

WATER PERMIT NO. 2397-2

Name of Applicant: City of Rapid City

Address: 300 6th Street, Rapid City SD

Phone: 605 394-4165

Amount of Water Claimed: 0.59 cfs

Total Acres: NA

Source of Water Supply: Rapid Creet

Water to be used for: municipal

County: Pennington

Type of Waste Disposal System:

Location:

PRIORITY

Date Received: 11-20-1997

Fee: \$50.00

Corrected Application Received: 12-03-1997

Period of Annual Use: January 1 - December 31

Remarks: Transfers the use of a portion of Rapid Creek natural flows historically used to irrigate 64 acres known as the Eisenbraum property

Diversion Point:

Land to be Irrigated:

Depth of Well: NA

Well Driller:

Remarks:

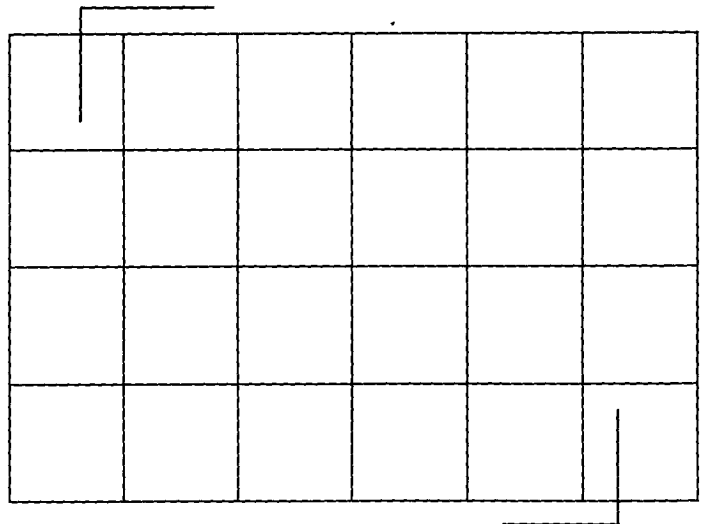
Type of Map: topo

Prepared by: Daniel Bjerke, PE

Reviewed and the Number Assigned on: 12-04-1997

By: Karen Schlaak

Notice of Hearing - date to intervene: _____



SOUTH DAKOTA
WATER PERMIT NO. 2397-2

Date of first receipt of application November 20, 1997.

The Water Management Board approved Water Permit Application No. 2397-2 on February 25, 1998 for the City of Rapid City, 300 6th St, Rapid City SD 57701 authorizing the construction of the water use system and the placing of water to beneficial use subject to the following limitations, conditions and qualifications:

1. Water Permit No. 2397-2 transfers the use of a portion of Rapid Creek natural flows historically used to irrigate 68 acres known as the Eisenbraun property from South Side Ditch. The portion of Rapid Creek natural flows to be transferred to the city is 0.59 cubic feet of water per second (cfs) with an annual volume limitation of 111.5 acre-feet, if diverted at the city's water treatment plant and infiltration galleries or 57.3 acre-feet, if stored in Pactola Reservoir. Historically, the 0.59 cfs has been used to irrigate approximately 59.3 acres located in W 1/2 NE 1/4 Section 26-T1N-R8E. The existing diversion point on Rapid Creek for South Side Ditch is located in the SE 1/4 NW 1/4 Section 15-T1N-R8E. This permit is to change the diversion point for 0.59 cfs to diversion points for use by the city to be located in the SE 1/4 NE 1/4 Section 3 (Rapid City Water Treatment Plant); SW 1/4 SW 1/4 Section 3 (Sioux Park Gallery); SE 1/4 NE 1/4 Section 9 (Meadowbrook Gallery); NW 1/4 SE 1/4 Section 8 (Jackson Springs Gallery); all in T1N-R7E or to allow storage in Pactola Reservoir. The location of the Pactola Reservoir diversion point is the NW 1/4 SW 1/4 Section 2-T1N-R5E and the reservoir impounds water in portions of Sections 2, 3, 4, 5, 10, 11 of T1N-R5E and Sections 31, 32, 33, 34 of T2N-R5E. This permit does not authorize any new water appropriations from Rapid Creek.
2. The water appropriated shall be used for the purpose of meeting Rapid City's water needs and may not exceed the amount of water needed for beneficial use for municipal, industrial, commercial, common distribution system, rural water system, suburban housing and domestic purposes.
3. The water is to be used during the following described annual period: May 1 - September 30 for diversions from the Water Treatment Plant, Sioux Park Gallery, Meadowbrook Gallery and Jackson Springs Gallery and January 1 - December 31 for Pactola Reservoir diversion releases from storage.
4. The date from which applicant may claim right is May 3, 1880.
5. Water rights obtained in compliance with the laws of the State of South Dakota may not be unlawfully impaired by this appropriation.

QUALIFICATIONS

1. Permit No. 2397-2 is limited to a diversion rate of 0.59 cfs for a total annual volume of 57.3 acre-feet at Pactola Reservoir or a total annual volume of 111.5 acre-feet at Sioux Park Gallery (SW 1/4 SW 1/4 Section 3), Meadowbrook Gallery (SE 1/4 NE 1/4 Section 9), Jackson Springs Gallery (NW 1/4 SE 1/4 Section 8), and the Rapid City Water Treatment Plant (SE 1/4 NE 1/4 Section 3), all in T1N-R7E. Maximum monthly diversion volumes at Pactola or the diversion points within Rapid City are as follows:

(continued)

Monthly	Monthly acre-feet at Pactola	Monthly acre-feet at diversion points within Rapid City
May	8.23	16.00
June	11.81	22.97
July	12.20	23.72
August	14.28	27.76
September	10.82	21.03
October	0.0	0.0

Diversions during a month may be made at either Pactola Reservoir or at the diversion points within Rapid City, but not simultaneously at both Pactola and the Rapid City diversion points.

2. Permit No. 2397-2 authorizes diversion of only natural flow water by the City of Rapid City and does not include any rights to stored irrigation water available under contract from Pactola Reservoir.
3. That the City of Rapid City report to the Chief Engineer annually the amount of water withdrawn each month at Pactola Reservoir or the diversion points within Rapid City.
4. That the Water Management Board is retaining jurisdiction of Permit No. 2397-2 in the event that additional information shows that changes need to be made in the monthly or total annual volumes authorized by Permit No. 2397-2.
5. Diversions under Permit No. 2397-2 may not interfere with existing water rights in effect prior to approval of No. 2397-2 or any domestic rights.
6. The amount of water with a May 3, 1880, priority date, which may be appropriated under Vested Water Right No. 2040-2 is reduced by 0.59 cfs and the number of irrigated acres are decreased by 59.3 acres.
7. Approval of Permit No. 2397-2 retires the 59.3 acres, known as the Erwin and Janice Eisenbraun property which has been historically irrigated from South Side Ditch, located in the W 1/2 NE 1/4 Section 26-T1N-R8E from future irrigation.

WATER MANAGEMENT BOARD

By: _____

John Hatch
John Hatch, Chief Engineer
Water Rights Program
Department of Environment and Natural Resources

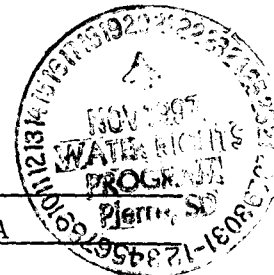
APR 28 1998

date



523 E. Capitol
Pierre, SD 57501
(605) 773-3352No. 2397-2 Hydrologic Unit 10/20/10
Map No. _____ Basin Upper Cheyenne
Newspaper Rapid City Journal, Rapid City, SD**Application For Permit To Appropriate Water Within The State Of South Dakota**Check use of water: Industrial ☒ Commercial ☒ Municipal ☒ Other Common Distribution System ☒
Rural Water System ☒ Suburban Housing ☒ Geothermal Heat ☐ Institutional ☐ Recreational ☐
Domestic ☒ (above 18gpm) Other ☐

Type of Application: Check one or more of the following

New ☐ Vested Right ☐ Future Use ☐ Change Use ☒☒ Amend Permit No. 2040-2 with old priority date retainedChange diversion point(s) ☒ Add diversion point(s) ☒ Other ☐☐ Application to: Change diversion point(s) ☐ Add diversion point(s) ☐ on Permit No. N/A☐ Construction to use water reserved by Future Use Permit No. N/A

- Name of Applicant CITY OF RAPID CITY Phone No. 605-394-4165
Post Office Address 300 6TH STREET, RAPID CITY State SD 57701-2724
(Street, RR or Box) (City) Zip Code
- Amount of water claimed (c.f.s) 0.59 CFS NOT TO EXCEED 111.5 AF/YR. OR 57.3 AF/YR. AT ALTERNATE
RACTOLA RESERVOIR DIVERSION
- Source of water supply RAPID CREEK (SEE ATTACHED EXHIBIT 1)
- Location of point of diversion SEE ATTACHED EXHIBIT 2 FOR LEGAL DESCRIPTIONS OF CITY OF RAPID
CITY WATER TREATMENT PLANT, GALLERIES AND ALTERNATE PACTOLA RESERVOIR DIVERSION POINTS.
County PENNINGTON
- Counties where water will be used PENNINGTON COUNTY, SOUTH DAKOTA
- Annual period during which water is to be used APRIL 15 THROUGH OCTOBER 15 (JANUARY 1 THROUGH
DECEMBER 31 FOR PACTOLA DIVERSION RELEASES FROM STORAGE)
- Give a brief description of proposed project. When available include any preliminary engineering report or other reports or information that will help explain the project. (Attach sheet if more space is needed)
THE PROJECT IS DESCRIBED IN DETAIL IN THE ACCOMPANYING MC LAUGHLIN WATER ENGINEERS, INC. REPORT. THE PROJECT WILL DIVERT WATER FROM RAPID CREEK TO THE CITY OF RAPID CITY WATER TREATMENT PLANT THROUGH THE EXISTING DIVERSION STRUCTURE ON RAPID CREEK, AND TO THE EXISTING INFILTRATION GALLERIES. THE PROJECT WILL ALSO, IN THE ALTERNATIVE BUT NOT SIMULTANEOUSLY, DIVERT WATER FROM RAPID CREEK TO STORAGE IN PACTOLA RESERVOIR. SEE EXHIBIT 3 FOR LOCATION MAP

Attachments: Attach Form 2A if diversion from a well or dugout, or if storage of water, is proposed. Attach map (see instruction)

STATE OF SOUTH DAKOTA)
County of PENNINGTON)^{ss}I, JIM SHAW, MAYOR FOR THE CITY OF RAPID CITY the applicant, certify that I have read this application, have examined the attached map and that the matters stated are true and that I intend, and am able to complete the necessary construction.Signed Jim ShawSubscribed and sworn to before me this 18th day of November 1997Kay R. Ruppert
Notary Public

Supplemental Information

(type or print in ink)

1. Well Information - Proposed construction N/A

- a) Drill Hole Diameter _____ Depth _____
- b) Casing Type _____ Diameter _____ Thickness _____
- c) Screen Type _____ Diameter _____ Thickness _____
- d) Gravel Pack Thickness _____ Length of Gravel Pack _____
- e) Depth to Top of Water Bearing Material _____
- f) Depth to Water (ground surface to water level) _____
- g) Distance to nearest existing domestic well:

On applicants property _____ On property owned by others _____

2. Dugout Information Estimates N/A

- a) Surface Dimensions _____ Depth _____
- b) Depth to water (ground surface to water level) _____

3. Water Storage Dams (EXISTING PACTOLA RESERVOIR)



If the proposed water use system contains one or more storage dams, please furnish the information requested below. The locations of each dam should be shown on the map submitted with the application.

- a) If a private engineering firm or government agency was involved in the design of this dam please give their name and address

UNITED STATES BUREAU OF RECLAMATION

DEPARTMENT OF THE INTERIOR

b) Freeboard 3.3 FT

c) Crest Width 40 FT

Crest Length 5,200 FT (INCLUDING DIKES)

d) Height 245 FT

e) Primary Outlet Capacity 1,150 CFS
If Pipe, diameter TWO 2.75 FT X 2.75 FT GATES

f) Secondary Spillway Capacity 245,000 CFS
Spillway width 425 FT

g) X & Y Slope
Upstream 2-1/2:1

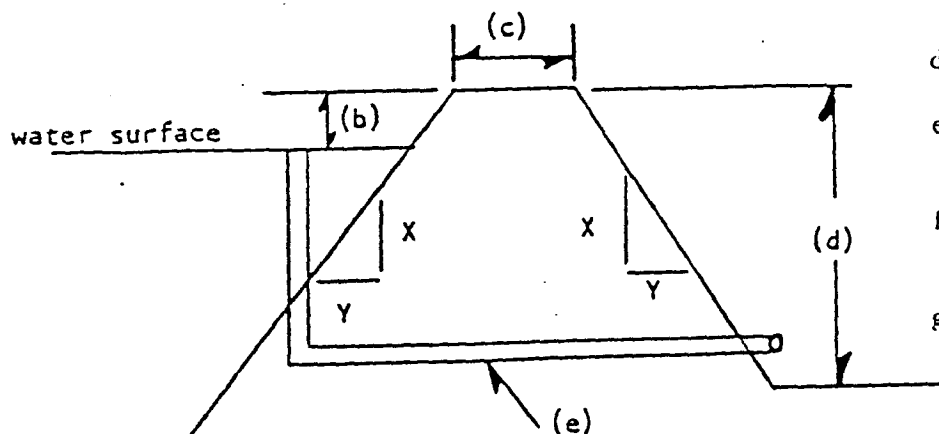
Downstream 2:1

Surface Area of Impoundment 1,232 ACRES
1/

Storage 99,029 1/ acre feet

Drainage area above dam 319 SQ MI

1/ INCLUDES FLOOD POOL



Signature of Applicant

JIM SHAW, MAYOR
CITY OF RAPID CITY

EXHIBIT 1

LEGAL DESCRIPTION OF IRRIGATED LAND
AFFECTED BY APPLICATION

West one-half of the NE1/4, less Lots 1 through 7, and a portion of Lot 8 of Eisenbraum Subdivision and dedicated right-of-way, Section Twenty-Six (26), Township One (1) North, Range Eight (8) East of the Black Hills Meridian, Pennington County, South Dakota, consisting of 68 acres, more or less.



EXHIBIT 2

APPLICATION FOR PERMIT TO APPROPRIATE WATER
WITHIN THE STATE OF SOUTH DAKOTA

4) LOCATION OF POINTS OF DIVERSION

City of Rapid City Water Treatment Plant:

North 71° 39' West, 1205 ft. from East $\frac{1}{4}$ corner of Section Three (3), Township One (1) North, Range Seven (7) East of the Black Hills Meridian.

Sioux Park "Girl Scout" Gallery:

1270 ft. North 54° 05' East of Southwest corner of Section Three (3), Township One (1) North, Range Seven (7) East of the Black Hills Meridian.

Meadowbrook Gallery:

2032 ft. South 31° 41' West of Northeast corner of Section Nine (9), Township One (1) North, Range Seven (7) East of the Black Hills Meridian.

Jackson Springs Gallery:

2943 ft. North 58° 54' West of Southeast corner of Section Eight (8), Township One (1) North, Range Seven (7) East of the Black Hills Meridian.

Alternate Pactola Reservoir Diversion (Inlet to Service Spillway:

South 19° East, 3740 ft. of Northwest corner of Section Two (2), Township One (1) North, Range Five (5) East of the Black Hills Meridian.

Reservoir generally located in portions of Sections Two (2), Three (3), Four (4), Five (5), Ten (10) and Eleven (11), Township One (1) North, Range Five (5) East of the Black Hills Meridian, and portions of Sections Thirty-One (31), Thirty-Two (32), Thirty-Three (33) and Thirty-Four (34), Township One (1) North, Range Five (5) East of the Black Hills Meridian.

All of the above in Pennington County, South Dakota.



RECEIPT

415546

Division of Water Rights

South Dakota Department of Environment and Natural Resources

Pierre, _____ December 3, 19 97

RECEIVED OF City of Rapid City, 300 Sixth Street, Rapid City, SD 57701

the following amount in fees for services rendered as provided for by law:

Fee for Application for Permit No. <u>27972</u> to Appropriate Water, to construct and to put water to beneficial use _____	50	00
Fee for Application for Permit No. _____ to Appropriate Water, for Future Use _____		
Fee to retain Future Use Permit No. _____ after period of seven years.		
Fee for Inspecting Constructed Works, confirming beneficial use and issuing Water License No. _____		
Fee for Filing Transfer Form _____		
Fee for Filing Extension Request _____		
Fee for _____		

(Any Other Work Provided by Law)	Total	50 00

By John Hatcher
Chief Engineer



McLaughlin Water Engineers, Ltd.

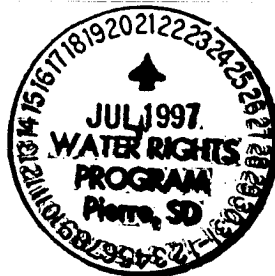
2420 Alcott Street, Denver, Colorado 80211 (303) 458-5550

Facsimile (303) 480-9766

mwe@central.com

July 18, 1997

Mr. Mark Rath
Water Rights Division
Dept of Environment and Natural Resources
Joe Foss Building
523 East Capitol Avenue
Pierre, South Dakota 57301



RONALD C. McLAUGHLIN
LEO M. EISEL
HALFORD E. ERICKSON
WILLIAM R. KENDALL
RALPH L. TOREN
TERRENCE P. KENYON
RICHARD E. McLAUGHLIN
RONALD J. McLAUGHLIN
GERALD L. LAMB

GENE A. BURRELL
MICHAEL E. MERCER
JOHN M. PFLAUM
MICHAEL R. GALUZZI
SCOTT E. LEHMAN
BRIAN S. KOLSTAD
G. DEAN DEROSIER
EDWARD D. BAIN
BRIAN E. CHEVALIER
DANIEL F. BLAHA

LEANDER L. URMY
DANIEL M. PETRAMALA
RONALD D. LUCERO

Re: Erwin Eisenbraun Property Water Rights Transfer

Dear Mr. Rath:

McLaughlin Water Engineers, Ltd. has quantified the irrigated acreage under the South Ditch belonging to Eich and Erwin Eisenbraun and Helga Bauer. This acreage has been used to determine the amount of water that can be transferred to Pactola Reservoir and the Rapid City water treatment plant and infiltration galleries based on data and engineering calculations detailed in the engineering report prepared for the Stromer property dated March 1992 and the Jundt property engineering report dated December 15, 1992.

These calculations are based upon a flood irrigation efficiency of 50 percent and a 9.8 percent seepage loss for the South Side Ditch.

The South Side Ditch Water License shows 74 acres in the northwest and southwest quarters of the northeast quarter of Section 26, Township 1 North, Range 8 East of the Black Hills Meridian. Planimetrying the ASCS aerial photo for the property indicates approximately 59.3 acres irrigated on the unplatted portion of the property owned by Erwin Eisenbraun and another 4.1 acres are irrigated on the platted lots located at the north end of the property that are owned by Erwin Eisenbraun (2.1 acres), Eich Eisenbraun (0.5 acres) and Helga Bauer (1.5 acres). Calculations in Table A produce the following results:

► Erwin Eisenbraun property:

- Average annual transferable amount to Pactola Reservoir:
 $(61.4 \text{ acres}) \times (0.967 \text{ acre-feet/acre}) = 59.3 \text{ acre-feet}$
- Average annual transferable amount to city WTP and infiltration galleries:
 $(61.4 \text{ acres}) \times (1.934 \text{ acre-feet/acre}) = 118.7 \text{ acre-feet}$

► Eich Eisenbraun property:

- Average annual transferable amount to Pactola Reservoir:

$$(0.5 \text{ acres}) \times (0.967 \text{ acre-feet/acre}) = 0.5 \text{ acre-feet}$$

- Average annual transferable amount to city WTP and infiltration galleries:

$$(0.5 \text{ acres}) \times (1.934 \text{ acre-feet/acre}) = 1.0 \text{ acre-feet}$$

► Helga Bauer property:

- Average annual transferable amount to Pactola Reservoir:

$$(1.5 \text{ acres}) \times (0.967 \text{ acre-feet/acre}) = 1.5 \text{ acre-feet}$$

- Average annual transferable amount to city WTP and infiltration galleries:

$$(1.5 \text{ acres}) \times (1.934 \text{ acre-feet/acre}) = 2.9 \text{ acre-feet}$$

$$\text{Total Transferable to Pactola Reservoir} = 61.3 \text{ acre-feet}$$

$$\text{Total Transferable to City WTP and Infiltration Galleries} = 122.6 \text{ acre-feet}$$

The calculations to determine if a full irrigation supply was provided by the South Side Ditch to the Eisenbraun property are based on 1,313 acres of presently irrigated land for the South Side Ditch as agreed to in a 1992 telephone conference with Del Brosz and Mark Rath. The 1,313 acres consists of 1,078 acres irrigated under the South Side Ditch priority and 235 acres irrigated under the Little Giant Ditch priority.

The monthly transferable amount to the Pactola Reservoir and the City's WTP and infiltration galleries are presented in Table B. Diversion at the alternate points of Pactola Reservoir and the water treatment plant and infiltration galleries will only take place during the permitted irrigation season for the South Side Ditch (April 15 to November 30); Table B, however, includes transferable amounts for only May through September because no historic diversion by the South Side Ditch is recorded for April and October.

The rate of diversion for the transferable amount from the Eisenbraun property is calculated by the following method:

► Erwin Eisenbraun property:

$$\frac{61.4 \text{ acres}}{1877 \text{ acres}} \times 23.4 \text{ cfs at the ditch Headgate} \times (1.0 - 0.098) = 0.690 \text{ cfs}$$

► Eich Eisenbraun property:

$$\frac{0.5 \text{ acres}}{1877 \text{ acres}} \times 23.4 \text{ cfs at the ditch Headgate} \times (1.0 - 0.098) = 0.006 \text{ cfs}$$

► Helga Bauer property:

$$\frac{1.5 \text{ acres}}{1877 \text{ acres}} \times 23.4 \text{ cfs at the ditch Headgate} \times (1.0 - 0.098) = \underline{0.017 \text{ cfs}}$$

$$\text{Total Diversion} = \underline{0.713 \text{ cfs}}$$

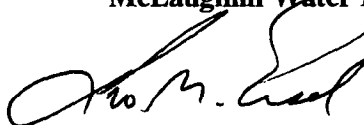
During those periods when the South Side Ditch is diverting stored water, diversion by Rapid City at the infiltration galleries and/or water treatment plant will be limited to the historic consumptive use amounts (as shown in the "Diversion to Storage in Pactola Reservoir" column in Table B). This limitation is to insure that Rapid City does not divert stored water.

Where the 1,877 acres is the total licensed irrigated acreage for the South Side Ditch, the 23.4 is the licensed diversion amount, and the 9.8 percent carriage loss is the amount that will remain in the ditch.

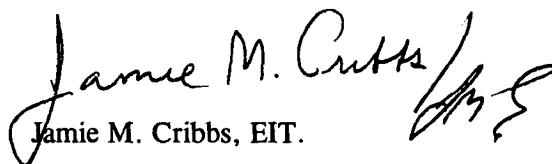
These transferable amounts and this rate of diversion insure that there will be no injury to downstream water rights, and that depletions to Rapid Creek will not exceed historic depletions.

If you have any questions regarding these calculations, please do not hesitate to contact us.

Very truly yours,
McLaughlin Water Engineers, Ltd.



Leo M. Eisel, Ph.D., P.E.



Jamie M. Cribbs, EIT.

cc: Daniel L. Bjerke

TABLE A-1

DETERMINATION OF CONSUMPTIVE USE FOR TRANSFER
RAPID CITY WATER RIGHTS
95-002.001P
July 8, 1997

TRANSFERABLE AMOUNT FROM ERWIN EISENBRAUN PROPERTY PORTION OF SOUTH SIDE DITCH WATER RIGHTS (AVERAGE)
61.4 ACRES

Q MONTH	R SOUTH SIDE WATER (AF)
MAY	404
JUN	580
JUL	599
AUG	701
SEP	531
TOTAL	2815

A MONTH	B C.U.	C PRECIP.	D EFFECT. PRECIP.	E PRECIP. ADJ. C.U.	F EXCESS PRECIP. TO SOIL MOIST. DURING MONTH	G SOIL MOIST. USED TO SATISFY ADJUST. C.U.	H REMAIN. CROP REQUIR.	I GROSS CROP NEEDS	J FARM IRRIG. SUPPLY	K EXCESS IRRIG. SOIL MOIST. CONTRIB.	L ACCUM. SOIL MOIST. STORAGE AFTER IRRIG.	M ADDITIONAL WATER REQUIRED TO MEET C.U. NEEDS FROM SUBIRRIG.	N DEEP PERC. (25.0%)	O SURFACE WATER RETURN FLOW (25.0%)	P CLAIMED IRRIG. C.U. FOR TRANSFER
	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)
NOV	0.00	0.53	0.37	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.37	0.00	0.00	0.00	0.00
DEC	0.00	0.41	0.29	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.66	0.00	0.00	0.00	0.00
JAN	0.00	0.50	0.35	0.00	0.35	0.00	0.00	0.00	0.00	0.00	1.01	0.00	0.00	0.00	0.00
FEB	0.00	0.59	0.41	0.00	0.41	0.00	0.00	0.00	0.00	0.00	1.42	0.00	0.00	0.00	0.00
MAR	0.00	1.11	0.78	0.00	0.78	0.00	0.00	0.00	0.00	0.00	2.20	0.00	0.00	0.00	0.00
APR	0.29	2.11	0.15	0.14	0.00	0.14	0.00	0.00	0.00	0.00	2.06	0.00	0.00	0.00	0.00
MAY	3.62	2.58	1.76	1.86	0.00	1.86	0.00	0.00	3.33	1.67	1.86	0.00	0.83	0.83	1.67
JUN	5.25	3.29	2.40	2.85	0.00	1.86	0.99	1.97	4.78	1.40	1.40	0.00	1.20	1.20	2.39
JUL	7.22	1.87	1.62	5.60	0.00	1.40	4.20	8.39	4.94	0.00	0.00	1.73	1.23	1.23	2.47
AUG	6.17	1.55	1.28	4.89	0.00	0.00	4.89	9.78	5.78	0.00	0.00	2.00	1.44	1.44	2.89
SEP	3.47	1.10	0.79	2.68	0.00	0.00	2.68	5.36	4.38	0.00	0.00	0.49	1.09	1.09	2.19
OCT	1.40	0.75	0.29	1.11	0.00	0.00	1.11	2.22	0.00	0.00	0.00	1.11	0.00	0.00	0.00
TOTAL	27.42	18.39	10.49	19.13	2.20	5.27	13.86	27.73	23.21	3.07	10.98	5.33	5.80	5.80	11.60

AVERAGE CONDITIONS; CROP = 50% HAY, 50% ALFALFA

SOUTH SIDE DITCH = 1313

9.8% SEEPAGE LOSS IN 1989

IRRIGATED ACREAGE = 61.4

50% IRRIGATION EFFICIENCY USING FLOOD IRRIGATION

DEEP PERCOLATION IS ONE HALF OF IRRIGATION INEFFICIENCY (25.0%) PLUS EXCESS SOIL MOISTURE

OTHER HALF OF IRRIGATION INEFFICIENCY (25.0%) IS SURFACE WATER RETURN FLOW

PACT. = PACTOLA RESERVOIR

WTP = RAPID CITY WATER TREATMENT PLANT AND INFILTRATION GALLERIES

SOUTH SIDE DITCH AVERAGE MONTHLY DIVERSION IS FOR YEARS 1949-1979 DUE TO CONSISTENCY OF DATA

**GROSS TRANSFERABLE AMOUNT FROM
ERWIN EISENBRAUN PROPERTY UNDER SOUTH SIDE DITCH**

	(INCHES)	(FEET)	(AC.FT)
TO PACT.	11.60	0.97	59.37
TO WTP	23.21	1.93	118.74

TABLE A-2

DETERMINATION OF CONSUMPTIVE USE FOR TRANSFER
RAPID CITY WATER RIGHTS
95-002.001P
July 8, 1997

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0.5 ACRES**

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	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)
NOV	0.00	0.53	0.37	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.37	0.00	0.00	0.00	0.00
DEC	0.00	0.41	0.29	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.66	0.00	0.00	0.00	0.00
JAN	0.00	0.50	0.35	0.00	0.35	0.00	0.00	0.00	0.00	0.00	1.01	0.00	0.00	0.00	0.00
FEB	0.00	0.59	0.41	0.00	0.41	0.00	0.00	0.00	0.00	0.00	1.42	0.00	0.00	0.00	0.00
MAR	0.00	1.11	0.78	0.00	0.78	0.00	0.00	0.00	0.00	0.00	2.20	0.00	0.00	0.00	0.00
APR	0.29	2.11	0.15	0.14	0.00	0.14	0.00	0.00	0.00	0.00	2.06	0.00	0.00	0.00	0.00
MAY	3.62	2.58	1.76	1.86	0.00	1.86	0.00	0.00	3.33	1.67	1.86	0.00	0.83	0.83	1.67
JUN	5.25	3.29	2.40	2.85	0.00	1.86	0.99	1.97	4.78	1.40	1.40	0.00	1.20	1.20	2.39
JUL	7.22	1.87	1.62	5.60	0.00	1.40	4.20	8.39	4.94	0.00	0.00	1.73	1.23	1.23	2.47
AUG	6.17	1.55	1.28	4.89	0.00	0.00	4.89	9.78	5.78	0.00	0.00	2.00	1.44	1.44	2.89
SEP	3.47	1.10	0.79	2.68	0.00	0.00	2.68	5.36	4.38	0.00	0.00	0.49	1.09	1.09	2.18
OCT	1.40	0.75	0.29	1.11	0.00	0.00	1.11	2.22	0.00	0.00	0.00	1.11	0.00	0.00	0.00
TOTAL	27.42	16.39	10.49	19.13	2.20	5.27	13.86	27.73	23.21	3.07	10.98	6.33	6.80	6.80	11.60

AVERAGE CONDITIONS; CROP = 50% HAY, 50% ALFALFA

SOUTH SIDE DITCH = 1313

9.8% SEEPAGE LOSS IN 1989

IRRIGATED ACREAGE = 0.5

50% IRRIGATION EFFICIENCY USING FLOOD IRRIGATION

DEEP PERCOLATION IS ONE HALF OF IRRIGATION INEFFICIENCY (25.0%) PLUS EXCESS SOIL MOISTURE

OTHER HALF OF IRRIGATION INEFFICIENCY (25.0%) IS SURFACE WATER RETURN FLOW

PACT. = PACTOLA RESERVOIR

WTP = RAPID CITY WATER TREATMENT PLANT AND INFILTRATION GALLERIES

SOUTH SIDE DITCH AVERAGE MONTHLY DIVERSION IS FOR YEARS 1949-1979 DUE TO CONSISTENCY OF DATA

**GROSS TRANSFERABLE AMOUNT FROM
EICH EISENBRAUN PROPERTY UNDER SOUTH SIDE DITCH**

	(INCHES)	(FEET)	(AC.FT)
TO PACT.	11.60	0.97	0.48
TO WTP	23.21	1.93	0.97

TABLE A-3

DETERMINATION OF CONSUMPTIVE USE FOR TRANSFER
RAPID CITY WATER RIGHTS
95-002.001P
July 8, 1997

**TRANSFERABLE AMOUNT FROM HELGA BAUER PROPERTY PORTION OF SOUTH SIDE DITCH WATER RIGHTS (AVERAGE)
1.5 ACRES**

Q MONTH	R SOUTH SIDE WATER (AF)
MAY	404
JUN	580
JUL	599
AUG	701
SEP	531
TOTAL	2815

A MONTH	B C.U.	C PRECIP.	D EFFECT. PRECIP.	E PRECIP. ADJ. C.U.	F EXCESS PRECIP. TO SOIL MOIST. DURING MONTH	G SOIL MOIST. USED TO SATISFY ADJUST. C.U.	H REMAIN. CROP REQUIR.	I GROSS CROP NEEDS	J FARM IRRIG. SUPPLY	K EXCESS IRRIG. SOIL MOIST. CONTRIB.	L ACCUM. SOIL MOIST. STORAGE AFTER IRRIG.	M ADDITIONAL WATER REQUIRED TO MEET C.U. NEEDS FROM SUBIRRIG.	N DEEP PERC. (25.0%)	O SURFACE WATER RETURN FLOW (25.0%)	P CLAIMED IRRIG. C.U. FOR TRANSFER
	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)
NOV	0.00	0.53	0.37	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.37	0.00	0.00	0.00	0.00
DEC	0.00	0.41	0.29	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.66	0.00	0.00	0.00	0.00
JAN	0.00	0.50	0.35	0.00	0.35	0.00	0.00	0.00	0.00	0.00	1.01	0.00	0.00	0.00	0.00
FEB	0.00	0.59	0.41	0.00	0.41	0.00	0.00	0.00	0.00	0.00	1.42	0.00	0.00	0.00	0.00
MAR	0.00	1.11	0.78	0.00	0.78	0.00	0.00	0.00	0.00	0.00	2.20	0.00	0.00	0.00	0.00
APR	0.29	2.11	0.15	0.14	0.00	0.14	0.00	0.00	0.00	0.00	2.06	0.00	0.00	0.00	0.00
MAY	3.62	2.58	1.76	1.86	0.00	1.86	0.00	0.00	3.33	1.67	1.86	0.00	0.83	0.83	1.67
JUN	5.25	3.29	2.40	2.85	0.00	1.86	0.99	1.97	4.78	1.40	1.40	0.00	1.20	1.20	2.39
JUL	7.22	1.87	1.62	5.60	0.00	1.40	4.20	8.39	4.94	0.00	0.00	1.73	1.23	1.23	2.47
AUG	6.17	1.55	1.28	4.89	0.00	0.00	4.89	9.78	5.78	0.00	0.00	2.00	1.44	1.44	2.89
SEP	3.47	1.10	0.79	2.68	0.00	0.00	2.68	5.36	4.38	0.00	0.00	0.49	1.09	1.09	2.19
OCT	1.40	0.75	0.29	1.11	0.00	0.00	1.11	2.22	0.00	0.00	0.00	1.11	0.00	0.00	0.00
TOTAL	27.42	16.39	10.49	19.13	2.20	6.27	13.86	27.73	23.21	3.07	10.98	5.33	5.80	5.80	11.60

AVERAGE CONDITIONS; CROP = 50% HAY, 50% ALFALFA

SOUTH SIDE DITCH = 1313

9.8% SEEPAGE LOSS IN 1989

IRRIGATED ACREAGE = 1.5

50% IRRIGATION EFFICIENCY USING FLOOD IRRIGATION

DEEP PERCOLATION IS ONE HALF OF IRRIGATION INEFFICIENCY (25.0%) PLUS EXCESS SOIL MOISTURE

OTHER HALF OF IRRIGATION INEFFICIENCY (25.0%) IS SURFACE WATER RETURN FLOW

PACT. = PACTOLA RESERVOIR

WTP = RAPID CITY WATER TREATMENT PLANT AND INFILTRATION GALLERIES

SOUTH SIDE DITCH AVERAGE MONTHLY DIVERSION IS FOR YEARS 1949-1979 DUE TO CONSISTENCY OF DATA

**GROSS TRANSFERABLE AMOUNT FROM
HELGA BAUER PROPERTY UNDER SOUTH SIDE DITCH**

	(INCHES)	(FEET)	(AC.FT)
TO PACT.	11.60	0.97	1.45
TO WTP	23.21	1.93	2.90

TABLE A-4

DETERMINATION OF CONSUMPTIVE USE FOR TRANSFER
RAPID CITY WATER RIGHTS
95-002.001P
July 8, 1997

**TOTAL TRANSFERABLE AMOUNT FROM EISENBRAUN PROPERTY PORTION OF SOUTH SIDE DITCH WATER RIGHTS (AVERAGE)
63.4 ACRES**

Q MONTH	R SOUTH SIDE WATER (AF)
MAY	404
JUN	580
JUL	599
AUG	701
SEP	531
TOTAL	2816

A MONTH	B C.U.	C PRECIP.	D EFFECT. PRECIP.	E PRECIP. ADJ. C.U.	F EXCESS PRECIP. TO SOIL MOIST. DURING MONTH	G SOIL MOIST. USED TO SATISFY ADJUST. C.U.	H REMAIN. CROP REQUIR.	I GROSS CROP NEEDS	J FARM IRRIG. SUPPLY	K EXCESS IRRIG. SOIL MOIST. CONTRIB.	L ACCUM. SOIL MOIST. STORAGE AFTER IRRIG.	M ADDITIONAL WATER REQUIRED TO MEET C.U. NEEDS FROM SUBIRRIG.	N DEEP PERC. (25.0%)	O SURFACE WATER RETURN FLOW (25.0%)	P CLAIMED IRRIG. C.U. FOR TRANSFER
	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)
NOV	0.00	0.53	0.37	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.37	0.00	0.00	0.00	0.00
DEC	0.00	0.41	0.29	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.66	0.00	0.00	0.00	0.00
JAN	0.00	0.50	0.35	0.00	0.35	0.00	0.00	0.00	0.00	0.00	1.01	0.00	0.00	0.00	0.00
FEB	0.00	0.59	0.41	0.00	0.41	0.00	0.00	0.00	0.00	0.00	1.42	0.00	0.00	0.00	0.00
MAR	0.00	1.11	0.78	0.00	0.78	0.00	0.00	0.00	0.00	0.00	2.20	0.00	0.00	0.00	0.00
APR	0.29	2.11	0.15	0.14	0.00	0.14	0.00	0.00	0.00	0.00	2.06	0.00	0.00	0.00	0.00
MAY	3.62	2.58	1.76	1.86	0.00	1.86	0.00	0.00	3.33	1.67	1.86	0.00	0.83	0.83	1.67
JUN	5.25	3.29	2.40	2.85	0.00	1.86	0.99	1.97	4.78	1.40	1.40	0.00	1.20	1.20	2.39
JUL	7.22	1.87	1.62	5.60	0.00	1.40	4.20	8.39	4.94	0.00	0.00	1.73	1.23	1.23	2.47
AUG	6.17	1.55	1.28	4.89	0.00	0.00	4.89	9.78	5.78	0.00	0.00	2.00	1.44	1.44	2.89
SEP	3.47	1.10	0.79	2.68	0.00	0.00	2.68	5.36	4.38	0.00	0.00	0.49	1.09	1.09	2.19
OCT	1.40	0.75	0.29	1.11	0.00	0.00	1.11	2.22	0.00	0.00	0.00	1.11	0.00	0.00	0.00
TOTAL	27.42	16.39	10.49	19.13	2.20	5.27	13.86	27.73	23.21	3.07	10.98	5.33	5.80	6.80	11.60

AVERAGE CONDITIONS; CROP = 50% HAY, 50% ALFALFA

SOUTH SIDE DITCH = 1313

9.8% SEEPAGE LOSS IN 1989

EISENBRAUN IRRIGATED ACREAGE = 63.4

50% IRRIGATION EFFICIENCY USING FLOOD IRRIGATION

DEEP PERCOLATION IS ONE HALF OF IRRIGATION INEFFICIENCY (25.0%) PLUS EXCESS SOIL MOISTURE

OTHER HALF OF IRRIGATION INEFFICIENCY (25.0%) IS SURFACE WATER RETURN FLOW

PACT. = PACTOLA RESERVOIR

WTP = RAPID CITY WATER TREATMENT PLANT AND INFILTRATION GALLERIES

SOUTH SIDE DITCH AVERAGE MONTHLY DIVERSION IS FOR YEARS 1949-1979 DUE TO CONSISTENCY OF DATA

**GROSS TRANSFERABLE AMOUNT
UNDER SOUTH SIDE DITCH**

	(INCHES)	(FEET)	(AC.FT)
TO PACT.	11.60	0.97	61.30
TO WTP	23.21	1.93	122.61

TABLE A
FOOTNOTES FOR EISENBRAUM TRANSFERABLE AMOUNT

<u>Column A:</u>	Month
<u>Column B:</u>	Gross consumptive use calculated by weighting 50 percent hay and 50 percent alfalfa results from the Blaney-Criddle method presented in Tables C-1 and C-2, respectively.
<u>Column C:</u>	Total monthly precipitation taken from NOAA gage at Rapid City airport.
<u>Column D:</u>	Effective precipitation is precipitation available to meet crop consumptive use requirements. Nongrowing season: $0.7 \times C_i$ Growing season: Calculated by weighting 50 percent hay and 50 percent alfalfa results from the Blaney-Criddle regression presented in Tables C-1 and C-2 respectively.
<u>Column E:</u>	Net consumptive use. Growing season: $B_i - D_i$ Nongrowing season: 0
<u>Column F:</u>	Excess precipitation to soil moisture in storage. All months: if $D_i \geq B_i$, then $D_i - B_i$, else 0
<u>Column G:</u>	Soil moisture used to satisfy adjusted consumptive use. All months: if $E_i = 0$, then 0, else if $L_{i-1} \geq E_i$, then E_i, else L_{i-1}
<u>Column H:</u>	Remaining crop needs. All months: if $E_i \geq L_{i-1}$, then $E_i - L_{i-1}$, else 0
<u>Column I:</u>	Gross crop needs accounting for farm irrigation inefficiencies All months: $H/0.50$
<u>Column J:</u>	Farm irrigation supply is prorated for the Eisenbraum property as percentage of South Side water (9.8 percent South Side Ditch seepage loss and 1,313 total acres of land irrigated by South Side Ditch water rights). November - April: $R = 0$ May - September: $R \times 0.902 \times 12/1,313$ (average year conditions) October: $R = 0$

Column K: Excess irrigation soil moisture contribution.

All months: if $J_i = 0$, then 0, else, if $J_i \leq I_i$, then 0, else $(J_i - I_i) \times 0.50$

Column L: Accumulative soil moisture storage after irrigation.

All months: if $J_i - I_i < 0$, then 0 else,
If $F_i = 0$ then $L_{i-1} - G_i + K_i$, else $L_{i-1} + F_i$

Column M: Additional water required to meet consumptive use needs from subirrigation.

All months: if $L_i = 0$, then $(I_i - J_i) \times 0.50$, else 0

Column N: Deep percolation with flood irrigation.

All months: if $L_i > 9.5$, then $L_i - 9.5 + (J_i \times 0.25)$, else $J_i \times 0.25$

Column O: Surface water return flow.

All months: $J_i \times 0.25$

Column P: Claimed irrigation consumptive use for transfer from Eisenbraun property.

All months: if $J_i = 0$, then $P_i = 0$;
if $E_i \leq 0.50 J_i$, then $P_i = E_i$;
if $E_i > 0.50 J_i$, then $P_i = 0.50 J_i$

Column Q: Month during irrigation season :

Column R: South Side diversions (AF).

TABLE B-1
ERWIN EISENBRAUN PROPERTY
MONTHLY TRANSFER SUMMARY
61.4 ACRES

MONTH	DIVERSION TO STORAGE IN PACTOLA RESERVOIR (AC.FT)*	DIVERSION AT THE RAPID CITY WTP AND INFILTRATION GALLERIES (AC.FT)**
MAY	8.52	17.04
JUNE	12.23	24.46
JULY	12.63	25.27
AUGUST	14.78	29.57
SEPTEMBER	11.20	22.40
OCTOBER	0.00	0.00
TOTAL	69.37	118.74

* Monthly amount transferable to storage in Pactola Reservoir:
Column P (Table I) x No. of acres x 1 foot/12 inches

** Monthly amounts transferable to Rapid City WTP and infiltration galleries:
Column J (Table I) x No. of acres x 1 foot/12 inches

TABLE B-2
EICH EISENBRAUN
MONTHLY TRANSFER SUMMARY
0.5 ACRES

MONTH	DIVERSION TO STORAGE IN PACTOLA RESERVOIR (AC.FT)*	DIVERSION AT THE RAPID CITY WTP AND INFILTRATION GALLERIES (AC.FT)**
MAY	0.07	0.14
JUNE	0.10	0.20
JULY	0.10	0.21
AUGUST	0.12	0.24
SEPTEMBER	0.09	0.18
OCTOBER	0.00	0.00
TOTAL	0.48	0.97

* Monthly amount transferable to storage in Pactola Reservoir:

Column P (Table I) x No. of acres x 1 foot/12 inches

** Monthly amounts transferable to Rapid City WTP and Infiltration galleries:

Column J (Table I) x No. of acres x 1 foot/12 inches

TABLE B-3
HELGA BAUER
MONTHLY TRANSFER SUMMARY
1.5 ACRES

MONTH	DIVERSION TO STORAGE IN PACTOLA RESERVOIR (AC.FT)*	DIVERSION AT THE RAPID CITY WTP AND INFILTRATION GALLERIES (AC.FT)**
MAY	0.21	0.42
JUNE	0.30	0.60
JULY	0.31	0.62
AUGUST	0.36	0.72
SEPTEMBER	0.27	0.55
OCTOBER	0.00	0.00
TOTAL	1.45	2.90

* Monthly amount transferable to storage in Pactola Reservoir:
Column P (Table I) x No. of acres x 1 foot/12 inches

** Monthly amounts transferable to Rapid City WTP and infiltration galleries:
Column J (Table I) x No. of acres x 1 foot/12 inches

TABLE B-4
TOTAL
MONTHLY TRANSFER SUMMARY
63.4 ACRES

MONTH	DIVERSION TO STORAGE IN PACTOLA RESERVOIR (AC.FT)*	DIVERSION AT THE RAPID CITY WTP AND INFILTRATION GALLERIES (AC.FT)**
MAY	8.80	17.60
JUNE	12.63	25.26
JULY	13.04	26.09
AUGUST	15.27	30.53
SEPTEMBER	11.56	23.13
OCTOBER	0.00	0.00
TOTAL	61.30	122.61

* Monthly amount transferable to storage in Pactola Reservoir:
Column P (Table I) x No. of acres x 1 foot/12 inches

** Monthly amounts transferable to Rapid City WTP and Infiltration galleries:
Column J (Table I) x No. of acres x 1 foot/12 inches

TABLE C-1

TR-21 CONSUMPTIVE USE CALCULATIONS (AVERAGE) SOUTH SIDE DITCH

LATITUDE: 44 N

CROP: HAY

YEAR: 49-54, 56-59, 63-68, 70-79

STATION: RAPID CITY WSO AP

IRR. APPL. IN.: 3.00

f =

1.00067

LIMIT: 45 F MEAN TEMP

MONTH	DAYS	TEMP	ADJ. TEMP.	% DAY	ADJ. DAY	CU FACTOR	CLIMATE COEFF.	GROWTH COEFF.	CU COEFF.	MONTH CU	MONTH PPT.	PPT. FACTOR	EFFECT. PPT.	ADJUSTED CU
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
JAN	—	—	—	6.48	0.00	0.0000	0.3000	0.49	0.1470	0.00	—	-0.12	0.00	0.00
FEB	—	—	—	6.57	0.00	0.0000	0.3000	0.57	0.1710	0.00	—	-0.12	0.00	0.00
MAR	—	—	—	8.29	0.00	0.0000	0.3000	0.73	0.2190	0.00	—	-0.12	0.00	0.00
APR	9	43.9	47.4	9.05	2.84	1.3466	0.5060	0.85	0.4301	0.58	0.63	0.38	0.38	0.20
MAY	31	55.4	55.4	10.25	10.25	5.6785	0.6444	0.90	0.5800	3.29	2.58	1.72	1.72	1.57
JUN	30	63.2	63.2	10.39	10.39	6.5665	0.7794	0.92	0.7170	4.71	3.29	2.31	2.31	2.40
JUL	31	72.3	72.3	10.49	10.49	7.5843	0.9368	0.92	0.8618	6.54	1.87	1.55	1.55	4.99
AUG	31	70.8	70.8	9.71	9.71	6.8747	0.9108	0.91	0.8289	5.70	1.55	1.24	1.24	4.46
SEP	30	60.5	60.5	8.41	8.41	5.0881	0.7327	0.87	0.6374	3.24	1.10	0.78	0.78	2.46
OCT	26	49.3	51.1	7.64	6.67	3.4062	0.5700	0.79	0.4503	1.53	0.63	0.40	0.40	1.13
NOV	—	—	—	6.50	0.00	0.0000	0.3000	0.67	0.2010	0.00	—	-0.12	0.00	0.00
DEC	—	—	—	6.22	0.00	0.0000	0.3000	0.55	0.1650	0.00	—	-0.12	0.00	0.00

SUM 188

INCHES	25.59	11.65		8.39	17.20
FEET	2.13	0.97		0.70	1.43

TABLE C-2

TR-21 CONSUMPTIVE USE CALCULATIONS (AVERAGE) SOUTH SIDE DITCH

LATITUDE: 44 N
CROP: ALFALFA
YEAR: 49-54, 56-59, 63-68, 70-79

STATION: RAPID CITY WSO AP

IRR. APPL. IN.: 3.00 f= 1.00067
LIMIT: 50 F MEAN TEMP

MONTH	DAYS	TEMP	ADJ. TEMP.	% DAY	ADJ. DAY	CU FACTOR	CLIMATE COEFF.	GROWTH COEFF.	CU COEFF.	MONTH CU	MONTH PPT.	PPT. FACTOR	EFFECT. PPT.	ADJUSTED CU
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
JAN	—	—	—	6.48	0.00	0.0000	0.3000	0.63	0.1890	0.00	—	-0.12	0.00	0.0000
FEB	—	—	—	6.57	0.00	0.0000	0.3000	0.73	0.2190	0.00	—	-0.12	0.00	0.0000
MAR	—	—	—	8.29	0.00	0.0000	0.3000	0.86	0.2580	0.00	—	-0.12	0.00	0.0000
APR	—	—	—	9.05	0.00	0.0000	0.3000	0.99	0.2970	0.00	—	-0.12	0.00	0.0000
MAY	31	55.4	55.4	10.25	10.25	5.6785	0.6444	1.08	0.6960	3.95	2.58	1.79	1.79	2.1636
JUN	30	63.2	63.2	10.39	10.39	6.5665	0.7794	1.13	0.8807	5.78	3.29	2.46	2.46	3.3270
JUL	31	72.3	72.3	10.49	10.49	7.5843	0.9368	1.11	1.0398	7.89	1.87	1.67	1.67	6.2193
AUG	31	70.8	70.8	9.71	9.71	6.8747	0.9108	1.06	0.9655	6.64	1.55	1.31	1.31	5.3295
SEP	30	60.5	60.5	8.41	8.41	5.0881	0.7327	0.99	0.7253	3.69	1.10	0.80	0.80	2.8892
OCT	15	49.3	55.1	7.64	3.92	2.1579	0.6392	0.91	0.5817	1.26	0.36	0.21	0.21	1.0491
NOV	—	—	—	6.50	0.00	0.0000	0.3000	0.78	0.2340	0.00	—	-0.12	0.00	0.0000
DEC	—	—	—	6.22	0.00	0.0000	0.3000	0.64	0.1920	0.00	—	-0.12	0.00	0.0000

SUM 168

INCHES	29.20	10.75		8.23	20.98
FEET	2.43			0.69	1.75



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TERRENCE P. KENYON
RICHARD E. McLAUGHLIN
RONALD J. McLAUGHLIN
GERALD L. LAMB

GENE A. BURRELL
MICHAEL E. MERCER
JOHN M. PFLAUM
MICHAEL R. GALUZZI
SCOTT E. LEHMAN
BRIAN S. KOLSTAD
G. DEAN DEROSIER
EDWARD D. BAIN
BRIAN E. CHEVALIER
DANIEL F. BLAHA

LEANDER L. URMY
DANIEL M. PETRAMALA
RONALD D. LUCERO

Re: Erwin Eisenbraun Property Water Rights Transfer

Dear Mr. Rath:

McLaughlin Water Engineers, Ltd. has quantified the irrigated acreage under the South Ditch belonging to Erwin Eisenbraun and Helga Bauer. This acreage has been used to determine the amount of water that can be transferred to Pactola Reservoir and the Rapid City water treatment plant and infiltration galleries based on data and engineering calculations detailed in the engineering report prepared for the Stromer property dated March 1992 and the Jundt property engineering report dated December 15, 1992.

These calculations are based upon a flood irrigation efficiency of 50 percent and a 9.8 percent seepage loss for the South Side Ditch.

The South Side Ditch Water License shows 74 acres in the northwest and southwest quarters of the northeast quarter of Section 26, Township 1 North, Range 8 East of the Black Hills Meridian. Planimetrying the ASCS aerial photo for the property indicates approximately 59.3 acres irrigated on the unplatted portion of the property owned by Erwin Eisenbraun and another 3.6 acres are irrigated on the platted lots located at the north end of the property that are owned by Erwin Eisenbraun (2.1 acres), and Helga Bauer (1.5 acres). Calculations in Tables A-1, A-2, A-3, and B produce the following results:

► Erwin Eisenbraun farm property (59.3 acres):

- Average annual transferable amount to Pactola Reservoir:

$$(59.3 \text{ acres} \times 0.967 \text{ acre-feet/acre}) = 57.3 \text{ acre-feet}$$

- Average annual transferable amount to city WTP and infiltration galleries:

$$(59.3 \text{ acres} \times 1.934 \text{ acre-feet/acre}) \times (1.0 - .028) = 111.5 \text{ acre-feet}$$

Where 2.8 percent of the farm headgate deliveries to the Eisenbraun property are from Cyclone Ditch return flows. This portion of the South side Ditch flows cannot be transferred to the Rapid city WTP because they were not originally diverted at the South Side Ditch headgate.

► Erwin Eisenbraun lot (2.1 acres):

- Average annual transferable amount to Pactola Reservoir:

$$(2.1 \text{ acres} \times 0.967 \text{ acre-feet/acre}) = 2.0 \text{ acre-feet}$$
- Average annual transferable amount to city WTP and infiltration galleries:

$$(2.1 \text{ acres} \times 1.934 \text{ acre-feet/acre}) \times (1.0 - .028) = 3.9 \text{ acre-feet}$$

► Helga Bauer lot (1.5 acres):

- Average annual transferable amount to Pactola Reservoir:

$$(1.5 \text{ acres} \times 0.967 \text{ acre-feet/acre}) = 1.5 \text{ acre-feet}$$
- Average annual transferable amount to city WTP and infiltration galleries:

$$(1.5 \text{ acres} \times 1.934 \text{ acre-feet/acre}) \times (1.0 - .028) = 2.8 \text{ acre-feet}$$

The calculations to determine if a full irrigation supply was provided by the South Side Ditch to the Eisenbraun property are based on 1,313 acres of presently irrigated land for the South Side Ditch as agreed to in a 1992 telephone conference with Del Brosz and Mark Rath. The 1,313 acres consists of 1,078 acres irrigated under the South Side Ditch priority and 235 acres irrigated under the Little Giant Ditch priority.

The monthly transferable amounts to the Pactola Reservoir and the City's WTP and infiltration galleries are presented in Tables C-1, C-2, and C-3. Diversion at the alternate points of Pactola Reservoir and the water treatment plant and infiltration galleries will only take place during the permitted irrigation season for the South Side Ditch (April 15 to November 30); Tables C-1 through C-3, however, include transferable amounts for only May through September because no historic diversion by the South Side Ditch is recorded for April and October.

The rate of diversion for the transferable amount from the Eisenbraun property is calculated by the following method:

► Erwin Eisenbraun property:

$$\frac{59.3 \text{ acres}}{1877 \text{ acres}} \times 23.4 \text{ cfs at the ditch Headgate} \times (1.0 - 0.098 - 0.098) = 0.59 \text{ cfs}$$

► Erwin Eisenbraun lot:

$$\frac{2.1 \text{ acres}}{1877 \text{ acres}} \times 23.4 \text{ cfs at the ditch Headgate} \times (1.0 - 0.098 - 0.098) = 0.02 \text{ cfs}$$

► Helga Bauer property:

$$\frac{1.5 \text{ acres}}{1877 \text{ acres}} \times 23.4 \text{ cfs at the ditch Headgate} \times (1.0 - 0.098 - 0.098) = 0.02 \text{ cfs}$$

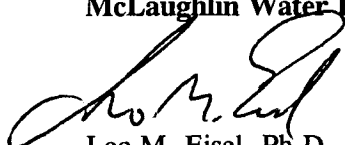
Where the 1,877 acres is the total licensed irrigated acreage for the South Side Ditch, the 23.4 is the licensed diversion amount, and the 9.8 percent carriage loss is the amount that will remain in the ditch to satisfy carriage losses in the South Side Ditch. Because the laterals serving the Eisenbraun property will remain in use to serve at least the Eich Eisenbraun 0.5 acre lot, an appropriate share of the carriage losses associated with this lateral must be left to protect the remaining users on the lateral. The appropriate amount is assumed to be the same percentage carriage loss as for the South Side Ditch, 9.8 percent. Therefore, the second 9.8 percent subtracted in the above calculations is to preserve sufficient carriage water to serve remaining users on the lateral.

During those periods when the South Side Ditch is diverting stored water, diversion by Rapid City at the infiltration galleries and/or water treatment plant will be limited to the historic consumptive use amounts (as shown in the "Diversion to Storage in Pactola Reservoir" column in Tables C-1, C-2, and C-3). This limitation is to insure that Rapid City does not divert stored water.

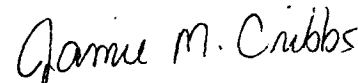
These transferable amounts and this rate of diversion insure that there will be no injury to downstream water rights, and that depletions to Rapid Creek will not exceed historic depletions.

If you have any questions regarding these calculations, please do not hesitate to contact us.

Very truly yours,
McLaughlin Water Engineers, Ltd.



Leo M. Eisel, Ph.D., P.E.



Jamie M. Cribbs, EIT.

cc: Daniel L. Bjerke

TABLE A-1

DETERMINATION OF CONSUMPTIVE USE FOR TRANSFER
RAPID CITY WATER RIGHTS
95-002.001P
Oct. 27, 1997

**TRANSFERABLE AMOUNT FROM ERWIN EISENBRAUN FARM PROPERTY PORTION
OF SOUTH SIDE DITCH WATER RIGHTS (AVERAGE)
59.3 ACRES**

Q MONTH	R SOUTH SIDE WATER (AF)
MAY	404
JUN	580
JUL	599
AUG	701
SEP	531
TOTAL	2815

A MONTH	B C.U.	C PRECIP.	D EFFECT. PRECIP.	E PRECIP. ADJ. C.U.	F EXCESS PRECIP. TO SOIL MOIST. DURING MONTH	G SOIL MOIST. USED TO SATISFY ADJUST. C.U.	H REMAIN. CROP REQUIR.	I GROSS CROP NEEDS	J FARM IRRIG. SUPPLY	K EXCESS IRRIG. SOIL MOIST. CONTRIB.	L ACCUM. SOIL MOIST. STORAGE AFTER IRRIG.	M ADDITIONAL WATER REQUIRED TO MEET C.U. NEEDS FROM SUBIRRIG.	N DEEP PERC. (25.0%)	O SURFACE WATER RETURN FLOW (25.0%)	P CLAIMED IRRIG. C.U. FOR TRANSFER
	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)
NOV	0.00	0.53	0.37	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.37	0.00	0.00	0.00	0.00
DEC	0.00	0.41	0.29	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.66	0.00	0.00	0.00	0.00
JAN	0.00	0.50	0.35	0.00	0.35	0.00	0.00	0.00	0.00	0.00	1.01	0.00	0.00	0.00	0.00
FEB	0.00	0.59	0.41	0.00	0.41	0.00	0.00	0.00	0.00	0.00	1.42	0.00	0.00	0.00	0.00
MAR	0.00	1.11	0.78	0.00	0.78	0.00	0.00	0.00	0.00	0.00	2.20	0.00	0.00	0.00	0.00
APR	0.29	2.11	0.15	0.14	0.00	0.14	0.00	0.00	0.00	0.00	2.06	0.00	0.00	0.00	0.00
MAY	3.62	2.58	1.76	1.86	0.00	1.86	0.00	0.00	3.33	1.67	1.86	0.00	0.83	0.83	1.67
JUN	5.25	3.29	2.40	2.85	0.00	1.86	0.99	1.97	4.78	1.40	1.40	0.00	1.20	1.20	2.39
JUL	7.22	1.87	1.62	5.60	0.00	1.40	4.20	8.39	4.94	0.00	0.00	1.73	1.23	1.23	2.47
AUG	6.17	1.55	1.28	4.89	0.00	0.00	4.89	9.78	5.78	0.00	0.00	2.00	1.44	1.44	2.89
SEP	3.47	1.10	0.79	2.68	0.00	0.00	2.68	5.36	4.38	0.00	0.00	0.49	1.09	1.09	2.19
OCT	1.40	0.75	0.29	1.11	0.00	0.00	1.11	2.22	0.00	0.00	0.00	1.11	0.00	0.00	0.00
TOTAL	27.42	16.39	10.49	19.13	2.20	5.27	13.86	27.73	23.21	3.07	10.98	5.33	5.80	5.80	11.60

AVERAGE CONDITIONS; CROP = 50% HAY, 50% ALFALFA

SOUTH SIDE DITCH = 1313

9.8% SEEPAGE LOSS IN 1989

IRRIGATED ACREAGE = 59.3

50% IRRIGATION EFFICIENCY USING FLOOD IRRIGATION

DEEP PERCOLATION IS ONE HALF OF IRRIGATION INEFFICIENCY (25.0%) PLUS EXCESS SOIL MOISTURE

OTHER HALF OF IRRIGATION INEFFICIENCY (25.0%) IS SURFACE WATER RETURN FLOW

PACT. = PACTOLA RESERVOIR

WTP = RAPID CITY WATER TREATMENT PLANT AND INFILTRATION GALLERIES

SOUTH SIDE DITCH AVERAGE MONTHLY DIVERSION IS FOR YEARS 1949-1979 DUE TO CONSISTENCY OF DATA

**GROSS TRANSFERABLE AMOUNT FROM
ERWIN EISENBRAUN PROPERTY UNDER SOUTH SIDE DITCH**

	(INCHES)	(FEET)	(AC.FT)
TO PACT.	11.60	0.97	57.34
TO WTP	23.21	1.93	114.68

TABLE A-2

DETERMINATION OF CONSUMPTIVE USE FOR TRANSFER
RAPID CITY WATER RIGHTS
95-002.001P
Oct. 27, 1997

**TRANSFERABLE AMOUNT FROM ERWIN EISENBRAUN LOT PROPERTY PORTION
OF SOUTH SIDE DITCH WATER RIGHTS (AVERAGE)
2.1 ACRES**

Q MONTH	R SOUTH SIDE WATER (AF)
MAY	404
JUN	580
JUL	599
AUG	701
SEP	531
TOTAL	2816

A MONTH	B C.U.	C PRECIP.	D EFFECT. PRECIP.	E PRECIP. ADJ. C.U.	F EXCESS PRECIP. TO SOIL MOIST. DURING MONTH	G SOIL MOIST. USED TO SATISFY ADJUST. C.U.	H REMAIN. CROP REQUIR.	I GROSS CROP NEEDS	J FARM IRRIG. SUPPLY	K EXCESS IRRIG. SOIL MOIST. CONTRIB.	L ACCUM. SOIL MOIST. STORAGE AFTER IRRIG.	M ADDITIONAL WATER REQUIRED TO MEET C.U. NEEDS FROM SUBIRRIG.	N DEEP PERC. (25.0%)	O SURFACE WATER RETURN FLOW (25.0%)	P CLAIMED IRRIG. C.U. FOR TRANSFER
	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)	(IN)
NOV	0.00	0.53	0.37	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.37	0.00	0.00	0.00	0.00
DEC	0.00	0.41	0.29	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.66	0.00	0.00	0.00	0.00
JAN	0.00	0.50	0.35	0.00	0.35	0.00	0.00	0.00	0.00	0.00	1.01	0.00	0.00	0.00	0.00
FEB	0.00	0.59	0.41	0.00	0.41	0.00	0.00	0.00	0.00	0.00	1.42	0.00	0.00	0.00	0.00
MAR	0.00	1.11	0.78	0.00	0.78	0.00	0.00	0.00	0.00	0.00	2.20	0.00	0.00	0.00	0.00
APR	0.29	2.11	0.15	0.14	0.00	0.14	0.00	0.00	0.00	0.00	2.06	0.00	0.00	0.00	0.00
MAY	3.62	2.58	1.76	1.86	0.00	1.86	0.00	0.00	3.33	1.67	1.86	0.00	0.83	0.83	1.67
JUN	5.25	3.29	2.40	2.85	0.00	1.86	0.99	1.97	4.78	1.40	1.40	0.00	1.20	1.20	2.39
JUL	7.22	1.87	1.62	5.60	0.00	1.40	4.20	8.39	4.94	0.00	0.00	1.73	1.23	1.23	2.47
AUG	6.17	1.55	1.28	4.89	0.00	0.00	4.89	9.78	5.78	0.00	0.00	2.00	1.44	1.44	2.89
SEP	3.47	1.10	0.79	2.68	0.00	0.00	2.68	5.36	4.38	0.00	0.00	0.49	1.09	1.09	2.19
OCT	1.40	0.75	0.29	1.11	0.00	0.00	1.11	2.22	0.00	0.00	0.00	1.11	0.00	0.00	0.00
TOTAL	27.42	16.39	10.49	19.13	2.20	6.27	13.86	27.73	23.21	3.07	10.98	5.33	5.80	5.80	11.60

AVERAGE CONDITIONS; CROP = 50% HAY, 50% ALFALFA

SOUTH SIDE DITCH = 1313

9.8% SEEPAGE LOSS IN 1989

IRRIGATED ACREAGE = 2.1

50% IRRIGATION EFFICIENCY USING FLOOD IRRIGATION

DEEP PERCOLATION IS ONE HALF OF IRRIGATION INEFFICIENCY (25.0%) PLUS EXCESS SOIL MOISTURE

OTHER HALF OF IRRIGATION INEFFICIENCY (25.0%) IS SURFACE WATER RETURN FLOW

PACT. = PACTOLA RESERVOIR

WTP = RAPID CITY WATER TREATMENT PLANT AND INFILTRATION GALLERIES

SOUTH SIDE DITCH AVERAGE MONTHLY DIVERSION IS FOR YEARS 1949-1979 DUE TO CONSISTENCY OF DATA

**GROSS TRANSFERABLE AMOUNT FROM
EICH EISENBRAUN PROPERTY UNDER SOUTH SIDE DITCH**

	(INCHES)	(FEET)	(AC.FT)
TO PACT.	11.60	0.97	2.03
TO WTP	23.21	1.93	4.06

TABLE A-3

DETERMINATION OF CONSUMPTIVE USE FOR TRANSFER
RAPID CITY WATER RIGHTS
95-002.001P
Oct. 27, 1997

**TRANSFERABLE AMOUNT FROM HELGA BAUER PROPERTY PORTION
OF SOUTH SIDE DITCH WATER RIGHTS (AVERAGE)
1.5 ACRES**

Q MONTH	R SOUTH SIDE WATER (AF)
MAY	404
JUN	580
JUL	599
AUG	701
SEP	531
TOTAL	2815

A MONTH	B C.U. (IN)	C PRECIP. (IN)	D EFFECT. PRECIP. (IN)	E PRECIP. ADJ. C.U. (IN)	F EXCESS PRECIP. TO SOIL MOIST. DURING MONTH (IN)	G SOIL MOIST. USED TO SATISFY ADJUST. C.U. (IN)	H REMAIN. CROP REQUIR. (IN)	I GROSS CROP NEEDS (IN)	J FARM IRRIG. SUPPLY (IN)	K EXCESS IRRIG. SOIL MOIST. CONTRIB. (IN)	L ACCUM. SOIL MOIST. STORAGE AFTER IRRIG. (IN)	M ADDITIONAL WATER REQUIRED TO MEET C.U. NEEDS FROM SUBIRRIG. (IN)	N DEEP PERC. (25.0%) (IN)	O SURFACE WATER RETURN FLOW (25.0%) (IN)	P CLAIMED IRRIG. C.U. FOR TRANSFER (IN)
NOV	0.00	0.53	0.37	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.37	0.00	0.00	0.00	0.00
DEC	0.00	0.41	0.29	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.66	0.00	0.00	0.00	0.00
JAN	0.00	0.50	0.35	0.00	0.35	0.00	0.00	0.00	0.00	0.00	1.01	0.00	0.00	0.00	0.00
FEB	0.00	0.59	0.41	0.00	0.41	0.00	0.00	0.00	0.00	0.00	1.42	0.00	0.00	0.00	0.00
MAR	0.00	1.11	0.78	0.00	0.78	0.00	0.00	0.00	0.00	0.00	2.20	0.00	0.00	0.00	0.00
APR	0.29	2.11	0.15	0.14	0.00	0.14	0.00	0.00	0.00	0.00	2.06	0.00	0.00	0.00	0.00
MAY	3.62	2.58	1.76	1.86	0.00	1.86	0.00	0.00	3.33	1.67	1.86	0.00	0.83	0.83	1.67
JUN	5.25	3.29	2.40	2.85	0.00	1.86	0.99	1.97	4.78	1.40	1.40	0.00	1.20	1.20	2.39
JUL	7.22	1.87	1.62	5.60	0.00	1.40	4.20	8.39	4.94	0.00	0.00	1.73	1.23	1.23	2.47
AUG	6.17	1.55	1.28	4.89	0.00	0.00	4.89	9.78	5.78	0.00	0.00	2.00	1.44	1.44	2.89
SEP	3.47	1.10	0.79	2.68	0.00	0.00	2.68	5.36	4.38	0.00	0.00	0.49	1.09	1.09	2.19
OCT	1.40	0.75	0.29	1.11	0.00	0.00	1.11	2.22	0.00	0.00	0.00	1.11	0.00	0.00	0.00
TOTAL	27.42	16.39	10.49	19.13	2.20	5.27	13.86	27.73	23.21	3.07	10.98	5.33	5.80	5.80	11.60

AVERAGE CONDITIONS; CROP = 50% HAY, 50% ALFALFA

SOUTH SIDE DITCH = 1313

9.8% SEEPAGE LOSS IN 1989

IRRIGATED ACREAGE = 1.5

50% IRRIGATION EFFICIENCY USING FLOOD IRRIGATION

DEEP PERCOLATION IS ONE HALF OF IRRIGATION INEFFICIENCY (25.0%) PLUS EXCESS SOIL MOISTURE

OTHER HALF OF IRRIGATION INEFFICIENCY (25.0%) IS SURFACE WATER RETURN FLOW

PACT. = PACTOLA RESERVOIR

WTP = RAPID CITY WATER TREATMENT PLANT AND INFILTRATION GALLERIES

SOUTH SIDE DITCH AVERAGE MONTHLY DIVERSION IS FOR YEARS 1949-1979 DUE TO CONSISTENCY OF DATA

**GROSS TRANSFERABLE AMOUNT FROM
HELGA BAUER PROPERTY UNDER SOUTH SIDE DITCH**

	(INCHES)	(FEET)	(AC.FT)
TO PACT.	11.60	0.97	1.45
TO WTP	23.21	1.93	2.90

TABLE A
FOOTNOTES FOR EISENBRAUM TRANSFERABLE AMOUNT

<u>Column A:</u>	Month
<u>Column B:</u>	Gross consumptive use calculated by weighting 50 percent hay and 50 percent alfalfa results from the Blaney-Criddle method presented in Tables C-1 and C-2, respectively.
<u>Column C:</u>	Total monthly precipitation taken from NOAA gage at Rapid City airport.
<u>Column D:</u>	Effective precipitation is precipitation available to meet crop consumptive use requirements. Nongrowing season: $0.7 \times C_i$ Growing season: Calculated by weighting 50 percent hay and 50 percent alfalfa results from the Blaney-Criddle regression presented in Tables C-1 and C-2 respectively.
<u>Column E:</u>	Net consumptive use. Growing season: $B_i - D_i$ Nongrowing season: 0
<u>Column F:</u>	Excess precipitation to soil moisture in storage. All months: if $D_i \geq B_i$, then $D_i - B_i$, else 0
<u>Column G:</u>	Soil moisture used to satisfy adjusted consumptive use. All months: if $E_i = 0$, then 0, else if $L_{i-1} \geq E_i$, then E_i, else L_{i-1}
<u>Column H:</u>	Remaining crop needs. All months: if $E_i \geq L_{i-1}$, then $E_i - L_{i-1}$, else 0
<u>Column I:</u>	Gross crop needs accounting for farm irrigation inefficiencies All months: $H/0.50$
<u>Column J:</u>	Farm irrigation supply is prorated for the Eisenbraum property as percentage of South Side water (9.8 percent South Side Ditch seepage loss and 1,313 total acres of land irrigated by South Side Ditch water rights). November - April: $R = 0$ May - September: $R \times 0.902 \times 12/1,313$ (average year conditions) October: $R = 0$

TABLE A
FOOTNOTES FOR EISENBRAUM TRANSFERABLE AMOUNT
(Continued)

Column K: Excess irrigation soil moisture contribution.

All months: if $J_i = 0$, then 0, else, if $J_i \leq I_i$, then 0, else $(J_i - I_i) \times 0.50$

Column L: Accumulative soil moisture storage after irrigation.

All months: if $J_i - I_i < 0$, then 0 else,
If $F_i = 0$ then $L_{i-1} - G_i + K_i$, else $L_{i-1} + F_i$

Column M: Additional water required to meet consumptive use needs from subirrigation.

All months: if $L_i = 0$, then $(I_i - J_i) \times 0.50$, else 0

Column N: Deep percolation with flood irrigation.

All months: if $L_i > 9.5$, then $L_i - 9.5 + (J_i \times 0.25)$, else $J_i \times 0.25$

Column O: Surface water return flow.

All months: $J_i \times 0.25$

Column P: Claimed irrigation consumptive use for transfer from Eisenbraum property.

All months: if $J_i = 0$, then $P_i = 0$;
if $E_i \leq 0.50 J_i$, then $P_i = E_i$;
if $E_i > 0.50 J_i$, then $P_i = 0.50 J_i$

Column Q: Month during irrigation season

Column R: South Side diversions (AF).

TABLE B

TRANSFERABLE AMOUNTS FROM EISENBRAUN PROPERTY PORTION OF THE SOUTH SIDE DITCH WATER RIGHTS

PROPERTY	DIVERSION POINT	GROSS JUNDT TRANSFER (AF)	RETURN FLOW CONTRIBUTION (%)	RETURN FLOW CONTRIBUTION (AF)	NET TRANSFERABLE AMOUNT (AF)
ERWIN EISENBRAUN	TO PACTOLA	57.3	--		57.3
FARM PROPERTY	TO WTP	114.7	2.8	3.2	111.5
ERWIN EISENBRAUN	TO PACTOLA	2	--		2.0
LOT	TO WTP	4.1	2.8	0.1	4.0
HELGA BAUER	TO PACTOLA	1.5	--		1.5
LOT	TO WTP	2.9	2.8	0.1	2.8

The return flow contribution is that portion of the Eisenbraun or Bauer property South Side Ditch water rights that is composed of return flows from the Cyclone ditch which reach Rapid Creek upstream from the South Side Ditch point of diversion. These percentages and amounts are calculated in Appendix N of the Engineering Report for Transfer of Stroman Property Portion of South Side Ditch Water Rights (March 1992).

TABLE C-1
ERWIN EISENBRAUN FARM PROPERTY
MONTHLY TRANSFER SUMMARY
59.3 ACRES

MONTH	DIVERSION TO STORAGE IN PACTOLA RESERVOIR (AC.FT)*	DIVERSION AT THE RAPID CITY WTP AND INFILTRATION GALLERIES (AC.FT)**
MAY	8.23	16.00
JUNE	11.81	22.97
JULY	12.20	23.72
AUGUST	14.28	27.76
SEPTEMBER	10.82	21.03
OCTOBER	0.00	0.00
TOTAL	57.34	111.47

* Monthly amount transferable to storage in Pactola Reservoir:
Column P (Table I) x No. of acres x 1 foot/12 inches

** Monthly amounts transferable to Rapid City WTP and infiltration galleries:
Column J (Table I) x No. of acres x 1 foot/12 inches

TABLE C-2
ERWIN EISENBRAUN LOT
MONTHLY TRANSFER SUMMARY
2.1 ACRES

MONTH	DIVERSION TO STORAGE IN PACTOLA RESERVOIR (AC.FT)*	DIVERSION AT THE RAPID CITY WTP AND INFILTRATION GALLERIES (AC.FT)**
MAY	0.29	0.57
JUNE	0.42	0.81
JULY	0.43	0.84
AUGUST	0.51	0.98
SEPTEMBER	0.38	0.74
OCTOBER	0.00	0.00
TOTAL	2.03	3.95

* Monthly amount transferable to storage in Pactola

Reservoir:

Column P (Table I) x No. of acres x 1 foot/12 inches

** Monthly amounts transferable to Rapid City WTP

and infiltration galleries:

Column J (Table I) x No. of acres x 1 foot/12 inches

TABLE C-3
HELGA BAUER
MONTHLY TRANSFER SUMMARY
1.5 ACRES

MONTH	DIVERSION TO STORAGE IN PACTOLA RESERVOIR (AC.FT)*	DIVERSION AT THE RAPID CITY WTP AND INFILTRATION GALLERIES (AC.FT)**
MAY	0.21	0.40
JUNE	0.30	0.58
JULY	0.31	0.60
AUGUST	0.36	0.70
SEPTEMBER	0.27	0.53
OCTOBER	0.00	0.00
TOTAL	1.45	2.82

* Monthly amount transferable to storage in Pactola

Reservoir:

Column P (Table I) x No. of acres x 1 foot/12 inches

** Monthly amounts transferable to Rapid City WTP
and infiltration galleries:

Column J (Table I) x No. of acres x 1 foot/12 inches

TABLE D-1

TR-21 CONSUMPTIVE USE CALCULATIONS (AVERAGE) SOUTH SIDE DITCH

LATITUDE: 44 N

CROP: HAY

YEAR: 49-54, 56-59, 63-68, 70-79

STATION: RAPID CITY WSO AP

IRR. APPL. IN.: 3.00

f =

1.00067

LIMIT: 45 F MEAN TEMP

MONTH	DAYS	TEMP	ADJ. TEMP.	% DAY	ADJ. DAY	CU FACTOR	CLIMATE COEFF.	GROWTH COEFF.	CU COEFF.	MONTH CU	MONTH PPT.	PPT. FACTOR	EFFECT. PPT.	ADJUSTED CU
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
JAN	—	—	—	6.48	0.00	0.0000	0.3000	0.49	0.1470	0.00	—	-0.12	0.00	0.00
FEB	—	—	—	6.57	0.00	0.0000	0.3000	0.57	0.1710	0.00	—	-0.12	0.00	0.00
MAR	—	—	—	8.29	0.00	0.0000	0.3000	0.73	0.2190	0.00	—	-0.12	0.00	0.00
APR	9	43.9	47.4	9.05	2.84	1.3466	0.5060	0.85	0.4301	0.58	0.63	0.38	0.38	0.20
MAY	31	55.4	55.4	10.25	10.25	5.6785	0.6444	0.90	0.5800	3.29	2.58	1.72	1.72	1.57
JUN	30	63.2	63.2	10.39	10.39	6.5665	0.7794	0.92	0.7170	4.71	3.29	2.31	2.31	2.40
JUL	31	72.3	72.3	10.49	10.49	7.5843	0.9368	0.92	0.8618	6.54	1.87	1.55	1.55	4.99
AUG	31	70.8	70.8	9.71	9.71	6.8747	0.9108	0.91	0.8289	5.70	1.55	1.24	1.24	4.46
SEP	30	60.5	60.5	8.41	8.41	5.0881	0.7327	0.87	0.6374	3.24	1.10	0.78	0.78	2.46
OCT	26	49.3	51.1	7.64	6.67	3.4062	0.5700	0.79	0.4503	1.53	0.63	0.40	0.40	1.13
NOV	—	—	—	6.50	0.00	0.0000	0.3000	0.67	0.2010	0.00	—	-0.12	0.00	0.00
DEC	—	—	—	6.22	0.00	0.0000	0.3000	0.55	0.1650	0.00	—	-0.12	0.00	0.00

SUM 188

INCHES	25.59	11.65		8.39	17.20
FEET	2.13	0.97		0.70	1.43

TABLE D-2

TR-21 CONSUMPTIVE USE CALCULATIONS (AVERAGE) SOUTH SIDE DITCH

LATITUDE: 44 N

CROP: ALFALFA

YEAR: 49-54, 56-59, 63-68, 70-79

STATION: RAPID CITY WSO AP

IRR. APPL. IN.: 3.00

f =

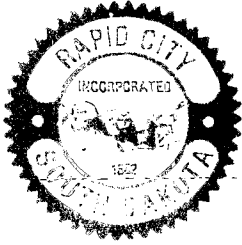
1.00067

LIMIT: 50 F MEAN TEMP

MONTH	DAYS	TEMP	ADJ. TEMP.	% DAY	ADJ. DAY	CU FACTOR	CLIMATE COEFF.	GROWTH COEFF.	CU COEFF.	MONTH CU	MONTH PPT.	PPT. FACTOR	EFFECT. PPT.	ADJUSTED CU
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
JAN	—	—	—	6.48	0.00	0.0000	0.3000	0.63	0.1890	0.00	—	-0.12	0.00	0.0000
FEB	—	—	—	6.57	0.00	0.0000	0.3000	0.73	0.2190	0.00	—	-0.12	0.00	0.0000
MAR	—	—	—	8.29	0.00	0.0000	0.3000	0.86	0.2580	0.00	—	-0.12	0.00	0.0000
APR	—	—	—	9.05	0.00	0.0000	0.3000	0.99	0.2970	0.00	—	-0.12	0.00	0.0000
MAY	31	55.4	55.4	10.25	10.25	5.6785	0.6444	1.08	0.6960	3.95	2.58	1.79	1.79	2.1636
JUN	30	63.2	63.2	10.39	10.39	6.5665	0.7794	1.13	0.8807	5.78	3.29	2.46	2.46	3.3270
JUL	31	72.3	72.3	10.49	10.49	7.5843	0.9368	1.11	1.0398	7.89	1.87	1.67	1.67	6.2193
AUG	31	70.8	70.8	9.71	9.71	6.8747	0.9108	1.06	0.9655	6.64	1.55	1.31	1.31	5.3295
SEP	30	60.5	60.5	8.41	8.41	5.0881	0.7327	0.99	0.7253	3.69	1.10	0.80	0.80	2.8892
OCT	15	49.3	55.1	7.64	3.92	2.1579	0.6392	0.91	0.5817	1.26	0.36	0.21	0.21	1.0491
NOV	—	—	—	6.50	0.00	0.0000	0.3000	0.78	0.2340	0.00	—	-0.12	0.00	0.0000
DEC	—	—	—	6.22	0.00	0.0000	0.3000	0.64	0.1920	0.00	—	-0.12	0.00	0.0000

SUM 168

INCHES	29.20	10.75		8.23	20.98
FEET	2.43			0.69	1.75



CITY OF RAPID CITY

RAPID CITY, SOUTH DAKOTA 57701-2724

Public Works Department

300 Sixth Street

605-394-4165

FAX 605-394-6636

November 18, 1997

Mr. Mark Rath
Natural Resource Engineer
Water Rights Division
SD Department of Environment & Natural Resources
523 East Capitol Avenue
Pierre, SD 57501



Re: Application For Permit To Appropriate Water - Water Rights Transfer
Erwin and Janice Eisenbraun Property on the South Side Ditch

Dear Mr. Rath:

Transmitted herewith are two copies of the above referenced application for your consideration. I have included a Purchase Order in the amount of \$50.00 for the application fee. The engineering report for the proposed water rights transfer has been previously submitted to you by the City's consultant, McLaughlin Water Engineers of Denver, Colorado.

If there is any additional information required or needed, please call me at (605) 394-4165. As per our recent telephone conversation, it is my understanding the application will be considered at the Water Management Board meeting in February or March, 1998.

Sincerely yours,
CITY OF RAPID CITY

Daniel L. Bjerke, PE/LS
Public Works Director of Engineering/Utilities

cc: Bob Jackson, City Attorney



EQUAL HOUSING
OPPORTUNITY

EQUAL OPPORTUNITY EMPLOYER



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181

November 21, 1997

Daniel L Bjerke
Public Works Department
City of Rapid City
300 6th St
Rapid City SD 57701-2724

Dear Mr. Bjerke:

Thank you for submitting the *Application for Permit to Appropriate Water* for the proposed water right transfer - Erwin and Janice Eisenbraun property.

Enclosed are the maps submitted with the application. Please sign these maps and include a signed map that shows the location of Rapid City's existing diversion points.

If you have any questions, please contact Eric Gronlund or me.

Sincerely,

Karen Schlaak
Water Rights Program
605 773-3352

enclosures



CITY OF RAPID CITY

RAPID CITY, SOUTH DAKOTA 57701-2724

Public Works Department

300 Sixth Street

605-394-4165

FAX 605-394-6636

December 1, 1997

Ms. Karen Schlaak
Water Rights Program
SD Department of Water & Natural Resources
Joe Foss Building, 523 East Capitol
Pierre, SD 57501-2724



Re: Erwin and Janice Eisenbraun Property
Application for Permit to Appropriate Water

Dear Ms. Schlaak:

As per your recent request, I am submitting signed maps showing the location of the Eisenbraun property and the location of the City's existing diversion points near Rapid Creek including Jackson Springs, Meadowbrook and Girl Scouts infiltration galleries and the Water Treatment Plant.

If you need any additional information, please call me at (605) 394-4165.

Sincerely yours,
CITY OF RAPID CITY

Daniel L. Bjerke
Public Works Director of Engineering/Utilities



EQUAL HOUSING
OPPORTUNITY

EQUAL OPPORTUNITY EMPLOYER

Report on Water Permit Application No. 2397-2
City of Rapid City
December 31, 1997

Application No. 2397-2, City of Rapid City, proposes to transfer an annual volume of 111.5 acre-feet of water (ac-ft), if diverted at the city's water treatment plant or infiltration galleries, or 57.3 ac-ft, if stored in Pactola Reservoir. The maximum diversion rate proposed for this transfer is 0.59 cubic feet of water per second (cfs) from the natural flows of Rapid Creek. The transfer is from irrigation to municipal, industrial, commercial, common distribution system, rural water system, suburban housing, and domestic uses for the City of Rapid City. Application No. 2397-2 proposes to transfer South Side Ditch Company stockholder/landowner's water which has been historically used to irrigate 59.3 acres located in the W1/2 NE1/4 Section 26 T1N-R8E also known as the Erwin and Janice Eisenbraun property.

The source of water for the proposed transfer is from the natural flow of Rapid Creek, when available, through South Side ditch. Vested Water Right No. 2040-2, South Side Ditch Company was validated for 23.40 cfs with a priority date of May 3, 1880. The existing diversion point for South Side ditch is located in the SE1/4 NW1/4 of Section 15 T1N-R8E. The locations of the diversion points for the proposed transfer are in the SE1/4 NE1/4 Section 3 (Rapid City Water Treatment Plant); SW1/4 SW1/4 Section 3 (Sioux Park Gallery); SE1/4 NE1/4 Section 9 (Meadowbrook Gallery); NW1/4 SE1/4 Section 8 (Jackson Springs Gallery); all in T1N-R7E and NW1/4 SW1/4 Section 2 T1N-R5E (Pactola Reservoir). Pactola Reservoir impounds water in portions of Sections 2, 3, 4, 5, 10, 11 of T1N-R5E and Sections 31, 32, 33, 34 of T2N-R5E. This application does not request any new water appropriation from Rapid Creek and the validated priority date of May 3, 1880, is to be retained by the city.

Review of Existing Water Rights

The water to be transferred has been appropriated under Vested Water Right No. 2040-2, South Side ditch, with a priority date of May 3, 1880. The water right authorizes the irrigation of 59.3 acres of the Erwin and Janice Eisenbraun property. There are 59.3 acres located in the W1/2 NE1/4 of Section 26 in T1N-R8E which have been continually irrigated.

There are 77 existing water rights/permits appropriating 267.41 cfs located on Rapid Creek between Pactola Reservoir and the confluence with the Cheyenne River. Of these, 14 water rights which appropriate approximately 28.32 cfs have priority dates which are senior to this proposed transfer.

Review of the Proposed Transfer

SDCL 46-5-34.1 states that no transfer can occur unless the transfer can be made without detriment to existing rights, or to individual domestic use rights. SDCL 46-5-34.1 also states "No land which has had an irrigation right transferred from it pursuant to this section may qualify for another irrigation right from any water source. SDCL 46-2A-12 allows a change in use "only if the change does not unlawfully impair existing rights and is for a beneficial use and in the public interest." Calculations using accepted scientific methods and available climatic and cropping data have been made to insure that adverse affects on existing water rights do not occur.

The volume of water which could be stored in Pactola Reservoir is 57.3 ac-ft annually. This volume of water is equal to the amount of water estimated to have been consumed annually by the crop. The amount of water which can be diverted at Rapid City water system intakes is 111.5 ac-ft annually. This volume of water includes the amount of water consumed by the crop plus the return water to Rapid Creek.

The volume of water estimated to have been consumed by the crop is calculated on a monthly basis. For each month the maximum amount of water the crop would use is calculated. This is compared to the amount of water that is available for the crop's use based on historical ditch diversions and the total acreage irrigated annually from the ditch. A determination is made, on a monthly basis, whether maximum crop water usage or available water supply is the limiting factor.

The lesser of these is used as the volume of water consumed by the crop for that particular month. Water which has been returned to Rapid Creek through irrigation would also be returned to Rapid Creek by Rapid City through their waste water treatment system. (Wright, 1992) If in the future the City of Rapid City stops returning effluent to Rapid Creek, then the diversion proposed by this application will need to be recalculated to reflect that condition.

Farm turnouts do not have measuring devices, so actual individual diversions from the ditch are unknown. Water in the ditch is shared by the users as needed. Based on actual past operations, the calculated diversion rate transfer is based on a pro rata share of the total ditch diversion. The proposed diversion rate transfer is based on water beneficially used as described under SDCL 46-1-8.

The transferable diversion rate is based on the pro rata share of water which is decreased by the 9.8 percent carriage loss that is to remain in the ditch. A lateral ditch off of the main South Side ditch has been used to supply the Erwin and Janice Eisenbraun property. The Eisenbraun lateral will remain in use to supply the remaining 14.7 irrigated acres along the lateral. A share of the carriage losses associated with the Eisenbraun lateral is to be left to protect the remaining use from the lateral. This amount is assumed to be the same percentage loss as for the South Side ditch, 9.8 percent. This gives a transferable diversion rate of 0.59 cfs.

If this transfer is approved, the diversion rate and acreage authorized by the May 3, 1880 priority date of Water Right No. 2040-2 should be decreased by 0.59 cfs and 59.3 acres due to the transfer. If at a future date, the remaining 14.7 acres that are served by the Eisenbraun lateral are no longer irrigated, an adjustment to the diversion rate for No. 2397-2 should be made. The diversion rate for No. 2397-2 should be increased by 0.07 cfs (9.8 percent) since carriage water in the Eisenbraun lateral would no longer be needed. Also, the diversion rate for South Side ditch would need to be adjusted, at that time, due to the reduction in total irrigated acres from the ditch and the elimination of the need for requiring the lateral carriage loss.

The water available for transfer is only from the natural flow in Rapid Creek and does not include stored water or stored water releases from the Deerfield - Pactola Reservoirs.

To insure that the transfer of the water can be made without detriment to existing water rights, the Water Management Board should monitor the management and operation of the proposed transfer.

Conclusions

1. SDCL 46-5-34.1 allows for the transfer of irrigation water rights apart from the land to municipal use when the transfer can be made without causing detriment to existing rights. SDCL 46-2A-12 allows a change in use only if the change does not unlawfully impair existing rights and is for a beneficial use and in the public interest.
2. The water has been historically used to irrigate 59.3 acres.
3. The priority date of May 3, 1880, should be retained.
4. The diversion rate to be transferred is 0.59 cfs, and is based on the pro-rated share of the total ditch diversion rate minus carriage losses for the main ditch and lateral.
5. The amount of water requested to be transferred, 111.5 ac-ft and 57.3 ac-ft is reasonable. The following table lists the monthly diversion associated with each volume:

Month	Diversion at Pactola (ac-ft)	Diversion at Intakes (ac-ft)
May	8.2	16.0
June	11.8	23.0
July	12.2	23.7
Aug	14.3	27.8
Sept	10.8	21.0
Oct	0.0	0.0
Total	57.3	111.5

6. If application No. 2397-2 is approved, the authorized diversion rate and acreage for the South Side Ditch Company Water Right No.2040-2 under the May 3, 1880 priority date should be decreased by 0.59 cfs and 59.3 acres.
7. The Water Management Board should monitor the management and operation of the proposed transfer.
8. Approval of Application No. 2397-2, only approves transfer of natural flow water and does not include any rights to stored irrigation water available under contract from Pactola Reservoir.
9. Because natural flow water has not been available for No. 2040-2 during lower flow periods, approval of No. 2397-2 does not guarantee that natural flow water will be available for No. 2397-2 for diversion or storage during low flow periods.
10. If at a future date, the remaining 14.7 acres that are served by the Eisenbraun lateral ditch are no longer irrigated, an adjustment to the diversion rate for No. 2397-2 should be made. The diversion rate for No. 2397-2 should be increased by 0.07 cfs (9.8 percent),

at that time, since carriage water in this lateral will no longer be needed. Also at that time, the diversion rate for South Side ditch would need to be adjusted accordingly.

11. The effect of approval of No. 2397-2 will be to retire 59.3 acres of the Erwin and Janice Eisenbraun property from irrigation pursuant to SDCL 46-5-34.1 which states "No land which has had an irrigation right transferred from it pursuant to this section may qualify for another irrigation right from any water source."

Mark D. Rath

Mark D. Rath
Natural Resources Engineer III

Approved by,

Delvin D. Brosz

Delvin D. Brosz
Natural Resources Engineer IV

References

1. Wright Water Engineers, Inc. 1992. Engineering Report for Transfer of Stroman Property Portion of South Side Ditch Water Rights. Wright Water Engineers, Inc. Engineering Consultants, Denver, Colorado.
2. U.S. Bureau of Reclamation. 1990. Rapid Valley Water Management Study. U.S. Bureau of Reclamation, Belle Fourche Projects Office, Newell, South Dakota.
3. S.D. Department of Environment and Natural Resources. Division of Water Rights Records.

RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 2397-2, City of Rapid City

Pursuant to SDCL 46-2A-2, the following is the recommendation of the Chief Engineer, Water Rights Program, Department of Environment and Natural Resources concerning Water Permit Application No. 2397-2, City of Rapid City, c/o Daniel Bjerke, Public Works Director of Engineering/Utilities, 300 Sixth Street, Rapid City, SD 57701-2724.

The Chief Engineer is recommending APPROVAL of Application No. 2397-2 because 1) the proposed diversion can be developed without unlawful impairment of existing rights, 2) the proposed use is a beneficial use and 3) it is in the public interest with the following qualifications:

1. Permit No. 2397-2 is limited to a diversion rate of 0.59 cfs for a total annual volume of 57.3 acre-feet at Pactola Reservoir or a total annual volume of 111.5 acre-feet at Sioux Park Gallery (SW 1/4 SW 1/4 Section 3), Meadowbrook Gallery (SE 1/4 NE 1/4 Section 9), Jackson Springs Gallery (NW 1/4 SE 1/4 Section 8), and the Rapid City Water Treatment Plant (SE 1/4 NE 1/4 Section 3), all in T1N-R7E. Maximum monthly diversion volumes at Pactola or the diversion points within Rapid City are as follows:

<u>Monthly</u>	<u>Monthly acre-feet at Pactola</u>	<u>Monthly acre-feet at diversion points within Rapid City</u>
May	8.23	16.00
June	11.81	22.97
July	12.20	23.72
August	14.28	27.76
September	10.82	21.03
October	0.0	0.0

Diversions during a month may be made at either Pactola Reservoir or at the diversion points within Rapid City, but not simultaneously at both Pactola and the Rapid City diversion points.

2. Permit No. 2397-2 authorizes diversion of only natural flow water by the City of Rapid City and does not include any rights to stored irrigation water available under contract from Pactola Reservoir.
3. That the City of Rapid City report to the Chief Engineer annually the amount of water withdrawn each month at Pactola Reservoir or the diversion points within Rapid City.
4. That the Water Management Board is retaining jurisdiction of Permit No. 2397-2 in the event that additional information shows that changes need to be made in the monthly or total annual volumes authorized by Permit No. 2397-2.

5. Diversions under Permit No. 2397-2 may not interfere with existing water rights in effect prior to approval of No. 2397-2 or any domestic rights.
6. The amount of water with a May 3, 1880, priority date, which may be appropriated under Vested Water Right No. 2040-2 is reduced by 0.59 cfs and the number of irrigated acres are decreased by 59.3 acres.
7. Approval of Permit No. 2397-2 retires the 59.3 acres, known as the Erwin and Janice Eisenbraun property which has been historically irrigated from South Side Ditch, located in the W 1/2 NE 1/4 Section 26-T1N-R8E from future irrigation.

See report on application for additional information.

A handwritten signature in black ink, appearing to read "John Hatch", written in a cursive style.

JOHN HATCH, Chief Engineer
January 13, 1998



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181

NOTE: TO BE SURE OF PUBLICATION ON
THE CORRECT DATES, CONTACT
THE NEWSPAPER RIGHT AWAY.

January 14, 1998

City of Rapid City
%Daniel Bjerke
300 6th Street
Rapid City, SD 57701-2724

Dear Mr. Bjerke:

Water Permit Application No. 2397-2 for municipal use has been examined and found to comply with the South Dakota Water Laws and applicable rules. A notice of hearing has been sent to the Publisher of the Rapid City Journal printed at Rapid City, SD (Ph # (605) 394-8300). For your information, a copy of the notice, the recommendation of the Chief Engineer and a report on the application are enclosed. Please review the notice prior to publication and notify this office, if you have any corrections or questions.

Be sure to contact the above newspaper to authorize publication of your Notice of Hearing and to arrange for payment. Early contact with the paper can eliminate delays. The publisher has been instructed to publish your notice once each week for two consecutive weeks with the last publication to occur twenty days before the board meeting. The newspaper has been instructed to send us the Proof of Publication. We must receive Proof of Publication before action can be taken on the application.

Sincerely,

Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures

NOTE: If you plan to contest any part of the Chief Engineer's recommendation, you must file a petition pursuant to the procedures outlined in the attached notice of hearing. The Water Management Board will then consider your concerns during a hearing on the application.



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181

January 14, 1998

Rapid City Journal
P.O. Box 450
Rapid City, SD 57709-0450

ATTENTION: Legal Department

Enclosed is a Notice of Hearing on Application No. 2397-2 to be published twice. Please publish the first notice on January 22, 1998, with the second publication 7 days later.

The APPLICANT MUST VERIFY TO YOU THAT THE NOTICE IS TO BE PUBLISHED, before you make the first publication. Please BILL the APPLICANT for the cost of publication. The APPLICANT is City of Rapid City, %Daniel Bjerke, 300 6th Street, Rapid City, SD 57701 (Ph # (605) 394-4165).

A copy of BOTH publications must be SENT to the WATER RIGHTS PROGRAM. IMMEDIATELY return the FIRST publication with the FIRST Transmittal form on the bottom of this page. The first copy is needed to check the publication for errors so any corrections can be made in the second publication. Publication errors can invalidate the public notice and cause the applicant costly delays.

Please be sure the SECOND publication is returned IMMEDIATELY with the enclosed Proof of Publication form. DO NOT WAIT until the end of the month or the billing cycle. No action may be taken on the permit application until proof of publication has been received.

Sincerely,


Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures

-----CUT HERE-----

FIRST TRANSMITTAL NOTICE

TO: Eric Gronlund
Water Rights Program
Joe Foss Building
Pierre SD 57501-3181

No. _____

Date _____

We are in receipt of your letter of _____ enclosing Notice of Hearing to Appropriate Water by Application No. _____ which was first published in our issue of _____. ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.

Name

Newspaper

Instruction to Newspaper - Publish first Notice on January 22, 1998, with the second publication 7 days later. The applicant is responsible for payment.

NOTICE OF APPLICATION NO. 2397-2 to Transfer Use

Notice is given that the City of Rapid City, 300 6th St, Rapid City SD 57701 has filed Water Permit Application No. 2397-2 pursuant to 46-5-34.1 to transfer the use of a portion of Rapid Creek natural flows appropriated for irrigation use by South Side Ditch to the City of Rapid City for municipal use, which includes industrial, commercial, common distribution system, rural water system, suburban housing, and domestic uses.

Water Permit No. 2397-2 is to transfer the use of a portion of Rapid Creek natural flows historically used to irrigate 68 acres known as the Eisenbraun property from South Side Ditch. The portion of Rapid Creek natural flows to be transferred to the city is 0.59 cubic feet of water per second (cfs) with an annual volume limitation of 111.5 acre-feet, if diverted at the city's water treatment plant and infiltration galleries or 57.3 acre-feet, if stored in Pactola Reservoir. Historically, the 0.59 cfs has been used to irrigate approximately 59.3 acres located in W 1/2 NE 1/4 Section 26-T1N-R8E. The existing diversion point on Rapid Creek for South Side Ditch is located in the SE 1/4 NW 1/4 Section 15-T1N-R8E. This permit is to change the diversion point for 0.59 cfs to diversion points for use by the city to be located in the SE 1/4 NE 1/4 Section 3 (Rapid City Water Treatment Plant); SW 1/4 SW 1/4 Section 3 (Sioux Park Gallery); SE 1/4 NE 1/4 Section 9 (Meadowbrook Gallery); NW 1/4 SE 1/4 Section 8 (Jackson Springs Gallery); all in T1N-R7E or to allow storage in Pactola Reservoir. The location of the Pactola Reservoir diversion point is the NW 1/4 SW 1/4 Section 2-T1N-R5E. The reservoir impounds water in portions of Sections 2, 3, 4, 5, 10, 11 of T1N-R5E and Sections 31, 32, 33, 34 of T2N-R5E. This permit does not authorize any new water appropriations from Rapid Creek and the claimed priority date of May 3, 1880, for use of 0.59 cfs is to be retained by the city.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 2397-2 because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest.

Any person interested in opposing or supporting this application must file a written petition with BOTH the applicant and Chief Engineer. The applicant must also file a petition if opposed to the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by February 13, 1998. The petition may be informal, but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application, and the signature and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained.

The Water Management Board will consider this application at 1:30 p.m. (cst), February 25, 1998, Floyd Matthew Training Center, Joe Foss Building, 523 East Capitol, Pierre, SD. The Chief Engineer's recommendation is not final or binding upon the Board. The Board is authorized to 1) approve, 2) approve with qualifications, 3) defer, or 4) deny this application based on the facts presented at the public hearing. The February 25, 1998, hearing date will be automatically delayed for at least 20 days upon written request to the Chief Engineer from the applicant or any interested person opposing the application. The request for an automatic delay must be filed by February 13, 1998.

Any hearing will be an adversary proceeding. Any person filing a petition and/or the applicant have the right to be represented by a lawyer and may present evidence or cross-examine witnesses according to SDCL 1-26. These and other due process rights will be forfeited if not exercised. Decisions of the Board may be appealed to the Circuit Court and State Supreme Court as provided by law. Contact Eric Gronlund by February 13, 1998, at the above Water Rights Program address to request copies of information pertaining to this application, to assure access to the hearing by the handicapped or to obtain an interpreter for the hearing impaired.

This application is made pursuant to SDCL 46-1-1 thru 46-1-9, 46-1-12 thru 46-1-16; 46-2-3.1, 46-2-9, 46-2-11, 46-2-13, 46-2-17; 46-2A-1 thru 46-2A-10, 46-2A-12, 46-2A-14, 46-2A-15, 46-2A-20, 46-2A-21; 46-5-1 thru 46-5-11, 46-5-13 thru 46-5-15, 46-5-24, 46-5-25, 46-5-30.2, 46-5-30.4, 46-5-31; 46-5-34.1; 46-6-3, 46-6-3.1, 46-6-6.1, 46-6-10, 46-6-13, 46-6-14, 46-6-26; and Board Rules ARSD 74:02:01:01 thru 74:02:01:15. Nettie H. Myers, Secretary, Department of Environment and Natural Resources.

Form 8



PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA)
County of Pennington) SS

I, Patricia K. Van Patten

certify that the attached printed Notice was taken

from the Rapid City Journal

printed and published in Rapid City

County of Pennington and

state of South Dakota. The notice was published

in the newspaper on the following two dates:

January 22, 1998

January 29, 1998

Cost of Printing One hundred thirty-

seven dollars and seventy cents (\$137.70).

Patricia K. Van Patten
(Signature)

Legal Advertising Representative
(Title)

January 29, 1998
(Date Signed)

Jan. 29, 1998 L 6076
NOTICE OF APPLICATION
NO. 2397-2 TO TRANSFER USE
Notice is given that the City of Rapid City, 300 6th St., Rapid City, SD 57501, has filed Water Permit Application No. 2397-2 pursuant to SDCL 46-2-1 to transfer the use of a portion of Rapid Creek natural flows appropriated for irrigation use in South Side Ditch to the City of Rapid City for municipal use, which includes industrial, commercial, common distribution system, water system, suburban home, and domestic uses.
Permit No. 2397-2 is to transfer the use of a portion of Rapid Creek natural flows appropriated for irrigation use to irrigate 68 acres.
The Chief Engineer recommends APPROVAL of Application No. 2397-2 because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 5) it is in the public interest.
Any person interested in opposing or supporting this application must file a written petition with BOTH the applicant and Chief Engineer. The applicant must also file a petition if opposed to the Chief Engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E. Capitol, Pierre, SD 57501 (605-773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by February 13, 1998. The petition may be informal, but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application, and the signature and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained.
The Water Management Board will consider this application at 1:30 p.m. (CST), February 25, 1998, Floyd Matthew Training Center, Joe Foss Building, 523 East Capitol, Pierre, S.D. The Chief Engineer's recommendation is not final or binding upon the Board. The Board is authorized to 1) approve, 2) approve with qualifications, 3) defer, or 4) deny this application based on the facts presented at the public hearing. The February 25, 1998, hearing date will be automatically delayed for at least 20 days upon written request to the Chief Engineer from the applicant or any interested person opposing the applications. The request for an automatic delay must be filed by February 13, 1998.
Any hearing will be an adversary proceeding. Any person filing a petition and/or the applicant have the right to be represented by a lawyer and may present evidence or cross-examine witnesses according to SDCL 1-26. These and other due process rights will be forfeited if not exercised. Decisions of the Board may be appealed to the Circuit Court and State Supreme Court as provided by law. Contact Eric Gronlund by February 13, 1998, at the above Water Rights Program address to request copies of information pertaining to this application, to assure access to the hearing by the handicapped or to obtain an interpreter for the hearing impaired.
This application is made pursuant to SDCL 46-1-1 thru 46-1-9, 46-1-12 thru 46-1-16; 46-2-3.1, 46-2-9, 46-2-11, 46-2-13, 46-2-17; 46-2A-1 thru 46-2A-10, 46-2A-12, 46-2A-14, 46-2A-15, 46-2A-20, 46-2A-21; 46-5-1 thru 46-5-11, 46-5-13 thru 46-5-15, 46-5-24, 46-5-25, 46-5-30.2, 46-5-30.4, 46-5-31; 46-5-34.1; 46-6-3, 46-6-3.1, 46-6-6.1, 46-6-10, 46-6-13, 46-6-14, 46-6-26; and Board Rules ARSD 74:02:01:01 thru 74:02:01:15.
Nettie H. Myers, Secretary
Department of Environment
and Natural Resources

PARTIES OF RECORD

WATER PERMIT APPLICATION NO. 2397-2, City of Rapid City

APPLICANT

Jim Shaw, Mayor
City of Rapid City
300 6th Street
Rapid City, SD 57701-2724

PETITIONERS

Jerry Hammerquist
Rapid Valley Water Conservancy District
Box 26
Caputa, SD 57725



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181

January 14, 1998

George Sanders Ranch
3023 Tomahawk Dr.
Rapid City, SD 57702

Dear Mr. Sanders:

Enclosed is a copy of the report, recommendation and notice of hearing for Water Permit Application No. 2397-2. The notice of hearing will be published in the Rapid City Journal. This application, filed by the City of Rapid City, proposes to transfer the use of a portion of Rapid Creek natural flows appropriated for irrigation use to municipal uses including industrial, commercial, common distribution system, rural water system, suburban housing and domestic purposes.

This information is being sent to you since you have shown an interest in other applications by the city to transfer use. If you have any questions concerning this application, please contact Mark Rath at (605) 773-3352.

Sincerely,

Eric Gronlund
Water Rights Program
(605) 773-3352

enclosures



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181

January 14, 1998

Kurt Anderson
Bureau of Reclamation
P.O. Box 226
Newell, SD 57760

Dear Mr. Anderson:

Enclosed is a copy of the report, recommendation and notice of hearing for Water Permit Application No. 2397-2. The notice of hearing will be published in the Rapid City Journal. This application, filed by the City of Rapid City, proposes to transfer the use of a portion of Rapid Creek natural flows appropriated for irrigation use to municipal uses including industrial, commercial, common distribution system, rural water system, suburban housing and domestic purposes.

This information is being sent to you since you have shown an interest in other applications by the city to transfer use. If you have any questions concerning this application, please contact Mark Rath at (605) 773-3352.

Sincerely,

Eric Gronlund
Water Rights Program
(605) 773-3352

enclosures



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181

January 14, 1998

*Letter
returned
by P.O.*

Mark Kieffer
Keystone Rt., Box 3808
Rapid City, SD 57702

Dear Mr. Kieffer:

Enclosed is a copy of the report, recommendation and notice of hearing for Water Permit Application No. 2397-2. The notice of hearing will be published in the Rapid City Journal. This application, filed by the City of Rapid City, proposes to transfer the use of a portion of Rapid Creek natural flows appropriated for irrigation use to municipal uses including industrial, commercial, common distribution system, rural water system, suburban housing and domestic purposes.

This information is being sent to you since you have shown an interest in other applications by the city to transfer use. If you have any questions concerning this application, please contact Mark Rath at (605) 773-3352.

Sincerely,

Eric Gronlund
Water Rights Program
(605) 773-3352

enclosures



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181

January 14, 1998

Zolton Szakacs
P.O. Box
Caputa, SD 57725

Dear Mr. Szakacs:

Enclosed is a copy of the report, recommendation and notice of hearing for Water Permit Application No. 2397-2. The notice of hearing will be published in the Rapid City Journal. This application, filed by the City of Rapid City, proposes to transfer the use of a portion of Rapid Creek natural flows appropriated for irrigation use to municipal uses including industrial, commercial, common distribution system, rural water system, suburban housing and domestic purposes.

This information is being sent to you since you have shown an interest in other applications by the city to transfer use. If you have any questions concerning this application, please contact Mark Rath at (605) 773-3352.

Sincerely,

Eric Gronlund
Water Rights Program
(605) 773-3352

enclosures



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181

January 14, 1998

Jerry Marsh
Marsh Ranch
HCR 36, Box 35
Caputa, SD 57725

Dear Mr. Marsh:

Enclosed is a copy of the report, recommendation and notice of hearing for Water Permit Application No. 2397-2. The notice of hearing will be published in the Rapid City Journal. This application, filed by the City of Rapid City, proposes to transfer the use of a portion of Rapid Creek natural flows appropriated for irrigation use to municipal uses including industrial, commercial, common distribution system, rural water system, suburban housing and domestic purposes.

This information is being sent to you since you have shown an interest in other applications by the city to transfer use. If you have any questions concerning this application, please contact Mark Rath at (605) 773-3352.

Sincerely,

Eric Gronlund
Water Rights Program
(605) 773-3352

enclosures



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181

January 14, 1998

Jerry Hammerquist
P.O. Box 26
Caputa, SD 57725

Dear Mr. Hammerquist:

Enclosed is a copy of the report, recommendation and notice of hearing for Water Permit Application No. 2397-2. The notice of hearing will be published in the Rapid City Journal. This application, filed by the City of Rapid City, proposes to transfer the use of a portion of Rapid Creek natural flows appropriated for irrigation use to municipal uses including industrial, commercial, common distribution system, rural water system, suburban housing and domestic purposes.

This information is being sent to you since you have shown an interest in other applications by the city to transfer use. If you have any questions concerning this application, please contact Mark Rath at (605) 773-3352.

Sincerely,

Eric Gronlund
Water Rights Program
(605) 773-3352

enclosures



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181

January 14, 1998

Melvin Brassfield
P.O. Box 24
Caputa, SD 57725

Dear Mr. Brassfield:

Enclosed is a copy of the report, recommendation and notice of hearing for Water Permit Application No. 2397-2. The notice of hearing will be published in the Rapid City Journal. This application, filed by the City of Rapid City, proposes to transfer the use of a portion of Rapid Creek natural flows appropriated for irrigation use to municipal uses including industrial, commercial, common distribution system, rural water system, suburban housing and domestic purposes.

This information is being sent to you since you have shown an interest in other applications by the city to transfer use. If you have any questions concerning this application, please contact Mark Rath at (605) 773-3352.

Sincerely,

Eric Gronlund
Water Rights Program
(605) 773-3352

enclosures



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181

January 14, 1998

Walter Jones
Jones Ranch
15248 Caputa Loop
Rapid City, SD 57701

Dear Mr. Jones:

Enclosed is a copy of the report, recommendation and notice of hearing for Water Permit Application No. 2397-2. The notice of hearing will be published in the Rapid City Journal. This application, filed by the City of Rapid City, proposes to transfer the use of a portion of Rapid Creek natural flows appropriated for irrigation use to municipal uses including industrial, commercial, common distribution system, rural water system, suburban housing and domestic purposes.

This information is being sent to you since you have shown an interest in other applications by the city to transfer use. If you have any questions concerning this application, please contact Mark Rath at (605) 773-3352.

Sincerely,

Eric Gronlund
Water Rights Program
(605) 773-3352

enclosures



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181

January 14, 1998

Wm Ham
Ham Ranch
HCR 36, Box 34
Caputa, SD 57725

Dear Mr. Ham:

Enclosed is a copy of the report, recommendation and notice of hearing for Water Permit Application No. 2397-2. The notice of hearing will be published in the Rapid City Journal. This application, filed by the City of Rapid City, proposes to transfer the use of a portion of Rapid Creek natural flows appropriated for irrigation use to municipal uses including industrial, commercial, common distribution system, rural water system, suburban housing and domestic purposes.

This information is being sent to you since you have shown an interest in other applications by the city to transfer use. If you have any questions concerning this application, please contact Mark Rath at (605) 773-3352.

Sincerely,

Eric Gronlund
Water Rights Program
(605) 773-3352

enclosures



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181

January 14, 1998

Ed Taylor
HCR 36, Box 60
Caputa, SD 57725

Dear Mr. Taylor:

Enclosed is a copy of the report, recommendation and notice of hearing for Water Permit Application No. 2397-2. The notice of hearing will be published in the Rapid City Journal. This application, filed by the City of Rapid City, proposes to transfer the use of a portion of Rapid Creek natural flows appropriated for irrigation use to municipal uses including industrial, commercial, common distribution system, rural water system, suburban housing and domestic purposes.

This information is being sent to you since you have shown an interest in other applications by the city to transfer use. If you have any questions concerning this application, please contact Mark Rath at (605) 773-3352.

Sincerely,

Eric Gronlund
Water Rights Program
(605) 773-3352

enclosures



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181

January 14, 1998

Robert Dustman
Dustman Ranch
P.O. Box 53
Caputa, SD 57725

Dear Mr. Dustman:

Enclosed is a copy of the report, recommendation and notice of hearing for Water Permit Application No. 2397-2. The notice of hearing will be published in the Rapid City Journal. This application, filed by the City of Rapid City, proposes to transfer the use of a portion of Rapid Creek natural flows appropriated for irrigation use to municipal uses including industrial, commercial, common distribution system, rural water system, suburban housing and domestic purposes.

This information is being sent to you since you have shown an interest in other applications by the city to transfer use. If you have any questions concerning this application, please contact Mark Rath at (605) 773-3352.

Sincerely,

Eric Gronlund
Water Rights Program
(605) 773-3352

enclosures



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181

January 14, 1998

Tom Odom
Odom Ranch
23232 Huntington Place
Rapid City, SD 57702

Dear Mr. Odom:

Enclosed is a copy of the report, recommendation and notice of hearing for Water Permit Application No. 2397-2. The notice of hearing will be published in the Rapid City Journal. This application, filed by the City of Rapid City, proposes to transfer the use of a portion of Rapid Creek natural flows appropriated for irrigation use to municipal uses including industrial, commercial, common distribution system, rural water system, suburban housing and domestic purposes.

This information is being sent to you since you have shown an interest in other applications by the city to transfer use. If you have any questions concerning this application, please contact Mark Rath at (605) 773-3352.

Sincerely,

Eric Gronlund
Water Rights Program
(605) 773-3352

enclosures

STATE OF SOUTH DAKOTA

SOUTH DAKOTA WATER MANAGEMENT BOARD

IN THE MATTER OF APPLICATION)
NO. 2397-2, CITY OF) SUBPOENA
RAPID CITY)

TO: MARK RATH, DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES,
FOSS BUILDING, 523 EAST CAPITOL AVENUE, PIERRE, SOUTH DAKOTA
57501-3182

You are hereby commanded to appear in the above-
entitled matter on February 25, 1998, at 1:30 p.m. at the
Matthews Training Center, Foss Building, 523 East Capitol Avenue,
Pierre, South Dakota, and then and there give testimony for the
South Dakota Department of Environment and Natural Resources in
the above-entitled action. This subpoena is issued pursuant to
SDCL 1-26-19.1.

Dated this 23rd day of January, 1998.

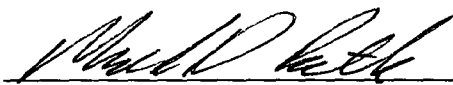


Diane Best
Assistant Attorney General
500 E. Capitol Avenue
Pierre, South Dakota 57501-5070
Telephone: (605) 773-3215

STATE OF SOUTH DAKOTA)
COUNTY OF HUGHES) : SS. ADMISSION OF
SERVICE

I, Mark Rath, do hereby certify that the above Subpoena
came into my possession on the 26 day of January, 1998. I
hereby admit service of the same.

Dated this 26 day of January, 1998, at Pierre,
South Dakota.



Mark Rath

Feb 12 1998

The Rapid Valley Water Conservancy District
is apposed to transfer of application # 2397-2
because of degrade of water quality & quantity.
We are the contracting agent for irrigation.



Rapid Valley Water Conservancy District
Box 26

Copied to Dak. 57725
by Jerry Hornsmyer
President



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE SOUTH DAKOTA 57501-3181

February 17, 1998

Daniel L. Bjerke
Public Work Director of Engineering/Utilities
City of Rapid City
300 Sixth Street
Rapid City, SD 57701-2724

Dear Mr. Bjerke:

I am enclosing a copy of a petition submitted in response to the notice of hearing on Rapid City's Water Permit Application No. 2397-2.

The hearing on this application is scheduled for 1:30 PM, February 25, 1998, in the Floyd Matthew Training Center, 523 E. Capitol Ave., Pierre SD. The agenda time is an estimate and may be delayed due to prior agenda items.

Sincerely,


Eric Gronlund
Water Rights Program
(605) 773-3352

enclosure



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE SOUTH DAKOTA 57501-3181

APR 28 1998

Daniel L. Bjerke
Public Works Director of Engineering/Utilities
300 6th Street
Rapid City, SD 57701

Dear Mr. Bjerke:

Enclosed is Water Permit No. 2397-2 issued to the City of Rapid City.

As long as the City uses the water beneficially, as stated in the water permit, State Water Laws provide that the City of Rapid City has a continuing right to use the water.

Very truly yours,

JOHN HATCH, Chief Engineer
Water Rights Program
(605) 773-3352

enclosure



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181
www.state.sd.us/denr

November 5, 1998

Daniel L Bjerke
City of Rapid City
300 6th St
Rapid City SD 57701-2724

Dear Mr. Bjerke:

The investigation of the City of Rapid City's water use systems was conducted on September 9, 1998, by Mark Rath, staff engineer. The investigation included the extent of application of water to beneficial use, as developed under each permit. The final water right documents, the Water Licenses, can now be issued. Below is a list of the permits that were investigated.

Permit No.	amount	source	
2136-2	0.78 cfs	Rapid Creek	Sioux Park
2138-2	12.38 cfs	Rapid Creek	Water Treatment Plant
* 2274-2	0.78 cfs	Rapid Creek	Water Treatment Plant
2156-2	1.11 cfs	Madison Formation	SW ¼ SE ¼ Sec 16-T1N-R7E
transfer the use of a portion of Rapid Creek flows			formerly known as
2142-2	0.62 cfs	Murphy Ditch	Tyler property
2199-2	0.05 cfs	Murphy Ditch	Pelle property
2201-2	0.13 cfs	Murphy Ditch	Long property
2217-2	0.33 cfs	South Side Ditch	Keller property
2218-2	2.16 cfs	South Side Ditch	Stromer property
2234-2	0.79 cfs	South Side Ditch	Eisenbraun property
2249-2	1.19 cfs	South Side Ditch	Weber property
2296-2	2.85 cfs	South Side Ditch	Jundt property
2316-2	0.81 cfs	Murphy Ditch	Morris property
2317-2	0.84 cfs	Hawthorne Ditch	Morris property
2360-2	0.37 cfs	South Side Ditch	Soetaert property
2397-2	0.59 cfs	South Side Ditch	Eisenbraun property
2399-2	0.75 cfs	Murphy & Little Giant Ditch	Wileman property

* license fee already submitted

Statutes require that we charge \$50.00 fee for the investigation and issuance of the each Water License. Upon receipt of the \$800.00 fee (16 permits x \$50) we will process the Water Licenses.

Please sent fee to: Dept. of Environment & Natural Resources, Water Rights Program, 523 E. Capitol, Pierre, SD 57501-3181. If you have questions, please contact us.

Sincerely,

Karen Schlaak

Karen Schlaak
Water Rights Program
605 773-3352

RECEIPT

Water Rights Program

South Dakota Department of Environment and Natural Resources

Nº 415965

Pierre, December 9, 19 98

RECEIVED OF City of Rapid City, 300 6th St., Rapid City, SD 57701-2724
the following amount in fees for services rendered as provided for by law:

Fee for Application for Permit No. _____ to Appropriate Water, to construct
and to put water to beneficial use _____

Fee for Application for Permit No. _____ to Appropriate Water, for Future
Use _____

Fee to retain Future Use Permit No. _____ after period of seven years.

Fee for Inspecting Constructed Works, confirming beneficial use and issuing Water
License No. 2397-2

Fee for Filing Transfer Form _____

Fee for Filing Extension Request _____

Fee for _____

(Any Other Work Provided by Law)

Total

50 00

By

Chief Engineer

John Hatcher 

Permit No. 2397-2
Cheyenne River - Water District

Report Of Examination Of Works

TO: Chief Engineer, Water Rights Program, DENR, Foss Bldg., Pierre, SD 57501

On, September 9, 1998, I made a thorough examination of the water use system constructed by City of Rapid City of 300 6th St, Rapid City SD holder of Permit No. 2397-2, bearing the priority of May 3, 1880 authorizing the diversion of 0.59 cu. ft. per second and an annual appropriation of 111.5 acre-feet if taken at Rapid City's municipal diversion points or 57.3 acre-feet if stored in Pactola Reservoir of the natural flow waters of surface water from Rapid Creek for municipal, industrial, commercial, common distribution system, rural water system, suburban housing, and domestic purposes, in Pennington County.

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

A. Works used to divert the water:

Pumps at the water treatment plant, Jackson Springs Gallery Sioux (aka Girl Scout) Gallery, Meadowbrook Gallery and storage in Pactola Reservoir.

The system is in the following condition good. The points of diversion are located in the SE1/4 NE1/4 Section 3 (Rapid City Water Treatment Plant); SW1/4 SW1/4 Section 3 (Sioux Park Gallery); SE1/4 NE1/4 Section 9 (Meadowbrook Gallery); NW1/4 SE1/4 Section 8 (Jackson Springs Gallery); all in T1N-R7E and NW1/4 SW1/4 Section 2 T1N-R5E (Pactola Reservoir). Pactola Reservoir impounds water in portions of Sections 2, 3, 4, 5, 10, 11 of T1N-R5E and Sections 31, 32, 33, 34 of T2N-R5E. The permit holder is entitled to divert and convey to the place of use 0.59 cu. ft. per second of water and an annual appropriation of 111.5 acre-feet if taken at Rapid City's municipal diversion points or 57.3 acre-feet if stored in Pactola Reservoir which is to be used for municipal, industrial, commercial, common distribution system, rural water system, suburban housing, and domestic purposes. Water has been put to beneficial use to the maximum extent and the license should be issued for 0.59 cfs and an annual appropriation of 111.5 acre-feet if taken at Rapid City's municipal diversion points or 57.3 acre-feet if stored in Pactola Reservoir

Applicable permit qualifications have been complied with: yes

Exceptions to compliance are: none



Mark D. Rath
Natural Resources Engineer
DENR, Water Rights Program

9/29/98
Date

REPORT ON INSPECTION OF PERMIT NO. 2397-2

DATE OF INSPECTION: September 9, 1998

Contact Person & Address: John Wagner, 300 6th St, Rapid City SD 57701

DIVERSION POINT LEGAL LOCATIONS: are in the SE1/4 NE1/4 Section 3 (Rapid City Water Treatment Plant); SW1/4 SW1/4 Section 3 (Sioux Park a.k.a. Girl Scout Gallery); SE1/4 NE1/4 Section 9 (Meadowbrook Gallery); NW1/4 SE1/4 Section 8 (Jackson Springs Gallery); all in T1N-R7E and NW1/4 SW1/4 Section 2 T1N-R5E (Pactola Reservoir). Pactola Reservoir impounds water in portions of Sections 2, 3, 4, 5, 10, 11 of T1N-R5E and Sections 31, 32, 33, 34 of T2N-R5E.

WATER SUPPLY Source: Rapid Creek

WATER TREATMENT PLANT

Pump\ Motor:

- | | |
|---------------------------------------|-----------------------------------|
| 1) Pump Make <u>Peerless</u> | 2) Model <u>258595</u> |
| 3) Capacity <u>5600</u> GPM | 4) Motor Make <u>GE</u> |
| 5) Model No. <u>5K405DP7011B FR2G</u> | 6) Horsepower rating <u>75</u> hp |

- | | |
|----------------------------------|------------------------------------|
| 1) Pump Make <u>Layne Bowler</u> | 2) Model <u>14MSL</u> |
| 3) Capacity <u>2780</u> GPM | 4) Motor Make <u>US Electrical</u> |
| 5) Model No. <u>326UP</u> | 6) Horsepower rating <u>30</u> hp |

- | | |
|-------------------------------|------------------------------------|
| 1) Pump Make <u>Vertiline</u> | 2) Model <u>27908</u> |
| 3) Capacity <u>5560</u> GPM | 4) Motor Make <u>US Electrical</u> |
| 5) Model No. <u>445UPY</u> | 6) Horsepower rating <u>60</u> hp |

- | | |
|----------------------------------|-----------------------------------|
| 1) Pump Make <u>Layne Bowler</u> | 2) Model <u>85522</u> |
| 3) Capacity <u>5875</u> GPM | 4) Motor Make <u>Louis Allis</u> |
| 5) Model No. <u>COG5B</u> | 6) Horsepower rating <u>60</u> hp |

- | | |
|-------------------------------|------------------------------------|
| 1) Pump Make <u>Vertiline</u> | 2) Model <u>27989</u> |
| 3) Capacity <u>8000</u> GPM | 4) Motor Make <u>US Electrical</u> |
| 5) Model No. <u>CFU</u> | 6) Horsepower rating <u>100</u> hp |

SIOUX PARK (a.k.a. Girl Scout) GALLERY

Pump\ Motor:

- | | |
|---------------------------------|------------------------------------|
| 1) Pump Make <u>Worthington</u> | 2) Model <u>12H13501</u> |
| 3) Capacity <u>1400</u> GPM | 4) Motor Make <u>US Electrical</u> |
| 5) Model No. <u>324UP</u> | 6) Horsepower rating <u>25</u> hp |

- | | |
|---------------------------------|------------------------------------|
| 1) Pump Make <u>Worthington</u> | 2) Model <u>12H13501</u> |
| 3) Capacity <u>1400</u> GPM | 4) Motor Make <u>US Electrical</u> |
| 5) Model No. <u>324UP</u> | 6) Horsepower rating <u>25</u> hp |

MEADOWBROOK GALLERY

Pump\ Motor:

- | | |
|---------------------------------|------------------------------------|
| 1) Pump Make <u>Worthington</u> | 2) Model <u>10QHA0</u> |
| 3) Capacity <u>1525</u> GPM | 4) Motor Make <u>US Electrical</u> |
| 5) Model No. <u>2743715</u> | 6) Horsepower rating <u>15</u> hp |

- | | |
|---------------------------------|------------------------------------|
| 1) Pump Make <u>Worthington</u> | 2) Model <u>10QHA0</u> |
| 3) Capacity <u>1475</u> GPM | 4) Motor Make <u>US Electrical</u> |
| 5) Model No. <u>2745675</u> | 6) Horsepower rating <u>15</u> hp |

- | | |
|---------------------------------|------------------------------------|
| 1) Pump Make <u>Worthington</u> | 2) Model <u>10QHA0</u> |
| 3) Capacity <u>1525</u> GPM | 4) Motor Make <u>US Electrical</u> |
| 5) Model No. <u>2744261</u> | 6) Horsepower rating <u>15</u> hp |

JACKSON SPRINGS GALLERY

Pump\ Motor:

- | | |
|-------------------------------------|-----------------------------------|
| 1) Pump Make <u>Fairbanks-Morse</u> | 2) Model <u>T4B242990A</u> |
| 3) Capacity <u>1390</u> GPM | 4) Motor Make <u>GE</u> |
| 5) Model No. <u>5K6258XH1A</u> | 6) Horsepower rating <u>75</u> hp |

Pump\ Motor:

- | | |
|-------------------------------------|------------------------------------|
| 1) Pump Make <u>Fairbanks-Morse</u> | 2) Model <u>T4B242992A</u> |
| 3) Capacity <u>2085</u> GPM | 4) Motor Make <u>GE</u> |
| 5) Model No. <u>5K6268XH1A</u> | 6) Horsepower rating <u>125</u> hp |

Pump\ Motor:

- | | |
|-------------------------------------|------------------------------------|
| 1) Pump Make <u>Fairbanks-Morse</u> | 2) Model <u>T4B242991A</u> |
| 3) Capacity <u>2085</u> GPM | 4) Motor Make <u>GE</u> |
| 5) Model No. <u>5K6258XH1A</u> | 6) Horsepower rating <u>125</u> hp |

PACTOLA RESERVOIR : This is a US Bureau of Reclamation dam with 55, 972 acre-feet of active storage

DISTRIBUTION LINES OR CANALS:

Municipal distribution system

PERMIT QUALIFICATIONS AND REGULATIONS:

- 1) Special qualifications to permit being abided by yes
- 2) All structures, wells and lands on map yes

COMMENTS: #



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181
www.state.sd.us/denr

JAN 15 1999

Daniel L Bjerke
City of Rapid City
300 6th St
Rapid City SD 57701-2724

Dear Mr. Bjerke:

Enclosed are the Water Licenses and receipts for the investigation and issuance of the water licenses. These water licenses are the final document which complete the process of obtaining a water right.

As long as the City of Rapid City uses the water beneficially, as stated in the water licenses, State Water Law provides that the City has a continuing right to use the water.

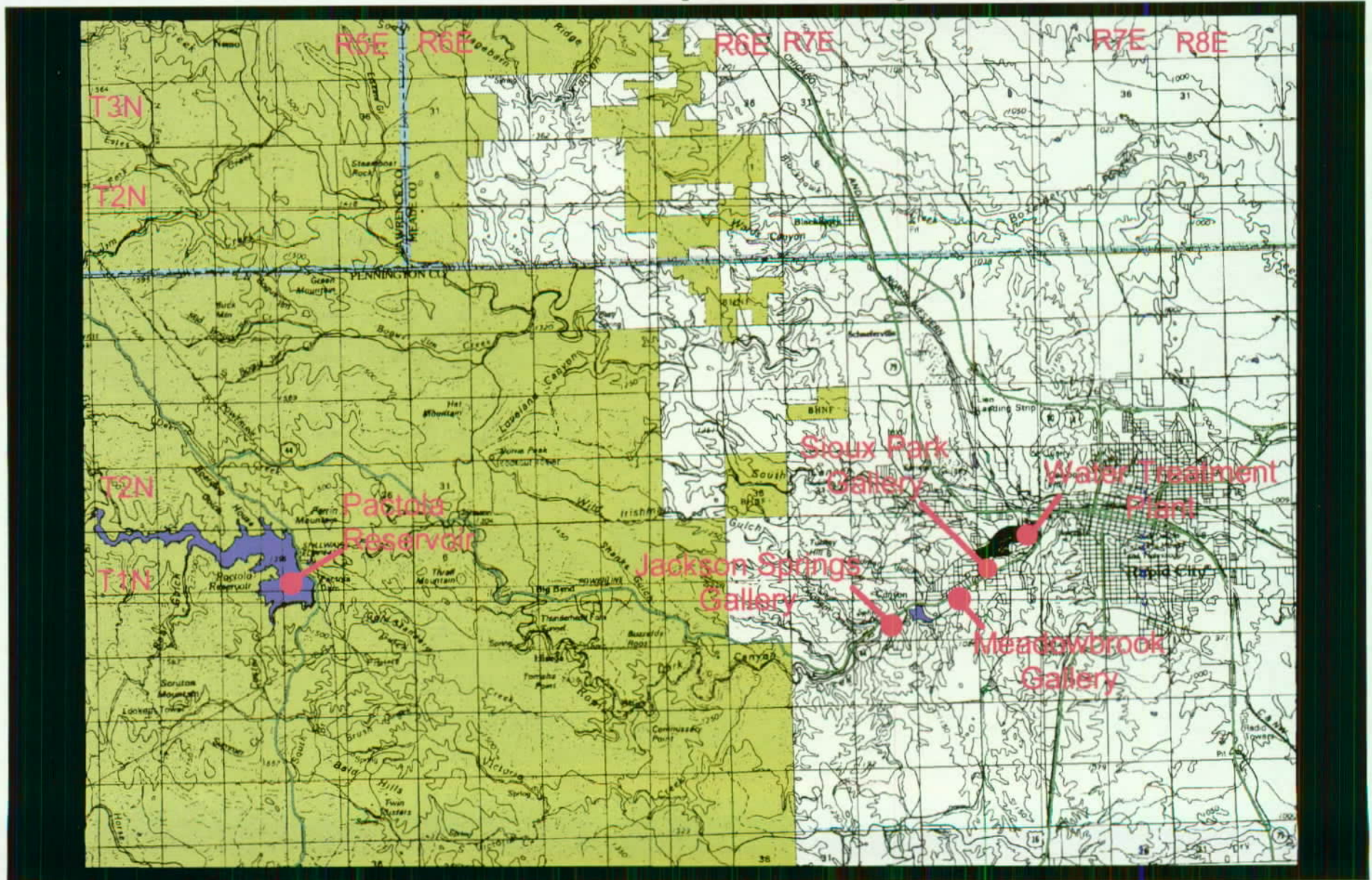
Very truly yours,

JOHN HATCH, Chief Engineer
Water Rights Program
605 773-3352

ks

enclosures

Area Map for Pactola Reservoir to Rapid City



*Map of Pactola
Reservoir to Rapid City
7/28/95*

STATE OF SOUTH DAKOTA

WATER LICENSE NO. 2397-2

(1) The City of Rapid City, 300 6th St, Rapid City SD 57701 made Application No. 2397-2, November 20, 1997 for a water permit to divert 0.59 cubic feet of water per second (cfs) from Rapid Creek with an annual volume limitation of 111.5 acre-feet, if diverted at the city's water treatment plant and infiltration galleries or 57.3 acre-feet, if stored in Pactola Reservoir, Pennington County, South Dakota for municipal, industrial, commercial, common distribution system, rural water system, suburban housing and domestic purposes. Permit No. 2397-2, with a priority date of May 3, 1880 (established by South Side Ditch) was approved February 25, 1998 and issued to the City of Rapid City for diversion of water with construction of the described water supply system and the application to beneficial use of said water completed.

(2) It is certified that the City of Rapid City has complied with the provisions of South Dakota State Law relating to completion of the construction of the water supply system and is entitled to divert 0.59 cfs from Rapid Creek with an annual volume limitation of 111.5 acre-feet, if diverted at the city's water treatment plant and infiltration galleries or 57.3 acre-feet, if stored in Pactola Reservoir for beneficial use. The location of the diversion points are: SE ¼ NE ¼ Section 3 (Rapid City Water Treatment Plant); SW ¼ SW ¼ Section 3 (Sioux Park Gallery); SE ¼ NE ¼ Section 9 (Meadowbrook Gallery); NW ¼ SE ¼ Section 8 (Jackson Springs Gallery); all in T1N-R7E and NW ¼ SW ¼ Section 2-T1N-R5E (Pactola Reservoir). Pactola Reservoir impounds water in portions of Sections 2, 3, 4, 5, 10, 11 of T1N-R5E and Sections 31, 32, 33, 34 of T2N-R5E.

(3) The City of Rapid City has complied with the provisions of South Dakota State Law relating to the application of water to beneficial use.

(4) Pursuant to South Dakota Water Law 46-5-30.1 the City of Rapid City, 300 6th St, Rapid City SD 57701 the holder and/or owner of Water Right No. 2397-2 is issued a license to appropriate water, the right to use 0.59 cfs from Rapid Creek with an annual volume limitation of 111.5 acre-feet, if diverted at the city's water treatment plant and infiltration galleries or 57.3 acre-feet, if stored in Pactola Reservoir with a priority date of May 3, 1880 (established by South Side Ditch) from the locations specified in (2) of this license for municipal, industrial, commercial, common distribution system, rural water system, suburban housing and domestic purposes. This license is subject to any limitations or qualifications listed in Water Right No. 2397-2 and subject to South Dakota State Law.



JOHN HATCH, Chief Engineer
Water Rights Program
Department of Environment and Natural Resources

JAN 15 1999

date



- WELL
- INFILTRATION GALLERY

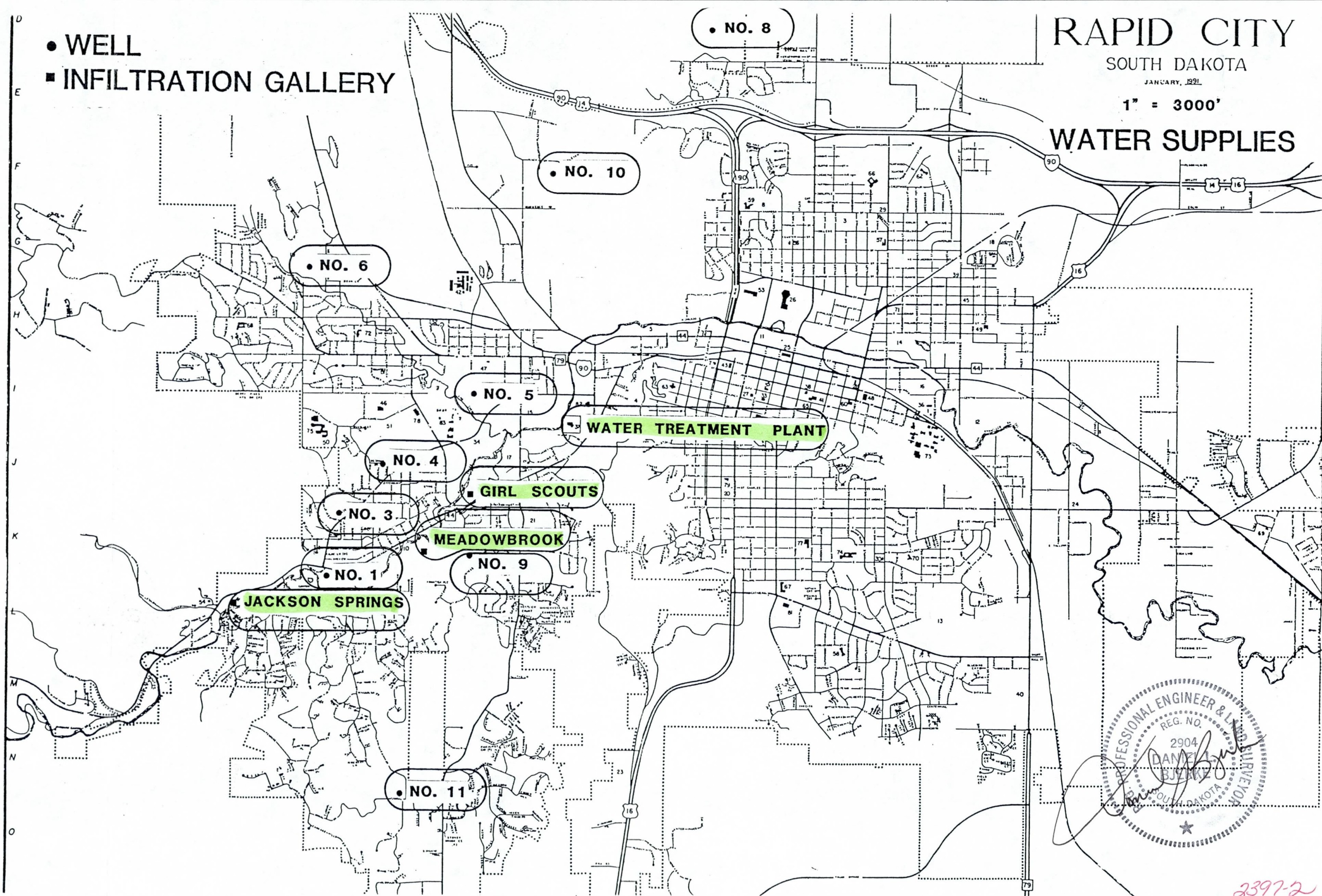
RAPID CITY

SOUTH DAKOTA

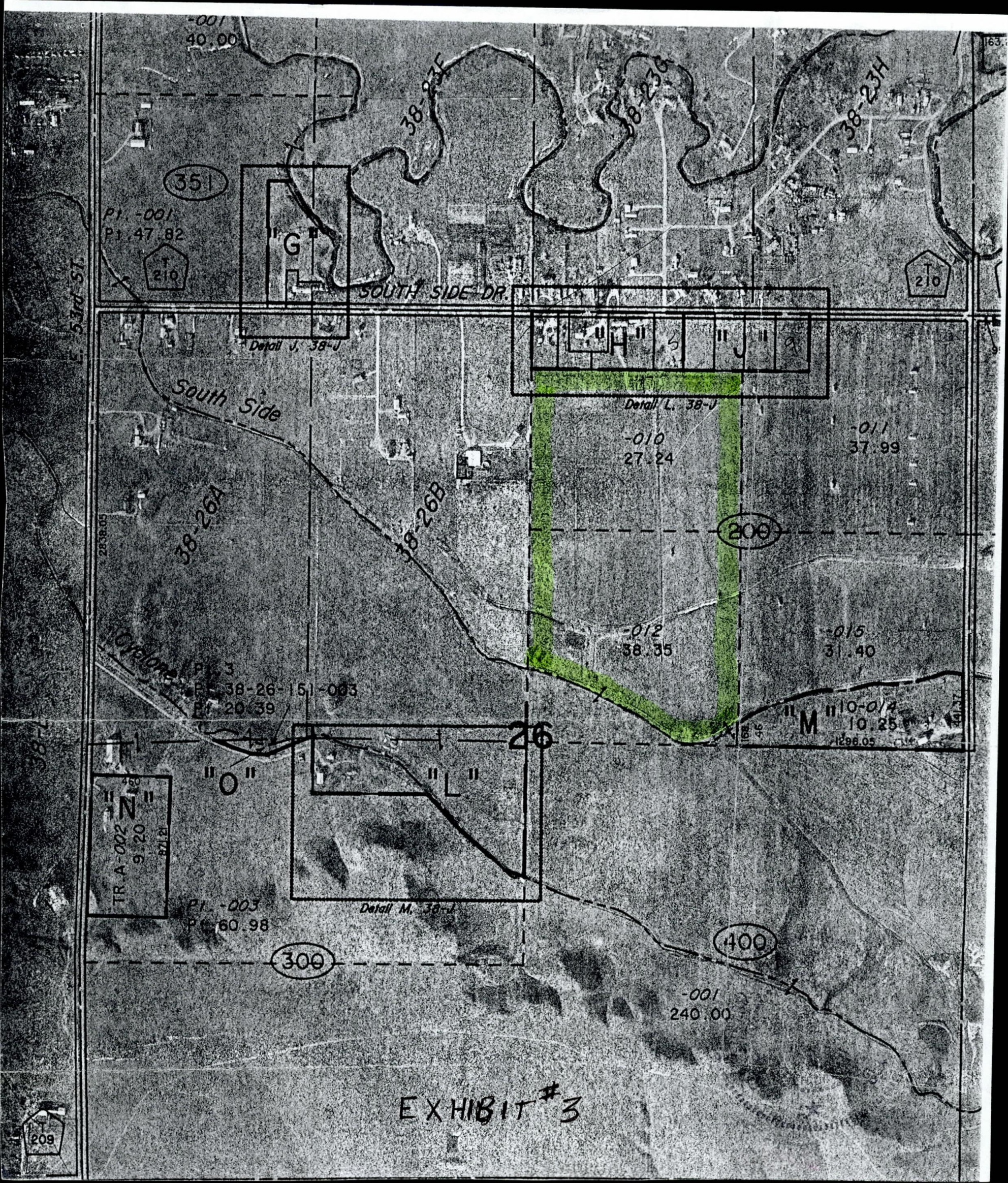
JANUARY, 1991

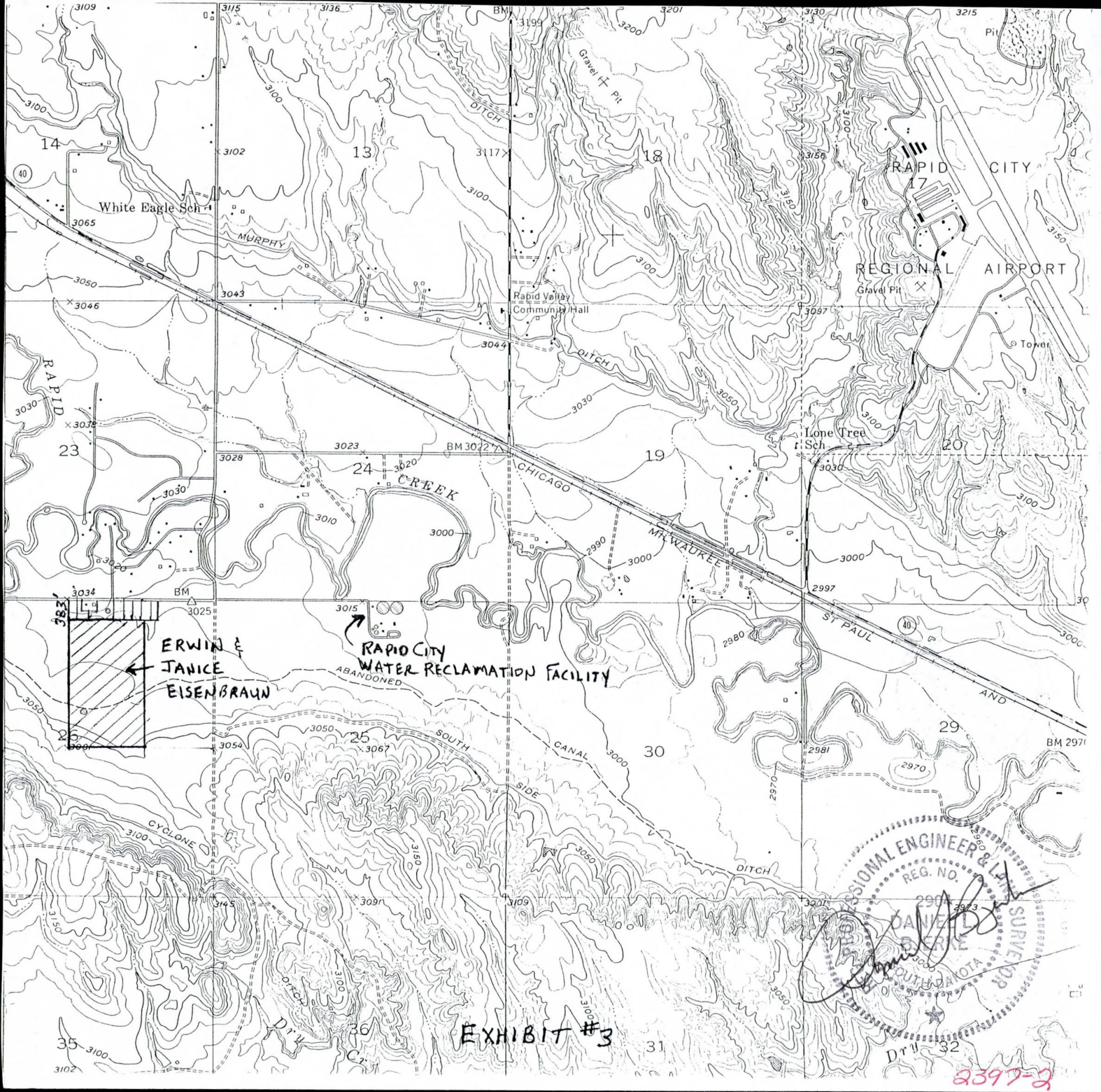
1" = 3000'

WATER SUPPLIES



2397-2







2397-2
**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

September 30, 2005

INTERNAL MEMORANDUM

TO: Garland Erbele, Chief Engineer
DENR Water Rights Program

FROM: Donald E. Stroup *Donald E. Stroup*
Natural Resources Project Engineer
DENR Water Rights Program

SUBJECT: Rapid City – Rapid Valley Water Rights Transfers

A total of 16.75 cubic feet per second (cfs) of water has been transferred from Rapid Valley irrigation ditches to Rapid City, SD. The amounts of flow transferred and acres retired by ditch are:

<u>Ditch</u>	<u>Flow (cfs)</u>	<u>Acres</u>
Murphy	4.12	325
Little Giant	0.99	26
South Side	10.80	1001.8
Hawthorne	0.84	46

The locations of the land retired from irrigation are shown on the Rapid City-Rapid Valley Water Rights Transfers Map. Following is a list summarizing the water transfers from Rapid Valley irrigators to Rapid City:

- 2399-2:** Retired 52-acres and 0.75-cfs of Wileman property from future irrigation, 26-acres and 0.33-cfs from Murphy Ditch and 26-acres and 0.42-cfs from Little Giant Ditch. Land located in the NE¼ Section 24 T1N R8E and water via Murphy Ditch at the same location.
- 2316-2:** Retired 64-acres and 0.81-cfs of Morris property from future irrigation via Murphy Ditch. Land located in the SE¼ Section 9 T1N R8E and water via Murphy Ditch at the same location.
- 2201-1:** Retired 10-acres and 0.13-cfs of Long property from future irrigation via Murphy Ditch. Land located in the center of Section 14 T1N R8E and water via Murphy Ditch at the same location.
- 2199-2** Retired 4-acres and 0.05-cfs of Pelle property from future irrigation via Murphy Ditch. Land located in the NW¼ Section 19 T1N R9E and water via Murphy Ditch at the same location.
- 2142-2** Retired 49-acres and 0.62-cfs of Tyler property from future irrigation via Murphy Ditch. Land located in the NW¼ and SW¼ Section 19 T1N R9E and water via Murphy Ditch at the same location.

- 2469-2** Retired 27-acres and 0.34-cfs of Murphy property from future irrigation via Murphy Ditch. Land located in the NW¼ and SW¼ Section 14 T1N R8E and water via Murphy Ditch at the same location.
- 2512-2** Retired 145-acres and 1.84-cfs of Schroeder property from future irrigation via Murphy Ditch. Land located in Section 19 T1N R9E and water via Murphy Ditch at the same location.
- 2513-2** Retired 74.9-acres and 0.84-cfs of Steen property from future irrigation via South Side Ditch. Land located in the NE¼ Section 25, and SW¼ and SE¼ Section 24 T1N R8E and water via South Side Ditch in Section 25 T1N R8E. The turnout for the supplying lateral has a turn screw gate that is functional.
- 2234-2** Retired 70-acres and 0.79-cfs of Eisenbraun property from future irrigation via South Side Ditch. Land located in the NE¼ Section 26 T1N R8E and water via South Side Ditch at the same location. The turnout for the supplying lateral is into a buried pipeline capped with a plastic bucket.
- 2411-2** Retired 3.6-acres and 0.04-cfs of Eisenbraun property from future irrigation via South Side Ditch. Land located in the NE¼ Section 26 T1N R8E and water via South Side Ditch at the same location. The turnout for the supplying lateral is into a buried pipeline capped with a plastic bucket.
- 2397-2** Retired 59.3-acres and 0.59-cfs of Eisenbraun property from future irrigation via South Side Ditch. Land located in the NE¼ Section 26 T1N R8E and water via South Side Ditch at the same location. The turnout for the supplying lateral is into a buried pipeline capped with a plastic bucket.
- 2468-2** Retired 34.8-acres and 0.57-cfs of Howie property from future irrigation via Little Giant Ditch water delivered via Murphy Ditch. Land located in the SW¼ Section 19 and NW¼ Section 30 T1N R9E and water via Murphy Ditch in the NE¼ Section 19 T1N R9E. The turnout for the supplying lateral is blocked by a silted-in board.
- 2249-2** Retired 105.5-acres and 1.19-cfs of Weber property from future irrigation via South Side Ditch. Land located in the NW¼ and SW¼ Section 30 T1N R9E and water via South Side Ditch in the SW¼ Section 30 T1N R9E.
- 2296-2** Retired 253.4-acres and 2.85-cfs of Jundt property from future irrigation via South Side Ditch. Land located in Section 33 T1N R9E and water via South Side Ditch in the NE¼ Section 33 T1N R9E. The turnout for the supplying lateral is not blocked and ditch and lateral do not appear to be maintained.
- 2360-2** Retired 32.6-acres and 0.37-cfs of Soetaert property from future irrigation via South Side Ditch. Land located in the E½ Section 33 T1N R9E and water via South Side Ditch in the NE¼ Section 33 T1N R9E. The turnout for the supplying lateral is not blocked and ditch and lateral do not appear to be maintained.
- 2415-2** Retired 146-acres and 1.64-cfs of Howie property from future irrigation via South Side Ditch. Land located in the NE¼ and SE¼ Section 32 T1N R9E and water via South Side Ditch in the NE¼ Section 32 T1N R9E. The turnout for the supplying lateral is not blocked and ditch and lateral do not appear to be maintained.

- 2217-2** Retired 29.2-acres and 0.33-cfs of Keller property from future irrigation via South Side Ditch. Land located in the SE¼ Section 29 T1N R9E and water via South Side Ditch in the NE¼ Section 32 T1N R9E. The turnout for the supplying lateral is not blocked and ditch and lateral do not appear to be maintained.
- 2218-2** Retired 192.5-acres and 2.16-cfs of Stromer property from future irrigation via South Side Ditch. Land located in the NW¼, SW¼ , and SE¼ of Section 29 T1N R9E and water via South Side Ditch in the SW¼ Section 29 T1N R9E. The turnout for the supplying lateral is not blocked and ditch and lateral do not appear to be maintained.
- 2317-2** Retired 46-acres and 0.84-cfs of Morris property from future irrigation via Hawthorne Ditch. Land located in the center of Section 9 T1N R8E and water via Hawthorne Ditch in the NE¼ Section 9 T1N R8E. Hawthorne Ditch is now piped underground through the area where the turnout for the supplying lateral was and the new Elk Vale Road by-pass, a school, and Western Electric have been constructed where the lateral previous ran. There is no evidence of a lateral at the location.

cc: Individual Files

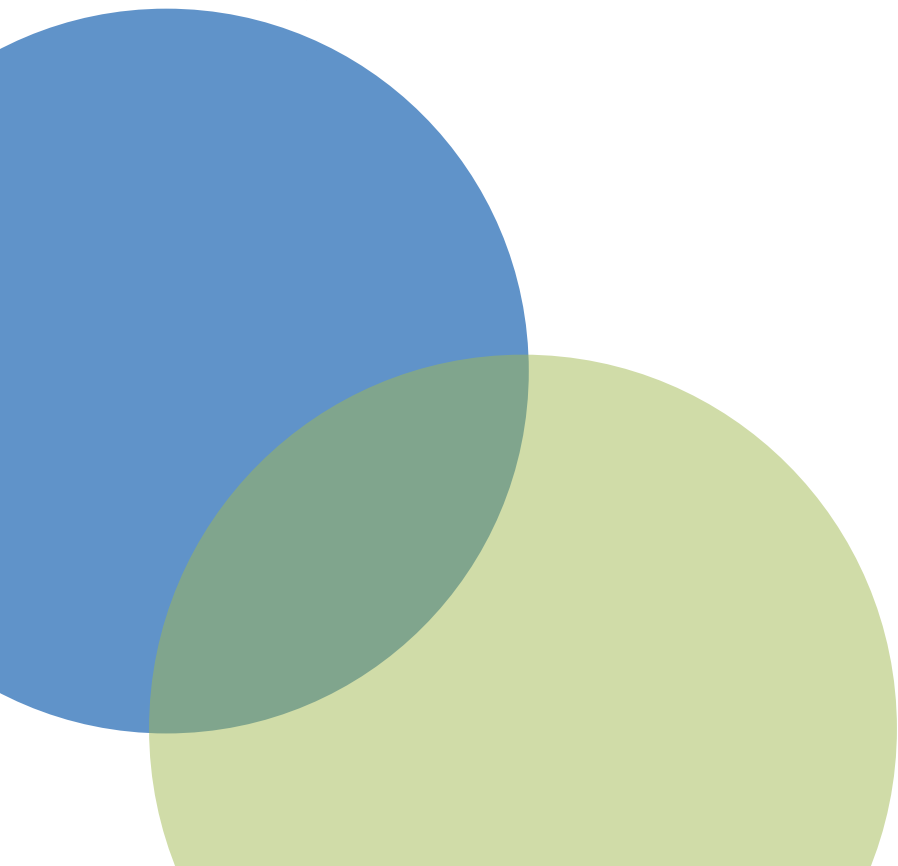
DOCUMENTATION OF
IRRIGATION DIVERSION POINT ABANDONMENT
FOR CITY OF RAPID CITY
PROJECT NO. 12-2034, CIP NO. 50922

Topical Report RSI-2317

prepared for

City of Rapid City
Public Works Department
Water Division
300 6th Street
Rapid City, SD 57701

January 2016



DOCUMENTATION OF
IRRIGATION DIVERSION POINT ABANDONMENT
FOR CITY OF RAPID CITY
PROJECT NO. 12-2034, CIP NO. 50922

Topical Report RSI-2317

by

Peter P. Rausch
Curtis D. Anderson
Adam J. Rutz
Jared K. Oswald

RESPEC
3824 Jet Drive
Rapid City, South Dakota 57703

prepared for

City of Rapid City
Public Works Department
Water Division
300 6th Street
Rapid City, SD 57701

January 2016

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1.0 BACKGROUND

The City of Rapid City has obtained the water permits from several irrigators served by Rapid Creek in the Rapid Valley area. According to the South Dakota Department of Environment and Natural Resources (SD DENR) Water Rights Division, the holder of a transferred permit shall permanently render inoperable the structural means of diverting water to land that is no longer subject to the water permit. The City of Rapid City has record of transfers and has now completed abandonment of the aforementioned diversion structures. The abandonment of the structures was performed by the City of Rapid City and reviewed by SD DENR personnel. This report documents the permits transferred, the diversion points associated with those permits, and the abandonment of those diversion points.

2.0 DATA SOURCES

Six sources were used to identify the diversion structures (turnouts) to be disabled. The first is the South Dakota Water Rights Program online permit database that is operated by the SD DENR [2012]. This database includes water rights documentation for each of the Rapid Valley irrigation ditches, identifies all permit transfers, and has documentation for individual water rights permits.

The second source is the Rapid Valley Water Management Study, which was completed in 1990 by the U.S. Bureau of Reclamation for ditches that have storage in Deerfield Reservoir, including the South Side, Cyclone, Little Giant, and Hawthorne irrigation ditches [U.S. Bureau of Reclamation, 1990]. The Murphy Ditch was excluded from the Rapid Valley Water Management Study because its water right is for natural Rapid Creek flows and, therefore, contractually has no storage in Deerfield Reservoir managed by the Bureau of Reclamation. The documentation from the study includes photographs of irrigation turnouts; associated notes; and irrigation ditch maps with turnout locations, photograph locations, and irrigated acreages.

The third source is an undocumented study conducted by the City of Rapid City in 2008. This study includes photographs of irrigation turnouts, associated notes, and maps that include data pertinent to water rights transferred to the city. The last three sources include parcel delineation and owner information from RapidMap [City of Rapid City and Pennington County, 2014], field investigations, and direct communication with irrigation ditch personnel and landowners.

Searches were conducted within the SD DENR Water Rights Program database to identify the water rights transferred to the City of Rapid City. Permit documentation associated with these transfers was downloaded. The water rights flow rate, acreage, location, previous owner, and approval date were identified for each transfer and this information is provided in Table 2-1.

By combining the information from Table 2-1 with the data from the RapidMap geodatabase, the parcels associated with each transfer were identified. Then, structure location maps from the Rapid Valley Water Management Study were used to identify the locations of turnouts requiring disablement. These locations were field-verified with help from ditch personnel and were recorded with Global Positioning System (GPS). Verified structure locations were digitized with ArcGIS mapping software.

Table 2-1. Information for Water Rights Transferred to the City of Rapid City

Permit No.	Ditch(s)	Previous Owner	Acres	Flow (cfs) ^(a)	Section	Township	Range	Quarter	Transfer Date
2655-2	Cyclone	Lamb	58	0.83	22	1N	8E	SW NW, NW NW	12/1/2010
2317-2	Hawthorne	Morris	46	0.84	9	1N	8E	SW NE, SE NW, NE SW, NW SE	5/1/1996
2399-2	Little Giant and Murphy	Wileman	52	0.75	24	1N	8E	E NE	5/7/1998
2468-2	Little Giant via Murphy	Howie	34.8	0.57	19; 30	1N	9E	W SW; NW NW	12/5/2001
2142-2	Murphy	Tyler	49	0.62	19	1N	9E	W NW, NW SW	5/1/1991
2199-2	Murphy	Pelle	4	0.05	19	1N	9E	NW NW	5/7/1992
2201-2	Murphy	Long	10	0.13	14	1N	8E	C	5/7/1992
2316-2	Murphy	Morris	64	0.81	9	1N	8E	W SE	5/1/1996
2469-2	Murphy	Murphy	27	0.34	14	1N	8E	S NW, N SW	12/5/2001
2512-2	Murphy	Schroeder	145	1.84	19	1N	9E	E NW, NE SW, SW SE, N SE, S NE	12/3/2003
2217-2	South Side	Keller	29.2	0.33	29	1N	9E	SE SE	7/22/1992
2218-2	South Side	Stromer	192.5	2.16	29	1N	9E	SW	7/22/1992
2234-2	South Side	Eisenbraun	70	0.79	26	1N	8E	E NE	5/1/1996
2249-2	South Side	Weber	105.5	1.19	30	1N	9E	E NW, NW SW, E SW	5/5/1993
2296-2	South Side	Jundt	253.4	2.85	28; 33	1N	9E	SW, SW SE; NW, W NE, NW SE, N SW	1/6/1994
2360-2	South Side	Soetaert	32.6	0.37	33	1N	9E	W NW	7/10/1996
2397-2	South Side	Eisenbraun	59.3	0.59	26	1N	8E	W NE	2/25/1998
2411-2	South Side	Eisenbraun	3.6	0.04	26	1N	8E	N NE	10/1/1998
2415-2	South Side	Howie	146	1.64	32	1N	9E	NE, N SE	12/2/1998
2513-2	South Side	Steen	74.9	0.84	24; 25	1N	8E	W SE; SW NE	12/3/2003

(a) cfs = cubic feet per second

3.0 IRRIGATION DITCH SUMMARIES

The information gathered for turnouts to parcels with water rights transferred from irrigation use to the City of Rapid City is described by permit number in the following sections. The information includes each turnout location, access, and disablement information. All maps can be found in Appendix A.

All references to compacted backfill or compacted embankment were completed according to City of Rapid City Specifications Section 14-Embankment. Rapid City Specifications are located at www.rcgov.org under Departments – Public Works – Engineering Services – Standard Specifications & Details 2007.

3.1 CYCLONE DITCH

A single Cyclone Ditch water right has been transferred to the City of Rapid City with a single associated turnout. Table 3-1 describes the turnout location and Figure A-1 maps the vicinity. The following section describes the turnout details.

Table 3-1. Cyclone Ditch Turnout Information

Turnout	Longitude	Latitude	Adjacent Landowner
2655-2	-103.151	44.034	David Lamb

3.1.1 Permit 2655-2

This permit is for 58 acres and 0.85 cubic feet per second (cfs) transferred from Mr. David Lamb.

3.1.1.1 Turnout

The single turnout for this permit was an open ditch cut through the bank of Cyclone Ditch. Water was directed down the turnout ditch by boarding up a steel flume immediately downstream in the Cyclone Ditch.

3.1.1.2 Access

The turnout was located adjacent to property owned by the Rapid City Area School District No. 51-4 (PIN 3822100004). Direct access to the site is along an over 1-mile, two-track road that runs through fields on property owned by Mr. David Lamb. It is accessible by a private driveway at 4555 Reservoir Road, south of East Highway 44.

3.1.1.3 Disablement

The flume has been removed, the turnout ditch filled, and the ditch reshaped by the landowner as illustrated in Figure 3-1.



Figure 3-1. The Turnout Ditch (Left Arrow) and Former Location of Flume (Right Arrow) Associated With Permit 2655-2. Cyclone Ditch Runs From Foreground to Background Through Large Concrete Pipe.

3.2 HAWTHORNE DITCH

A single Hawthorne Ditch water right has been transferred to the City of Rapid City with a single associated turnout. Table 3-2 provides the turnout location and Figure A-2 maps the vicinity. The following section describes the turnout details.

Table 3-2. Hawthorne Ditch Turnout Information

Turnout	Longitude	Latitude	Current Landowner
2317-2	-103.162	44.064	N/A

3.2.1 Permit 2317-2

This permit is for 46 acres and 0.84 cfs transferred from Mr. Morris.

3.2.1.1 Turnout

The supplying lateral and turnout for this permit no longer exist. An internal memorandum of SD DENR dated September 30, 2005, states “Hawthorne Ditch is now piped underground through the area where the turnout for the supplying lateral was and the new Elk Vale Road bypass, a school, and (the West River Electric Association building) have been constructed where the lateral previously ran. There is no evidence of a lateral at the location” [Stroup, 2005]. This statement was field-verified.

3.2.1.2 Access

The approximate, former location of the turnout is along East Highway 44 near the Elk Vale Road bypass.

3.2.1.3 Disablement

The turnout was previously disabled.

3.3 MURPHY DITCH

Eight Murphy Ditch water rights have been transferred to the City of Rapid City, and 11 associated turnout locations are described in Table 3-3 in order from upstream to downstream. Two vicinity maps of the turnouts are illustrated by Figures A-3 and A-4. The following sections describe each of the Murphy Ditch turnout locations by permit. The ditch has a 20-foot easement on either side for access and maintenance.

Table 3-3. Murphy Ditch Turnout Information

Turnout	Longitude	Latitude	Adjacent Landowner
2316-2	-103.158	44.059	Yasmeen Dream
2469-2 A	-103.128	44.049	Dennis Murphy
2469-2 B	-103.127	44.049	Dennis Murphy
2201-2	-103.121	44.047	Ramona Buchholz
2399-2 A	-103.097	44.038	Michelle Minnerath
2399-2 B	-103.091	44.037	Penn. Co. ROW
2468-2	-103.091	44.031	SD DOT
2142-2 and 2199-2	-103.089	44.037	Randall Albers or Melvin Ross
2512-2 A	-103.083	44.035	Rapid City
2512-2 B	-103.077	44.034	Rapid City
2512-2 C	-103.070	44.031	Rapid City ROW

3.3.1 Permit 2316-2

This permit is for 64 acres and 0.81 cfs transferred from Mr. Morris.

3.3.1.1 Turnout

A single turnout was associated with this permit. A wooden flume within the Murphy Ditch was used to check water up to a 12-inch-diameter corrugated metal pipe (CMP). The flume throat was 8 feet long, 4 feet 8 inches wide, and 4 feet 2 inches tall. The CMP was sedimented in and remained in segments. Figure 3-2 is a photograph of the flume and Figure 3-3 is a photograph of the CMP opening.



Figure 3-2. Wooden Flume Used as a Check for Permit 2316-2.



Figure 3-3. Opening to 12-Inch-Diameter Corrugated Metal Pipe Turnout for Permit 2316-2.

3.3.1.2 Access

The flume and pipe were adjacent to property owned by Yasmeen Dream that is accessible from Lytle Lane off of East Highway 44.

3.3.1.3 Disablement

The following are the procedures the City of Rapid City used in disabling the Permit 2316-2 turnout:

- Removed the wooden flume and all associated concrete from Murphy Ditch
- Removed the upstream CMP section from the ditch embankment
- Backfilled with compacted embankment material where items were removed
- Reshaped the ditch banks through the project area to match the cross section of existing banks outside of the project area

Figure 3-4 and Figure 3-5 document removal of the turnout.



Figure 3-4. Removal of Turnout associated with Permit 2316-2. Date 3/20/2014



Figure 3-5. Removal of Turnout associated with Permit 2316-2. Date 3/20/2014

3.3.2 Permit 2469-2

This permit is for 27 acres and 0.34 cfs transferred from Ms. Arlene Murphy.

3.3.2.1 Turnouts

Two turnouts were associated with this permit, and they were located at either end of an inverted siphon through which the Murphy Ditch passes. Both turnouts were approximately 10-inch-diameter plastic pipes through the ditch bank. The upstream pipe (Turnout A) was mostly buried and is shown in Figure 3-6. The downstream pipe (Turnout B) was exposed, as illustrated in Figure 3-7.



Figure 3-6. Pipe Turnout A for Permit 2469-2.

3.3.2.2 Access

Both turnouts were adjacent to property owned by Dennis Murphy (PIN 3814105010), and the sites are accessible from a private driveway at 5670 East Highway 44. Direct access to both turnouts was through fields along a two-track path. Access to the Turnout B site requires crossing an existing drainage or can alternatively be accessed by a two-track path off the end of Springfield Road.



Figure 3-7. Pipe Turnout B for Permit 2469-2.

3.3.2.3 *Disablement*

The following are the procedures the City of Rapid City used in disabling the Permit 2469-2 turnouts

- Removed both pipe turnouts from the ditch embankment
- Backfilled with compacted embankment material to match the existing bank cross section

Figures 3-8 and Figure 3-9 document removal of the turnouts.



Figure 3-8. Removal of Turnout A Associated With Permit 2469-2. Date 4/22/2014



Figure 3-9. Removal of Turnout B Associated With Permit 2469-2. Date 4/22/2014.

3.3.3 Permit 2201-2

This permit is for 10 acres and 0.13 cfs transferred from Mr. Long.

3.3.3.1 Turnout

The old turnout ditch for this permit was identified, but the turnout had been removed. No evidence of a turnout could be identified on the ditch side of the bank, as illustrated in Figure 3-10. The remains of wooden structures, possibly related to the turnout, were found nearby, as shown in Figure 3-11.

3.3.3.2 Access

The site is adjacent to property owned by Ms. Ramona Buchholz (PIN 3814326004) and is located directly west of Apple Tree Road. It is accessible from East Highway 44.

3.3.3.3 Disablement

The structure was previously disabled.



Figure 3-10. Photograph Taken From in the Murphy Ditch Running Right to Left (Bank in Foreground Is Likely Former Turnout Location for Permit 2201-2).



Figure 3-11. Wooden Remains Found Near the Site for Permit 2201-2.

3.3.4 Permit 2399-2

This permit is for 52 acres and 0.75 cfs transferred from Mr. Wesley Wileman.

3.3.4.1 *Turnouts*

Two turnout locations were associated with this permit. Turnout A had been removed but was not properly backfilled, as illustrated in Figure 3-12. A meeting on site with Mr. Jeep Williams, watermaster for Murphy Ditch, in April 2014 verified that the backfill at that site has been repaired since the photograph was taken. Turnout B was a 12-inch steel canal gate, as shown in Figure 3-13.

3.3.4.2 *Access*

The Turnout A site is adjacent to property owned by Ms. Michelle Minnerath (PIN 3824200002) and is north of Morris Lane. Direct access to the location is through a field with no defined path. Turnout B was located in the west ditch of Radar Hill Road.



Figure 3-12. Backfill Material at the Former Location of Turnout A for Permit 2399-2. This area has since had material added to the bank.



Figure 3-13. Turnout B for Permit 2399-2 (The 12-Inch Steel Canal Gate was Located on the Far Bank Adjacent to the Concrete Culvert, and Murphy Ditch Runs Right to Left).

3.3.4.3 *Disablement*

The following are the procedures the City of Rapid City used in disabling the Permit 2399-2 turnouts:

- Turnout A was previously disabled
- Turnout B
 - Removed the canal gate from Murphy Ditch
 - Removed a portion of the pipe from the ditch bank and backfilled with compacted embankment material to match the existing bank cross section

Figure 3-14 and Figure 3-15 document removal of Turnout B.



Figure 3-14. Removal of Turnout B for Permit 2399-2 Located on Murphy Ditch on Radar Road.
Date 4/22/2014



Figure 3-15. Removal of Turnout B for Permit 2399-2 Located on Murphy Ditch on Radar Road.
Date 4/22/2014

3.3.5 Permit 2468-2

This permit is for 34.8 acres and 0.57 cfs transferred from Mr. Gordon Howie.

3.3.5.1 *Turnouts*

A single turnout for this permit was once located on a lateral ditch. The turnout ditch was identified, as shown in Figure 3-16, but no turnout structure exists.



Figure 3-16. Disabled Turnout Ditch for Permit 2468-2 Running From the Foreground to the Background Along the East Side of Radar Hill Road (The Lateral Ditch Is in the Left Foreground, Turning Left at the Visible Tree Root).

3.3.5.2 *Access*

The site is located on property owned by the South Dakota Department of Transportation (SD DOT) on the east side of Radar Hill Road, south of East Highway 44 (PIN 3824427001).

3.3.5.3 *Disablement*

The structure was previously disabled.

3.3.6 Permits 2142-2 and 2199-2

Permit 2142-2 is for 49 acres and 0.62 cfs transferred from Mr. Tyler. Permit 2199-2 is for 4 acres and 0.05 cfs transferred from Mr. Pelle.

3.3.6.1 Turnout

A single turnout location was used for these two permits. Upon inspection, the turnout ditch was identified and a short, disconnected segment of a 12-inch-diameter CMP was found lying in the ditch at the site, but an existing turnout structure was not evident. The concrete check structure for the turnout has been removed and sits on the ditch bank at the location illustrated in Figure 3-17.



Figure 3-17. Former Location of the Turnout for Permits 2142-2 and 2199-2 (The Concrete Check Structure and a Disconnected Corrugated Metal Pipe Segment Sit on the Far Bank, and Murphy Ditch Flows Right to Left).

3.3.6.2 Access

The site is adjacent to property owned by Mr. Randall Albers (PIN 3919100002) along Morris Lane. Direct access to the site is through the Albers property or the neighboring property owned by Melvin Ross (PIN 391900001), or from the top side of the Murphy Ditch through Mr. Jerry Olson's property.

3.3.6.3 Disablement

The structure was previously disabled and no further action was required, as per a meeting with SD DENR personnel in April 2014.

3.3.7 Permit 2512-2

This permit is for 145 acres and 1.84 cfs transferred from Ms. Marilyn Schroeder.

3.3.7.1 Turnouts

Three turnouts were associated with this permit. Turnout A was a 10-inch-diameter plastic pipe through the ditch bank but was capped and buried, as shown in Figure 3-18. Turnout B was a clay pipe 12-inches in diameter and 20 feet long through the ditch bank. The downstream end of this pipe was previously buried. Figure 3-19 is a photograph of a plywood headgate used for Turnout B. Turnout C was a 24-inch steel canal gate secured in a concrete junction box, as shown in Figure 3-20. The junction box is on a lateral ditch and is shared with an identical gate for a separate, active permit.



Figure 3-18. Pipe Used for Turnout A of Permit 2512-2 (Red Arrow).

3.3.7.2 Access

Turnouts A and B were located adjacent to property owned by the City of Rapid City (PIN 3919200001). Turnout C was located in the west right-of-way for Airport Road.

3.3.7.3 Disablement

The following are the procedures the City of Rapid City used in disabling the Permit 2512-2 turnouts:

- Turnout A was previously disabled and no further action was required per discussion with the Murphy Ditch watermaster and SD DENR personnel in April 2014.
- Turnout B was previously disabled and no further action was required per discussion with the Murphy Ditch watermaster and SD DENR personnel in April 2014.

- Turnout C
 - Removed the canal gate and disabled the pipe with a Class M-5 concrete plug.

Figure 3-21 and Figure 3-22 document disablement of the Turnout C structure.



Figure 3-19. Plywood Headgate for Turnout B of Permit 2512-2.



Figure 3-20. Junction Box With 24-Inch Canal Gate for Turnout C of Permit 2512-2 (Turnout C Shown With Red Arrow, Leading South).



Figure 3-21. Removal of Turnout C for Permit 2512-2 Located on Murphy Ditch on the East Side of Airport Road. Date 4/22/2014



Figure 3-22. Removal of Turnout C for Permit 2512-2 Located on Murphy Ditch on the East Side of Airport Road Going South to the Airport. Date 4/22/2014.

3.4 SOUTH SIDE DITCH

Ten South Side Ditch water rights have been transferred to the City of Rapid City, and 13 associated turnout locations were identified by using maps from the Rapid Valley Water Management Study [U.S. Bureau of Reclamation, 1990] and field investigations. The locations are described in Table 3-4 from upstream to downstream. Two vicinity maps of the turnouts are provided by Figures A-5 and A-6.

Table 3-4. South Side Ditch Turnout Information

Turnout	Longitude	Latitude	Adjacent Landowner
2234-2, 2397-2 & 2411-2	-103.115	44.017	Reinhold Eisenbraun (south) Randy Christensen (north)
2513-2	-103.100	44.018	City of Rapid City
2249-2 A	-103.095	44.017	City of Rapid City
2249-2 B	-103.091	44.015	City of Rapid City
2249-2 C	-103.091	44.015	City of Rapid City
2249-2 D	-103.084	44.011	City of Rapid City
2218-2	-103.071	44.010	Merlin Stromer
2415-2 A	-103.065	44.008	Matt Bowen
2415-2 B	-103.061	44.006	Matt Bowen
2415-2 C	-103.059	44.006	Matt Bowen
2415-2 D	-103.056	44.006	Matt Bowen
2217-2	-103.056	44.011	Leonard V. Keller Trust
2296-2 and 2360-2	-103.05	44.007	Donald Jundt

3.4.1 Permits 2234-2, 2397-2, and 2411-2

Permit 2234-2 is for 70 acres and 0.79 cfs, Permit 2397-2 is for 59.3 acres and 0.59 cfs, and Permit 2411-2 is for 3.6 acres and 0.04 cfs, all transferred from Mr. Reinhold Eisenbraun.

3.4.1.1 Turnouts

One turnout structure could be found in the described vicinity of these permits, located in Section 26, 1N 8E. The ditch was walked for approximately 1/2 mile to the west and the only turnout found is shown in Figure 3-23.

3.4.1.2 Access

The turnout for Permit 2234-2 is accessed off of Highway 44 by turning south on Anderson Rd. and continuing south past Southside Dr. approximately 3/8 mile to South Side Ditch. The site is approximately 1/4 mile west. The land north of the ditch, including the structure, is owned by Mr. Randy Christensen, and the land south of the ditch is owned by Mr. Eisenbraun.

3.4.1.3 Disablement

The structure was previously disabled, and no further action was required by SD DENR personnel.



Figure 3-23. Turnout for Permit 2234-2. Note the headwall sticking out of the snow just upstream from the culvert crossing on the left or north side of the ditch (red arrow). The ditch behind the headwall has been filled in.

3.4.2 Permit 2513-2

This permit is for 74.9 acres and 0.84 cfs transferred from Mr. Steen.

3.4.2.1 Turnouts

One turnout was associated with Permit 2513-2. The turnout was located straight south of the Rapid City Water Treatment Plant near the middle of section 25 on South Side Ditch. The turnout inlet structure was concrete with a 15-inch canal gate and PVC pipe going under the north bank to a weir box. On the north side of the weir box, 15-inch PVC pipe ran from the box to a vertical PVC air vent and then continued north. Figures 3-24, 3-25, and 3-26 show the structures associated with Permit 2513-2.



Figure 3-24. Inlet Structure, Weir Box, and Air Vent Associated With Turnout 2513-2.



Figure 3-25. Inlet Structure, Weir Box, and Air Vent Associated With Turnout 2513-2.



Figure 3-26. Inside the Weir Box for Turnout 2513-2. Note center wall weir and PVC pipe exiting the box.

3.4.2.2 Access

The site is located on land owned by the City of Rapid City and occupied by Mr. Bud Steen. The site may be accessed by turning off Highway 44 on Anderson Rd., then turning east on Southside Dr. to the treatment plant, then south on Redemption Road at the west edge of the treatment plant. At South Side Ditch, the site is located just east of the road.

3.4.2.3 Disablement

The following are the procedures the City of Rapid City used in disabling the turnout associated with Permit 2513-2:

- Cut existing turnout pipe 5 feet north from air vent
- Removed the air vent, inlet structure, and appurtenances.
- Backfilled with compacted embankment material

Figure 3-27 documents disablement of the structure.



Figure 3-27. Removal of Turnout for Permit 2513-2. Headgate removed, measurement box filled with dirt and pipeline air vent removed. Date: 10/29/2015

3.4.3 Permit 2249-2

This permit is for 105.5 acres and 1.19 cfs transferred from Mr. Weber.

3.4.3.1 *Turnouts*

Four turnouts were associated with Permit 2249-2. Turnout A was located 1,500 feet downstream from the Permit 2513-2 turnout site and consisted of a steel-framed headgate and concrete headwall. The structure is shown in Figure 3-28.

Turnout B was located upstream from a culvert crossing, shown in Figure 3-29. This culvert was used as a check structure for Turnout B and is located just west of the line between Section 25, 1N 8E and Section 30, 1N 9E. Figure 3-30 shows the outlet end of the Turnout B pipe.

Turnout C consisted of a wooden structure on the north bank of South Side Ditch, just upstream from a second culvert crossing, shown in Figure 3-31. The Turnout C site is shown in Figure 3-32 and located just east of the line between Section 25, 1N 8E and Section 30, 1N 9E.

Turnout D was located in the SW1/4 of Section 30 T1N R9E and consisted of a steel frame canal gate and division box. The gate is shown in Figure 3-33 and the division box is shown in Figure 3-34.



Figure 3-28. Turnout A structure Associated with Permit 2249-2.



Figure 3-29. Culvert Crossing Used as a Check for Turnout B Associated with Permit 2249-2.



Figure 3-30. Outlet end of Turnout B pipe (Red Arrow). (Looking South, Towards South Side Ditch).



Figure 3-31. Second Culvert Crossing, Used as Check for Turnout C Associated With Permit 2249-2.



Figure 3-32. Wooden Structure (Red Arrow) for Turnout C Associated With Permit 2249-2. This structure is immediately upstream of the culvert crossing in Figure 3-31, on the north bank.



Figure 3-33. Metal Framed Canal Gate of Turnout D Associated With Permit 2249-2.



Figure 3-34. Turnout D Division Box Associated With Permit 2249-2. Date 10/30/2015.

3.4.3.2 Access

The turnout sites may be accessed by turning south from Highway 44 on Anderson Rd., then east on Southside Dr. to the treatment plant. The sites are adjacent to property owned by the City of Rapid City, southeast from the treatment plant.

3.4.3.3 Disablement

The following are the procedures the City of Rapid City used in disabling turnouts A, B, C, and D associated with Permit 2249-2:

- Turnout A
 - Removed turnout head gate
 - Placed concrete plug in turnout pipe
 - Filled turnout ditch with compacted material
- Turnout B
 - Removed pipe and structure
 - Backfilled with compacted embankment material to match existing ditch cross section
- Turnout C
 - Removed the wooden structure
 - Backfilled with compacted embankment material to match existing ditch cross section
- Turnout B
 - Removed the steel framed canal gate and structure
 - Backfilled with compacted embankment material to match the existing ditch cross section

Figures 3-35 through Figure 3-40 document the disablement of these four turnouts.



Figure 3-35. Turnout A Associated with Permit 2249-2. Headgate removed, turnout pipe filled with concrete, and outlet filled in. Date 10/29/2015



Figure 3-36. Turnout B Associated with Permit 2249-2. The old turnout structure has been removed. Date 10/29/2015.



Figure 3-37. Turnout C Associated With Permit 2249-2. Removed turnout structure. Date 10/29/2015.



Figure 3-38. Turnout D Associated With Permit 2249-2, removed by the City. Date 10/30/2015



Figure 3-39. Turnout D Associated With Permit 2249-2. Turnout being backfilled. Date 10/30/2015.



Figure 3-40. Turnout D Associated With Permit 2249-2. Photo of the division box being removed and backfilled by the City. Date 10/30/2015.

3.4.4 Permit 2218-2

This permit is for 192.5 acres and 2.16 cfs transferred from Mr. Merlin Stromer.

3.4.4.1 *Turnouts*

One turnout was associated with Permit 2218-2. The turnout consisted of a pipe inlet, a metal valve well, and an air vent immediately downstream of the valve well, shown in Figure 3-41.

3.4.4.2 *Access*

The turnout site for Permit 2218-2 is located turning south on Airport Road from Highway 44 and travelling about 0.7 miles to the driveway into Mr. Merlin Stromer's property, then another 0.3 miles south through the Stromer property to South Side Ditch.

3.4.4.3 *Disablement*

A discussion with Mr. Merlin Stromer in April of 2014 was that after Mr. Stromer sold his water rights to the city, he hired a contractor to disable the turnout. No water can be or has been delivered through the turnout since the water right transfer. Discussion with SD DENR was that this would satisfy abandonment requirements and the turnout would not be disturbed since it has been disabled.



Figure 3-41. Turnout for Permit 2218-2. This turnout has been disabled and will not be disturbed.

3.4.5 Permit 2415-2

This permit is for 146 acres and 1.64 cfs transferred from Mr. Gordon Howie.

3.4.5.1 Turnouts

Four turnouts were associated with Permit 2415-2, designated Turnout A through Turnout D (upstream to downstream on the South Side Ditch). Turnout A consisted of a gate structure composed of timber and is shown in Figure 3-42. A wooden flume was used as a check structure for Turnout A, located approximately 35 feet downstream and shown in Figure 3-43.

Turnout B was also a gate structure composed of timbers. As shown in Figure 3-44, a wooden flume was located next to Turnout B (Turnout B indicated by red arrow) and was used as a check structure.

Turnout C consisted of a wooden gate structure supported by concrete abutments. Figure 3-45 displays Turnout C (red arrow) along with a wooden weir check structure located downstream from Turnout C. The ditch from Turnout C led to a 24-inch-diameter concrete pipe that was used to convey diverted water, shown in Figure 3-46.

Turnout D consisted of a concrete flume/check structure, shown in Figure 3-47. The structure included outlets on both the north and south walls, with timbers used to convey diverted water from the structure. Figures 3-48 and 3-49 show the north and south outlets, respectively.



Figure 3-42. Turnout A for Permit 2415-2. The turnout is composed of timber.



Figure 3-43. Wooden Flume Used as a Check for Turnout A of Permit 2415-2.



Figure 3-44. Turnout B (Red Arrow) and the Flume Associated with Permit 2415-2.



Figure 3-45. Turnout C (Red Arrow) and the Wooden Weir Associated With Permit 2415-2.



Figure 3-46. Turnout C and the 24-Inch-Diameter Concrete Pipe (Red Arrow) Associated With Permit 2415-2.



Figure 3-47. Concrete Flume/Check Structure for Turnout D Associated With Permit 2415-2 (Looking Downstream).



Figure 3-48. North Flume/Check Structure Wall and Outlet for Turnout D Associated With Permit 2415-2.



Figure 3-49. South Flume/Check Structure Wall and Outlet for Turnout D Associated With Permit 2415-2.

3.4.5.2 Access

Turnouts A through D are adjacent to property owned by Mr. Matt Bowen (PINs 3932100003 and 3932200001). The sites are accessed by travelling approximately 1/2 mile south on Bradsky Road from Highway 44 to a private drive just north of the South Side Ditch crossing.

- The Turnout A and Turnout B sites are accessed by travelling west on the private drive for approximately 1/2 mile from Bradsky Road, crossing South Side Ditch, then leaving the private drive and following South Side Ditch along its south bank.
- The Turnout C and Turnout D sites are accessed from the private drive on the north bank of South Side Ditch, approximately 1/2 mile and 1/4 mile west of Bradsky Road, respectively.

3.4.5.3 Disablement

The following are the procedures the City of Rapid City used in disabling the four turnouts associated with Permit 2415-2.

- Turnout A
 - o Removed the timber turnout and the wooden flume structure
 - o Backfilled with compacted embankment material to match existing ditch cross section

- Turnout B
 - o Removed the timber turnout and the wooden flume structure
 - o Backfilled with compacted embankment material to match existing ditch cross section
- Turnout C
 - o Removed the wooden gate turnout structure, concrete abutments, and wooden weir check structure from South Side Ditch
 - o Backfilled ditch banks with compacted embankment material to match existing ditch cross section
 - o Backfilled existing turnout ditch from South Side Ditch to existing concrete pipe with compacted material to match existing adjacent grade
- Turnout D
 - o Removed the concrete inlets and wooden turnouts from the north and south banks.
 - o Backfilled with compacted embankment material to match existing ditch cross section.

Figures 3-50 through 3-57 document the disablement of the structures associated with the four turnouts.



Figure 3-50. Removal of Turnout A associated with Permit 2415-2. Date 7/30/2015



Figure 3-51. Turnout A Wooden Flume Structure Associated With Permit 2415-2, removed. Date 7/30/2015



Figure 3-52. Turnout B Associated With Permit 2415-2. Timber Turnout Removed. Date 7/30/2015.



Figure 3-53. Turnout B Associated With Permit 2415-2. Wooden Flume Structure Removed. Date 7/30/2015.



Figure 3-54. Turnout C Associated With Permit 2415-2 Timber Gate Turnout Structure, Concrete Abutments, and Timber Weir Check Structure Removed. Date 7/30/2015.



Figure 3-55. Turnout C Associated With Permit 2415-2. Turnout ditch filled in. Date 7/30/2015.



Figure 3-56. Turnout D Associated With Permit 2415-2. Headgate removed and concrete plug put in place for south turnout. Date 7/30/2015



Figure 3-57. Turnout D Associated With Permit 2415-2. Headgate removed and concrete plug put in place for north turnout. Date 7/30/2015.

3.4.6 Permit 2217-2

This permit is for 29.2 acres and 0.33 cfs transferred from Mr. Leonard Keller.

3.4.6.1 *Turnouts*

No turnouts associated with this permit were located.

3.4.6.2 *Access*

The site is along Back Country Trail off of Bradsky Road.

3.4.6.3 *Disablement*

This turnout was previously disabled.

3.4.7 Permit 2296-2 and Permit 2360-2

Permit 2296-2 is for 253.4 acres and 2.85 cfs transferred from Mr. Donald Jundt. Permit 2360-2 is for 32.6 acres and 0.37 cfs transferred from Mr. Soetaert.

3.4.7.1 Turnouts

The turnout structure associated with transferred Permit 2296-2 and transferred Permit 2360-2, shown in Figure 3-58, also serves the active Permit 2526-2 for 0.71 cfs currently serving 50 acres of irrigated land owned by Mr. Donald Jundt. The turnout will not be disabled.



Figure 3-58. Turnout Associated With Permit 2296-2 and Permit 2360-2, Currently Serving an Active Permit for 50 Acres Irrigated by Mr. Donald Jundt.

3.4.7.2 Access

The turnout for Permit 2296-2 and Permit 2360-2 is located approximately 1/2 mile south of Highway 44 on the east side of Bradsky Road at the South Side Ditch. All associated structures are on property owned by Mr. Donald Jundt.

3.4.7.3 Disablement

No disablement was required.

4.0 PERMITS AND REGULATIONS

4.1 CLEAN WATER ACT SECTION 404 PERMIT

According to the U.S. Army Corps of Engineers [2007]:

“Under Section 404(f)(1)(C) of the CWA (see also 33 CFR 323.4(a)(3) and 40 CFR 232.3(c)(3)), discharges of dredged or fill material associated with construction or maintenance of irrigation ditches, or the maintenance (but not construction) of drainage ditches, are not prohibited by or otherwise subject to regulation under Section 404 of the CWA (i.e., these activities are exempt from the need to obtain a Section 404 Permit from the Department of the Army (DA)). Discharges of dredged or fill material associated with siphons, pumps, headgates, wingwalls, weirs, diversion structures, and such other facilities as are appurtenant to and functionally related to irrigation ditches are included in the exemption for irrigation ditches.”

A 404 Permit was not required.

4.2 CLEAN WATER ACT SECTION 402 PERMIT

According to the South Dakota Department of Environment and Natural Resources [2010] Section 2.2.2:

“Storm water discharges from operators disturbing less than one acre that are part of a larger common plan of development or sale that, combined, disturb one or more acres.”

The combination of ground area disturbed by the combination of all disablements associated with this project did not exceed 1 acre.

A 402 Permit was not required.

4.3 FLOODPLAIN DEVELOPMENT PERMITS

After reviewing both the Pennington County and Rapid City Flood Insurance Rate Maps, it was determined that none of the disablement sites lie within the 100-year floodplain.

Floodplain permits were not required.

4.4 HISTORIC PRESERVATION

As required by State Preservation Law (South Dakota Codified Law (SDCL) 1-19A-11.1), the Office of History was given notice and an opportunity to investigate and comment on this proposed project. The Office of History concluded that the irrigation ditches in Rapid Valley are listed on neither the State nor the National Register of Historic Places. Additionally, because federal funding will not be used for this proposed project, Section 106 of the National Historic Preservation Act did not apply.

5.0 REFERENCES

City of Rapid City and Pennington County, 2012. *RapidMap*, retrieved September 19, 2012, from <http://www.rcgov.org/GIS/rapidmap.html>

South Dakota Department of Environment and Natural Resources, 2012. *South Dakota Water Rights*, retrieved September 19, 2012, from <http://denr.sd.gov/des/wr/dbwrsearch.aspx>

South Dakota Department of Environment and Natural Resources, 2010. *General Permit for Storm Water Discharges Associated With Construction Activities*, prepared by the South Dakota Department of Environment and Natural Resources, Pierre, SD.

Stroup, D. E., 2005. *Rapid City – Rapid Valley Water Rights Transfers*, internal memorandum from D. E. Stroup, South Dakota Department of Environment and Natural Resources, Water Rights Program, Pierre, SD, to G. Eberle, South Dakota Department of Environment and Natural Resources, Water Rights Program, Pierre, SD, September 30.

U.S. Army Corps of Engineers, 1990. *Exemptions for Construction or Maintenance of Irrigation Ditches and Maintenance of Drainage Ditches under Section 404 of Clean Water Act*, Regulatory Guidance Letter, prepared by U.S. Army Corps of Engineers, Washington, DC, July 4.

U.S. Bureau of Reclamation, 1990. *Rapid Valley Water Management Study*, prepared by U.S. Bureau of Reclamation, Newell, South Dakota.

APPENDIX A

TURNOUT VICINITY MAPS

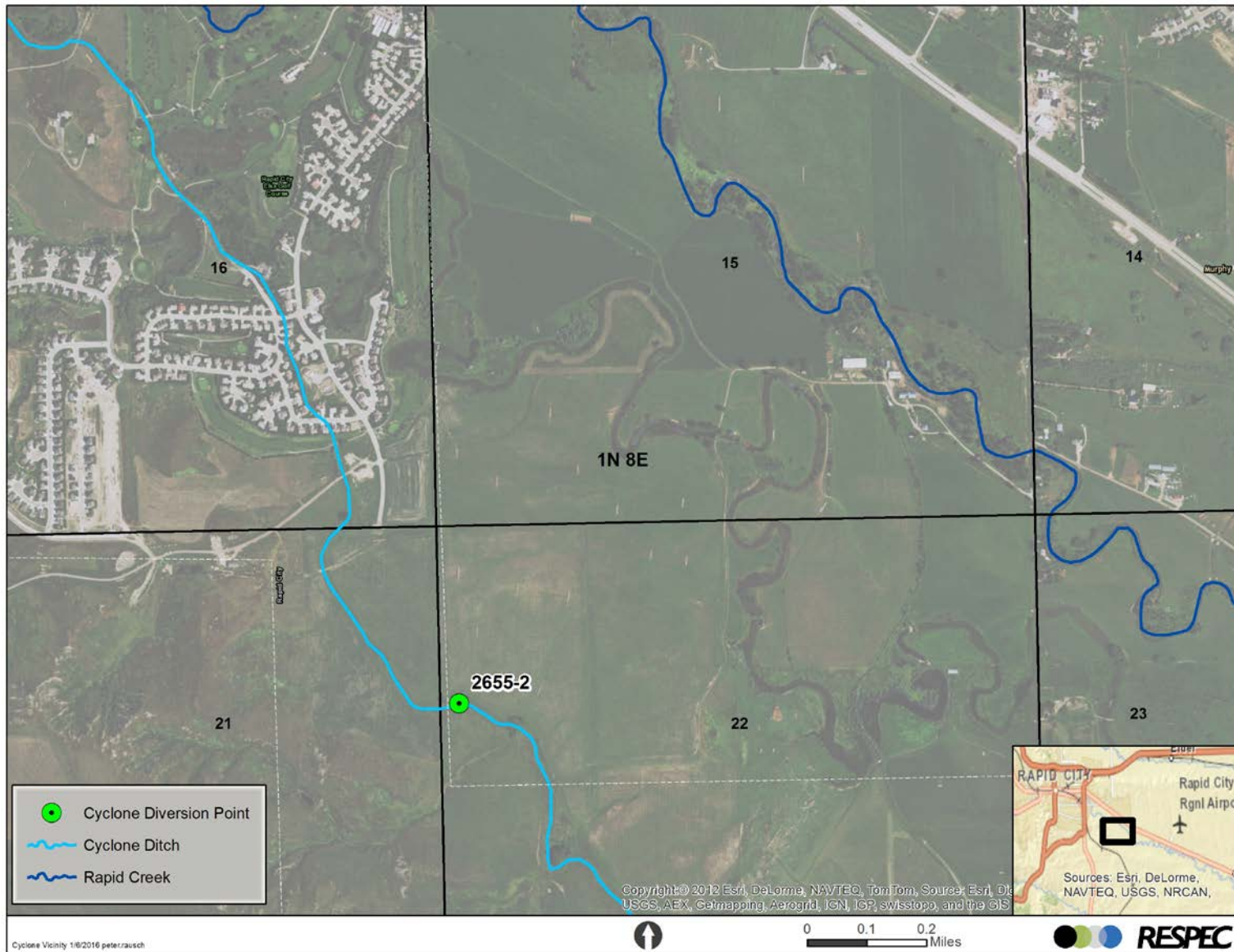


Figure A-1. Cyclone Ditch Turnout Vicinity Map.



Figure A-2. Hawthorne Ditch Turnout Vicinity Map.

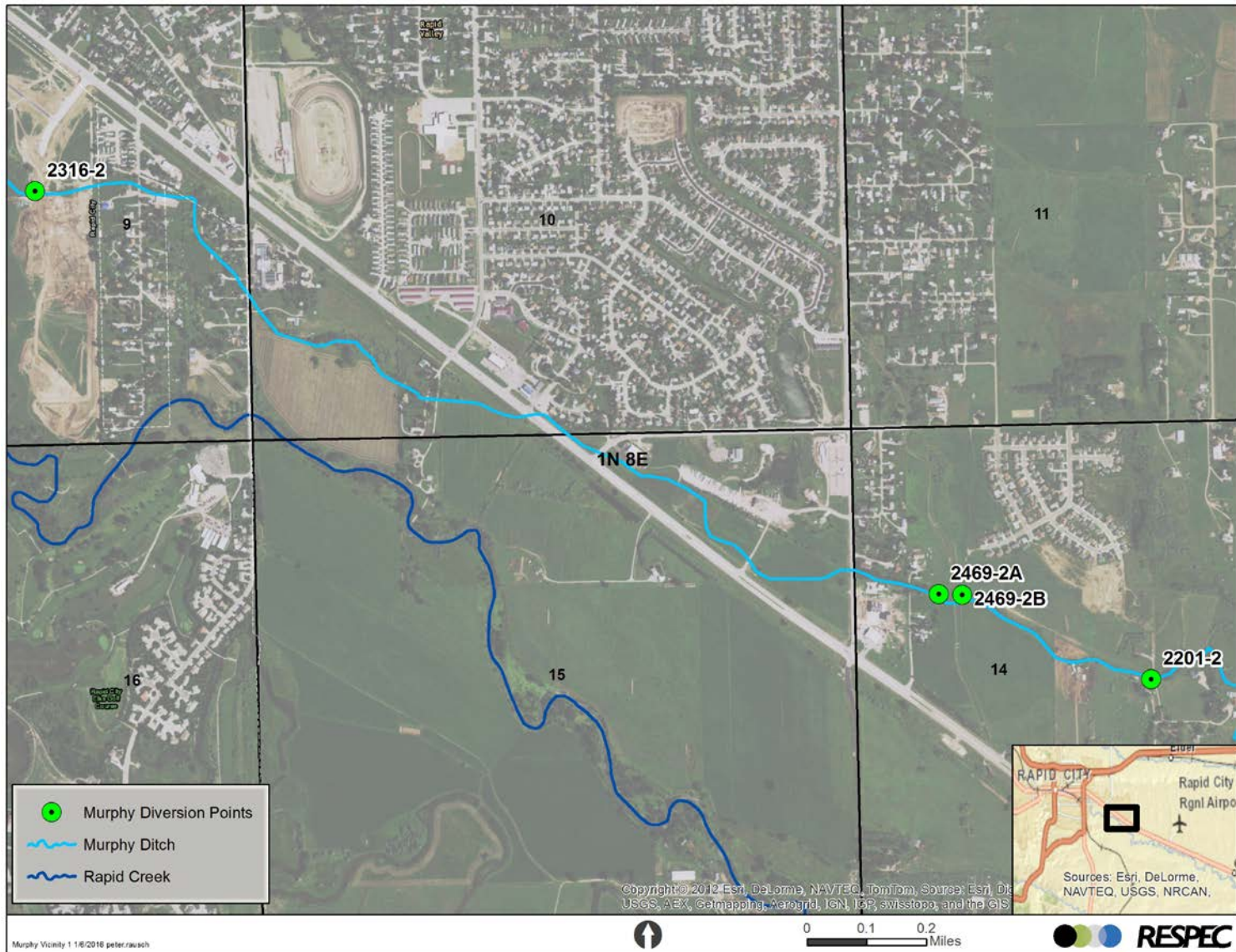


Figure A-3. Murphy Ditch Turnout Vicinity Map (1 of 2).

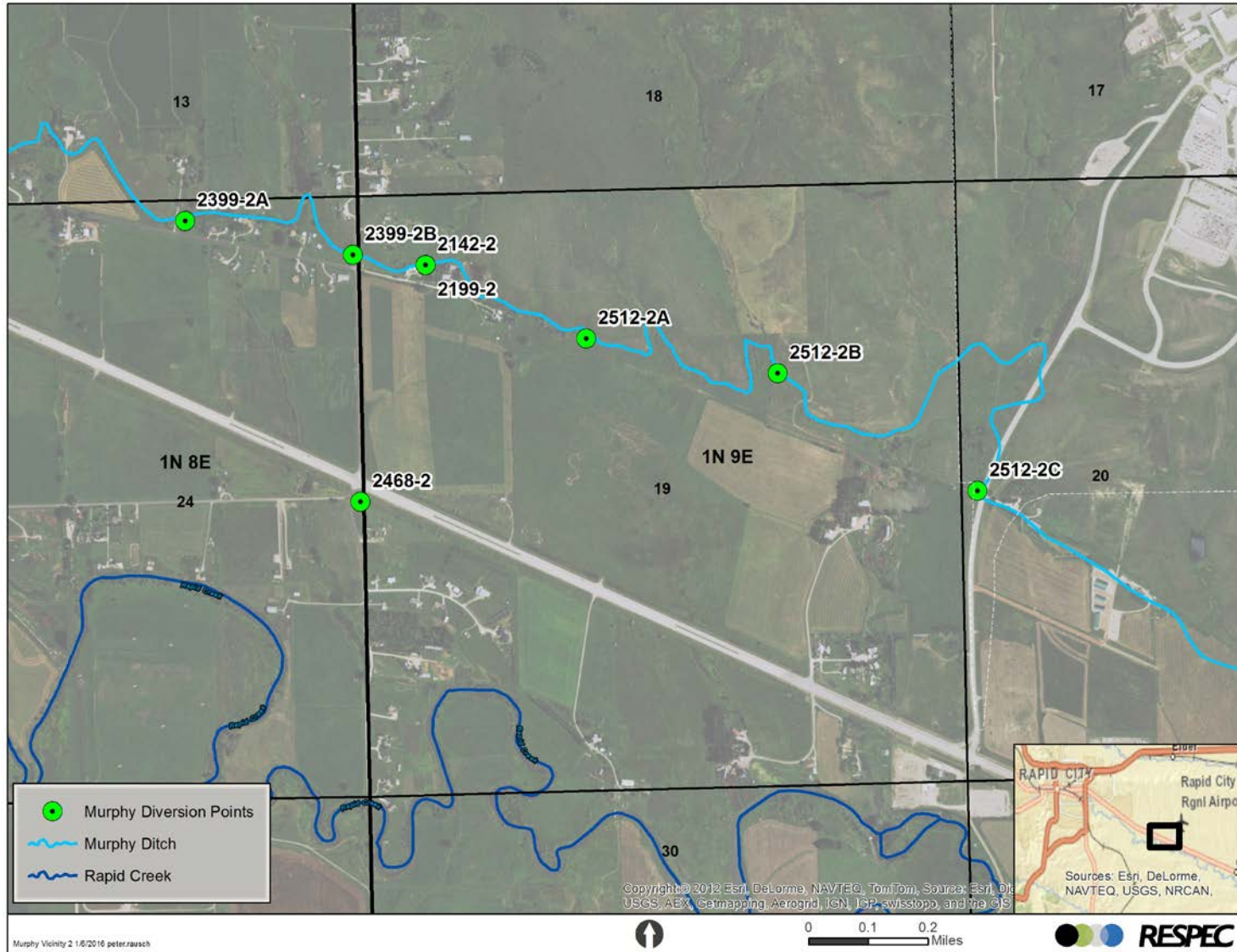


Figure A-4. Murphy Ditch Turnout Vicinity Map (2 of 2).

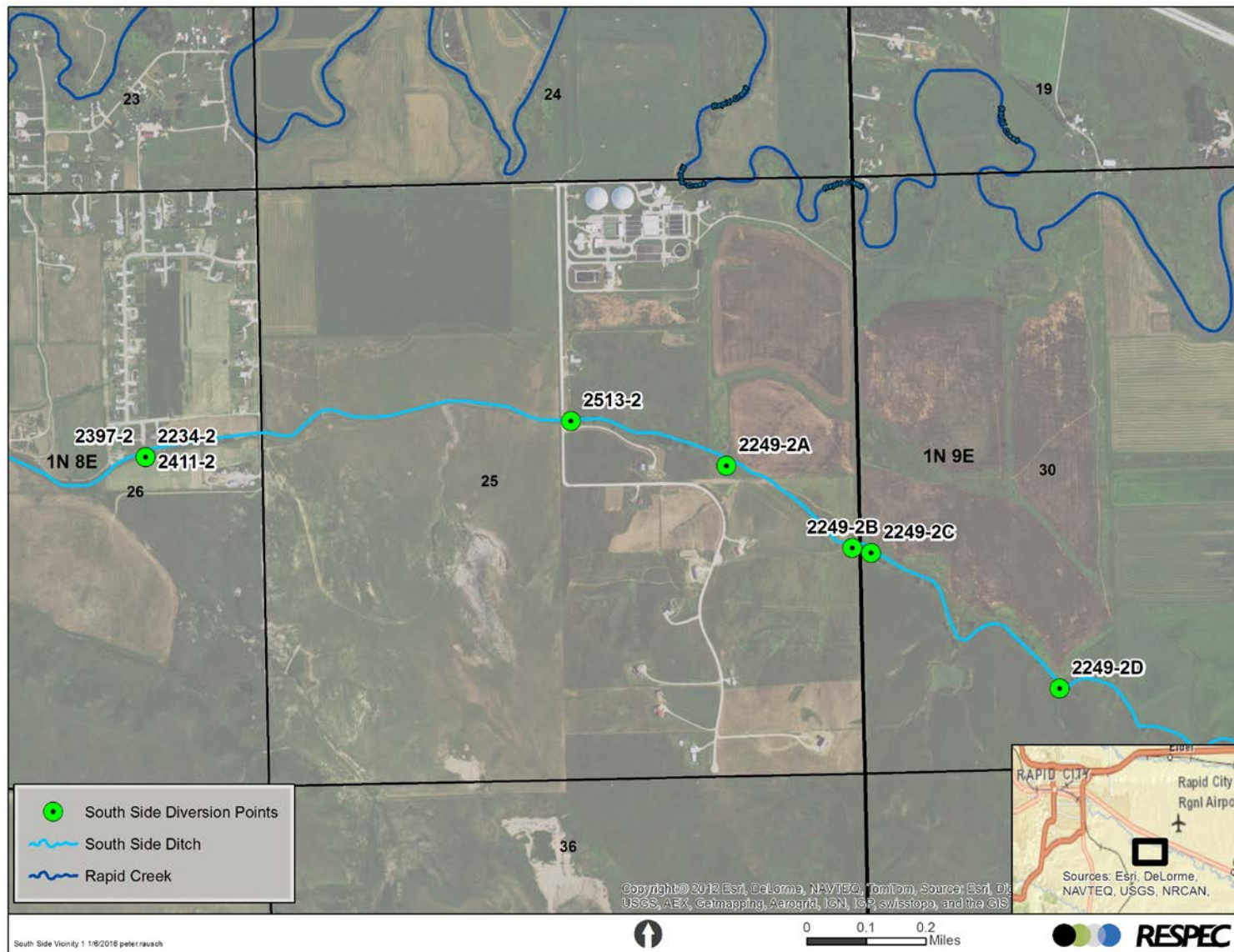


Figure A-5. South Side Ditch Turnout Vicinity Map (1 of 2).

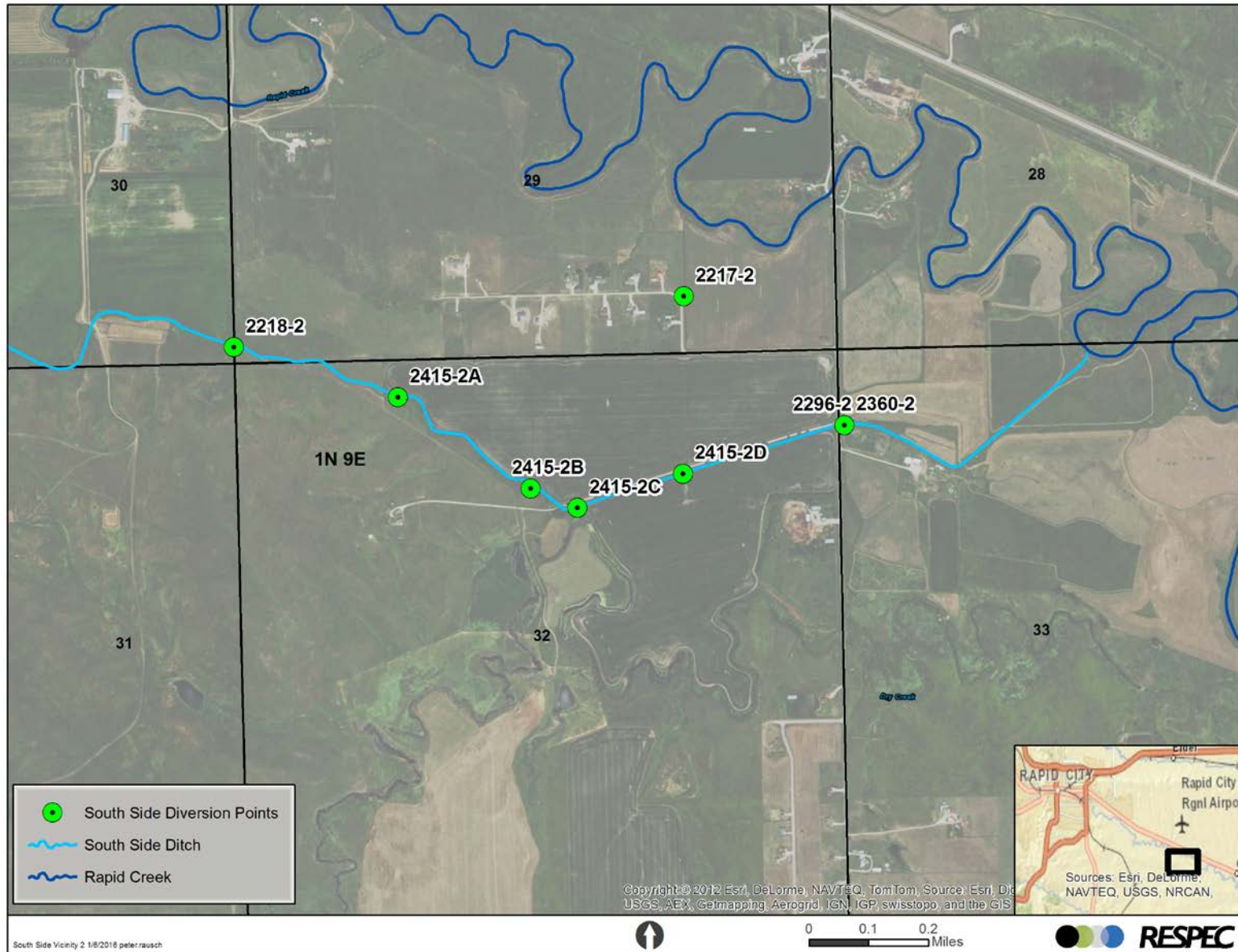


Figure A-6. South Side Ditch Turnout Vicinity Map (2 of 2)