 14,600,000 gallons per year, showing the average cost per 1,000 gallons to be \$0.88. This could be paid for in the suggested manner. With 170 users at \$10.00 per quarter for the first 2,000 gallons per quarter, the annual revenue would be \$6,800.00. The remaining 13,240,000 gallons would cost \$0.50 per 1,000 gallons, producing a revenue of \$6,620.00 per year. This would give a total estimated annual revenue of \$13,420.00. A suggested rate schedule is shown below.

Quarterly Rates:

First 2,000 gallons at \$10.00

Above 2,000 gallons at \$0.50 per M. Gallons

VIII. SUMMARY AND RECOMMENDATIONS

The following summary of findings and recommendations has been developed from the survey and study of water supply facilities for the City of Colome, South Dakota.

- A: A population of 400 was used as a basis for future design in this study.
- B: The City is presently served by a water supply system and water is available in all areas of the City which are developed.
- C: The system consists of six water wells, a 25,000 gallon cistern, a 50,000 gallon elevated storage reservoir, a transmission pipeline and water distribution line.
- D: The existing elevated storage reservoir should be maintained in service.
- E: The future water needs for the City of Colome can be met by the development of the new well field.
- F: Facilities required to develop the water supply from the new well field consists of two wells, pumping facilities, transmission pipeline and treatment by chlorination.

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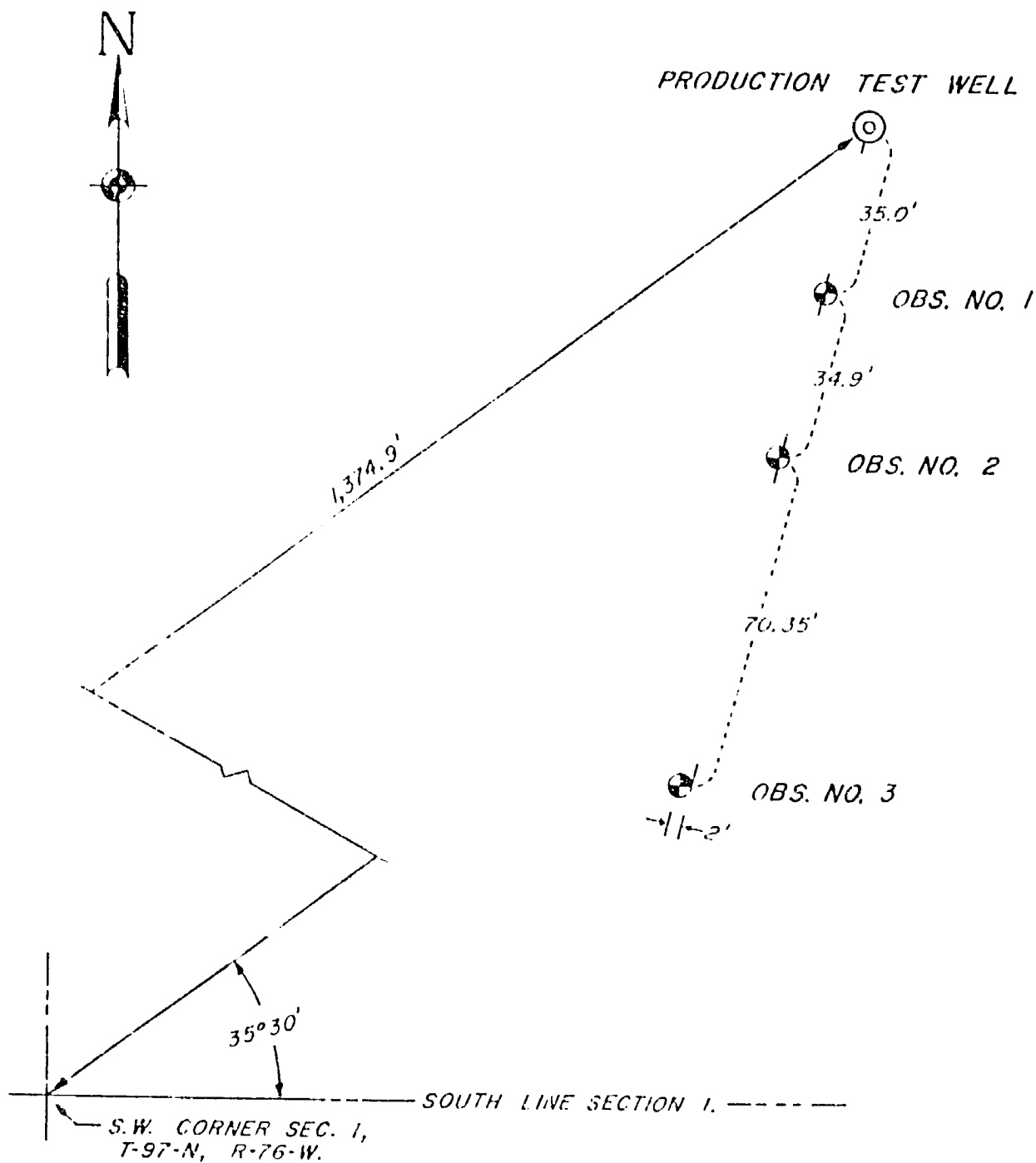
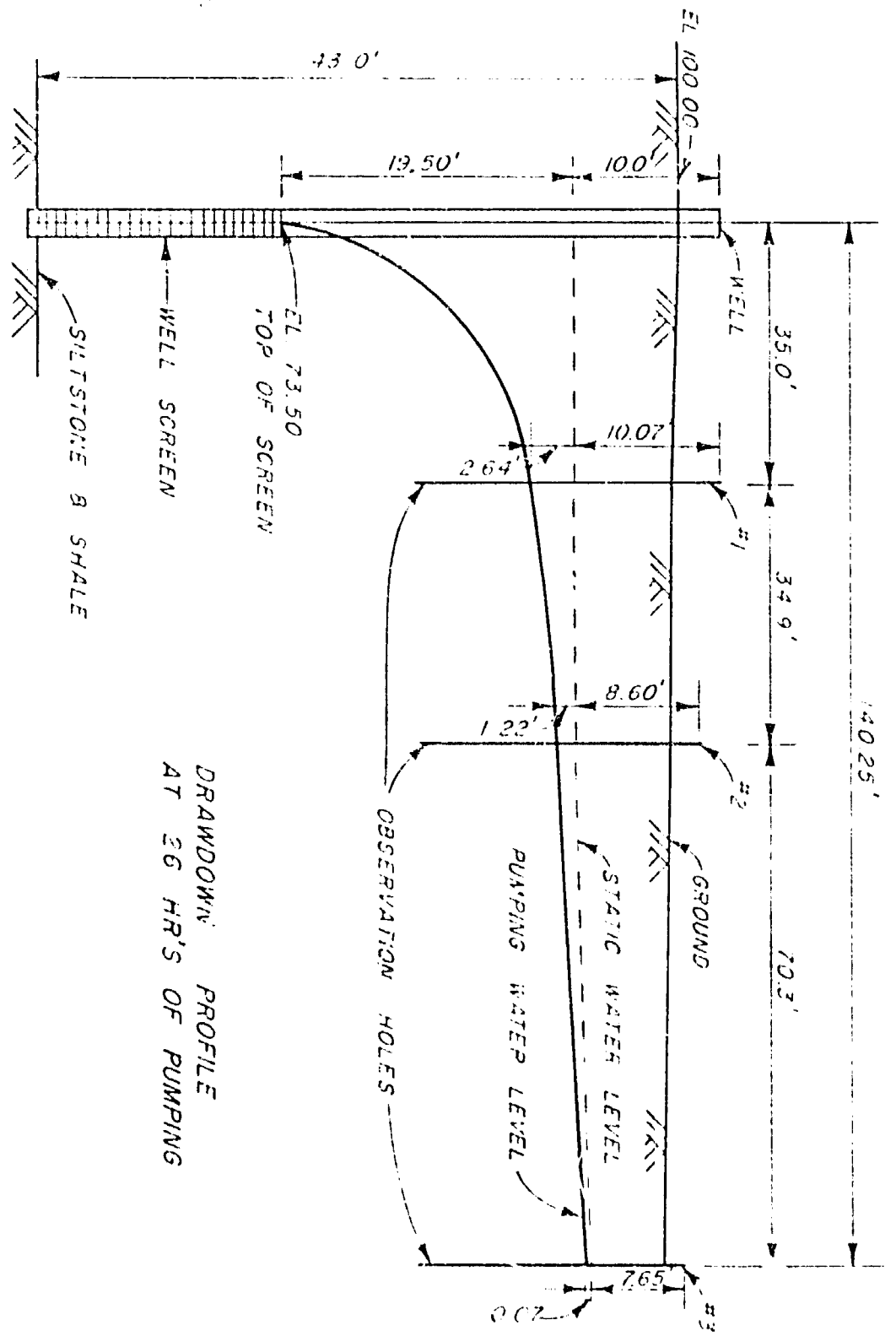


Figure No. 1
 PHYSICAL SETUP OF TEST SITE
 PRODUCTION TEST WELL
 COLOME, SOUTH DAKOTA



DRAWDOWN PROFILE
AT 26 HR'S OF PUMPING

Figure No. 2

DRAWDOWN CURVE

CHEMICAL ANALYSIS OF TEST WATER WELL

Location: SW $\frac{1}{4}$ of SW $\frac{1}{4}$ of Section 1, T. 97 N., R. 76 W.

Lab. No: 68-2187

Date: September 27, 1968

	<u>ppm</u>
Total Solids	288
Sulfate	12
Chloride	None
Calcium	52
Magnesium	10
Alkalinity as CaCO ₃	
Phenolphthalein	
Methyl Orange	166
Hardness as CaCO ₃	173
Iron	None
Manganese	None
Flouride	0.2
Sodium	4
Nitrate Nitrogen	5.8

Source: State Chemical Laboratory
Vermillion, South Dakota

(FIGURE NO. 3)

II. TRANSMISSION PIPELINE COMPUTATIONS

A. HEAD LOSS IN NEW PIPELINE:

$$L = 11,950 \text{ Lin. Ft.}$$

$$Q = 50 \text{ gallons per minute}$$

Try 8" Pipeline

$$H_L = 0.11 \text{ ft./1,000 ft.}$$

$$(\text{for } C = 100)$$

$$H_L = \frac{11,950 \times 0.11}{1,000} = 1.3 \text{ ft.}$$

Try 6" Pipeline

$$H_L = 0.45 \text{ ft./1,000 ft.}$$

$$(\text{for } C = 100)$$

$$H_L = \frac{11,950 \times 0.45}{1,000} = 5.4 \text{ ft.}$$

B. HEAD LOSS IN THE EXISTING PIPELINE:

$$L = 12,100 \text{ Lin. Ft.}$$

$$Q = 50 \text{ gallons per minute}$$

6" Cast Iron Pipe

$$H_L = 0.60 \text{ ft./1,000 ft.}$$

$$(\text{for } C = 80)$$

$$H_L = \frac{12,100 \times 0.6}{1,000} = 7.3 \text{ ft.}$$

C. TOTAL HEAD LOSS:

$$H_L = (\text{Total}) = 5.4 + 7.3 = 12.7 \text{ ft.}$$

III. ENERGY REQUIREMENTS

A. PUMP HORSEPOWER:

$$Q = 50 \text{ Gallons per minute}$$

$$\text{Static Head} = 103.5 \text{ ft.}$$

$$\text{Head Loss} = 12.7 \text{ ft.}$$

$$\text{Total Dynamic Head} = 116.2 \text{ ft.}$$

$$\text{Brake H.P. required} = \frac{\text{G.P.M.} \times \text{T.D.H.}}{3,960 \times \text{Pump Eff.}}$$

$$\text{H.P.} = \frac{50 \times 116.2}{3,960 \times .60} = 2.4 \text{ H.P.}$$

Use: 3.0 H.P. Motor

alternated Bids.

2. Plaster 150 P/E bid
6' " " " " " "

intermediate pipe - 2

58.50 bid \$1000.00

4" plaster pipe holes in #1.17

6" plaster pipe holes in #1.31

B. ELECTRICAL ENERGY:

Based on 14,600,000 Gallons per year

$$\text{KW-Hrs.} = \frac{14,600,000 \times 116.2 \times 0.00315}{1,000 \times .60}$$

$$\text{KW-Hrs.} = 8,900 \text{ KW-Hrs. per year}$$

IV. COSTS

A. NEW FACILITIES:

Item No.	Description	Quantity	Unit	Unit Cost	Total Cost
1.	Develop Wells	2	L.S.	\$4,000.00	\$ 8,000.00
2.	Pumps & Appurtenances	2	Each	2,000.00	4,000.00
3.	Automatic Controls	1	L.S.	2,760.00	2,760.00
4.	Cable for Controls	6	1/10 Mile	40.00	240.00
5.	Pump House	2	Each	1,500.00	3,000.00
6.	Chlorinator	1	L.S.	500.00	500.00
7.	Pipeline (6") <i>12.5</i>	11,950	L.F.	4.50	53,775.00 <i>23.5</i>
8.	Gate Valves	5	Each	120.00	600.00
9.	Check Valves	2	Each	200.00	400.00
10.	Air Valves & Manhole	4	Each	500.00	2,000.00
11.	Meter	1	Each	500.00	500.00
12.	Land	10	Acres	125.00	1,250.00
13.	Easements	1	L.S.	500.00	500.00
TOTAL					<u>\$ 77,525.00</u>

B. NEW PUMPING COST:

$$\text{Cost} = 8,900 \text{ KW-Hrs. per year} \times \$0.08 = \$ 712.00 \text{ per year}$$

V. FINANCING

Based on 14,600,000 gallons per year and an annual cost of \$11,291.31 per year.

Description	Annual Revenue	Total Gallons
170 Meters at \$40.00 annually	= \$ 6,800.00	= 1,360 M. Gallons
13,240 M. Gallons at \$0.50 Per M. Gallons	= \$ 6,620.00	= 13,240 M. Gallons
TOTALS	\$13,420.00	14,600 M. Gallons

R-76-W
R-75-W

25

30

29

28

36

31

32

33

EXISTING
WATER
WELL
FIELD

EXISTING
CISTERN &
PUMPING
STATION

EXISTING 50,000 GAL
STORAGE
TANK

COLOME

EXISTING 6"
CAST IRON PIPE

T-98-N
T-97-N

TEST
WELL
STAND-BY
WELL
400'

11,950 ft.

6

6

WELL
PUMPING STATION
STORAGE TANK
EXISTING WATER LINE
PROPOSED WATER LINE

Map "A"

SCALE 1" = 2,000'

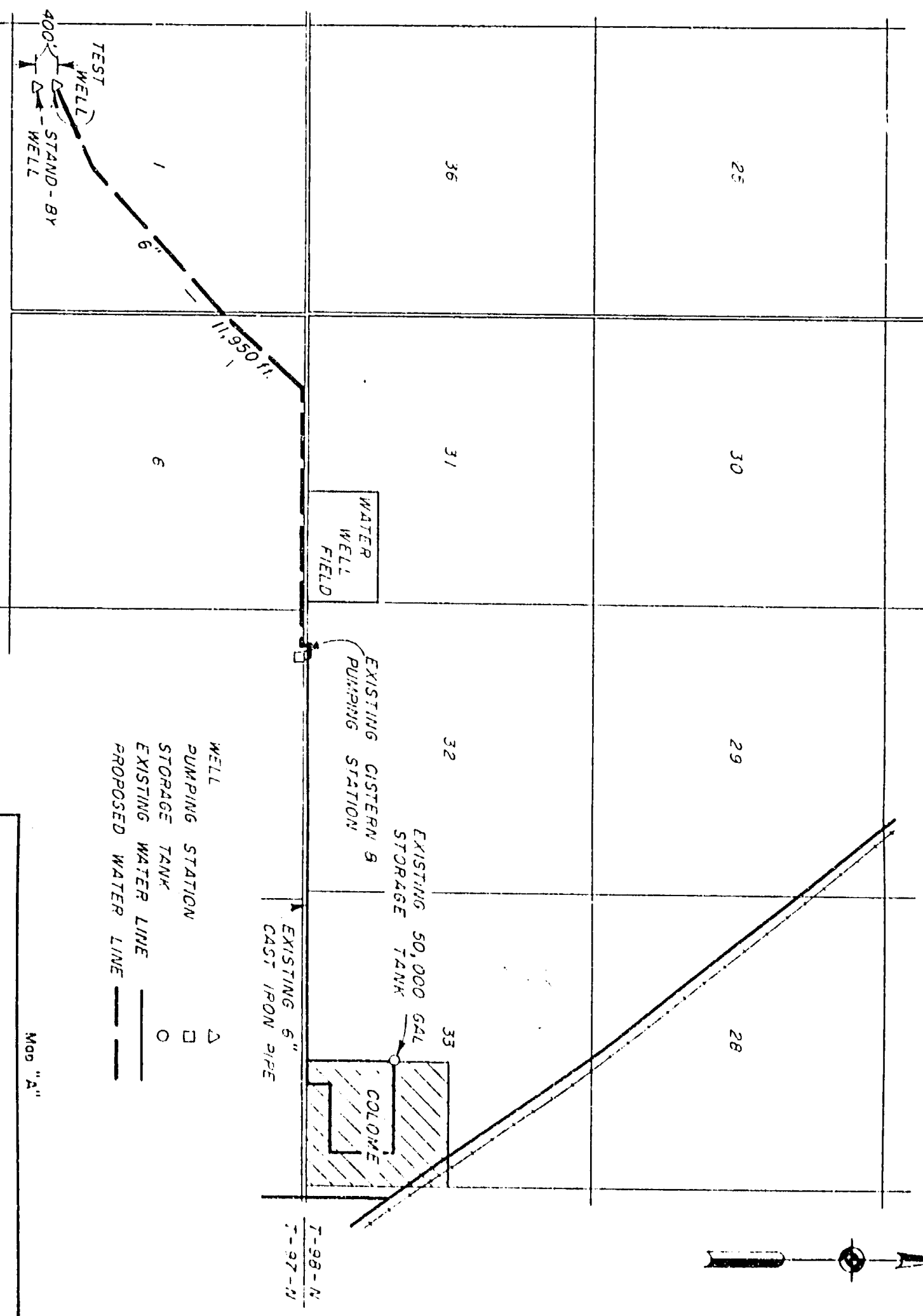
WATER SUPPLY IMPROVEMENTS
CITY OF COLOME, SOUTH DAKOTA

J.T. BANNER & ASSOCIATES INC.

CONSULTING ENGINEERS

RAPID CITY, SOUTH DAKOTA

R-76-W
R-75-W



SCALE 1" = 2,000'

- WELL
- PUMPING STATION
- STORAGE TANK
- EXISTING WATER LINE
- PROPOSED WATER LINE

Mod "A"

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