

WATER PERMIT NO. 6211-3

Name of Applicant: Delmar Ortman

Address: 26731 445th Ave, Marion SD 57043 Phone: 605 648-3262

Amount of Water Claimed: 59 AF Total Acres: NA

Source of Water Supply: runoff

Water to be used for: fish & wildlife propagation and livestock water County: McCook

Type of Waste Disposal System:

Location: miles north of Marion

PRIORITY Date Received: 5-31-2000 Fee: \$150

Corrected Application Received:: Period of Annual Use: January 1 – December 31

Remarks:

Diversion Point: SW ¼ NE ¼ Sec 33-
T101N-R54W

Water Impounded: NE ¼ Sec 33-T101N-R54W

Depth of Well: NA

Well Driller: :

Remarks:

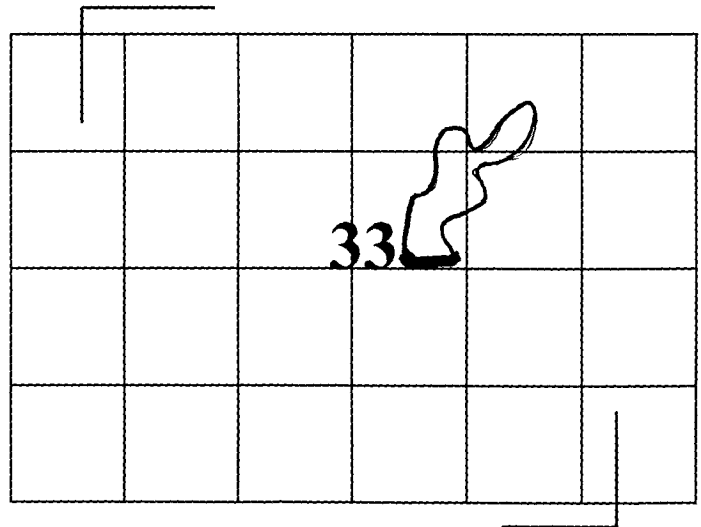
Type of Map: topo

Prepared by: Steven Quinsell

Reviewed and the Number Assigned on: 5-31-2000

By: **Karen Schlaak**

Notice of Hearing - date to intervene: _____



**SOUTH DAKOTA
WATER PERMIT NO. 6211-3**

Date of first receipt of application May 31, 2000.

The Water Management Board approved Water Permit Application No. 6211-3 on March 7, 2001 for Delmar Ortman, 26731 445th Ave, Marion SD 57043 authorizing the construction of the dam and the placing of water to beneficial use subject to the following limitations, conditions and qualifications:

1. Water Permit No. 6211-3 authorizes impoundment of 59 acre-feet of water from runoff by constructing a dam located in the SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 33 with water impounded in portions of the NE $\frac{1}{4}$ Section 33; all in T101N-R54W.
2. The water appropriated shall be used for the purpose of supplying water for fish and wildlife propagation and livestock watering and may not exceed the amount of water needed for beneficial use.
3. The water is to be used during the following described annual period: January 1 – December 31.
4. The date from which applicant may claim right is May 31, 2000.
5. One-fifth of the construction is to be completed on or before September 7, 2003.
6. All construction is to be completed on or before March 7, 2006.
7. Water is to be put to beneficial use on or before March 7, 2010.
8. Water rights obtained in compliance with the laws of the State of South Dakota may not be unlawfully impaired by this appropriation.

QUALIFICATIONS

1. Water Permit No. 6211-3 authorizes a dam with a storage capacity of 59 acre-feet of water and sufficient water annually to maintain the water level to the outlet elevation.
2. Low flows as needed for downstream domestic use, including livestock water and prior water rights must be by-passed.

WATER MANAGEMENT BOARD

By: Garland Erbele
Garland Erbele, Chief Engineer
Water Rights Program
Department of Environment and Natural Resources

MAY 09 2001
date





Mail to: Water Rights Program Joe Foss Building 523 E. Capitol Pierre, SD 57501-3181 (605) 773-3352	No. <u>6211-3</u>	(office use only) Hydrologic Unit <u>10170102</u>
	Basin <u>Vermillion River</u>	
	Newspaper <u>Salem Special, Salem, SD</u>	

Application For Permit To Appropriate Water Within The State Of South Dakota

Check use(s) of water:

☐ Municipal	☐ Suburban Housing	☐ Recreational	☐ Institutional
☐ Rural Water System	☐ Commercial	☒ Fish & Wildlife	☐ Geothermal Heat
☐ Domestic (over 18 gpm)	☐ Industrial	☐ Other	

Type of Application: ☒ New ☐ Vested Right (Use predates Mar 2, 1955) ☐ Future Use Reservation
(check one) ☐ Place to Beneficial Use Water Reserved by Future Use Permit No. _____
☐ Amendment/Correction to Permit No. _____

Description of amendment/correction: (i.e. change diversion point(s), add diversion point(s), change use, etc.) _____

- Name of Applicant Delmar Ortman Phone 605-648-3262
(check one) ☒ Owner ☐ Tenant/lessee
Mailing Address 26731 445th Ave., Marion State SD 57043
(Street, RR. or Box) (Zip Code)
- Amount of water claimed *CFS or **GPM 59-58.9 ***AF
(*Cubic Feet per Second) (**Gallons per Minute) (***)Acre Feet - storage capacity of dam/dugout or annual use if applicable)
- Source of water supply Natural Waterway (run off)
- Location of point of diversion (example - 3 wells in SW1/4 NE1/4 section 12-T104N-R53W)
SW1/4 NE1/4 of Section 33, T. 101 N., R. 54 W., 5th P.M. Water Impounded: _____
1/4 Sec 33 - T101N - R54W County McCook
- County or counties where water will be used McCook
- Annual period during which water is to be used Jan. 1 thru Dec. 31
- Give a description of the 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 U.S. Fish and Wildlife Service has a 30 yr. Wildlife Extension Agreement for lands to be inundated. This water is to be used for wildlife and livestock watering. See attached plans.

STATE OF SOUTH DAKOTA)

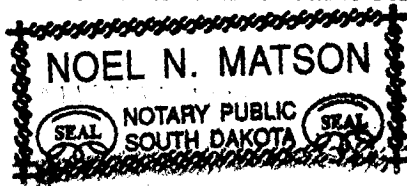
County of _____)

Attachments: Attach Form 2A if diversion is from a well or dugout, or if storage of water is proposed. Attach map and any other technical information. (see instructions)

I, X DELMAR ORTMAN, 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 x Delmar Ortman

Subscribed and sworn to before me this 30th day of May 2000



[Signature]

Notary Public

My Commission expires Feb. 23, 2001

Supplemental Information

(type or print in ink)



1. Well Information - Proposed Construction

- a) Drill Hole Diameter _____ Depth _____
- b) Casing Type _____ Diameter _____ Thickness _____
- c) Screen Type _____ Diameter _____ Thickness _____
- d) Gravel Pack _____ 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. Wastewater Disposal System Information

- a) Type of System (i.e. septic tank, drain field) _____
- b) System Capacity (gallons) _____ Year Constructed _____
- c) Connected to the City of _____ Sanitary System _____

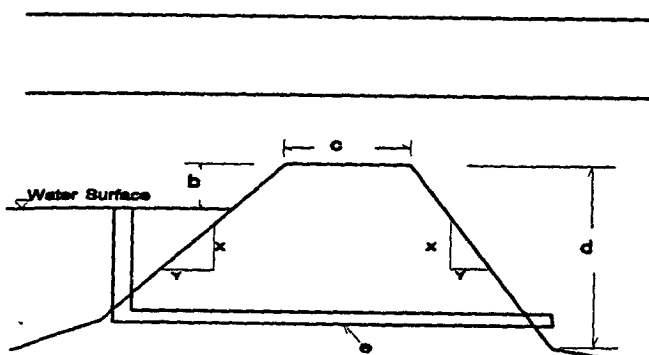
3. Dugout Information

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

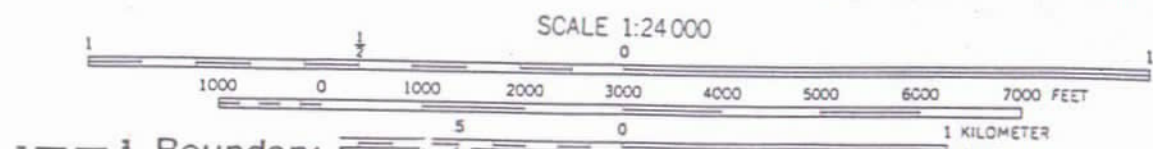
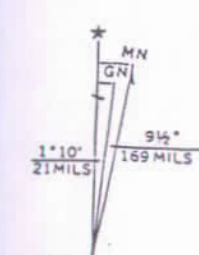
4. Water Storage Dams

If the proposed water use system contains one or more storage dams, please furnish the information requested below for each dam. The locations of the dams need to 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:



- b) Freeboard _____ 7 feet
- c) Crest Width _____ 12 feet
- Crest Length _____ 375 feet
- d) Height _____ 22 feet
- e) Primary Outlet Capacity _____ 423.3 cfs.
- If pipe, diameter _____ 2X36"
- f) Secondary Spillway Capacity _____ 310.6 cfs.
- Spillway Width _____ 150 feet
- g) X & Y Slope _____
- Upstream _____ 3:1
- Downstream _____ 2:1
- h) Surface Area of Impoundment _____ 10 ac.
- i) Storage _____ 58.9 Acre Feet
- j) Drainage Area Above Dam _____ 4,200 Acres



- Boundary
- U = Structure (POD)
- = Pond Area

CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

USFWS
Div. of Water Resources
Lakewood, CO

Filing Map No. 6R-SD-682-WR-P-30

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR WASHINGTON, D.C. 20242
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

6211-3

RECEIPT

Water Rights Program

South Dakota Department of Environment and Natural Resources

N2 416536

Pierre, May 31, 2000

RECEIVED OF Del or Maxine Ortman, 26731 445th Ave., Marion, SD 57043-6407
the following amount in fees for services rendered as provided for by law:

Fee for Application for Permit No. <u>6211-3</u> to Appropriate Water, to construct and to put water to beneficial use _____	150	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. <u>6211-3</u>	50	00
Fee for Filing Transfer Form _____		
Fee for Filing Extension Request _____		
Fee for _____		

(Any Other Work Provided by Law)	Total	200 00

By T. J. Anderson
Chief Engineer

Water Permit Application # 6211-3

Delmar Outman

Top of Dam Elev. - 1443.2
 2nd Spillway Elev. - 1440.2
 P. Spillway Elev. - 1436.2
 D/S Toe Elev. - 1421.2

Cat. 3 - Low Hazard Dam

Height = 22 ft.

Normal Storage Capacity - 59
 Int. Storage Capacity - 100
 Max. Storage Capacity - 145

Int. Capacity x EFR Ht. = $100 \times 20 = 2000 < 3000 \therefore 25 \text{ year}$
Minimum Spillway Design

From USGS WRI 80-80 "Tech. for Est Flood Peaks ... in SD"

DA = 4200 Ac = 6.56
 Slope = 30 ft/mi
 SI = 3.33

$$Q_{15} = 83.4 A^{.65} S^{.46} S_i^{-.67}$$

$$= 83.4 (6.56)^{.65} (30)^{.46} (3.33)^{-.67}$$

$$= 83.4 (3.09) (4.47) (.42)$$

$$= \underline{490 \text{ cfs}}$$

$$Q_{100} = 132 A^{.65} S^{.46} S_i^{-.67}$$

$$= 132 (6.56)^{.65} (30)^{.46} (3.33)^{-.67}$$

$$= 132 (3.39) (4.78) (.45)$$

$$= \underline{962 \text{ cfs}}$$

Secondary Spillway Flow

$$Q = C L H^{3/2} \quad C = 2.6 \quad L = 150 \text{ ft} \quad H = 3 \text{ ft}$$

$$= 2.6 (150) (3)^{1.5}$$

$$= \underline{2025 \text{ cfs}}$$

Section 74:02:08:09

1. Topo Map - OK
2. Dam Axis Profile - OK
3. Dam Max X-Sec. - OK
4. Area Capacity - OK
5. Outlet Details - OK
6. Spillway Rating - OK
7. Spillway Details - OK
8. Specs - STD NRCS - OK
9. EPP - N/A Cat. 3 - OK

NRCS Annual Yield

DA = 4200 Ac, CN = 76, ISO = 3

$$80\% = 0.27$$

$$0.27 \times 4200/12 = \underline{96 \text{ Ac} \cdot \text{Ft.}}$$

$$50\% \text{ chance} = 0.66$$

$$0.66 \times 4200/12 = \underline{231 \text{ Ac} \cdot \text{Ft.}}$$

$$10\% \text{ chance} = 2.8$$

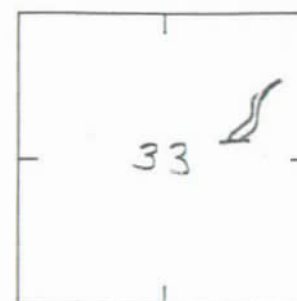
$$2.8 \times 4200/12 = \underline{980 \text{ Ac} \cdot \text{Ft.}}$$

DRAINAGE AREA	ANNUAL YIELD	PEAK RUNOFF	EMERG. SPVY.	WATER DEPTH	SURFACE AREA	SEDIMENT STORAGE	STORAGE		
							e P.S.	e E.S.	e TOP OF DAM
ACRES	AC.FT.	25 YR. CFS.	50 YR. CFS.	e P.S. FT.	e P.S. ACRES	AC.FT.	AC.FT.	AC.FT.	
4,200	95.6	626	495	12.3	10.0	25.5	58.9	100.3	144.9

1. S.D. LAW STATES: "NO EXCAVATOR MAY BEGIN ANY EXCAVATION WITHOUT FIRST NOTIFYING THE ONE-CALL NOTIFICATION CENTER AT THE NUMBER 1-800-781-7474 OR FAX 612-454-0170".
2. LANDOWNER IS RESPONSIBLE FOR COMPLYING WITH ALL FEDERAL, STATE, AND LOCAL LAWS.
3. THIS IS A CLASS 'A' HAZARD STRUCTURE AS DEFINED BY NRCS.

4. THIS PROJECT IS X IS NOT —
CLASSIFIED AS A "DAM" BY S.D. LAW.
S.D. "DAM" DEFINITION: > EITHER
25' HIGH (TOP TO D.S. TOE). OR
50 AC.FT. STORAGE TO TOP OF DAM.
EXCEPT NOT A "DAM" IF:
< 6' HIGH OR STORAGE < 15 AC.FT.

5. IF CULTURAL RESOURCES ARE DISCOVERED,
DISCONTINUE CONSTRUCTION AND NOTIFY
THE LOCAL NRCS OFFICE.

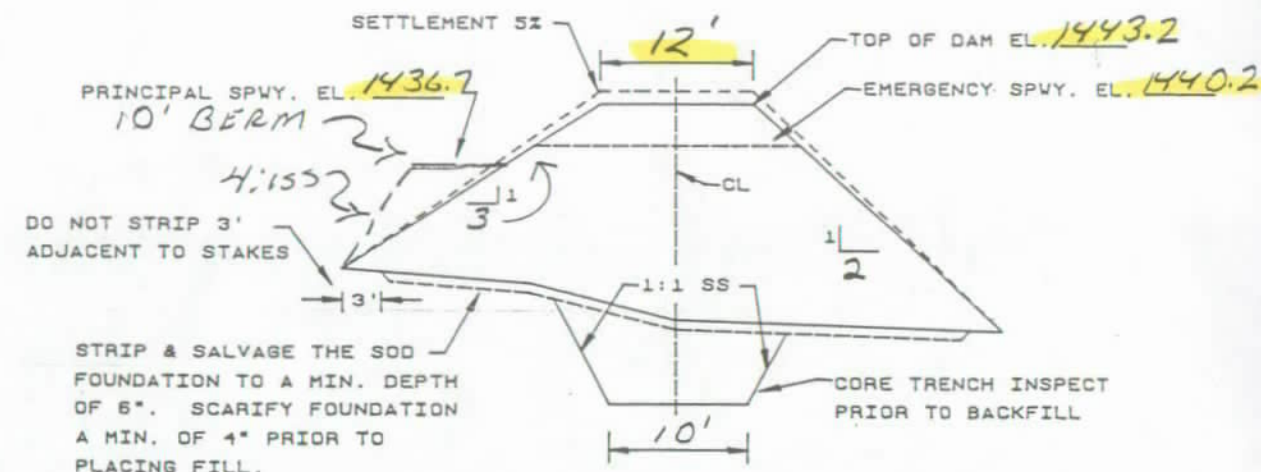


NP 4 SEC. 33 T 101 R 54
LOCATION MAP

[illegible]

NOTE: ABOVE QUANTITIES MAY BE ESTIMATED.

- 6.) Ground where earth fill is to be placed shall be stripped and then scarified to a depth of 6 inches. Salvage and spread topsoil.
- 7.) Seed above HWL., the top and backslope of dam, the E. S., all dikes, and all disturbed areas designated by the engineer. Seeding is to be performed by owner.
- 8.) According to NEM. 210-520.21 this is a class A hazard structure located in a rural agriculture area. This structure is to be maintained in accordance with Operation and Maintenance Guidelines.
- 9.) **Concrete cradle** is 1,600-2,000 psi concrete, and 8 inches thick minimum. The concrete cradle shall be installed along the entire length from the sand anti-seep collar to the riser and thus the difficult compaction under the pipe is eliminated. Place concrete around the CMP to CPE joint at 4 ft. DS of riser.
- 10.) The core trench shall be inspected and approved by the authorized personnel prior to backfill. Excavate core trench 6 to 12 inches into impermeable material. Minimum core trench depth is 2 ft. after stripping. Construct the full depth (i.e. min. 2 ft.) of the core trench to P.S. elevation.
- 11.) Place angular rock (4.4 cy.) around the pipe support to protect it from erosive water turbulence. The rock (approx. 3.3 cy.) surrounding the P.S. riser may be fieldstone.
- 12.) Construct a local berm at PS. Outlet. Berm to have a 10 ft. wide top, 2:1 ss and 1:1 ES, with 2 ft. of cover over pipe.
- 13.) Cut the top of the 48" dia. CMP 12" on the downstream end of the pipe. **Insert 36" dia. CPE inside the 48" CMP.** Use a 1/4" dia. rod w/lug and tighten over the cpe pipe. Place 'O-ring' or butyl-rubber between the two pipes prior to tightening the 48" pipe. File cut on CMP smooth if jagged. The CPE shall be 12" downstream of the riser while inside the 48" CMP. The CPE pipe shall extend 1 foot downstream of the CPM at the outlet of the P.S..
- 14.) CPE shall be smooth inside and corrugated on the outside with $n = 0.01$. Joints shall be 'o-ring' gasketed. Place male end DS.



TYPICAL CROSS SECTION OF DAM

SD - 4 STRIPPING
SD - 5 EXCAVATION
SD - 7S EARTH FILL CLASS "S"
SD - 10 SALVAGING & SPREADING TOPSOIL
SD - 15, 50 C.M.P.
SD - 16 TIMBER FAB. & INSTALLATION
SD - 17 METAL FAB. & INSTALLATION
SD - 28 SEEDING

SD-125 CONCRETE FORMWORK STR
RC 15 HOPE PIPE CONDUITS
SD-50 STEEL CORRUGATED PIPE

DELMAR ORTMAN MCCOOKS
MULTI-PURPOSE DAM S.D.
SWY. NEY. S 33. T 101. R 54

U. S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

Date 5-75 Designed CINDY STELLS PETE ANDERSON Drawn 3-02 Checked 4/4/2000	Approved Title 4. Edmundo Sheet 1 Drawing No. fn: 101
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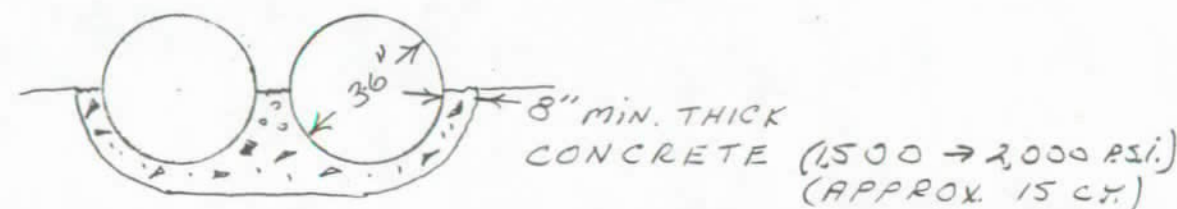
SEE SHEET #2

PLAN VIEW OF DAM & POOL AREA
approximate scale 1" = ____ ft.

JOB PLAN 1A

6211-3

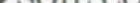
50 40 30 20 10 0 10 20 30 40 50 60



CONCRETE CRADLE DETAIL
SCALE 1"=4'

TABLE OF QUANTITIES FOR P.S..			AS-BUILT
ITEM	QUAN.	UNIT	
36" C.P.E. PIPE (R=0.01)	160	LIN. FT.	
60" C.M.P. RISER @ 10' LONG W/4' OF 48" DIA. C.M.P. @ 92°	2	EACH	
RISER BASE (12 1/2' x 7' x 1' CONCRETE	1	EACH	
TRASH RACK @ 3.2 C.Y.)	2	EACH	
PIPE SUPPORT	1	EACH	
ROCK RIPRAP (3.3 CU. YD @ RISER & 4.4 C.Y. @ PIPE SUPPORT)	7.7	CU YD.	
-ANTI-SEEP COLLAR (@ 9.1 C.Y.)	1	EACH	
CONCRETE CRADLE (15 C.Y. 1500 #2000	1	EACH	

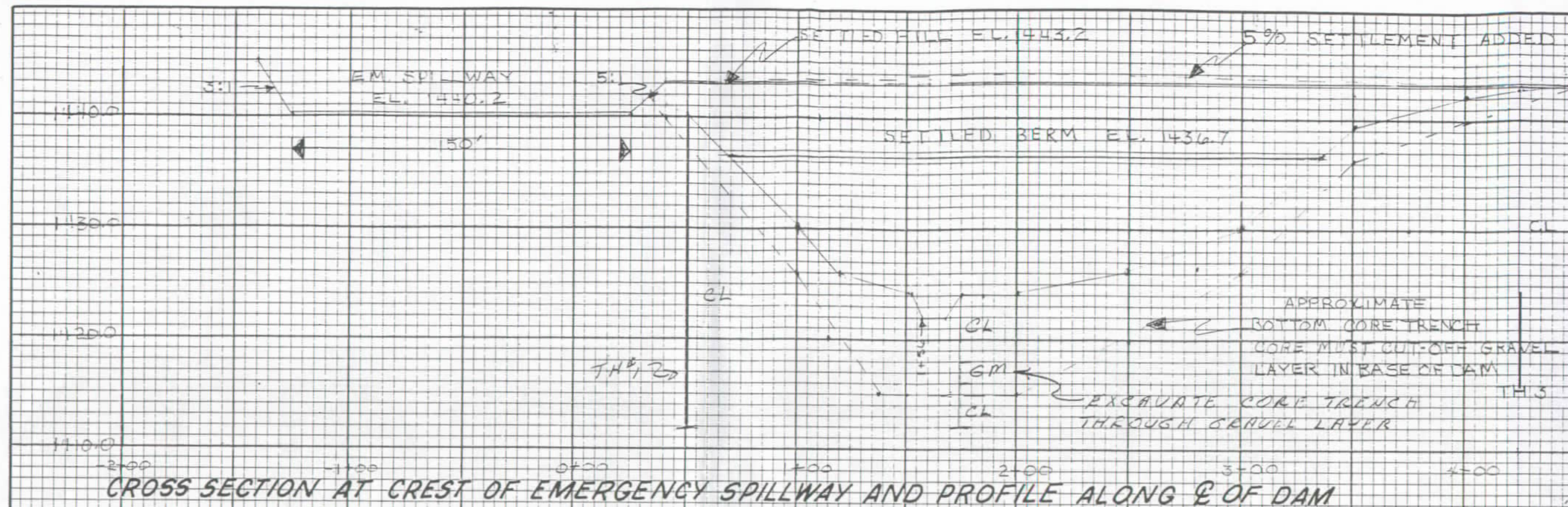
DELMAR JRTMAN
MULTI-PURPOSE DAM
MCCOOK CO. SD.



U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Date		Approved by.	
Designed <u>PEA 4-13-00</u>		Title _____	
Drawn <u>PEA 4-13-00</u>		Title _____	
Traced _____		Sheet	Drawing No.
Checked _____		No <u>3</u>	<u>0</u>



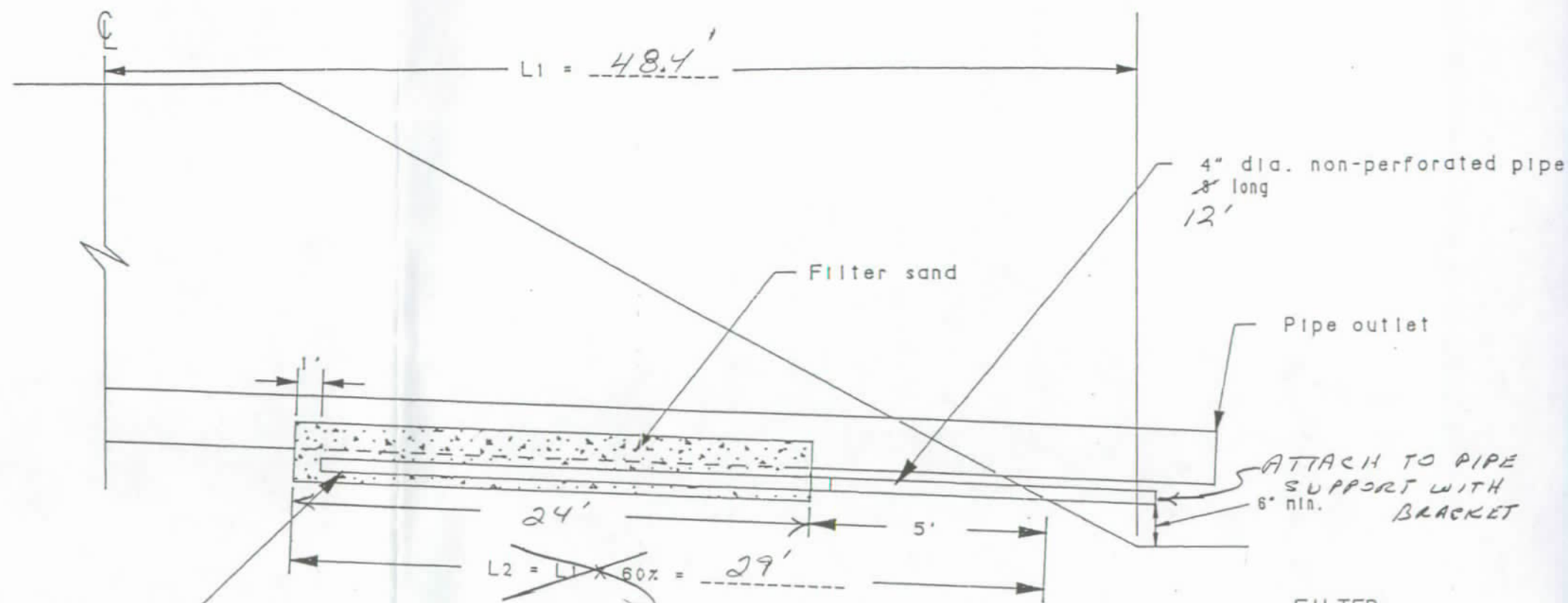


SEDIMENT YIELD SHEET 4 OF 8

ERODIBILITY AREA ACRES	GROSS RATE A.F./AC./YR.	DRAINAGE AREA ACRES	DELIVERY RATE %	DESIGN PERIOD YEARS	REQ'D. SEDIMENT VOLUME AC.FT.
H	.0028	2.00	14	25	25.5

(Rev. 4-73) 5, N-29, 073.1a (2)





SIDE VIEW

FILTER GRADATION

SIEVE SIZE	PERCENT PASSING
3/8"	100
4	95-100
8	80-100
16	50-85
30	25-60
50	10-30
100	2-10

SAND VOL:

$$8'-8" \times 2' = 17.34 \text{ ft}^2/\text{ft}$$

$$-\frac{\pi R^2 \times 2}{2} = 7.07$$

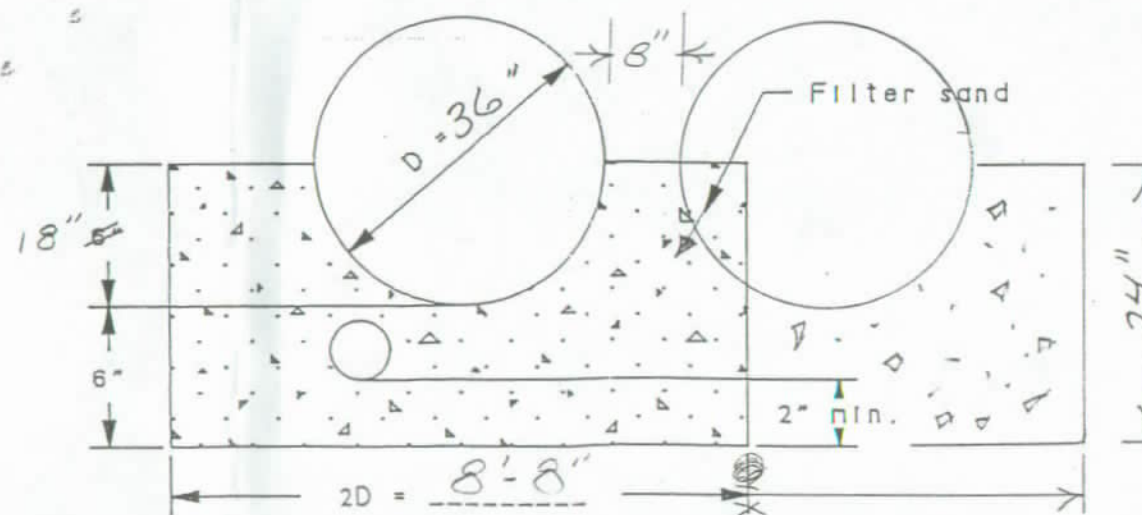
$$\text{AREA} = 17.34 - 7.07 = 10.27 \text{ ft}^2/\text{ft}$$

$$\text{Vol.} = 10.27 \text{ ft}^2/\text{ft} \times 24' \text{ long} \div 27$$

$$= 9.1 \text{ cu. yd.}$$

NOTE:

1. THE 4" DIA. PIPE SHALL BE SDR 35 PVC, OR STRONGER
2. PROVIDE AN ANIMAL GUARD ON DRAIN OUTLET PIPE. DRILL 2, 1/2" DIA. HOLES, ON E 6" FROM END OF PIPE AND PLACE A 3/8" DIA., 5 1/2" LONG GALVANIZED STEEL BOLT THRU THEM AND SECURE WITH A NUT (PLACE BOLT HORIZONTAL).
3. FILTER SAND WILL BE CLEAN PEA AGGREGATE OR CONCRETE SAND.



UPSTREAM VIEW

SAND ANTISEEP DRAIN

OPERATOR DELMAR ORTMAN

CONSERVATION DISTRICT _____

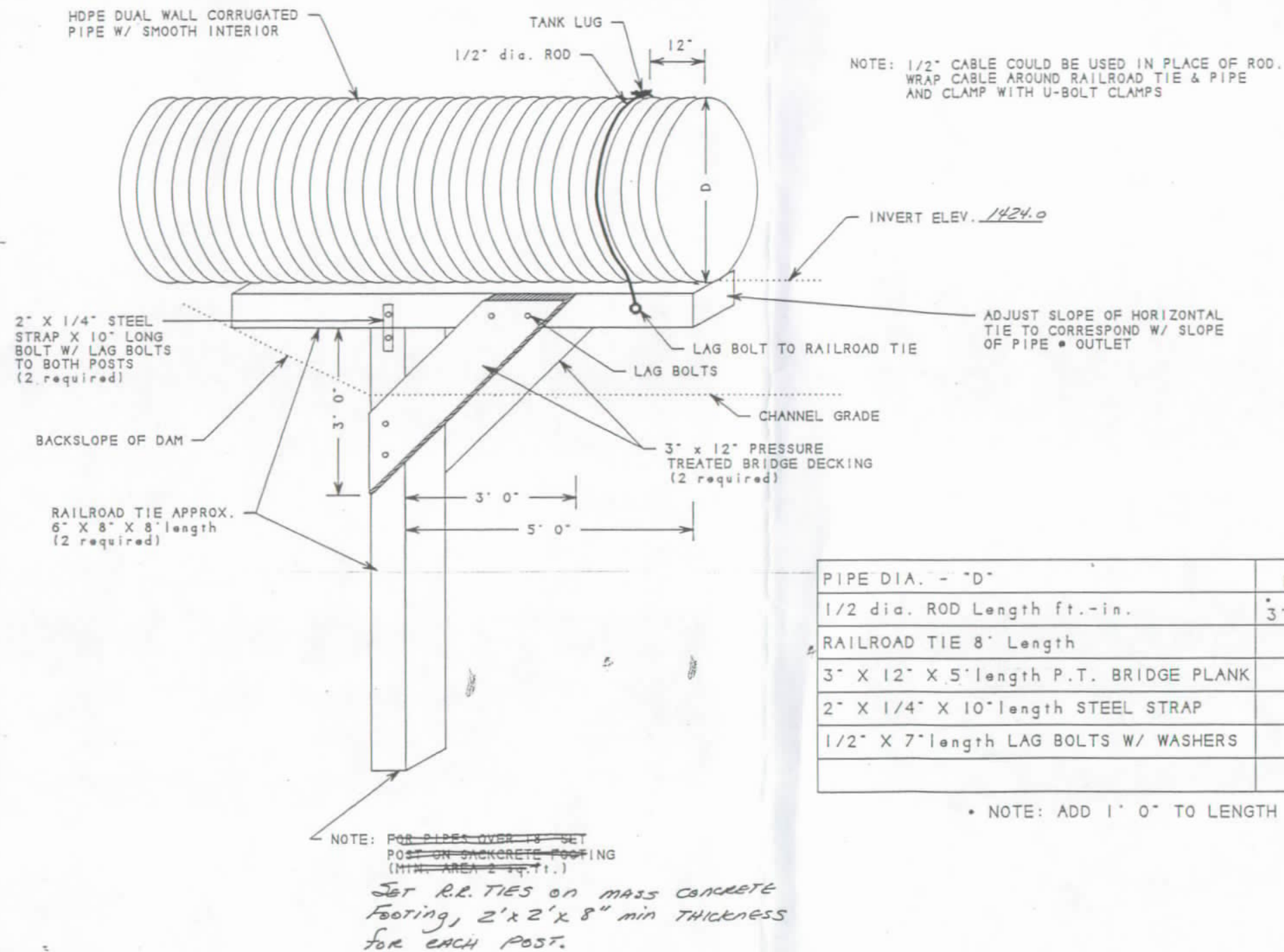
U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

Designed PSA 3-23-03 Date _____ Approved by _____
 Drawn _____ Title _____
 Traced _____ Title _____
 Checked _____ Sheet No. 5 Dwg. No. _____
 of 8

Rev. 3/96

JOB PLAN NO. 3.8-P





PIPE DIA. - "D"	10"	12"	15"	18"	24"	30"	36"
1/2 dia. ROD Length ft.-in.	3' 2"	3' 8"	4' 6"	5' 4"	7' 0"	8' 6"	10' 1"
RAILROAD TIE 8' Length	2 ea.						
3" X 12" X 5' length P.T. BRIDGE PLANK	2 ea.						
2" X 1/4" X 10' length STEEL STRAP	2 ea.						
1/2" X 7' length LAG BOLTS W/ WASHERS	14 ea.						

• NOTE: ADD 1' 0" TO LENGTH IF CABLE IS USED

NOTE: TWO PIPE SUPPORTS REQUIRED.

PIPE SUPPORT FOR HDPE PIPE

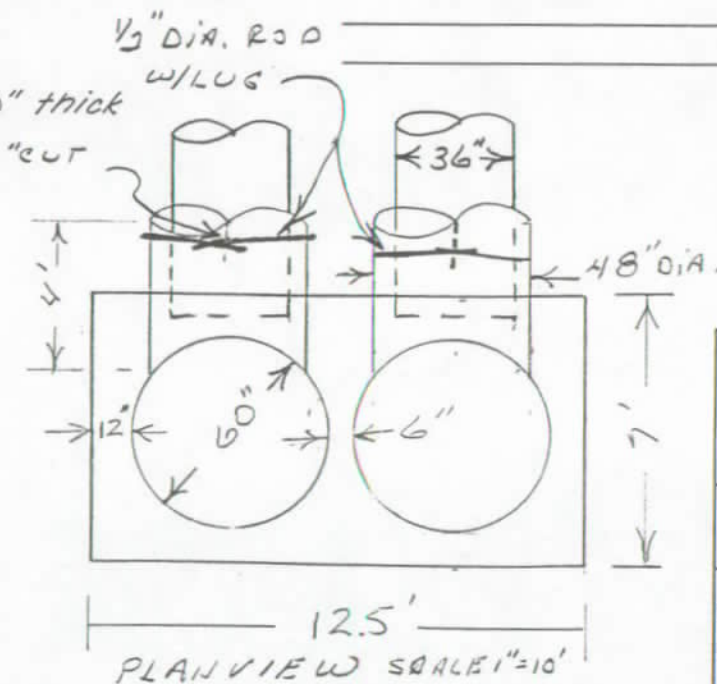
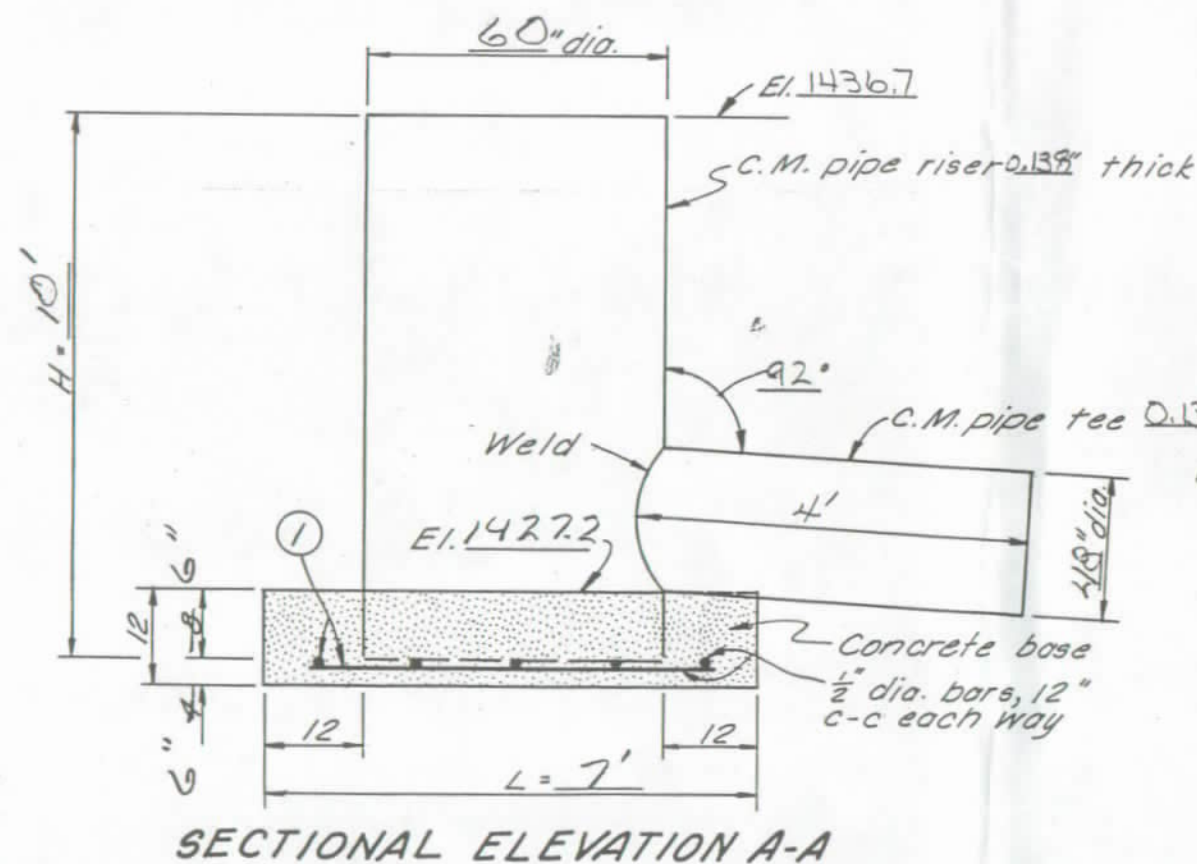
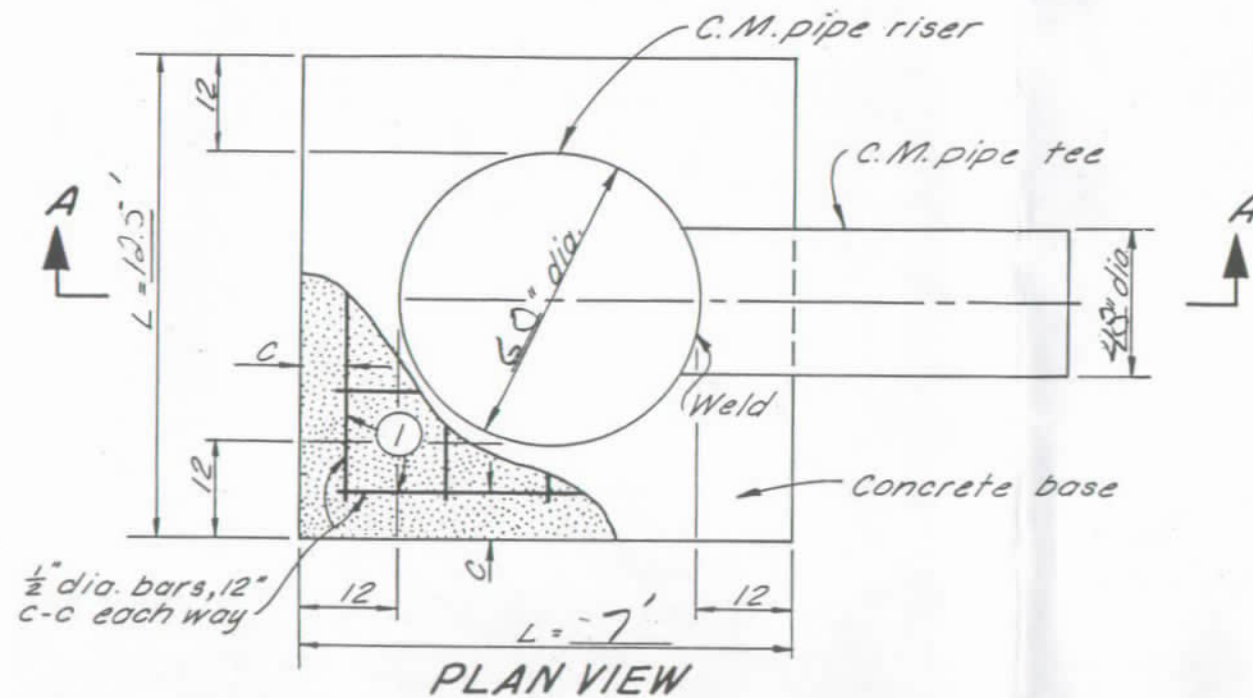
DELMAR ORTMAN

USDA U.S. Department of Agriculture
Natural Resources Conservation Service

DESIGNED BY _____ APPROVED BY _____
DRAFTED BY _____ TITLE _____
DATE _____ SHEET 6 of 8 DWS NO. PPE-SUP.gcd

JOB PLAN NO. 4.4 2/96





STEEL SCHEDULE

RISER DIA. IN.	BAR SIZE	MARK	TYPE	NO. REQ'D.	LENGTH FT.-IN.	TOTAL LENGTH FT.-IN.	TOTAL WT. LB.	C IN.	L FT.-IN.
60	4	I	STR.			180.5'	121	6"	7'12.5'

$$8 @ 12' = 96'$$

$$13 @ 6' - 6" = 84.5'$$

$$180.5'$$

TABLE OF QUANTITIES

ITEM	UNIT	QUANTITY
CONCRETE	CU. YD.	3.2
REINFORCING STEEL	LB.	121

NOTE: SEE SHEET #1 AND SD-SPECIFICATION 15
AND SD-SPECIFICATION 50
PLACE INSIDE EDGE OF RISERS 6" APART.

C.M. PIPE RISER WITH FABRICATED TEE

OPERATOR: DELMAR ORTMAN

CONSERVATION DISTRICT: Mc Cook

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed: D. STEELE Date: 6/95 Approved by: _____
Drawn: _____ Title: _____
Traced: _____ Title: _____
Checked: _____ No. 7 of 8 Drawing No. _____

REFERENCE: GUIDE PLAN NO. 5.3

JOB PLAN NO. 5.3

5, N-29, 073.5-30



FABRICATE TRASHRACK FROM
5/8" DIA. SMOOTH RODS
(SEE NOTE #2)

ANTI-VORTEX PLATE

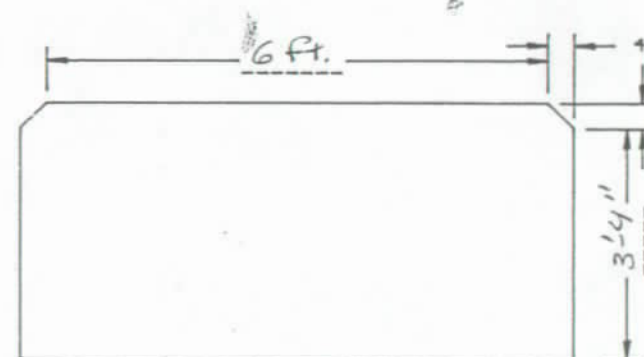
ROCK RIPRAP:
SEE NOTE #5
WHEN SPECIFIED

INSTALLATION STOP RODS:
5/8" ROD 3" LONG
WELD TO VERTICAL ROD
AT TOP OF RISER LOCATION
OPPOSITE (90°) FROM BAFFLE
(2 REQUIRED)

1/2" DIA. LUG RODS
(2 REQUIRED)

TRASH RACK DETAIL

no scale



ANTI-VORTEX BAFFLE DETAIL

no scale

DESIGN & CONSTRUCTION NOTES:

- 1.) TRASH RACK SHALL BE PAINTED INSIDE AND OUT WITH ONE COAT OF ZINC BASE PRIMER AND TWO COATS OF ALKYD ENAMEL FLAT BLACK PAINT. SPOT PAINT ANY AREAS DAMAGED DURING INSTALLATION.
- 2.) ALL RODS SHALL BE GRADE 40 OR GRADE 60 STEEL. RODS ARE 12" ON CENTER FOR THE CIRCULAR PORTION, EXCEPT THE TOP HORIZONTAL CIRCULAR HOOP IS DOUBLED (I.E. THERE ARE TWO CIRCULAR 5/8" DIA. ROD AT TOP OF THE TRASH RACK). TOP (FLAT) PORTION OF THE TRASH RACK IS 5/8" STEEL RODS SPACED 8" O.C. WELD ALL RODS BEING CONNECTED.
- 3.) THE TRASH RACK MAY BE ASSEMBLED BY ONE OF THE FOLLOWING METHODS:
a.) CUT HOLE IN ANTI-VORTEX PLATE AND THREAD 5/8" DIA. ROD THROUGH THE OPENING, OR b.) ASSEMBLING TWO SYMMETRICAL HALVES AND INSERTING THE ANTI-VORTEX PLATE AND THEN WELDING THE THREE PIECES TOGETHER. WHEN USING METHOD 'b', STIFFEN THE HORIZONTAL HOOPS BY WELDING AN ADDITIONAL 5/8" DIA. x 3'-6" ROD ADJACENT TO THE ANTI-VORTEX PLATE, OR c.) FORMING ANI-VORTEX BAFFLE FROM THREE SECTIONS AND SOLIDLY ATTACHING TOGETHER BY BRACKETS AND BOLTS OR CONTINUOUS WELDING. THE TRASH RACK AND BAFFLE SHALL BE ONE CONTINUOUS SOLID UNIT.
- 4.) ANTI-VORTEX BAFFLE SHALL BE INSTALLED PERPENDICULAR TO CL OF DAM.
- 5.) PLACE ROCK RIPRAP AROUND RISER. ROCK SHALL BE 2 FT. WIDE AND 1 FT. THICK. ROCK SHALL BE WELL GRADED WITH 50% OF ROCK > 75 LB. AND 10% < 10 LBS.

TABLE OF QUANTITIES

ITEM - QUANTITY - UNIT

- 1.) ANTI-VORTEX STEEL PLATE - 6' x 3'-4" - EACH
- 2.) 5/8" DIA. STEEL ROD - 143 - LIN.FT.
- 3.) 1/2" DIA. ROD W/ LUGS @ 6 ft LONG - 2 - EACH
- 4.) ROCK RIPRAP - 1.6 - CU.YD.

NOTE: THERE ARE 2 RISERS SO ABOVE QUANTITIES ARE DOUBLED.



fn: conitras

Approved by:

Title:

Design: 4/22/00
Drawn: 4/22/00
Checked: 4/22/00

Designed: Pete Anderson
Drawn: PETE ANDERSON
Checked:

STEEL CONICAL TRASH RACK AND BAFFLE
NE 4 SEC 33, T 101 N, R 54 W McCOOK CO. SD
NATURAL RESOURCES CONG. SVC. U. S. DEP. OF AGRICULTURE

Sheet 8 of 8
LEVEL 2 14 18

Final Run 7/25/2000
 Using (2) 36" PE pipes
 1st run @ 5 yr. storm

1*****

 SITES XEQ 04/25/2000 WATER RESOURCE SITE ANALYSIS COMPUTER PROGRAM
 VER 96.1 (USER MANUAL - DATED MAY 1996) E.S.
 TIME 15:17:36

***** 80-80 LIST OF INPUT DATA *****

SITES 03/01/1996 Del Ortman - 378 COMPLETE DESIGN W/CU YD
 STRUCTURE

22	0
25.7	1.85
29.7	10.85
33.7	31.85
37.7	67.85
41.7	119.85
43.2	142.0
47.0	215.0

ENDTABLE						
WSDATA	2A101	AC 74	54R	4200	14.0	254R.
PDIRECT		3.40			4.6	5.2
POOLDATA	ELEV	36.7		36.7		
PSDATA	2	84		36.25		
PSINLET	ELEV	1		15.7	60" risers	.010
ASCREST	ELEV			40.2		25.50
ASDATA	1	145		.04	3	.04
BTMWIDTH	FEET	100		125	150	10
CLPROFILE		-0.5		CL Profile of Original Ground		
	0	43.2		50	40.9	100
	120	26.1		152	24.1	156
	164	22		167	24	250
	300	30.2		331	36.2	350
	400	42		450	43.1	38.7

ENDTABLE				
TEMPLATE	12	3.5	2.5	12
CROWN	0			
MINDEPTH	1.0	3.0	1.0	2.0

PSFULL
 *
 *5yr PS TYPE I STORM
 *TIME OF CONCENTRATION ADJUSTED FROM CALCULATED VALUE OF 10.7 HRS
 *TO1 4 HRS. TO ACCOUNT FOR THE LARGE PERCENTAGE OF POTHOLE AREAS

IN
 *DRAI NAGE AREA AND TO BETTER APPROXIMATE THE USGS CALCULATED PEAK
 *BUT STILL PRESERVE THE HYDROGRAPH VOLUME.

*
 *ESH YDROGRAH - 25 YR TYPE II STORM
 *FREE BOARD HYDROGRAPH - 50 YR TYPE II STORM (DENR SAFTY OF DAMS
 REQD)

*(2) 36" PE BARRELS, WITH 60" CMP RISERS, 84FT LONG

GO, DESIGN NEL TYPE2 24 TYPE1378 24
 ENDJOB



***** MESSAGE - ALTERNATE STRUCTURE ID (S 1) BEING USED
SINCE USER DID NOT INPUT AN ID.

***** MESSAGE - DRAINAGE AREA FROM WSDATA CONTROL BEING CONVERTED FROM
ACRES TO SQUARE MILES FOR COMPUTATION PURPOSES.

1SITES XEQ 04/25/2000 ----- COMMENT PAGE -----

VER 96.1 Del Ortman - 378 COMPLETE DESIGN W/CU Y WSID =
DELORISE

***** WARNING - CONTROL WORD INVALID - FOLLOWING DATA RECORD IGNORED:

*5yr PS TYPE I STORM

***** WARNING - CONTROL WORD INVALID - FOLLOWING DATA RECORD IGNORED:

*TIME OF CONCENTRATION ADJUSTED FROM CALCULATED VALUE OF 10.7
HRS

***** WARNING - CONTROL WORD INVALID - FOLLOWING DATA RECORD IGNORED:

*TO1 4 HRS. TO ACCOUNT FOR THE LARGE PERCENTAGE OF POTHOLE
AREAS

***** WARNING - CONTROL WORD INVALID - FOLLOWING DATA RECORD IGNORED:

*DRAI NAGE AREA AND TO BETTER APPROXIMATE THE USGS CALCULATED
PEAK

***** WARNING - CONTROL WORD INVALID - FOLLOWING DATA RECORD IGNORED:

*BUT STILL PRESERVE THE HYDROGRAPH VOLUME.

1SITES XEQ 04/25/2000 ----- COMMENT PAGE -----

VER 96.1 Del Ortman - 378 COMPLETE DESIGN W/CU Y WSID =
DELORISE

***** WARNING - CONTROL WORD INVALID - FOLLOWING DATA RECORD IGNORED:

*ESH HYDROGRAPH - 25 YR TYPE II STORM

***** WARNING - CONTROL WORD INVALID - FOLLOWING DATA RECORD IGNORED:

*FREE BOARD HYDROGRAPH - 50 YR TYPE II STORM (DENR SAFTY OF
DAMS

***** WARNING - CONTROL WORD INVALID - FOLLOWING DATA RECORD IGNORED:

*(2) 36" PE BARRELS, WITH 60" CMP RISERS, 84FT LONG

1SITES XEQ 04/25/2000 ----- COMMENT PAGE -----

VER 96.1 Del Ortman - 378 COMPLETE DESIGN W/CU Y WSID =
DELORISE

1SITES -----

XEQ 04/25/2000 Del Ortman - 378 COMPLETE DESIGN W/CU Y WSID=
DELORISE
VER 96.1 SUBW=
01
TIME 15:17:36 SITE = S 1 PASS= 1 PART=
1

***** BASIC DATA

HUMID- SUBHUMID CLIMATE AREA DESIGN CLASS A1 = LT
3000.

STORM DISTRIBUTION-PSH 24 HOUR TYPE I RAINFALL DISTRIBUTION

STORM DISTRIBUTION AUX. -24 HOUR TYPE II RAINFALL DISTRIBUTION

PRECIP. - P-PS,1-DAY	P-PS,10-DAY	P-SD	P-FB
3.40	.00	4.60	5.20
WSDATA - CN	DA-SM	TC/L	-/H
QRF			
74.00	6.56	14.00	.00
.00			
SITEDATA- PERM POOL	CREST PS	FP SED	VALLEY FL
378?			
36.70	36.70	.00	.00
YES			

BASEFLOW	INITIAL EL	EXTRA VOL	SITE TYPE
.00	.00	.00	DESIGN
PSDATA - NO. COND	COND L	DIA/W	-/H
2.00	84.00	36.25	.00
PS N	KE	WEIR L	TW EL
.010	1.00	15.70	25.50

2ND STG	ORF H	ORF L	START AUX.
.00	.00	.00	.00
ASCRESTS - AUX.1	AUX.2	AUX.3	AUX.4
AUX.5	.00	40.20	.00
.00			
AUX.DATA - REF.NO.	RETARD. Ci	TIE STATION	INLET LENGTH
1	.00	.00	145
AUX.DATA - INLET N	SIDE SLOPE	EXIT N	EXIT SLOPE
ACTUAL AUX?	.040	3.00	.040
NO			.100
BTM WIDTH - BW1	BW2	BW3	BW4
BW5			
ft	100.00	125.00	150.00
.00			.00

AUXILIARY SPILLWAY RATING DEVELOPED USING WSPVRT.

1SITES -----

XEQ 04/25/2000 Del Ortman - 378 COMPLETE DESIGN W/CU Y WSID=
 DELORISE
 VER 96.1 SUBW=
 01
 TIME 15:17:36 SITE = S 1 PASS= 1 PART=
 2

PERM POOL	36.70 FT	58.8 ACFT	.00 AC	.0 CFS
CREST PS	36.70 FT	58.8 ACFT	.00 AC	.0 CFS
SED ACCUM	36.70 FT	58.8 ACFT	.00 AC	.0 CFS
START ELEV	36.70 FT	58.8 ACFT	.00 AC	.0 CFS

NRCS-PSH	D= 24.00 HR	P= 3.40 IN	Q= 1.17 IN	DA=
6.56 SM				
	TC= 14.00 HR	CN= 74.00	VOL= 410.0 ACFT	

PEAK = 296.0 CFS, AT 21.8 HRS.

ROUTED RESULT - HYD TYPE	EMAX	VOL-MAX	AMAX
QMAX			
NRCS-PSH	40.01 FT	97.9 ACFT	.00 AC
285.2 CFS			

*E.S. CREST @ 54K STORM
 IF E.S. CREST SET @ 40.2 -
 See LATER RUN*

PS STORAGE 39.0 ACFT, BETWEEN AUX. CREST AND SED. ACCUM ELEVATIONS.

DRAWDOWN (DDT) TEST	36.70 FT	58.8 ACFT	.00 CFS
CONTROL IS .000 DETENTION STORAGE			

TIME = 1.90 DAYS, TO .0 CFS (LIMIT = 10.00 DAYS)

RATING TABLE DEVELOPED, SITE = S 1:
BY PROGRAM FOR PS AND AUX. SPILLWAYS
AUX. RATING USED WSPVRT METHOD.

RATING TABLE NUMBER 1

	ELEV. FEET	Q-TOTAL CFS	Q-PS CFS	Q-AUX. CFS	VOLUME AC-FT	AREA ACRE
1	36.70	.00	.00	.00	58.85	.00
2	37.51	35.58	35.58	.00	66.15	.00
3	38.32	100.63	100.63	.00	75.95	.00
4	39.13	184.87	184.87	.00	86.50	.00
5	39.95	284.63	284.63	.00	97.05	.00
FULL CONDUIT FLOW, ELEV =						
39.95 FT						
6	40.83	293.24	293.24	.00	108.51	.00
7	41.71	301.55	301.55	.00	119.99	.00
8	42.59	309.65	309.65	.00	133.01	.00
9	43.47	317.53	317.53	.00	147.24	.00
10	44.35	325.23	325.23	.00	164.18	.00
11	45.24	332.75	332.75	.00	181.12	.00
12	46.12	340.10	340.10	.00	198.06	.00
13	47.00	347.30	347.30	.00	215.00	.00

***** MESSAGE - PSFULL CONTROL ENTERED BUT NOT USED IN THE NEXT RATING:
BECAUSE EITHER THE PS OR AUX. SPILLWAY RATINGS ARE
GIVEN,
OR THE AUX. CREST ELEVATION 40.01 IS HIGHER THAN THE
FULL PIPE FLOW ELEVATION 39.95.

1SITES -----

XEQ 04/25/2000 Del Ortman - 378 COMPLETE DESIGN W/CU Y WSID=
DELORISE
VER 96.1 SUBW=
01
TIME 15:17:36 SITE = S 1 PASS= 1 PART=
3

AUX. CREST 40.01 FT 97.9 ACFT .00 AC 285.2 CFS

PS STORAGE 39.0 ACFT, BETWEEN AUX. CREST AND SED. ACCUM
ELEVATIONS.

START ELEV 36.70 FT 58.9 ACFT .00 AC .0 CFS
EFFECTIVE HEIGHT(H)= 19.2 FEET, PRODUCT= 1880. (H * STORAGE AT
CREST AUX.).

INPUT DESIGN CLASS = A1 = LT 3000. PRODUCT.

NRCS-SDH D= 24.00 HR P= 4.60 IN Q= 2.05 IN DA=
6.56 SM
TC= 14.00 HR CN= 74.00 VOL= 717.4 ACFT

PEAK = 625.3 CFS, AT 21.2 HRS.

NRCS-FBH D= 24.00 HR P= 5.20 IN Q= 2.52 IN DA=

6.56 SM TC= 14.00 HR CN= 74.00 VOL= 883.7 ACFT

PEAK = 775.5 CFS, AT 21.2 HRS.

RATING TABLE DEVELOPED, SITE = S 1:
BY PROGRAM FOR PS AND AUX. SPILLWAYS
AUX. RATING USED WSPVRT METHOD.

RATING TABLE NUMBER 2

	ELEV. FEET	Q-TOTAL CFS	Q-PS CFS	Q-AUX. CFS	VOLUME AC-FT	AREA ACRE
1	36.70	.00	.00	.00	58.85	.00
2	37.51	35.58	35.58	.00	66.15	.00
3	38.32	100.63	100.63	.00	75.95	.00
4	39.13	184.87	184.87	.00	86.50	.00
5	39.95	284.63	284.63	.00	97.05	.00
FULL CONDUIT FLOW, ELEV =						
39.95 FT	✓	O.K.				
6	39.95	284.75	284.75	.00	97.15	.00
7	39.96	284.83	284.83	.00	97.25	.00
8	39.97	284.91	284.91	.00	97.35	.00
9	39.98	284.99	284.99	.00	97.45	.00
10	39.99	285.06	285.06	.00	97.56	.00
11	39.99	285.14	285.14	.00	97.66	.00
12	40.00	285.22	285.22	.00	97.76	.00
13	40.01	285.29	285.29	.00	97.86	.00
14	40.36	307.94	288.71	19.23	102.40	.00
15	40.71	355.43	292.09	63.35	106.95	.00
16	41.34	534.21	298.07	236.14	115.13	.00
17	42.11	872.51	305.22	567.29	125.84	.00
18	43.50	1844.19	317.81	1526.38	147.84	.00
19	45.25	3488.90	332.88	3156.02	181.42	.00
20	47.00	5614.32	347.30	5267.02	215.00	.00

ROUTED AUX.	BTM WIDTH FT	MAX ELEV FT	VOL-MAX ACFT	AREA-MAX AC	AUX.-HP FT	VOL- ACFT
NRCS-SDH	100.0	41.56	118.0	.0	1.55	
20.1						

PEAK - CFS Q-PS Q-AUX. Q-TOT.
DISCHARGE = 300.1 323.9 624.0

	CRITICAL DEPTH FT	CRITICAL VELOCITY FT/SEC	CRITICAL SLOPE-Sc FT/FT	25% OF Q Sc FT/FT
AUXILIARY SPILLWAY ---	.68	4.64	.027	.036

AUXILIARY SPILLWAY DURATION FLOW = 14.5 HOURS

***** MESSAGE - NHCP378 CRITERIA USED BUT AUXILIARY SPILLWAY RATING NOT
BASED ON ASFILE RATINGS.

EXIT CHANNEL FLOW SUPERCRITICAL: MAX VELOCITY= 6.9 FT/SEC
 EXIT SLOPE = .100 FT/FT
 FLOW DEPTH = .5 FT

DRAWDOWN USING FREEBOARD STORM FOLLOWS, STARTING AT ELEVATION
 40.01 FT.

DRAWDOWN (DDT) TEST 36.70 FT 58.8 ACFT .00 CFS
 CONTROL IS .000 DETENTION STORAGE

TIME = 1.51 DAYS, TO .0 CFS (LIMIT = 10.00 DAYS)

ROUTED AUX.	BTM WIDTH	MAX ELEV	VOL-MAX	AREA-MAX	AUX.-HP	VOL-
RESULTS	FT	FT	ACFT	AC	FT	ACFT
NRCS-FBH	100.0	41.89	122.7	.0	1.88	
24.8						

PEAK - CFS Q-PS Q-AUX. Q-TOT.
 DISCHARGE = 303.3 469.9 773.2

	CRITICAL DEPTH	CRITICAL VELOCITY	CRITICAL SLOPE-Sc	25% OF Q Sc
AUXILIARY	FT	FT/SEC	FT/FT	FT/FT
SPILLWAY ---	.87	5.24	.025	.033

AUXILIARY SPILLWAY DURATION FLOW = 16.5 HOURS
 ATTACK, OE/B = 3.3 ACFT/FT

***** MESSAGE - NHCP378 CRITERIA USED BUT AUXILIARY SPILLWAY RATING NOT
 BASED ON ASFILE RATINGS.

EXIT CHANNEL FLOW SUPERCRITICAL: MAX VELOCITY= 8.0 FT/SEC
 EXIT SLOPE = .100 FT/FT
 FLOW DEPTH = .6 FT

>>>>> NHCP378 RUN - MINIMUM FLOW IN AUX. SPILLWAY FROM TR60
 USING FORMULA WITHOUT 200 CFS MINIMUM LIMIT (599.
 CFS).

ROUTED AUX.	BTM WIDTH	MAX ELEV	VOL-MAX	AREA-MAX	AUX.-HP	VOL-
RESULTS	FT	FT	ACFT	AC	FT	ACFT
MIN. AUX.	100.0	42.16	126.6	.0	2.15	
28.7						

PEAK - CFS Q-PS Q-AUX. Q-TOT.
 DISCHARGE = 305.7 599.2 904.9

	CRITICAL DEPTH	CRITICAL VELOCITY	CRITICAL SLOPE-Sc	25% OF Q Sc
AUXILIARY	FT	FT/SEC	FT/FT	FT/FT
SPILLWAY ---	1.03	5.66	.023	.032

>>>>> NHCP378 RUN - MINIMUM DEPTH, DESIGN FLOW TO TOP OF DAM; 1.00 FT
 REQUIRED

FOR THIS PASS. NEW TOP OF DAM ELEVATION =
42.89.

ROUTED AUX.	BTM WIDTH	MAX ELEV	VOL-MAX	AREA-MAX	AUX.HP	VOL-
RESULTS	FT	FT	ACFT	AC	FT	ACFT
MINIMUM AUX.	100.0	42.89	138.2	.0	2.94	

40.4

PEAK - CFS	Q-PS	Q-AUX.	Q-TOT.
DISCHARGES =	312.8	1106.5	1419.3

	CRITICAL DEPTH	CRITICAL VELOCITY	CRITICAL SLOPE-Sc	25% OF Q Sc
AUXILIARY	FT	FT/SEC	FT/FT	FT/FT
SPILLWAY ---	1.54	6.88	.021	.028

EMBANKMENT QUANTITIES

VOLUME FILL=	11278. CY,	MAX. HEIGHT =	22.1 FT
TOP WIDTH =	12.0 FT,	TOP LENGTH =	450.0 FT
AREA OF DAM=	.83 AC,	AREA TO SEED=	.63 AC (PROJECTED
HORZ. AREA)			

WAVE BERM AT ELEVATION = 36.70, VOLUME = 1145.5 CY
(BERM IS INCLUDED IN VOLUME OF FILL.)

***** WARNING - TOP OF DAM EXCEEDS CLPROFILE ENDPOINT -
CL Profile of Original Ground

RATING TABLE DEVELOPED, SITE = S 1:
BY PROGRAM FOR PS AND AUX. SPILLWAYS
AUX. RATING USED WSPVRT METHOD.

RATING TABLE NUMBER 3

	ELEV. FEET	Q-TOTAL CFS	Q-PS CFS	Q-AUX. CFS	VOLUME AC-FT	AREA ACRE
1	36.70	.00	.00	.00	58.85	.00
2	37.51	35.58	35.58	.00	66.15	.00
3	38.32	100.63	100.63	.00	75.95	.00
4	39.13	184.87	184.87	.00	86.50	.00
5	39.95	284.63	284.63	.00	97.05	.00
FULL CONDUIT FLOW, ELEV =						
39.95 FT						
6	39.95	284.75	284.75	.00	97.15	.00
7	39.96	284.83	284.83	.00	97.25	.00
8	39.97	284.91	284.91	.00	97.35	.00
9	39.98	284.99	284.99	.00	97.45	.00
10	39.99	285.06	285.06	.00	97.56	.00
11	39.99	285.14	285.14	.00	97.66	.00
12	40.00	285.22	285.22	.00	97.76	.00
13	40.01	285.29	285.29	.00	97.86	.00
14	40.36	312.67	288.71	23.97	102.40	.00

15	40.71	371.17	292.09	79.08	106.95	.00
16	41.34	592.34	298.07	294.27	115.13	.00
17	42.11	1010.58	305.22	705.36	125.84	.00
18	43.50	2205.97	317.81	1888.16	147.84	.00
19	45.25	4214.92	332.88	3882.04	181.42	.00
20	47.00	6787.28	347.30	6439.98	215.00	.00

ROUTED AUX.	BTM WIDTH	MAX ELEV	VOL-MAX	AREA-MAX	AUX.-HP	VOL-
RESULTS	FT	FT	ACFT	AC	FT	ACFT
NRCS-SDH	125.0	41.40	116.0	.0	1.39	
18.1						

PEAK - CFS	Q-PS	Q-AUX.	Q-TOT.
DISCHARGE =	298.7	326.1	624.7

	CRITICAL DEPTH	CRITICAL VELOCITY	CRITICAL SLOPE-Sc	25% OF Q Sc
AUXILIARY	FT	FT/SEC	FT/FT	FT/FT
SPILLWAY ---	.59	4.34	.028	.038

AUXILIARY SPILLWAY DURATION FLOW = 14.5 HOURS

***** MESSAGE - NHCP378 CRITERIA USED BUT AUXILIARY SPILLWAY RATING NOT BASED ON ASFILE RATINGS.

EXIT CHANNEL FLOW SUPERCRITICAL: MAX VELOCITY=	6.4 FT/SEC
EXIT SLOPE =	.100 FT/FT
FLOW DEPTH =	.4 FT

DRAWDOWN USING FREEBOARD STORM FOLLOWS, STARTING AT ELEVATION 40.01 FT.

DRAWDOWN (DDT) TEST	36.70 FT	58.8 ACFT	.00 CFS
CONTROL IS .000 DETENTION STORAGE			

TIME = 1.51 DAYS, TO .0 CFS (LIMIT = 10.00 DAYS)

ROUTED AUX.	BTM WIDTH	MAX ELEV	VOL-MAX	AREA-MAX	AUX.-HP	VOL-
RESULTS	FT	FT	ACFT	AC	FT	ACFT
NRCS-FBH	125.0	41.69	119.8	.0	1.69	
21.9						

PEAK - CFS	Q-PS	Q-AUX.	Q-TOT.
DISCHARGE =	301.4	472.5	773.9

	CRITICAL DEPTH	CRITICAL VELOCITY	CRITICAL SLOPE-Sc	25% OF Q Sc
AUXILIARY	FT	FT/SEC	FT/FT	FT/FT
SPILLWAY ---	.76	4.90	.026	.035

AUXILIARY SPILLWAY DURATION FLOW =	16.5 HOURS
ATTACK, OE/B =	2.6 ACFT/FT

***** MESSAGE - NHCP378 CRITERIA USED BUT AUXILIARY SPILLWAY RATING NOT BASED ON ASFILE RATINGS.

EXIT CHANNEL FLOW SUPERCRITICAL: MAX VELOCITY=	7.4 FT/SEC
--	------------

EXIT SLOPE = .100 FT/FT
FLOW DEPTH = .5 FT

>>>> NHCP378 RUN - MINIMUM FLOW IN AUX. SPILLWAY FROM TR60
USING FORMULA WITHOUT 200 CFS MINIMUM LIMIT (599.
CFS) .

ROUTED	BTM WIDTH	MAX ELEV	VOL-MAX	AREA-MAX	AUX.-HP	VOL-
AUX.						
RESULTS	FT	FT	ACFT	AC	FT	ACFT
MIN. AUX.	125.0	41.92	123.1	.0	1.91	
25.2						
	PEAK - CFS	Q-PS	Q-AUX.	Q-TOT.		
	DISCHARGE =	303.5	599.2	902.7		
		CRITICAL	CRITICAL	CRITICAL	25% OF Q	
		DEPTH	VELOCITY	SLOPE-Sc	Sc	
	AUXILIARY	FT	FT/SEC	FT/FT	FT/FT	
	SPILLWAY ---	.89	5.29	.025	.033	

>>>> NHCP378 RUN - MINIMUM DEPTH, CREST AUX. TO TOP OF DAM IS 2.00
FT.

NEW TOP OF DAM ELEVATION = 42.01.

ROUTED	BTM WIDTH	MAX ELEV	VOL-MAX	AREA-MAX	AUX.HP	VOL-
AUX.						
RESULTS	FT	FT	ACFT	AC	FT	ACFT
MINIMUM AUX.	125.0	42.01	124.5	.0	2.00	
26.6						
	PEAK - CFS	Q-PS	Q-AUX.	Q-TOT.		
	DISCHARGES =	304.4	653.2	957.6		
		CRITICAL	CRITICAL	CRITICAL	25% OF Q	
		DEPTH	VELOCITY	SLOPE-Sc	Sc	
	AUXILIARY	FT	FT/SEC	FT/FT	FT/FT	
	SPILLWAY ---	.94	5.44	.024	.033	

>>>> NHCP378 RUN - MINIMUM DEPTH, DESIGN FLOW TO TOP OF DAM; 1.00 FT
REQUIRED

FOR THIS PASS. NEW TOP OF DAM ELEVATION =

42.69.

ROUTED	BTM WIDTH	MAX ELEV	VOL-MAX	AREA-MAX	AUX.HP	VOL-
AUX.						
RESULTS	FT	FT	ACFT	AC	FT	ACFT
MINIMUM AUX.	125.0	42.69	135.1	.0	2.72	
37.2						
	PEAK - CFS	Q-PS	Q-AUX.	Q-TOT.		
	DISCHARGES =	310.9	1202.9	1513.9		
		CRITICAL	CRITICAL	CRITICAL	25% OF Q	
		DEPTH	VELOCITY	SLOPE-Sc	Sc	
	AUXILIARY	FT	FT/SEC	FT/FT	FT/FT	
	SPILLWAY ---	1.41	6.62	.021	.028	

EMBANKMENT QUANTITIES

VOLUME FILL= 11022. CY, MAX. HEIGHT = 21.9 FT
 TOP WIDTH = 12.0 FT, TOP LENGTH = 450.0 FT
 AREA OF DAM= .82 AC, AREA TO SEED= .62 AC (PROJECTED
 HORZ. AREA)

WAVE BERM AT ELEVATION = 36.70, VOLUME = 1145.5 CY
 (BERM IS INCLUDED IN VOLUME OF FILL.)

***** WARNING - TOP OF DAM EXCEEDS CLPROFILE ENDPOINT -
 CL Profile of Original Ground

RATING TABLE DEVELOPED, SITE = S 1:
 BY PROGRAM FOR PS AND AUX. SPILLWAYS
 AUX. RATING USED WSPVRT METHOD.

RATING TABLE NUMBER 4

	ELEV. FEET	Q-TOTAL CFS	Q-PS CFS	Q-AUX. CFS	VOLUME AC-FT	AREA ACRE
1	36.70	.00	.00	.00	58.85	.00
2	37.51	35.58	35.58	.00	66.15	.00
3	38.32	100.63	100.63	.00	75.95	.00
4	39.13	184.87	184.87	.00	86.50	.00
5	39.95	284.63	284.63	.00	97.05	.00

FULL CONDUIT FLOW, ELEV =

39.95 FT

6	39.95	284.75	284.75	.00	97.15	.00
7	39.96	284.83	284.83	.00	97.25	.00
8	39.97	284.91	284.91	.00	97.35	.00
9	39.98	284.99	284.99	.00	97.45	.00
10	39.99	285.06	285.06	.00	97.56	.00
11	39.99	285.14	285.14	.00	97.66	.00
12	40.00	285.22	285.22	.00	97.76	.00
13	40.01	285.29	285.29	.00	97.86	.00
14	40.36	317.41	288.71	28.70	102.40	.00
15	40.71	386.91	292.09	94.82	106.95	.00
16	41.34	650.48	298.07	352.41	115.13	.00
17	42.11	1148.67	305.22	843.45	125.84	.00
18	43.50	2567.50	317.81	2249.69	147.84	.00
19	45.25	4940.93	332.88	4608.05	181.42	.00
20	47.00	7962.27	347.30	7614.97	215.00	.00

ROUTED AUX.	BTM WIDTH FT	MAX ELEV FT	VOL-MAX ACFT	AREA-MAX AC	AUX.-HP FT	VOL- ACFT
RESULTS						
NRCS-SDH	150.0	41.27	114.3	.0	1.27	
16.5						

PEAK - CFS	Q-PS	Q-AUX.	Q-TOT.
DISCHARGE =	297.5	326.6	624.1

CRITICAL CRITICAL CRITICAL 25% OF Q

	DEPTH	VELOCITY	SLOPE-Sc	Sc
AUXILIARY	FT	FT/SEC	FT/FT	FT/FT
SPILLWAY ---	.53	4.09	.029	.039

AUXILIARY SPILLWAY DURATION FLOW = 14.5 HOURS

***** MESSAGE - NHCP378 CRITERIA USED BUT AUXILIARY SPILLWAY RATING NOT
BASED ON ASFILE RATINGS.

EXIT CHANNEL FLOW SUPERCRITICAL: MAX VELOCITY= 6.0 FT/SEC
EXIT SLOPE = .100 FT/FT
FLOW DEPTH = .4 FT

DRAWDOWN USING FREEBOARD STORM FOLLOWS, STARTING AT ELEVATION
40.01 FT.

DRAWDOWN (DDT) TEST 36.70 FT 58.8 ACFT .00 CFS
CONTROL IS .000 DETENTION STORAGE

TIME = 1.54 DAYS, TO .0 CFS (LIMIT = 10.00 DAYS)

ROUTED	BTM WIDTH	MAX ELEV	VOL-MAX	AREA-MAX	AUX.-HP	VOL-
AUX.						
RESULTS	FT	FT	ACFT	AC	FT	ACFT
NRCS-FBH	150.0	41.54	117.8	.0	1.53	
19.9						

PEAK - CFS Q-PS Q-AUX. Q-TOT.
DISCHARGE = 300.0 474.2 774.2

	CRITICAL	CRITICAL	CRITICAL	25% OF Q
	DEPTH	VELOCITY	SLOPE-Sc	Sc
AUXILIARY	FT	FT/SEC	FT/FT	FT/FT
SPILLWAY ---	.67	4.63	.027	.036

AUXILIARY SPILLWAY DURATION FLOW = 16.5 HOURS
ATTACK, OE/B = 2.2 ACFT/FT

***** MESSAGE - NHCP378 CRITERIA USED BUT AUXILIARY SPILLWAY RATING NOT
BASED ON ASFILE RATINGS.

EXIT CHANNEL FLOW SUPERCRITICAL: MAX VELOCITY= 6.9 FT/SEC
EXIT SLOPE = .100 FT/FT
FLOW DEPTH = .5 FT

>>>> NHCP378 RUN - MINIMUM FLOW IN AUX. SPILLWAY FROM TR60
USING FORMULA WITHOUT 200 CFS MINIMUM LIMIT (599.
CFS).

ROUTED	BTM WIDTH	MAX ELEV	VOL-MAX	AREA-MAX	AUX.-HP	VOL-
AUX.						
RESULTS	FT	FT	ACFT	AC	FT	ACFT
MIN. AUX.	150.0	41.75	120.5	.0	1.74	
22.7						

PEAK - CFS Q-PS Q-AUX. Q-TOT.
DISCHARGE = 301.9 599.2 901.1

	CRITICAL	CRITICAL	CRITICAL	25% OF Q
	DEPTH	VELOCITY	SLOPE-Sc	Sc
AUXILIARY	FT	FT/SEC	FT/FT	FT/FT
SPILLWAY ---	.79	5.00	.025	.034

>>>> NHCP378 RUN - MINIMUM DEPTH, CREST AUX. TO TOP OF DAM IS 2.00 FT.

NEW TOP OF DAM ELEVATION = 42.01.

ROUTED	BTM WIDTH	MAX ELEV	VOL-MAX	AREA-MAX	AUX.HP	VOL-
AUX.						
RESULTS	FT	FT	ACFT	AC	FT	ACFT
MINIMUM AUX.	150.0	42.01	124.5	.0	2.00	
26.6						

PEAK - CFS	Q-PS	Q-AUX.	Q-TOT.
DISCHARGES =	304.4	781.2	1085.5

	CRITICAL	CRITICAL	CRITICAL	25% OF Q
	DEPTH	VELOCITY	SLOPE-Sc	Sc
AUXILIARY	FT	FT/SEC	FT/FT	FT/FT
SPILLWAY ---	.94	5.45	.024	.033

>>>> NHCP378 RUN - MINIMUM DEPTH, DESIGN FLOW TO TOP OF DAM; 1.00 FT REQUIRED

FOR THIS PASS. NEW TOP OF DAM ELEVATION = 42.54.

ROUTED	BTM WIDTH	MAX ELEV	VOL-MAX	AREA-MAX	AUX.HP	VOL-
AUX.						
RESULTS	FT	FT	ACFT	AC	FT	ACFT
MINIMUM AUX.	150.0	42.54	132.7	.0	2.56	
34.8						

PEAK - CFS	Q-PS	Q-AUX.	Q-TOT.
DISCHARGES =	309.5	1281.2	1590.6

	CRITICAL	CRITICAL	CRITICAL	25% OF Q
	DEPTH	VELOCITY	SLOPE-Sc	Sc
AUXILIARY	FT	FT/SEC	FT/FT	FT/FT
SPILLWAY ---	1.30	6.39	.022	.029

EMBANKMENT QUANTITIES

VOLUME FILL=	10826. CY,	MAX. HEIGHT =	21.8 FT
TOP WIDTH =	12.0 FT,	TOP LENGTH =	445.8 FT
AREA OF DAM=	.81 AC,	AREA TO SEED=	.61 AC (PROJECTED
HORZ. AREA)			

WAVE BERM AT ELEVATION = 36.70, VOLUME = 1145.5 CY
(BERM IS INCLUDED IN VOLUME OF FILL.)

***** MESSAGE - PSFULL CONTROL ENTERED BUT NOT USED IN THE NEXT RATING:
BECAUSE EITHER THE PS OR AUX. SPILLWAY RATINGS ARE

GIVEN,

OR THE AUX. CREST ELEVATION 40.20 IS HIGHER THAN THE
FULL PIPE FLOW ELEVATION 39.95.

1SITES -----

XEQ 04/25/2000 Del Ortman - 378 COMPLETE DESIGN W/CU Y WSID=
DELORISE
VER 96.1 SUBW=
01
TIME 15:17:36 SITE = S 1 PASS= 1 PART=
4

AUX. CREST 40.20 FT 100.3 ACFT .00 AC 287.2 CFS

PS STORAGE 41.5 ACFT, BETWEEN AUX. CREST AND SED. ACCUM
ELEVATIONS.

START ELEV 36.70 FT 58.9 ACFT .00 AC .0 CFS

EFFECTIVE HEIGHT (H) = 19.4 FEET, PRODUCT= 1947. (H * STORAGE AT
CREST AUX.).

INPUT DESIGN CLASS = A1 = LT 3000. PRODUCT.

NRCS-SDH D= 24.00 HR P= 4.60 IN Q= 2.05 IN DA=
6.56 SM

TC= 14.00 HR CN= 74.00 VOL= 717.4 ACFT

PEAK = 625.3 CFS, AT 21.2 HRS.

NRCS-FBH D= 24.00 HR P= 5.20 IN Q= 2.52 IN DA=
6.56 SM

TC= 14.00 HR CN= 74.00 VOL= 883.7 ACFT

PEAK = 775.5 CFS, AT 21.2 HRS.

RATING TABLE DEVELOPED, SITE = S 1:
BY PROGRAM FOR PS AND AUX. SPILLWAYS
AUX. RATING USED WSPVRT METHOD.

RATING TABLE NUMBER 5

	ELEV. FEET	Q-TOTAL CFS	Q-PS CFS	Q-AUX. CFS	VOLUME AC-FT	AREA ACRE
1	36.70	.00	.00	.00	58.85	.00
2	37.51	35.58	35.58	.00	66.15	.00
3	38.32	100.63	100.63	.00	75.95	.00
4	39.13	184.87	184.87	.00	86.50	.00
5	39.95	284.63	284.63	.00	97.05	.00
FULL CONDUIT FLOW, ELEV =						
6	39.98	284.99	284.99	.00	97.46	.00
7	40.01	285.30	285.30	.00	97.87	.00
8	40.04	285.61	285.61	.00	98.29	.00
9	40.07	285.93	285.93	.00	98.70	.00

39.95 FT ✓ o.k.

10	40.10	286.24	286.24	.00	99.11	.00
11	40.14	286.55	286.55	.00	99.52	.00
12	40.17	286.86	286.86	.00	99.94	.00
13	40.20	287.17	287.17	.00	100.35	.00
14	40.54	308.81	290.47	18.34	104.77	.00
15	40.88	353.57	293.74	59.83	109.19	.00
16	41.49	522.91	299.52	223.38	117.15	.00
17	42.24	845.00	306.45	538.55	127.82	.00
18	43.60	1771.20	318.65	1452.55	149.68	.00
19	45.30	3329.08	333.28	2995.80	182.34	.00
20	47.00	5356.49	347.30	5009.19	215.00	.00

ROUTED AUX.	BTM WIDTH	MAX ELEV	VOL-MAX	AREA-MAX	AUX.-HP	VOL-
RESULTS	FT	FT	ACFT	AC	FT	ACFT
NRCS-SDH	100.0	41.74	120.5	.0	1.54	
20.1						

25 YR. H.P.

PEAK - CFS	Q-PS	Q-AUX.	Q-TOT.
DISCHARGE =	301.9	321.9	623.8

	CRITICAL DEPTH	CRITICAL VELOCITY	CRITICAL SLOPE-Sc	25% OF Q Sc
AUXILIARY	FT	FT/SEC	FT/FT	FT/FT
SPILLWAY ---	.68	4.64	.027	.036

AUXILIARY SPILLWAY DURATION FLOW = 13.9 HOURS

***** MESSAGE - NHCP378 CRITERIA USED BUT AUXILIARY SPILLWAY RATING NOT BASED ON ASFILE RATINGS.

EXIT CHANNEL FLOW SUPERCRITICAL: MAX VELOCITY= 6.9 FT/SEC
EXIT SLOPE = .100 FT/FT
FLOW DEPTH = .5 FT

DRAWDOWN USING FREEBOARD STORM FOLLOWS, STARTING AT ELEVATION 40.20 FT.

DRAWDOWN (DDT) TEST 36.70 FT 58.8 ACFT .00 CFS
CONTROL IS .000 DETENTION STORAGE

TIME = 1.51 DAYS, TO .0 CFS (LIMIT = 10.00 DAYS)

ROUTED AUX.	BTM WIDTH	MAX ELEV	VOL-MAX	AREA-MAX	AUX.-HP	VOL-
RESULTS	FT	FT	ACFT	AC	FT	ACFT
NRCS-FBH	100.0	42.08	125.4	.0	1.88	
25.1						

50 YR. H.P.

PEAK - CFS	Q-PS	Q-AUX.	Q-TOT.
DISCHARGE =	305.0	468.0	772.9

	CRITICAL DEPTH	CRITICAL VELOCITY	CRITICAL SLOPE-Sc	25% OF Q Sc
AUXILIARY	FT	FT/SEC	FT/FT	FT/FT
SPILLWAY ---	.87	5.23	.025	.033

AUXILIARY SPILLWAY DURATION FLOW = 15.9 HOURS
ATTACK, OE/B = 3.2 ACFT/FT

***** MESSAGE - NHCP378 CRITERIA USED BUT AUXILIARY SPILLWAY RATING NOT
BASED ON ASFILE RATINGS.

EXIT CHANNEL FLOW SUPERCRITICAL: MAX VELOCITY= 8.0 FT/SEC
EXIT SLOPE = .100 FT/FT
FLOW DEPTH = .6 FT

>>>> NHCP378 RUN - MINIMUM FLOW IN AUX. SPILLWAY FROM TR60
USING FORMULA WITHOUT 200 CFS MINIMUM LIMIT (599.
CFS).

ROUTED AUX.	BTM WIDTH	MAX ELEV	VOL-MAX	AREA-MAX	AUX.-HP	VOL-
RESULTS	FT	FT	ACFT	AC	FT	ACFT
MIN. AUX.	100.0	42.34	129.3	.0	2.14	
28.9						

PEAK - CFS DISCHARGE =	Q-PS	Q-AUX.	Q-TOT.
	307.3	599.2	906.5

	CRITICAL DEPTH	CRITICAL VELOCITY	CRITICAL SLOPE-Sc	25% OF Q Sc
AUXILIARY SPILLWAY ---	FT	FT/SEC	FT/FT	FT/FT
	1.03	5.66	.023	.032

>>>> NHCP378 RUN - MINIMUM DEPTH, DESIGN FLOW TO TOP OF DAM; 1.00 FT
REQUIRED
FOR THIS PASS. NEW TOP OF DAM ELEVATION =
43.08.

ROUTED AUX.	BTM WIDTH	MAX ELEV	VOL-MAX	AREA-MAX	AUX.HP	VOL-
RESULTS	FT	FT	ACFT	AC	FT	ACFT
MINIMUM AUX.	100.0	43.08	141.3	.0	2.95	
40.9						

PEAK - CFS DISCHARGES =	Q-PS	Q-AUX.	Q-TOT.
	314.7	1101.1	1415.8

	CRITICAL DEPTH	CRITICAL VELOCITY	CRITICAL SLOPE-Sc	25% OF Q Sc
AUXILIARY SPILLWAY ---	FT	FT/SEC	FT/FT	FT/FT
	1.53	6.87	.021	.028

EMBANKMENT QUANTITIES
VOLUME FILL= 11535. CY, MAX. HEIGHT = 22.4 FT
TOP WIDTH = 12.0 FT, TOP LENGTH = 450.0 FT
AREA OF DAM= .85 AC, AREA TO SEED= .65 AC (PROJECTED
HORZ. AREA)

WAVE BERM AT ELEVATION = 36.70, VOLUME = 1145.5 CY
(BERM IS INCLUDED IN VOLUME OF FILL.)

***** WARNING - TOP OF DAM EXCEEDS CLPROFILE ENDPOINT -
CL Profile of Original Ground

RATING TABLE DEVELOPED, SITE = S 1:
BY PROGRAM FOR PS AND AUX. SPILLWAYS
AUX. RATING USED WSPVRT METHOD.

RATING TABLE NUMBER 6

	ELEV. FEET	Q-TOTAL CFS	Q-PS CFS	Q-AUX. CFS	VOLUME AC-FT	AREA ACRE
1	36.70	.00	.00	.00	58.85	.00
2	37.51	35.58	35.58	.00	66.15	.00
3	38.32	100.63	100.63	.00	75.95	.00
4	39.13	184.87	184.87	.00	86.50	.00
5	39.95	284.63	284.63	.00	97.05	.00
FULL CONDUIT FLOW, ELEV =						
39.95 FT						
6	39.98	284.99	284.99	.00	97.46	.00
7	40.01	285.30	285.30	.00	97.87	.00
8	40.04	285.61	285.61	.00	98.29	.00
9	40.07	285.93	285.93	.00	98.70	.00
10	40.10	286.24	286.24	.00	99.11	.00
11	40.14	286.55	286.55	.00	99.52	.00
12	40.17	286.86	286.86	.00	99.94	.00
13	40.20	287.17	287.17	.00	100.35	.00
14	40.54	313.34	290.47	22.87	104.77	.00
15	40.88	368.43	293.74	74.70	109.19	.00
16	41.49	577.92	299.52	278.39	117.15	.00
17	42.24	976.20	306.45	669.76	127.82	.00
18	43.60	2112.64	318.65	1793.99	149.68	.00
19	45.30	4023.57	333.28	3690.29	182.34	.00
20	47.00	6477.41	347.30	6130.12	215.00	.00

ROUTED AUX.	BTM WIDTH	MAX ELEV	VOL-MAX	AREA-MAX	AUX.-HP	VOL-
RESULTS	FT	FT	ACFT	AC	FT	ACFT
NRCS-SDH	125.0	41.59	118.4	.0	1.39	
18.0						

PEAK - CFS	Q-PS	Q-AUX.	Q-TOT.
DISCHARGE =	300.4	324.2	624.6

	CRITICAL DEPTH	CRITICAL VELOCITY	CRITICAL SLOPE-Sc	25% OF Q Sc
AUXILIARY SPILLWAY ---	FT .59	FT/SEC 4.33	FT/FT .028	FT/FT .038

AUXILIARY SPILLWAY DURATION FLOW = 13.9 HOURS

***** MESSAGE - NHCP378 CRITERIA USED BUT AUXILIARY SPILLWAY RATING NOT
BASED ON ASFILE RATINGS.

EXIT CHANNEL FLOW SUPERCRITICAL: MAX VELOCITY= 6.4 FT/SEC
EXIT SLOPE = .100 FT/FT
FLOW DEPTH = .4 FT

DRAWDOWN USING FREEBOARD STORM FOLLOWS, STARTING AT ELEVATION
40.20 FT.

DRAWDOWN (DDT) TEST 36.70 FT 58.8 ACFT .00 CFS
CONTROL IS .000 DETENTION STORAGE

TIME = 1.54 DAYS, TO .0 CFS (LIMIT = 10.00 DAYS)

ROUTED AUX.	BTM WIDTH	MAX ELEV	VOL-MAX	AREA-MAX	AUX.-HP	VOL-
RESULTS	FT	FT	ACFT	AC	FT	ACFT
NRCS-FBH	125.0	41.87	122.4	.0	1.67	
22.0						

PEAK - CFS Q-PS Q-AUX. Q-TOT.
DISCHARGE = 303.1 470.7 773.8

	CRITICAL DEPTH	CRITICAL VELOCITY	CRITICAL SLOPE-Sc	25% OF Q Sc
AUXILIARY	FT	FT/SEC	FT/FT	FT/FT
SPILLWAY ---	.76	4.89	.026	.035

AUXILIARY SPILLWAY DURATION FLOW = 15.9 HOURS
ATTACK, OE/B = 2.6 ACFT/FT

***** MESSAGE - NHCP378 CRITERIA USED BUT AUXILIARY SPILLWAY RATING NOT
BASED ON ASFILE RATINGS.

EXIT CHANNEL FLOW SUPERCRITICAL: MAX VELOCITY= 7.4 FT/SEC
EXIT SLOPE = .100 FT/FT
FLOW DEPTH = .5 FT

>>>> NHCP378 RUN - MINIMUM FLOW IN AUX. SPILLWAY FROM TR60
USING FORMULA WITHOUT 200 CFS MINIMUM LIMIT (599.
CFS).

ROUTED AUX.	BTM WIDTH	MAX ELEV	VOL-MAX	AREA-MAX	AUX.-HP	VOL-
RESULTS	FT	FT	ACFT	AC	FT	ACFT
MIN. AUX.	125.0	42.11	125.9	.0	1.91	
25.6						

PEAK - CFS Q-PS Q-AUX. Q-TOT.
DISCHARGE = 305.3 599.2 904.4

	CRITICAL DEPTH	CRITICAL VELOCITY	CRITICAL SLOPE-Sc	25% OF Q Sc
AUXILIARY	FT	FT/SEC	FT/FT	FT/FT
SPILLWAY ---	.89	5.29	.025	.033

>>>> NHCP378 RUN - MINIMUM DEPTH, CREST AUX. TO TOP OF DAM IS 2.00
FT.

NEW TOP OF DAM ELEVATION = 42.20.

ROUTED AUX.	BTM WIDTH	MAX ELEV	VOL-MAX	AREA-MAX	AUX.HP	VOL-
RESULTS	FT	FT	ACFT	AC	FT	ACFT
MINIMUM AUX.	125.0	42.20	127.3	.0	2.00	

26.9

PEAK - CFS	Q-PS	Q-AUX.	Q-TOT.
DISCHARGES =	306.1	648.8	954.9

	CRITICAL	CRITICAL	CRITICAL	25% OF Q
	DEPTH	VELOCITY	SLOPE-Sc	Sc
AUXILIARY	FT	FT/SEC	FT/FT	FT/FT
SPILLWAY ---	.94	5.43	.024	.033

>>>> NHCP378 RUN - MINIMUM DEPTH, DESIGN FLOW TO TOP OF DAM; 1.00 FT
REQUIRED

FOR THIS PASS. NEW TOP OF DAM ELEVATION =
42.87.

ROUTED	BTM WIDTH	MAX ELEV	VOL-MAX	AREA-MAX	AUX.HP	VOL-
AUX.						
RESULTS	FT	FT	ACFT	AC	FT	ACFT
MINIMUM AUX.	125.0	42.87	138.0	.0	2.73	

37.6

PEAK - CFS	Q-PS	Q-AUX.	Q-TOT.
DISCHARGES =	312.7	1192.0	1504.7

	CRITICAL	CRITICAL	CRITICAL	25% OF Q
	DEPTH	VELOCITY	SLOPE-Sc	Sc
AUXILIARY	FT	FT/SEC	FT/FT	FT/FT
SPILLWAY ---	1.40	6.60	.021	.029

EMBANKMENT QUANTITIES

VOLUME FILL=	11259. CY,	MAX. HEIGHT =	22.1 FT
TOP WIDTH =	12.0 FT,	TOP LENGTH =	450.0 FT
AREA OF DAM=	.83 AC,	AREA TO SEED=	.63 AC (PROJECTED

HORZ. AREA)

WAVE BERM AT ELEVATION = 36.70, VOLUME = 1145.5 CY
(BERM IS INCLUDED IN VOLUME OF FILL.)

***** WARNING - TOP OF DAM EXCEEDS CLPROFILE ENDPOINT -
CL Profile of Original Ground

RATING TABLE DEVELOPED, SITE = S 1:
BY PROGRAM FOR PS AND AUX. SPILLWAYS
AUX. RATING USED WSPVRT METHOD.

RATING	TABLE	NUMBER	7
	ELEV.	Q-TOTAL	Q-PS
	FEET	CFS	CFS
1	36.70	.00	.00
2	37.51	35.58	35.58
3	38.32	100.63	100.63
		Q-AUX.	VOLUME
		CFS	AC-FT
			ACRE

AUX.
 RESULTS FT FT ACFT AC FT ACFT
 MINIMUM AUX. 150.0 42.73 135.7 .0 2.58
 35.4

PEAK - CFS Q-PS Q-AUX. Q-TOT.
 DISCHARGES = 311.3 1285.3 1596.6

CRITICAL CRITICAL CRITICAL 25% OF Q
 DEPTH VELOCITY SLOPE-Sc Sc
 AUXILIARY FT FT/SEC FT/FT FT/FT
 SPILLWAY --- 1.30 6.40 .022 .029

EMBANKMENT QUANTITIES

VOLUME FILL= 11073. CY, MAX. HEIGHT = 22.0 FT
 TOP WIDTH = 12.0 FT, TOP LENGTH = 450.0 FT
 AREA OF DAM= .82 AC, AREA TO SEED= .62 AC (PROJECTED
 HORZ. AREA)

WAVE BERM AT ELEVATION = 36.70, VOLUME = 1145.5 CY
 (BERM IS INCLUDED IN VOLUME OF FILL.)

***** WARNING - TOP OF DAM EXCEEDS CLPROFILE ENDPOINT -
 CL Profile of Original Ground

 1SITES....JOB NO. 1 COMPLETE.

DELORISE Del Ortman - 378 COMPLETE DESIGN W/CU Y

0 SUBWATERSHED(S) ANALYZED.

1 STRUCTURE(S) ANALYZED.

13 HYDROGRAPHS ROUTED AT LOWEST SITE.

0 TRIALS TO OBTAIN BOTTOM WIDTH FOR SPECIFIED STRESS OR VELOCITY.

SITES.....COMPUTATIONS COMPLETE

1 SUMMARY TABLE 1 SITES VERSION
 96.1
 03/01/1996 DATED

WATERSHED ID RUN DATE
 RUN TIME

DELORISE
15:17:36

04/25/2000

```
>>>  SITE    SUBWS    SUBWS DA    CURVE    TC    TOTAL DA    TYPE    STRUC
<<<
      ID      ID      (SQ MI)    NO.      (HRS)    (SQ MI)    DESIGN    CLASS
      ----      ----      -
      S   1     01      6.56      74.     14.00      6.56     378CR     A1
```

```
PASS DIA./  AUX.CREST  BTM.  MAX.  MAX.  EMB.  INTEGR.*  EXIT*
TYPE NO.  WIDTH    ELEV    WIDTH  HP    ELEV  VOL.  DIST.    VEL.
HYD   (IN/FT)  (FT)    (FT)  (FT)  (FT)  (CY)  (FT)  (FT/SEC)
-----
      1   36.3    40.0   100.0  2.9   42.9  11278.  0.    8.0
MIN. AUX.
      1   36.3    40.0   125.0  2.7   42.7  11022.  0.    7.4
MIN. AUX.
      1   36.3    40.0   150.0  2.6   42.5  10826.  0.    6.9
MIN. AUX.
      1   36.3    40.2   100.0  3.0   43.1  11535.  0.    8.0
MIN. AUX.
      1   36.3    40.2   125.0  2.7   42.9  11259.  0.    7.4
MIN. AUX.
      1   36.3    40.2   150.0  2.6   42.7  11073.  0.    6.9
MIN. AUX.
```

* INTEGRITY DIST. AND EXIT VEL. ARE BASED ON THE ROUTED HYDROGRAPH
AND WILL NOT RELATE TO THE MAX. ELEV. (TOP OF DAM),
WHICH IS SET BY MINIMUM DESIGN CRITERIA.

SITES.....SUMMARY TABLE 1 COMPLETED.

NRCS SITES VERSION 96.1 ,03/01/1996
DELORISE FILES

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OUTPUT - DATED 04/25/2000 15:17:36
ORTMAN365



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Madison Wetland Management District

P.O. Box 48

On Hwy. 19, 3/4 mile South of Hwy. 34 Junction

Madison, SD 57042

Telephone: (605) 256-2974

May 30, 2000

DENR Water Rights Division
Joe Foss Building
523 E. Capital
Pierre, SD 57501



Dear Sirs/Madam:

Enclosed you will find a Water Rights Permit and Engineering Specifications for Delmar Ortman's dam project in McCook Co. of South Dakota. Please send any bills for publication to the U.S. Fish and Wildlife Service in care of Noel Matson, P.O. Box 48 Madison, SD 57042. If you have any questions just give me a call.

Sincerely,

Noel Matson
Madison WMD

James or Debra K Tieszen

26610 446th Avenue
Marion, South Dakota 57043-6409
Home Phone (605) 648-3446

July 13, 2000

Water Rights Program
Foss Building
523 E. Capital
Pierre, South Dakota 57501



Re: Application #6211-3

Dear Sir,

We hereby request a hearing on the above noted application.

We own land up and down stream from the proposed dam, and feel we have a right to more information.

Please send copies of any information pertaining to this project. Also, please allow adequate time to have the documents examined by legal counsel, should we decide to do so, before the hearing.

Please be advised, we may choose to cancel our request for the hearing should the documents satisfy our quest for information.

Sincerely,

James and Debra K. Tieszen

cc: Delmar D. Ortman



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

June 27, 2000

Delmar Ortman
26731 445th Ave.
Marion, SD 57043

Dear Mr. Ortman:

We have reviewed the plans and specifications for your dam project located in the NE 1/4 of Section 33-T101N-R54W, in McCook County. The plans and specifications as submitted are approved. Approval of the plans and specifications does not authorize construction of the dam. The construction may not begin until Water Permit Application No. 6211-3 is approved.

Our review was to determine compliance with the requirements of the Water Management Board Safety of Dams Rules, Chapter 74:02:08. Approval of these plans and specifications does not release you, as owner of the dam, from the responsibility for operating and maintaining the dam in good repair to ensure the safety of the dam.

The Ortman Dam will be classified as a small size Category 3, Low Hazard dam with a dam height of 22 feet and a normal storage capacity of 59 acre-feet and a maximum storage capacity of 145 acre-feet.

If you have any questions, please feel free to contact us.

Sincerely,

Gale N. Selken, P.E.
Natural Resources Engineer IV
for Garland Erbele, Chief Engineer
Water Rights Program
(605) 773-3352

c: Pete Anderson, NRCS Brookings

REPORT ON
WATER PERMIT APPLICATION NO. 6211-3
Delmar Ortman
June 22, 2000

Water Permit Application No. 6211-3 has been filed by Delmar Ortman to impound 59 acre-feet of water from runoff by constructing a dam located in the SW 1/4 NE 1/4 of Section 33-T101N-R54W, in McCook County. The application also requests impoundment of sufficient water to maintain water at the outlet elevation. The water will be used for fish and wildlife production and livestock watering.

Discussion:

The dam will be classified as a small size, Category 3, Low Hazard dam. The project has been designed by the Natural Resources Conservation Service (NRCS). The plans and specifications have been reviewed and will be approved; however, construction of the dam can not begin until Water Permit Application No. 6211-3 is approved.

The Ortman Dam will be 22 feet high with a normal storage capacity of 59 acre-feet with a reservoir level at the primary spillway elevation, and a maximum storage capacity of 145 acre-feet with a reservoir level at the top of dam elevation. A dam of this size and hazard classification is required to have a minimum spillway design capable of passing a 25-year frequency event.

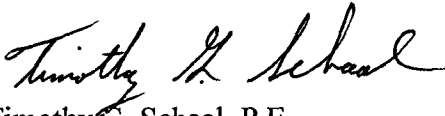
The dam has a drainage area of 6.56 square miles. A 25-year frequency event for this drainage area produces a peak runoff of approximately 490 cfs. A 100-year frequency event produces a peak of approximately 962 cfs. The dam is designed to have a 150 foot wide earth spillway with 3 feet of available freeboard. The 150 foot wide spillway will have a capacity of approximately 2025 cfs.

The annual yield for this drainage area with an 80 percent chance of occurrence, or 8 out of 10 years, is expected to be 96 acre-feet. The annual yield with a 50 percent chance of occurrence, or 1 out of 2 years, is expected to be 231 acre-feet and the annual yield with a 10 percent chance, or 1 out of 10 years, is expected to be 980 acre-feet.

The Ortman Dam will be located in the SW 1/4 NE 1/4 of Section 33-T101N-R54W on an unnamed tributary of the West Fork of the Vermillion River about two miles upstream of its confluence with the river. There are no existing Water Permits/Rights located on the unnamed tributary between the proposed dam and the West Fork of the Vermillion River.

Conclusions:

1. Water Permit Application No. 6211-3 should be approved since unappropriated water is available and approval should not have any adverse effect on existing Water Permits/Rights.
2. If approved, the low flow bypass requirement for downstream domestic use should be a qualification on Water Permit Application No. 6211-3.



Timothy G. Schaal, P.E.
Natural Resources Engineer III

Approved by:



Gale N. Selken, P.E.
Natural Resources Engineer IV



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

**RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 6211-3, Delmar Ortman**

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. 6211-3, Delmar Ortman, 26731 445th Avenue, Marion, SD 57043.

The Chief Engineer is recommending APPROVAL of Application No. 6211-3 because 1) there is reasonable probability that there is unappropriated water available for the applicant's proposed use, 2) the proposed diversion can be developed without unlawful impairment of existing rights, 3) the proposed use is a beneficial use and 4) it is in the public interest with the following qualifications:

1. Water Permit No. 6211-3 authorizes a dam with a storage capacity of 59 acre feet of water and sufficient water annually to maintain the water level to the outlet elevation.
2. Low flows as needed for downstream domestic use, including livestock water and prior water rights must be by-passed.

See report on application for additional information.

Garland Erbele, Chief Engineer
June 23, 2000



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

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

June 27, 2000

Salem Special
P.O. Box 220
Salem, SD 57058-0220

ATTENTION: Legal Public Notice

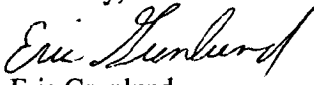
Enclosed is a Notice of Hearing on Application No. 6211-3 to Appropriate Water to be published twice. Please publish the first notice on July 6, 2000, with the second publication 7 days later.

The applicant must verify to you that the notice is to be published, before you make the first publication. **Please BILL U.S. Fish & Wildlife Service for the cost of publication.** Their address is U.S. Fish & Wildlife Service, %Noel Matson, P.O. Box 48, Madison, SD 57042 (Ph # (605) 256-2974).

Please send the Water Rights Program the first publication immediately. The publication is checked for accuracy so any corrections can be made in the second publication. You may use the form below or fax a copy of the first publication. Any fax should be sent to the attention of Karen Schlaak at (605) 773-4068. Publication errors can invalidate the public notice.

After the second publication, **please send us an affidavit or use the enclosed Proof of Publication form.** The applicant pays the cost of publication, but the Water Rights Program records require an affidavit or Proof of Publication. Delays in receiving the affidavit can be costly to the applicant.

Sincerely,


Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures

-----CU T HERE-----

No. 6211-3

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

Date _____

We are in receipt of your letter of June 27, 2000, enclosing Notice of Hearing to Appropriate Water by Application No. 6211-3 which was first published in our issue of _____. **ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.**

Name

Newspaper



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

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

June 27, 2000

Delmar Ortman
26731 445th Ave.
Marion, SD 57043

Dear Mr. Ortman:

Water Permit Application No. 6211-3 for fish and wildlife propagation, and livestock water 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 Salem Special printed at Salem, SD (Ph # (605) 425-2361). 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

cc: Noel Matson, U.S. Fish & Wildlife Service, P.O Box 48, Madison, SD 57042

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.

Instruction to Newspaper - Publish first Notice on July 6, 2000, with the second publication 7 days later. The applicant is responsible for payment.

NOTICE OF APPLICATION NO. 6211-3 to Appropriate Water

Notice is given that Delmar Ortman, 26731 445th Ave, Marion SD 57043 has filed an application for a water permit to impound 59 acre-feet of water from runoff by constructing a dam located in the SW ¼ NE ¼ Section 33 with water impounded in portions of the NE ¼ Section 33; all in T101N-R54W. This application requests impoundment of sufficient water to maintain water at the outlet elevation and is to be used for fish and wildlife propagation and livestock watering.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 6211-3 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. In accordance with SDCL 46-2A-23, the Chief Engineer will act on the application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider the application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting 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 July 24, 2000.

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. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this application. Steven M. Pirner, Secretary, Department of Environment and Natural Resources.

**PROOF OF PUBLICATION**

STATE OF SOUTH DAKOTA)
) SS
 County of McCook)

I, Troy Schwans

certify that the attached printed Notice was
 taken

from the Salem Special

printed and published in Salem

County of McCook and

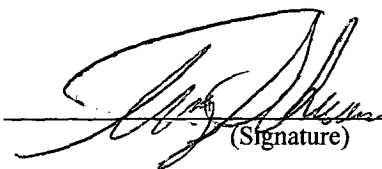
state of South Dakota. The notice was published

in the newspaper on the following two dates:

July 6, 2000

July 13, 2000

Cost of Printing \$40.93


 (Signature)

Editor

(Title)

7-13-00

(Date Signed)

Public Notice**NOTICE OF APPLICATION**

NO. 6211-3 to

APPROPRIATE WATER

Notice is given that Delmar Ortman, 26731 445th Ave, Marion SD 57043 has filed an application for a water permit to impound 59-acre-feet of water from runoff by constructing a dam located in the SW 1/4 NE 1/4 Section 33 with water impounded in portions of the NE 1/4 Section 33; all in T101N-R54W. This application requests impoundment of sufficient water to maintain water at the outlet elevation and is to be used for fish and wildlife propagation and livestock watering.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 6211-3 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. In accordance with SDCL 46-2A-23, the Chief Engineer will act on the application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider the application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and Chief Engineer. The applicant must file a petition if contesting 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 July 24, 2000.

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. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to the application. Steven M. Pirner, Secretary, Department of Environment and Natural Resources.

7/6, 7/13

CERTIFICATION

I hereby certify that on August 2, 2000, I have personally deposited with the United States mail at Pierre, South Dakota, first class postage, prepaid envelopes containing a Notice dated August 2, 2000, regarding Notice of Hearing on Contested Water Permit Application No. 6211-3, Delmar Ortman, addressed as stated below:

Delmar Ortman, 26731 445th Ave., Marion, SD 57043.

James and Debra K. Tieszen, 26610 446th Avenue, Marion, SD 57043-4609.

Noel Matson, U.S. Fish and Wildlife Service, P.O. Box 48, Madison, SD 57042.

A copy of the above described Notice was sent Inter-office to:

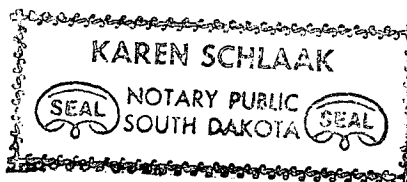
Diane Best, Assistant Attorney General, Capitol Building.


Cheryl F. Frost
Secretary

[illegible]

Sworn to, before me, this 3rd day of August, 2000

Karen Schlaak
Notary Public



KAREN SCHLAAK, Notary Public
My Commission Expires
April 1, 2001



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

August 2, 2000

NOTICE

TO: Delmar Ortman James and Debra K. Tieszen
26731 445th Ave. 26610 446th Avenue
Marion, SD 57043 Marion, SD 57043-6409

FROM: Garland Erbele, Chief Engineer *Garland Erbele*
Water Rights Program

SUBJECT: Notice of Hearing on Contested Water Permit Application No. 6211-3, Delmar Ortman

A petition to Application No. 6211-3 has been filed in response to the Notice of Application to appropriate water published July 6 and 13, 2000, in the Salem Special.

As specified in the publication notice, Application No. 6211-3 proposes to impound 59 acre-feet of water from runoff by constructing a dam located in the SW ¼ NE ¼ Section 33 with water impounded in portions of the NE ¼ Section 33; all in T101N-R54W. This application requests impoundment of sufficient water to maintain water at the outlet elevation and is to be used for fish and wildlife propagation and livestock watering. A copy of the Water Rights Program's report and recommendation prepared on this application is enclosed for the petitioner.

The Water Management Board will conduct a hearing to consider Application No. 6211-3 at 8:30 am, on September 28, 2000, in the Angostura Room, Radisson Hotel, 445 Mt. Rushmore Road, Rapid City, SD. Pursuant to SDCL 46-2-9, 46-2-11, and 46-2A-23, the Board has legal authority and jurisdiction to conduct this hearing. The agenda time is an estimate and may be delayed due to prior agenda items.

As the Board meeting approaches, changes in agenda times may need to be made. Future notice will be provided to all parties if there is a change in the hearing time.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 6211-3 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. 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 evidence presented at the public hearing.

The September 28, 2000, 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 September 18, 2000.

This hearing is an adversary proceeding. Any party of record 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.

Notice is further given to persons with disabilities that this hearing is being held in a physically accessible place and that interpreter services will be provided, upon request, during the hearing. Please notify Eric Gronlund at (605) 773-3352 by September 18, 2000, if you have any questions about the hearing process or have special needs for which the department will make arrangements.

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-23; 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; and Board Rules ARSD 74:02:01:01 thru 74:02:01:15.

Enclosure (to petitioner)

c: Diane Best, Assistant Attorney General
Noel Matson, U.S. Fish and Wildlife Service, P.O. Box 48, Madison, SD 57042

26610 446th Ave.
Marion, South Dakota 57043



August 18, 2000

Mr. Garland Erbele, Chief Engineer
Joe Foss Building
523 East Capital
Pierre, South Dakota 57501-3182

Dear Mr. Erbele,

Please grant an extension of the hearing on Water Permit Application No. 6211-3,
Delmar Ortman.

The scheduled hearing would be during harvest and would be nearly impossible
for us to attend. If we could schedule something during November or December
it would work better for us.

Sincerely,

James and Debra K. Tieszen

Water Rights Division -DENR
Conversation or File Documentation

NAME OF PERSON OR FILE: Delmar Ortman

ADDRESS: XXXXXXXXXXXXX

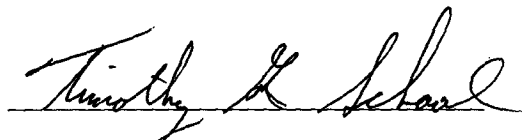
COUNTY: McCook

DATE: August 31, 2000

TELEPHONE: XXXXXXX

RE: James Tieszen's petition

I talked to both James Tieszen and Delmar Ortman yesterday concerning Application No. 6211-3. Mr. Tieszen's main concerns with the application were: 1) the discharge from the dam will cause increased velocity and erosion of his property below the dam, and wanted the USFWS to riprap his creek channel. I tried to explain to him that the spillway channel will be riprapped to displace increased velocity and there should not be any additional erosion than what would be caused from a runoff event without the dam. 2) Having a dam downstream of him, particularly one that involved the USFWS, would cause increased attention to the runoff from his dairy operation and the USFWS/State or the government in general would make him control the runoff from his dairy operation. I told him he should already be concerned with that. 3) The reservoir created by the dam would cause increased mosquitoes. He also had a concern with downstream water availability and I explained to him the low flow bypass qualification. He seemed to understand that and was satisfied with having that qualification.



Timothy G. Schaal, P.E.
Natural Resources Engineer III
Water Rights Program



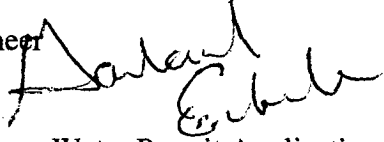
**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

August 31, 2000

NOTICE

TO: Delmar Ortman James and Debra K. Tieszen
26731 445th Ave. 26610 446th Avenue
Marion, SD 57043 Marion, SD 57043-6409

FROM: Garland Erbele, Chief Engineer
Water Rights Program 

SUBJECT: Automatic Delay of Hearing on Water Permit Application No. 6211-3, Delmar Ortman

In response to the notice of hearing, dated August 2nd, petitioners have requested an automatic delay of the September 28, 2000, hearing before the Water Management Board. Therefore, the hearing on Application No. 6211-3 is automatically delayed pursuant to SDCL 46-2A-4 and 46-2A-5 and will not be held on September 28, 2000. A copy of the petitioners request is enclosed to the applicant.

The hearing on this application will be scheduled for the December 6 and 7, 2000 Water Management Board meeting. Future notice of the exact date, time and place of the hearing for Application No. 6211-3 will be provided to all parties of record.

Please contact Eric Gronlund at (605) 773-3352, if you have any questions.

enclosure

c: Diane Best, Assistant Attorney General
Noel Matson, U.S. Fish and Wildlife Service, P.O. Box 48, Madison, SD 57042

CERTIFICATION

I hereby certify that on August 31, 2000, I have personally deposited with the United States mail at Pierre, South Dakota, first class postage, prepaid envelopes containing a Notice dated August 31, 2000, regarding Automatic Delay of Hearing on Vested Right Permit Application No. 6211-3, Delmar Ortman, addressed as stated below:

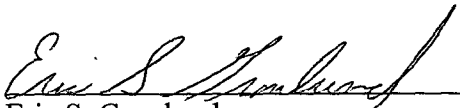
Delmar Ortman, 26731 445th Ave., Marion, SD 57043

James and Debra K. Tieszen, 26610 446th Ave., Marion, SD 57043-6409

Noel Matson, U.S. Fish and Wildlife Service, P.O. Box 48, Madison, SD 57042

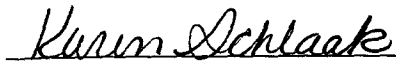
A copy of the above described Notice was sent Inter-office to:

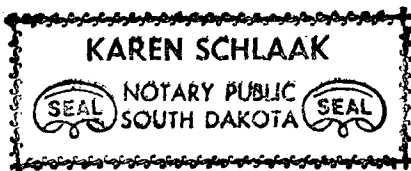
Diane Best, Assistant Attorney General, Capitol Building


Eric S. Gronlund
Natural Resources Engineer
Water Right Program

STATE OF SOUTH DAKOTA)
) SS
COUNTY OF HUGHES)

Sworn to, before me, this 1st day of September, 2000.


Karen Schlaak
Notary Public



KAREN SCHLAACK, Notary Public
My Commission Expires
April 1, 2001



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

November 6, 2000

NOTICE

TO: Delmar Ortman James and Debra K. Tieszen
26731 445th Ave. 26610 446th Avenue
Marion, SD 57043 Marion, SD 57043-6409

FROM: Garland Erbele, Chief Engineer *Garland Erbele*
Water Rights Program

SUBJECT: Scheduling of Hearing on Water Permit Application No. 6211-3, Delmar Ortman

Water Permit Application No. 6211-3 proposes to impound 59 acre feet of water by construction a dam for fish and wildlife propagation and livestock watering. Mr. and Mrs. Tieszen contested the application and requested an automatic delay of the September 28, 2000, hearing before the Water Management Board.

The Water Management Board will now consider Application No. 6211-3 on December 6, 2000, at 9:30 AM, in the Conference Room, Floyd Matthew Training Center, Joe Foss Building, 523 E. Capitol Avenue, Pierre, SD. The agenda time is an estimate and may be delayed due to prior agenda items.

Applicable provisions of the Notice published July 6 and 13, 2000, in the Salem Special and the Notice of Hearing dated August 2, 2000 will still apply at the December 6th hearing before the Water Management Board. This hearing is an adversary proceeding. Any party of record has the right to be present and to be represented by a lawyer. These and other due process rights will be forfeited if they are not exercised. Decisions of the Board may be appealed to the Circuit Court and State Supreme Court as provided by law.

Please contact Eric Gronlund at (605) 773-3352, if you have any questions.

c: Diane Best, Assistant Attorney General
Noel Matson, U.S. Fish and Wildlife Service, P.O. Box 48, Madison, SD 57042

CERTIFICATION

I hereby certify that on November 6, 2000, I have personally deposited with the United States mail at Pierre, South Dakota, first class postage, prepaid envelopes containing a Notice dated November 6, 2000, regarding Scheduling of a Hearing on Water Right Permit Application No. 6211-3, Delmar Ortman, addressed as stated below:

Delmar Ortman, 26731 445th Ave., Marion, SD 57043

James and Debra K. Tieszen, 26610 446th Ave., Marion, SD 57043-6409

Noel Matson, U.S. Fish and Wildlife Service, P.O. Box 48, Madison, SD 57042

A copy of the above described Notice was sent Inter-office to:

Diane Best, Assistant Attorney General, Capitol Building



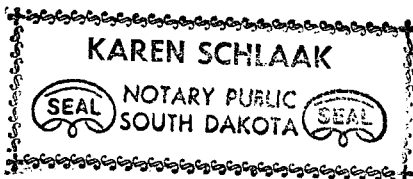
Eric S. Gronlund
Natural Resources Engineer
Water Right Program

STATE OF SOUTH DAKOTA)
) SS
COUNTY OF HUGHES)

Sworn to, before me, this 7th day of November, 2000.



Karen Schlaak
Notary Public



KAREN SCHLAACK, Notary Public
My Commission Expires
April 1, 2001



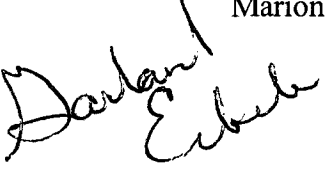
**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

December 18, 2000

NOTICE

TO: Delmar Ortman James and Debra Tieszen
26731 445th Avenue 26610 446th Avenue
Marion SD 57043 Marion SD 57043

FROM: Garland Erbele, Chief Engineer 
Water Rights Program

SUBJECT: Preparation of Findings of Fact, Conclusions of Law and Final Decision

The Water Management Board directed John Guhin, the Board's attorney, to prepare proposed Findings of Fact, Conclusions of Law and a Final Decision in the matter of Water Permit Application No. 6211-3 filed by the Delmar Ortman. The Board will consider the proposed Findings, Conclusions and Final Decision at 1:00 PM on March 7, 2001 in the Floyd Matthew Training Center, Joe Foss Building, 523 E. Capitol Avenue, Pierre SD.

The Board requested that a copy of the proposed Findings, Conclusions and Final Decision be mailed to each Board member and Parties of Record (names listed above) by February 15, 2001. Written objections or comments in support of the proposed Findings, Conclusions and Final Decision, or alternative Findings, Conclusions and Final Decision are to be mailed to each Board member, the Board attorney (mailing list enclosed) and all Parties of Record by February 26, 2001.

Oral arguments by parties filing written comments in opposition or support of the proposed Findings, Conclusions and Final Decision, or alternative Findings, Conclusions and Final Decision may be made on March 7, 2001. The public hearing was completed December 6, 2000. No additional testimony will be received on March 7, 2001.

Enclosure

c: John Guhin, Deputy Attorney General
Diane Best, Assistant Attorney General
Noel Matson, U.S. Fish and Wildlife Service, PO Box 48, Madison SD 57042

CERTIFICATION

I, hereby certify that on December 18, 2000 , I have personally deposited with the United States mail at Pierre, South Dakota, first class postage, prepaid envelopes containing a Notice dated December 18, 2000 regarding Preparation of Findings of Fact, Conclusions of Law and Final Decision in the matter of Water Permit Application No. 6211-3 addressed as stated below:

Delmar Ortman
26731 445th Avenue
Marion SD 57043

James and Debra Tieszen
26610 446th Avenue
Marion SD 57043

Noel Matson
US Fish & Wildlife Service
PO Box 48
Madison SD 57042

A copy of the above described Notice was sent Inter-office to:

Diane Best, Assistant Attorney General, Capitol Building
John Guhin, Deputy Attorney General, Capitol Building



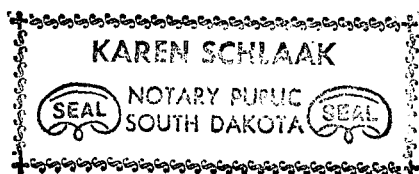
Eric Gronlund
Natural Resource Engineer
Water Right Program

STATE OF SOUTH DAKOTA)
) SS
COUNTY OF HUGHES)

Sworn to, before me, this 19th day of December, 2000.



Notary Public



KAREN SCHLAACK, Notary Public
My Commission Expires
April 1, 2001

STATE OF SOUTH DAKOTA



OFFICE OF ATTORNEY GENERAL

500 East Capitol Avenue
Pierre, South Dakota 57501-5070
Phone (605) 773-3215
FAX (605) 773-4106
www.state.sd.us/atg

MARK BARNETT
ATTORNEY GENERAL

LAWRENCE LONG
CHIEF DEPUTY ATTORNEY GENERAL

February 6, 2001

TO: Members of the Water Management Board and Interested Parties

FROM: John P. Guhin, Deputy Attorney General *John P. Guhin*

RE: Water Permit Application No. 6211-3

Pursuant to the direction of the Board, I am herewith enclosing proposed Findings of Fact, Conclusions of Law, and a Final Decision. Please see the Notice of the Chief Engineer dated December 18, 2000, for further information.

JPG:js
Enclosures

STATE OF SOUTH DAKOTA

BEFORE THE WATER MANAGEMENT BOARD

IN THE MATTER OF WATER PERMIT	)	FINDINGS OF FACT, CONCLUSIONS
APPLICATION NO. 6211-3,	)	OF LAW AND FINAL DECISION
DELMAR ORTMAN,	)	

FINDINGS OF FACT

1. This is an application to authorize a dam with a storage capacity of 59 acre feet of water and to appropriate sufficient water annually to maintain the water level to the outlet elevation.

2. The water is proposed to be used for fish and wildlife production and livestock watering.

3. The dam is proposed to be 22 feet high with a normal storage capacity of 59 acre feet with a reservoir level at the primary spillway elevation, and a maximum storage capacity of 145 acre feet with a reservoir level at the top of the dam elevation.

4. The dam will be classified as a small size, Category 3, Low Hazard dam. A dam of this size and hazard classification must be designed to have a minimum spillway design capable of passing a twenty-five year frequency event. This dam will have a 150-foot wide secondary spillway which will have a capacity of approximately 2,025 CFS. A twenty-five year frequency event for this drainage area produces a peak run-off of approximately 490 CFS. The hundred year frequency event produces a peak of approximately 962 CFS. The spillway design is therefore easily sufficient to pass the probable precipitation events in the area.

5. The Board finds that there is a reasonable probability that there is unappropriated water available for the Applicant's

proposed use. The uncontradicted evidence demonstrates that the annual yield for this drainage area with an eighty percent chance of occurrence is 96 acre feet. The annual yield with a fifty percent chance of occurrence is 231 acre feet.

6. The Board finds that the fish and wildlife protection and livestock watering are beneficial uses.

7. The Opponents, in effect, challenge the grant of this permit on the grounds that it cannot be developed without unlawful impairment of existing rights and that it is not in the public interest.

8. The Opponents essentially argue that the operation of the dam will cause erosion to their detriment. In particular, the Opponents allege that when the dam is full, and the secondary spillway is in use, the water will fall 14 1/2 feet below the spillway to the ground with great velocity. The water will then, they argue, flow rapidly to the property of the Opponents and into a creek which goes through their pasture, and the bends in the creek will be eroded.

9. The Board finds, contrary to the assertions of the Opponents, that the existence of the dam will, in fact, ameliorate or lessen any adverse effects to the Opponents from precipitation events. The Board's finding is based upon several facts. First, Peter Anderson, the NRCS employee who designed the dam, testified that dam, as designed, would lessen erosion because it will meter water out slowly; the slower velocity of the water will cause less erosion than would naturally occur. When the water does come through the secondary spillway, the

event will be of short duration, according to Anderson. When the land is vegetated, it can endure the amount of water which will flow on it without erosion. Mr. Anderson testified that he had designed hundreds of dams and indicated that his testimony was consistent with his experience with regard to those dams.

10. Next, the Board credits the testimony of a neighbor who lives five miles away and who had a similar dam put in by U.S. Fish and Wildlife. The owner testified that he had had the same concerns as the present Opponents. His experience, however, was that even after a major rainfall event, the amount of water that flowed over the spillway was very minimal; he testified that even immediately after the construction of the dam, erosion was minute. The neighbor testified that when vegetation grew up, the effect became even less.

11. The neighbor testified that the drop of his spillway to the ground was ten feet, at least, and the creek about which he was concerned was much shallower than the creek about which the present day Opponents are concerned.

12. In addition, the testimony of the State employee expert indicated that the dam was over designed and that it would actually pass more than the standards demanded. According to the testimony of the State's expert, federal modeling indicates that the velocity of water over the spillway will be less than five feet per second. At that velocity, no erosion should occur, according to the modeling utilized by the federal government.

13. The evidence strongly indicates that the project thus can be developed without unlawful impairment of existing rights

and that it is in the public interest, and that the downstream opponents will not be harmed.

CONCLUSIONS OF LAW

1. The Board has jurisdiction of the matter.
2. There is a reasonable probability that there is unappropriated water available for the Applicant's proposed use.
3. The proposed diversion can be developed without unlawful impairment of existing rights. The Board has found above that the dam, as designed, should operate to lessen the effects of erosion downstream, not increase them.
4. The proposed uses for fish and wildlife protection and livestock watering are beneficial uses.
5. The proposed uses are in the public interest, as the permit is qualified below.

FINAL DECISION

The Application for Water Permit No. 6211-3 is granted with the following qualifications:

1. Water Permit No. 6211-3 authorizes a dam with a storage capacity of 59 acre feet of water and sufficient water annually to maintain the water level to the outlet elevation.
2. Low flows as needed for downstream domestic use, including livestock water and prior water rights must be by-passed.

Dated this _____ day of _____, 2001.

BY THE BOARD:

Chairman

CERTIFICATE OF SERVICE

The undersigned hereby certifies that true and correct copies of proposed Findings of Fact, Conclusions of Law, and Final Decision in the case entitled In the Matter of Water Permit Application No. 6211-3, Delmar Ortman were served upon each of the following by enclosing the same in envelopes with first class postage, prepaid and affixed thereto, and depositing said envelopes in the United States mail, at Pierre, South Dakota, on this 6th day of February, 2001:

Leo Holzbauer
RR 1, Box 170
Wagner, SD 57380-9681

Rodney Freeman, Jr.
P.O. Box 176
Huron, SD 57350-0176

Bernita Loucks
219 42nd Street
Rapid City, SD 57702-0240

Marian Gunderson
811 W. 3rd
Yankton, SD 57078-3702

Dwayne Rollag
320 Lincoln Lane S.
Brookings, SD 57785

Francis E. Brink
1214 S. Wells Street
Aberdeen, SD 57401-7351

James Reed
20780 132nd Avenue
Sturgis, SD 57785

John Bruch
HC 77, Box 36
Sturgis, SD 57785

Delmar Ortman
26731 445th Avenue
Marion, SD 57043

James and Debra Tieszen
26610 446th Avenue
Marion, SD 57043

Noel Matson
U.S. Fish and Wildlife Service
P.O. Box 48
Madison, SD 57042-0048

by hand delivery upon:

Diane Best, Assistant Attorney General
Office of Attorney General
Capitol Building
500 East Capitol Avenue
Pierre, SD 57501-5070

and by interoffice mail upon:

Eric Gronlund, Natural Resource Engineer
Department of Environment and
Natural Resources
Foss Building
523 E. Capitol Avenue
Pierre, SD 57501-3182



John P. Guhin
Deputy Attorney General
500 East Capitol Avenue
Pierre, South Dakota 57501-5070
Telephone: (605) 773-3215

j-wmb.jpg Water Permit No. 6211-3

STATE OF SOUTH DAKOTA



OFFICE OF ATTORNEY GENERAL

500 East Capitol Avenue
Pierre, South Dakota 57501-5070
Phone (605) 773-3215
FAX (605) 773-4106
www.state.sd.us/atg

MARK BARNETT
ATTORNEY GENERAL

LAWRENCE LONG
CHIEF DEPUTY ATTORNEY GENERAL

February 21, 2001

Leo Holzbauer
RR 1, Box 170
Wagner, SD 57380-9681

Rodney Freeman, Jr.
P.O. Box 176
Huron, SD 57350-0176

Bernita Loucks
219 42nd Street
Rapid City, SD 57702-0240

Marian Gunderson
811 W. 3rd
Yankton, SD 57078-3702

Dwayne Rollag
320 Lincoln Lane S.
Brookings, SD 57006

Francis E. Brink
1214 S. Wells Street
Aberdeen, SD 57401-7351

Re: In the Matter of Water Permit Application No. 6211-3, Delmar
Ortman

Members of the Board:

The Department of Environment and Natural Resources, Water Rights Program, has reviewed the proposed Findings of Fact and Conclusions of Law in the above-referenced matter. The DENR has no objection to entry of the proposed findings as drafted. The DENR does note, however, that Finding of Fact No. 9, line 7, provides that the dam will "meter" water out slowly. Since the term "meter" is used most frequently with reference to a measuring device, you may want to consider the term "mete" since a measuring device is not used. Thank you for the opportunity to comment on this matter.

By copy of this letter, I am providing the DENR's comments to the parties in this case.

Sincerely,

Diane Best
Diane Best
Assistant Attorney General

DB:nan
Enclosure
cc/enc: Delmar Ortman
James and Debra Tieszen
Noel Matson
John Guhin
Eric Gronlund



STATE OF SOUTH DAKOTA

BEFORE THE WATER MANAGEMENT BOARD

IN THE MATTER OF WATER PERMIT)
APPLICATION NO. 6211-3,)
DELMAR ORTMAN)

CERTIFICATE OF
SERVICE

The undersigned hereby certifies that a true and correct copy of proposed letter dated February 21, 2001, regarding Findings of Fact, Conclusions of Law, and Final Decision in the above-captioned matter was served by United States mail, first class, postage prepaid upon:

Leo Holzbauer
RR 1, Box 170
Wagner, SD 57380-9681

Rodney Freeman, Jr.
P.O. Box 176
Huron, SD 57350-0176

Bernita Loucks
219 42nd Street
Rapid City, SD 57702-0240

Marian Gunderson
811 W. 3rd
Yankton, SD 57078-3702

Dwayne Rollag
320 Lincoln Lane S.
Brookings, SD 57006

Francis E. Brink
1214 S. Wells Street
Aberdeen, SD 57401-7351

Delmar Ortman
26731 445th Avenue
Marion, SD 57043

James and Debra Tieszen
26610 446th Avenue
Marion, SD 57043

Noel Matson
U.S. Fish and Wildlife Service
P.O. Box 48
Madison, SD 57042-0048

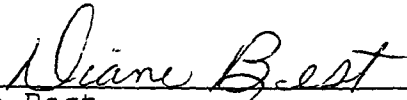
by interoffice mail upon:

Eric Gronlund
Department of Environment and
Natural Resources
Foss Building
523 E. Capitol Avenue
Pierre, SD 57501-3182

and by hand delivery upon:

John P. Guhin
Deputy Attorney General
500 E. Capitol Avenue
Pierre, SD 57501-5070

on this 21st day of February, 2001.



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

pld220.db(nan)



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

March 26, 2001

NOTICE

TO: Delmar Ortman James and Debra Tieszen
26731 445th Avenue 26610 446th Avenue
Marion SD 57043 Marion SD 57043

FROM: Garland Erbele, Chief Engineer
Water Rights Program *Garland Erbele*

SUBJECT: Adoption of Findings of Fact, Conclusions of Law and Final Decision

This is to notify you that the Final Decision, including Findings of Fact and Conclusions of Law, were adopted March 7, 2001, by the Water Management Board approving Water Right Permit Application No. 6211-3 filed by Delmar Ortman. A copy of the signed Findings of Fact, Conclusions of Law and Final Decision is enclosed.

South Dakota statutes provide that decisions of the Board may be appealed to the Courts. Notice of appeal of the Board's decision must be filed within thirty days of this notice and be in accordance with procedures established in SDCL 1-26-31.

Enclosure

c: John Guhin, Deputy Attorney General
Diane Best, Assistant Attorney General
Noel Matson, U.S. Fish and Wildlife Service, PO Box 48, Madison SD 57042

CERTIFICATION

I hereby certify that on March 26, 2001 , I have personally deposited with the United States mail at Pierre, South Dakota, first class postage, prepaid envelopes containing a Notice dated March 26, 2001 regarding Notice of Adoption of Findings of Fact, Conclusions of Law and Final Decision addressed as stated below:

Delmar Ortman
26731 445th Avenue
Marion, SD 57043

James and Debra Tieszen
26610 446th Avenue
Marion, SD 57043

Noel Matson
US Fish and Wildlife Service
PO Box 48
Madison, SD 57042

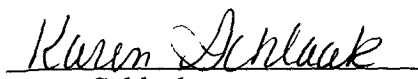
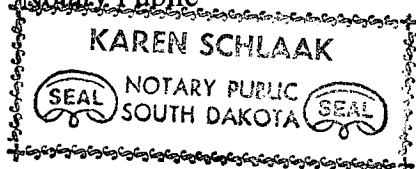
A copy of the above described Notice was sent Inter-office to:

Diane Best, Assistant Attorney General, Capitol Building
John Guhin, Deputy Attorney General, Capitol Building


Eric Gronlund
Natural Resource Engineer
Water Rights

STATE OF SOUTH DAKOTA)
) SS
COUNTY OF HUGHES)

Sworn to, before me, this 27th day of March, 2001.


Karen Schlaak
Notary Public

KAREN SCHLAAK, Notary Public
My Commission Expires
April 1, 2001

STATE OF SOUTH DAKOTA

BEFORE THE WATER MANAGEMENT BOARD

IN THE MATTER OF WATER PERMIT	)	FINDINGS OF FACT, CONCLUSIONS
APPLICATION NO. 6211-3,	)	OF LAW AND FINAL DECISION
DELMAR ORTMAN,	)	

FINDINGS OF FACT

1. This is an application to authorize a dam with a storage capacity of 59 acre feet of water and to appropriate sufficient water annually to maintain the water level to the outlet elevation.

2. The water is proposed to be used for fish and wildlife production and livestock watering.

3. The dam is proposed to be 22 feet high with a normal storage capacity of 59 acre feet with a reservoir level at the primary spillway elevation, and a maximum storage capacity of 145 acre feet with a reservoir level at the top of the dam elevation.

4. The dam will be classified as a small size, Category 3, Low Hazard dam. A dam of this size and hazard classification must be designed to have a minimum spillway design capable of passing a twenty-five year frequency event. This dam will have a 150-foot wide secondary spillway which will have a capacity of approximately 2,025 CFS. A twenty-five year frequency event for this drainage area produces a peak run-off of approximately 490 CFS. The hundred year frequency event produces a peak of approximately 962 CFS. The spillway design is therefore easily sufficient to pass the probable precipitation events in the area.

5. The Board finds that there is a reasonable probability that there is unappropriated water available for the Applicant's

proposed use. The uncontradicted evidence demonstrates that the annual yield for this drainage area with an eighty percent chance of occurrence is 96 acre feet. The annual yield with a fifty percent chance of occurrence is 231 acre feet.

6. The Board finds that the fish and wildlife protection and livestock watering are beneficial uses.

7. The Opponents, in effect, challenge the grant of this permit on the grounds that it cannot be developed without unlawful impairment of existing rights and that it is not in the public interest.

8. The Opponents essentially argue that the operation of the dam will cause erosion to their detriment. In particular, the Opponents allege that when the dam is full, and the secondary spillway is in use, the water will fall 14 1/2 feet below the spillway to the ground with great velocity. The water will then, they argue, flow rapidly to the property of the Opponents and into a creek which goes through their pasture, and the bends in the creek will be eroded.

9. The Board finds, contrary to the assertions of the Opponents, that the existence of the dam will, in fact, ameliorate or lessen any adverse effects to the Opponents from precipitation events. The Board's finding is based upon several facts. First, Peter Anderson, the NRCS employee who designed the dam, testified that dam, as designed, would lessen erosion because it will reduce the outflow rate; the slower velocity of the water will cause less erosion than would naturally occur. When the water does come through the secondary spillway, the

event will be of short duration, according to Anderson. When the land is vegetated, it can endure the amount of water which will flow on it without erosion. Mr. Anderson testified that he had designed hundreds of dams and indicated that his testimony was consistent with his experience with regard to those dams.

10. Next, the Board credits the testimony of a neighbor who lives five miles away and who had a similar dam put in by U.S. Fish and Wildlife. The owner testified that he had had the same concerns as the present Opponents. His experience, however, was that even after a major rainfall event, the amount of water that flowed over the spillway was very minimal; he testified that even immediately after the construction of the dam, erosion was minute. The neighbor testified that when vegetation grew up, the effect became even less.

11. The neighbor testified that the drop of his spillway to the ground was ten feet, at least, and the creek about which he was concerned was much shallower than the creek about which the present day Opponents are concerned.

12. In addition, the testimony of the State employee expert indicated that the dam was over designed and that it would actually pass more than the standards demanded. According to the testimony of the State's expert, federal modeling indicates that the velocity of water over the spillway will be less than five feet per second. At that velocity, no erosion should occur, according to the modeling utilized by the federal government.

13. The evidence strongly indicates that the project thus can be developed without unlawful impairment of existing rights

and that it is in the public interest, and that the downstream opponents will not be harmed.

CONCLUSIONS OF LAW

1. The Board has jurisdiction of the matter.
2. There is a reasonable probability that there is unappropriated water available for the Applicant's proposed use.
3. The proposed diversion can be developed without unlawful impairment of existing rights. The Board has found above that the dam, as designed, should operate to lessen the effects of erosion downstream, not increase them.
4. The proposed uses for fish and wildlife protection and livestock watering are beneficial uses.
5. The proposed uses are in the public interest, as the permit is qualified below.

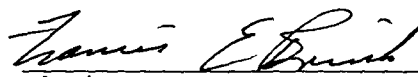
FINAL DECISION

The Application for Water Permit No. 6211-3 is granted with the following qualifications:

1. Water Permit No. 6211-3 authorizes a dam with a storage capacity of 59 acre feet of water and sufficient water annually to maintain the water level to the outlet elevation.
2. Low flows as needed for downstream domestic use, including livestock water and prior water rights must be by-passed.

Dated this 20th day of March 2001.

BY THE BOARD:


Chairman



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

MAY 09 2001

Delmar Ortman
26731 445th Ave.
Marion, SD 57043

Dear Mr. Ortman:

Enclosed is Water Permit No. 6211-3 authorizing construction of your water diversion system and beneficial use of the water, not exceeding the limits as specified in the Water Permit.

Form 10, *Notice of Completion of Works and Application of Water to Beneficial Use*, is enclosed. Please return this completed form after you have finished the system and have put the water to beneficial use. An investigation can then be scheduled so the water license may be issued, thus completing the acquisition of a water right.

An informational sheet *Common Water Right Questions?* is also enclosed. This sheet is intended to answer some of the questions associated with obtaining and keeping a water right.

Sincerely,

Garland Erbele, Chief Engineer
Water Rights Program
(605) 773-3352

enclosures

Permit No. 6211-3
Vermillion River - Water District

Report Of Examination Of Works And/Or Application of Water To Beneficial Use

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

I have this day, May 29, 2002, made a thorough examination of the water use system constructed by Delmar Ortman of 26731 445th Ave., Marion, SD 57043 holder of Permit No. 6211-3, bearing the priority of May 31, 2000 authorizing the storage of 59 acre-feet of the waters of runoff for fish & wildlife propagation and livestock water purposes, in McCook County.

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

A. Works used to divert the water:

A 22 foot high dam with twin 60 inch dia. CMP risers with 36 inch dia. CMP barrels as the primary spillway and a 150 foot wide earthcut secondary spillway that stores 59 acre-feet of water.

B. Works used to transport water to place of use:

N/A

C. Works used to apply water to beneficial use:

A 22 foot high dam with twin 60 inch dia. CMP risers with 36 inch dia. CMP barrels as the primary spillway and a 150 foot wide earthcut secondary spillway that stores 59 acre-feet of water.

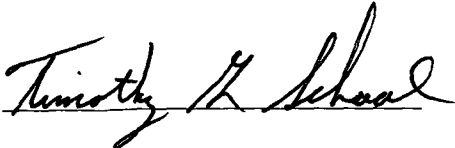
The system is in the following condition good. The point of diversion is located 1220 ft. south & 1800 ft. west of the NE corner of Sec. 33 T101N-R54W (SW 1/4 NE 1/4). The works are capable of storing 59 acre-feet of water which is to be used for fish & wildlife propagation and livestock water. Water has been put to beneficial use to the maximum extent as follows:

A 22 foot high dam with twin 60 inch dia. CMP risers with 36 inch dia. CMP barrels as the primary spillway and a 150 foot wide earthcut secondary spillway that stores 59 acre-feet of water.

and the license should be issued for 59 acre-feet of storage.

Applicable permit qualifications have been complied with: Yes X

Exceptions to compliance are: none Date Report Completed: July 26, 2002



Timothy G. Schaal, P.E.
Natural Resources Engineer Specialist
DENR, Water Rights Program

REPORT ON INSPECTION OF PERMIT NO. 6211-3

Other permit(s) associated with the project: XXXX

DATE OF INSPECTION: May 29, 2002

NAME & ADDRESS OF INSPECTION CONTACT/ Delmar Ortman

RELATIONSHIP TO PERMIT HOLDER, IF APPLICABLE: owner

NAME & ADDRESS OF PERMIT HOLDER: Delmar Ortman, 26731 445th Ave., Marion, SD 57043

DIVERSION POINT LEGAL LOCATION: 1220 ft. south & 1800 ft. west of the NE corner of Sec. 33-T101N-R54W (SW 1/4 NE 1/4).

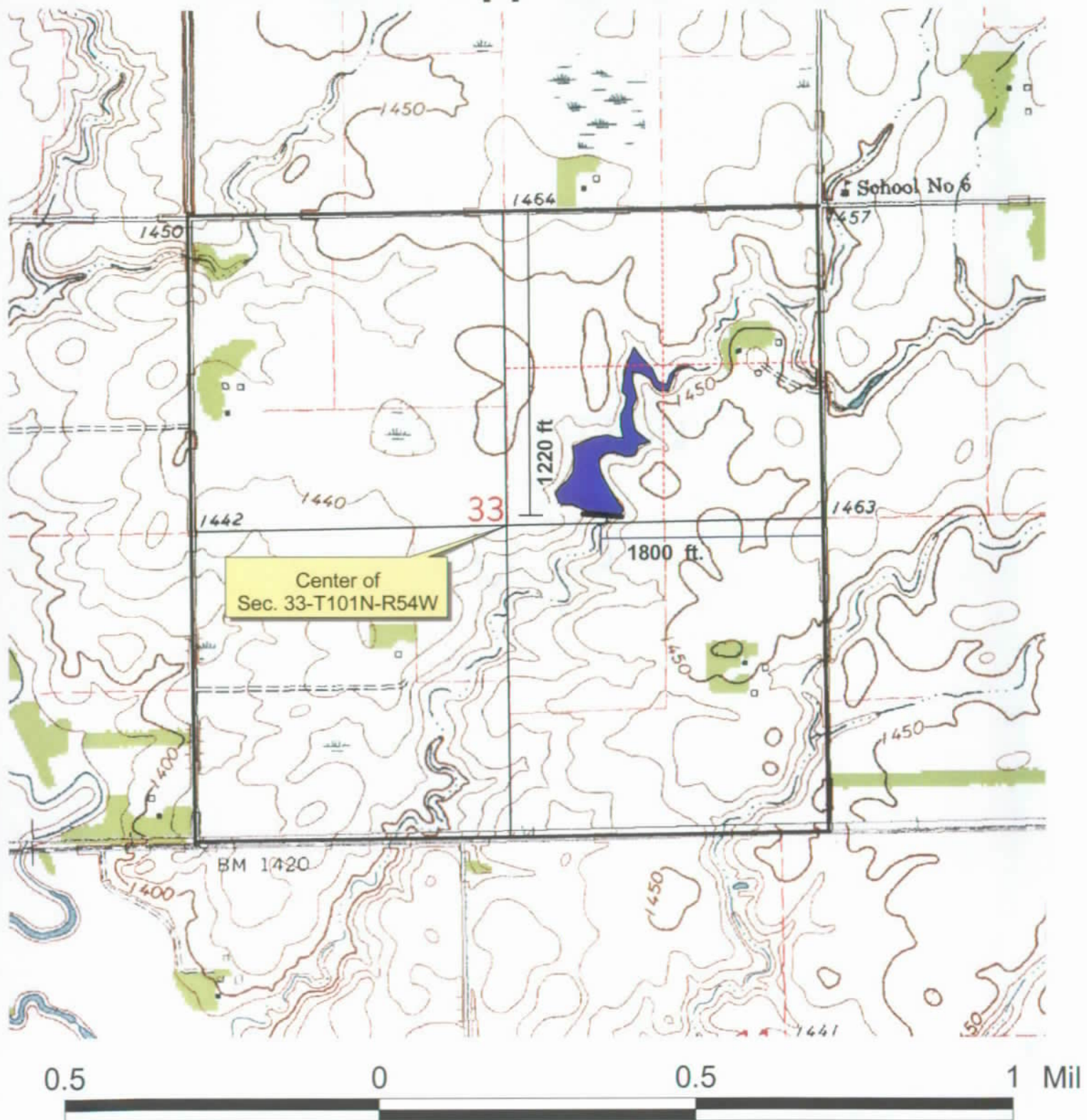
DAM INFORMATION:

- 1) Height to crest 22 feet
- 2) Height to primary spillway 15 feet
- 3) Height to secondary spillway 19 feet
- 4) Crest width 12 feet
- 5) Crest length 375 feet
- 6) Spillway length XXX feet
- 7) Spillway width 150 feet
- 8) Approx. storage (Normal) 59 acre-feet
- 9) Approx. storage (Maximum) 145 acre-feet
- 10) Date constructed: 2001

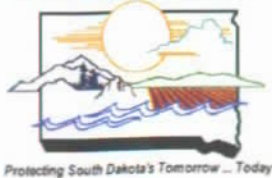
PERMIT QUALIFICATIONS AND REGULATIONS:

- 1) Soil and water permit lands agree with lands being irrigated and lands listed on permit N/A
- 2) Special qualifications to permit being abided by yes
- 3) All structures, wells and lands on map yes
- 4) Irrigation Questionnaires checked to determine if permit owner started irrigation by the end of construction period N/A

Water Permit Application No. 6211-3



South Dakota Department of
Environment and Natural Resources



Timothy G. Schaal
Timothy G. Schaal, P.E. 7/26/02
Natural Resources Engineer Specialist
Water Rights Program

STATE OF SOUTH DAKOTA

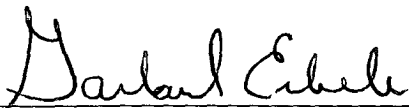
WATER LICENSE NO. 6211-3

(1) Delmar Ortman, 26731 445th Ave, Marion SD 57043 made Application No. 6211-3, May 31, 2000 for a water permit to impound 59 acre-feet of water from runoff, McCook County, South Dakota for fish and wildlife propagation purposes. Permit No. 6211-3, with a priority date of May 31, 2000 was approved March 7, 2001 and issued to the applicant for diversion of water with construction of the described water supply system to be completed on or before March 7, 2006 and for the application to beneficial use of said water on or before March 7, 2010.

(2) It is certified that the permit holder has complied with the provisions of South Dakota State Law relating to completion of the construction of the storage dam and is entitled to impound 59 acre-feet of water for beneficial use with sufficient water annually to maintain the water level to the outlet elevation. The location of the storage dam (spillway) is 1,220 feet south and 1,800 feet west of the northeast corner of Section 33-T101N-R54W (SW ¼ NE ¼).

(3) The permit holder 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 Delmar Ortman, 26731 445th Ave, Marion SD 57043 the holder and/or owner of Water Right No. 6211-3 is issued a license to appropriate water, the right to impound 59 acre-feet of water from runoff with sufficient water annually to maintain the water level to the outlet elevation with a priority date of May 31, 2000 from the location specified in (2) of this license for fish and wildlife propagation purposes. This license is subject to any limitations or qualifications listed in Water Right No. 6211-3 and subject to South Dakota State Law.



Garland Erbele, Chief Engineer
Water Rights Program
Department of Environment and Natural Resources

SEP 20 2002

date





**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

SEP 20 2002

6211-3

Delmar Ortman
26731 445th Ave
Marion SD 57043

Dear Mr. Ortman:

Enclosed is Water License No. 6211-3. This is the final water right document completing your process of obtaining a Water Right.

As long as you use the water beneficially, as stated in the Water License, State Water Laws provide that you have a continuing right to use the water.

Sincerely,

Garland Erbele, Chief Engineer
Water Rights Program
(605) 773-3352

enclosures