

No. 1466-3Water Division No. 3 BIG SIOUX RIVER District
(Blanks to be filled by the Engineer for the W. R. C.)

DEC 11 1987

WATER RESOURCES COMMISSION

TESTED 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 BULLHEAD LAKE - Deuel County
As required to fill lake to outlet level approximately 1800
3. Amount of water claimed acre feet per year cubic feet per second _____
4. Source of water supply dry draw
One point in the watershed located in the SE $\frac{1}{4}$ of
5. Location of point of diversion Sec. 10, T 117, R 50
_____ on _____ bank Deuel 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 irrigated _____ acres.

(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 the inundated portion of Sec. 10, 11, 15, 14, T 117, R 50.

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

- (a) Nature of use public recreational purposes
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:

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

II. Dimensions of works. Information requested not applicable, Bullhead Lake is a meandered lake. Maximum depth is approximately 11 feet

(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 2640 acre feet. Surface area at highwater mark 600 acres.

DEPTH AT OUTLET-FEET	SURFACE AREA AT EACH DEPTH AT OUTLET--ACRES	ACRE-FOOT 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 MIL.
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.

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, R. A. Hodgins, 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 R. A. Hodgins

Subscribed and sworn to before me this 8th day of December 1967

Notary Public (or other qualified officer.)

*Each diversion must have a headgate or measuring device.

H. E. Bowers, Notary Public
 My Commission Expires

"VESTED RIGHT" CLAIMED

Pierre, South Dakota, FEBRUARY 6, 1968

State Water Resources Commission

By:

Chief Engineer, Executive Officer

Approved JANUARY 10 1968 Recorded in Book 10 Page 72

Continuously
6th day of FEBRUARY 1968

By:

Chief Engineer, Executive Officer

Water License issued **FEBRUARY 6** 19**68**

Permit No. 1466-3

Water Division No. 2 Big Sioux 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 Parks~~

of Pierre, County of Hughes, and State of South Dakota, the holder Verted Right of Permit No. 1466-3, issued upon Application No. 1466-3, bearing date of priority of 1889, authorizing the diversion of 1800 acre feet annually ~~from a portion~~ of the waters of dry drain County of Deuel, State of South Dakota, at a point in the SE 1/4, Section 10, Township 117N- Range 50W, for public recreation purposes, has fully complied with the provisions of the laws of the State of South Dakota relating to proof of recognized as completion of the works of diversion set out and described in said Permit; that said works are ~~found to be~~ found to be satisfactory ~~condition~~ for diverting and conveying to the place of intended use 1800 acre feet annually ~~from a~~ portion of water; and that the ~~lands proposed to be irrigated by~~ 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 6th day of February A. D. 1968

State Water Resources Commission

By:

J.W. GRILES
Chief Engineer, Executive Officer

STATE OF SOUTH DAKOTA

WATER LICENSE No... 1466-3...

WHEREAS, On the 11th day of December A. D. 1967,
the Department of Game, Fish, and Parks
 of Pierre County of Hughes and State of
South Dakota duly made application (No. 1466-3) to us for a Vested Right permit to use 1800 acre feet annually
~~cubic feet per second~~ of the waters of dry draws
 County of Deuel, State of South Dakota, for public recreation
 purposes; and

WHEREAS, On the 6th day of February A. D. 1968,
Vested Right Permit No. 1466-3 was issued to said applicant... for the diversion of said water, and recognizing
 completion of the works of diversion therein described on the date of
XXXXXX and for the application to beneficial use of said
 water XXXXXX and,
XXXXXX

WHEREAS, On the 11th day of December A. D. 1967,
 the holder... of said permit duly made proof of the completion of adequate works for the diversion of 1800 acre feet
annually ~~cubic feet per second~~ of said water, as evidenced by our Certificate No. 1466-3
 dated February 6, 1968 confirming the completion of works of sufficient capacity for
 diverting and conveying to the place of intended use 1800 acre feet annually
XXXXXX of water, with date of
 priority of 1839 ~~XXXXXX~~ and,

WHEREAS, On the 11th day of December A. D. 1967,
 proof was duly made of the application to beneficial use of 1800 acre ~~cubic feet per second~~
to be used in place for public recreation purposes

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, ^{Vested Right}

of Pierre the holder and owner of said permit No. 1466-3

a water right, dating from 1889 to the use of 1800 acre feet annually,

~~in the waters of~~ of the waters of dry draws

In the County of Deuel and State of South Dakota, or so much thereof as may be

necessray for the purposes hereinbelow mentioned, to be diverted at a point in the SE 1/4 NW 1/4, Section 10,

Township 117N, Range 50W

and ~~continuous and open~~ stored in place

for the purpose of public recreation, subject to any limitations listed in the Permit

to appropriate water, and

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 6th day of February A. D. Nineteen

Hundred and Sixty-Eight

State Water Resources Commission

By:

J. W. GRIMES
Chief Engineer, Executive Officer

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. Dry draw - one point in the watershed located in the SE 1/4 of Sec. 10,
T. 117, R 50.

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 11 feet - 600 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)

R. H. Hoggins

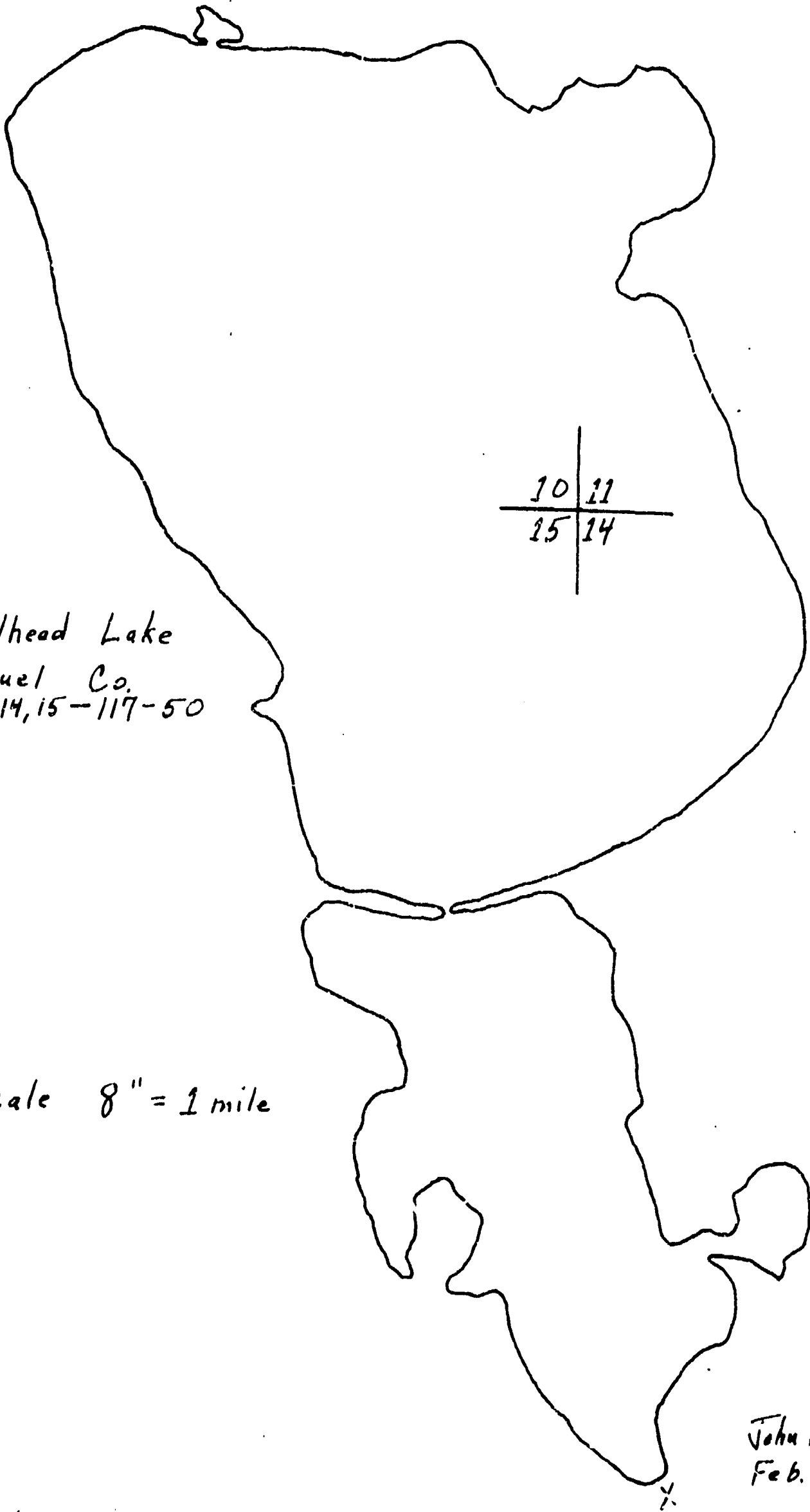
I hereby certify that the foregoing testimony was read to the above subscriber before its signing that I believe him to be the person he represents himself to be, and that said testimony was subscribed and sworn to before me, at my office in Pierre, County of Hughes

State of South Dakota, on this 8th day of December A. D. 1967

Witnesses.

H. E. Bowers
H. E. Bowers, Notary Public

I, the undersigned, do hereby certify that I am a duly qualified ~~notary~~ ^{notary} residing in the immediate vicinity of the diversion works designated in the foregoing testimony, that I have ~~no~~ ^{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.



Bullhead Lake
Deuel Co.
10, 11, 14, 15 - 117-50

10	11
15	14

Scale 8" = 1 mile

John Popowski
Feb. 2, 1959

**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.

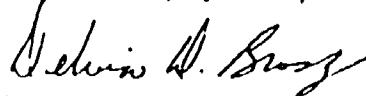


September 21, 1988
Richard Beringson, Secretary
Page 2

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



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

March 31, 1998

NOTICE

TO: John Cooper, Secretary
South Dakota Department of Game, Fish and Parks
523 E. Capitol Ave.
Pierre, SD 57501

FROM: *for* John Hatch, Chief Engineer
Water Rights Program
(605) 773-3352

SUBJECT: Hearing to Consider Validation of Recognized Vested Water Right Claim No. 1466-3 for
Bullhead Lake in Deuel County

The Notice of Intent to validate recognized Vested Water Right No. 1466-3 was published in the Clear Lake Courier on July 22 and 29, 1988. The notice as published was to validate the claim for sufficient water to fill the lake annually to the outlet elevation or to the elevation necessary to maintain the ordinary high water mark, whichever is lower. As Chief Engineer, I filed a petition in response to the notice of intent to validate all of Game, Fish and Parks claims. The purpose of filing was to allow amendments and qualifications necessary to clarify claims.

The Water Management Board will consider validation of Claim No. 1466-3 at 9:00 AM, May 6, 1998, in the Floyd Matthew Training Center, Joe Foss Building, 523 E. Capitol Ave., Pierre, SD. The validation of recognized Claim No. 1466-3 is being scheduled before the Water Management Board in conjunction with the hearing on establishment of the Ordinary High Water Mark (OHWM) and outlet elevation for Bullhead Lake. John A. Haan who is an adjoining landowner to Bullhead Lake had made a request for these determinations. Lynn Beck of my staff conducted a OHWM investigation for this lake.

The published notice stated that the outlet is located in the SE1/4 NW1/4 of Section 10, T117N, R50W. Lynn Beck's report indicates that the outlet is located in the SW1/4 NE1/4 Section 10, T117N, R50W. The notice of hearing on the OHWM and outlet elevation will clarify the location of the outlet as being near the center of Section 10, T117N, R50W.

I propose that the Water Management Board validate recognized Vested Water Right Claim No. 1466-3 using the language "for sufficient water to maintain the water level to the outlet elevation of 1,861.1 feet mean sea level". The vested water right has a priority date of November 2, 1889.

Please contact Lynn Beck or Eric Gronlund of my staff if you have any questions.

c: Diane Best, Assistant Attorney General
Tim Olson, G.F.&P Water Permits Coordinator

CERTIFICATION

I hereby certify that on March 31, 1998, I have personally deposited into the **INTER-OFFICE MAIL** at Pierre, South Dakota, envelopes containing a Notice dated March 31, 1998, regarding Hearing to Consider Validation of Recognized Vested Water right Claim No. 1466-3 for Bullhead Lake in Deuel County, addressed as stated below:

John Cooper, Secretary, Department of Game, Fish & Parks, Joe Foss Building.

Tim Olson, Water Permits Coordinator, Department of Game, Fish & Parks, Joe Foss Building.

Diane Best, Assistant Attorney General, Capitol Building.



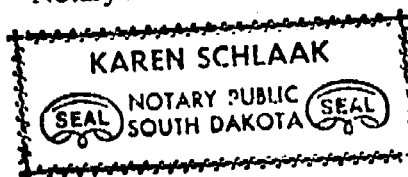
Cheryl F. Frost
Secretary

STATE OF SOUTH DAKOTA)
) SS
COUNTY OF HUGHES)

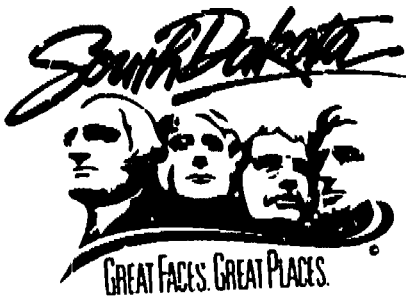
Sworn to, before me, this 1st day of April, 1998



Notary Public



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



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

JUN 29 1998

Tim Olson
SD Dept. of Game, Fish and Parks
523 E Capitol
Pierre SD 57501

Dear Mr. Olson:

The Water Management Board has validated the enclosed Vested Water Right No. 1466-3, Bullhead Lake in Deuel County. This validation gives legal status to the claim and is the final document for your vested right. Enclosed is the reissued water license that reflects the vested right as validated by the Board.

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 Program
605 773-3352

enclosures

SOUTH DAKOTA

VESTED WATER RIGHT NO. 1466-3

Date of Receipt of Claim October 11, 1967.

Date of Validation May 6, 1998.

The Water Management Board validated Vested Water Right Claim No. 1466-3 for the South Dakota Department of Game, Fish and Parks, 523 E Capitol, Pierre SD 57501 with the following limitations, conditions and qualifications:

1. Vested Water Right No. 1466-3 is for sufficient water to maintain the water level to the outlet elevation of 1,861.1 feet mean sea level. The outlet for Bullhead Lake is located on the north side of the lake near the center of Section 10-T117N-R50W.
2. The appropriated water is used for fish and wildlife propagation, conservation and recreation and may not exceed the amount of water needed for beneficial use.

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

JUN 29 1998

date



REISSUED

STATE OF SOUTH DAKOTA

VESTED RIGHT WATER LICENSE NO. 1466-3

(1) The South Dakota Department of Game, Fish and Parks, 523 E Capitol, Pierre SD 57501 was issued Water License No. 1466-3, February 6, 1968 for a vested right claim to appropriate 1,800 acre-feet of water annually in Bullhead Lake, Deuel County, South Dakota, for public recreation purposes with a priority date of 1889. Construction of the described water supply system and application of water to beneficial use has been completed and complies with applicable provisions of South Dakota State Law.

On May 6, 1998, the Water Management Board validated Vested Water Right No. 1466-3. The water license is being reissued to reflect the vested right as validated.

(2) The vested right owner is entitled to sufficient water to maintain the water level to the outlet elevation of 1,861.1 feet mean sea level. The location of the diversion point (outlet) is near the center of Section 10-T117N-R50W.

(3) Pursuant to Section 46-5-30.1 the South Dakota Department of Game, Fish and Parks, 523 E Capitol, Pierre SD 57501 the holder and/or owner of Vested Water Right No. 1466-3 is reissued a license for sufficient water to maintain the water level to the outlet elevation of 1,861.1 feet mean sea level with a priority date of November 2, 1889 from the location specified in (2) of this license. The water is to be used for the purpose of fish and wildlife propagation, conservation and recreation use. This reissued license is subject to any limitations, conditions or qualifications listed in Vested Water Right No. 1466-3 and subject to South Dakota State Law.



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

JUN 29 1998

date



REPORT ON
BULLHEAD LAKE - DEUEL COUNTY
ORDINARY HIGH WATER MARK INVESTIGATION



WATER RIGHTS PROGRAM

March 3, 1998



Department of Environment and Natural Resources
Joe Foss Building
523 East Capitol
Pierre, South Dakota 57501-3181

Table of Contents

	Page
List of Attachments-----	2
Abstract-----	3
Introduction-----	4
Meander Line-----	6
General Information-----	6
Water Rights-----	7
Geology-----	7
Hydrology-----	8
Water Levels-----	8
Climatological Data-----	9
Runoff Factors-----	9
Man Made Influences-----	10
Field Investigation-----	10
Bench Mark Establishment and Collection of Field Data-----	10
Ordinary High Water Mark Evidence-----	10
Erosion-----	10
Changes in the Character of the Soil-----	11
Boulder Lines/Ice Pushed Ridges-----	11
Terrestrial Vegetation-----	11
Outlet-----	13
Conclusions-----	14
Recommendation of the Chief Engineer-----	15
Bibliography-----	16
Persons and Agencies Referenced-----	16

List of Attachments

	Number
OHWL Investigation Map of Bullhead Lake, Deuel County-----	1
Meander Line Survey of Bullhead Lake, Deuel County-----	2
Meltwater Channel-----	3
Measured Water Levels for Bullhead Lake-----	4
Measured Water Levels for Bullhead Lake and Well GT-81A Graph-----	5
Measured Water Levels for Bullhead, School, Round, and Wigdale Lakes Graph-----	6
OHWL Evidence-----	7
OHWL Evidence Graph-----	8
Water Year Precipitation Graph-----	9
Climatological Data-----	9a
Photographs-----	10

ABSTRACT

John A Haan, Box 96, Kranzburg, South Dakota 57247 (Appendix No. 9), has requested the Water Management Board to establish the Ordinary High Water Mark (OHWM), Ordinary Low Water Mark (OLWM), and outlet elevation for Bullhead Lake in Deuel County.

In response to the request and pursuant to SDCL 43-17-1, 43-17-21, 43-17-24 and 43-17-28, an investigation was conducted by the South Dakota Department of Environment and Natural Resources, Water Rights Program acting on behalf of the Water Management Board.

This report contains the results of the field investigation conducted in October 1997.

During the field investigation of Bullhead Lake, the following easily recognizable characteristics were used in recommending an elevation for the OHWM and outlet: erosion, changes in the character of the soil, and terrestrial vegetation. The evidence for the Ordinary Low Water Mark (OLWM) was covered by high water conditions.

Based on the finding in this report, the recommended elevations for the Bullhead Lake OHWM and outlet are 1862.0 and 1861.1 feet above mean sea level respectively.

INTRODUCTION

On January 14, 1993, the Water Rights Program received a written request for the establishment of an Ordinary High Water Mark, Ordinary Low Water Mark, and outlet elevation for Bullhead Lake from John Haan, riparian landowner. Based on the request, an investigation was conducted to determine elevations to be recommended for the Ordinary High Water Mark (OHWM), Ordinary Low Water Mark (OLWM), and outlet.

OHWM is defined by SDCL 43-17-20(2), which states:

“Ordinary high water mark,” the term as defined in decisions rendered by the courts of this state.

An OHWM is established by the processes of nature. The Water Management Board’s (Board) setting thereof is merely a formal recognition of the mark established by nature.

An Ordinary Low Water Mark (OLWM) elevation will not be recommended for Bullhead Lake. The high water conditions at Bullhead Lake covered evidence for an OLWM.

State law (SDCL 43-17-2) provides that all navigable rivers and lakes are public highways within 50 feet landward from the water’s edge, provided that the outer boundary of such public highway may not expand beyond the OHWM and may not contract within the 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, but not limited to, the right to graze and water livestock, to hay, or to build a boat dock.

South Dakota Codified Law (SDCL) 43-17-23 states that in determining the OHWM, natural factors take precedence. Man-made influences, either those that have been constructed to lower the mark or those constructed to raise the mark, shall be disregarded unless the influences have been lawfully constructed or have existed and been accepted for a period of time determined by the Board to be the equivalent of natural conditions.

When requested to do so, the Board is required by 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. Madson 35 S.D. 457, 152 N.W. 796, (1915)). 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).

“Ordinary” according to SDCL 43-17-20(2) is defined in decisions rendered by the courts of this state. In the case of Flisrand v. Madson, 35 S.D. 457, 152 N.W. 796, (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)

MEANDER LINE

A meander line, as the name implies, is a line that meanders and is not at a constant topographic elevation. An OHWM is at a constant topographic elevation. Hence, a meander line is not and cannot be associated with an OHWM. A meander line survey is established by man for surveying and mapping purposes and to establish the number of acres subject to sale. A meander line is not a property line. OHWM's are established by nature and defined by man.

In the case of *Flisrand v. Madson*, 1915, the South Dakota Supreme Court wrote:

“The fact alone that the lake in question was meandered by the government survey does not directly control this matter, as a meander line is not considered a boundary line, but merely serves to define the sinuosities of the bank of the lake and a means of ascertaining the amount of land in the fractional tract subject to sale, which is to be paid for by the purchaser. *St. Paul Ry. Co., Shurmeier* 7 Wall 272, 19 L. Ed. 74, and note page 972.”

The meander line was surveyed around Bullhead Lake in 1872 (see Attachment No. 2).

GENERAL INFORMATION

Bullhead Lake is located in northwestern Deuel County 5 miles north of the city of Goodwin. Bullhead Lake is located in Sections 10, 11, 14, and 15, T117N, R50W. The present outlet elevation is 1861.1 feet above mean sea level (fmsl). The outlet channel is located on the north side of the lake in the SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 10, T117N, R50W (see Attachment No.1).

All elevations in this report are referenced to a United States Department of Commerce, Environmental Sciences Services Administration, Coast and Geodetic Survey benchmark with a 1969 sea-level datum described as follows:

The benchmark is located 3 miles south and 2 miles east of Troy and 4 miles south and 3 miles west of Stranburg, both in Grant County, South Dakota; near the corner of Sections 27, 28, 33, and 34 in T118N, R50W; 116 feet north and 52 feet west and 1.6 feet lower than the crossroads; 81 feet north and 1 foot east of the fence corner; a standard tablet set in the top of a concrete post at elevation 1898.688 fmsl, stamped “10 HEH 1969”.

Temporary benchmarks were established by the Water Rights Program along the perimeter of Bullhead Lake. The locations and elevations of the temporary benchmarks are available from the Water Rights Program upon request.

WATER RIGHTS

Vested Water Right Claim No. 1466-3 held by the South Dakota Department of Game, Fish and Parks (SD GF&P) is the only existing claim on file for water stored in Bullhead Lake. (Water Right files, 1997) There are also domestic uses (i.e. livestock watering, dams, dugouts, etc.) present within the Bullhead Lake drainage basin.

Vested Water Right Claim No. 1466-3, Bullhead Lake, claims an 1889 priority date, and approximately 1800 acre-feet of water per year to fill Bullhead Lake for public recreational purposes. The claim states that the location of the Bullhead Lake outlet is in the SE $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 10, T117N, R50W. This claim indicates a capacity (lake storage) when filled of 2640 acre-feet and a surface area of 600 acres at a maximum depth of 11 feet. The lake storage and surface area at full water level were estimated by the SD GF&P on December 8, 1967. The storage and area of the lake are only estimates and may not be the actual lake storage or surface area at the OHWM.

A correction will need to be made to Vested Water Right Claim No. 1466-3 for Bullhead Lake. The location of the outlet will need to be corrected from the SE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 10 to the SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 10, T117N, R50W.

GEOLOGY

Most of Deuel County lies on the Coteau De Prairies division of the central lowlands province. The surface of the Coteau is primarily glacial moraine topography with a generally hummocky appearance as a result of glacial movement and subsequent melting of ice (Beissel and Gilbertson, 1987). Most of the surficial land forms are a result of the late Wisconsin glaciation.

The Bemis moraine, from the last ice advance into the Coteau Des Prairies, acts as a drainage divide between the Big Sioux River and the Minnesota River. Bullhead Lake lies on the western flank of the moraine and is therefore a part of the Big Sioux River drainage basin.

The Altamont Moraine is believed to be the outermost moraine of the last Wisconsin Glacial period. Like the Bemis moraine it runs from the northwest to the southeast in Deuel County (Beissel and Gilbertson, 1987).

The limit of the Altamont moraines occur just east of the chain of lakes which includes Bullhead Lake and ends at Round Lake. A meltwater outwash lies under the chain of lakes, see Attachment No. 3. The channel starts at approximately Wigdale Lake and travels north to Round Lake continuing west along Willow Creek and ultimately to the Big Sioux River.

HYDROLOGY

Bullhead Lake water levels appear to fluctuate with the water levels of the water table aquifer that occurs in the area. The Water Rights Program monitors one well in the water table aquifer that encompasses Bullhead Lake; well GT-81A which lies 3.5 miles northwest of Bullhead Lake. The general fluctuations in the water levels in well GT-81A follow measured lake levels for Bullhead Lake over the last 13 years, see Attachment No. 5. The difference between groundwater levels and Bullhead Lake water levels seem to remain relatively the same throughout the period of record.

There are four lakes in the chain of lakes that include Bullhead Lake. The chain consists of Wigdale, School, and Round lakes, also included is a connection between Bullhead and Round lake. All four hydrographs for these lakes have the same shape for the period of lake level measurements. This also follows the yearly precipitation graph and the hydrograph for well GT-81A, see Attachment Nos. 5, 6, and 9.

Besides ground water and yearly precipitation, water levels in Bullhead Lake could also be maintained by the meltwater channel that connects the lakes below the surface of the ground, see Attachment No. 3 (Beissel and Gilbertson, 1987). This meltwater channel formed when water from melting glaciers was carried away in established or developing drainages. The action of the meltwater created the near surface outwash aquifer underlying and connecting the four lakes.

Surface flow from Round Lake is also a contributing factor to water levels in Bullhead Lake. When Round Lake water levels are higher than Bullhead Lake and above elevation 1860 fmsl water flows from Round Lake to Bullhead Lake.

The direction of surface water flow between these lakes depends on water levels in the individual lakes. At the time of investigation, water was flowing from Wigdale Lake to School Lake to Round Lake. There was no flow between Bullhead Lake and Round Lake. Water was spilling from Round Lake to Willow Creek and ultimately to the Big Sioux River.

WATER LEVELS

Available measured water level measurements of Bullhead Lake are shown in Attachment No. 4. The water level measurements were taken by the Water Rights Program.

John Haan, landowner at Bullhead Lake, recalls that during a typical spring water levels in the lake reach into the trees along the shore. Landowners in the Bullhead Lake area also recall that the sloughs around the lake are wet during normal spring thaws.

CLIMATOLOGICAL DATA

Climatological data for Bullhead Lake is included in this report as Attachment Nos. 9 and 9a. The climatological data is discussed in detail under the heading of RUNOFF FACTORS in this report.

RUNOFF FACTORS

Beginning soil moisture conditions refer to the degree that a soil is saturated with water. During a “dry” year(s), the soil moisture becomes depleted due to plant use, evaporation, and natural drainage. Runoff Volume from a rainfall event during depleted soil moisture conditions would be reduced due to the rain soaking into the ground.

On the other hand, during a “wet” year(s), the soil becomes saturated with water and isn’t capable of absorbing the rainfall event. Hence, the identical rainfall event during “wet” years will produce a much larger runoff volume than during “dry” years. The more saturated the soil becomes, the larger the runoff volumes generated during a particular rainfall event.

A single rainfall event whose duration is spread over a number of days or weeks can generate a relatively small runoff volume. Conversely, a single rainfall event whose duration is only a few minutes or hours could generate a relatively large runoff volume. Hence, the runoff volume generated by any given rainfall event is dependent upon the amount and how rapidly the rain falls.

The potential for the largest runoff volumes for any drainage basin (Bullhead Lake or any other lake) are generated when saturated soil moisture conditions are present going into the winter. The ground then freezes nearly solid and becomes impermeable due to winter temperatures below 32 degrees Fahrenheit. Snow accumulations coupled with cold winter temperatures set the scene for a major runoff event the following spring.

A rapid temperature rise in the spring quickly melts the previous winters snow accumulation. The still frozen/saturated soil is not able to soak up any of the snow melt-water, hence, nearly all snow melt-water arrives at terminal locations such as depressions, dams and lakes or discharge to streams.

As previously shown, yearly runoff entering Bullhead Lake is dictated by a complicated set of circumstances that include general climatic factors, soil moisture conditions, and snow melt.

MAN MADE INFLUENCES

Natural factors are given precedence in determining the ordinary high water mark. Man-made influences, either those that have been constructed to lower the mark or those constructed to raise the mark, shall be disregarded unless the influences have been lawfully constructed or have existed and been accepted for a period of time determined by the Board to be the equivalent of natural conditions (SDCL 43-17-23).

There appears to be manmade influences at Bullhead Lake and as on many other lakes the influences are in the inlet and outlet areas. Roads and culverts have replaced portions of the natural channel between the chain of lakes which include Bullhead Lake. The above man-made influences have apparently had an affect on the OHWM but have been in place for such a time they probably constitute natural conditions.

FIELD INVESTIGATION

BENCH MARK ESTABLISHMENT AND COLLECTION OF FIELD DATA

Temporary bench marks were established around Bullhead Lake. The locations and elevations for the temporary bench marks are available from the Water Rights Program upon request.

Field data for Bullhead Lake was collected in October of 1997. The field information contained in this report is from natural outcrops along the perimeter of Bullhead Lake. The data collected can be found in Attachment Nos. 7 and 8.

ORDINARY HIGH WATER MARK EVIDENCE

Distinct physical evidence used in identifying the OHWM are: erosion (change in slope of the bank), changes in the character of the soil, boulder lines, growth and destruction of terrestrial vegetation (FLISRAND V. MADSON, 1915; ANDERSON v. RAY, 1916; S.D. WILDLIFE FEDERATION v. WATER MGT. BD., 1986; Red Lake, Brule County Ordinary High Water Mark and Ordinary Low Water Mark, and Outlet Elevation Investigation Report).

Erosion

Distinct erosional features around Bullhead Lake are summarized in Attachment No. 8.

Consistent erosional features at Bullhead Lake consist of cutbanks and washed root systems. These features are found at the following elevations: 1860.7 to 1862.0 fmsl, bottom of cutbank; 1861.9 to 1863.0 fmsl for top of cutbank and top of washed root systems. The erosion elevations at or near 1862 fmsl, while allowing for wave action, are consistent with water levels measured since November 8, 1983.

Changes in the character of the soil

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 (sand, silts, clays, peats) are transported the greatest distance into the lake. An idealized lake shore progression would start with backshore boulder sized materials and terminate with clay and peat materials deposited in the deepest portions of the lake. Historical lake levels can be inferred by locating areas showing remnant soil stratification.

Lake water levels limited the amount of visible soil changes. The few soil characteristics observed were found at elevations of 1861.4 to 1862.6 fmsl for top of pebbles, and 1861.6 to 1863.0 fmsl for the top of sandy beach and beginning of top soil. Distinct surficial changes in the character of the soil at Bullhead Lake can be found in Attachment No. 8. Also see washed pebbles in photo no. 15.

Boulder Lines/Ice Pushed Ridges

In the spring lake shores 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/boulder lines can be composed of foreshore and backshore materials. There were no visible boulder lines found at Bullhead Lake, however, an ice pushed ridge was present at the southeast corner of the lake, see photo no. 16. Top of ridge elevations are summarized in Attachment No. 8. Top of ridge elevations range from 1863.5 to 1865 fmsl. The base of the ice pushed ridge corresponds with the top of the cutbank and top of sandy beach elevations which range from 1861.1 to 1863.0 fmsl.

Terrestrial Vegetation

The tree population observations in this report are limited to easily recognizable characteristics such as species, diameter and elevation. The tree population around Bullhead Lake is predominately cottonwood and elm. Growth of terrestrial vegetation around Bullhead Lake is summarized in Attachment No. 8.

Certain species of trees are able to survive periods of flooding better than others. Elm and cottonwood trees are the predominant trees on Bullhead Lake's shore. Elm trees are considered intermediately tolerant to flooding. This means an elm tree with good vigor can survive occasional inundation between 20 and 30 percent of the growing season. Cottonwood trees are considered tolerant to flooding. This means a cottonwood tree with good vigor is able to survive when flooded more than 30 percent but less than 40 percent of the growing season. (Hightshoe, 1988)

The ability for certain trees to survive occasional flooding may be due to the formation of lateral roots at or just above the waterline (Gill). Photo Nos. 11 and 13 show lateral roots washed by wave action. The base of these washed root systems occur at 1860.8 in Photo No. 11 and 1861.2 in Photo No. 13. The top of the washed root systems occur at 1862.3 in Photo No. 11 and 1862.9 in Photo No. 13.

Using trees on a lake without other OHWM evidence would suggest that the OHWM elevation lies between the elevation of predominant destruction of terrestrial vegetation and the top of the washed root systems. Destruction of terrestrial vegetation (i.e. trees) at Bullhead Lake occurs far enough below the lake water level (at the time of the investigation) that the base elevation of destroyed trees could not be measured, see Photo No. 8. The lake water level at the time of investigation was 1861.0 fmsl, therefore destruction of terrestrial vegetation has occurred below that elevation. The highest elevation for top of washed root systems occur at 1862.9 fmsl.

Elm and cottonwood trees measured at Bullhead Lake range in diameter from nine inches to 5.5 feet and have grown between the elevations of 1860.6 and 1867.2 fmsl. Large trees were found at all locations investigated around the lake and at several different elevations. At lower elevations large trees consisted of two four foot diameter live cottonwood trees found at elevation 1860.8 and 1861.3 fmsl. Also found just at the waters edge were two 3.5 foot diameter live cottonwood trees at elevation 1861.2 and 1861.4 fmsl. The largest tree measured was a 5.5 foot diameter live cottonwood tree found at elevation 1862.8 fmsl. A four foot diameter cottonwood was also found at elevation 1862.8 fmsl. In the upper regions of the lake bank large trees consisted of a four foot elm at elevation 1865.0 fmsl, a 3.5 foot diameter elm at 1864.6 fmsl, and a 3.5 foot diameter cottonwood at 1863.6 fmsl. The lowest terminal elevation for live trees at Bullhead Lake is 1860.6 fmsl.

Consistent elevations for various tree classes (diameters, heights) at Bullhead Lake are difficult to determine from the field data collected. However, it does appear that there are four zones of tree growth. Two zones occur at elevations of 1860.6 to 1861.5 fmsl and 1862.0 to 1862.8 fmsl representing tree growth at or near the shoreline. The other two zones occur at elevations of 1863.1 to 1865.0 fmsl and 1866.1 to 1867.2 fmsl representing tree growth on the upper limits of the bank. Cottonwood trees are predominant in the two lower growth zones while Elm trees make up the upper two growth zones.

OUTLET

The outlet for Bullhead Lake is located in the SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 10, T117N, R50W. There are three outlet channels between Bullhead Lake and a slough at the north end of the lake. The longest channel, which is the one farthest east, has an overflow elevation of 1861.1 fmsl. This channel consists of a grassed waterway and two small depressions where water pools before spilling to the slough at the north end of Bullhead Lake. The slough spills to Round Lake at a culvert bottom elevation of 1860.0 fmsl. The two shorter channels have overflow elevations of 1861.4 and 1862.0 fmsl.

Two of the channels are well grassed with some potential for erosion. The shortest and highest channel is a low spot in the dirt road between Bullhead Lake and the slough. There is great potential for erosion in this area.

In South Dakota most of the lakes with OHWM's have outlets that are six inches to one foot below the OHWM. The recommended OHWM for Round Lake is 0 to 0.9 feet above the overflow elevations of the three outlet channels. The lowest overflow elevation is 1861.1 fmsl and is therefore the recommended outlet elevation.

CONCLUSIONS

1. The term "Ordinary" for any given lake, as defined by established OHWM's can be synonymous with average, normal and yearly. "Ordinary" can also take into consideration periodic fluctuating water levels based upon prevailing climatic conditions and watershed characteristics.
2. A meander line is not at a constant elevation and is not considered in determining the OHWM for any given lake.
3. Historical water levels indicate that Bullhead Lake has experienced 6.4 feet of fluctuation since November 8, 1983.
4. Man made influences caused by road construction and culvert installation over and in the outlet and inlet channels may have affected the Bullhead Lake OHWM, but have been in existence long enough to constitute natural conditions.
5. Based upon the field data collected, potential OHWM elevations for Bullhead Lake are as follows: Visible changes in the character of the soil occur from 1861.4 to 1862.6; visible erosional features occur from 1860.7 to 1862.9 fmsl; the lowest terminal elevation for live trees is at 1860.6 fmsl.
6. Based upon the field data summarized in conclusion number 5, a potential OHWM elevation for Bullhead Lake is 1862.0 fmsl. Data from soil characteristics were limited due to the water level in the lake. However, erosional features and terrestrial vegetation afforded strong evidence with supportive evidence from soil characteristics. OHWM's are not associated with the highest limits of a lake bank but are associated with the upper limits of a lake bank. The majority of the indicators show the OHWM exists at the elevation of 1862.0 fmsl, it is recommended that the OHWM be established at 1862.0 fmsl.
7. It is recommended that the outlet elevation for Bullhead Lake be established at 1861.1 fmsl.
8. Vested Water Right Claim No.1466-3 will need to be corrected prior to being validated.



Lynn Beck
Natural Resources Engineer III
Water Rights Program



Gale N. Selken, P.E.
Natural Resources Engineer IV
Water Rights Program

**RECOMMENDATION OF CHIEF ENGINEER ON ESTABLISHMENT OF AN ORDINARY
HIGH WATER MARK and OUTLET ELEVATION and VALIDATION OF RECOGNIZED
VESTED WATER RIGHT CLAIM NO. 1466-3 FOR BULLHEAD LAKE, DEUEL COUNTY**

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 establishment of an Ordinary High Water Mark, outlet elevation and validation of Recognized Vested Water Right Claim No. 1466-3 for Bullhead Lake in Deuel County.

The Chief Engineer of the Water Rights Program recommends that the:

- 1) Ordinary High Water Mark for Bullhead Lake, Deuel County be established at an elevation of 1,862.0 feet mean sea level (fmssl).
- 2) Outlet elevation for Bullhead Lake, Deuel county be established at elevation 1,861.1 fmssl.
- 3) Validation of Recognized Vested Water Right Claim No. 1466-3 for sufficient water to maintain the water level to the outlet elevation of 1,861.1 feet mean sea level.

See report for additional information.



JOHN HATCH, Chief Engineer
March 24, 1998

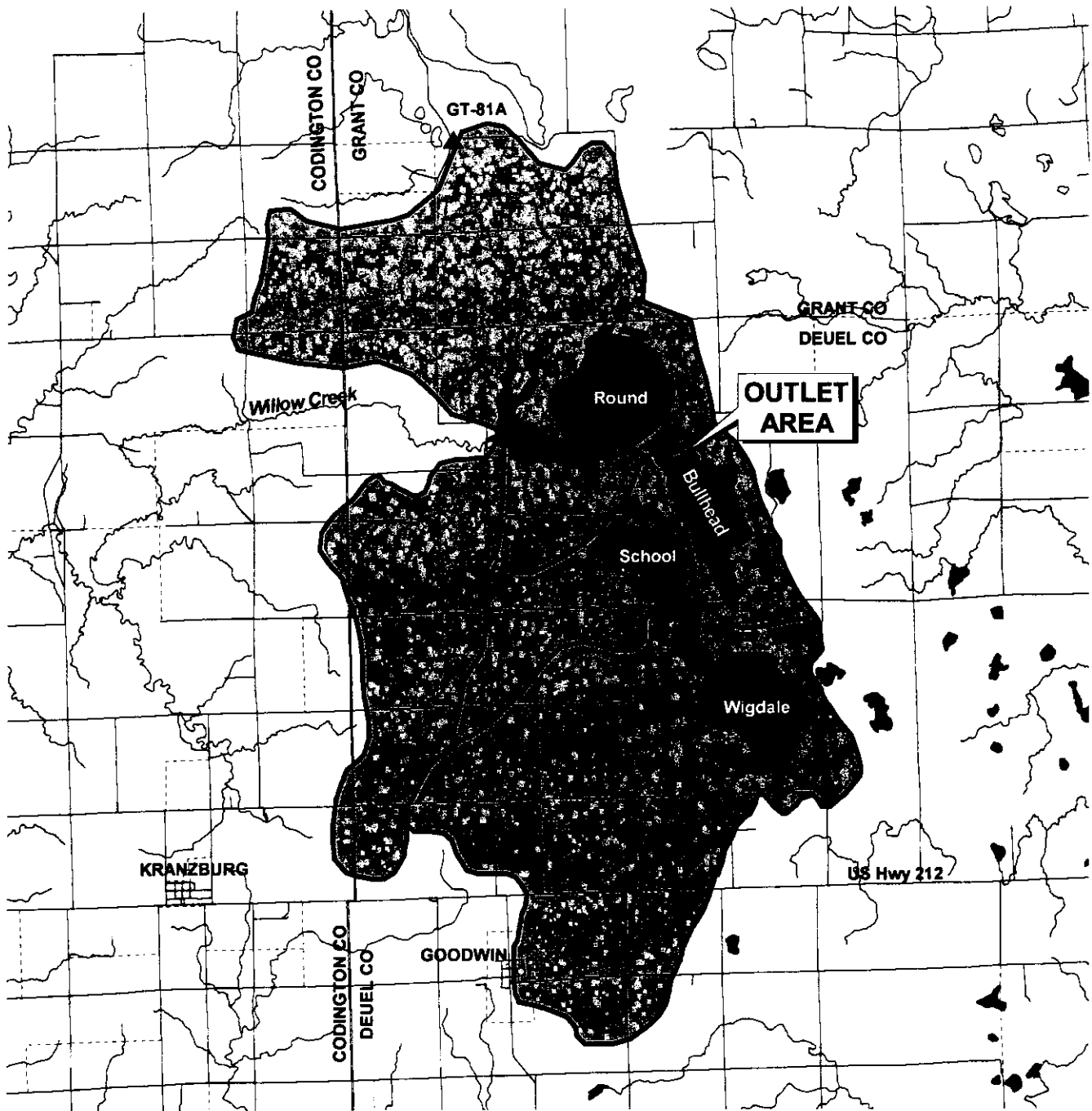
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- Water Rights Program Files, 1997, Department of Environment and Natural Resources, Joe Foss Building, 523 East Capitol, Pierre, SD 57501.

Persons and Agencies Referenced

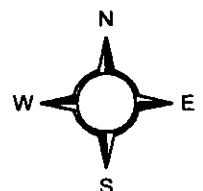
- Archives, State Library Building, Pierre, SD 57501
- Deuel County Register of Deeds, County Courthouse, Milbank, SD 57252
- State Climatologist, South Dakota State University, Brookings, SD 57007

Attachment No. 1
BULLHEAD LAKE, DEUEL COUNTY
ORDINARY HIGH WATER MARK INVESTIGATION MAP



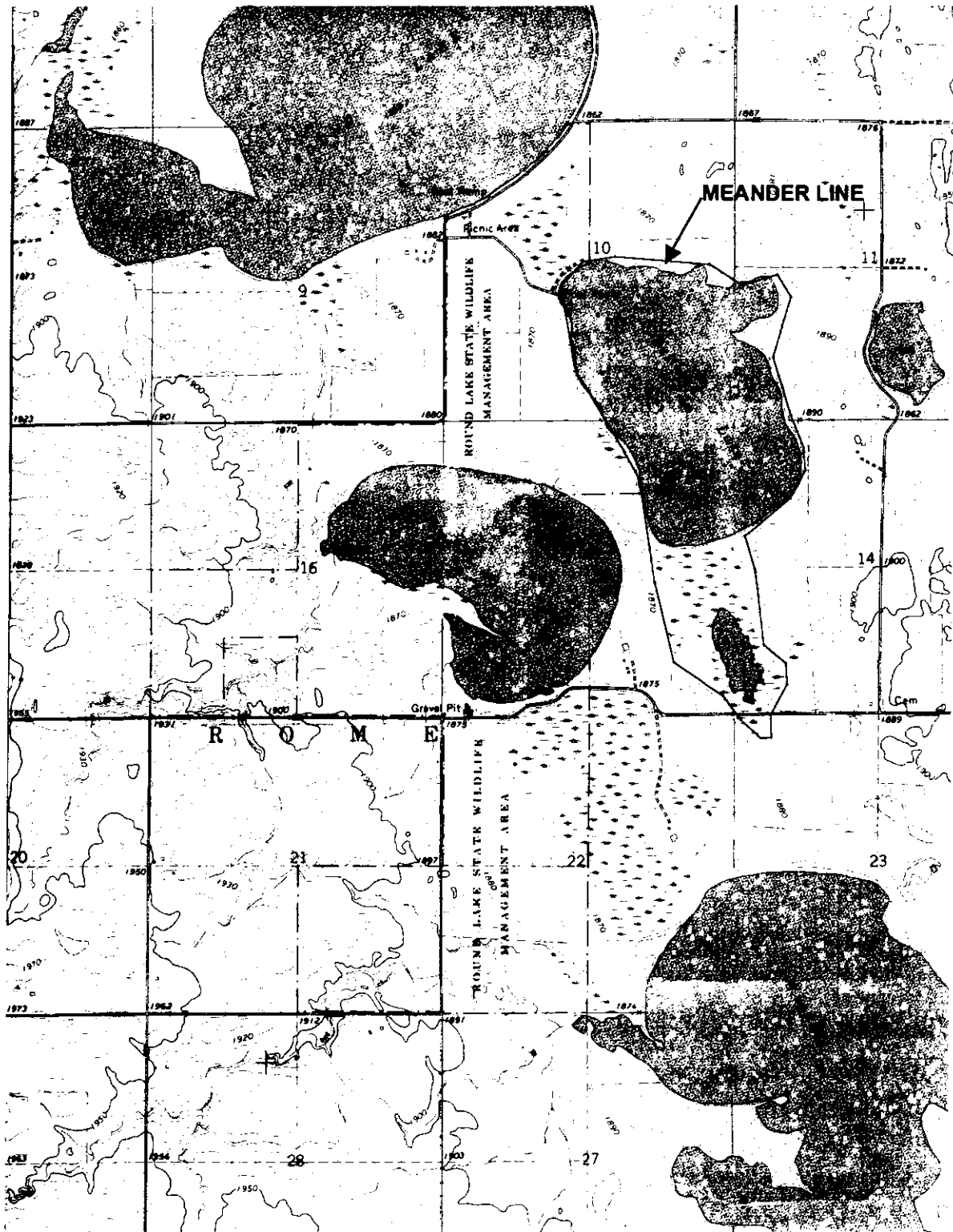
LEGEND

- Roads
- Hydrology
- Boundaries
- OHWM Evidence
- Lakes
- Wetlands
- Observation Well GT-81A
- Watersheds



Attachment No. 2

GOODWIN QUADRANGLE
SOUTH DAKOTA, DEUEL COUNTY
7.5 MINUTE SERIES (TOPOGRAPHY)



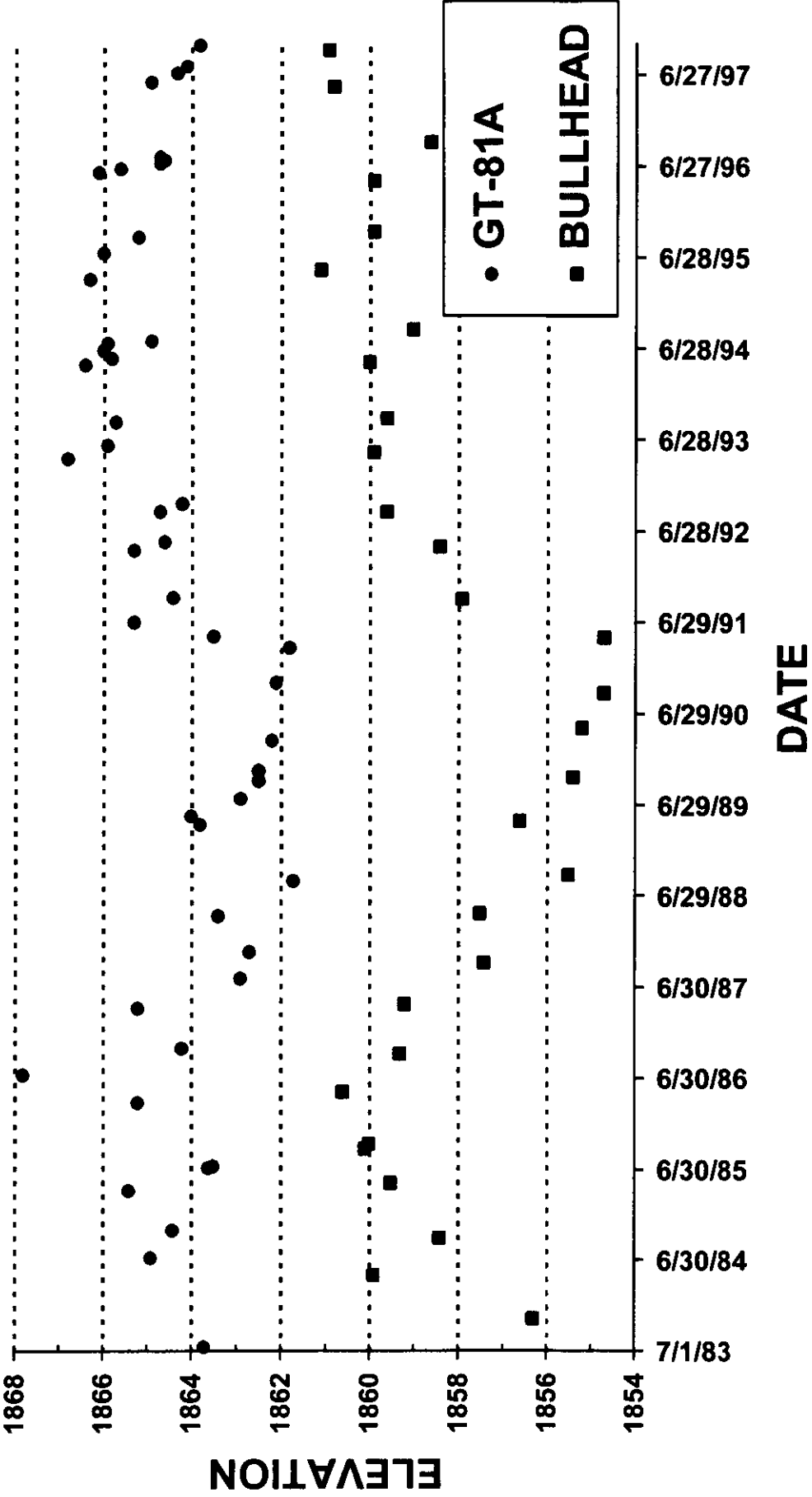
Attachment No. 4

**MEASURED WATER LEVELS
FOR
BULLHEAD LAKE, DEUEL COUNTY**

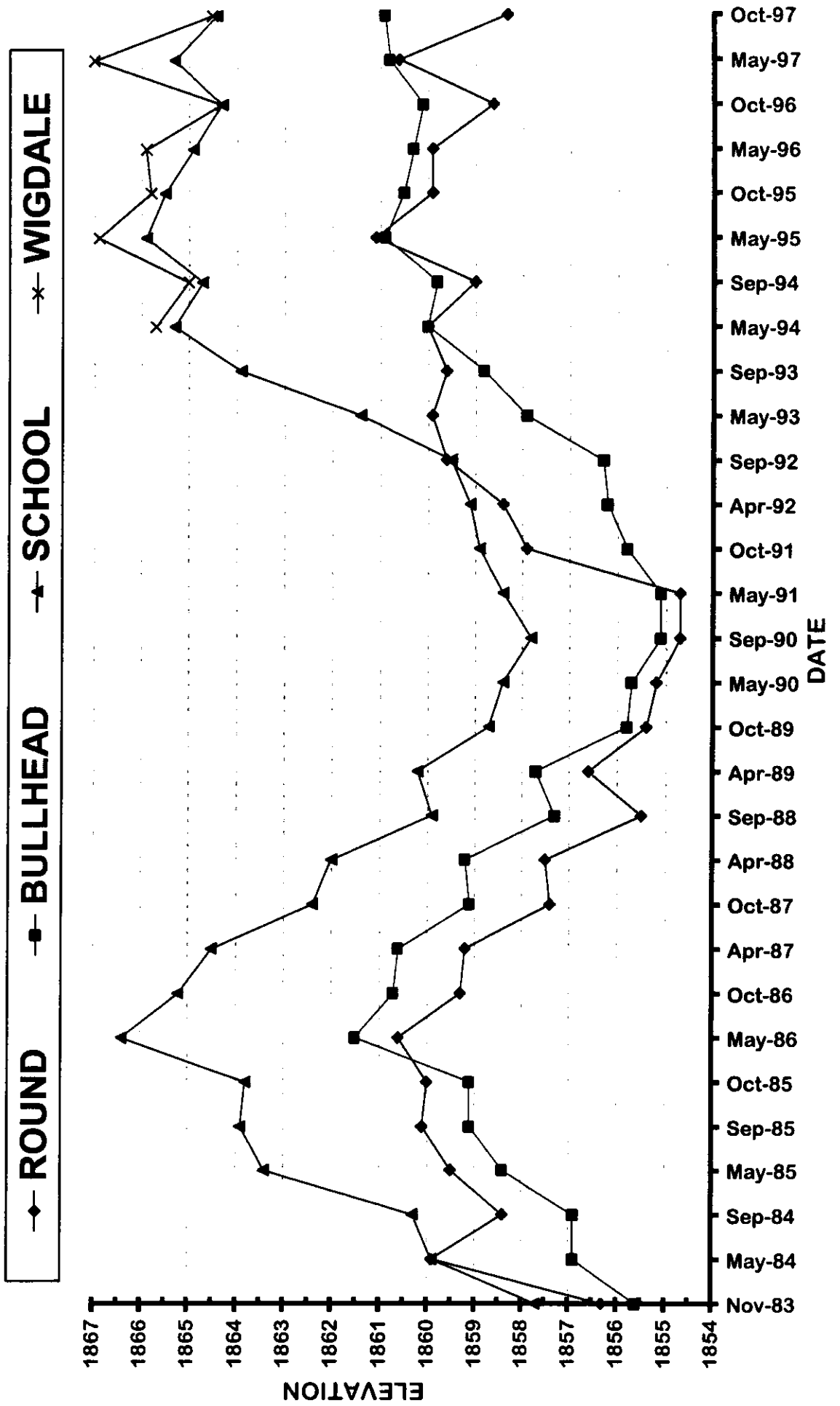
DATE	WATER LEVELS
11-08-83	1855.6
05-01-84	1856.9
09-27-84	1856.9
05-08-85	1858.4
09-19-85	1859.1
10-10-85	1859.1
05-07-86	1861.5
10-08-86	1860.7
04-23-87	1860.6
10-07-87	1859.1
04-20-88	1859.2
09-21-88	1857.3
04-26-89	1857.7
10-18-89	1855.8
05-02-90	1855.7
09-19-90	1855.1
05-01-91	1855.1
10-02-91	1855.8
04-29-92	1856.2
09-16-92	1856.3
05-12-93	1857.9
09-22-93	1858.5
05-04-94	1860.0
09-14-94	1859.8
05-10-95	1860.9
10-11-95	1860.5
05-01-96	1860.3
10-02-96	1860.1
05-13-97	1860.8
10-08-97	1860.9

Measurements by Water Rights Program

**OBSERVATION WELL GT-81A AND BULLHEAD LAKE
WATER LEVELS**



BULLHEAD, ROUND, SCHOOL, AND WIGDALE LAKES DEUEL COUNTY LAKE LEVELS



Attachment No. 7

OHWM EVIDENCE

EROSIONAL CHARACTERISTICS:

Elevation (fmst)	Legal Description	Comments
1864.96	W $\frac{1}{2}$ NW $\frac{1}{4}$ Sec. 14, T117N, R50W	Top of sand ridge.
1864.66	"	"
1864.57	"	"
1864.49	"	"
1864.47	"	"
1864.12	"	"
1864.10	"	"
1863.88	"	"
1862.88	"	Top of washed root systems.
1862.73	"	"
1862.33	"	"
1862.30	"	"
1862.25	"	"
1862.14	NW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 11, T117N, R50W	"
1861.93	"	"
1860.93	"	"
1862.96	W $\frac{1}{2}$ NW $\frac{1}{4}$ Sec. 14, T117N, R50W	Top of cutbank
1862.78	"	"
1862.73	"	"
1862.32	"	"
1862.20	NW $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 10, T117N, R50W	"
1861.88	"	"
1861.98	W $\frac{1}{2}$ NW $\frac{1}{4}$ Sec. 14, T117N, R50W	Base of cutbank
1861.70	"	"
1861.57	"	"
1861.26	NW $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 10, T117N, R50W	"
1861.23	W $\frac{1}{2}$ NW $\frac{1}{4}$ Sec. 14, T117N, R50W	"
1861.23	"	"
1861.17	"	"
1861.15	"	"
1860.97	"	"
1860.78	NW $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 10, T117N, R50W	"
1860.78	NW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 11, T117N, R50W	"
1860.69	"	"

SOIL CHARACTERISTICS:

Elevation (fmsl)	Legal Description	Comments
1862.57	W $\frac{1}{2}$ NW $\frac{1}{4}$ Sec. 14, T117N, R50W	Top of pebbles.
1862.47	"	"
1862.40	"	"
1862.11	"	"
1861.98	"	"
1961.77	"	"
1961.70	"	"
1861.57	"	"
1861.43	NW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 11, T117N, R50W	"
1862.57	W $\frac{1}{2}$ NW $\frac{1}{4}$ Sec. 14, T117N, R50W	Top of beach.
1861.77	"	"
1861.77	NW $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 10, T117N, R50W	"
1861.70	W $\frac{1}{2}$ NW $\frac{1}{4}$ Sec. 14, T117N, R50W	"
1861.57	NW $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 10, T117N, R50W	"
1861.26	"	"

TERRESTRIAL VEGETATION:

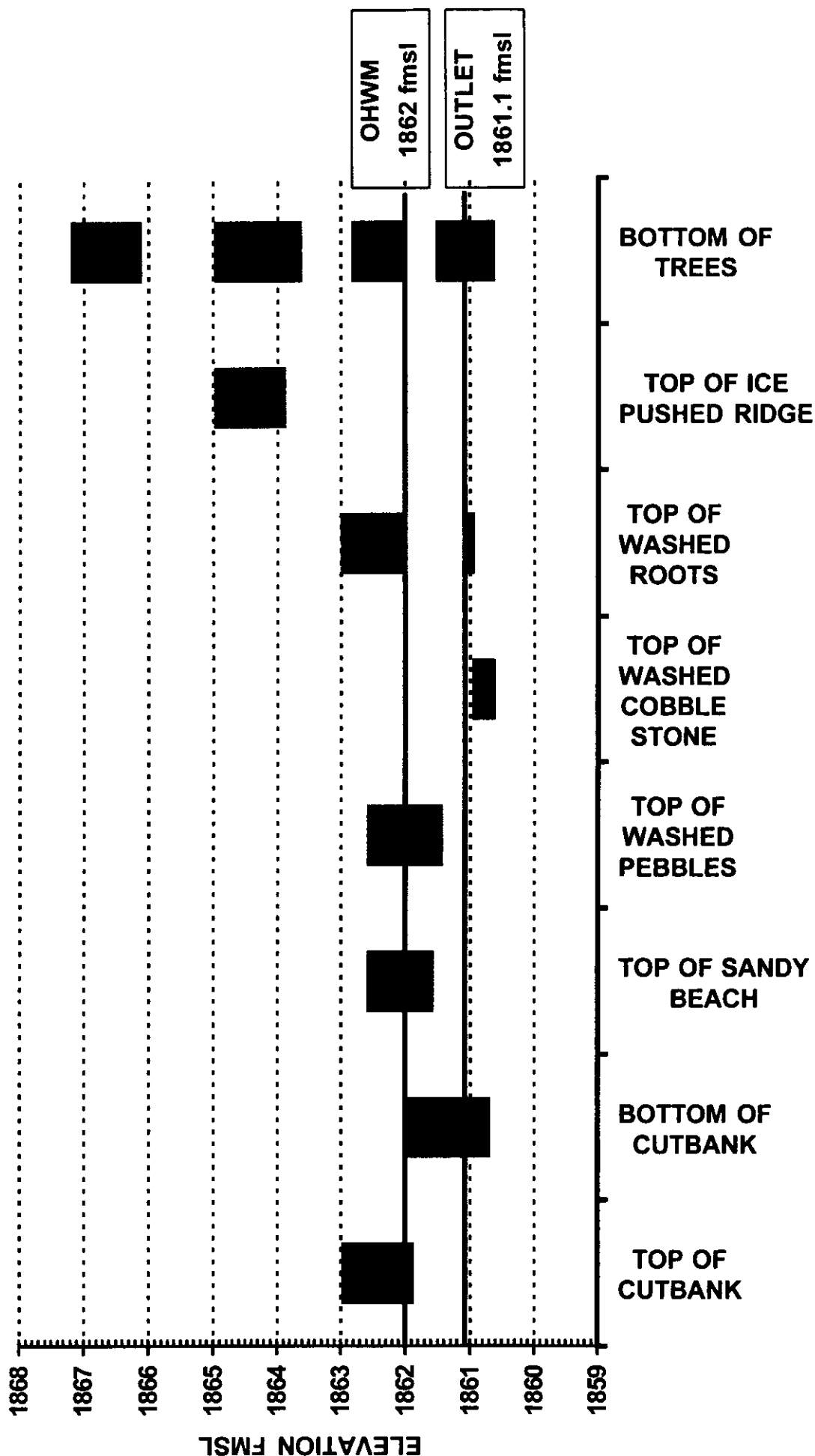
Elevation (fmsl)	Legal Description	Comments
1867.18	W $\frac{1}{2}$ NW $\frac{1}{4}$ Sec. 14, T117N, R50W	Lakeside 1.5' dia. live elm
1867.16	"	" 1.5' dia. elm
1867.10	"	" 1.5' dia. live elm
1866.83	"	" 1.5' dia. live elm
1866.28	"	" 9" dia. live elm
1866.12	"	" 1.3' dia. live elm
1864.96	"	" 4' dia. live elm
1864.66	"	" 1.5' dia. live elm
1864.57	"	" 3.5' dia. live elm
1864.49	"	" 1' dia. live elm
1864.47	"	" 2.5' dia. live cottonwood
1864.12	"	" 1.5' dia. live elm
1863.88	"	" 1' dia. live elm
1863.62	"	" 3.5' dia. live cottonwood
1862.81	"	" 5.5' dia. live cottonwood
1862.75	"	" 4' dia. live cottonwood
1862.45	"	" 2' dia. live cottonwood
1862.27	"	" 1.5' dia. live cottonwood
1862.10	NW $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 10, T117N, R50W	" 1.5' dia. live cottonwood (begin line of trees)

Terrestrial vegetation continued:

Elevation (fsm)	Legal Description	Comments
1862.08	"	Lakeside 1.5' dia. live cottonwood (begin line of trees)
1862.04	"	" 1' dia. live cottonwood
1861.50	W $\frac{1}{2}$ NW $\frac{1}{4}$ Sec. 14, T117N, R50W	" 1' dia. live elm
1861.35	"	" 3.5' dia. live cottonwood
1861.27	NW $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 10, T117N, R50W	" 4' dia. live cottonwood
1861.22	W $\frac{1}{2}$ NW $\frac{1}{4}$ Sec. 14, T117N, R50W	" 3.5' dia. live cottonwood
1861.04	NW $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 10, T117N, R50W	" 3' dia. live elm
1860.94	NW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 11, T117N, R50W	" 9" dia. live hickory
1860.78	W $\frac{1}{2}$ NW $\frac{1}{4}$ Sec. 14, T117N, R50W	" 1' dia. live elm
1860.75	NW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 11, T117N, R50W	" 4' dia. live cottonwood
1860.65	"	" 2.5' dia. live cottonwood
1860.63	NW $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 10, T117N, R50W	" 2.5' dia. live cottonwood
1860.61	NW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 11, T117N, R50W	" 2.5' dia. live cottonwood
1864.57	W $\frac{1}{2}$ NW $\frac{1}{4}$ Sec. 14, T117N, R50W	landside 3.5' dia. live cottonwood
1864.22	"	" 1.5' dia. live elm
1863.84	"	" 5.5' dia. live cottonwood
1863.28	"	" 3.5' dia. live cottonwood
1863.12	"	" 3.5' dia. live elm
1863.04	"	" 2' dia. live cottonwood
1863.02	"	" 4' dia. live cottonwood
1862.70	"	" 1' dia. live elm
1862.54	NW $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 10, T117N, R50W	" 3' dia. live cottonwood
1862.44	NW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 11, T117N, R50W	" 2.5' dia. live cottonwood
1862.23	NW $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 10, T117N, R50W	" 4' dia. live cottonwood
1862.13	NW $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 11, T117N, R50W	" 4' dia. live cottonwood
1862.11	"	" 2.5' dia. live cottonwood
1861.83	W $\frac{1}{2}$ NW $\frac{1}{4}$ Sec. 14, T117N, R50W	" 1' dia. live elm
1861.80	NW $\frac{1}{4}$ SE $\frac{1}{4}$ Sec. 10, T117N, R50W	" 2.' dia. live cottonwood

OHWM EVIDENCE GRAPH

The green bar segments represent bands of evidence along Bullhead Lake's shore. Each segment is a group of a particular category of evidence found at or near the same elevation.



Attachment No. 9

WATER YEAR PRECIPITATION TOTALS
FOR
CLEAR LAKE, DEUEL CO. STATION



MONTHLY PRECIPITATION FOR CLEAR LAKE

STATION NO. 39177707

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1938	NA	NA	NA	NA	NA	NA	NA	4.55	2.55	0.28	0.73	0.19	NA
1939	1.59	0.75	0.71	1.31	2.54	5.78	7.18	4.21	1.10	1.03	0.00	0.05	26.25
1940	0.05	0.45	2.80	1.78	1.01	4.94	1.13	7.26	0.31	1.36	1.23	0.47	22.79
1941	0.75	0.21	0.17	4.66	1.64	3.29	1.94	1.58	1.58	2.64	0.25	0.65	19.36
1942	0.00	0.09	2.68	2.15	7.29	3.19	2.14	2.83	4.99	0.70	0.01	0.40	26.47
1943	0.57	0.67	1.43	0.43	3.36	4.37	4.69	4.11	0.98	1.64	1.38	0.00	23.63
1944	1.05	0.49	0.60	2.28	2.71	4.01	1.88	5.10	2.17	0.17	0.95	0.12	21.53
1945	0.29	0.81	0.58	1.55	4.09	5.15	5.82	1.55	1.62	0.47	0.73	1.48	24.14
1946	0.00	1.31	1.91	0.92	4.37	6.05	4.20	1.75	5.86	4.09	1.18	0.48	32.12
1947	0.64	0.25	1.03	4.81	1.33	6.59	0.32	2.11	3.31	1.84	3.07	0.12	25.42
1948	0.07	1.94	0.45	2.99	0.74	5.14	5.94	5.37	2.68	1.08	1.34	0.13	27.87
1949	0.79	0.00	1.74	0.43	2.27	4.24	5.33	0.97	3.70	1.82	1.47	0.95	23.71
1950	0.68	0.00	2.32	1.21	4.70	1.41	2.51	1.56	1.82	1.71	0.43	0.56	18.91
1951	0.44	0.64	2.73	2.70	3.81	4.31	4.36	5.90	0.84	1.85	0.49	2.19	30.26
1952	1.77	1.49	1.59	0.52	1.42	7.46	1.29	1.35	0.84	0.00	0.84	0.32	18.89
1953	1.12	1.82	0.82	4.53	3.26	5.96	5.09	1.38	0.32	0.54	1.16	1.81	27.81
1954	0.27	0.69	2.71	2.45	2.44	3.74	1.79	1.65	3.57	1.69	0.94	0.08	22.02
1955	0.47	MM	0.34	2.30	0.67	4.84	4.78	3.03	0.79	0.35	NA	1.93	NA
1956	0.80	0.15	1.39	1.85	3.47	6.51	4.67	5.74	1.77	0.69	1.24	0.16	28.44
1957	0.43	0.95	0.68	2.38	5.44	2.58	1.91	3.20	4.60	3.02	1.30	0.76	27.25
1958	0.13	0.67	0.73	2.75	1.57	3.48	2.42	1.80	3.06	0.15	1.86	0.29	18.91
1959	0.38	0.68	0.12	1.21	4.68	1.63	3.01	1.59	1.73	2.37	1.10	1.56	20.06
1960	0.72	0.00	1.11	2.42	2.27	5.12	2.06	8.31	1.75	0.85	0.94	1.06	26.61
1961	0.04	0.52	0.57	1.43	5.40	4.27	1.64	3.04	2.64	1.73	0.26	0.54	22.08
1962	NA	NA	NA	NA	4.25	4.95	6.59	0.59	1.89	0.84	0.56	0.06	NA
1963	0.33	0.38	1.82	2.53	1.65	3.22	9.19	0.77	3.20	1.56	0.56	0.52	25.73
1964	0.00	0.09	1.42	2.70	1.52	2.36	4.15	5.77	1.14	0.05	0.41	0.42	20.03
1965	0.75	0.32	2.26	3.13	7.45	2.68	2.38	3.57	4.60	0.77	0.80	0.51	29.22
1966	0.22	0.88	0.67	1.75	1.69	2.12	4.10	4.24	2.28	0.86	0.38	0.34	19.53
1967	0.88	0.96	0.18	2.39	0.64	6.94	1.14	1.72	0.85	1.16	0.17	0.39	17.42
1968	0.24	0.00	0.74	4.36	2.22	3.90	2.12	2.06	2.85	4.04	0.86	2.02	25.41
1969	1.75	2.01	0.44	1.79	2.33	2.65	5.22	2.04	0.80	3.04	0.21	1.07	23.35
1970	0.24	0.03	1.31	3.85	4.44	3.86	4.86	1.43	2.04	4.20	3.26	0.22	29.74
1971	0.10	0.98	0.03	1.77	1.77	6.72	3.78	2.63	1.03	4.57	2.54	0.36	26.28
1972	0.50	0.31	0.89	3.03	8.51	1.02	5.98	2.10	0.65	3.34	1.26	1.37	28.96

1973	0.22	0.44	2.17	1.15	3.78	0.47	1.35	2.74	1.99	1.40	0.84	0.77	17.32
1974	0.00	1.20	1.07	1.75	4.39	2.90	1.56	3.07	0.66	0.83	0.50	0.14	18.07
1975	1.93	0.32	4.21	4.50	1.13	4.70	1.83	3.99	1.81	0.81	0.92	0.19	26.34
1976	0.84	0.56	1.41	1.00	0.38	1.52	1.60	NA	NA	0.39	0.09	0.54	NA
1977	0.50	1.53	5.29	1.94	2.10	4.36	2.34	4.50	5.60	3.60	3.48	1.42	36.66
1978	0.19	0.41	1.12	3.37	4.87	2.83	2.14	4.87	2.51	0.32	0.99	0.54	24.16
1979	2.39	0.55	1.75	3.02	2.48	4.01	2.62	6.04	0.66	3.62	0.22	0.16	27.52
1980	0.32	0.67	0.69	0.13	2.54	7.97	2.72	4.64	0.78	1.16	0.06	0.14	21.82
1981	0.39	1.38	1.41	1.26	1.21	4.16	2.69	1.13	0.75	2.03	1.22	0.90	18.80
1982	1.75	0.27	1.14	1.43	5.33	2.65	6.80	3.73	2.60	3.47	1.34	0.41	30.92
1983	1.00	0.09	4.09	1.46	1.63	3.23	2.48	1.64	2.62	1.57	5.21	0.67	25.69
1984	0.57	0.75	2.06	3.28	2.56	7.92	1.18	1.09	3.55	6.85	0.02	0.78	30.61
1985	NA	0.22	3.09	2.35	2.94	2.43	5.03	4.33	5.30	1.20	1.72	0.66	NA
1986	0.38	0.76	1.35	5.85	4.15	3.42	5.85	2.34	4.43	0.50	0.42	0.00	29.45
1987	0.17	0.43	2.20	0.70	1.42	1.35	4.93	1.95	2.78	1.16	0.87	0.92	18.88
1988	1.35	0.37	1.08	1.21	1.74	0.48	2.27	6.34	2.34	0.17	1.24	0.39	18.98
1989	0.21	0.82	2.95	1.82	1.10	1.89	2.48	4.66	3.15	1.55	0.74	0.05	21.42
1990	0.00	0.38	1.53	1.44	3.88	8.46	5.10	3.02	1.12	1.65	0.07	0.42	27.07
1991	0.27	0.68	1.15	4.67	4.38	5.82	3.03	3.59	2.45	0.72	1.14	0.03	27.93
1992	0.99	0.77	1.41	2.00	1.39	16.12	4.10	2.73	2.08	0.58	2.29	0.75	35.21
1993	1.13	0.70	1.92	2.67	4.99	8.41	5.51	2.14	2.85	0.51	2.55	0.97	34.55
1994	1.94	1.00	0.57	3.02	1.89	6.84	2.70	4.27	3.07	2.16	0.85	0.41	28.72
1995	0.53	0.27	3.95	5.05	4.37	1.58	5.45	1.86	4.14	2.71	0.82	0.26	30.99
1996	1.22	0.50	0.40	0.77	5.47	1.94	1.88	2.95	2.96	4.76	3.14	0.94	26.93
1997	2.03	1.07	1.58	2.83	1.14	1.49	7.27	4.49	1.59	2.17	0.17	0.31	26.14

Attachment No. 10

BULLHEAD LAKE PHOTOS

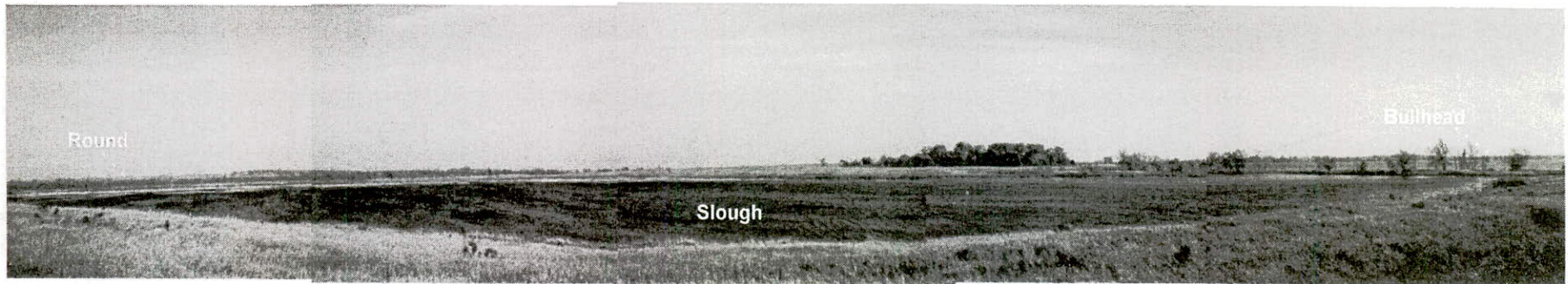


Photo No. 1 - Slough between Bullhead Lake and Round Lake, part of the outlet channel between Bullhead Lake and Round Lake.

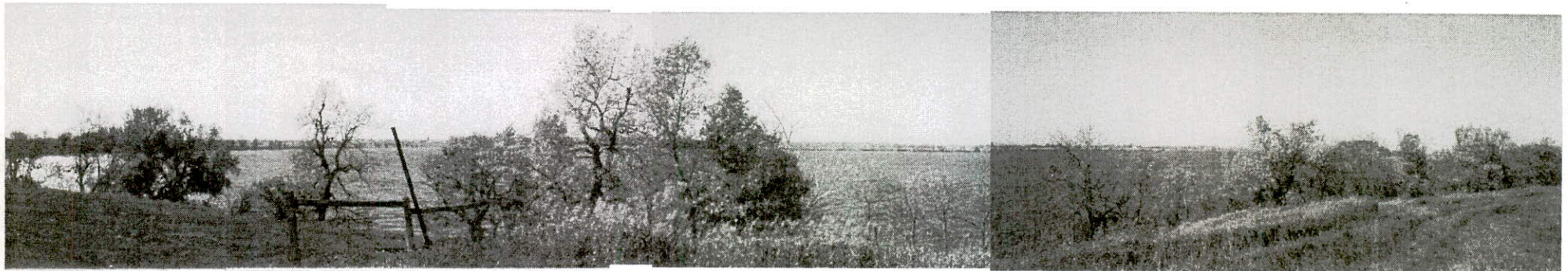


Photo No. 2 - Bullhead Lake taken from the east side looking west.



Photo No. 3 - Outlet channel looking toward Bullhead Lake, overflow elevation 1861.1 fmsl.



Photo No. 4 - Outlet channel looking toward the slough between Bullhead Lake and Round Lake, overflow elevation 1861.1 fmsl.

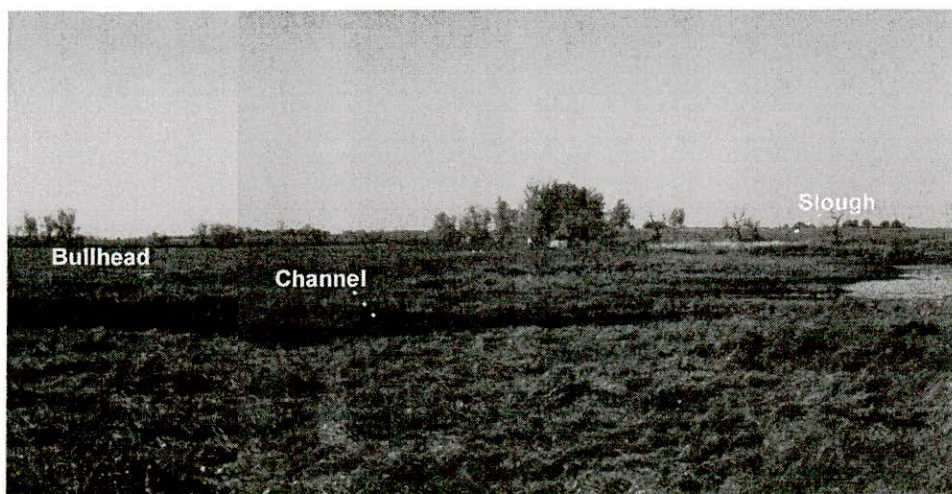


Photo No. 5 - Outlet channel just west of the above channel, overflow elevation 1862 fmsl. Flows to the slough between Bullhead Lake and Round Lake.



Photo No. 6 - At the NW corner of the lake, 4 foot live cottonwood tree.
lakeside elev. 1861.3 fmsl
landside elev. 1862.2 fmsl



Photo No. 7 - At the NW corner of the lake, 3 foot live cottonwood tree.
lakeside elev. 1861.0 fmsl
landside elev. 1862.5 fmsl

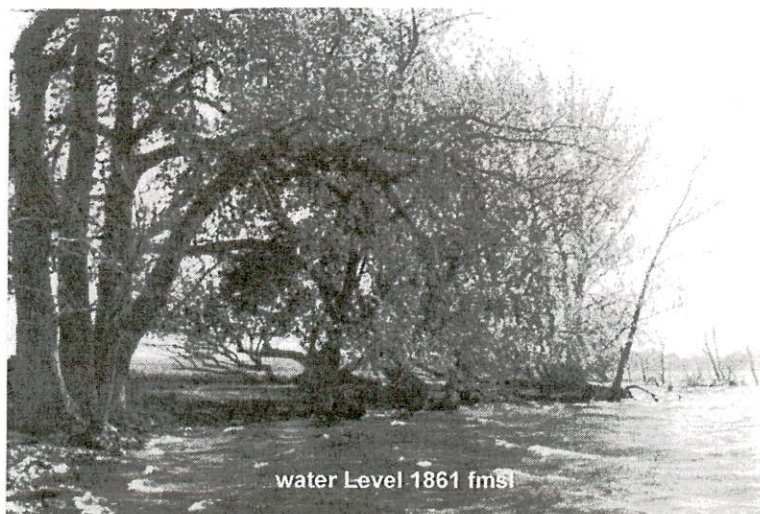


Photo No. 8 - At the NW corner of the lake line of large trees at the waters edge. Inundated trees in the background.

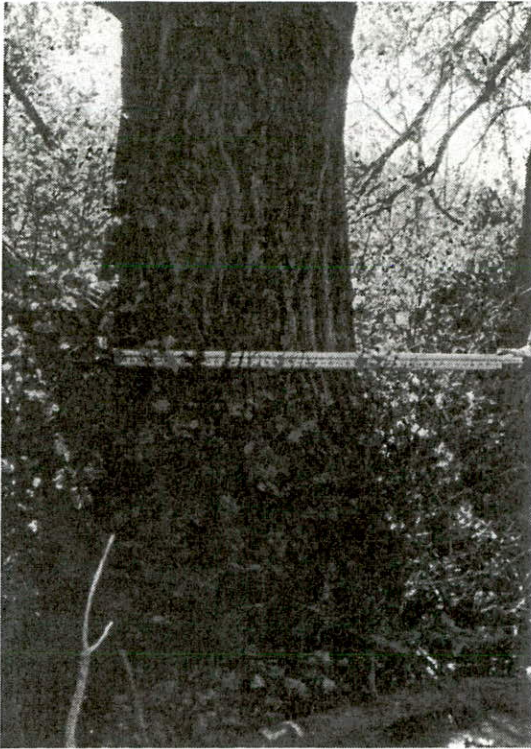


Photo No. 9 - At the NE corner of the lake, 4 foot live cottonwood tree.
lakeside elev. 1860.8 fmsl
landside elev. 1862.1 fmsl

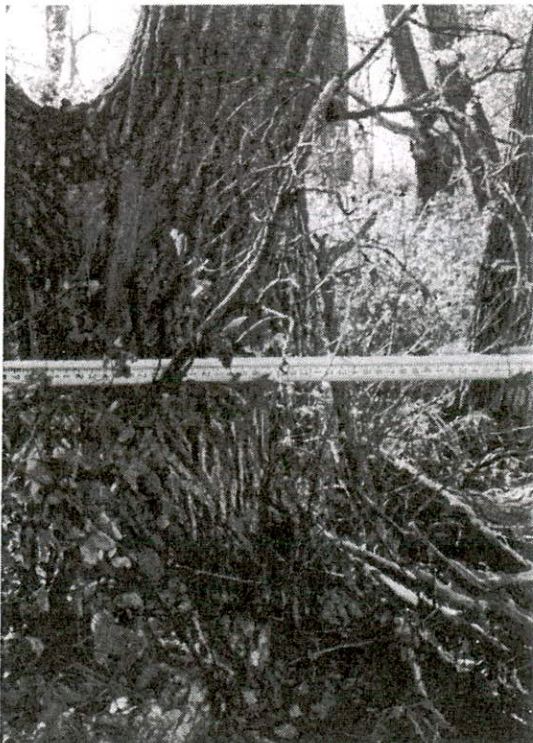
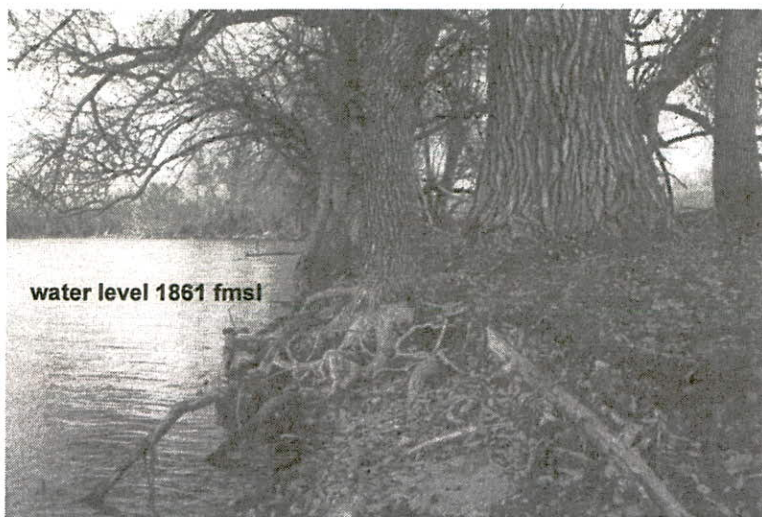


Photo No. 10 - At the NE corner of the lake, 2.5 foot live cottonwood tree.
lakeside elev. 1860.7 fmsl
landside elev. 1862.1 fmsl



water level 1861 fmsl

Photo No. 11 - At the SE corner of the lake, 1 foot live elm tree.
lakeside elev. 1860.8 fmsl
landside elev. 1862.7 fmsl
top of washed root system 1862.3 fmsl



Photo No. 12 - At the SE corner of the lake, 5.5 foot live cottonwood tree.
lakeside elev. 1862.9 fmsl
landside elev. 1863.8 fmsl



Photo No. 13 - At the SE corner of the lake, 5.5 foot live cottonwood tree.
top of washed root system 1862.9 fmsl

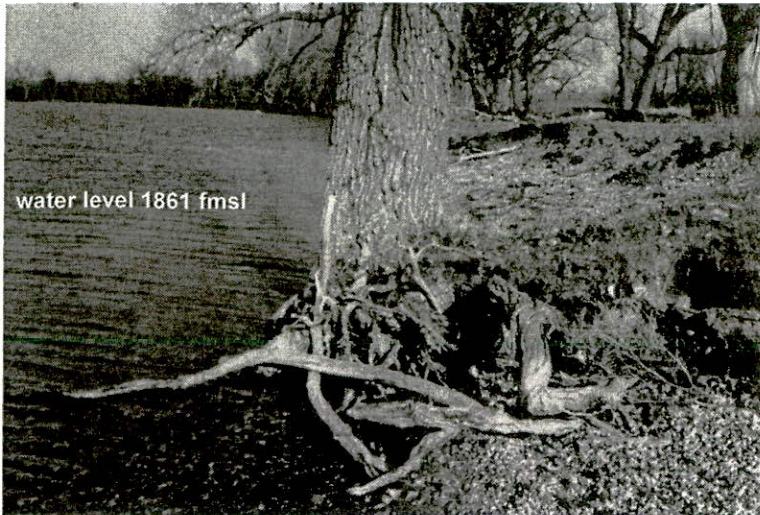


Photo No. 14 - At the SE corner of the lake, 2 foot live cottonwood tree.
lakeside elev. 1862.45 fmsl
landside elev. 1863.0 fmsl



Photo No. 15 - At the SE corner of the lake, washed pebbles at the base of an ice pushed ridge.
top of washed pebble elev 1862.4 fmsl

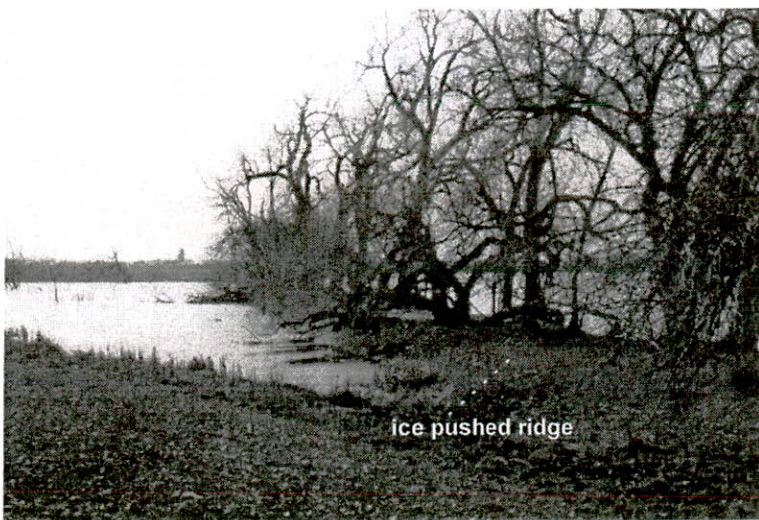


Photo No. 16 - At the SE corner of the lake, ponded water on the east side of an ice pushed ridge.
top of ridge elev. 1863.9 to 1865 fmsl



DENR
SOUTH DAKOTA

DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

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Memo to File

Bullhead Lake in Deuel County

VWR No. 1466-3

The OHWM was set by the Water Management Board on May 6, 1998.

OHWM elevation 1862.0 fmsl NGVD29

The outlet elevation was set by the Water Management Board on May 6, 1998.

Outlet elevation 1861.1 fmsl NGVD29

The Water Management Board validated Vested Water Right No. 1466-3 on May 6, 1998