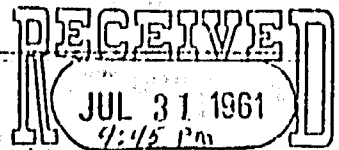


No. 800-3Water Division No. 3 JAMES RIVER

(Blanks to be Filled by the Engineer for the W. R. C.)

STATE WATER RESOURCES COMM.
PIERRE, SOUTH DAKOTAVESTED RIGHT
APPLICATION FOR PERMIT

To Appropriate Water within the State of South Dakota

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

1. Name of applicant South Dakota Department of Game, Fish and Parks
 Postoffice address Pierre, County Hughes, State South Dakota

- I. If a corporation _____
 (a) Name of same _____
 (b) Date and place of incorporation _____
 (c) Amount of capital stock _____
 (d) Amount paid in _____
 (e) Names and addresses of directors _____

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

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

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

(b) Cash on hand, \$ _____ (c) Treasury stock, \$ _____

(d) Bonds to be issued, \$ _____ (e) Other resources, \$ _____

2. Name of diversion work FISH LAKE - Aurora County
As required to fill lake to spillway outlet - approximately
 3. Amount of water claimed 1800 acre feet per second
 4. Source of water supply Enemy Creek
 5. Location of point of diversion One point in the watershed located in the SW1/4 Section
10, T103, R63 - Outlet NE1/4 Sec. 26 T104, R66 bank _____ County.
 6. Annual period or periods during which water is to be used continuously
 7. To be used for:

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

(a) Number of acres to be irrigate _____ acres.

(b) Legal subdivisions to be irrigated _____

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

(c) Statement as to domestic use (giving location, etc.) To the ordinary high water mark of
inundated portions of Section 15 and 16, T. 103, R. 63.

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

(a) Nature of use Public recreational uses

Name any of the above uses claimed

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

Amount claimed for engine cooling _____

(c) Location of plant _____

(d) Method of developing power _____

(e) Point where water will be returned to stream _____

8. Estimated cost of work:

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

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

(c) Fluming, \$-----

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

Rock, \$-----

(e) Other structures ----- \$-----

Total, \$-----

9. Description of diversion works: information requested not applicable. Eis Lake is a meandered lake. Maximum depth is approximately 5 feet.

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

II. Dimensions of works.

(a) Dam: Height ----- feet; length at bottom ----- feet; length at top ----- feet; thickness at bottom ----- feet; thickness at top ----- feet; slope at front water face -----; slope at back face ----- material used in construction -----

(b) Reservoir: Capacity when filled ----- acre feet. Surface area at highwater mark 590 ----- acres.

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

(c)* Head gate: Width ----- feet; height ----- feet; Material -----

(d) Canal: Total length ----- miles.

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

(Give dimensions where reductions in size are made.)

10. Time required for completion of work ----- years. Not applicable - a meandered lake

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

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

STATE OF SOUTH DAKOTA

County of Hughes

ss.

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

Signed Walter J. Fillmore

Subscribed and sworn to before me this 21st day of July 1911

[Signature]
Notary Public (or other qualified officer.)

*Each diversion must have a headgate or measuring device.

Remarks by State Water Resources Commission:

"Vested right" claimed

STATE OF SOUTH DAKOTA

County of HUGHES ss.

Pierre, South Dakota,

December 10, 1962

This is to certify that the foregoing application was received by the Commission at 4:45 o'clock

P.m. upon the 31st day of July, 1961.

State Water Resources Commission

By:

John H. Jones
Chief Engineer, Executive Officer

Number of permit 800-3

Date of first receipt of application July 31, 1961

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

Date of receipt of corrected application —, 19—

Date from which applicant may claim right 1889, 19—

Approved December 10, 1962, Recorded in Book 7 Page 248

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

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

2nd. The whole of said work is ~~to be~~ completed on or before —

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

The water appropriated shall be used for the purpose of public recreation

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

6th. The amount of the appropriation herein granted shall not exceed 1800 acre feet annually ~~cubic feet per second~~; neither shall it exceed the capacity of the above described system of diversion works, nor the least amount of water that experience may hereafter indicate as necessary for the production of crops in the exercise of the best husbandry; and further, said appropriation must be limited to not more than one ~~cubic foot of water per second of time for each acre of land to which water is actually~~ used for public recreation ~~used for irrigation~~ WA 1

and beneficially ~~applied for irrigation~~ on or before June 30, 1955; said water to be used during the following described annual period:

Witness my hand this 10th day of December, 1962. Continuously

State Water Resources Commission

By:

John H. Jones
Chief Engineer, Executive Officer

Certificate of Construction Issued December 10, 1962

Water License Issued December 10, 1962

Permit No. 800-3Water Division No. 3 James River Water District**Certificate of Completion of Works**

TO ALL WHOM IT MAY CONCERN:

This is to Certify, That the Department of Game, Fish and Parksof Pierre, County of Hughes, and State of South Dakota, the holder of Permit No. 800-3, Issued upon Application No. 800-3, bearing date of priority of 1889, authorizing the diversion of1800 acre feet annually of the waters of Roanoke CreekCounty of Aurora, State of South Dakota, at a point in the
SW $\frac{1}{4}$ SW $\frac{1}{4}$ Section 16, T103N, R63Wfor public recreationpurposes, has fully complied with the provisions of the laws of the State of South Dakota relating to proof of completion of the works of diversion set out and described in said Permit: that said works are recognized assatisfactory for diverting and conveying to the place of intended use 1800 acre feet annuallyof water; and that the ~~lands proposed to be irrigated by the use of said water~~ are described as follows,
to-wit: to be used in place for public recreation.Witness my hand this 10th day of December A. D. 1962

State Water Resources Commission

By:

Chief Engineer, Executive Officer
J. W. ORMES

STATE OF SOUTH DAKOTA

WATER LICENSE No. 800-3

WHEREAS, On the 31st day of March A. D. 1961
the Department of Game, Fish and Parks

of Pierre County of Hughes and State of
South Dakota duly made application (No. 800-3) to us for a permit to use 1800 acre feet annual-
ly
XXXXXX of the waters of Enemy Creek
County of Aurora, State of South Dakota, for public recreation
purposes; and

WHEREAS, On the 10th day of December A. D. 1962
recognizing
/Permit No. 800-3 was issued to said applicant for the diversion of said water, and providing for the
completion of the works of diversion therein described XXXXXX
XXXXXX and for the application to beneficial use of said
water XXXXXX
and,

WHEREAS, On the 31st day of July A. D. 1961
the holder of said permit duly made proof of the completion of adequate works for the diversion of 1800 acre feet
annually XXXXXX
cubic feet per second of said waters, as evidenced by our Certificate No. 800-3
dated December 10, 1962 confirming the completion of works of sufficient capacity for
1800 acre feet annually
diverting and conveying to the place of intended use XXXXXX
cubic feet per second of water, with date of
priority of 1889 and,

WHEREAS, On the 31st day of July A. D. 1961
proof was duly made of the application to beneficial use of 1800 acre feet annually
to be used in place for public recreation.

NOW, THEREFORE, By the virtue of the authority vested in us by the laws of the State of South Dakota,
We hereby grant and confirm to the Department of Game, Fish and Parks
of Pierre Vested Right
the holder and owner of said permit No. 800-3
a water right, dating from 1889 to the use of 1800 acre feet annually
cubic feet per second of the waters of Enemy Creek
in the County of Aurora and State of South Dakota, or so much thereof as may be
necessary for the purposes hereinbelow mentioned, to be diverted at a point in the
SW 1/4 SW 1/4 Section 16, T103N, R63W
and ~~conducted by siphon~~ stored in place
for the purpose of public recreation

subject, however, to the laws of the State of South Dakota applicable to a license for the use of the waters of the
State, and subject, also to the local or community customs, rules and regulations which have been or may be
adopted from time to time by a majority of the users from a common source of supply, canal or lateral from
which such water may be taken, when such rules and regulations have for their object the economical use of such
water.

WITNESS, My hand and seal of our office at Pierre, South Dakota,
this 10th day of December A. D. Nineteen
Hundred and Sixty-Two.

State Water Resources Commission

By:

Chief Engineer, Executive Officer
J. W. GRIMES

STATE OF SOUTH DAKOTA

Water License No. _____

To _____

Source of Supply _____

County _____

Am't _____ c. f. s.

Point of Diversion _____

Place of Use _____

Purpose _____

Date of Priority _____

Recorded _____

In Book _____ of _____ Page _____

December 20, 1962

Mr. Walter J. Fillmore, Director
Department of Game, Fish and Parks
Pierre, South Dakota

Dear Walt:

Enclosed herewith are your "Vested Right" permit, Certificate of Completion of Works and Water License for the following applications:

<u>No.</u>	<u>Name of Lake</u>	<u>County</u>
794-3	Buffalo Slough	Lake
795-3	Long Lake	Jerauld
796-3	Crow Lake	Jerauld
797-3	Cottonwood Lake	Jerauld
798-3	Wilmarth Lake	Aurora
799-3	Stoddard Lake	Aurora
✓800-3	Fish Lake	Aurora
801-3	White Lake	Aurora
802-3	Stickney Lake	Aurora
803-3	Stoney Run	Beadle

Sincerely,

J. W. GRIMES
Chief Engineer and
Executive Officer

JW:imf

Encls. as above

Location No. _____

Water Division No. _____ Water District _____

Proof of Application of Water to Beneficial Use**PETITION OF HOLDER**

Ques. 1. State your name, residence, occupation and postoffice address.

Ans. South Dakota Department of Game, Fish and Parks, Pierre, South Dakota

Ques. 2. If acting in behalf of a corporation, state its name, principal place of business (if a foreign corporation, give name and postoffice of statutory agent,) your position with reference to same, and your authority for appearing in its behalf.

Ans. _____

Ques. 3. State date of posting and date of recording notice of appropriation.

Ans. _____

Ques. 4. State source of water supply and give exact location of point of diversion.

Ans. Enemy Creek

Ques. 5. Describe your works of diversion giving length and height of each dam and state amount of water they are capable of conveying from point of diversion to place of use, and give name of canal or ditch or other works by which water is conducted to such place of use, and date of completion of same.

Ans. A meandered lake - depth 5 feet - 590 acres

Ques. 6. State for what purpose water is used and describe place of use. (If for irrigation, name each subdivision in which used, and number of acres in each subdivision that have ACTUALLY been irrigated with said water.)

Ans. Fish and wildlife propagation, conservation and recreation

Ques. 7. If for other than irrigation purpose, state how applied, amount of horse power generated, etc.

Ans. Used in place in lake or reservoir

Ques. 8. What is the minimum amount of water required for the use specified above?

Ans. As required to fill lake to outlet level - approximately 1800 acre feet per year

Ques. 9. If you are not the person or representative of the corporation to whom above mentioned permit was originally issued, please state how ownership was acquired by present holder.

Ans. _____

Ques. 10. State when, how, in what amount and to what extent, the water diverted under above mentioned permit has been used.

Ans. ----- A meandered lake. Used by the public for uses specified except for that amount lost by evaporation and seepage. -----

(Sign) *Walter J. Allmon*

I hereby certify that the foregoing testimony was read to the above subscriber before its signing, that I believe him to be the person he represents himself to be, and that said testimony was subscribed and sworn to before me, at my office in *Pine*, County of *Hughes*

State of South Dakota, on this *21st* day of *August* A. D. 19*11*

Witnesses. *Edna B. Brown*
11-6-11

I, the undersigned, do hereby certify that I am a duly qualified elector residing in the immediate vicinity of the diversion works designated in the foregoing testimony, that I have no interest in the works, water or land above described, that I have read the foregoing testimony and that I know of my own personal knowledge that the matters therein stated are true.

Location No. -----

PROOF OF APPLICATION OF
WATER TO BENEFICIAL USE

PETITION OF HOLDER

Amount of Water ----- c. f. s.

Source -----

County -----

Purpose -----

Place of Use -----

Date of recording -----

Received and filed -----



DEPARTMENT OF WATER & NATURAL RESOURCES

Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

GREAT FACES. GREAT PLACES.

March 22, 1991

Tim Olson, Water Permits Coordinator
SD Dept of Game, Fish & Parks
523 E Capitol
Pierre SD 57501

Dear Mr. Olson:

The Water Management Board has validated the enclosed Vested Water Right No 800-3. This validation gives legal status to the claim and is the final document for your vested right.

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

Very truly yours,

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

enclosure

cc: Susan N Steele, Deputy States Attorney
Office of States Attorney
Plankinton SD 57368

SOUTH DAKOTA

VALIDATION OF VESTED WATER RIGHT CLAIM NO. 800-3

Date Claim Accepted For Filing July 31, 1961.

Date of Validation September 27, 1989.

Pursuant to SDCL 46-2A-17 the Water Management Board validated Vested Water Right Claim No. 800-3 for the South Dakota Department of Game, Fish and Parks, 523 E. Capitol, Pierre, South Dakota 57501 with the following limitations, conditions and qualifications:

1. Vested Water Right No. 800-3 is for sufficient runoff water annually to fill Fish Lake in Aurora County to an elevation of 1425.1 feet above mean sea level. Fish Lake is located in Sections 15 and 16, T103, R63W.

2. The appropriated water is used for maintaining water levels in Fish Lake and may not exceed the amount of water needed for beneficial use for public recreation purposes.

The water is to be used during the following annual period:
January 1 - December 31

3. The priority date of the Vested Water Right is: November 2, 1889.

4. The water use system has been constructed and water has been applied to beneficial use.

5. Water Rights obtained in compliance with the laws of the State of South Dakota must not be unlawfully impaired by this appropriation.

WATER MANAGEMENT BOARD

By: _____

John Hatfield
Chief Engineer

Division of Water Rights

Dept. of Water and Natural Resources

MAR 22 1991

date

SOUTH DAKOTA
Dakota Department of
Water & Natural Resources

Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

September 21, 1988

Richard Beringson, Secretary
Department of Game, Fish and Parks
Anderson Building
445 E Capitol
Pierre SD 57501

Dear Mr. Beringson:

I am writing to notify you that pursuant to the Notice of Intent to Validate Vested Water Right Claims dated June 20, 1988 that I intend to oppose validation of all Department of Game, Fish and Parks Vested Water Right Claims for lakes for the following reasons:

1. Until the outlet elevation for each lake is surveyed and the outlet elevation is set by the Water Management Board.
2. To allow the Vested Water Right Claim to be amended, if necessary, as follows:
 - a) Include the outlet elevation;
 - b) To correct the amount of water claimed;
 - c) To add the qualification that a vested claim is subject where necessary to installation of a concrete outlet structure to assure retention of the outlet as the established elevation; and
 - d) To add any amendments and qualifications necessary to clarify a Vested Right Claim.

Also, that I intend to oppose validation of all Department of Game, Fish and Parks Vested Water Right Claims for dams to allow the Vested Water Right Claim to be amended, if necessary, as follows:

1. To include the spillway elevation;
2. To correct the amount of water claimed; and
3. To add any amendments and qualifications necessary to clarify a Vested Right Claim.

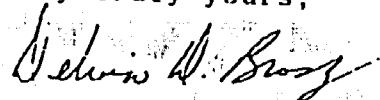


September 21, 1988
Richard Reringson, Secretary
Page 2

We will be working with your staff on these validations. We have already discussed setting outlet elevations before validating claims for lakes. Although the work necessary to complete the validation process will take several years to complete, the results should be of benefit to the public and to your Department. As the work is completed to validate each claim, the claim will be presented to the Water Management Board for validation.

Please advise if you have any questions.

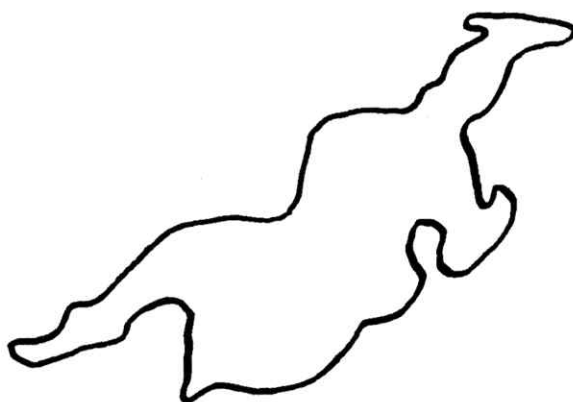
Very truly yours,


for JOHN HATCH, Chief Engineer
Water Rights Division
605 773-3352

cc: Ron Koth, Department of Game, Fish and Parks

ORDINARY HIGH WATER MARK
INVESTIGATION
FISH LAKE

AUGUST 1988



AURORA COUNTY

DIVISION OF WATER RIGHTS

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ABSTRACT

This report contains the results of an investigation performed at the request of the Aurora County Board of Commissioners. An investigation was conducted to determine the elevation of the Ordinary High Water Mark and outlet for Fish Lake, Aurora County, South Dakota.

The primary factors involved in determining the Ordinary High Water Mark for Fish Lake were erosion, beach scarps, beaches, soil stratification, boulder lines and terrestrial vegetation.

Based on the findings in this report, the recommended Ordinary High Water Mark and outlet elevations are 1425.6 and 1425.1 feet above mean sea level, respectively.

INTRODUCTION

At the request of the Aurora County Board of Commissioners, received May 26, 1987, an investigation was conducted to establish the Ordinary High Water Mark (OHWM) and Outlet Elevation for Fish Lake, Aurora County.

State law provides that all navigable rivers and lakes are public highways within 50 feet landward from the water's nearest edge, provided that the outer boundary of such public highway may not expand beyond the OHWM and may not contract within the Ordinary Low Water Mark (OLWM). Thus, the public has the right to use a strip of land up to 50 feet wide below the OHWM beginning at the water's edge or the OLWM for public purposes.

Further, while the public may use the 50 foot strip of land for only "public" purposes, the private adjoining landowner may use the land for any purpose not inconsistent with the rights of the public. Such purposes ordinarily would include the right to graze and water livestock, to hay, or to build a boat dock.

The Water Management Board is required by South Dakota Codified Law (SDCL) 43-17-21 and 43-17-28 to establish the OHWM for public lakes. SDCL 43-17-1 provides that the ownership of land below the OHWM, and of land below the water of a navigable lake or stream, is regulated by the laws of the United States or by such laws of the state as the Legislature may enact.

A lake is "navigable" if its waters constitute "public waters" (Flisrand v. Madison (1915) 35 S.D.457, 152 N.W. 796). A lake is also "navigable" when, if maintained at the high-water mark, it is suitable for rowing, fishing, fowling and bathing (Anderson v. Ray (1916) 37 S.D.17, 156 N.W. 591).

The OHWM according to SDCL 43-17-20(2) is defined in decisions rendered by the courts of this state. In the case of Flisrand v. Madison, 35 S.D.457, 152 N.W. 796. 800-801 (1915) the Court wrote:

Neither high or low water mark means the highest or lowest point reached by the waters of a lake during periods of extreme and continued freshets, or periods of extreme and continued drought, but does mean the high and low points of variation of such waters under ordinary conditions, unaffected by either extreme.

In the case of Anderson v. Ray, 37 S.D.17, 156 N.W. 591 (1916) the South Dakota Supreme Court wrote:

In the case of freshwater rivers and lakes - in which there is no ebb and flow of the tide, but which are subject to irregular and occasional changes of height, without fixed quantity of time, except that they are periodical, recurring with the wet or dry seasons of the year - high water mark, as a line between the riparian owner and the public, is to be determined by examining the bed and banks, and ascertaining where the presence and action of the water are so common and usual, and so long-continued in all ordinary

years, as to mark upon the soil of the bed a character distinct from that of the banks, in respect to vegetation, as well as respects the nature of the soil itself.

In the Waubay Lake decision, issued on January 17, 1986, the South Dakota Supreme Court stated the determination of these water marks is to be done on a case by case basis. The Court stated that:

" . . . under ordinary circumstances, the Ordinary High Water Mark will be set at a level where there is a distinct mark which evidences erosion, and changes in the character of the soil, and destruction of terrestrial vegetation, which have occurred under the ordinary and continuous conditions of the lake, disregarding periods of extreme and periodic freshets, and disregarding the highest water mark which does not evidence erosion and soil changes and destruction of vegetation occasioned under ordinary conditions. If a single distinct mark, occasioned under ordinary circumstances and evidencing all of the factors delineated above does not exist, i.e., there is conflicting evidence of the role of the Ordinary High Water Mark, it is the level where significant major, and substantial terrestrial vegetation ends, that the OHWM is to be set." (cites omitted)

GENERAL INFORMATION

Fish Lake is a 190 acre shallow lake capable of sustaining fish life only during periods of relatively wet years. A contour map of the lake bottom is not published; however, the lake has an estimated average depth of 3 feet, a maximum depth of 5 feet, and a storage capacity of approximately 525 acre feet (Hamilton, 1985). The lake is managed as a marginal fisheries water (sustains fish life three years out of five), for water fowl, furbearers, and associated upland and big game (Hanten, 1974).

Fish Lake is located within the James River Lowland Division of the Central Lowlands physiographic province. The landscape occurs as end moraines of the Mankato Substage of the Wisconsin Glaciation (Aurora County Soil Survey, 1980). The 20.5 square mile drainage basin for Fish Lake is characterized as being level to nearly level to having undulating slopes of 0 - 0.5% with some depressions. The drainage basin size was difficult to determine due to the very flat topography. Elevations within the drainage basin vary from 1585 to 1325 feet above mean sea level (fmsl).

Creeks in the drainage are ephemeral and generally flow only during late winter and spring of wet years as a result of snowmelt and from intense thunderstorms during the spring and summer months (Hamilton, 1985).

Fish Lake is located in Sections 15 and 16, T103N, R63W which is approximately 4 1/2 miles east and 1/4 mile north of Plankinton, Aurora County. The lake was never meandered by the U.S. Government and the deeded bed of the lake is owned by the State of South Dakota and by adjoining land owners.

Elevations in this report are referenced to a Coast and Geodetic Survey bench mark located about 4 miles east along the Chicago, Milwaukee, St. Paul & Pacific Railroad from Plankinton, Aurora County, about 10 rail sections (approximately 230 feet) west of trestle R 952 over a section-line road, 42 feet south of the center line of the track, and about two feet higher than the track. A standard disk, stamped "B 7 1925" and set in the top of a concrete post projecting about 3 inches above ground at elevation 1459.981 fmsl. A marker sign is placed next to the bench mark.

More than half of the acreage in Aurora County is cropland and about 42 percent supports native grass. Corn, oats, grain sorghum, smooth brome grass, and alfalfa are the main crops. Farming is diversified; livestock is the main source of income, but income from cash crops is also important. (Aurora County Soil Survey, 1980)

WATER RIGHTS

The South Dakota Department of Game, Fish and Parks holds Vested Water Right Claim No. 800-3 for Fish Lake with a priority date of 1889. The Vested Water Right Claim is licensed to use 1800 acre feet annually of the waters of Enemy Creek for public recreation purposes. Enemy Creek flows into Fish Lake.

Location Notice Number 6051, filed August 27, 1954 by Donald Driscoll of the State Engineers Office, is for a dam in the NE1/4 NE1/4 of Section 29, T103N, R63W with a surface area of 10 acres and a drainage area of 6000 acres. The purpose of the structure was to direct 200 acre-feet of flood waters from the dam annually for irrigation and livestock purposes via a diversion ditch. Diverted flood waters enter the Fish Lake drainage basin via the diversion ditch and supplement annual inflows to Fish Lake. Annual diversion records for the dam were not kept by the Department of Game, Fish and Parks. However, it is believed that the diversion ditch has directed water into Fish Lake during the mid 1950's, early 1960's, and mid 1980's (Heismeyer, 1988).

Fish Lake Country Club, Inc. holds Water Permit No. 2118-3 and No. 4530-3 with priority dates of September 23, 1974 and June 9, 1980 respectively. Water Permit No. 2118-3 permits 0.11 cfs of Fish Lake water to be used for irrigating 4 acres of trees, greens, and the Clubhouse area. A qualification on the permit states: "if in the opinion of the Water Rights Commission, the Fish Lake water level lowers to a critical level, the diversion of water under this permit is to be suspended until the water level raises to an acceptable level, in order to protect the interests of the public under the Department of Game, Fish, and Parks "Vested Right" filing No. 800-3".

Water Permit No. 4530-3 permits 0.69 cfs of groundwater to be used for irrigating 48.25 acres of grass greens on the Golf Course from a 34 inch diameter well 60 feet deep. Land covered under this permit is also covered under Permit No. 2118-3. Combinations of diversions under the two permits are not to exceed the statutory limit of 1 cfs for each 70 acres of land to be irrigated.

GEOLOGY

Fish Lake is located on the James River Lowland Division of the Central Lowlands physiographic province. The landscape around Fish Lake occurs as Pleistocene end moraines of the Mankato Substage of the Wisconsin Glaciation (Aurora County Soil Survey, 1980). The end moraines are composed of glacial drift which are chiefly till (Flint, 1955). Fish Lake is glacial in origin.

No major sand and gravel deposits are present in the Fish Lake drainage basin with only a small amount of alluvium found along Enemy Creek. The cumulative thickness of saturated sand and gravel found in the vicinity of Fish Lake ranges from 0-9 feet with the maximum thickness found in the alluvium of Enemy Creek. (Blaze, Hammond, 1980) Well logs in the vicinity suggest that there is no hydrologic connection of any consequence between Fish Lake and a glacial aquifer (Division Well Logs and Files) (see Appendix III for location of well logs).

A ground reconnaissance of the lake shoreline found exposed outcrops and cutbanks of glacial till. The glacial till on the southeastern edge of the lake is an unsorted and unstratified mixture of clay, silt, sand, gravel and boulders with sand and clay being the dominant matrix as evidenced by the well developed sand beach. Newspaper records indicate that the Department of Game, Fish and Parks may have trucked in 200 loads of beach sand and gravel during the winter of 1955.

The glacial till on the northwestern edge of the lake is unsorted and unstratified with a matrix dominated by gravels and boulders as evidenced by the moderately developed gravel and boulder pavements found along the shoreline.

SOILS INFORMATION

Soils in the 20.5 square mile drainage basin consist of the Houdek-Dudley-Hoven Association. Appendix IV shows the soils found around the perimeter of Fish Lake and in the drainage basin. The Houdek-Dudley-Hoven Association is on uplands that are characterized by many swales and depressions. Slopes generally are level to undulating but are steeper along entrenched drainageways. The drainage pattern is poorly defined in most areas where drainageways terminate in small depressions, but it is well defined along the larger drainageways. The

association is about 40 percent Houdek soils, 25 percent Dudley soils, 10 percent Hoven soils and 25 percent minor soils.

The well drained Houdek soils are on broad flats and on rises. Slopes dominantly are 0 to 6 percent but range to 9 percent along drainageways. The moderately well drained Dudley soils are on short, concave side slopes ranging from 0 to 6 percent. The poorly drained Hoven soils are in depressions with slopes less than 2 percent.

Runoff from soils in the Houdek-Dudley-Hoven Association is slow to ponded.

RUNOFF CALCULATIONS

Estimates of the magnitude and frequency of future flood volumes for the Fish Lake drainage basin were determined using the methods described in the U.S. Geological Survey publication, "TECHNIQUES FOR ESTIMATING FLOOD PEAKS, VOLUMES, AND HYDROGRAPHS ON SMALL STREAMS IN SOUTH DAKOTA," Water-Resources Investigations 80-80, September, 1980.

A limitation inherent with these estimates (Table 1) is that the estimating relations for runoff volume are not applicable to floods resulting from snowmelt runoff nor to floods where ice effects occur because only floods resulting from rainfall were considered in the modeling.

Table 1

Recurrence Interval (years)	Fish Lake Drainage Basin estimated runoff volume (acre-feet)	Diversion Dam Drainage Basin estimated runoff volume (acre-feet)
2	104	87
5	189	118
10	272	169
25	390	257
50	557	339
100	728	440

Estimates of the magnitude and frequency of future flood volumes for Fish Lake were also determined using the methods described in the U.S. Department of Agriculture, Soil Conservation Service publication, SOUTH DAKOTA ENGINEERING FIELD MANUAL FOR CONSERVATION PRACTICES, pp.2-11 - 2-29, January, 1971; U.S. Department of Agriculture, Soil Conservation Service, Soil Conservation Workshop, DESIGN HYDROGRAPHS FOR SOUTH DAKOTA, pp.1-5, Huron, SD, March 28-31, 1972; U.S. Department of Agriculture, Soil Conservation Service, NATIONAL ENGINEERING HANDBOOK, SECTION 4, HYDROLOGY, P. 21.3; and Ven Te Chow, HANDBOOK OF APPLIED HYDROLOGY, pp.21-27 - 21-32, 1964. The estimated flood volumes assuming average, below average, and above average beginning (antecedent) soil moisture conditions are listed in Tables 2-4.

Table 2

AVERAGE ANTECEDENT MOISTURE CONDITIONS		
24 hour storm Frequency (years)	Fish Lake Drainage basin estimated runoff volume (acre-feet)	Diversion Dam Drainage estimated runoff volume (acre-feet)
2	936	374
5	1584	637
10	2016	861
25	2232	1123
50	2736	1310
100	3024	1423

Table 3

BELOW AVERAGE ANTECEDENT MOISTURE CONDITIONS		
24 hour storm Frequency (years)	Fish Lake Drainage basin estimated runoff volume (acre-feet)	Diversion Dam Drainage estimated runoff volume (acre-feet)
2	360	112
5	792	300
10	1008	374
25	1368	524
50	1656	674
100	1944	824

Table 4

ABOVE AVERAGE ANTECEDENT MOISTURE CONDITIONS		
24 hour storm Frequency (years)	Fish Lake Drainage basin estimated runoff volume (acre-feet)	Diversion Dam Drainage estimated runoff volume (acre-feet)
2	1296	637
5	1944	936
10	2304	1123
25	2736	1348
50	3168	1573
100	3456	1722

Fish Lake has a surface area of 190 acres with an average depth of approximately 3 - 4 feet when the lake level is at 1425 - 1426 fmsl. Approximately 525 - 760 acre-feet of water is stored in Fish Lake when the lake level is at 1425 - 1426 fmsl.

WATER QUALITY DATA

Water quality data are not available prior to the annual measurements taken by the Division of Water Rights. The total dissolved solids content was estimated for Fish Lake using a conductivity meter. These measurements are shown in Table 5.

Table 5

Date	Total Dissolved Solids (ppm)
10-22-86	355
10-20-87	470
4-29-88	400

HISTORICAL WATER LEVELS

Historical water level measurements of Fish Lake are not available prior to the biannual lake level measurements taken by the Division of Water Rights. The measured Fish Lake stage elevations are shown in Table 6.

Table 6

<u>Date</u>	<u>Water Level of Fish Lake (fmsl)</u>
July 25, 1986	1426.6
October 22, 1986	1426.2
April 27, 1987	1427.1
October 20, 1987	1424.5
March 29, 1988	1424.6

MAN MADE INFLUENCES

Fish Lakes' natural drainage basin is approximately 13.5 square miles. In approximately the fall of 1954/winter of 1955, a diversion dam and canal (see Photo No. 1) were constructed by the Department of Game, Fish and Parks which has a drainage basin of approximately 7.0 square miles. Currently, the total drainage basin for Fish Lake is approximately 20.5 square miles.

Plans and specifications for the diversion dam and canal are microfilmed and on file with the Department of Game, Fish and Parks, Sigurd Anderson Building, Pierre, SD.

The diversion dam has the potential to supplement natural Fish Lake inflows by 31 - 84% depending upon the runoff method used, recurrence interval/storm frequency used, and soil moisture conditions (see Tables 1 - 4). As stated earlier, the diversion dam is believed to have diverted water during the mid 1950's, early 1960's, and mid 1980's. The Department of Game, Fish and Parks currently regulates when flows are by-passed or diverted. The by-passed flows enter the 164 acre slough which is adjacent to Fish Lake.

At the time the diversion dam and canal were constructed, an earthen embankment was constructed between Fish Lake and the 164 acre slough (Heismeyer, 1988) (see Appendix IV and Photo No. 2 for location of the earthen embankment).

Dugouts and dams in the Fish Lake drainage basin can potentially store 79 acre-feet of runoff annually (Division Files).

OUTLET

As discussed earlier under the MAN MADE INFLUENCES section of this report, the current outlet for Fish Lake is located between the lake and the adjacent slough. The outlet is a vegetative covered man-made earthen embankment (see Photo No. 2). The

location and elevation of the natural outlet for Fish Lake prior to construction of the embankment is not known.

Fish Lake Water levels increased during the early 1960's which caused flooding of adjacent land. It was reported that the earthen embankment between Fish Lake and the adjacent slough was lowered to an unknown elevation in an attempt to alleviate the flooding (Heismeyer, 1988). The present elevation of the earthen embankment crest located in the NW1/4 SE1/4 NE1/4 SE1/4 of Section 16, T103N, R63W is 1427.2 fmsl.

Vertical beach scarps of 2 - 5 feet in height along the perimeter of Fish Lake indicate that the lake is no longer in a natural state of equilibrium. A beach scarp is a vertical escarpment/cliff formed by water and wave erosion processes (see Photos No. 3 - 5). The beach scarps are found at the same elevation as the current earthen embankment crest (1427.2 fmsl). The beach scarps represent water level elevations that were produced by a combination of man-made and natural conditions.

FIELD INVESTIGATION

Field investigations were conducted at Fish Lake on October 14-16, 1987, April 27, and May 19, 1988.

Physical evidence used in identifying an OHWM is erosion, beach scarps, beaches, soil stratification, boulder lines and terrestrial vegetation.

Outcrops along the shoreline of Fish Lake consist primarily of glacial till with sand, silt and clay outcrops found adjacent to inlets to the lake. Erosion of the glacial till is obvious all around the lake. Vertical beach scarps of 2 - 5 feet in height are found along the perimeter of the lake. The base elevation of the beach scarps ranged from 1426.0 - 1427.3 fmsl on the northwestern side of the lake to 1427.0 - 1427.3 fmsl on the southeastern side of the lake (see Photos No. 3 - 5).

Soil stratification occurs around a lake when wave action washes the lake shore and leaves the larger parent materials (pebbles, cobbles, boulders) relatively stationary while the fine grained materials (sands, silts, clays, peats) are transported the greatest distance into the lake. A very distinct change in soil characteristics occurs at the base of the glacial till beach scarp. The glacial till below the beach scarp has been stratified with the largest parent materials found on the backshore (upper part of the beach). The foreshore (lower part of the beach) is dominated by sand and silt which progressively thickens toward the lake and conversely pinches out toward the beach scarp.

In the spring, lake shorelines can be acted upon by ice sheets/wind action which form ice pushed ridges. The lake ice melts first near the shores because of the relatively rapid

heating of the earthy material of the shore and the shallow bottom. An open lane of water is formed which is further widened by a rise in lake level from the water added by the melting snow of the surrounding slopes. If strong winds develop before the ice becomes rotten, the ice is blown about from side to side by the winds and pushed on the shores with almost irresistible force. The direction of shove is related to that of the winds and may vary along any shore even during a jam, if the winds shift considerably. The force of the push depends on the firmness and momentum of the ice, the latter being determined by the velocity and duration of the wind, the weight of the ice and to some extent the distance through which the ice is free to move. (Dionne, 1979)

Ice pushed ridges can be composed of foreshore and backshore materials. Ice pushed boulder lines are found at Fish Lake. Base elevations of boulder lines ranged from 1424.2 - 1426.1 fmsl with a median elevation of 1425.6 fmsl (see Photos No. 6 - 8). Terminal elevations of boulder lines ranged from 1425.2 - 1427.0 fmsl. A change in slope occurs at a boulder-cobble pavement contact on the west side of the lake at elevation 1425.6 fmsl (see Photo No. 9). Three boulders which are three feet in diameter are on the west side of the lake at elevation 1425.3 fmsl (see Photo No. 10).

Cottonwood and Willow trees are the significant and major terrestrial vegetation found around the perimeter of Fish Lake. A discussion on woody plants and their tolerance to flooding is included in this report as Appendix V (Schumacher, C. M., 1978). Trees have been undercut, uprooted, and killed by wave/ice action (see Photos No. 11 - 15). Dead trees were found at elevations of 1425.2 - 1425.8 fmsl. Live trees were found at elevations 1425.6 - 1426.5 fmsl with a median elevation of 1426.0 fmsl (see Photos No. 16 - 19). The majority of the live trees were found at elevations of 1425.6 - 1426.0 fmsl. It is interesting to note that seven live trees survived water inundation for a period of at least nine months during the summer and spring of 1986-1987.

Previous OHWM investigations have found OHWM characteristics (i.e., boulder lines and locations of live trees) similar to those found at Fish Lake (Division Files, OHWM investigations on: Lake Campbell, Oak Lake, and Oakwood Lakes in Brookings County; Lake Kampeska, and Pelican Lake in Codington County; Clear Lake in Deuel County; Brant Lake, Lake Madison in Lake County; Roy Lake in Marshall County; Wall Lake in Minnehaha County; Swan Lake in Turner County; and Swan Lake in Walworth County). In each of the previously mentioned OHWM investigations, the outlet elevation was established by the Water Management Board 0.5 feet below the OHWM elevation. Based upon the field evidence and previous OHWM investigations, the recommended natural OHWM elevation for Fish Lake is 1425.6 fmsl and the natural outlet elevation for Fish Lake is 1425.1 fmsl. The current crest elevation of the existing man-made earthen embankment is 1427.2 fmsl which is 2.1 feet higher than the recommended natural outlet elevation for Fish Lake.

CONCLUSIONS

Erosion lines around the entire lake are obvious along the beach scarps at elevations ranging from 1426.0 - 1427.3 fmsl on the northwestern side of the lake to 1427.0 - 1427.3 on the southeastern side of the lake. A distinct change in soil characteristics (soil stratification) occurs at and below the beach scarps. The beach scarps are related to the current man-made earthen embankment crest elevation of 1427.2 fmsl.

Base elevations of boulder lines ranged from 1424.2 - 1426.1 fmsl with a median elevation of 1425.6 fmsl. A change in slope occurs at a boulder-cobble pavement contact at elevation 1425.6 fmsl. The boulder lines are representative of natural lake conditions prior to construction of the man-made earthen embankment and do not appear to have been affected by man-made influences.

Live cottonwood and willow trees were found at elevations 1425.6 - 1426.5 fmsl with a median elevation of 1426.0 fmsl.

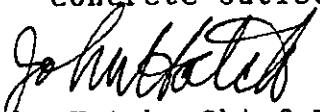
Based upon previous OHWM investigations and outlet elevations established by the Water Management Board, the field evidence indicates that the natural OHWM and outlet elevation for Fish Lake are 1425.6 and 1425.1 fmsl, respectively.

David S. Brown

David S. Brown
Natural Resources Engineer
DWNR, Water Rights Division

RECOMMENDATION OF CHIEF ENGINEER

- 1) That the OHWM for Fish Lake, Aurora County be established at elevation 1425.6 fmsl.
- 2) That the outlet elevation for Fish Lake, Aurora County be set at 1425.1 fmsl and that Vested Water Right Claim No. 800-3 be amended to establish the outlet elevation at 1425.1 fmsl.
- 3) That Vested Water Right Claim No. 800-3 be amended to correct the amount of water claimed from 1800 acre feet annually to "sufficient water to fill Fish Lake annually to the outlet elevation of 1425.1 fmsl".
- 4) That Vested Water Right Claim No. 800-3 be amended with the qualification that No. 800-3 is subject to installation of a concrete outlet structure at elevation 1425.1 fmsl.


John Hatch, Chief Engineer
DWNR, Division of Water Rights

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AGENDA

WATER MANAGEMENT BOARD MEETING DECEMBER 7 & 8, 1988

Place: Room Dakota A, Howard Johnsons, 3300 W Russell, Sioux Falls SD
Scheduled Hearing Times are Estimates and May be Delayed due to Prior Agenda Items

December 7, 1988

- 8:00 am Call to Order
Approval of October 5 & 6 1988 Board minutes
Set May 10 & 11, 1989 meeting location (Pierre Suggested)
Status and review of water rights litigation -- Harold Deering and John Guhin
Request to Advertise Proposed Revisions to:
1) General Rules Chapter 74:02:01 -- Del Brosz
2) Safety of Dams Rules Chapter 74:02:08 -- Tim Schanl
Discussion on Superfund Report -- Susan Bowar
Administer Oath to the Water Rights Staff
- 8:15 am Consider Establishing the Ordinary High Water Mark and Setting the Outlet
Elevation for Lake Oliver in Deuel County -- Tim Tollefsrud
Reconsider Flood Control Permit Application No. FC-8, Deuel County - Deferred
from September 1987 Board meeting -- Tim Tollefsrud
- 9:00 am Cancellation Considerations
- 9:15 am Consider Establishing the Ordinary High Water Mark and Setting the Outlet
Elevation for:
1) Cottonwood Lake in Sully County -- David Brown
X 2) Fish Lake in Aurora County - Deferred from October 1988 Board
meeting --- David Brown
- 9:30 am Consider Request for Variance from Spillway Requirements for Opal Dam, Department
of Game, Fish & Parks -- Tim Schaal
- 9:45 am Break
- 10:00 am Introduction of Water Rights Staff, Board and Legislative Oversight Committee
Consider New Permit Applications and Vested Right Validations
- 10:30 am Consider Water Permit Application No. 5208-3 and Future Use Permit Application
No. 5209-3, Kingbrook Rural Water System - Automatic Delay from the October 1988
Board meeting -- Jim Goodman
- 11:00 am Consider an Intercounty Drainage Dispute in Roberts and Grant Counties -
Automatic Delay from the October 1988 Board meeting -- Tim Tollefsrud
- 12:00 Lunch
- 1:00 pm Consideration of Findings of Fact, Conclusions of Law and Final Decision on
Denial of Extension of Time to Construct Works specified on Permit Nos. 40-2A
and 1812-2, Robert and Mark Tubbs
- 1:15 pm Reconsider Water Permit No. 5189-3, Isabelle Fryer - Deferred from the October
1988 Board meeting -- Ron Duvall
Reconsider Cancellation of Water Permit No. 4780-3, Vincent and Isabelle Fryer --
Ron Duvall

riprapped in 1986 and the water was on the road most of that summer. In 1986, just north of the culvert they breached a 30 foot area about 1 foot lower which helped alleviate the problem to some extent. They will be filling in the breached area. They would like to put in a pipe which would be bigger than the culvert so it does not restrict the flow going out. They would like some continuity in the 1804 OHWM level so ramps for boating can be put in. They would like a viable lake.

Mr. Rollag MOVED, SECONDED by Mr. Brink:

1. That the OHWM for Cottonwood Lake, Sully County be established at elevation 1804.0 fmsl.
2. That the outlet elevation for Cottonwood Lake, Sully County be set at 1804.0 fmsl.

MOTION CARRIED.

Ordinary High Water Mark and Outlet Elevation for Fish Lake

David Brown presented the report prepared on the OHWM for Fish Lake (report on file). Mr. Brown stated two more readings needed to be added to Table 6 on Page 8 of the report. On September 30, 1988 the water level in Fish Lake was at 1422.4 fmsl and on October 12, 1988, the water level was at 1422.25 fmsl. Mr. Brown stated since there was concern and the hearing had been deferred to this meeting a supplemental investigation was done. Mr. Brown also presented the Addendum to Fish Lake, Aurora County, OHWM Report (report on file). Mr. Brown stated two core samples were taken in the outlet area and it appears that beach sediment is present in the outlet area.

Mr. Brown stated the County Commissioners and the Department of Game, Fish and Parks would like to see the existing outlet remain where it is, at approximately 2.1 feet above the OHWM.

Mr. Brown stated staff recommendation would be to establish the OHWM elevation at 1425.6 fmsl and defer Nos. 2), 3) and 4) of the chief engineers recommendation. Deferral would give time to the Department of Game, Fish and Parks to apply for a vested right claim for the existing outlet which is approximately 2 feet higher than the natural outlet elevation.

Mr. Brown stated three letters were received on the OHWM (copies on file). The letter received from Jesse Hawkins, a landowner around the lake, stated he was opposed to lowering the outlet for Fish Lake. A letter was received from Tom Page, President of the Plankinton Service Club also opposed to lowering the outlet elevation for Fish Lake. Mr. Brown read a letter from the Fish Lake Country Club Association stating they concurred with the OHWM for Fish Lake being set at 1425.6 fmsl and oppose any changes being made in the current manmade outlet.

Chairman Gunderson administered the oath to Ron Koth, Department of Game, Fish and Parks.

Mr. Koth stated many times the outlets are not lower than the OHWM. Infrequent outflows do not contribute to the maintenance of any type of manmade or natural outlet. Infrequent outflows

contribute to the overtime buildup of materials in an outlet. Mr. Koth stated in other actions before the Board, where lake outlet elevations are raised, there has been significant erosion problems evidenced over the years. With this lake we have 30 plus years of record to draw upon.

Chairman Gunderson administered the oath to Allen Knapp.

Mr. Knapp stated he was the assistant regional supervisor, for the Dept. of Game, Fish and Parks in charge of fisheries in the Sioux Falls area. Mr. Knapp presented a report prepared on Fish Lake (copy on file). Mr. Knapp stated he would like to see the outlet elevation set at the present outlet elevation of 1427.2 fmsl.

Chairman Gunderson administered the oath to Gerald Heismeyer.

Mr. Heismeyer stated he was a conservation officer for the Department of Game, Fish and Parks in Plankinton. During 1984 through 1986 there were outflows of Fish Lake that were causing landowner problems. They would like to know what elevation the outlet should be to handle the excess flows of water that the lake can not handle at its present level. The idea was never to lower the level.

Mr. Hatch stated he felt the vested right claim should be submitted so there is a legal outlet elevation above the natural elevation.

Chairman Gunderson administered the oath to Bea Heismeyer.

Mrs. Heismeyer stated she was representing the Fish Lake Country Club. Mrs. Heismeyer stated they have no objections to setting the OHWM at the proposed elevation. They would prefer that the man-made outlet level be deferred until further study could be made.

Ron Koth stated he would support the effort to come before the Board with a vested water right claim for the higher outlet structure based on the construction date.

Mr. Rollag MOVED, SECONDED by Mr. Brink that the OHWM for Fish Lake, Aurora County be established at elevation 1425.6 fmsl. MOTION CARRIED.

Mr. Rollag MOVED, SECONDED by Mr. Lloyd to DEFER Nos. 2), 3) and 4) of the Recommendation of Chief Engineer. MOTION CARRIED.

Introductions were made of the Water Rights Division Staff and Board.

Request for Variance from Spillway Requirements for Opal Dam
Tim Schaal presented the Report prepared on the Opal Dam Variance Request (copy on file). Mr. Schaal stated a letter was received from Senator Bruce Walker and Charles Vansickel supporting the request for a variance (copies on file). Mr. Vansickel is the



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Memo to File

Fish Lake in Aurora County

Recognized VWR No. 800-3

The OHWM was set by the Water Management Board on December 7, 1988

OHWM elevation 1425.6 fmsl NGVD29