

WATER PERMIT NO. 6634-3

Name of Applicant: P J Werdel & Sons Inc.

Address: 21711 345th Ave, Ree Heights SD 57371

Phone: 605 943-5609

Amount of Water Claimed: 1.89 cfs

Total Acres: 160

Source of Water Supply: runoff – 196 AF storage dam

Water to be used for: irrigation

County: Hand

Type of Waste Disposal System:

Location: 19 miles south of Ree Heights

PRIORITY Date Received: 6-17-05

Application/License Fee: \$300

Corrected Application Received: 6-24-05

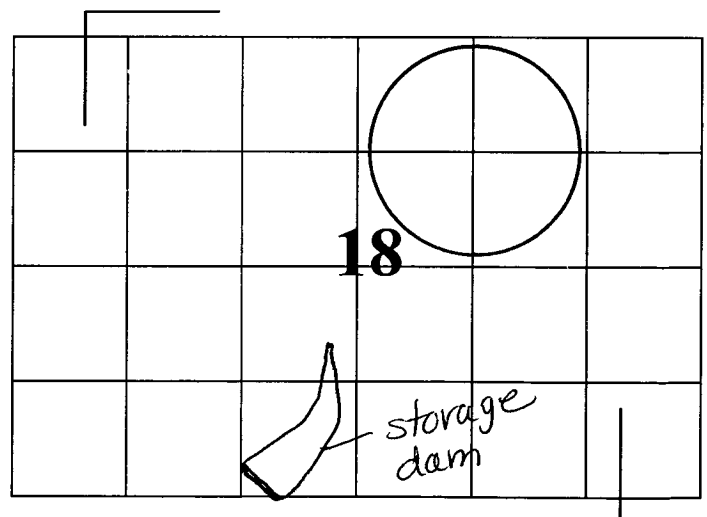
Period of Annual Use: May 1 – October 31 (irrigation)

Remarks:

Storage Dam location: SE ¼ SW ¼ Sec 18-T109N-

R70W

Land to be Irrigated: NE ¼ Sec 18-T109N-R70W



Depth of Well: NA

Well Driller:

Remarks:

Type of Map: plat

Prepared by: Dale F Leffers, PE

Reviewed and the Number Assigned on: 6-27-05

By: Karen Schlaak

Notice of Hearing - date to intervene: _____

Mail to: Water Rights Program Joe Foss Building 523 E. Capitol Pierre, SD 57501-3181 (605) 773-3352	No. <u>6634-3</u> (office use only)	Hydrologic Unit <u>10140105</u>
	Basin <u>Missouri River</u>	
	Newspaper <u>Miller Press</u>	

RECEIVED

JUN 17 2005

WATER RIGHTS
PROGRAM

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 <u>Irrigation</u> | |

Type of Application:
(check one)

- ☒ New ☐ Vested Right (Use predates Mar 2, 1955) ☐ Future Use Reservation
☐ 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 PJ Werdel & Sons Inc. Phone (605) 943-5609
 (check one) ☒ Owner ☐ Tenant/lessee
 Mailing Address 21711 345th Ave Ree Heights State SD 57371
 (Street, RR, or Box and City) (Zip Code)
- Amount of water claimed 1.89 *CFS or 850 **GPM 196.00 ***AF
 (*Cubic Feet per Second) (**Gallons per Minute) (***Acre Feet - storage capacity of dam/dugout or annual use if applicable)
- Source of water supply storage dam-runoff Acres Irrigated: 160
- Location of point of diversion (example - 3 wells in SW1/4 NE1/4 section 12-T104N-R53W) County Hand
1 Dam in SE 1/4 SW1/4 Section 18-T109N-R70W water Impounded: E 1/2 SW 1/4 Sec 18-T109N-R70W
Area Irrigated: NE 1/4 Sec 18 - T109N-R70W
- County or counties where water will be used Hand
- Annual period during which water is to be used May to October 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)
Construct a dam to contain runoff water for irrigation use.

STATE OF SOUTH DAKOTA)

County of Hand

SS

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, Ed Werdel, 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.Applicant's signature Ed WerdelSubscribed and sworn to before me this 14 day of June 20 05
Sheila Coss
 Notary Public signature
My Commission
Expires 3/27/2009

**SOUTH DAKOTA
WATER PERMIT NO. 6634-3**

Date of first receipt of application June 17, 2005.

Date of return to applicant for corrections, amendments or changes July 14, 2005.

Date of receipt of corrected application August 24, 2005.

The Chief Engineer, on behalf of the Water Management Board, issues Water Permit No. 6634-3 to PJ Werdel & Sons Inc., 21711 345th Ave, Ree Heights SD 57371 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. 6634-3 appropriates 1.89 cubic feet of water per second from a dam (196 acre-feet storage capacity) located in the SE ¼ SW ¼ Section 18 to irrigate 160 acres located in the NE ¼ Section 18; all in T109N-R70W. The dam is located on an unnamed tributary to Elm Creek. Water from the dam may be blended with effluent from a wastewater lagoon from a cattle feeding operation prior to application to the land.
2. The amount of the appropriation may not exceed 2 acre feet annually for each acre of land to which water is actually and beneficially applied for irrigation. The water is to be used during the following described annual period: May 1 – October 31 (irrigation) and January 1 – December 31 (storage dam).
3. The date from which applicant may claim right is August 24, 2005.
4. The date of approval of Permit No. 6634-3 is October 3, 2005.
5. One-fifth of the construction is to be completed on or before April 3, 2008.
6. All construction is to be completed on or before October 3, 2010.
7. Water is to be put to beneficial use on or before October 3, 2014.
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. 6634-3 authorizes a dam with a storage capacity of 196 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 bypassed.
3. The system shall be designed to prohibit the flow of liquid from the livestock waste pond back towards the irrigation dam. Depending on the design, this may require installation of a check valve or similar device.
4. This Permit is approved subject to the irrigation water use questionnaire being submitted each year.

WATER MANAGEMENT BOARD

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

NOV 03 2005
date



(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

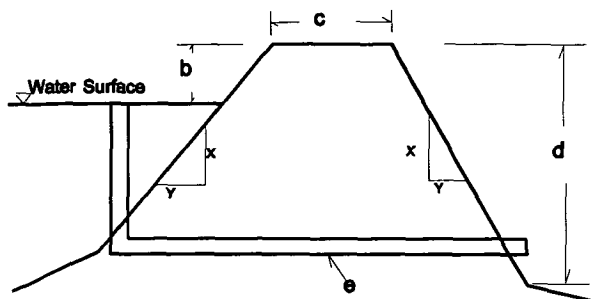
- a) Surface Dimensions _____ Depth _____
- b) Depth to water (ground surface to water level) _____

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:

Settje Agri-Services and Engineering, Inc.
4700 W Rock Creek Rd
Raymond NE 68428



- b) Freeboard 15
- c) Crest Width 15
Crest Length See plans
- d) Height 38 40
- e) Primary Outlet Capacity 93 cfs
If pipe, diameter 24 in
- f) Secondary Spillway Capacity 1116 cfs
Spillway Width 50
- g) X & Y Slope
Upstream 3:1
Downstream 3:1
- h) Surface Area of Impoundment 12.3
- i) Storage 196.0 Acre Feet
- j) Drainage Area Above Dam 1,055.0 Acres

RECEIPT

WATER RIGHTS PROGRAM

South Dakota Department of Environment and Natural Resources

Date June 17, 20 05

RECEIVED OF Settje Agri@services & Engineering Inc., 4700 W Rock Creek Rd., Raymond NE 68428

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

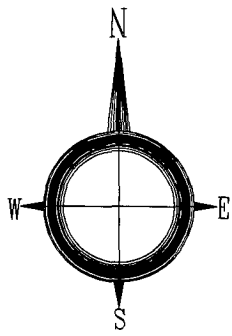
Fee for Application for Permit No. <u>6634-3</u> to Appropriate Water, to construct and to put water to beneficial use	250	00
Fee for Application for Permit No. _____ to Appropriate Water for Future use		
Fee to retain Future Use Permit No. _____ after period of seven years.		
Fee for Inspecting Constructed Works, confirming beneficial use and issuing Water License No. <u>6634-3</u>	50	00
Fee for Filing Transfer Form _____		
Fee for _____		
Fee for Issuing New Well Driller's License No. _____ for C.Y. _____		
Fee for Renewal of Well Driller's License No. _____ for C.Y. _____		
Fee for Issuing Well Pump Installer's License No. _____ for C.Y. _____		
Fee for Renewal of Well Pump Installer's License No. _____ for C.Y. _____		
(Any Other Work Provided by Law)	TOTAL	300.00

No.

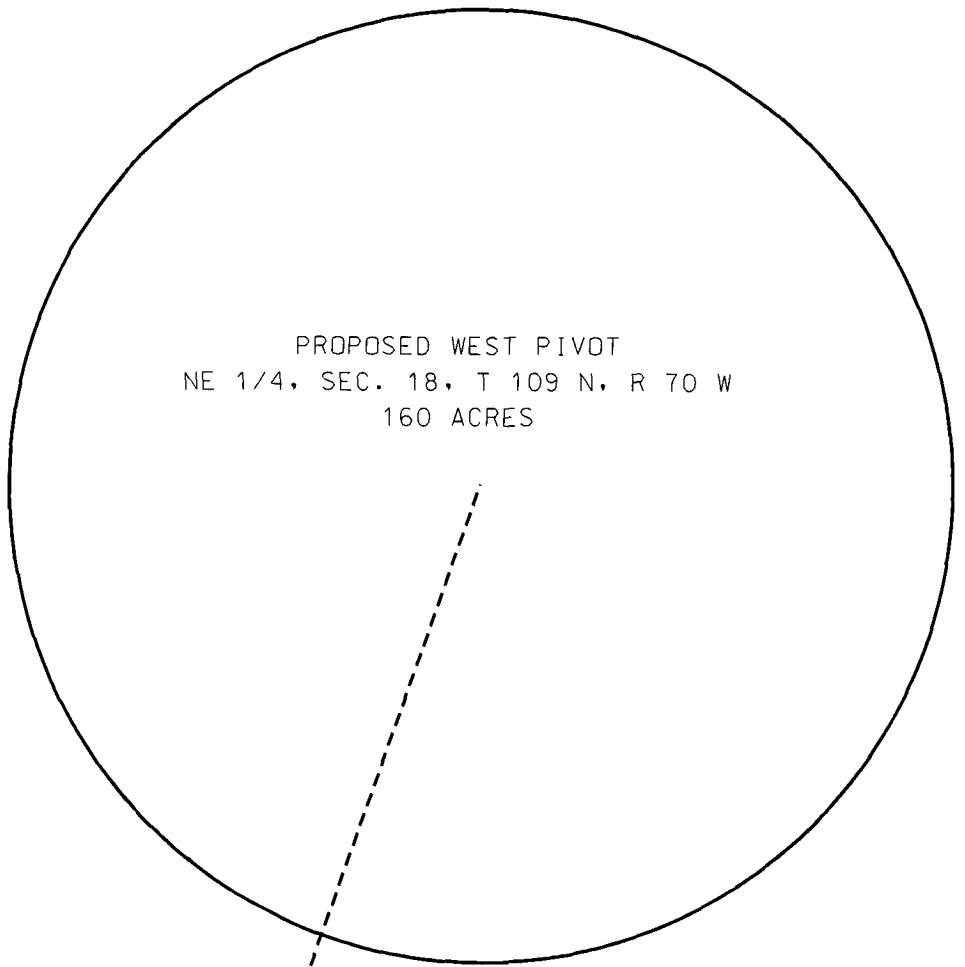
00187

By

Darlene Ebele
Chief Engineer gm



SCALE: 1"=500'



UNDERGROUND PIPE TO PIVOT

PROPOSED WEST
IRRIGATION POND

850 GPM PUMP

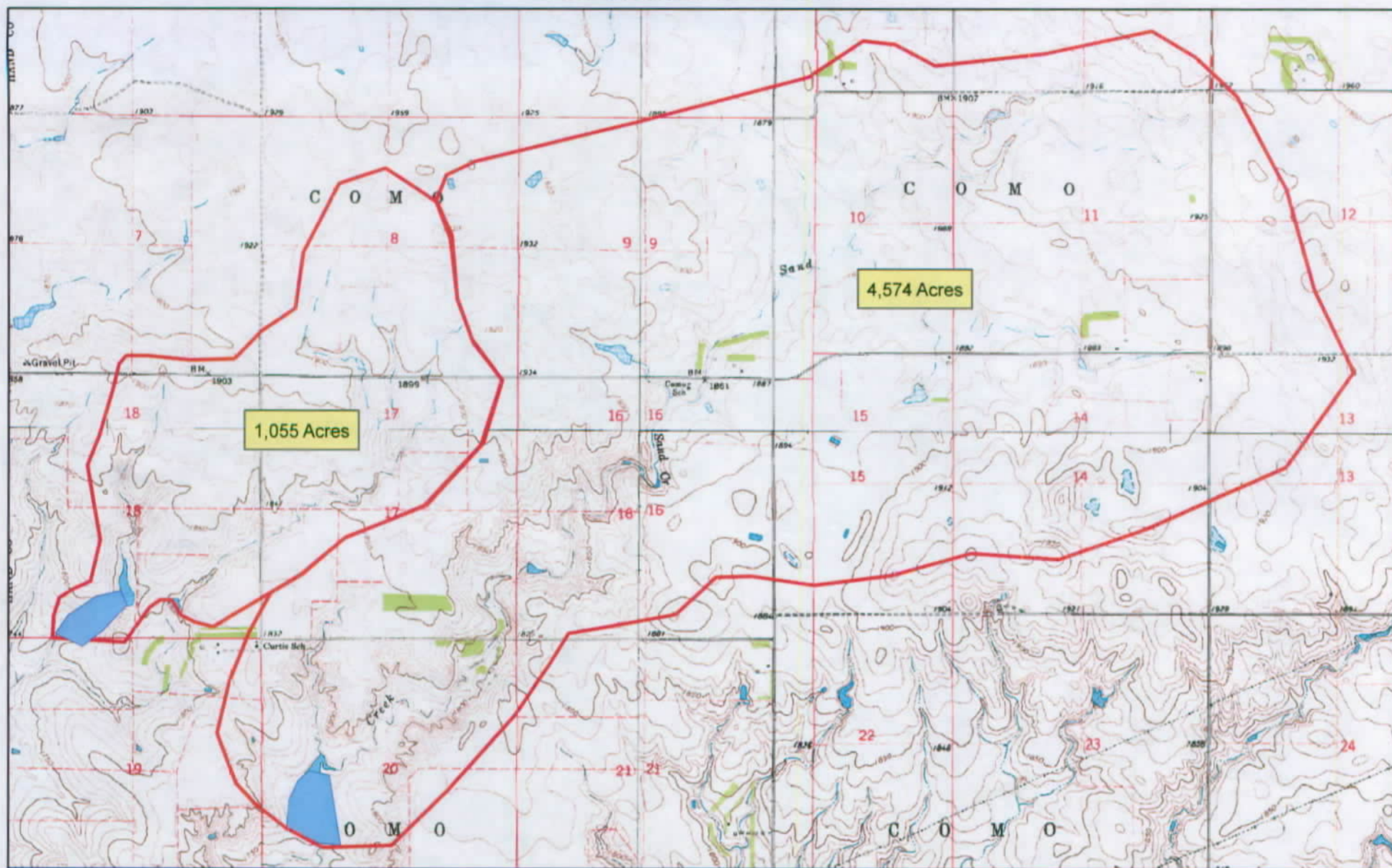
PROPOSED LIVESTOCK
WASTE POND

WEST IRRIGATION PLAN
PJ WERDEL & SONS INC.
NE 1/4, SEC 19, T 109 N, R 70 W
NE 1/4, SEC 20, T 109 N, R 70 W
HAND COUNTY
SETTJE AGRI SERVICES
AND ENGINEERING, INC.

REGISTERED PROFESSIONAL ENGINEER AND ARCHITECT
REG. NO. 6617
DALE F. LEFFERS
SOUTH DAKOTA

4/22/16

P.J. Werdel & Sons Inc



-  Drainage Area
-  Irrigation Ponds

0 900 1,800 3,600 5,400 7,200 Feet



Settje Agri-Services & Engineering, Inc.



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

July 14, 2005

Steve Westerbuhr
Settje Agri-Services & Engineering
4700 W. Rock Creek Rd.
Raymond, NE 68428

I'm writing as a follow up to the phone conversation we had yesterday regarding the plans and specifications for the two dams associated with Water Permit Nos. 6633-3 and 6634-3 for PJ Werdel & Sons, Inc. The follow is a summary of the items we discussed.

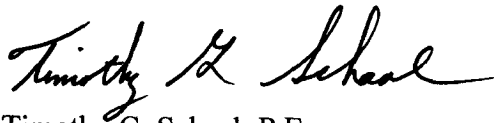
1. In your cover letter dated June 22, 2005 you reference that both dams were designed for 50-year, 24 hour events; however, the Waterway Capacity Calculations data indicates a return period of 25 years was used. You indicated that you thought the calculations were correct and only needed to change the return period figure, however, you would double check the calculations along with sending me copies of your reference material for these calculations.
2. We discussed using 3 feet of freeboard on the emergency spillways for both dams instead of only 2 feet as shown on the plan sheets and stage storage data. Along with that, we discussed the fact that the elevations for top of dam, secondary spillway and primary spillway for the West Dam on the plan sheet Cross Section BB and the elevations used on the stage storage data page do not match up. You indicated the elevations on the stage storage page should be the correct elevations; however, to reflect the 3 foot freeboard change you will need to submit new cross sections and stage storage data for both dams.
3. Instead of using the HDPE pipe as the primary spillway risers, we discussed using a concrete riser on both dams similar to what I see on NRCS designed dams in South Dakota. Enclosed is a copy of a set of NRCS plans illustrating what I would like to see incorporated in your design and shown on the plan sheets. I checked with the NRCS and they get the pre-cast risers from South Dakota Concrete Products in Rapid City (605-343-1450).
4. You indicated you would send size and elevation information on the breach and/or diversion ditch from the east dam transferring that drainage over to the west dam.

Page 2
Steve Westerbuhr
July 14, 2005

5. And finally, we discussed the existing dam just upstream of the West Dam. You indicated that you did not include the upper dam's storage capacity in the Water Permit Application since it will be unavailable to use with the pump being located in the lower reservoir. My concern with this is that with the additional drainage area diverted into the upper dam from the east, the existing spillway located at the west end of the upper dam will eventually eroded to where both reservoirs are connected or there may be times during low runoff years that the Werdel's may want the two reservoirs connected. You indicated you would talk this over with Mr. Werdel and maybe try to connect the reservoirs with an additional pipe. If so, that detail should be included on the plan sheets and the storage capacity for Water Permit Application No. 6634-3 (West Dam) should be changed to include both reservoirs.

Thank you for discussing these matters with me and please let me know if you have any questions. Also please let me know when you will be up here on site so I could come out and look things over with you.

Sincerely,



Timothy G. Schaal, P.E.
Natural Resources Engineer Specialist
Water Rights Program
(605) 773-3352

enclosure

c: PJ Werdel & Sons, Inc.

Water Permit Application No. 6634-3
 P I Wierdel & Sons Inc.
 West Dam

Top of Dam Elev. - *1806
 2nd Spillway Elev. - 1803
 P. Spillway Elev. - 1801
 DIS Top Elev. - 1766

Cont. 3 - Low Hazard Dam

Ht. = 40 ft. * Elevations are Local Datum

Normal Storage Capacity - 196 Ac-Ft
 Int. Storage Capacity - 222
 Max. Storage Capacity - 265

Int. Capacity x Eff. Ht. = $222 \times 37 = 821473000 \therefore 50 \text{ yr.}$
Minimum Spillway Design

From USGS WRI 98-4055" Tech. for Est. Peak Flood ... in 50"

$$DA = 1055 A_c = 1.65$$

$$P_{II} = 0.80 \text{ Region B}$$

$$Q_{50} = 206 C A^{.606} P_{II}^{.728}$$

$$= 206 (1.65)^{.606} (0.80)^{.728}$$

$$= 206 (1.3546) (0.8501)$$

$$= \underline{237 \text{ cfs}}$$

$$Q_{100} = 275 C A^{.625} P_{II}^{.742}$$

$$= 275 (1.65)^{.625} (0.80)^{.742}$$

$$= 275 (1.3675) (0.8474)$$

$$= \underline{320 \text{ cfs}}$$

Secondary Spillway Flow

$$Q = C L H^{3/2}$$

$$C = 2.6$$

$$L = 50$$

$$H = 3$$

$$= 2.6 (50) (3)^{1.5}$$

$$= \underline{675 \text{ cfs}}$$

Settje Hy-Services used the Rational Method $Q = CIA$ to calc. a Q_{50} peak of 650 cfs and a sloped Secondary Spillway.

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. EPM - N/A Cont. 3 - OK

NRCS Annual Yield

$$DA = 1055 ISD = 2 \quad CN = 78$$

$$80\% \text{ chance} = 0.20$$

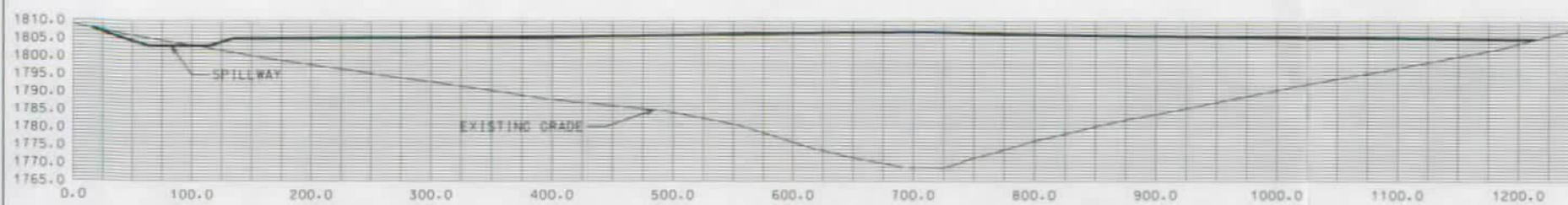
$$0.20 \times 1055^{1/2} = \underline{18 \text{ Ac-Ft}}$$

$$50\% \text{ chance} = 0.50$$

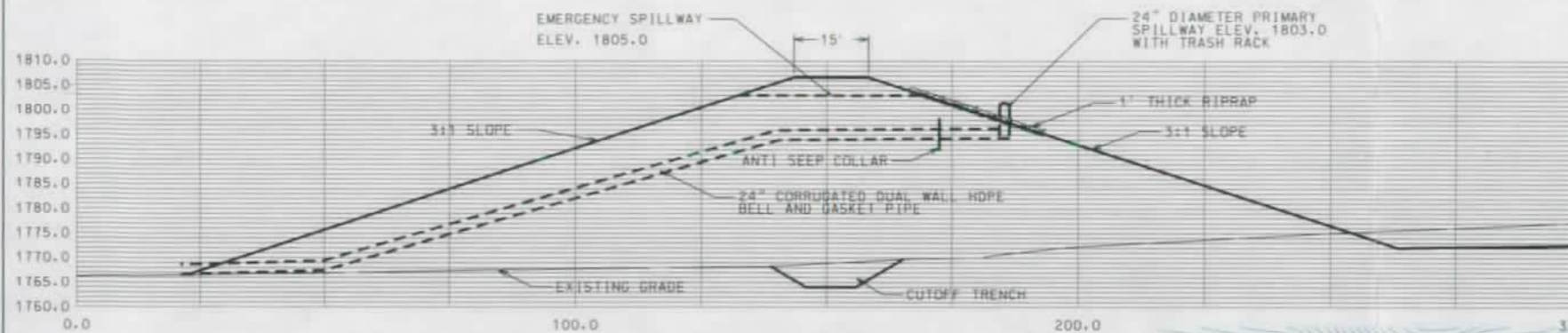
$$0.50 \times 1055^{1/2} = \underline{44 \text{ Ac-Ft}}$$

$$10\% \text{ chance} = 2.3$$

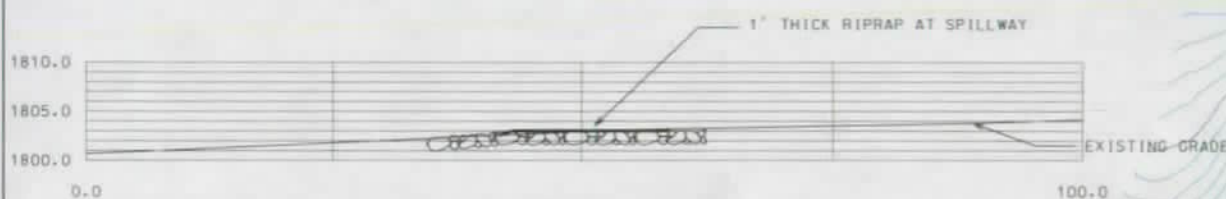
$$2.3 \times 1055^{1/2} = \underline{202 \text{ Ac-Ft}}$$



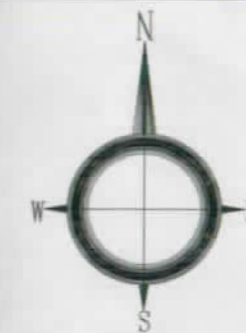
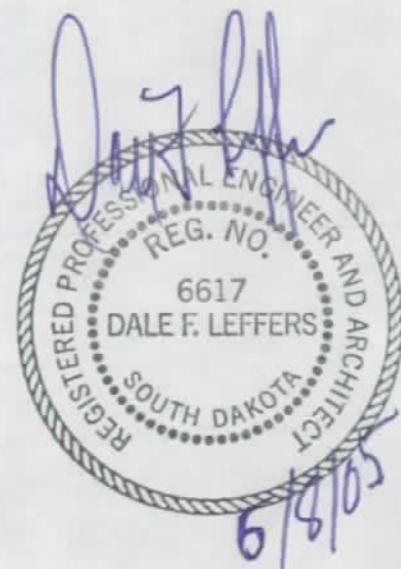
CROSS SECTION AA



CROSS SECTION BB

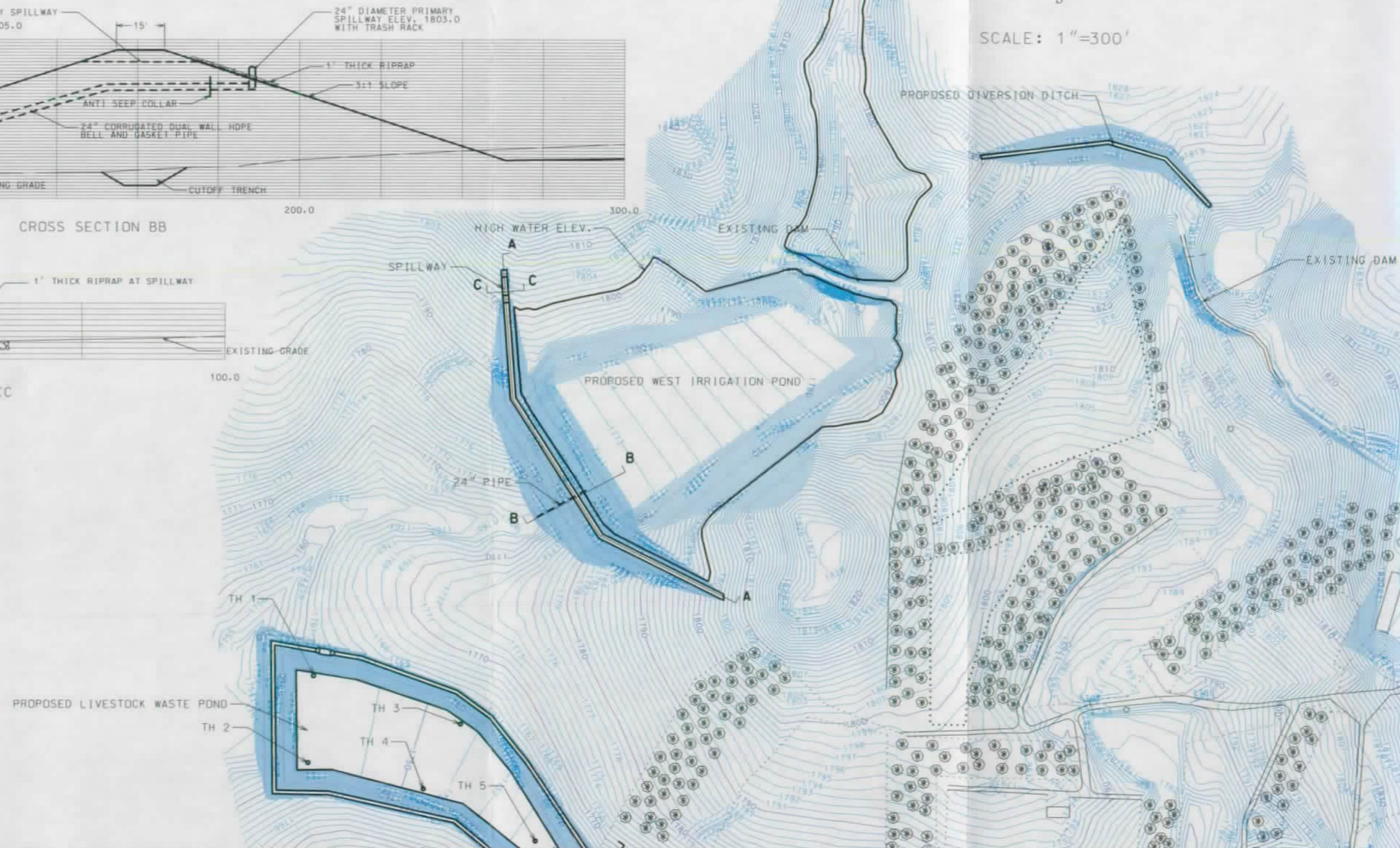


CROSS SECTION CC



SCALE: 1"=300'

WEST IRRIGATION POND
PJ WERDEL & SONS INC.
NE 1/4, SEC 19, T 109 N, R 70 W
NE 1/4, SEC 20, T 109 N, R 70 W
HAND COUNTY
SETTJE AGRI SERVICES
AND ENGINEERING, INC.



**Stage Storage Data
West Irrigation Pond**

	Depth		Area Sq. ft	Volume			
	Elev.	From Bottom		Cubic ft.	Acre ft.	Acre in.	Gallons
Top of Berm	1805.0	33	642,790	10,895,472	250.1	3001.5	81,498,131
	1804.0	32	612,992	10,267,992	235.7	2828.6	76,804,580
Emergency Spillway	1803.0	31	585,329	9,666,405	221.9	2662.9	72,304,709
	1802.0	30	559,658	9,090,333	208.7	2504.2	67,995,691
Primary Spillway	1801.0	29	535,833	8,538,021	196.0	2352.1	63,864,397
	1800.0	28	513,710	8,008,362	183.8	2206.2	59,902,548
	1799.0	27	493,143	7,500,195	172.2	2066.2	56,101,459
	1798.0	26	473,988	7,012,845	161.0	1931.9	52,456,081
	1797.0	25	456,099	6,545,799	150.3	1803.3	48,962,577
	1796.0	24	439,333	6,098,220	140.0	1680.0	45,614,686
	1795.0	23	423,544	5,669,001	130.1	1561.7	42,404,127
	1794.0	22	408,587	5,256,306	120.7	1448.0	39,317,169
	1793.0	21	394,318	4,858,839	111.5	1338.5	36,344,116
	1792.0	20	380,591	4,475,979	102.8	1233.1	33,480,323
	1791.0	19	367,263	4,108,185	94.3	1131.7	30,729,224
	1790.0	18	354,187	3,753,054	86.2	1033.9	28,072,844
	1789.0	17	341,219	3,410,316	78.3	939.5	25,509,164
	1788.0	16	328,215	3,079,296	70.7	848.3	23,033,134
	1787.0	15	315,029	2,759,454	63.3	760.2	20,640,716
	1786.0	14	301,517	2,450,790	56.3	675.1	18,331,909
	1785.0	13	287,534	2,153,412	49.4	593.2	16,107,522
	1784.0	12	272,935	1,867,887	42.9	514.6	13,971,795
	1783.0	11	257,575	1,594,080	36.6	439.1	11,923,718
	1782.0	10	241,309	1,331,451	30.6	366.8	9,959,253
	1781.0	9	223,992	1,085,724	24.9	299.1	8,121,216
	1780.0	8	205,480	863,838	19.8	238.0	6,461,508
	1779.0	7	185,628	665,901	15.3	183.4	4,980,939
	1778.0	6	164,291	492,480	11.3	135.7	3,683,750
	1777.0	5	141,324	344,196	7.9	94.8	2,574,586
	1776.0	4	116,582	221,616	5.1	61.1	1,657,688
	1775.0	3	89,920	125,334	2.9	34.5	937,498
	1774.0	2	61,194	56,106	1.3	15.5	419,673
	1773.0	1	30,259	14,121	0.3	3.9	105,625
	1772.0	0	0	0	0.0	0.0	0

WATERWAY CAPACITY CALCULATIONS $Q=CIA$

WEST DRAINAGE AREA

CAPACITY REQUIRED

DRAINAGE AREA

1055 acres

RETURN PERIOD

25 years

RUNOFF COEFFICIENT =C

0.44

HEIGHT OF MOST REMOTE PT

145.0 ft

DISTANCE FROM MOST REMOTE PT

14,470 ft

MINUTES TO CONCENTRATION

73.3 min

FACTOR =2 GRASS, 1.5 CULTIVATED

1.5

ACTUAL MINUTES TO CONCENTRATION

110 min

INTENSITY=I

1.40 in/hr $Q=CiA$ 650 cfs

SPILLWAY CAPACITY

LEFT SLOPE OF SIDE

10.00 :1

RIGHT SLOPE OF SIDE

10.00 :1

WIDTH AT BOTTOM

50.00 ft

WIDTH AT TOP

90.00 ft

DEPTH

2.00 ft

SLOPE OF SPILLWAY

0.01000 ft/ft

CHANNEL AREA

140.00 sq ft

WET PERIMETER

90.20

HYDRAULIC RAD

1.55

n

0.025 Q 1116 cfs

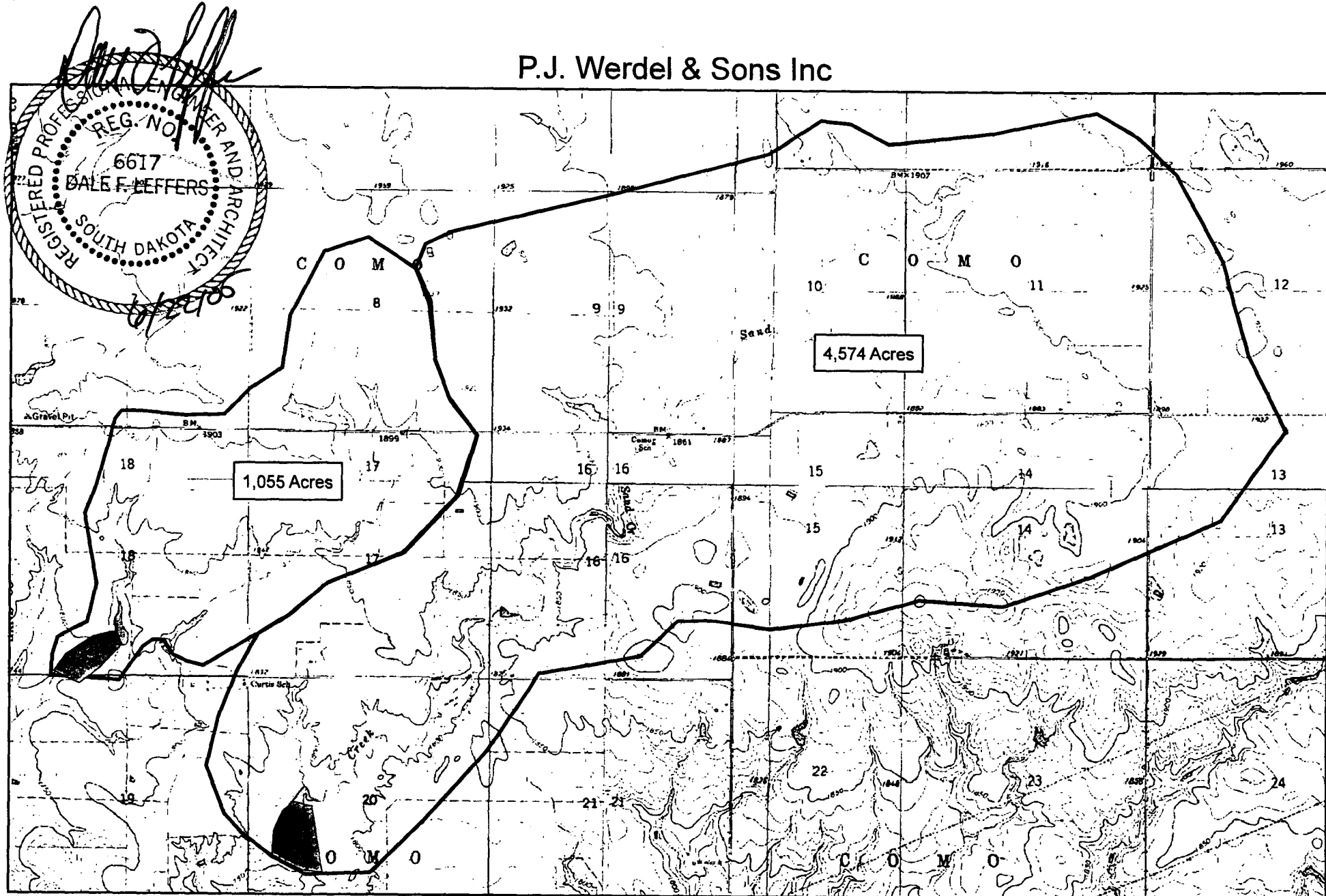
PERCENT CAPACITY

172%**MAXIMUM PIPE FLOW CALCULATIONS $V=(2g\Delta Z/(1+fL/D+\Sigma K_L))^{1/2}$; $Q=VA$**

Q =flowrate; A =inside pipe area; V =velocity in pipe; g =acceleration of gravity; ΔZ =total head; f =friction losses due to pipe
 L =pipe length; D =inside pipe diameter; ΣK_L =total minor losses from entrances, exits, valves, etc.

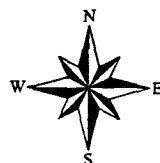
L, Pipe Length (ft)	<u>150</u>	Pipe Material	<u>HDPE</u>
D, Inside Pipe Diameter (in)	<u>24</u>	ϵ , Roughness (Table 1)	<u>5.0E-06</u>
Inside Pipe Area (in ²)	<u>452.4</u>	Re, Reynold's Number	<u>4.91E+06</u>
ΔZ , Total Head (ft)	<u>34</u>	Turbulent/Laminar?	<u>Turbulent</u>
ΣK_L , Total Minor Losses	<u>0.8</u>	V, Max. Velocity (ft/s)	<u>29.73</u>
Seed Friction Factor	<u>0.009</u>	Q, Max. Flowrate (cfs)	<u>93.40</u>
f, Friction Factor (calculated)	<u>0.009</u>	Q, Max. Flowrate (gpm)	<u>41920</u>
		% of Required Capacity	<u>14.4%</u>

P.J. Werdel & Sons Inc



- Drainage Area
- Irrigation Ponds

0 900 1,800 3,600 5,400 7,200 Feet



Settje Agri-Services & Engineering, Inc.



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

April 21, 2005

Ed Werdel
P.J. Werdel & Sons, Inc.
21711 345th Avenue
Ree Heights, SD 57371-7009

RE: P.J. Werdel & Sons, Inc. Manure Management System
Animal General Permit Application Review

Dear Mr. WerdelMr. Wipf:

The Department of Environment and Natural Resources has received four copies of your application for coverage under the General Water Pollution Control Permit for Concentrated Animal Feeding Operations. The manure management system will be located in the Northeast $\frac{1}{4}$ of Section 19, and the Northeast $\frac{1}{4}$ of Section 20, Township 109 North, Range 70 West in Hand County, South Dakota.

Your manure management system is for existing and proposed open lots feeding a maximum of 10,000-head of feeder cattle. Your manure management system consists of a west system and an east system, each feeding 5,000-head of feeder cattle.

Your proposed west system consists of piping, diversion dikes or channels, a sediment basin, a holding pond, and 148.57 acres of drainage area. The sediment basin designed capacity is 182 days of solids storage. The holding pond designed capacity is 365 days of liquid storage.

Your proposed east system consists of piping, diversion dikes or channels, three sediment basins, a holding pond, and 95.11 acres of drainage area. The sediment basins have a designed capacity of 182 days of solids storage. The holding pond designed capacity is 365 days of liquid storage.

We have reviewed and hereby conditionally approve the plans and specifications for your project. This approval expires on April 21, 2007, unless construction of the manure management system has been started by that date. Requirements that you must implement are listed on the attached page(s). Failure to implement the requirements on the following page(s) prior to operation of the manure management system will invalidate this approval.

Ed Werdel
P.J. Werdel & Sons, Inc.
April 21, 2005
Page 2 of 9

Two copies of the approved plans and specifications are being retained for our files. If any deviations are required from the approved plans, the department must approve those changes and all change orders prior to construction. A complete set of as-built plans will be required if several major deviations result.

Upon completion of construction, the enclosed Notice of Completion must be returned to the department. **For the existing lots and manure management system, the department will issue a Certificate of Compliance and permit coverage once a Notice of Completion has been received and a satisfactory construction inspection has been conducted. For the proposed lots, you cannot populate these lots until the department issues a Certificate of Compliance and permit coverage.** Continued compliance is dependent upon you performing proper operation and maintenance activities. You will be liable for any noncompliance with applicable South Dakota environmental laws or regulations.

Our review is primarily to assure that the system meets the requirements of the general permit and does not cover items such as, quality of material, structural soundness, electrical, and mechanical design features. Approval of the plans and specifications does not in any way release the producer from the responsibility that the project will be an operable facility when construction is completed.

If you have any questions regarding the content of this letter, please feel free to contact Ben Myers, Surface Water Quality at (605) 773-3351. Thank you for your cooperation.

Sincerely,

Kent R. Woodmansey, PE
Natural Resources Engineering Director
Surface Water Quality Program
Phone: (605) 773-3351

Enclosures: Construction Postcard
Notice of Completion Form

cc: Dale F. Leffers, PE, Settje Agri Services and Engineering, Inc, Raymond, NE
Marvin Nelson, District Conservationist, NRCS, Miller, SD
Hand County Commissioners
Hyde County Commissioners

REQUIREMENTS

The following requirements must be implemented before we will issue a Certificate of Compliance and coverage under the animal general permit. Failure to implement these requirements will invalidate this approval.

Plans and Specifications

The plans and specifications review is to determine whether seepage, storage, and other design requirements will be met.

1. Trash Screen

A trash screen or some other means of preventing solids from entering the pond must be installed in front of the 18-inch RCP that routes runoff from the proposed lot north of proposed holding pond 2 into the pond. **Your engineer must submit a revised plan sheet showing the location of the trash screen and a typical trash screen detail to the department or submit information about the frequency of cleaning solids from the pond and how this will be accomplished without damaging the liner.**

2. Road Ditches

Your submittal indicates that two proposed lots will be constructed on the north side of the county road in Section 20. The runoff from these lots will drain through piping under the road. Your engineer must submit information on how runoff from the proposed lots will be kept out of the road ditch and how clean water will be routed around this area. Your engineer must also submit a pipe profile for the piping that discharges into holding pond 2. **You cannot begin construction of these proposed lots until the department receives this information and approves the proposed lots.**

3. Holding Pond Design

The proposed holding ponds are designed with non-uniform bottoms that slope toward the permanent markers on the opposite side of the ponds as the discharge piping. The department is concerned that the location of the discharge piping and the amount of slope proposed for the pond bottoms will damage the clay liner and potentially cause excess seepage. If erosion problems are found during inspections, erosion protection may be required.

4. Pipe Specifications

The force main to be installed between the pump station and holding pond 2 must pass a leakage test. The testing procedure must be included in the specifications. Force mains shall be tested at a minimum pressure of at least 50 percent above the design operating pressure, for at least 30 minutes. Leakage shall not exceed the amount given by the following formula:

REQUIREMENTS CONTINUED

$$L = NDP^{1/2} / 1850$$

L = The allowable leakage in gallons per hour
N = The number of pipe joints
D = The nominal pipe diameter in inches
P = The test pressure in psi

The effluent lines section of the construction specifications indicates that the tolerance for sewer grades shall be ($\pm 0.5\%$) in any 100-foot section. Please be aware that construction must follow the plans approved by the department. The minimum slope for a 10-inch gravity flow pipe is 0.28 feet for any 100-foot section. **If changes will be made to the approved plans, revised plans must be submitted to the department for approval prior to construction.**

5. Pumping Station

The pumping station detail indicates the proposed pump pit is over 15 feet deep. The pit must have a ventilated opening. Portable ventilation may be required if you enter this pit. Also, specifications for the material and the installation of the pump station are not included in the plans or specifications. The pump station must also be designed with an alarm system. **Please submit revised specifications and a revised pump station detail showing an alarm system.**

Because the pre-cast pump station is designed to hold liquid waste, the department is requiring the installation of a monolithic base in the pump station structure. The base of the pump station must be poured monolithically or keyed and provided with waterstops to be considered watertight. Please submit information showing how this requirement will be met. **A revised pump station and piping detail indicating the installation of a monolithic base must be submitted to the department for approval.**

6. Concrete Chute and Splash Pad Detail

The submitted concrete chute and splash pad detail does not include any reinforcement. Reinforcement must be included in the construction of the chute and splash pad. **Please submit a revised detail indicating the type and placement of reinforcement that will be used.**

7. Irrigation Piping

Your submittal indicates that wastewater from the proposed holding ponds will be used for irrigation purposes via underground PVC piping connected to center pivots. If this piping is not existing, plans and specifications must be submitted to the department before the piping can be installed. Also, if permanent pumping equipment will be installed, your engineer must submit plans for the installation of this equipment.

8. Existing Dams

Your submittal indicates an existing dam will be removed and another existing dam will be extended. You must submit plans and specifications for these changes to the department before construction on

REQUIREMENTS CONTINUED

the dams can begin. Please contact Tim Schaal with the Water Rights Program at (605) 773-3352 if you have any questions.

General Permit

You will be required to operate your feeding operation and manure management system in accordance with the requirements in the animal general permit.

1. Permit Deadline

The Federal Environmental Protection Agency has given existing South Dakota livestock producers until September 30, 2005, to get existing Concentrated Animal Feeding Operations (CAFO's) permitted. You must have all your existing CAFO's covered under DENR's general permit by September 30, 2005.

2. Soil Borings

The general permit requires drilling logs **and the elevation of the top of the boring** from soil borings in the vicinity of the containment structure. The elevation shall be relative to the elevation submitted on the manure containment system plans. The submitted soil borings did not include the surface elevation and the submitted site plan drawings showing the locations of the 10 soil borings did not include the original contours for the boring locations for use in determining the surface elevations. Please submit information providing the surface elevations for the soil borings. Please refer to item K. on page 23 of the general permit.

3. Ground Water Monitoring

Based on the system design, soil boring logs, and other published reports and information, this system does not appear to overlie a shallow aquifer and should not impact ground water. Therefore, a Ground Water Discharge Permit or ground water monitoring will not be required. Should the design or operation of the facility change appreciably, new hydrogeological information become available, or any contamination problems be reported, the department reserves the right to reassess the need for possible remediation, monitoring of ground water, or a Ground Water Discharge Permit.

4. Emergency Spillway

Any discharge through the emergency spillway located along the north side of holding pond 1 must be reported to the department as soon as possible, but no later than twenty-four (24) hours from the time you first become aware of a discharge. The report shall be made to the State of South Dakota at (605) 773-3351. If after normal business hours (8:00 am to 5:00 pm central time on Monday through Friday), the producer shall report the discharge by calling (605) 773-3231. If possible, the producer shall also take immediate steps to notify anyone downstream that may be impacted by the discharge.

The emergency spillway is located to discharge outside of the manure management system containment areas. The department prefers to not have any kind of emergency discharge system in manure management systems as they could lead to non-compliance discharges. The department

REQUIREMENTS CONTINUED

recommends that the emergency spillway be relocated so as to empty back into the feedlot, if possible. Also, information on erosion protection for the spillway was not provided. **Please submit a detail drawing showing how the spillway will be protected from erosion if it is retained in the holding pond design.**

5. Notification

Construction Schedule - You or your engineer must notify the department of the proposed construction schedule for your project to allow our personnel the opportunity for construction inspections. Please fill out the enclosed postcard and return it to us prior to beginning construction of the manure management system. If any of the dates change from the ones submitted on the postcard, please notify us at (605) 773-3351 and ask for Ben Myers.

Local Government - You are responsible for contacting your local planning and zoning office to determine if there are any local ordinances or requirements with which you need to comply. If a stream, lake, or wetland will be dredged or filled during the construction of the feeding operation, then you need to contact the United States Corps of Engineers at (605) 224-8531 prior to construction of the manure management system.

Notice of Completion - The Notice of Completion form must be completed by your engineer and returned to the department when construction of the manure management system is complete. The department cannot issue you a Certificate of Compliance and coverage under the general permit until we receive a Notice of Completion. **For the existing lots and manure management system, the department will issue a Certificate of Compliance and permit coverage once a Notice of Completion has been received and a satisfactory construction inspection has been conducted. For the proposed lots, you cannot populate these lots until the department issues a Certificate of Compliance and permit coverage.**

6. Setback Distances

The manure management system and the application sites must be located at least 150 feet from a private well owned by you, 250 feet from a private well not owned by you and 1,000 feet from an existing public supply well or public drinking water source. These areas cannot be included in the land application areas.

7. Nutrient Management Plan

A. Phosphorus Soil Tests

A field list was submitted with your initial nutrient management plan. This list contained background phosphorus levels for each of the proposed land application sites. However, a copy of this soil test was not submitted. Please submit a copy of the phosphorus soil test for all of the fields so we may complete our review. **You cannot apply manure to these fields until a copy of the background soil tests are submitted to the department for review.**

REQUIREMENTS CONTINUED

B. Manure Application Agreement

Field 16, located in the E ½ of the SE ¼ of Section 9, Township 109 North, Range 70 West, cannot be included in your approved NMP until manure application agreement information is submitted. No manure application agreement was submitted for **Field 16**. Information from the Hand County Director of Equalization office indicates **Field 16** is owned by Charles Yost. If the information from the Director of Equalization office is the most current, a manure application agreement signed by Charles Yost must be submitted before this field can be included in your approved NMP. If the information from the Director of Equalization office is not the most current, please submit documentation verifying that you own the field. **You cannot apply manure to fields that are not in your approved NMP.**

C. Annual Soil Testing

The following table lists the legal descriptions and sampling requirements for all the fields in your nutrient management plan. All the fields require soil testing from 0 to 2-feet prior to manure application.

For fields that require additional soil testing from 2 to 4 feet, you have the option to either conduct the initial 0 to 2-foot and the 2 to 4-foot soil test prior to land application or the alternative option to conduct the initial 0 to 2-foot soil test prior to land application and a second 0 to 2-foot soil test within four weeks of harvesting the crop. Please refer to section 1.4.4.4., beginning on page 29 of the general permit, for the annual nutrient management requirements. **You must notify the department in writing if you plan to use the alternative post-harvest soil sampling option instead of the 2 to 4-foot soil sampling requirement.**

D. Nitrogen Based Manure Application

As indicated in your initial nutrient management plan, manure application on the following fields may be based on nitrogen need as determined from Table 2, on page 29 of the general permit. Please refer to Table 2, on page 29 of your permit prior to land application, to determine the proper procedure for calculating the appropriate application rate for each specific field.

Field ID	County	Location	Soil Sampling	
			Shallow (0-2')	Deep (2-4')
1	Hand	NE ¼, Sec. 18, T109N, R70W	Yes	
2	Hand	SW ¼, Sec. 17, T109N, R70W	Yes	
3	Hyde	S ½ of the N ½, Sec. 1, T109N, R71W	Yes	
4	Hyde	SE ¼, Sec. 1, T109N, R71W	Yes	
5	Hyde	NE ¼, Sec. 12, T109N, R71W	Yes	
6	Hand	SW ¼, Sec. 2, T109N, R70W	Yes	
7	Hand	S ½, Sec. 3, T109N, R70W	Yes	
8	Hand	S ½, Sec. 6, T109N, R70W	Yes	
9	Hand	N ½, Sec. 7, T109N, R70W	Yes	

REQUIREMENTS CONTINUED

10	Hand	SW ¼, Sec. 8, T109N, R70W	Yes	
11	Hand	SE ¼, Sec. 8, T109N, R70W	Yes	
12	Hand	SW ¼, Sec. 9, T109N, R70W	Yes	
13	Hand	S ½ of the SE ¼, Sec. 9, T109N, R70W	Yes	
14	Hand	SW ¼ of the SE ¼, Sec. 9, T109N, R70W	Yes	
15	Hand	N ½, Sec. 10, T109N, R70W	Yes	
17	Hand	N ½, Sec. 11, T109N, R70W	Yes	
18	Hand	Sec. 16, T109N, R70W	Yes	
19	Hand	W ½, Sec. 18, T109N, R70W	Yes	
20	Hand	NW ¼, Sec. 18, T109N, R70W	Yes	
21	Hand	NE ¼, Sec. 18, T109N, R70W	Yes	
22	Hand	SW ¼, Sec. 18, T109N, R70W	Yes	
23	Hand	W ½, Sec. 19, T109N, R70W	Yes	
24	Hand	SE ¼, Sec. 19, T109N, R70W	Yes	
25	Hand	W ½, Sec. 20, T109N, R70W	Yes	
26	Hand	W ½ of the SE ¼, Sec. 20, T109N, R70W	Yes	
27	Hand	E ½ of the SE ¼, Sec. 20, T109N, R70W	Yes	
28	Hand	SW ¼, Sec. 24, T109N, R70W	Yes	
29	Hand	W ½, Sec. 25, T109N, R70W	Yes	
30	Hand	E ½, Sec. 26, T109N, R70W	Yes	
31	Hand	S ½ of the SE ¼, Sec. 28, T109N, R70W	Yes	Yes
32	Hand	W ½ of the SW ¼, Sec. 29, T109N, R70W	Yes	Yes
33	Hand	N ½ of the SE ¼, Sec. 28, T109N, R70W	Yes	Yes
34	Hand	S ½ and NW ¼, Sec. 30, T109N, R70W	Yes	Yes
35	Hand	W ½, Sec. 33, T109N, R70W	Yes	Yes
36	Hand	NE ¼ of the NE ¼, Sec. 33, T109N, R70W	Yes	Yes
37	Hand	SE ¼ and S ½ of the NE ¼, Sec. 33, T109N, R70W	Yes	Yes
38	Hand	Sec. 34, T109N, R70W	Yes	
39	Hand	NE ¼, Sec. 35, T109N, R70W	Yes	
40	Hand	Sec. 36, T109N, R70W	Yes	
41	Hand	NW ¼, Sec. 17, T109N, R70W	Yes	
42	Hand	NE ¼, Sec. 17, T109N, R70W	Yes	
43	Hand	SW ¼, Sec. 17, T109N, R70W	Yes	
44	Hand	E ½ of the SW ¼, Sec. 31, T109N, R69W	Yes	
45	Hand	SE ¼, Sec. 7, T109N, R70W	Yes	
46	Hand	SW ¼ of the SE ¼, Sec. 7, T109N, R70W	Yes	
47	Hand	NW ¼, Sec. 13, T109N, R70W	Yes	
48	Hand	S ½ of the NW ¼ and N ½ of the SW ¼, Sec. 13, T109N, R70W	Yes	
49	Hand	S ½ of the NE ¼, Sec. 13, T109N, R70W	Yes	Yes
50	Hand	S ½, Sec. 13, T109N, R70W	Yes	
51	Hand	SW ¼, Sec. 7, T109N, R69W	Yes	
52	Hand	NW ¼, Sec. 18, T109N, R69W	Yes	
53	Hand	NE ¼, Sec. 18, T109N, R69W	Yes	

REQUIREMENTS CONTINUED

54	Hand	E ½ of the NE ¼, Sec. 7, T109N, R70W	Yes	
55	Hand	SE ¼, Sec. 19, T109N, R70W	Yes	
56	Hand	W ½ of the SW ¼, Sec. 27, T109N, R70W	Yes	Yes
57	Hand	SW ¼ of the SW ¼, Sec. 27, T109N, R70W	Yes	Yes

Please note in your nutrient management plan the estimated time it will take to build your listed fields up to 50 ppm of phosphorus. You may need additional land in order to apply to your fields based on phosphorus removal at that time.

E. Phosphorus Based Manure Application

As indicated in your initial nutrient management plan, none of the fields require a manure application based on phosphorus crop removal at this time. Please review Table 2, on page 29 of the general permit for the phosphorus application requirements when it becomes necessary to apply manure based on phosphorus removal.

8. Other Permits That May or Will be Required

Storm Water Permit - Since the construction of your project disturbs more than one acre in total land area, a general storm water construction permit is required. This permit must be obtained 15 days prior to starting construction. As part of the requirement for obtaining coverage under this permit you must develop and implement a pollution prevention plan. Information concerning this permit and the pollution prevention plan can be obtained by calling Al Spangler at 1-800-737-8676. **A copy of this plan must be kept on site during construction for review by DENR inspectors.**

Water Right Permit - Depending on your water usage, you may need to obtain a water rights permit. You must submit information regarding the source(s) of all water to be used in the operation of your manure management system. You must include the average and maximum daily volumes of water to be used from each source. The water volumes must include all water usage such as water for consumption, washing, misters, overflow watering systems, cooling, dust control, etc. Information concerning this permit can be obtained by calling Eric Gronlund at (605) 773-3352. **Please contact Eric so he can assist you in determining if you need to obtain a water rights permit.**

SETTJE

Agri-Services & Engineering

4700 W. Rock Creek Rd.
Raymond, Ne 68428
office (402) 783-2100
fax (402) 783-2104

Dean Settje

Dale Leffers P.E.

August 19, 2005

Timothy Schaal
Joe Foss Building
523 East Capital Avenue
Pierre, SD 57501-3182

RECEIVED

AUG 24 2005

**WATER RIGHTS
PROGRAM**

Reference:

Irrigation Pond Addendum
PJ Werdel & Sons, Inc.
Part of S19 & 20, T109N, R70W - Hand County

Dear Mr. Schaal,

This addendum is in response to your comment letter dated July 14, 2005. The following comments and the enclosed information have been provided for clarification.

1. I have changed the return period to 50 year and the calculations were correct. I have also included a copy of the IDF curves used for the calculations.
2. The spillways for both ponds now provide 3 feet of depth.
3. After talking with South Dakota Concrete Products about their concrete risers, I am not comfortable with the joint from concrete to HDPE or the trash rack that they can provide. Therefore, I have proposed using the HDPE risers with a concrete case poured around them.
4. I have provided cross sections and capacity calculations for the diversion ditch which transfers water over to the west dam.
5. The management of this facility would like to leave the existing dam as it is today to help settle any sediment out before it reaches the new irrigation pond. They will place riprap in the existing spillway to provide erosion protection.

If you have any further questions regarding this application please give me a call at the number listed above.

Sincerely,



Steve Westerbuhr

WATERWAY CAPACITY CALCULATIONS $Q=CiA$

RECEIVED

AUG 24 2005

WATER RIGHTS
PROGRAM

WEST DRAINAGE AREA DIVERSION DITCH CAPACITY REQUIRED

DRAINAGE AREA	<u>830</u>	acres
RETURN PERIOD	<u>50</u>	years
RUNOFF COEFFICIENT = C	<u>0.44</u>	

HEIGHT OF MOST REMOTE PT	<u>145.0</u>	ft
DISTANCE FROM MOST REMOTE PT	<u>12,450</u>	ft
MINUTES TO CONCENTRATION	<u>61.6</u>	min
FACTOR = 2 GRASS, 1.5 CULTIVATED	<u>2.0</u>	
ACTUAL MINUTES TO CONCENTRATION	<u>123</u>	min
INTENSITY = I	<u>1.50</u>	in/hr

$Q=CiA$	<u>548</u>	cfs
---------	------------	-----

DIVERSION DITCH CAPACITY

LEFT SLOPE OF SIDE	<u>3.50</u>	:1
RIGHT SLOPE OF SIDE	<u>3.50</u>	:1
WIDTH AT BOTTOM	<u>10.00</u>	ft
WIDTH AT TOP	<u>38.00</u>	ft
DEPTH	<u>4.00</u>	ft
SLOPE OF DITCH	<u>0.00300</u>	ft/ft
CHANNEL AREA	<u>96.00</u>	sq ft
WET PERIMETER	<u>39.12</u>	
HYDRAULIC RAD	<u>2.45</u>	
n	<u>0.025</u>	

Q	<u>569</u>	cfs
PERCENT CAPACITY	<u>104%</u>	

WATERWAY CAPACITY CALCULATIONS $Q=CIA$

WEST DRAINAGE AREA

CAPACITY REQUIRED

DRAINAGE AREA

1055 acres

RETURN PERIOD

50 years

RUNOFF COEFFICIENT =C

0.44

HEIGHT OF MOST REMOTE PT

145.0 ft

DISTANCE FROM MOST REMOTE PT

14,470 ft

MINUTES TO CONCENTRATION

73.3 min

FACTOR =2 GRASS, 1.5 CULTIVATED

1.5

ACTUAL MINUTES TO CONCENTRATION

110 min

INTENSITY=I

1.40 in/hr

$Q=CiA$

650 cfs

RECEIVED

AUG 24 2005

WATER RIGHTS
PROGRAM

SPILLWAY CAPACITY

LEFT SLOPE OF SIDE

10.00 :1

RIGHT SLOPE OF SIDE

10.00 :1

WIDTH AT BOTTOM

50.00 ft

WIDTH AT TOP

90.00 ft

DEPTH

2.00 ft

SLOPE OF SPILLWAY

0.01000 ft/ft

CHANNEL AREA

140.00 sq ft

WET PERIMETER

90.20

HYDRAULIC RAD

1.55

n

0.025

Q

1116 cfs

PERCENT CAPACITY

172%

MAXIMUM PIPE FLOW CALCULATIONS $V=(2g\Delta Z/(1+fL/D+\Sigma K_L))^{1/2}$; $Q=VA$

Q=flowrate; A=inside pipe area; V=velocity in pipe; g=acceleration of gravity; ΔZ =total head; f=friction losses due to pipe

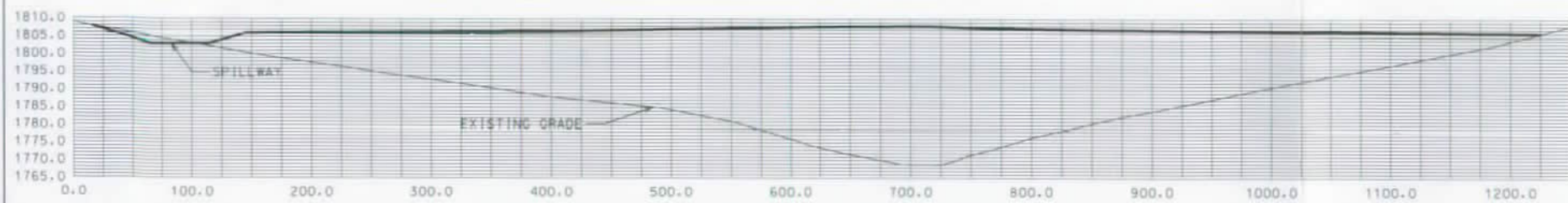
L=pipe length; D=inside pipe diameter; ΣK_L =total minor losses from entrances, exits, valves, etc.

L, Pipe Length (ft)	<u>150</u>	Pipe Material	<u>HDPE</u>
D, Inside Pipe Diameter (in)	<u>24</u>	ϵ , Roughness (Table 1)	<u>5.0E-06</u>
Inside Pipe Area (in ²)	<u>452.4</u>	Re, Reynold's Number	<u>4.91E+06</u>
ΔZ , Total Head (ft)	<u>34</u>	Turbulent/Laminar?	<u>Turbulent</u>
ΣK_L , Total Minor Losses	<u>0.8</u>	V, Max. Velocity (ft/s)	<u>29.73</u>
Seed Friction Factor	<u>0.009</u>	Q, Max. Flowrate (cfs)	<u>93.40</u>
f, Friction Factor (calculated)	<u>0.009</u>	Q, Max. Flowrate (gpm)	<u>41920</u>
		% of Required Capacity	<u>14.4%</u>

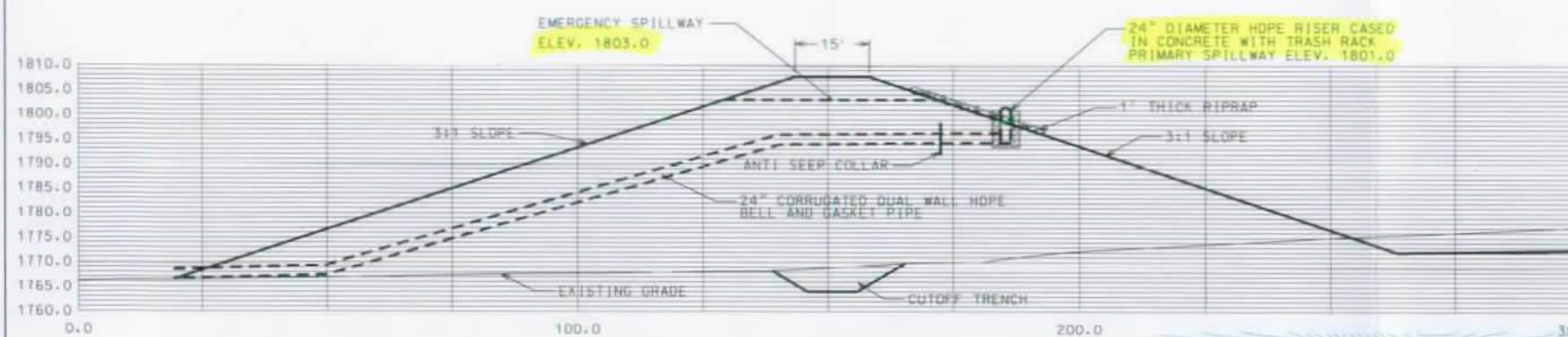
**Stage Storage Data
West Irrigation Pond**

	Depth		Area Sq. ft	Volume			
	Elev.	From Bottom		Cubic ft.	Acre ft.	Acre in.	Gallons
Top of Berm	1806.0	34	674,869	11,551,194	265.2	3182.1	86,402,931
	1805.0	33	642,790	10,895,472	250.1	3001.5	81,498,131
	1804.0	32	612,992	10,267,992	235.7	2828.6	76,804,580
Emergency Spillway	1803.0	31	585,329	9,666,405	221.9	2662.9	72,304,709
	1802.0	30	559,658	9,090,333	208.7	2504.2	67,995,691
Primary Spillway	1801.0	29	535,833	8,538,021	196.0	2352.1	63,864,397
	1800.0	28	513,710	8,008,362	183.8	2206.2	59,902,548
	1799.0	27	493,143	7,500,195	172.2	2066.2	56,101,459
	1798.0	26	473,988	7,012,845	161.0	1931.9	52,456,081
	1797.0	25	456,099	6,545,799	150.3	1803.3	48,962,577
	1796.0	24	439,333	6,098,220	140.0	1680.0	45,614,686
	1795.0	23	423,544	5,669,001	130.1	1561.7	42,404,127
	1794.0	22	408,587	5,256,306	120.7	1448.0	39,317,169
	1793.0	21	394,318	4,858,839	111.5	1338.5	36,344,116
	1792.0	20	380,591	4,475,979	102.8	1233.1	33,480,323
	1791.0	19	367,263	4,108,185	94.3	1131.7	30,729,224
	1790.0	18	354,187	3,753,054	86.2	1033.9	28,072,844
	1789.0	17	341,219	3,410,316	78.3	939.5	25,509,164
	1788.0	16	328,215	3,079,296	70.7	848.3	23,033,134
	1787.0	15	315,029	2,759,454	63.3	760.2	20,640,716
	1786.0	14	301,517	2,450,790	56.3	675.1	18,331,909
	1785.0	13	287,534	2,153,412	49.4	593.2	16,107,522
	1784.0	12	272,935	1,867,887	42.9	514.6	13,971,795
	1783.0	11	257,575	1,594,080	36.6	439.1	11,923,718
	1782.0	10	241,309	1,331,451	30.6	366.8	9,959,253
	1781.0	9	223,992	1,085,724	24.9	299.1	8,121,216
	1780.0	8	205,480	863,838	19.8	238.0	6,461,508
	1779.0	7	185,628	665,901	15.3	183.4	4,980,939
	1778.0	6	164,291	492,480	11.3	135.7	3,683,750
	1777.0	5	141,324	344,196	7.9	94.8	2,574,586
	1776.0	4	116,582	221,616	5.1	61.1	1,657,688
	1775.0	3	89,920	125,334	2.9	34.5	937,498
	1774.0	2	61,194	56,106	1.3	15.5	419,673
	1773.0	1	30,259	14,121	0.3	3.9	105,625
	1772.0	0	0	0	0.0	0.0	0

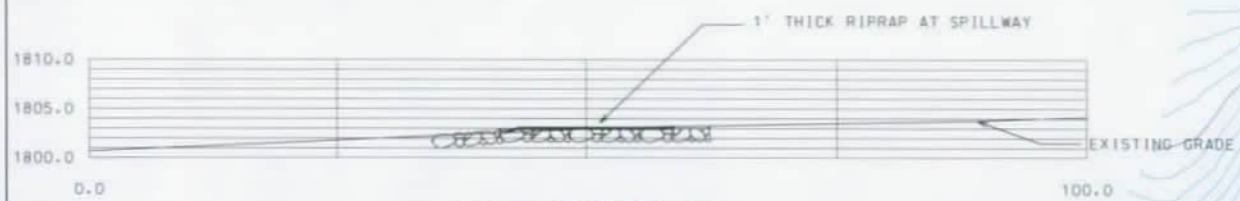
RECEIVED
AUG 24 2005
WATER RIGHTS
PROGRAM



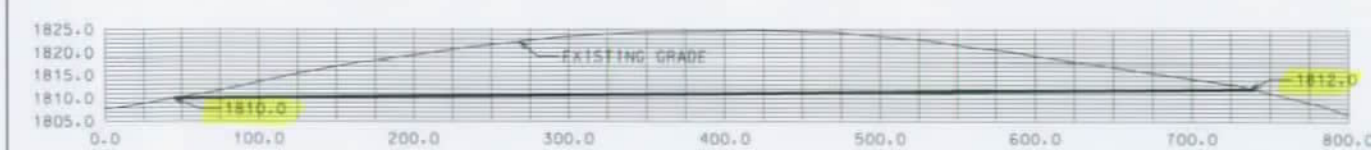
CROSS SECTION AA



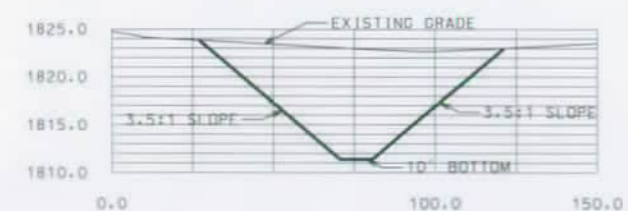
CROSS SECTION BB



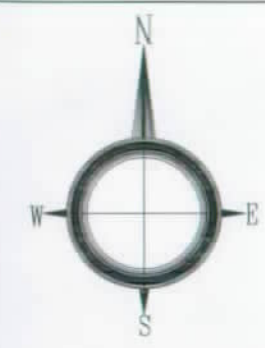
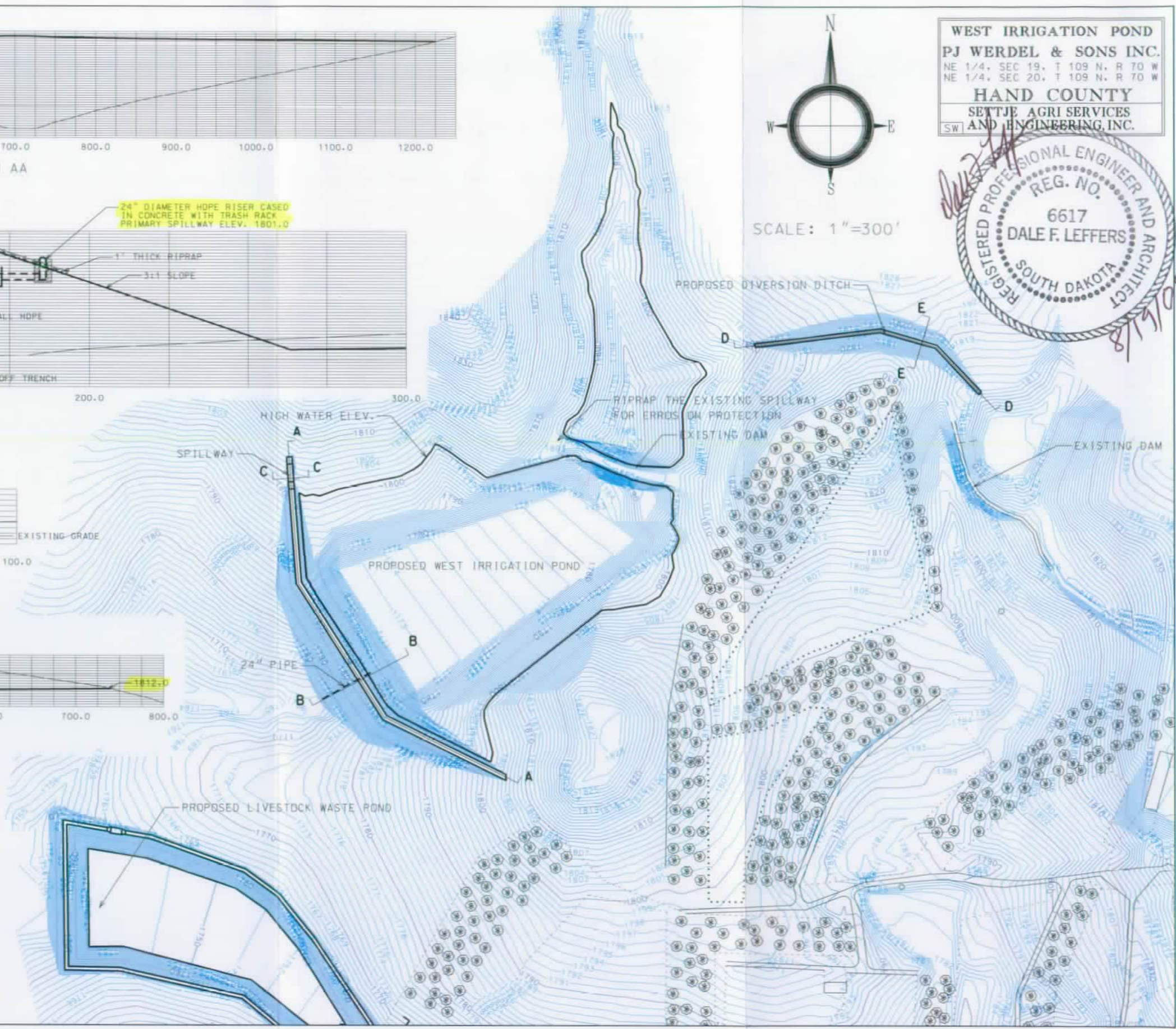
CROSS SECTION CC



CROSS SECTION DD



CROSS SECTION EE



SCALE: 1"=300'

WEST IRRIGATION POND
 PJ WERDEL & SONS INC.
 NE 1/4, SEC 19, T 109 N, R 70 W
 NE 1/4, SEC 20, T 109 N, R 70 W
HAND COUNTY
 SETTJE AGRI SERVICES
 AND ENGINEERING, INC.



REPORT ON
WATER PERMIT APPLICATION No. 6634-3
PJ Werdel & Sons Inc.
August 29, 2005

Water Permit Application No. 6634-3 has been filed by PJ Werdel & Sons Inc. to impound 196 acre-feet of water by constructing a dam located in the SW $\frac{1}{4}$ of Section 18-T109N-R70W on an unnamed tributary to Elm Creek, in Hand County. Water from the dam will be blended with effluent from a wastewater lagoon from a cattle feeding operation to irrigate 160 acres of land located in the NE $\frac{1}{4}$ of Section 18-T109N-R70W.

Discussion:

The dam will be classified as a small size, Category 3, Low Hazard dam. Settje Agri-Services & Engineering has designed the dam. The plans and specifications have been reviewed and will be approved; however, construction of the dam can not begin until Water Permit Application No. 6634-3 is approved.

The dam will be 40 feet high with a normal storage capacity of 196 acre-feet with a reservoir level at the primary spillway elevation, and a maximum storage capacity of 265 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 50-year frequency event.

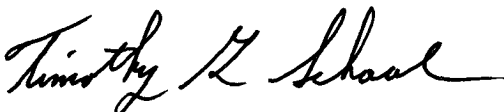
The dam has a drainage area of 1055 acres or 1.65 square miles. The dam is designed to have a 24 inch diameter HDPE drop inlet structure with 5.0 feet freeboard as the primary spillway, and a 50 foot wide earthcut secondary spillway with 3.0 feet of available freeboard. A 50 year frequency event produces a peak runoff of 237 cfs and a 100 year frequency event produces a peak runoff of 320 cfs. The 50 foot wide secondary spillway has a capacity of approximately 675 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 18 acre-feet. The annual yield with a 50 percent chance of occurrence, or 1 out of 2 years, is expected to be 44 acre-feet and the annual yield with a 10 percent chance, or 1 out of 10 years, is expected to be 202 acre-feet.

The Werdel West Dam will be located in the SW $\frac{1}{4}$ of Section 18-T109N-R70W on an unnamed tributary to Elm Creek about 2.0 miles upstream of the confluence of the unnamed tributary and Elm Creek and about 18 miles upstream of the confluence of Elm Creek and Crow Creek, which eventually empties into Lake Francis Cass on the Missouri River about 6 miles downstream of the Big Bend Dam at Fort Thompson. There are no existing Water Permits/Rights located between the proposed dam and Lake Francis Case.

Conclusions:

1. Water Permit Application No. 6634-3 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. 6634-3.



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



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

PMB 2020
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. 6634-3, PJ Werdel & Sons, Inc.**

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. 6634-3, PJ Werdel & Sons, Inc., 21711 345th Avenue, Ree Heights, SD 57371.

The Chief Engineer is recommending APPROVAL of Application No. 6634-3 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. 6633-3 authorizes a dam with a storage capacity of 196 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.
3. The system shall be designed to prohibit the flow of liquid from the livestock waste pond back towards the irrigation dam. Depending on the design, this may require installation of a check valve or similar device.
4. This Permit is approved subject to the irrigation water use questionnaire being submitted each year.

See report on application for additional information.

Garland Erbele, Chief Engineer
September 8, 2005

Subscribed and sworn to before me
this 22 day of 9 2005
Paula L McFarlane
Paula L. McFarlane, Notary Public
My Commission expires: 10-11-10

WATER RIGHTS
PROGRAM

Instruction to Newspaper - Publish first Notice on September 14, 2005 with the second publication 7 days later. The applicant is responsible for payment.

NOTICE OF APPLICATION NOS. 6633-3 and 6634-3 to Appropriate Water

Notice is given that P J Werdel & Sons Inc., 21711 345th Ave, Ree Heights SD 57371 have filed the following applications for a water permit.

Application No. 6633-3 proposes to appropriate 1.89 cubic feet of water per second (cfs) from a dam (273 acre feet storage capacity) located in the SW ¼ Section 20 to irrigate 160 acres located in the SW ¼ Section 17; all in T109N-R70W. The dam is located on Sand Creek. Water from the dam may be blended with effluent from a wastewater lagoon from a cattle feeding operation prior to application to the land.

Application No. 6634-3 proposes to appropriate 1.89 cfs from a dam (196 acre-feet storage capacity) located in the SE ¼ SW ¼ Section 18 to irrigate 160 acres located in the NE ¼ Section 18; all in T109N-R70W. The dam is located on an unnamed tributary to Elm Creek. Water from the dam may be blended with effluent from a wastewater lagoon from a cattle feeding operation prior to application to the land.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application Nos. 6633-3 and 6634-3 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 applications, as recommended, unless a petition is filed opposing the applications or the applicant files a petition contesting the Chief Engineer's recommendation. If a petition opposing the applications or contesting the recommendations is filed, then a hearing will be scheduled and the Water Management Board will consider the applications. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting these applications or recommendations 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 October 3, 2005.

The petition may be informal, but must include a statement describing the petitioner's interest in the applications, the petitioner's reasons for opposing or supporting the applications, 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.



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

PMB 2020
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.**

September 9, 2005

PJ Werdel & Sons Inc.
21711 345th Ave
Ree Heights SD 57371

Dear Mr. Werdel:

Water Permit Application Nos. 6633-3 & 6634-3 for irrigation use has been examined and found to comply with the South Dakota Water Laws and applicable rules. A notice has been sent to the Publisher of the Miller Press printed at Miller, SD (Ph # 605-853-3375). You will need to contact the newspaper and authorize publication of this notice. For your information, a copy of the notice, the recommendations of the Chief Engineer and the reports on the applications 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 and to arrange for payment. Early contact with the paper can eliminate delays. Upon receiving authorization, the publisher has been instructed to publish your notice once each week for two consecutive weeks. The newspaper has also 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: Steve Westerbuhr, Settje Agri-Service, 4700 W Rock Creek Rd., Raymond NE 578428

NOTE: If you plan to contest any part of the Chief Engineer's recommendations, 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 applications.



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

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

September 9, 2005

Miller Press
PO Box 196
Miller SD 57362-0196

ATTENTION: Legal Public Notice

Enclosed is a Notice on Application Nos. 6633-3 & 6634-3 to Appropriate Water to be published twice. Please publish the first notice on September 14, 2005 with the second publication 7 days later. The text of the notice can be e-mailed to your paper by contacting Karen Schlaak at (605) 773-3352.

The applicant must verify to you that the notice is to be published, before you make the first publication. **Please BILL the APPLICANT for the cost of publication.** The APPLICANT is P J Werdel & Sons Inc., 21711 345th Ave, Ree Heights SD (Ph # 605-943-5609).

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

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

No. 6633-3 & 6334-3

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

Date _____

We are in receipt of your letter of September 9, 2005 enclosing Notice to Appropriate Water by Application Nos. 6633-3 & 6634-3 which was first published in our issue of _____. ENCLOSED IS A COPY OF THIS FIRST PUBLICATION.

Name

Newspaper



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

NOV 03 2005

P J Werdel & Sons Inc
21711 34th Ave
Ree Heights SD 57371

Dear Mr. Werdel:

Enclosed is Water Permit No. 6633-3 & 6634-3 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



6634-3
DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

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

January 24, 2012

NOTICE

TO: P J WERDELL & SONS INC, 21711 345TH AVE, REE HEIGHTS, SD 57371
FROM: Ron Duvall, Natural Resources Engineer
for Garland Erbele, Chief Engineer
Water Rights Program
SUBJECT: Reporting Requirement for 2011 Irrigation Questionnaire(s)

Our records indicate that the 2011 Irrigation Questionnaire(s) has not been submitted for Permit No(s) 6633-3, 6634-3. The request for the Questionnaire was dated October 14, 2011. The Water Management Board has directed that owners of water permits who have not submitted the 2011 Irrigation Questionnaire(s) be given notice of permit violation and a hearing to be held by the Board. The hearing is to determine what action is to be taken for violation of Water Permit No(s) 6633-3, 6634-3 qualification:

"This permit is approved subject to the Irrigation Water Use Questionnaire being submitted each year."

The hearing will be held at **10:00 am, March 7, 2012** in the Floyd Matthew Training Center, Joe Foss Building, 523 E Capitol Avenue, Pierre, SD and will be conducted pursuant to SDCL 46-1-12, 46-1-14, 46-2-9, 46-2-11 and 46-2-17. These are contested case hearings pursuant to Chapter 1-26. According to SDCL 46-1-12, the Board may suspend a permit for a period of up to one year for the first violation of a permit qualification or up to three years for a second violation, or cancel a permit for a third violation. Following the hearing, the Water Management Board can:

1. Suspend or cancel Permit No(s) 6633-3, 6634-3 in accordance with applicable provisions of SDCL 46-1-12;
2. Postpone any action; or
3. Take no action.

The hearing is an adversary proceeding. The permit owner has the right to be present or 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 the State Supreme Court as provided by law.

If the questionnaire(s) is (are) received in this office on/or before **March 2, 2012**, you will no longer be in violation of your permit and your name will be removed from the Board agenda. Enclosed are additional questionnaire(s) for your use. If you have questions or need assistance, please contact Genny McMath at (605) 773-3352 or email at genny.mcmath@state.sd.us. If you prefer, you can complete the questionnaire online at the following link: <http://denr.sd.gov/iq.aspx>

NOTE: Please contact the Water Rights Program, Joe Foss Building, 523 E Capitol, Pierre, SD (605-773-3352) to assure access to the meeting room for the handicapped or to obtain an interpreter for the hearing impaired.

6634-3



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
PMB 2020
523 EAST CAPITOL
PIERRE SOUTH DAKOTA 57501-3182
www.denr.sd.gov

February 7, 2012

6633-3
6634-3

P J Werdell & Sons Inc
21711 345th Ave
Ree Heights SD 57371

Dear Sirs:

I am writing to acknowledge receipt of your 2011 irrigation questionnaires.

You may disregard the January 24, 2012, "Notice" concerning reporting requirements for Water Permit Nos. 6633-3 and 6634-3. The information was received in our office prior to the Water Management Board meeting and your name has been deleted from the agenda.

If you have any questions, please contact me.

Sincerely,

A handwritten signature in black ink that reads "Genny McMath". The signature is written in a cursive, flowing style.

Genny McMath
Environmental Scientist
Water Rights Program
(605) 773-3352
email: genny.mcmath@state.sd.us

Report of Examination of Works and/or Application of Water to Beneficial Use For Permit No. 6634-3

I have this day, August 8, 2024, made a thorough examination of the water use system constructed by PJ Werdel & Sons of 21711 345th Ave, Ree Heights, SD 57371 holder of Permit No. 6634-3, bearing the priority of August 24, 2005 authorizing the diversion of 1.89 cu. ft. per second and/or the storage of 196 acre-feet of the waters of surface water for irrigation purposes, in Hand County.

Inspection contact relationship **Kyle Werdel, operator**

A. Works used to divert the water:

Dam Information:

- 1) Height to crest 34 feet
- 2) Height to primary spillway 29 feet
- 3) Height to secondary spillway 31 ft
- 4) Crest width 15 feet
- 5) Crest length 1050 feet
- 6) Spillway length 150 feet
- 7) Spillway width 50 feet
- 8) Approx. storage 196 ac-ft
- 9) Approx. storage to crest 265 ac-ft
- 10) Date constructed: 2009

Pump:

- 1) Make Berkley
- 2) Model BP4EPBM
- 3) Size 8
- 4) Capacity 750 GPM

Motor:

- 1) Make Marathon
- 2) Model No. DM326TTDP82248DL
- 3) Horsepower rating 60 hp

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

- 1) Type PVC 2) Size 8 inches 3) Length 3550 feet
- Comments: none

C. Works used to apply water to beneficial use:

Center pivot:

- 1) Make Valley
- 2) Overall length 1280 feet
- 3) Number of towers 7
- 4) End gun Y

5) Capacity 750 GPM

Chemigation Equipment:

- 1) Does chemigate Y
- 2) Main line check valve Y
- 3) Inspection port/air relief Y
- 4) Low pressure drain Y
- 5) Discharge is 20' from source Y
- 6) Interlock type electrical
- 7) Injection pump type piston
- 8) Injection check valve Y
- 9) Injection line check valve or positive displacement pump Y

Comments: none

D. Compliance with Permit Requirements:

- 1) Permit qualifications being abided by Y
- 2) Irrigation Questionnaires checked to determine if permit owner started irrigation by the end of construction period Y
List any extended period of nonuse: none
- 3) Exceptions to compliance are: none

E. Condition and Location:

1. The system is in good condition with the point(s) of diversion located as follows: from the SE corner of Sec 18 T109N-R70W 3490 ft W and 50 ft N, latitude of 44.23863 and longitude of -99.29342, SE ¼ SW¼
2. The works are capable of diverting and conveying to the place of use 1.67 cu. ft. per second of water and/or storing 196 acre-feet of water which is to be used for irrigation use. Water has been put to beneficial use to the maximum extent as follows: All land is located in Sec 18 T109N-R70W NW ¼ NE ¼ - 30 ac NE ¼ NE ¼ - 31 ac SE ¼ NE ¼ - 30 ac SW ¼ NE ¼ - 30 ac comprising a total of 121 acres of land and the license should be issued for 1.67 cfs and/or 196 acre-feet of storage.
3. All structures, wells and lands on map Y
If no, describe: none

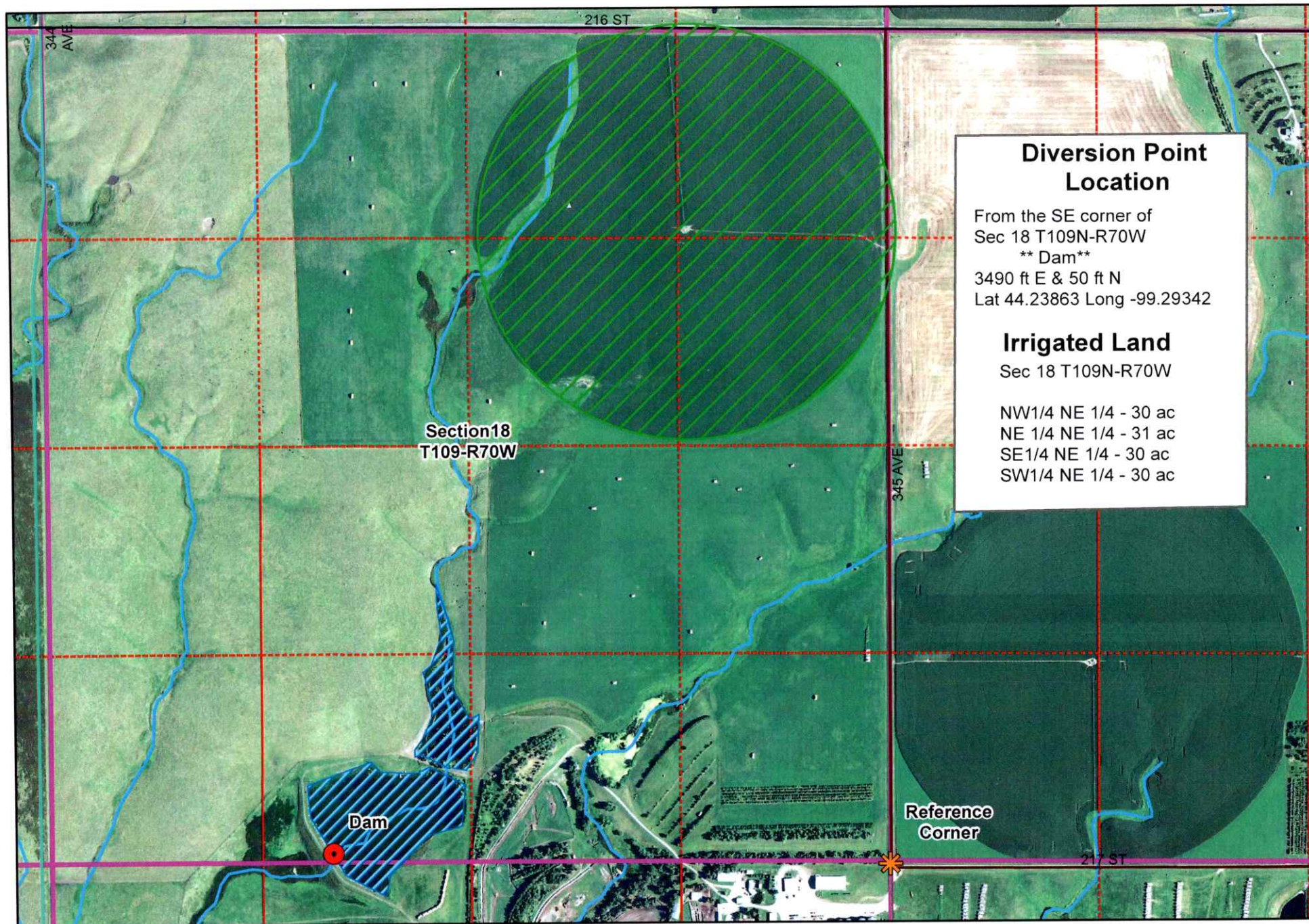
F. Comments or other permit(s) associated with the project:

None.



Mark D Rath
Water Right Inspector
DANR, Water Rights Program

Date report completed: 08/29/2024



0.5

0.25

0

0.5 Miles



**DEPARTMENT of AGRICULTURE
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 E CAPITOL AVE
PIERRE SD 57501-3182
danr.sd.gov

SEP 10 2024

6634-3

PJ Werdel & Sons Inc.
c/o Ed Werdel
21711 345th Ave
Ree Heights SD 57371

Dear Mr. Werdel:

Enclosed is Water License No. 6634-3. This is the final water right document completing your process of obtaining a Water Right. Included with your license is a map prepared by the staff engineer who conducted the field investigation.

So 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,

Eric Gronlund, Chief Engineer
Water Rights Program
(605) 773-3352

NOTE: Water from the dam may be blended with effluent from a wastewater lagoon from the cattle feeding operation, prior to its application to irrigated acres.

enclosures

**STATE OF SOUTH DAKOTA
WATER LICENSE NO. 6634-3**

(1) PJ Werdel & Sons Inc., 21711 345th Ave, Ree Heights SD 57371, made Application No. 6634-3, June 17, 2005, for a water permit to divert 1.89 cubic feet of water per second from a 196 acre-foot storage dam located in Hand County, South Dakota for irrigation purposes. Permit No. 6634-3, with a priority date of August 24, 2005, was approved October 3, 2005, and issued to the applicant for diversion of water with construction of the described water supply system to be completed on or before October 3, 2010, and for the application to beneficial use of water on or before October 3, 2014.

(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 water supply system and is entitled to divert 1.67 cubic feet of water per second for beneficial use. The location of the diversion point is:

- 3,490 ft W & 50 ft N of the SE corner Section 18, T109N, R70W (SE $\frac{1}{4}$ SW $\frac{1}{4}$)
(Latitude 44.23863 & Longitude -99.29342)

(3) The amount of appropriation may not exceed 2 acre-feet annually for each acre of land to which water is actually and beneficially applied for irrigation. The water is to be used during the following described annual period: May 1 – October 31 (irrigation) & January 1 – December 31 (storage dam).

(4) The permit holder has complied with the provisions of South Dakota State Law relating to the application of water to beneficial use to irrigate to following land:

Section 18, T109N, R70W			
NE $\frac{1}{4}$ NE $\frac{1}{4}$	31 acres	SW $\frac{1}{4}$ NE $\frac{1}{4}$	30 acres
NW $\frac{1}{4}$ NE $\frac{1}{4}$	30 acres	SE $\frac{1}{4}$ NE $\frac{1}{4}$	30 acres
TOTAL: 121 acres			

(5) Pursuant to South Dakota Water Law 46-5-30.1 PJ Werdel & Sons Inc., the holder and/or owner of Water Right No. 6634-3 is issued a license to appropriate water, the right to use 1.67 cubic feet of water per second from the storage dam, with a priority date of August 24, 2005, from the location specified in (2) of this license for irrigation purposes.

This license is subject to South Dakota Water Law, any limitations or conditions listed in Water Right No. 6634-3 and subject to the following qualifications:

1. Water Permit No. 6634-3 authorizes a dam with a storage capacity of 196 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 bypassed.
3. The system shall be designed to prohibit the flow of liquid from the livestock waste pond back towards the irrigation dam. Depending on the design, this may require the installation of a check valve of similar device.
4. This Permit is approved subject to the irrigation water use questionnaire being submitted each year.


Eric Gronlund, Chief Engineer
Water Rights Program
Department of Agriculture and Natural Resources

SEP 10 2024
date

