

FORM 2: Application for flood control permit
(type or print)



Mail to:
Water Rights Division
Joe Foss Building
523 E Capitol
Pierre SD 57501-3181
605 773-3352

No. FC-17 Hydrologic Unit 10/70201
Basin Sioux River
Newspaper Brookings Register, Brookings, SD
(office use only)

APPLICATION FOR A FLOOD CONTROL PERMIT WITHIN THE STATE OF SOUTH DAKOTA

1. Name of Applicant South Dakota Department of Transportation
Address P.O. Box 449
(Street, RR or Box)
Brookings South Dakota 57006-0449 Phone No. (605) 693-3231
(City) (State) (Zip Code)
2. Name of watercourse Unknown NE 1/4
3. Location of project (legal description) NE 1/4 of Section 16 and SE 1/4 & SW 1/4 of Section 9
T110N, R52W
4. County or counties where project is located Brookings
5. Give a brief description of the proposed project including the type of project (Dam, Dikes, Channel Modifications, etc.) and purpose for the project. When available include any preliminary engineering report or other reports or information that will help explain the project. (Attach sheet if more space is needed.)

An existing ditch constructed in the spring of 1995 will be replaced with a pipe varying from 42" to 30". This project drained water off US 14 and the finished project will keep water off US 14 in the future even with heavy rains.

Attachment: Attach map (see instruction)

STATE OF SOUTH DAKOTA)
County of Brookings) SS

I, Robert Orcutt the applicant, certify that I have read this application, have examined the attached map and that the matters stated are true and that I intend, and am able to complete the necessary construction.

Signed

[Signature]

Subscribed and sworn to before me this 14 day of December 19 95

Debra K. Wiskum

Notary Public

Commission Expires April 12, 2001



SOUTH DAKOTA
FLOOD CONTROL PERMIT NO. FC-17

Date of first receipt of application December 21, 1995.

The Chief Engineer, on behalf of the Water Management Board, issues Flood Control Permit No. FC-17 to South Dakota Department of Transportation, PO Box 449, Brookings SD 57006-0449 authorizing the construction of the water use system and the placing of water to beneficial use subject to the following limitations, conditions and qualifications:

1. Flood Control Permit No. FC-17 authorizes a combination ditch and pipe varying from 30 to 42 inches in diameter to drain water off of US Highway 14. The body of water proposed to be drained is part of the Brush Lakes chain and is specifically known as East Brush Lake No. 2. The proposed ditch and pipeline is to be constructed at an outlet elevation of 1753.0 feet mean sea level along a line from an inlet point located in the NW 1/4 NE 1/4 Section 16 to a discharge point located in the NE 1/4 SW 1/4 Section 9; all in T110N-R52W. The discharge is to the Lake Goldsmith drainage. The project proposes to replace an existing temporary ditch constructed in the spring of 1995 as an emergency measure to remove flood water that overtopped Highway 14 along the section line between section 16 and 21 T110N-R52W.
2. Approval of the permit will not increase the likelihood or severity of flood damages downstream, will not endanger human life or property, will not impair existing rights and is in the public interest because failure to drain water of of US Highway 14 may result in unsafe driving conditions.
3. The date of approval of Flood Control Permit No. FC-17 is March 22, 1996.
4. The date from which applicant may claim right is December 21, 1995.
5. All construction is to be completed on or before March 22, 2001.

WATER MANAGEMENT BOARD

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

APR 3 1996
date



Gronlund, Eric

From: Hatch, John
To: Nelson, Jim
Cc: Gronlund, Eric; Selken, Gale; Beck, Lynn; Olson, Tim
Subject: Highway 14, Brush Lake
Date: Monday, December 04, 1995 9:14AM
Priority: High

I have discussed the question of whether a flood control permit is necessary for DOT to install an outlet for drainage of water to protect Highway 14 west of Volga with Diane Best, Assistant Attorney General.

Since the water body is a meandered lake, one of the Brush Lakes, a flood control permit is necessary. As I understand this issue a 12-inch culvert, installed in 1986, bottom elevation 1754.5 msl, was removed and a ditch dug (bottom elevation 1752.5) to provide temporary removal of water. Now DOT wants to install 1450 feet of 36" pipe and 600 feet of 30-inch pipe for drainage of Brush Lake. The proposed outlet elevation is 1753.5 msl.

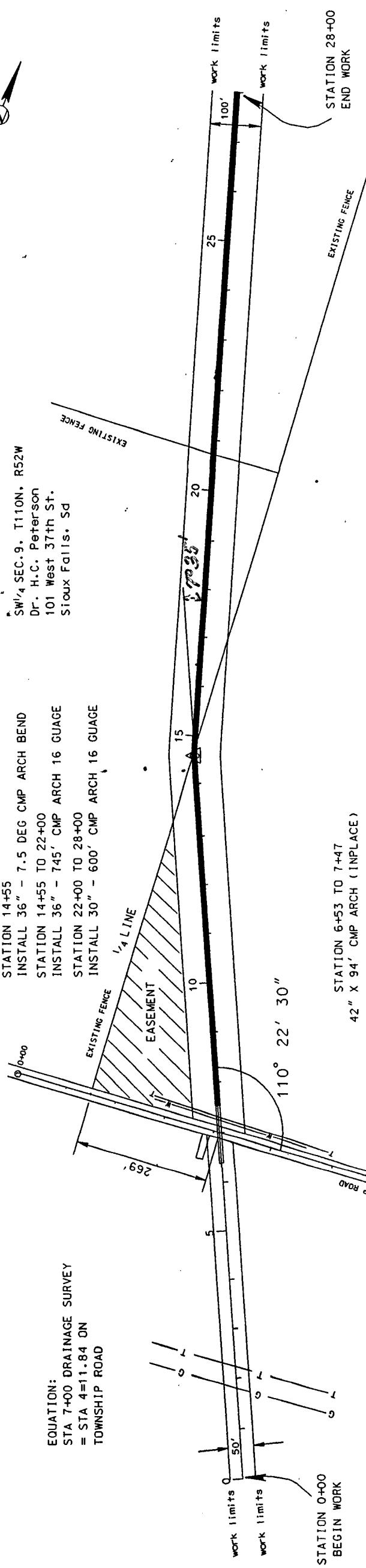
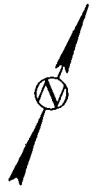
The flood control permit will serve to protect DOT from future legal action and additional expense if the outlet would need to be changed in the future because the 1753.5 elevation was determined to have been set without legal authority to do so. Since this is a meandered lake, there is public ownership of the bed of the lake even though in drier periods it is a slough. If this Lake was not meandered, then drainage under the drainage laws under the jurisdiction of the county would be appropriate.

Unless there is opposition from downstream landowners, a flood control permit could be issued following application and publication of notice of the project without a hearing before the Water Management Board.

STATION 7+47 TO 14+55
 INSTALL 36" - 708' CMP ARCH 16 GUAGE
 STATION 14+55
 INSTALL 36" - 7.5 DEG CMP ARCH BEND
 STATION 14+55 TO 22+00
 INSTALL 36" - 745' CMP ARCH 16 GUAGE
 STATION 22+00 TO 28+00
 INSTALL 30" - 600' CMP ARCH 16 GUAGE

SW 1/4 SEC. 9, T110N, R52W
 Dr. H.C. Peterson
 101 West 37th St.
 Sioux Falls, Sd

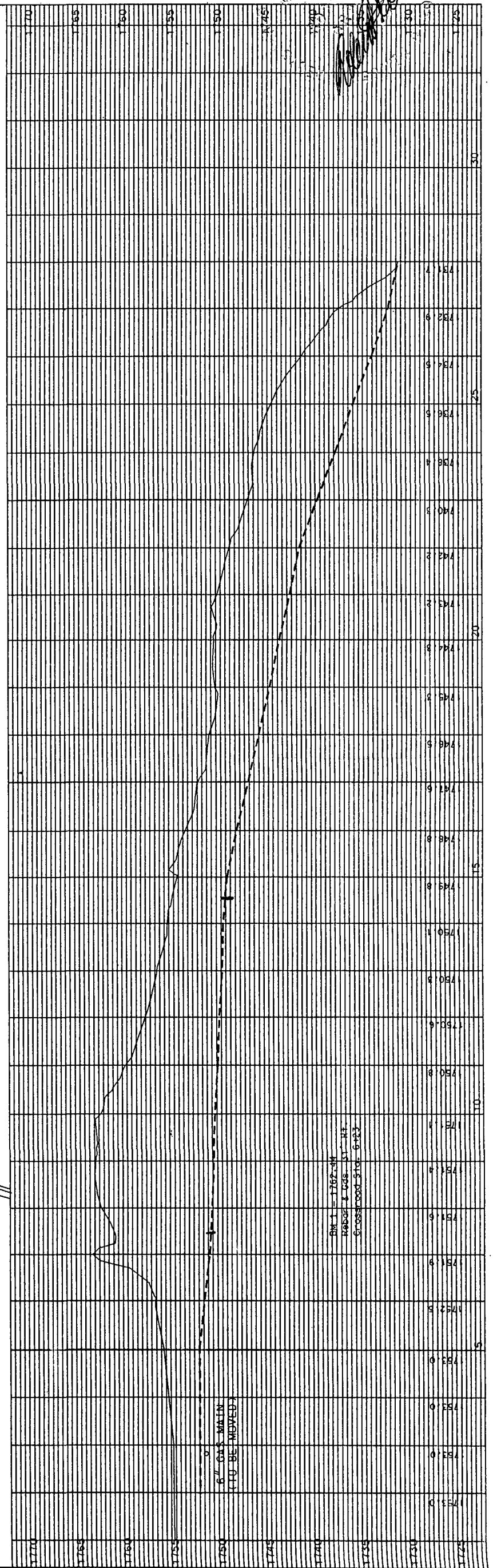
EQUATION:
 STA 7+00 DRAINAGE SURVEY
 = STA 4+11.84 ON
 TOWNSHIP ROAD



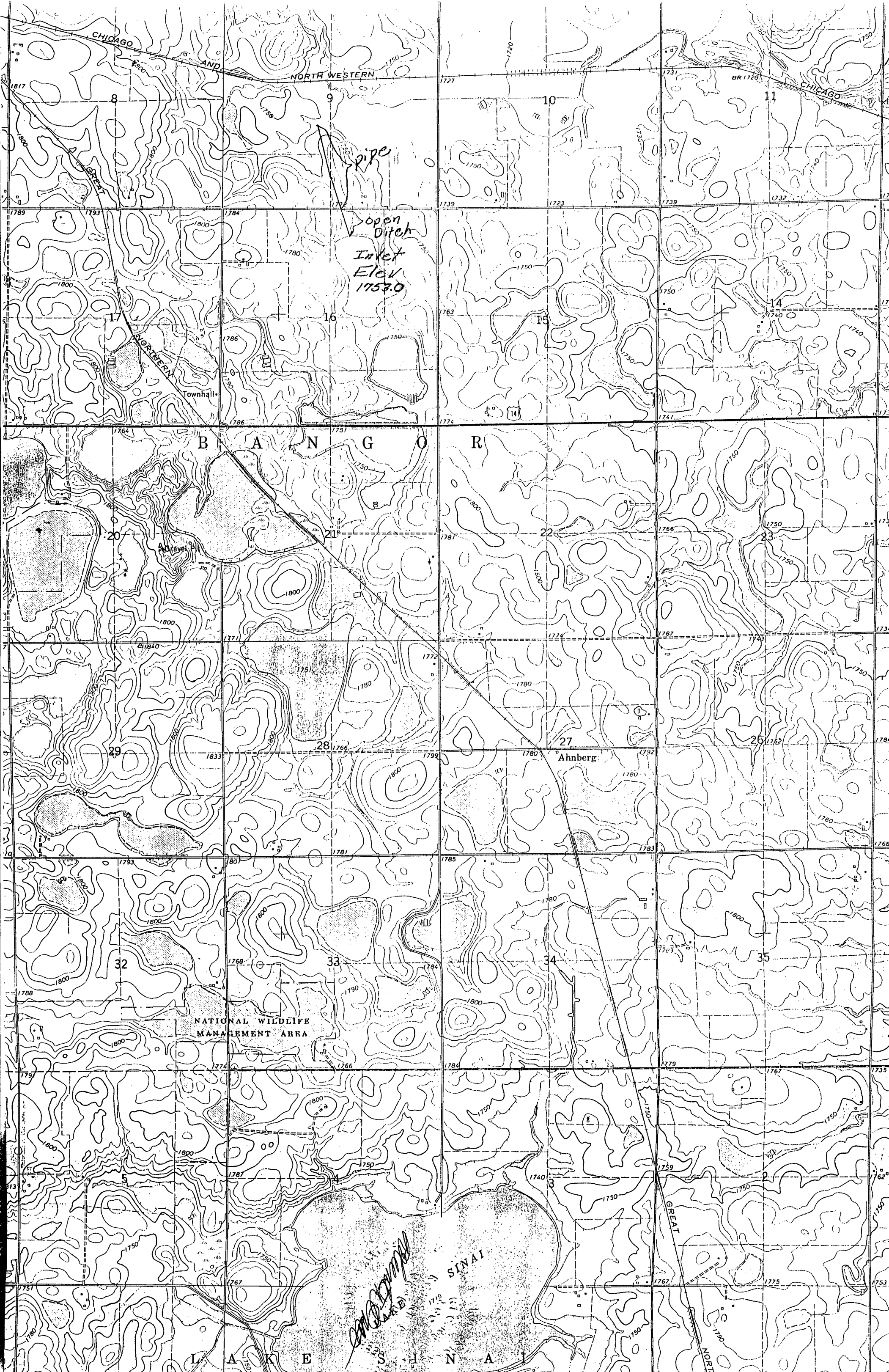
STATION 6+53 TO 7+47
 42" X 94' CMP ARCH (INPLACE)

NE 1/4 SEC. 16, T110N, R52W
 Richard Renkly
 RR2
 Arlington, S.D.

SE 1/4 SEC. 9, T110N, R52W
 U.S. Fish & Wildlife



BM 1 = 1767.44
 H8502 & 045-131-47
 CROSSROAD STA. 6+23



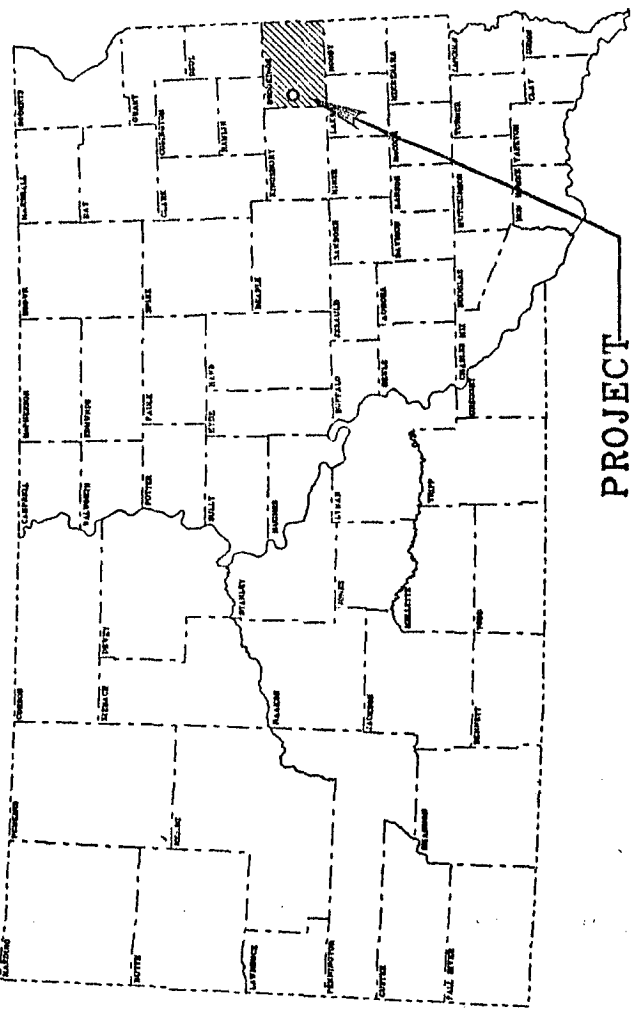
FED. HWY. ADMIN. NO.	STATE OF S.D.	PROJECT NO.	SHEET NO.	TOTAL SHEETS
6		0142-171		1

INDEX OF SHEETS

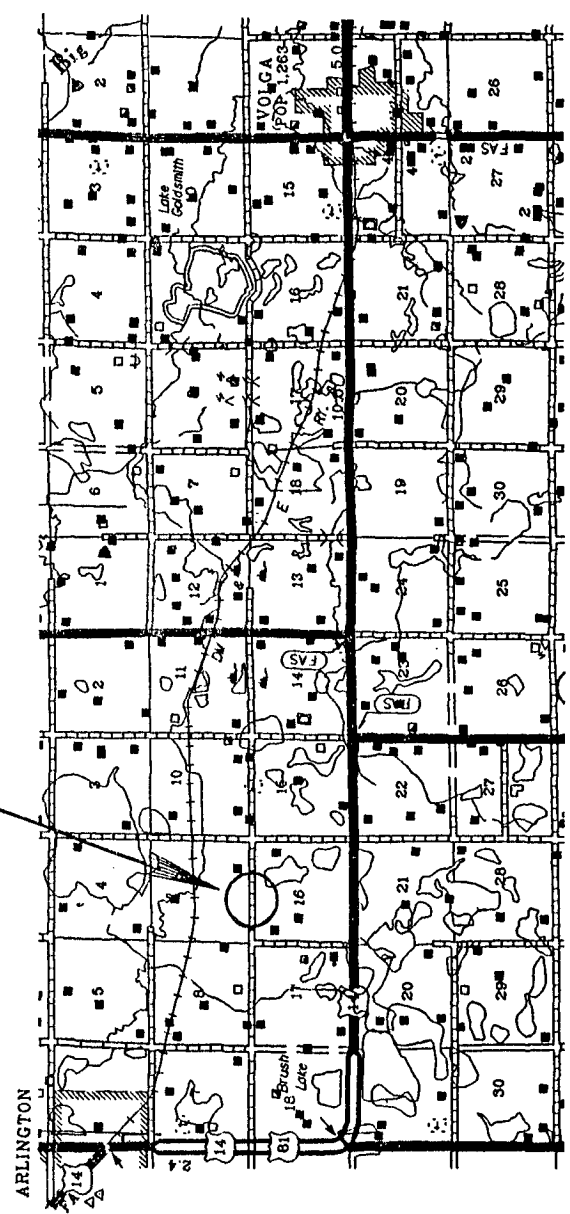
STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

PROJECT NO. 0142-171 BROOKINGS COUNTY

INSTALL PIPE IN DRAINAGE CHANNEL



PROJECT LOCATION



REDUCTION SCALE
1 INCH = 1 INCH

APPROVED	DATE
ADMINISTRATIVE ENGINEER SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION	
U.S. DEPT. OF TRANSPORTATION FEDERAL HIGHWAY ADMIN.	
APPROVED	DATE
DIVISION ADMINISTRATOR	

Robert [Signature]



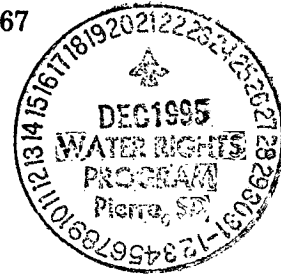
Department of Transportation

Division of Engineering

700 E Broadway Avenue

Pierre, South Dakota 57501-2586 605/773-3267

FAX: 605/773-6608



Memorandum

DATE: December 20, 1995

TO: John Hatch, DENR

FROM: Jim Nelson, Environmental Engineer
Office of Project Development

RE: Maintenance Project 0142-171 - Flood Control Permit
US 14A west of Volga

Enclosed is a flood control permit application for the above project. If you have any questions, please feel free to contact me or Bob Orcutt, DOT Area Engineer at Brookings (605) 693-3231.

Enclosure

cc: Larry Afdahl, Region Engineer
Larry Weiss, Director of Engineering
Monte Schneider, Project Development Engineer

Conversation or File Documentation

NAME OF PERSON OR FILE: Bob Occutt, DOT BrookingsADDRESS: BROOKINGS SD COUNTY BROOKINGSDATE: 12/26/95 TELEPHONE 605 693-3231RE: FC-17 design Questions

COMMENTS:

I Called Bob Occutt Concerning FC-17 Application Concerning
Easements and specifics about the water flow

He told me that the pipe will discharge on some land currently owned by
A Doctor Peterson. He said that SDOOT is currently in the process of
Tryng to negotiate a ~~purchase~~ purchase of the portion of the Peterson property
that will be affected by the water.

File in Permit or other file as necessary. Use to document conversations and what the other party was told; why action or decision was made.

NAME: Phil Shell

PROJECT 0142-171 BROOKINGS COUNTY PCEMS 8046
US14 Drainage by Arlington



In the Spring of 1995, US14 was covered by water at a wetland site located west of Volga, South Dakota, in Sections 16 and 21, T110N-R52W Brookings County. Traffic on this US Highway had to be detoured. In 1986, the South Dakota Department of Transportation (SDDOT) installed an overflow system in the wetland to relieve the wetland from flood flows at an elevation of 1754.5 ft. The overflow system was inadequate, however, and the water overtopped the road by at least 18". US14 centerline elevation at the wetland is at 1757.0 ft and the pavement edge is at approximately 1756.5 ft.. (See Map 1 for 100-year floodplain boundary). In May 1995, SDDOT contracted to improve the overflow system by constructing a trench system. (See Photo 1.) This improvement was successful and the highway was reopened. The control elevation for the improvement was left at the same elevation (1754.5) but the trench area opening was significantly greater than the 12" pipe that previously served as the discharge pipe.

Although the wetland elevation of 1754.5 allows traffic movement through the wetland area, safety problems still exist. During windy conditions, water is sprayed on the driving surface causing slippery conditions especially during spring and fall when freezing conditions exist. To minimize this safety issue a freeboard of 3 to 4 feet is desirable, i.e. a wetland elevation of 1752.5 to 1753.5.

The optimum elevation would be one that minimized safety concerns and one that removed only flood flows from the wetland and didn't lower the wetland below normal levels.

The following information was utilized to determine the "normal" elevation of the wetland.

**Wetland Investigation
US14 between Arlington and Volga
Sec.16 & 21, T110N-R52W
Brookings County**

References

- * NWI Map
- * NRCS Wetland Map (Preliminary)
- * SCS - CPA - 026's for Sec. 10, 28, 21 T110N-R52W
- * COE 1987 Wetland Determination Manual
- * T110N-R52W Sec. 16 & 21 Hydric Soil Investigations Map
- * USGS 7.5 Minute Quadrangle Map
- * FEMA Floodplain Management Map
- * Original Survey 1874 (Meander)
- * Sept.13, 1995 Aerial Photos

Proposed Project

The project consists of a channel from Wetland 1 to the township road between Section 16 and 9. (See Map 2.) The channel, depending on the depth, may require moving a buried natural gas pipeline. A 42-inch culvert has been installed in the township road. 1450 feet of 36-inch CMPA and 600 feet of 30-inch CMPA will be installed from the township road north to a natural drainage (see attached memo), flow from the pipe will then go NE to a USFWS WPA wetland in Section 10. If this wetland overflows, water would flow east to lake Goldsmith which overflows to the Big Sioux River.

NWI Map

The NWI map (Map 2) shows the wetlands that may be impacted by the overflow system. Three separate wetland systems labeled 1, 2 and 3 could be affected depending on the elevation of the flooded area. Wetland 1 is classified as a PEMCd. The elevation of this wetland on the NWI map is approximately 1750 ft. This wetland has been artificially drained to wetland 2.

Wetland 2 is classified as L2 AB 6. A stockpond dugout on the south edge is classified as PABF_x. The elevation of wetland 2 is difficult to determine from the NWI

map but it is between 1750 and 1755 ft. Since wetland 1 was originally drained to wetland 2, it would seem that wetland 1 was normally higher in elevation than wetland 2.

Wetland 3 is classified as L2 AB 6 and PEMF. A stockpond dugout located on the south edge of wetland 3 is classified as PABF_x. Again, the wetland elevation is difficult to determine but is between approximately 1750 to 1752 ft.

Based on the above discussion, it appears that the normal elevation of the wetland 1, 2 and 3 complex is between 1750 and 1752 ft. The surface area of this complex is 188 acres.

NRCS Preliminary Wetland Map

This map (Map 3) is preliminary, subject to change and not official. It represents off-site work only and has not been reviewed by landowners or operators or by an NRCS field review. The maps show wetland 1 connected to wetland 2. Wetland 2 is separated from Wetland 3 by US14. Comparing the north edge of wetland 1 with the USGS quad map, the approximate elevation of the wetland is 1753 ft. Comparing the south edge of wetland 3 with the USGS quad map, the approximate elevation of the wetland is 1751 ft. Based on the above discussion, it appears the wetland elevation is between 1751 and 1753 ft. The surface area of this wetland complex is approximately 250 acres.

USGS 7.5 Minute Quadrangle Maps

The USGS quad maps (Map 4) show the water elevation of wetland 1 as between 1750 and 1760, wetland 2 below 1750 and wetland 3 below 1750.

Brookings County Soils Survey Map

Map 5 is from the Brookings County soils survey. Soils in and surrounding the wetlands are as follows:

Mc = Marsh

Pa = Parnell silty clay loam, nearly level

Ph = Poinsett - Buse - Pierce soils undulating

Pe = Poinsett silt loam undulating

Oc = Oldham silty clay loam, nearly level

Wb = Waubay silty clay loam, drainageways

The Parnell and Oldham soils are examples of Hydric soils in Brookings County.

Original Survey Map

Map 6 shows the original meander survey notes from 1874 showing the size of the lake (wetlands 2 & 3) at that time. This map does not show wetland 1 as a meandered lake.

Based on the above listed maps, a wetland water level elevation of 1752 is consistent with the elevations in the NWI maps, the preliminary NRCS map and the 7.5 topo maps.

The surface area at 1752 elevation represents 198 acres which is 10 acres more than that shown on the NWI map and 54 acres less than that shown on the preliminary NRCS map.

Areas shown on the NWI map and the preliminary NRCS map do not conform with elevations shown on the USGS quad map. To obtain a baseline surface area based on elevation, SDDOT flew and photographed the wetlands, and surveyed the surface water elevation of the wetlands the same time as the aerial survey. The wetland elevation the day of the flight was 1754.5 ft.. The surface area of the wetlands on the photos was 206 acres. (See Photos 2 and 3.)

Since the wetland control elevation has been at 1754.5 since 1986 and the photos show the wetland surface at the 1754.5 elevation, it is proposed to use 1754.5 as the wetland water level elevation. This elevation provides 18 more acres than shown on the

NWI map, however, flooding conditions have existed the last few years, which have provided higher than normal water elevations.

If the elevation of the wetland is lowered to 1752.0 ft., the surface area of the wetland will be reduced to approximately 198 acres based on an approximate areas from the USGS topo which are shown in 10-ft. contours. Therefore, a mitigation requirement of approximately 8 acres could be required. If the wetland elevation was lowered to 1753.0 ft., the approximate surface area of the wetland would be 201 acres. Wetland mitigation of approximately 5 acres would be required. Also, there appears to be a blockage between wetland 1 and wetland 2. Bob Orcutt, Brookings Area Engineer, estimates that at the blockage there is approximately 2 ft. of water.

Because of the inaccuracies of determining areas associated with the 10-ft. contour, it is proposed that if an elevation of 1752 or 1753 is selected then the approximate wetland mitigation acreage be removed from the wetland bank. Once the elevation of the wetland is established, the wetland could be flown and the area be compared to the existing photos taken at the 1754.5 ft. An exact wetland loss could then be established and the amount taken from the bank adjusted accordingly. It is recognized that the surface water area may not represent the exact wetland boundary. It is assumed that for comparative purposes, it represents a relative value. An alternative to using the wetland bank is to use wetland created at a proposed project near DeSmet for mitigation.

The cost of adjusting the gas line is approximately \$92,000 and the pipe cost will be approximately \$50,000. The ditch cost was approximately \$30,000. The alternative of raising the grade was considered. The estimated cost for raising the grade is approximately \$1 million and would require filling 3-5 acres of wetland.

Memorandum

DATE: September 26, 1995

TO: Central File

FROM: Keyin Heiman, Office of Bridge Design
Keyin Heiman

RE: 0142-171, Brookings Co., MRM 404.4 to MRM 404.9
Install Pipe in Drainage Channel

This office has completed the analysis of the proposed pipe size for the above referenced project as requested by the Aberdeen Regional Office. We reviewed the feasibility to reduce the 42 inch CMPA placed through the township road to an appropriate pipe size which would maintain maximum flow capacity.

It was determined that a reduction in the 42 inch pipe through the township road can be achieved and the following pipe configuration would be feasible:

Sta 7+50+ to Sta 15+00	36 inch CMPA
Sta 15+00 to Sta 22+00	36 inch CMPA
Sta 22+00 to Sta 27+00	30 inch CMPA
Sta 27+00 to Sta 28+00	30 inch CMPA

The above configuration would meet or exceed the performance of the 42 inch CMPA and maintain a near full pipe flow throughout entire length of pipe. With the above pipe configuration, transition sections would be required for a change in pipe size from one size to another. Consulting with a corrugated metal pipe manufacture, reducer section of almost any configuration are possible. Manholes may be preferred over reducer sections at each pipe junction for aid in future inspection and cleanout of the pipeline.

With the reduction in the pipe size throughout the pipe line, there is a possibility of plugging to occur. To prevent possible plugging, placement of a trash rack at the inlet would catch large debris from entering into the pipeline and would prevent possible internal plugging of the proposed pipeline.

If you have any further questions or concerns, please contact the Office of Bridge Design at (605) 773-3285.

cc: Aberdeen Region (Afdahl)
Brookings Area (Orcutt)
Clyde Pietz
Norman Humphries
Larry Weiss
John Cole

Photo 1

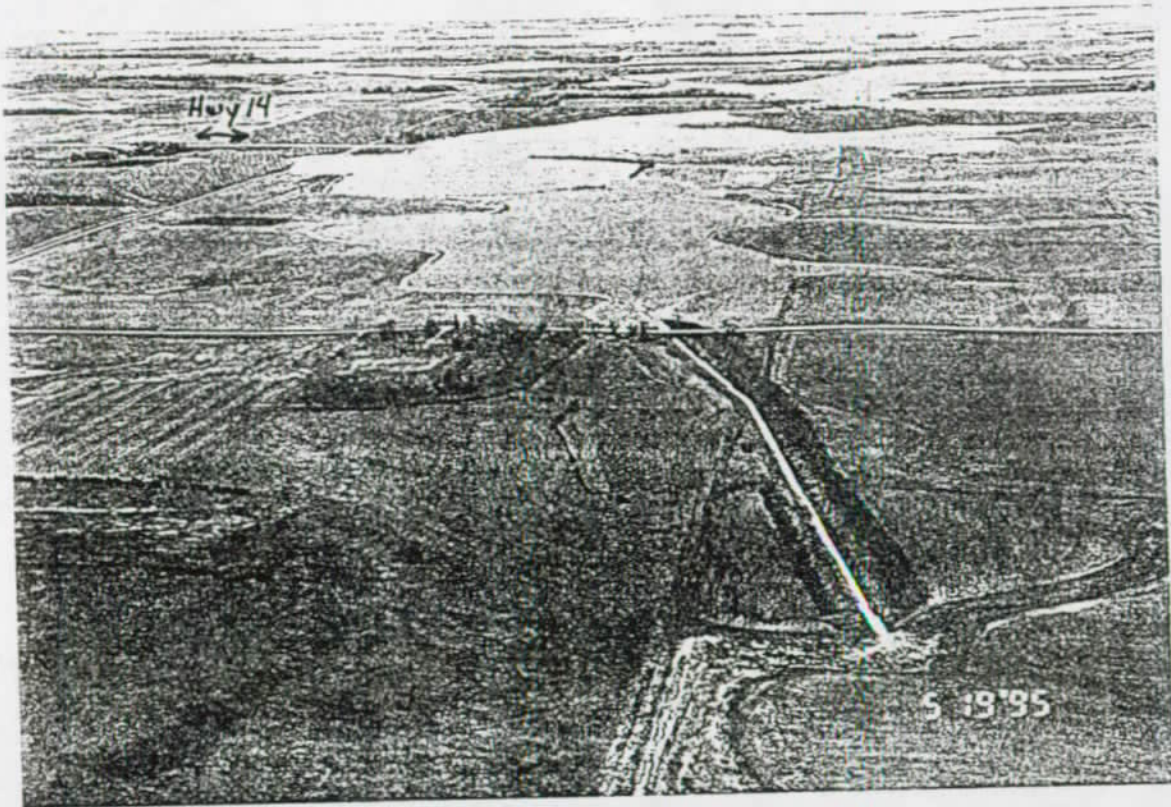


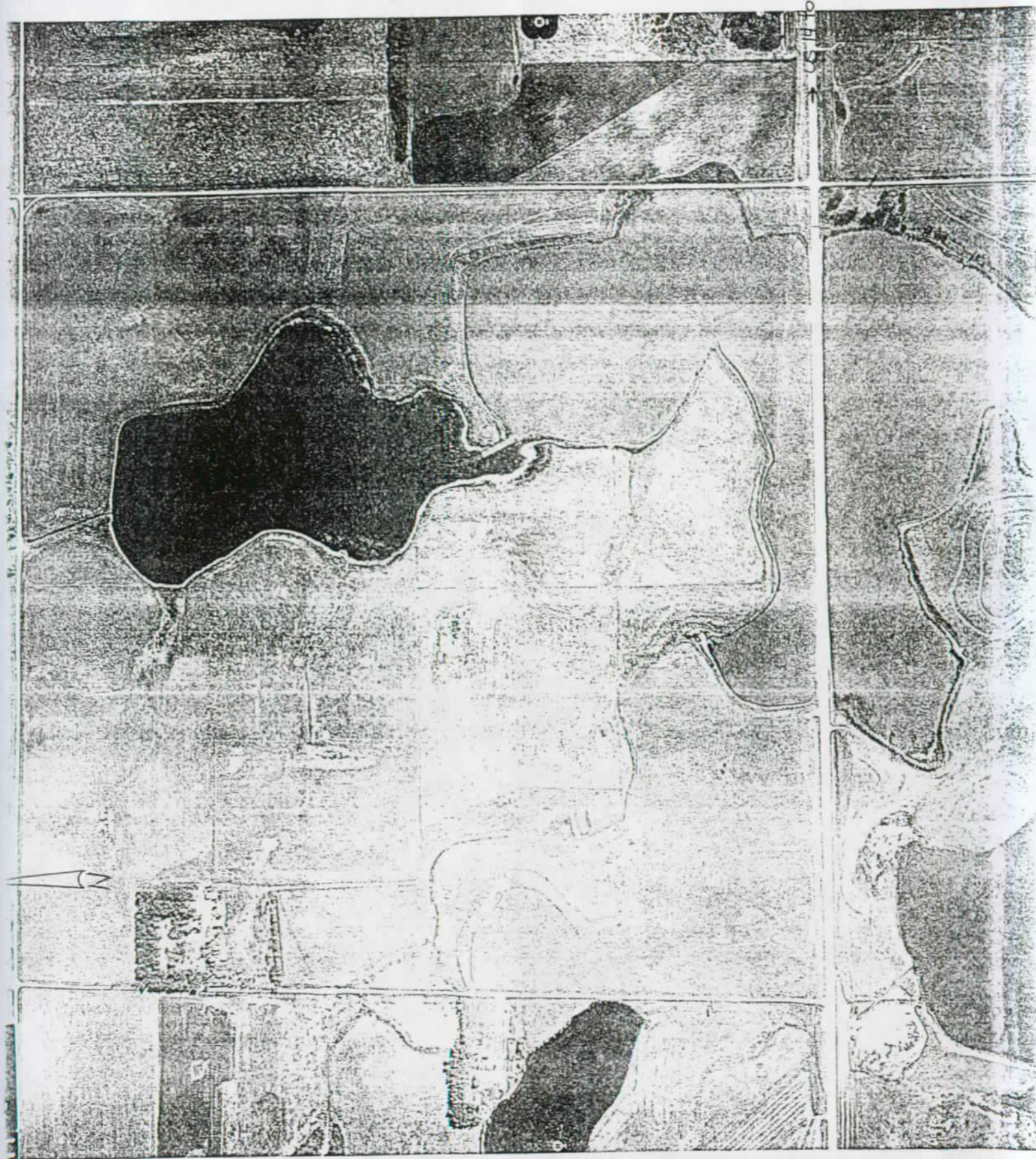
Photo 2

← 4544 Brookings →



Photo 3

→ US 14 to Brookings →



**Map 1
Floodplain**

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations (BFEs) or depths are shown within this zone.

Zone A1-A30

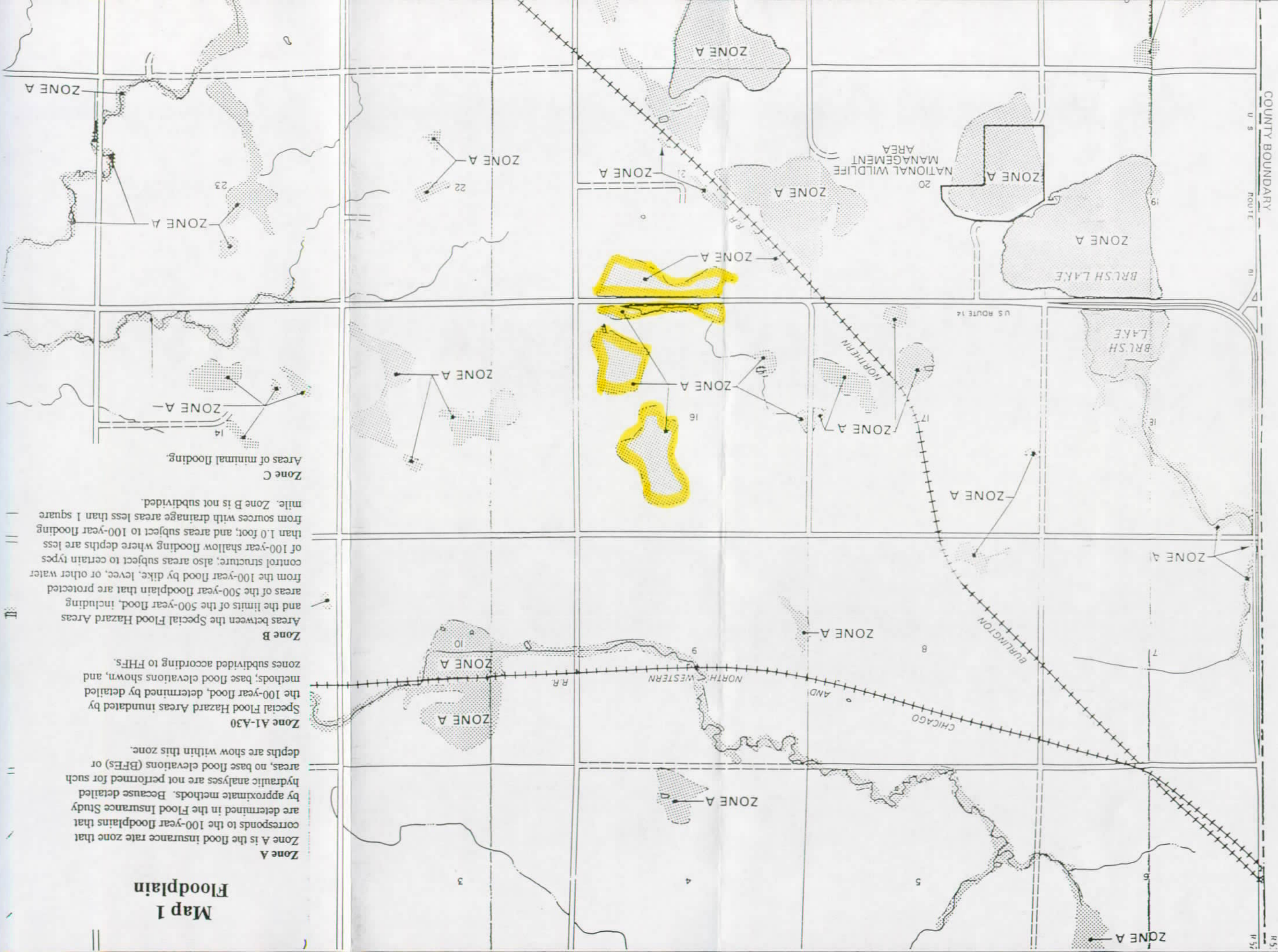
Special Flood Hazard Areas inundated by the 100-year flood, determined by detailed methods; base flood elevations shown, and zones subdivided according to FIFs.

Zone B

Areas between the Special Flood Hazard Areas and the limits of the 500-year flood, including areas of the 500-year flood that are protected from the 100-year flood by dike, levee, or other water control structure; also areas subject to certain types of 100-year shallow flooding where depths are less than 1.0 foot; and areas subject to 100-year flooding from sources with drainage areas less than 1 square mile. Zone B is not subdivided.

Zone C

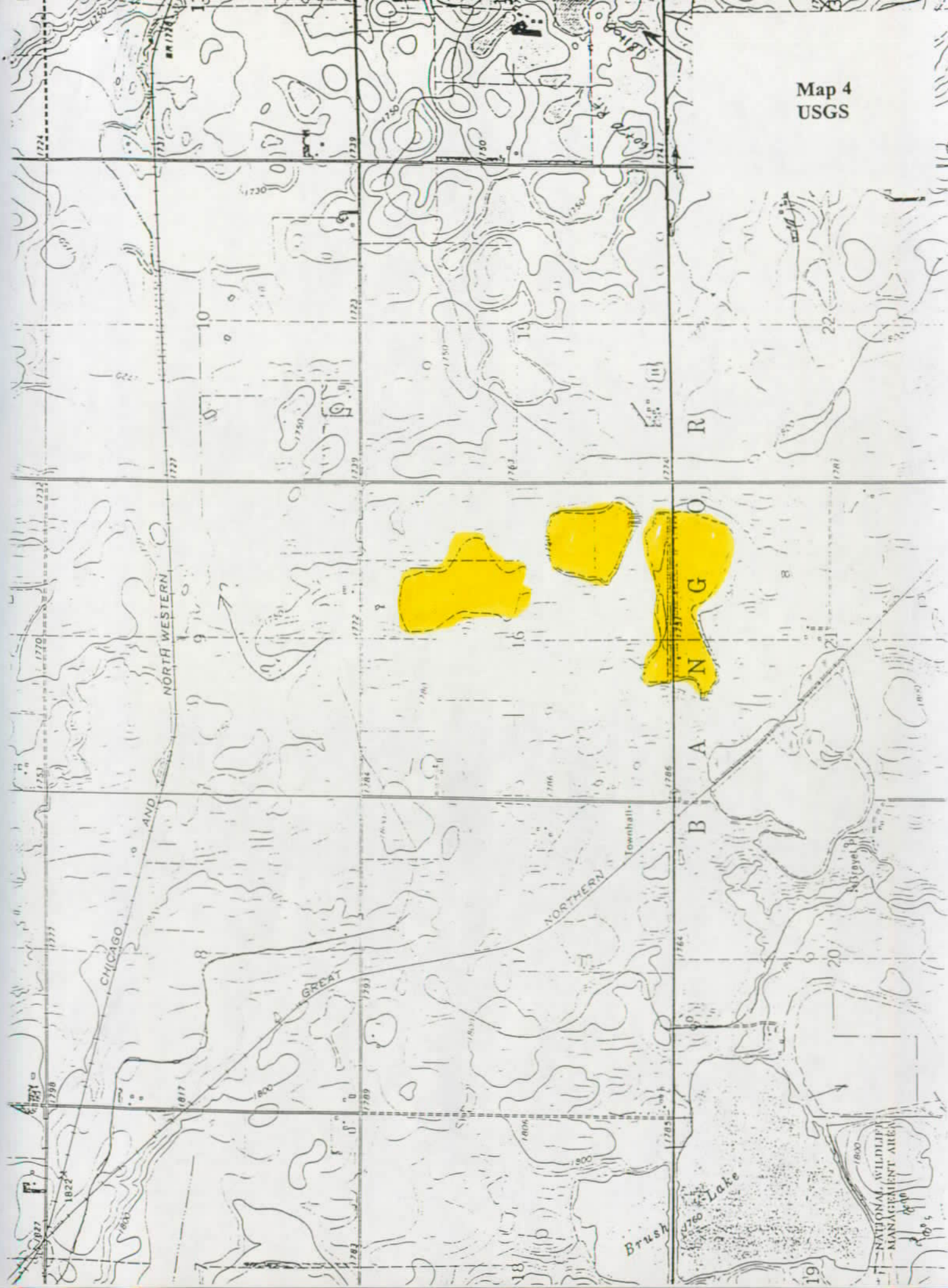
Areas of minimal flooding.



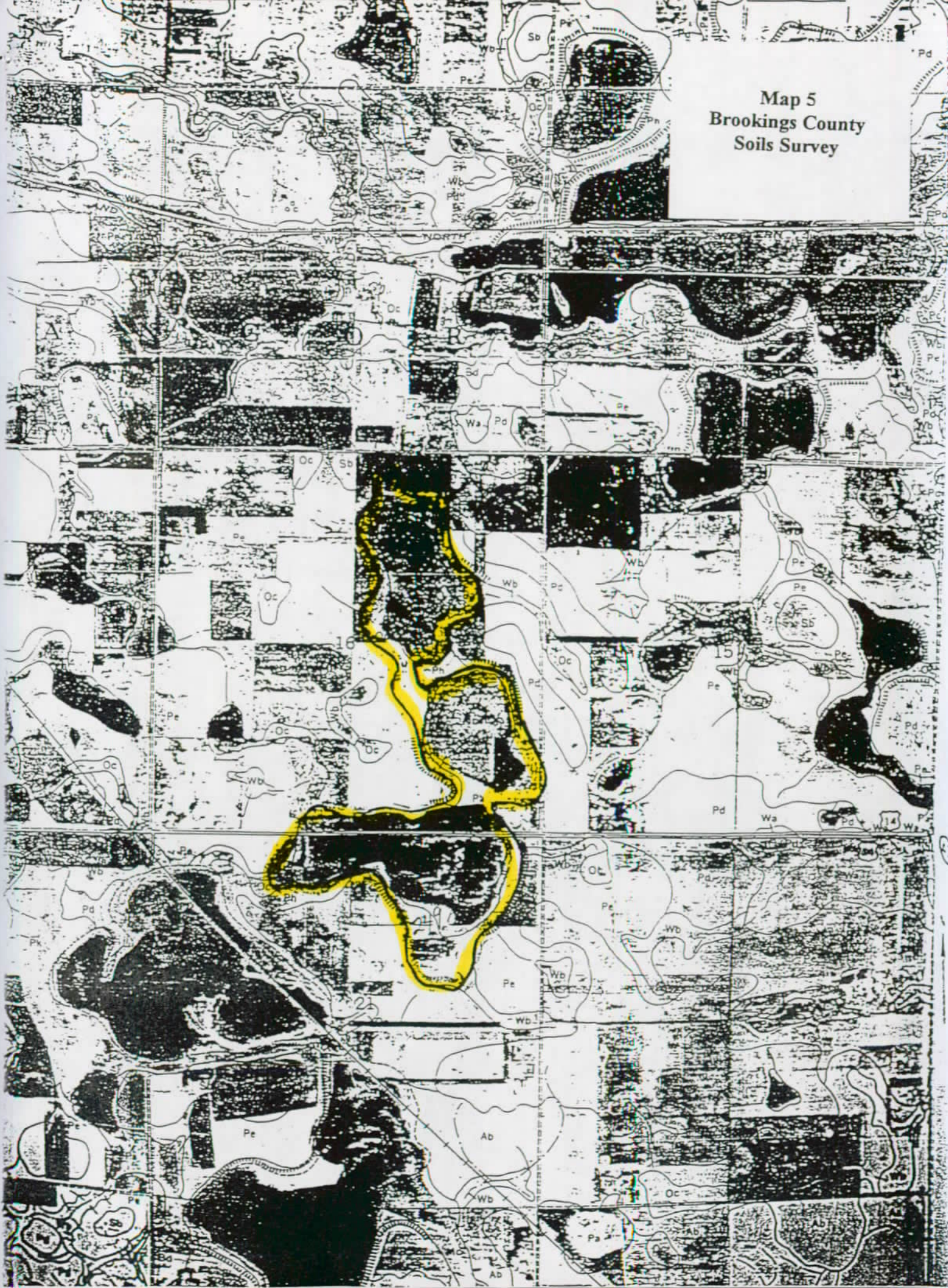




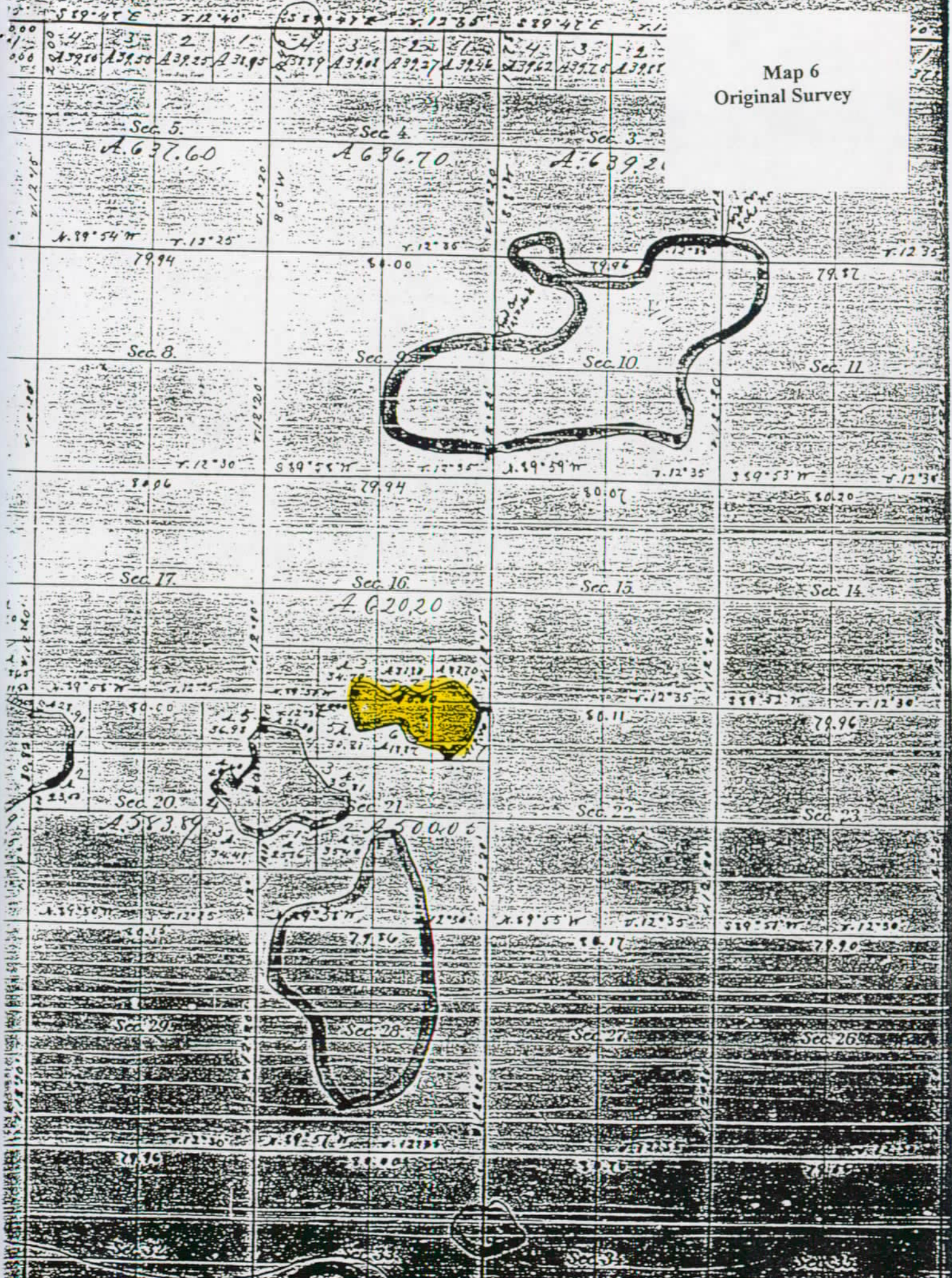
Map 4
USGS



Map 5
Brookings County
Soils Survey



Map 6
Original Survey



■ ARLINGTON

Argus Leader 1-24-96

Pipe will drain water surrounding highway connecting two towns

Action will lower level near road shoulder

By TOM LAWRENCE

Argus Leader Staff

The South Dakota Transportation Department will install a permanent pipe to drain a huge pool of water surrounding a portion of U.S. Highway 14.

The Brookings County Commission voted unanimously Tuesday to grant DOT a drainage permit. Pipe installation will begin this summer, said Bob Orcutt, area engineer.

The pipe will lower the water level one foot. "Right now, it's 2½ feet below the shoulder of the road," Orcutt said.

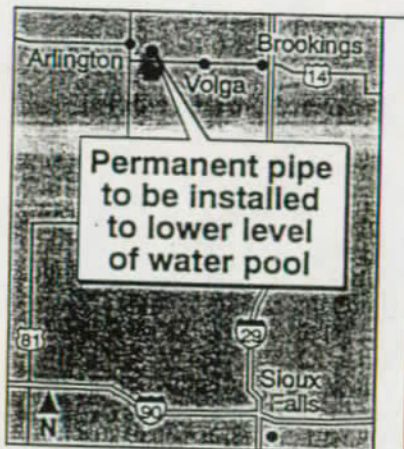
The water is located on both sides of Highway 14 a few miles east of Arlington. Last year the water rose so high the highway was closed for a time, and when it was re-opened, vehicles still splashed through standing water.

Efforts are under way to ease flooding problems that have plagued the same area for a decade, Orcutt said.

"The federal wildlife is going to try to restore wetlands north of this so this area gets less water," he said.

Brookings County Zoning Officer David Rusten said the county and state have tried to drain water from this same area since 1986. A ditch was dug there that year, he said, and a 12-inch pipe was installed in 1990.

Last year the county granted DOT an emergency permit to dig another ditch to drain some water



Linda Smith/Argus Leader

from the pond. The pond is as large as some lakes in the state, but is not considered a lake, state officials have said.

DOT had to negotiate with the U.S. Fish and Wildlife Service and the Natural Resources Conservation Service to lower the water level, Orcutt said.

The water will be dumped onto wetlands owned by the federal government, Orcutt said. It will then drain to Dry Lake and Lake Goldsmith before ending up in the Big Sioux River, he said.

Orcutt said the state must create 42 acres of wetlands elsewhere in the county to replace land that will be drained.

No one spoke in opposition to the drainage plan.

Jury indicts man who threatened judge

From staff reports

A federal grand jury has indicted a Hudson man on charges of

committed treason, Schreier said.

The false claim charge stems from a claim that Schreier was to



Hatch, John

From: Nelson, Jim
To: Hatch, John
Cc: Nelson, Jim; Schneider, Monte
Subject: Highway 14, Brush Lake Brookings County
Date: Tuesday, January 30, 1996 9:25AM

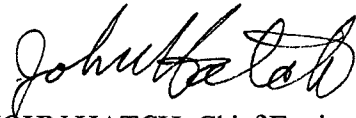
This is to clarify your December 4, 1995 E-mail concerning the above subject. The inlet elevation for the pipe will be set at 1753.0 msl (not 1753.5, as stated in your E-mail).

**RECOMMENDATION OF CHIEF ENGINEER FOR FLOOD CONTROL PERMIT
APPLICATION NO. FC-17, South Dakota Department of Transportation**

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 Flood Control Permit Application No. FC-17, South Dakota Department of Transportation, %Robert Orcutt, P.O. Box 449, Brookings, SD 57006-0449.

The Chief Engineer is recommending APPROVAL of Application No. FC-17 because 1) the project will not increase the likelihood or severity of flood damages downstream, 2) will not endanger human life or property, 3) will not impair existing water rights, and 4) is in the public interest because failure to drain water off of US Highway 14 may result in unsafe driving conditions.

See report on application for additional information.

A handwritten signature in cursive script, appearing to read "John Hatch", written in dark ink.

JOHN HATCH, Chief Engineer
February 16, 1996

Report on Flood Control Permit Application No. FC-17
South Dakota Department of Transportation
February 7, 1996

Application No. FC-17, South Dakota Department of Transportation (SDDOT), proposes to replace an existing temporary ditch with a combination ditch and pipe varying from 30 to 42 inches in diameter to drain water off of US Highway 14 (US 14) at an outlet elevation of 1753.0 feet mean sea level (fmsl) in western Brookings County. The existing ditch was constructed in the spring of 1995 as an emergency measure to remove flood water that had overtopped US 14 along the section line between Sections 16 and 21; all in T110N-R52W. The body of water proposed to be drained is part of the Brush lakes chain and is specifically known as East Brush Lake No. 2. The proposed ditch and pipeline is to be constructed along a line from an inlet point located in the NW1/4 NE1/4 of Section 16 to a discharge point located in the NE1/4 SW1/4 of Section 9; all in T110N-R52W.

Review of the Proposed Project

East Brush Lake No. 2 is a meandered lake with a meandered surface area of 77.3 acres. During the wet years of 1983 - 1986 water levels in East Brush Lake No. 2 rose significantly. An overflow system was installed in 1986 to relieve flooding problems at this site. The system consisted of a 12 inch pipe installed at an outlet elevation of 1754.5 fmsl. Due to extremely wet conditions the past few years, US Highway 14 at a point approximately 7.5 miles west of Volga was overtopped by water and closed where it crosses East Brush Lake No. 2. It was found that the existing overflow system was inadequately designed. As an emergency measure, SDDOT replaced the original overflow system with a temporary ditch in May of 1995. The temporary ditch was constructed with an East Brush Lake No. 2 outlet elevation of 1754.5 fmsl, the same as the original overflow system.

In the spring of 1995 prior to the construction of the temporary ditch, water levels in East Brush Lake No. 2 reach an elevation of 1758.7 feet mean sea level (fmsl) or approximately 1.5 feet over the top of the road. At this elevation the water surface of the lake encompassed approximately 590 surface acres. By lowering the water level in East Brush Lake No. 2 by 4.2 feet approximately 3300 ac-ft of water was discharged out of the basin to the Lake Goldsmith drainage. The temporary ditch was successful in lowering the water sufficiently to allow SD 14 to be reopened.

There continue to be safety issues concerning water levels at the site. During windy conditions, water is sprayed onto the road surface and becomes slippery particularly when freezing conditions exist. In order to minimize the safety issues a freeboard of 3 to 4 feet is desirable. The applicant proposes to construct a combination ditch and pipeline at an East Brush Lake No. 2 outlet elevation of 1753.0 fmsl to replace the temporary ditch. The proposed outlet elevation of 1753.0 fmsl would be an artificial outlet elevation not based upon either natural geographic conditions or existing high water evidence. The outlet elevation is proposed because of public safety concerns along US Highway 14.

Review of Possible Downstream Effects

The proposed pipeline will discharge at a drainageway that runs through a US Fish and Wildlife Service waterfowl production area. The drainageway is part of the watershed that supplies Lake Goldsmith and eventually discharges to the Big Sioux River. The proposed pipeline has a maximum design capacity of 54 cubic feet of water per second (cfs) or a total maximum volume of 107 acre-feet of water per day. The portion of the Lake Goldsmith drainage area upstream of the pipe line discharge encompasses approximately 3400 acres. Using an accepted scientific method for determining flood peaks from watersheds, it is estimated the peak discharge from this portion of watershed for a 2-year recurrence interval flood would be 42 cfs. The peak discharge for a 5-year recurrence interval flood would be 113 cfs, for a 10-year flood it would be 194 cfs and for a 25-year flood it would be 338 cfs. The pipe discharging at a maximum rate of 54 cfs, would increase flow in the channel during a 2-year flood event to a rate less than that of a 5-year flood event.

The total watershed area that supplies Lake Goldsmith is approximately 14,000 acres (22 sqmi). Lake Goldsmith is a meandered lake of approximately 250 surface acres. The Water Rights Program measures lake levels in Lake Goldsmith as part of its lake level program. This lake has been measured semiannually since 1983. Lake levels reached a recorded low of 1642.8 fmsl in September 1988 to a high of 1646.8 in May 1993, a 4.0 foot change. During the period of record water levels in Lake Goldsmith have fluctuated up and down 2 feet or more within a six month period. This is not uncommon for a lake capable of spilling, having a relatively small surface area, and a large drainage basin. This proposed project at the restricted discharge rate would not be expected to increase the likelihood or severity of flooding to downstream areas. The proposed restricted releases would, during wet periods, extend the period of spilling from Lake Goldsmith to the Big Sioux River. There will be no noticeable effects to Lake Goldsmith during dry periods.

At the time this report was drafted, SDDOT was in the process of obtaining either title to the land or the required easements to construct this ditch and pipeline.

Conclusions

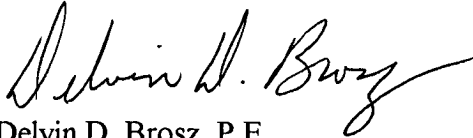
1. Application No. FC-17 proposes to replace an existing temporary ditch with a combination ditch and pipeline to lower the East Brush Lake No. 2 outlet elevation from 1754.5 fmsl to 1753.0 fmsl. The proposed outlet elevation of 1753.0 fmsl would be an artificial outlet elevation not based upon either natural geographic conditions or existing high water evidence. The outlet elevation is proposed because of public safety concerns along US Highway 14.
2. During the spring of 1995, US Highway 14 was overtopped with water because the original overflow system was inadequate. A temporary ditch was constructed that successfully lowered the water elevation to 1754.5 fmsl and US Highway 14 was reopened. A safety issue continues to exist at this water level. During windy conditions water sprays on the road surface and can cause slippery conditions particularly when it freezes. The proposal is to lower water levels an additional 1.5 feet and allow for a 3 to 4 foot freeboard.

3. The proposed pipeline would have a maximum capacity of 54 cfs. At this restricted discharge rate the proposed project would not be expected to increase the likelihood or severity of flooding to downstream areas. The proposed restricted releases would, during wet periods, extend the period of spilling from Lake Goldsmith to the Big Sioux River. There will be no noticeable effects to Lake Goldsmith during dry periods.
4. SDDOT is in the process of obtaining the required easements and land ownership for this proposed ditch and pipeline.



Mark D. Rath
Natural Resources Engineer III

Approved by



Delvin D. Brosz, P.E.
Natural Resources Engineer IV

References

1. US Geological Survey. 1980. Techniques for Estimating Flood Peaks, Volumes, and Hydrographs on Small Streams in South Dakota. US Geological Survey, Water-Resources Investigations 80-80.
2. SD Department of Environment and Natural Resources. 1996. Water Rights Program files.
3. SD Department of Game, Fish and Parks. Listing of Meandered Lakes. Prepared by Land Management Section, Edward M. Cassel, Chief.



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

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

February 23, 1996

South Dakota Department of Transportation
%Robert Orcutt
P.O. Box 449
Brookings, SD 57006-0449

Dear Mr. Orcutt:

Water Permit Application No. FC-17 for flood control use has been examined and found to comply with the South Dakota Water Laws and applicable rules. A notice of hearing has been sent to the Publisher of the Brookings Register printed at Brookings, SD (Ph # (605) 692-6271). For your information, a copy of the notice, the recommendation of the Chief Engineer and a report on the application are enclosed. Please review the notice prior to publication and notify this office, if you have any corrections or questions.

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

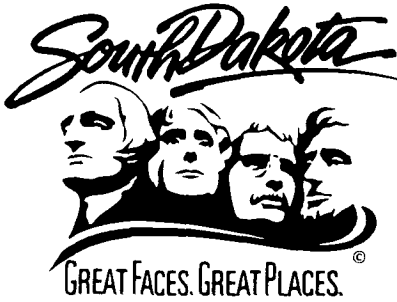
Sincerely,

Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures

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

c: US Fish and Wildlife Services, P.O. Box 48, Madison, SD 57042.



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

February 23, 1996

Brookings Register
P.O. Box 177
Brookings, SD 57006-0177

ATTENTION: Legal Department

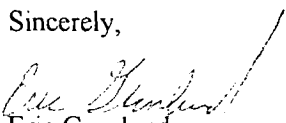
Enclosed is a Notice of Hearing on Application No. FC-17 to be published twice. Please publish the first notice on March 5, 1996, with the second publication 7 days later.

The APPLICANT MUST VERIFY TO YOU THAT THE NOTICE IS TO BE PUBLISHED, before you make the first publication. Please BILL the APPLICANT for the cost of publication. The APPLICANT is South Dakota Department of Transportation, %Robert Orcutt, P.O. Box 449, Brookings, SD 57006-0449 (Ph # (605) 693-3231).

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

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

Sincerely,


Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures

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

FIRST TRANSMITTAL NOTICE

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

No. _____

Date _____

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

Name

Newspaper

Instruction to Newspaper - Publish first Notice on March 5, 1996, with the second publication 7 days later. The applicant is responsible for payment.

NOTICE OF APPLICATION NO. FC-17 for a Flood Control Permit

Notice is given that the South Dakota Department of Transportation, %Robert Orcutt, P.O. Box 449, Brookings, SD 57006-0449 has filed an application for a flood control permit to authorize a combination ditch and pipe varying from 30 to 42 inches in diameter to drain water off of US Highway 14. The body of water proposed to be drained is part of the Brush Lakes chain and is specifically known as East Brush Lake No. 2. The proposed ditch and pipeline is to be constructed at an outlet elevation of 1753.0 feet mean sea level along a line from an inlet point located in the NW 1/4 NE 1/4 Section 16 to a discharge point located in the NE 1/4 SW 1/4 Section 9; all in T110N, R52W. The discharge is to the Lake Goldsmith drainage. The project proposes to replace an existing temporary ditch constructed in the spring of 1995 as an emergency measure to remove flood water that overtopped Highway 14 along the section line between section 16 and 21, T110N, R52W.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. FC-17 because 1) the project will not increase the likelihood or severity of flood damages downstream, 2) will not endanger human life or property, 3) will not impair existing water rights, and 4) it is in the public interest because failure to drain water off of US Highway 14 may result in unsafe driving conditions. In accordance with SDCL 46-2A-23, the chief engineer will act on the application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the chief engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider the application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and chief engineer. The applicant must file a petition if contesting the chief engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by March 22, 1996.

The petition may be informal, but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application, and the signature and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this application. Nettie H. Myers, Secretary, Department of Environment and Natural Resources.

Form 8

PROOF OF PUBLICATION

STATE OF SOUTH DAKOTA)
County of Brookings) SS

1. Nancy P. Skyberg

certify that the attached printed Notice was

taken from the Brookings
Register

printed and published in Brookings

County of Brookings and State of

South Dakota. The notice was published in
the newspaper on the following two dates:

March 5, 1996

March 12, 1996

Cost of Printing: Forty-six and
69/100 dollars = \$46.69

Nancy P. Skyberg
(Signature)

Legal Ad Coordinator
(Title)

March 12, 1996
(Date Signed)



Legal 111, 2x, March 5, 12
NOTICE OF APPLICATION

NO FC-17

for a Flood Control Permit

Notice is given that the South Dakota Department of Transportation, %Robert Orcutt, P.O. Box 449, Brookings, SD 57006-0449 has filed an application for a flood control permit to authorize a combination ditch and pipe varying from 30 to 42 inches in diameter to drain water off of US Highway 14. The body of water proposed to be drained is part of the Brush Lakes chain and is specifically known as East Brush Lake No. 2. The proposed ditch and pipeline is to be constructed at an outlet elevation of 1,753.0 feet mean sea level along a line from an inlet point located in the NW 1/4 NE 1/4 Section 16 to a discharge point located in the NE 1/4 SW 1/4 Section 9; all in T110N, R52W. The discharge is to the Lake Goldsmith drainage. The project proposes to replace an existing temporary ditch constructed in the spring of 1995 as an emergency measure to remove flood water that overtopped Highway 14 along the section line between section 16 and 21, T110N, R52W.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No: FC-17 because 1) the project will not increase the likelihood or severity of flood damages downstream, 2) will not endanger human life or property, 3) will not impair existing water rights, and 4) it is in the public interest because failure to drain water off of US Highway 14 may result in unsafe driving conditions. In accordance with SDCL 46-2A-23, the chief engineer will act on the application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the chief engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider the application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and chief engineer. The applicant must file a petition if contesting the chief engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501 (605-773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by March 22, 1996.

The petition may be informal, but must include a statement describing the petitioner's interest in the application, the petitioner's reasons for opposing or supporting the application, and the signature and mailing address of the petitioner or the petitioner's legal counsel, if legal counsel is obtained. Contact Eric Gronlund at the above Water Rights Program address to request copies of information pertaining to this application.

Nettie H. Myers, Secretary,
Department of Environment and
Natural Resources



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

APR 3 1996

Robert Orcutt
South Dakota Department of Transportation
P.O. Box 449
Brookings, SD 57006-0449

Dear Mr. Orcutt:

Enclosed is Flood Control Permit No. FC-17 as approved by the Water Management Board. If you have any questions pertaining to the permit, please contact this office.

Very truly yours,

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

Enclosure

c: Jim Nelson, Department of Transportation

NOTICE OF COMPLETION OF WORKS AND APPLICATION OF WATER TO BENEFICIAL USE

Date 8-11-98

TO: Water Rights Program, DENR
523 E. Capitol
Pierre, SD 57501-3181

FROM: Roger Jenner
(name)
East Highway 14
(address)
Brookings SD 57006 605-693-3231
(city, state, zip) (phone)

I have completed the construction of the water use system and I have put the water to beneficial use to the maximum extent it is going to be used.

FC-17
Water Permit No. _____ states that the water use system is to be constructed by
MAC 2001, and water is to be put to beneficial use by MAC 2001
(date) (date)

The water use system was completed on Aug, 1996
(date)

Applying the water to beneficial use was completed on Aug 1996
(date)

You may schedule an investigation so that the water license may be issued.

Roger Jenner
(signature)



Flood Control Permit No. FC-17
Big Sioux River - Water District

Report Of Examination Of Works

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

On, August 11, 1998, I made a thorough examination of the flood control project constructed by the South Dakota Department of Transportation of PO Box 449, Brookings SD holder of Flood Control Permit No. FC-17, bearing the priority of December 21, 1995 authorizing the construction and operation of the flood control project, in Brookings County.

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

A. Works used to divert the water:

A buried pipeline with an outlet elevation of 1753.0

The system is in the following condition good. The flood control project is located : the inlet is located the NW1/4 NE1/4 of Sec 16 T110N-R52W with the discharge located in the NE1/4 SW1/4 of Sec 9 T110N-R52W

Applicable permit qualifications have been complied with: yes

Exceptions to compliance are: none



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

11/3/98

Date

REPORT ON INSPECTION OF FLOOD CONTROL PERMIT NO. FC-17

DATE OF INSPECTION: August 11, 1998

Contact Person & Address: Roger Jenner, SD DOT Engineer, East Hwy 14, Brookings SD

PROJECT LEGAL LOCATION: the inlet is located the NW1/4 NE1/4 of Sec 16 T110N-R52W with the discharge located in the NE1/4 SW1/4 of Sec 9 T110N-R52W

Description of Flood Control Works: a pipe set to an outlet elevation of 1753.0 fmsl the outlet let discharges into a the Lake Goldsmith drainage.

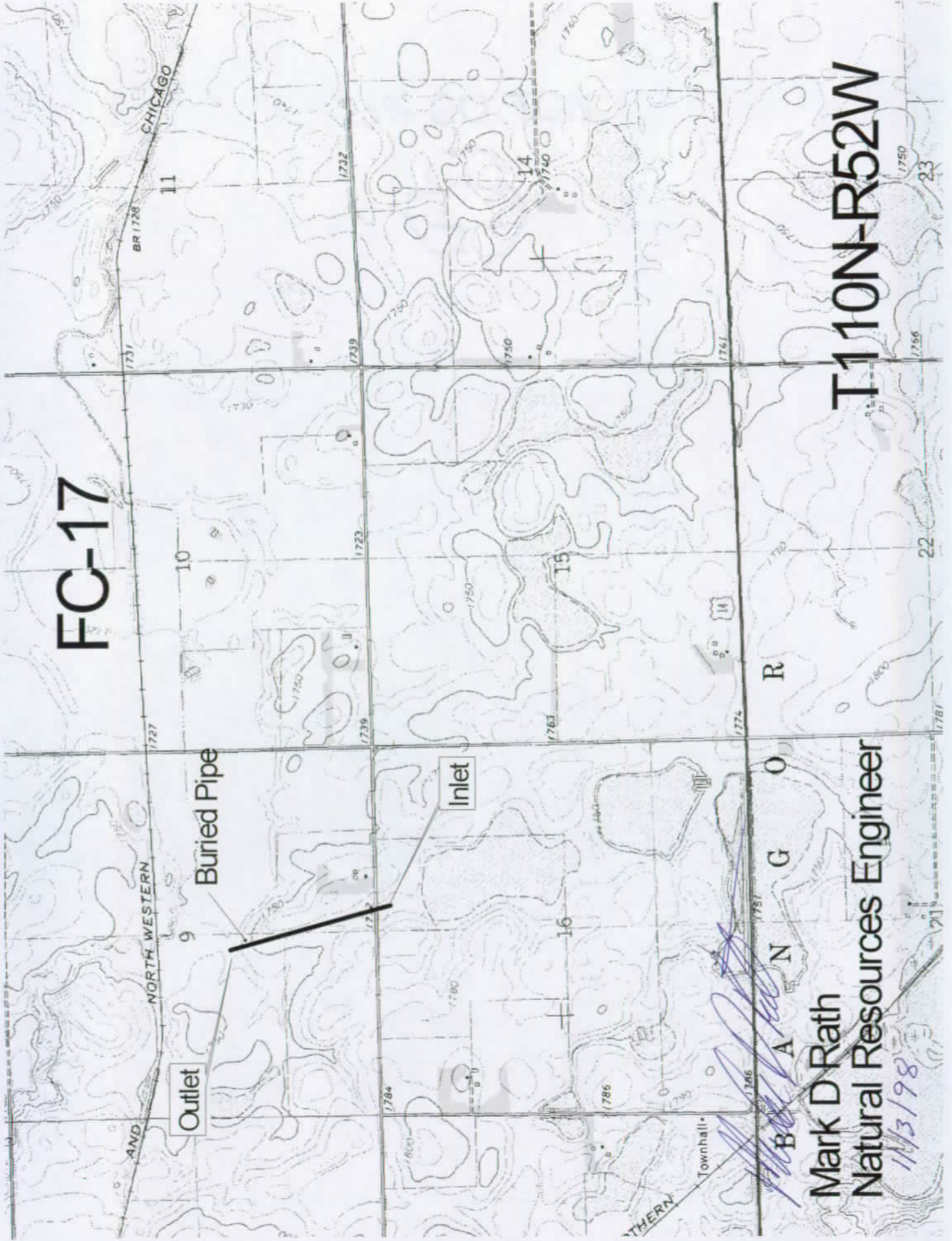


Inlet Structure for FC-17



Outlet tube for FC-17

FC-17



T110N-R52W

Mark D Rath
Natural Resources Engineer
11/3/98

STATE OF SOUTH DAKOTA

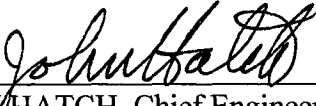
FLOOD CONTROL WATER LICENSE NO. FC-17

(1) The South Dakota Department of Transportation, PO Box 449, Brookings, SD 57006-0449 made Application No. FC-17, December 21, 1995 for a flood control permit which authorized a combination ditch and pipe varying from 30-42 inches in diameter to drain water off of US Hwy 14, Brookings County, South Dakota. Flood Control Permit No. FC-17, with a priority date of December 21, 1995 was approved March 22, 1996 with construction and operation of the project to be completed on or before March 22, 2001.

On August 11, 1998, a "Notice of Completion of Works" was submitted which indicated the project was completed and operational in August, 1996.

(2) It is certified that the permit holder has complied with the provisions of South Dakota State Law relating to completion of the flood control project. An outlet structure from East Brush Lake No. 2 set to an elevation of 1753.0 feet mean sea level located in the NW ¼ NE ¼ Section 16, T110N, R52W discharges water through a buried pipeline to the Lake Goldsmith drainage located in the NE ¼ SW ¼ of Section 9, T110N, R52W.

(3) Pursuant to South Dakota Water Law 46-5-30.1 the South Dakota Department of Transportation, PO Box 449, Brookings, SD 57006-0449 the holder and/or owner of Flood Control Permit No. FC-17 is issued a license for flood control purposes. This license is subject to any limitations or qualifications listed in Flood Control Permit No. FC-17 and subject to South Dakota State Law.


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

JAN 21 1999

date





**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

JAN 21 1999

Roger Jenner
SD Department of Transportation
PO Box 449
Brookings SD 57006-0449

FC-17

Dear Mr Jenner:

Enclosed is Flood Control Water License No. FC-17. Flood Control Water License No. FC-17 is final document relating to completion of the flood control project.

If you have any questions concerning the enclosed license, please contact us.

Very truly yours,

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

ks

enclosures

c: Jim Nelson, Department of Transportation