

WATER PERMIT NO. 6080-3

Name of Applicant: Melvin Kolb

Address: 37353 118th St, Westport SD 57481

Phone: 605 439-3427

Amount of Water Claimed: 40.6 acre-feet

Total Acres: NA

Source of Water Supply: runoff

Water to be used for: fish & wildlife, livestock watering

County: McPherson

Type of Waste Disposal System: NA

Location: 5 miles east and 3 miles north of Leola

PRIORITY Date Received: 5-20-1998

Fee: \$150

Corrected Application Received:

Period of Annual Use: January 1 – December 31

Remarks:

Diversion Point: SE ¼ SE ¼ Sec 31-T127N-R66W

Water Impounded: E ½ SE 1/4

Sec 31-T127N-R66W

Depth of Well: NA

Well Driller:

Remarks:

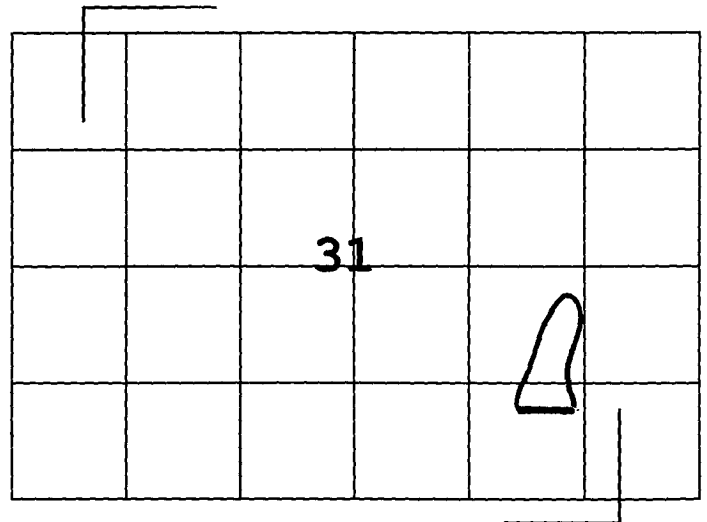
Type of Map: topo

Prepared by: Doug Lipetzky

Reviewed and the Number Assigned on: XX

By: Karen Schlaak

Notice of Hearing - date to intervene: _____



**SOUTH DAKOTA
WATER PERMIT NO. 6080-3**

Date of first receipt of application May 20, 1998.

The Chief Engineer, on behalf of the Water Management Board, issues Water Permit No. 6080-3 to Melvin Kolb, 37353 118th St., Westport SD 57481 authorizing the construction of a dam and the placing of water to beneficial use subject to the following limitations, conditions and qualifications:

1. Water Permit No. 6080-3 authorizes impoundment of 40.6 acre-feet of runoff water through the Willow Creek drainage by constructing a dam located in the SE $\frac{1}{4}$ SE $\frac{1}{4}$ Section 31 with water impounded in the E $\frac{1}{2}$ SE $\frac{1}{4}$ Section 31; all in T127N-R66W. The permit authorizes impoundment of sufficient water annually to maintain the water level at the outlet elevation of 1509.0 feet mean sea level.
2. The water appropriated shall be used for the purpose of providing habitat for fish and wildlife propagation and livestock water and may not exceed the amount of water needed for beneficial use.
3. The water is to be used during the following described annual period: January 1 – December 31.
4. The date of approval of Permit No. 6080-3 is July 13, 1998.
5. The date from which applicant may claim right is May 20, 1998.
6. One-fifth of the construction is to be completed on or before January 13, 2001.
7. All construction is to be completed on or before July 13, 2003.
8. Water is to be put to beneficial use on or before July 13, 2007.
9. Water rights obtained in compliance with the laws of the State of South Dakota may not be unlawfully impaired by this appropriation.

QUALIFICATIONS

1. Water Permit No. 6080-3 authorizes a dam with storage capacity of 40.6 acre-feet of water and sufficient water annually to maintain the water level to the outlet elevation.
2. Low flows as needed for downstream domestic use, including livestock water and prior water rights must be by-passed.

WATER MANAGEMENT BOARD

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

AUG 17 1998
date



FORM 2: Application for uses other than irrigation
(type or print)

Mail to: Water Rights Program Joe Foss Building 523 E. Capitol Pierre, SD 57501-3181 (605) 773-3352	No. <u>6080-3</u>	(office use only) Hydrologic Unit <u>10130106 10160004</u>
	Basin <u>Missouri River James River</u>	
	Newspaper <u>McPherson Co. Herald, Leola, SD</u>	



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

Check use(s) of water:

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

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

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

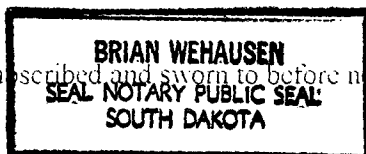
- Name of Applicant Melvin Kolb Phone (605)439-3427
(check one) ☒ Owner ☐ Tenant/lessee
Mailing Address 37353 118th St. Westport State SD 57481
(Street, RR, or Box) (Zip Code)
- Amount of water claimed _____ *CFS or _____ **GPM 40.6 ***AF
(*Cubic Feet per Second) (**Gallons per Minute) (***.Acre Feet - storage capacity of dam dugout or annual use if applicable)
- Source of water supply Surface Runoff through Willow Creek drainage.
- Location of point of diversion (example - 3 wells in SW1/4 NE1/4 section 12-T104N-R53W)
SE 1/4 of SE 1/4 of Sec. 31 T127N R66W Water Impounded: E 1/2 SE 1/4
Sec. 31 - T127N - R66W County McPherson
- County or counties where water will be used McPherson
- Annual period during which water is to be used Year Round Jan 1 - Dec 31
- Give a description of the project. When available include any preliminary engineering report or other reports or information that will help explain the project. (Attach sheet if more space is needed)

See Attached Information..

STATE OF SOUTH DAKOTA) SS
County of McPherson)

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

I, Melvin Kolb, 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 Melvin Kolb
Subscribed and sworn to before me this 13 day of May 19 98
Brian Wehausen
Notary Public

Supplemental Information

(type or print in ink)



1. Well Information - Proposed Construction

- a) Drill Hole Diameter _____ Depth _____
- b) Casing Type _____ Diameter _____ Thickness _____
- c) Screen Type _____ Diameter _____ Thickness _____
- d) Gravel Pack _____ Length of Gravel Pack _____
- e) Depth to Top of Water Bearing Material _____
- f) Depth to Water (ground surface to water level) _____
- g) Distance to nearest existing domestic well: _____

On applicants property	On property owned by others
1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____	1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____

2. Wastewater Disposal System Information

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

3. Dugout Information

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

4. Water Storage Dams

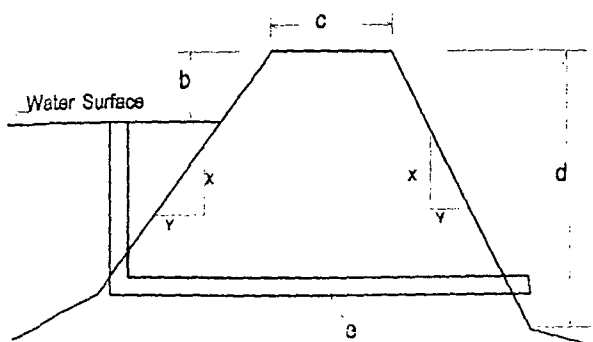
If the proposed water use system contains one or more storage dams, please furnish the information requested below for each dam. The locations of the dams need to be shown on the map submitted with the application.

- a) If a private engineering firm or government agency was involved in the design of this dam, please give their name and address:

Ducks Unlimited, Inc.

3502 Franklin Ave.

Bismark, ND 58501



- b) Freeboard 3.5 ft.
- c) Crest Width 12.0 ft
Crest Length 831 ft.
- d) Height 9 ft.
- e) Primary Outlet Capacity 36 CFS
If pipe, diameter 30 in.
- f) Secondary Spillway Capacity 1478 CFS
Spillway Width 120 ft.
- g) X & Y Slope _____
Upstream 3:1
Downstream 3:1
- h) Surface Area of Impoundment 21 acres
- i) Storage 40.6 Acre Feet
- j) Drainage Area Above Dam 22,590 Acres

RECEIPT

Water Rights Program

South Dakota Department of Environment and Natural Resources

NO 415771

Pierre, May 20, 19 98

RECEIVED OF U.S. Fish & Wildlife Service, 39650 Sand Lake Drive, Columbia, SD 57433-9761
the following amount in fees for services rendered as provided for by law:

Fee for Application for Permit No. <u>6080-3</u> to Appropriate Water, to construct and to put water to beneficial use _____	150	00
Fee for Application for Permit No. _____ to Appropriate Water, for Future Use _____		
Fee to retain Future Use Permit No. _____ after period of seven years.		
Fee for Inspecting Constructed Works, confirming beneficial use and issuing Water License No. _____		
Fee for Filing Transfer Form _____		
Fee for Filing Extension Request _____		
Fee for _____		

(Any Other Work Provided by Law)	Total	150 00

By _____
Chief Engineer

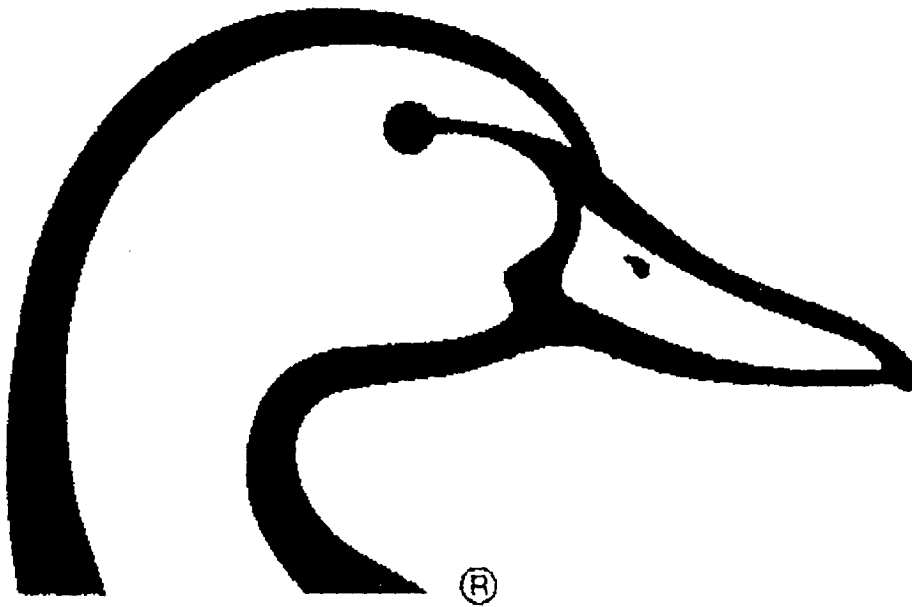
John Hatch (Signature)

DESIGN REPORT

for

MELVIN KOLB WETLAND PROJECT

SD-0168-001



January 29, 1998

Prepared by:
Ducks Unlimited, Inc.

PROJECT: MELVIN KOLB WETLAND PROJECT
SD-0168-001

LOCATION: SE ¼ of SE ¼ of Sec. 31, T 127 N, R 66 W
5 miles east, 3 miles north of Leola
McPherson County, South Dakota

MARSH DATA: Full Service Level (FSL) @ 1509.0
21.0 Surface Acres @ FSL
40.6 Acre-Feet Capacity @ FSL

Emergency Spillway (E.S.) Crest @ 1510.0
27.1 Surface Acres @ E.S. Crest
64.7 Acre-Feet Capacity @ E.S. Crest

Top of Compacted Embankment @ 1513.5
63.5 Surface Acres @ Top of Dam
248.4 Acre-Feet Capacity @ Top of Dam

PROJECT DESCRIPTION:

The project as proposed involves the reconstruction of a small dam located on private land owned and managed by Mr. Melvin Kolb. The existing dam has been in place for a number of years, however, the earthen spillway has eroded to the extent that water is no longer impounded behind the dam. No primary spillway was incorporated into the original design. The proposed project will restore the 21-acre wetland located on land owned by Melvin Kolb, Timmy Kolb and Alvin Zandstra. All owners have agreed to sign a Wildlife Extension Agreement with the U.S. Fish & Wildlife Service allowing restoration of the wetland. The wetland is located near the headwaters of a drainage known as Willow Creek. Willow Creek Dam exists approximately 15-20 creek miles downstream from the proposed project site. Discharge flows from the Willow Creek Dam enter the Elm River, which eventually discharges into the James River in Brown County. The total Willow Creek watershed above the proposed project site consists of approximately 22,590 acres or 35.3 square miles.

PRELIMINARY RISK ASSESSMENT:

The project site is located in a rural area of McPherson County. No residences or other buildings are located in the way of danger immediately downstream adjacent to the outlet channel. Upon leaving the outlet structure, flows will follow the natural drainage channel for approximately 1.5 miles prior to passing through four 6' diameter corrugated metal pipe (CMP) culverts in a gravel-surfaced, section-line road. The culverts have about 10' of available head from the inverts to the top of the road. Flows then

continue in the creek channel, intersecting 5 more roads in the next 15-20 creek miles before entering Willow Lake, and then the Elm River.

Based on information obtained in the field, data present on the U.S.G.S. quadrangular maps, and the relative small size and capacity (64.7 acre-feet at the emergency spillway crest) of the restored marsh, the general public should be in no danger in the unlikely event of a dam failure. No loss of life and minimal or no economic loss would be expected. Therefore, per the classification criteria outlined in Chapter 74:02:08 "Safety of Dams," it is recommended that the proposed dam be classified as a low hazard, small, Category 3 dam.

The product of the intermediate storage capacity (64.7 acre-feet) times the effective height (Elev. 1510.0-1504.5 = 5.5 feet) is 356 which is less than 3000. Therefore, the minimum spillway design flood is a 25-year frequency per 74:02:08:07.01 and must be passed through the spillway without overtopping the embankment.

DESIGN:

As designed, the primary and emergency spillways will pass flows in excess of those produced by a 25-year, 24-hour rainfall event. In fact, the spillways have been designed to pass flows produced by a 100-year, 24-hour rainfall event without overtopping the compacted embankment, except through the emergency spillway section as planned. A section of the compacted embankment will be lowered and protected to act as the emergency spillway.

A single 48" diameter CMP overflow riser with a trashrack connected to a 30" diameter CMP outlet barrel is proposed as the primary spillway. The structure will have removable stoplogs to provide variable control and drawdown capability to elevation 1505.5. The riser overflow crest elevation or full service level (FSL) is proposed at elevation 1509.0. This structure will pass smaller, long term flows up to approximately 36 cubic feet per second (cfs) without using the emergency spillway. The 120-foot wide emergency spillway incorporated into the embankment, with the level crest at elevation 1510.0 will assist in passing high flows and will be armored with cable concrete, grout and grouted-riprap to prevent erosion.

Regression equations provided in *Techniques for Estimating Flood Peaks, Volumes, and Hydrographs on Small Streams in South Dakota*¹ were used to develop flood peaks for design purposes. No flood

¹Becker, Lawrence D., U.S. Geological Survey, Water Resources Investigations 80-80, September 1980.

routing of flows through the proposed wetland basin was completed as the ratio of watershed to basin storage indicated such routing need not be considered. It should be noted that there are a number of small dams and other wetlands spread throughout the watershed, as well as a numerous roads with culverts intersecting the various drainages that flow into the proposed project site. Storage associated with these wetlands and road crossings was not quantified nor used in the hydrological analysis. Thus, the design peak flood flows used for the structure design should be quite conservative.

The primary spillway capacity was calculated by comparing discharges developed by the weir flow formula and formulas for calculating head loss through corrugated metal pipe. The emergency spillway capacity was calculated using a computer program that computes gradually-varied flow profiles in prismatic open channels using the Standard Step method. These computations are often referred to as "backwater curves." Maximum water surface elevations shown below were estimated using the calculated peak inflows and flow profiles over the emergency spillway. Discharge curves for the proposed spillways are attached.

The following is a relationship between peak inflows, corresponding outflows, and reservoir elevations using the previously-mentioned methods of analysis:

<u>EVENT</u>	<u>PEAK INFLOWS</u>	<u>MAXIMUM WATER SURFACE ELEVATION</u>	<u>FREEBOARD AVAILABLE</u>	<u>TOTAL DISCHARGE</u>
2 YR	151 CFS	1510.48	3.02 FT	151 CFS
5 YR	431 CFS	1510.88	2.62 FT	431 CFS
10 YR	784 CFS	1511.26	2.24 FT	784 CFS
25 YR	1478 CFS	1511.85	1.65 FT	1478 CFS
50 YR	2236 CFS	1512.39	1.11 FT	2236 CFS
100 YR	3164 CFS	1512.96	0.54 FT	3164 CFS

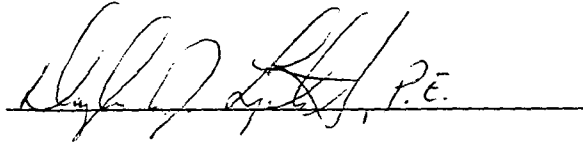
Primary Spillway (Riser) Crest Elevation . . @ 1509.0
 120' Wide Emergency Spillway Crest @ 1510.0
 Top of Compacted Embankment Elevation. . . . @ 1513.5

As indicated by the results in the previous table, the project will comply with State dam safety rules passing the 25-year, 24-hour rainfall event without exceeding the top of the compacted embankment. Although the emergency spillway is actually part of the embankment, measures are being taken to protect the spillway from erosion, allowing flow over the protected section. In addition to providing excellent waterfowl and other wildlife habitat, the basin will provide livestock watering benefits to the landowners as well.

Construction plans have been drafted outlining project specifics. A set of standard construction specifications has previously been submitted to the Division of Water Rights.

Submitted By:

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of South Dakota.

A handwritten signature in dark ink, appearing to read 'D. J. Lipetzky, P.E.', is written over a horizontal line.

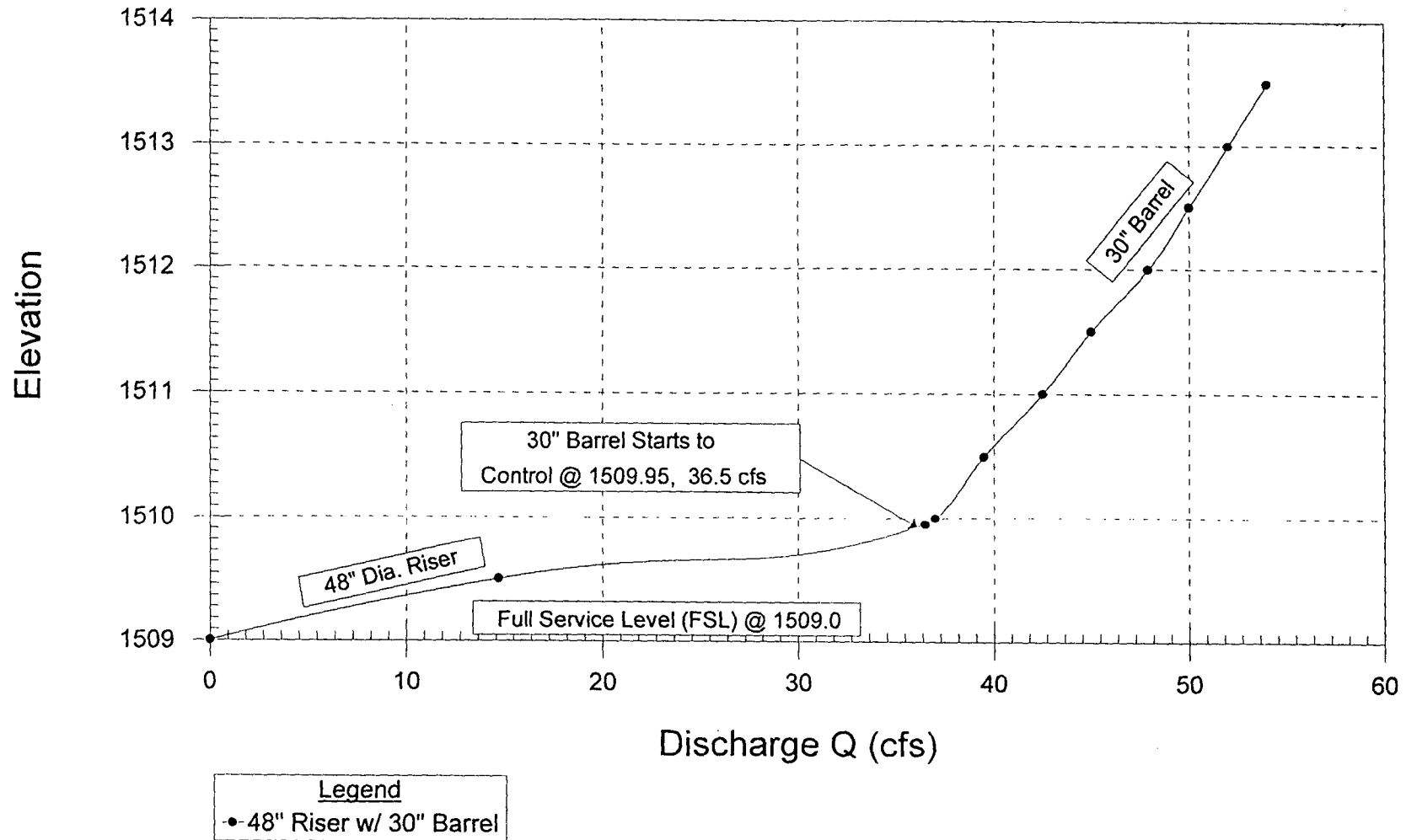
Douglas J. Lipetzky, P.E.
PE-4499

January 29, 1998

Date

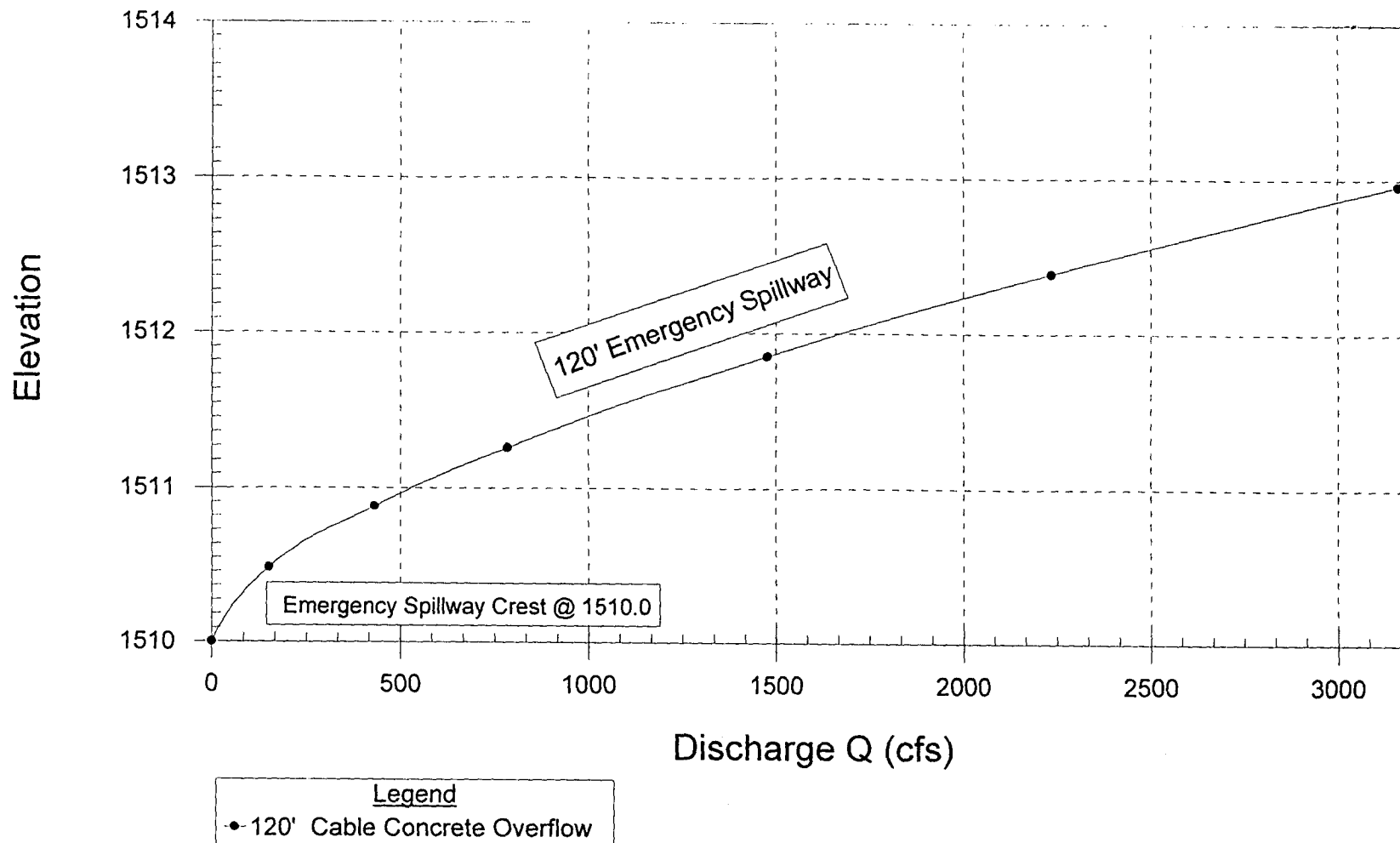
MELVIN KOLB WETLAND

Discharge Curve For Primary Spillway



MELVIN KOLB WETLAND

Discharge Curve For Emergency Spillway



Water Permit Application No. 6080-3 Melvin Kolb

Top of Dam Elev. - 1513.5
P. Spillway Elev. - 1509
2nd Spillway Elev. - 1510
D/S Toe Elev. - 1504.5

Cat. 3 - Low Hazard Dam

Height = 9 ft.

Normal Storage Capacity - 40.6 Ac-Ft
Int. Storage Capacity - 64.7 Ac-Ft
Max. Storage Capacity - 248.4 Ac-Ft

Int. Storage Capacity X Eff. Height = $64.7 \times 5.5 = 356 < 3000$ ∴
25 year Minimum Spillway Design

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

DA = 22,590 Ac = 35.30 mi.²
Slope - Ave = 40 ft/mi
SE = 2.99

$$\begin{aligned} Q_{25} &= 83.4 A^{.65} S^{.46} i^{.67} \\ &= 83.4 (35.3)^{.65} (40)^{.46} (2.99)^{.67} \\ &= 83.4 (8.48) (5.07) (0.45) \\ &= \underline{1600 \text{ cfs}} \end{aligned}$$

$$\begin{aligned} Q_{100} &= 132 A^{.65} S^{.46} i^{.67} \\ &= 132 (35.3)^{.65} (40)^{.46} (2.99)^{.67} \\ &= 132 (10.14) (5.46) (0.48) \\ &= \underline{3500 \text{ cfs}} \end{aligned}$$

Ducks Unlimited used the NRCS TR-20 to route a Q_{25} peak = 1478 cfs through the structure with 1.65 ft of freeboard available and a Q_{100} peak = 3164 cfs through the structure with 0.5 ft of freeboard available.

Section 74:02:08

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

NRCS Annual Yield

DA = 22,590 Ac, CN = 72, ISO = 2

$$\begin{aligned} 80\% \text{ chance} &= 0.084 \\ 0.084 \times 22590/12 &= 158 \text{ Ac-Ft} \end{aligned}$$

$$\begin{aligned} 50\% \text{ chance} &= 0.25 \\ 0.25 \times 22590/12 &= 470 \text{ Ac-Ft} \end{aligned}$$

$$\begin{aligned} 10\% \text{ chance} &= 1.45 \\ 1.45 \times 22590/12 &= 2730 \text{ Ac-Ft} \end{aligned}$$



PUBLIC NOTICE

US Army Corps
of Engineers

Omaha District

APPLICANT: US FISH & WILDLIFE SERVICE
APPLICATION NO: 199830192
WATERWAY: WILLOW CREEK

ISSUE DATE: JUNE 11, 1998
EXPIRATION DATE: JULY 2, 1998

Regulatory Office, 28563 Powerhouse Rd, Room 120, Pierre, SD 57501

21 DAY NOTICE

JOINT NOTICE OF PERMIT PENDING

US ARMY CORPS OF ENGINEERS
AND

SOUTH DAKOTA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

The application of the US Fish and Wildlife Service, RR1 Box 25, Columbia, South Dakota 57433, for approval of plans and issuance of a permit under authority of the Secretary of the Army is being considered by the District Engineer, US Army Engineer District, Omaha, Nebraska.

The applicant requests authorization to construct an earthen embankment across Willow Creek in the southeast quarter (1/4) of Section 31, Township 127 North, Range 66 West, McPherson County, South Dakota.

The proposed project will consist of the reconstruction of a small dam with native soils excavated from the site. The existing dam has been in place for a number of years, however, the earthen spillway has eroded to the extent that water is no longer impounded behind the dam. Approximately 1.7 acres of wetland (Willow Creek channel and adjacent floodplain channel) will be filled by the embankment. A single 48 inch diameter corrugated metal pipe (CMP) overflow riser with a trashrack connected to a 30 inch CMP outlet barrel is proposed as the primary spillway. The structure will have removable stoplogs to provide variable control of water and drawdown capacity. The project plans include a riser overflow structure and emergency spillway armored with cable concrete, grout and grouted-riprap to prevent erosion. The primary and emergency spillways are designed to pass flows produced by a 100 year, 24 hour rain event without overtopping the compacted embankment.

The purpose of the project is to create and enhance wetlands for wildlife habitat and will also be used to water livestock. The proposed project is the result of an agreement between the applicant and the property owners allowing restoration of the 21 acre wetland created by the dam.

The South Dakota Department of Environment and Natural Resources, Division of Environmental Regulation, 523 East Capitol Avenue, Pierre, South Dakota 57501-3181, will review the proposed project for state certification in accordance with the provisions of Section 401 of the Clean Water Act. The certification, if issued, will express the State's opinion that the operations undertaken by the applicant will not result in a violation of applicable water quality standards. The South Dakota Department of Environment and Natural Resources hereby incorporates this public notice as its own public notice and procedures by reference (ARSD 74:03:02).

Omaha District will comply with the National Historic Preservation Act of 1966 and 36 CFR 800. The applicant is coordinating the proposed project with the State Historic Preservation Officer (SHPO) and has scheduled a professional archeological survey of the project site during the month of June. However, we will evaluate input by the SHPO and the public in response to this public notice.

In compliance with the Endangered Species Act, our review indicates that the proposed activity will not affect species designated as threatened or endangered pursuant to the Endangered Species Act or their critical habitat.

The decision whether to issue a permit will be based on an evaluation of the probable impacts including cumulative impacts of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit which reasonably may be expected to accrue from the proposals must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the activity will be considered including the cumulative effects thereof; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, cultural values, fish and wildlife values, flood hazards, flood plain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food production, and, in general the needs and welfare of the people. In addition, the evaluation of the impacts of the project on public interest will include application of the guidelines promulgated by the Administrator, Environmental Protection Agency, under authority of Section 404(b) of the Clean Water Act (40 CFR Part 230).

The Corps of Engineers is soliciting comments from the public; Federal, state, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps of Engineers to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

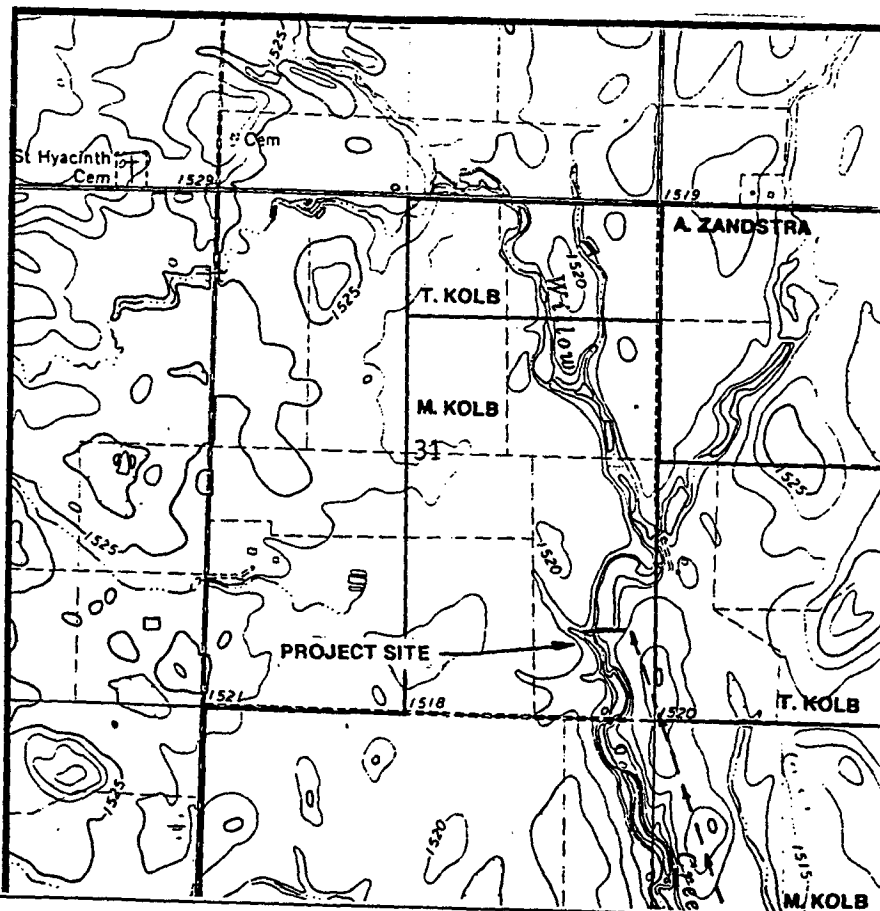
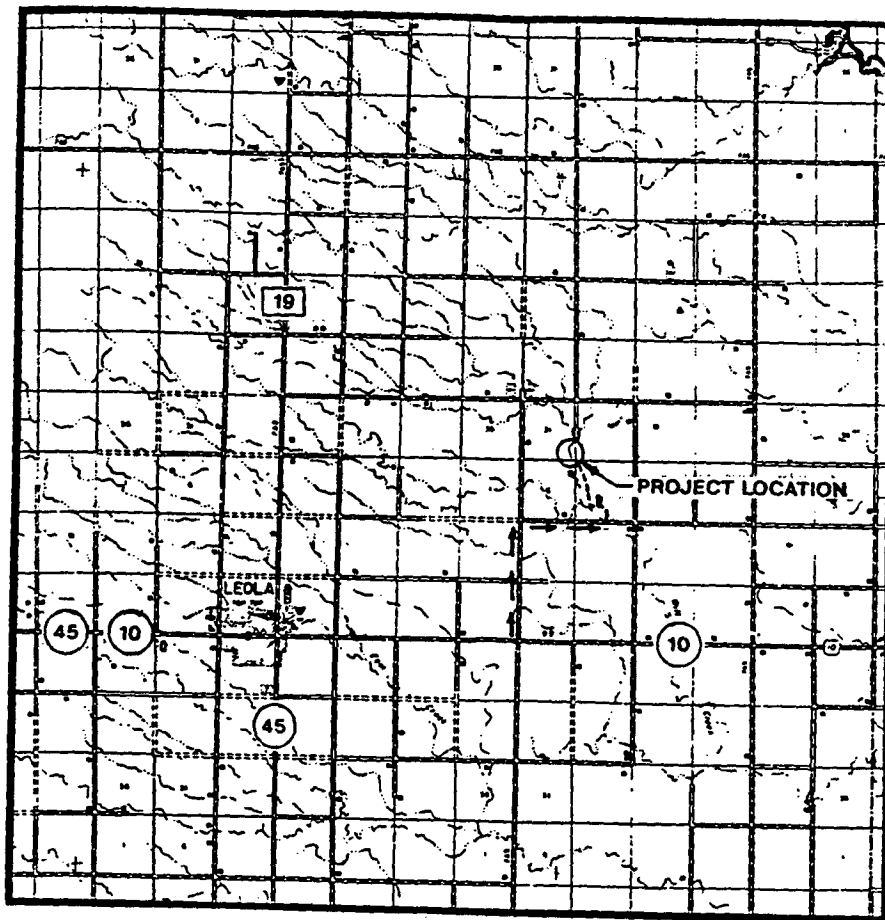
Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider this application. Requests for public hearings shall state, with particularity, the reason for holding a public hearing. The request must be submitted to the US Army Corps of Engineers, South Dakota Regulatory Office, 28563 Powerhouse Road, Room 120, Pierre, South Dakota 57501.

Any interested party (particularly officials of any town, city, county, state, Federal agency, or local association whose interests may be affected by the proposed work) is invited to submit to this office, written facts, arguments, or objections on or before July 2, 1998. Any agency or individual having an objection to the proposed work should specifically identify it as an objection with clear and specific reasons. Comments, both favorable and unfavorable, will be accepted, made a part of the record and will receive full consideration in subsequent actions on this permit application. All replies to the public notice should be addressed to the address listed in the previous paragraph. Thomas A. Lowin, telephone number (605) 224-8531, may be contacted for additional information.

Comments received after the close of the business day on the expiration date of this public notice will not be considered.

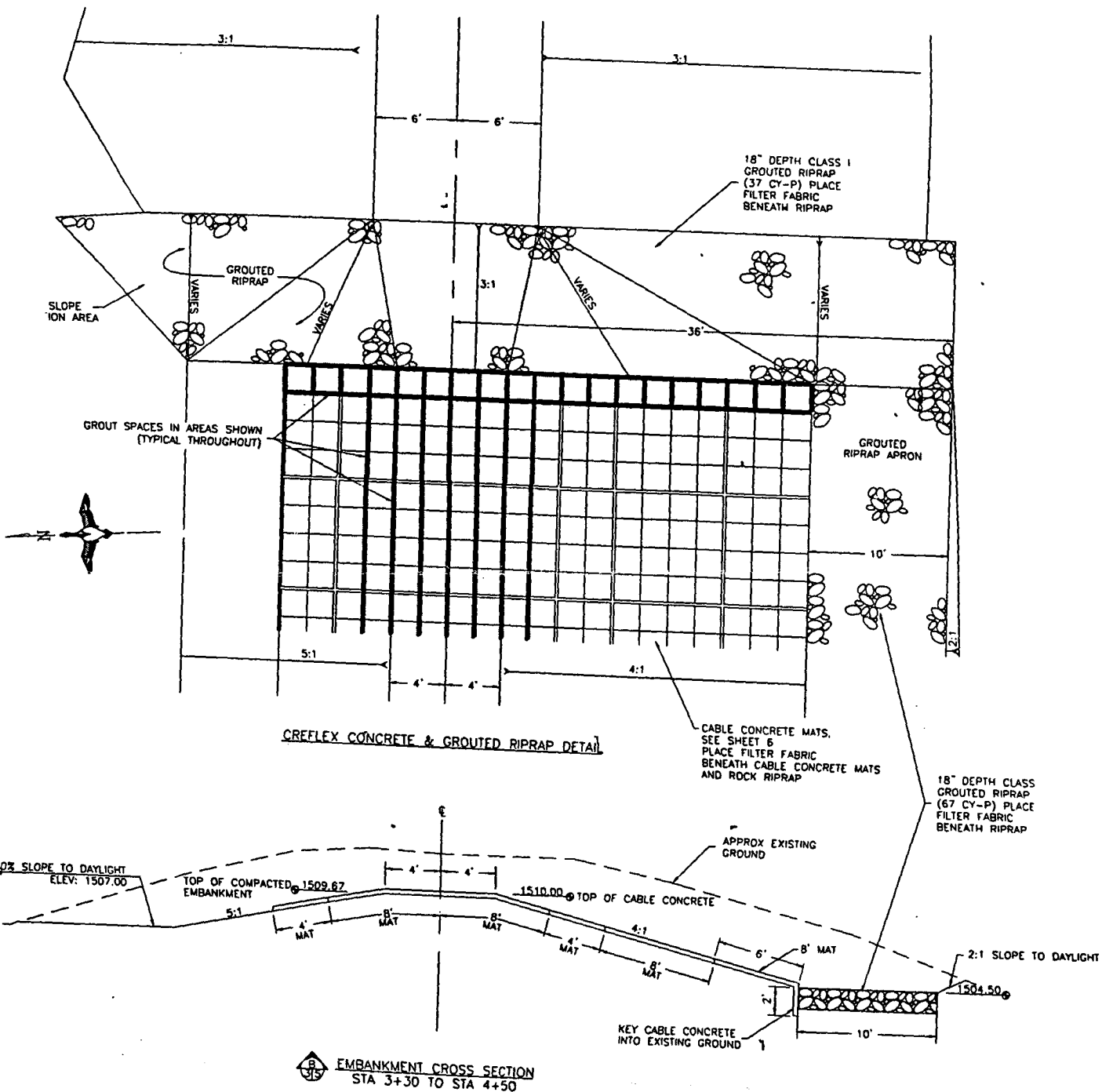
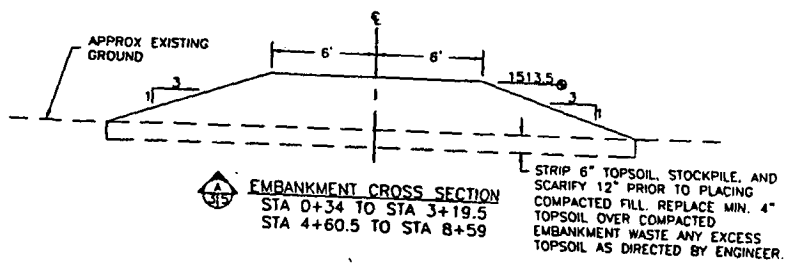
This project, if authorized, will be under the provisions of Section 404 of the Clean Water Act.

Drawings showing the location and extent of the work are attached to this notice.



PURPOSE: Wildlife Habitat
APPLICATION BY:
 US Fish & Wildlife Service
ADJ. PROPERTY OWNERS:
 1) Melvin Kolb 2) Timmy Kolb
 3) Alvin Zandstra 4) Terry Pudwill

IN Willow Creek
 AT Sec. 31/T127N/R66W
 COUNTY McPherson
 DATE 6/9/98
 SHEET 1 of 7

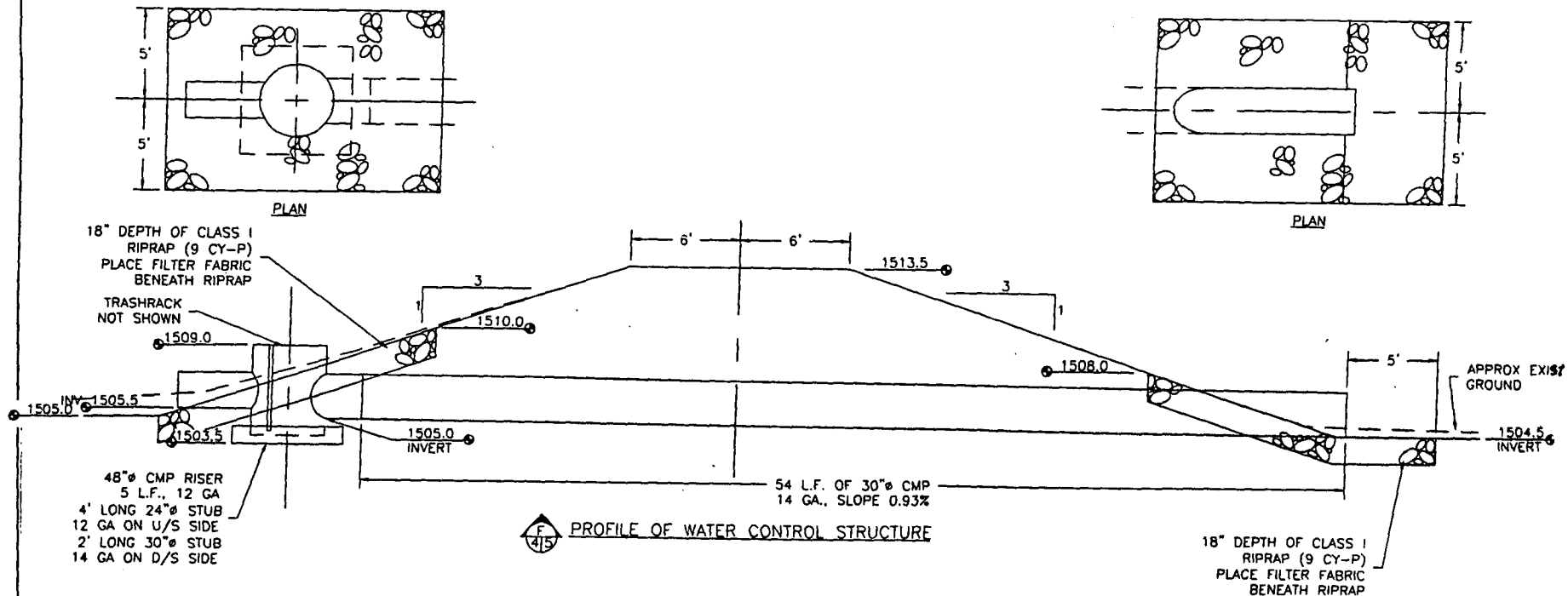


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IN Willow Creek
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 SHEET 5 of 7

PURPOSE: Wildlife Habitat
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IN Willow Creek
 AT Sec. 31/T127N/R66W
 COUNTY McPherson
 DATE 6/9/98
 SHEET 6 of 7



PREPARED BY:



DUCKS
 UNLIMITED
 INC.
 GREAT PLAINS REGIONAL OFFICE

PROJECT NO. SD-0168-001

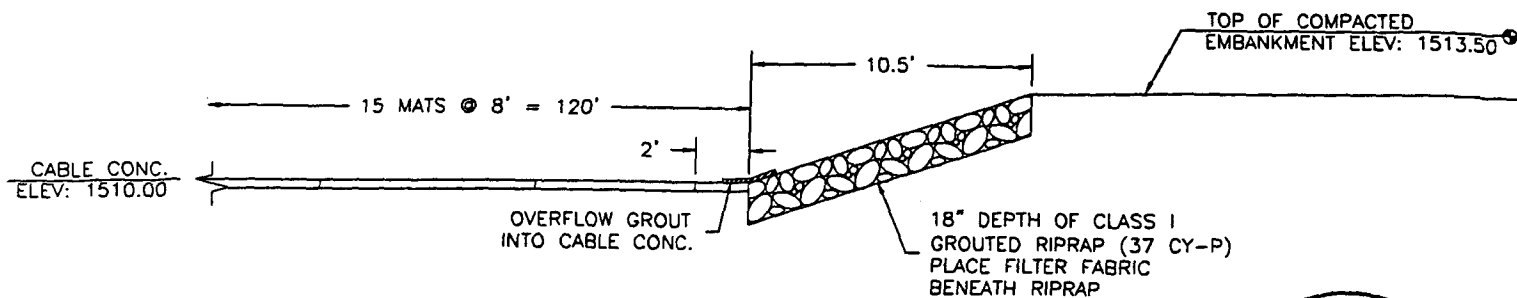
KOLB DAM
 CROSS SECTIONS
 & PROFILES

DESIGNED BY:

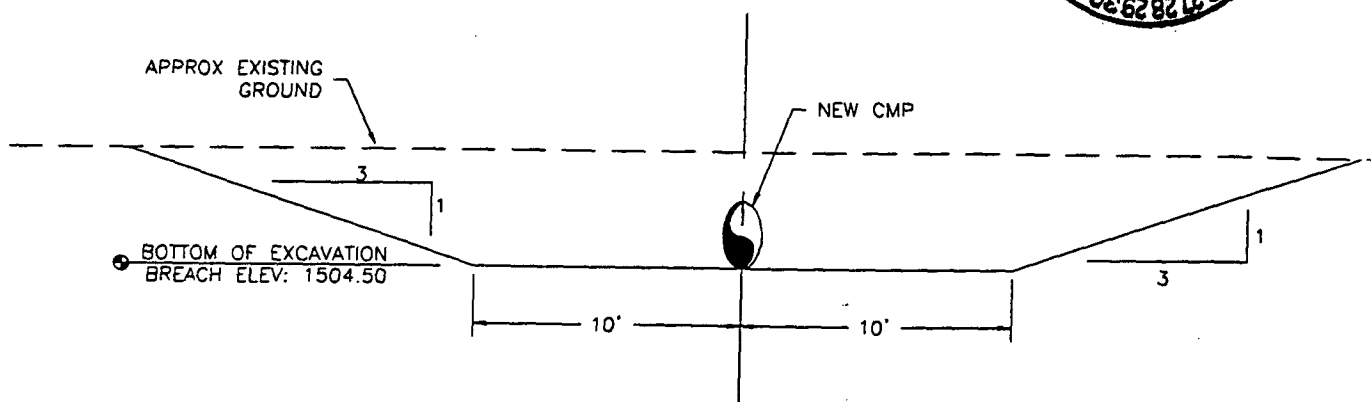
DRAWN BY:

SURVEYED BY:

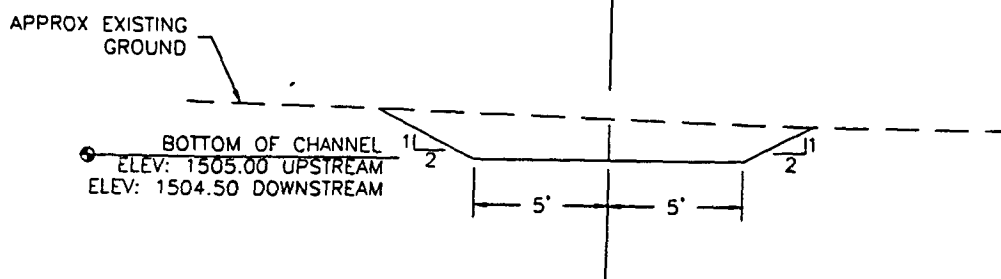
CHECKED BY:



PROFILE OF TRANSITION BETWEEN
EMBANKMENT & OVERFLOW



CROSS SECTION OF STRUCTURE EXCAVATION
STA 4+68.5 TO STA 5+33



CROSS SECTION OF CHANNEL EXCAVATION
STA 4+45 TO STA 4+68.5
STA 5+33 TO STA 6+24

PURPOSE: Wildlife Habitat
APPLICATION BY:
US Fish & Wildlife Service
ADJ. PROPERTY OWNERS:
1) Melvin Kolb 2) Timmy Kolb
3) Alvin Zandstra 4) Terry Pudwill

IN Willow Creek
AT Sec. 31/T127N/R66W
COUNTY McPherson
DATE 6/9/98
SHEET 7 of 7

REPORT ON
WATER PERMIT APPLICATION No. 6080-3
Melvin Kolb
June 9, 1998

Water Permit Application No. 6080-3 has been filed by Melvin Kolb to impound 40.6 acre-feet of water in a dam located in the E ½ SE ¼ of Section 31-T127N-R66W, in McPherson County. The application requests impoundment of sufficient water to maintain water at the outlet elevation of 1509.0 feet mean sea level and the water is to be used to provide habitat for and fish and wildlife production and livestock watering.

Discussion:

The Kolb Dam has been designed by Ducks Unlimited, Inc. The plans and specifications have been reviewed and will be approved; however, construction of the project can not begin until Water Permit Application No. 6080-3 is approved.

The dam will be classified as a small size Category 3, Low Hazard dam. It will have an embankment height of 9 feet, a normal storage capacity of 40.6 acre-feet with a reservoir level at the spillway elevation, and a maximum storage capacity of 248.4 acre-feet with a reservoir level at the top of dam elevation. A dam of this size and hazard classification is required to have a minimum spillway design capable of passing a 25-year frequency event.

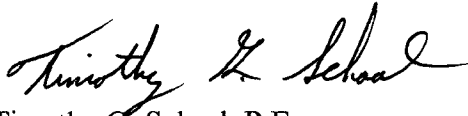
The dam is designed to have a CMP drop inlet structure with a 48 inch diameter riser and a 30 inch diameter barrel as the primary spillway structure and a 120 foot wide secondary spillway protect with articulated concrete mat. The dam will have a drainage area of 22,590 acres (35.3 square miles). Ducks Unlimited used the NRCS TR-20 model to route a 25-year frequency event with a peak of 1478 cfs through the spillways with 1.65 feet of freeboard available and a 100-year frequency event with a peak of 3164 cfs through the spillways with 0.54 feet of freeboard available.

The annual yield for the drainage area above the dam with a 80 percent chance of occurrence, or 8 out of 10 years, is expected to be 158 acre-feet. The annual yield with a 50 percent chance of occurrence, or 1 out of 2 years, is expected to be 470 acre-feet, and the annual yield with a 10 percent chance of occurrence, or 1 out of 10 years, is expected to be 2730 acre-feet.

The Kolb Dam will be located in the SE¼ of Section 31-T127N-R66W on Willow Creek about 20 miles upstream of Willow Creek Dam. The City of Aberdeen holds Water Permit No. 3009-3, which authorizes the storage of 4100 acre-feet of storage in Willow Creek Dam. Willow Creek Dam has a drainage area of 155 square miles compared to the 35.3 square mile drainage area for Kolb Dam. Considering the amount of expected runoff compared to the reservoir storage, plus the drainage area sizes, the approval of Water Permit Application No. 6080-3 should not have any adverse effect on Water Permit No. 3009-3. There are no other existing Water Rights/Permits located on Willow Creek between the proposed dam and Willow Creek Dam.

Conclusions:

1. Water Permit Application No. 6080-3 should be approved since unappropriated water is available and approval should not have any adverse effect on existing Water Permits/Rights.
2. If approved, the low flow bypass requirement for downstream domestic use should be a qualification on Water Permit Application No. 6080-3.



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

Approved by:



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

**RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT
APPLICATION NO. 6080-3, Melvin Kolb**

Pursuant to SDCL 46-2A-2, the following is the recommendation of the Chief Engineer, Water Rights Program, Department of Environment and Natural Resources concerning Water Permit Application No. 6080-3, Melvin Kolb, 37353 118th Street, Westport, SD 57481.

The Chief Engineer is recommending APPROVAL of Application No. 6080-3 because 1) there is reasonable probability that there is unappropriated water available for the applicant's proposed use, 2) the proposed diversion can be developed without unlawful impairment of existing rights, 3) the proposed use is a beneficial use and 4) it is in the public interest with the following qualifications:

1. Water Permit No. 6080-3 authorizes a dam with storage capacity of 40.6 acre feet of water and sufficient water annually to maintain the water level to the outlet elevation.
2. Low flows as needed for downstream domestic use, including livestock water and prior water rights must be by-passed.

See report on application for additional information.

A handwritten signature in black ink, appearing to read "John Hatch", written in a cursive style.

JOHN HATCH, Chief Engineer
June 16, 1998



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

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

June 17, 1998

Melvin Kolb
37353 118th St.
Westport, SD 57481

Dear Mr. Kolb:

Water Permit Application No. 6080-3 for fish & wildlife, and livestock watering 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 McPherson Co. Herald printed at Leola, SD (Ph # (605) 439-3131). 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.



DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES

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

June 17, 1998

McPherson Co. Herald
Box 170
Leola, SD 57456-0170

ATTENTION: Legal Department

Enclosed is a Notice of Hearing on Application No. 6080-3 to Appropriate Water to be published twice. Please publish the first notice on June 24, 1998, 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 Melvin Kolb, 37353 118th St., Westport, SD 57481 (Ph # (605) 439-3427).

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

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

Sincerely,

Eric Gronlund
Natural Resources Engineer
605 773-3352

enclosures

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

No. 6080-3

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

Date _____

We are in receipt of your letter of June 17, 1998, enclosing Notice of Hearing to Appropriate Water by Application No. 6080-3 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 June 24, 1998, with the second publication 7 days later. The applicant is responsible for payment.

NOTICE OF APPLICATION NO. 6080-3 to Appropriate Water

Notice is given that Melvin Kolb, 37353 118th St, Westport SD 57481 has filed an application for a water permit to impound 40.6 acre-feet of runoff water through the Willow Creek drainage by constructing a dam located in the SE ¼ SE ¼ Section 31 with water impounded in the E ½ SE ¼ Section 31; all in T127N-R66W. This application requests impoundment of sufficient water to maintain water at the outlet elevation of 1509.0 feet mean sea level and is to be used for fish and wildlife propagation and livestock watering.

Pursuant to SDCL 46-2A-2, the Chief Engineer recommends APPROVAL of Application No. 6080-3 because 1) unappropriated water is available, 2) existing rights will not be unlawfully impaired, 3) it is a beneficial use of water, and 4) it is in the public interest. In accordance with SDCL 46-2A-23, the chief engineer will act on the application, as recommended, unless a petition is filed opposing the application or the applicant files a petition contesting the chief engineer's recommendation. If a petition opposing the application or contesting the recommendation is filed, then a hearing will be scheduled and the Water Management Board will consider the application. Notice of the hearing will be given to the applicant and any person filing a petition.

Any person interested in opposing or supporting this application or recommendation must file a written petition with BOTH the applicant and chief engineer. The applicant must file a petition if contesting the chief engineer's recommendation. The Chief Engineer's address is "Water Rights Program, Foss Building, 523 E Capitol, Pierre SD 57501 (605 773-3352)" and the applicant's mailing address is given above. A petition filed by either an interested person or the applicant must be filed by July 13, 1998.

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.

6*24-7*1



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

June 17, 1998

Melvin Kolb
37353 118th St,
Westport, SD 57481

Dear Mr. Kolb:

We have reviewed the plans and specifications for the Ducks Unlimited Melvin Kolb Wetland project in the SE ¼ of Section 31-T127N-R66W, in McPherson County. The plans and specifications as submitted are approved. Approval of the plans and specifications does not authorize construction of the dam. Construction may not begin until Water Permit Application No. 6080-3 is approved.

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

The Kolb Dam will be classified as a small size Category 3, Low Hazard dam with a dam height of 9 feet, a normal storage capacity of 40.6 acre-feet and a maximum storage capacity of 248.4 acre-feet.

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

Sincerely,

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

c: Doug Lipetzky, Ducks Unlimited



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

June 17, 1998

Robin Bobzien, Public Works Director
City of Aberdeen
123 S. Lincoln
Aberdeen, SD 57401-4215

Dear Mr. Bobzien:

I am enclosing a copy of the report, recommendation and notice of hearing for Water Permit Application No. 6080-3 filed by Melvin Kolb. This information is being sent to the city because the application proposes a small dam in the Willow Creek drainage.

If you have any questions, please contact either Tim Schaal or myself at (605) 773-3352.

Sincerely,

Eric Gronlund
Water Rights Program
(605) 773-3352

enclosure



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

AUG 17 1998

Melvin Kolb
37353 118th St.
Westport, SD 57481

Dear Mr. Kolb:

Enclosed is Water Permit No. 6080-3 authorizing construction of your water diversion system and beneficial use of the water, not exceeding the limits as specified in the Water Permit.

Also enclosed is Form 10, Notice of Completion of Works and Application of Water to Beneficial Use, which you are to complete and submit to the Chief Engineer when you have completed the system and/or have put the water to beneficial use. An inspection can then be scheduled so that the Water License may be issued, thus completing your acquisition of a Water Right.

Very truly yours,

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

enclosures

PLEASE NOTE: Certain changes may be made to your water permit usually without affecting the priority date. The location of a point of diversion may be changed or additional points of diversion may be approved if the water source remains unchanged; no additional water is appropriated; and, if irrigating, no additional land is irrigated. The change may be allowed without application or publication, if the Water Rights Program is contacted and the chief engineer makes a finding that the change does not increase the potential for interference with existing diversions.

A new water permit application is required to change water sources, increase the permitted diversion rate, or increase the irrigated acreage. If the application is approved, the water permit will receive a new priority date.



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

Date January 27, 1999

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

FROM: MELVIN KOLB 37353 118th St.
(name) (address)
WESTPORT SD 57481 (605) 439-3325
(city) (state) (zip) (phone)

I have completed the construction of the water diversion system and I have put the water to beneficial use to the maximum extent it is going to be used. I have not exceeded the amounts specified in Water Permit No. 6080-3.

Water Permit No. 6080-3 states that the diversion system is to be constructed by July 13, 2003, and that the water is put to beneficial use by July 13, 2007.
(date) (date)

The diversion system was completed on January 14, 1999.
(date)

Applying the water to beneficial use was completed on January 14, 1999.
(date)

You may schedule an inspection so that the Water License may be issued.

Melvin Kolb
(signature)



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

December 29, 1999

6080-3

Melvin Kolb
37353 118th St.
Westport, SD 57481

Dear Mr. Kolb:

The investigation of your water use system was conducted on September 28, 1999, by Tim Schaal, staff engineer. The investigation included the extent of application of water to beneficial use, as developed under Water Permit No. 6080-3. Your final water right document, the Water License, can now be issued.

Statutes require that we charge a \$50.00 fee for the investigation and issuance of the Water License. Upon receipt of the \$50.00 fee from you, we will begin processing your Water License.

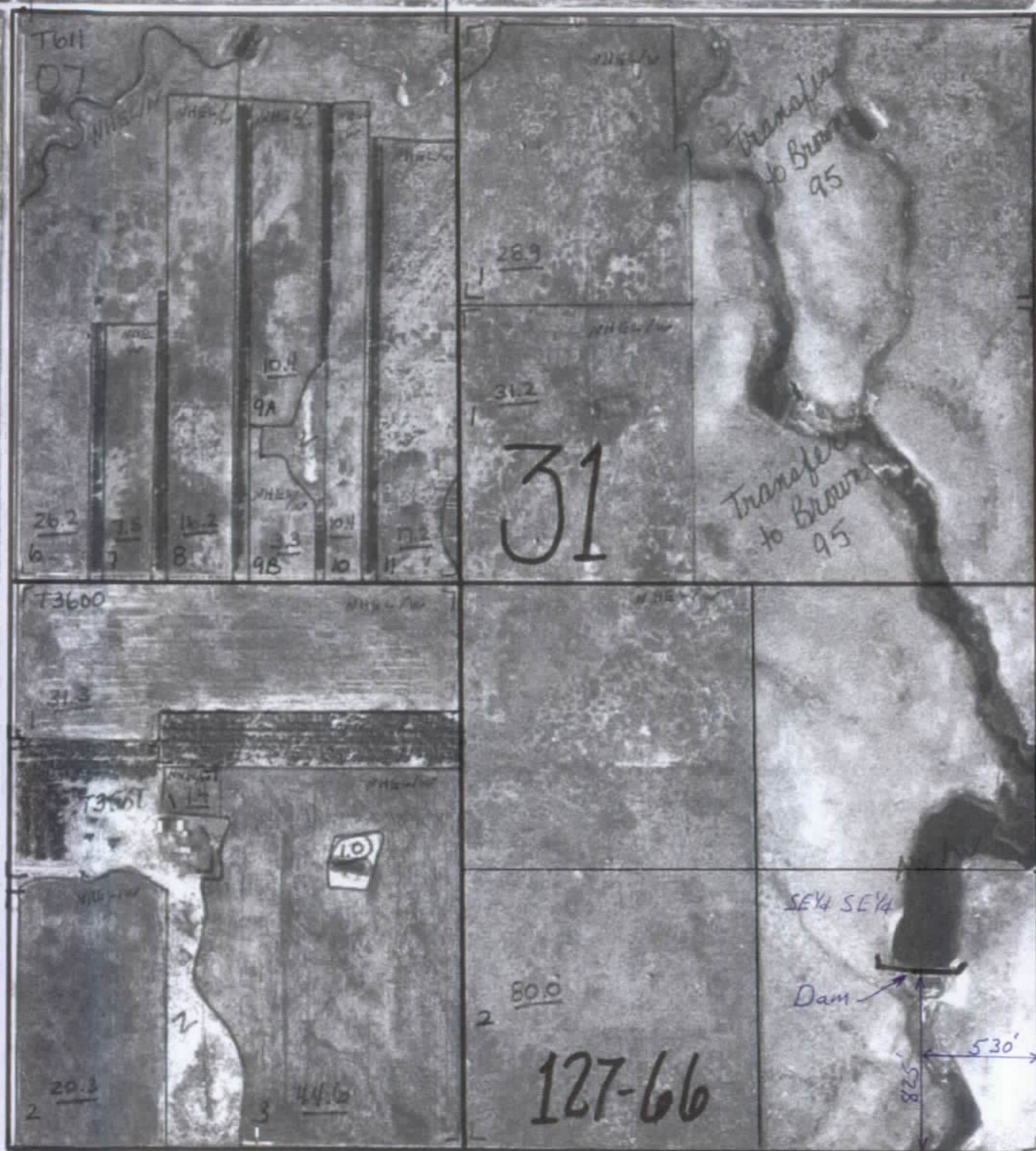
**Please remit fee to:
Department of Environment & Natural Resources
Water Rights Program
523 E. Capitol
Pierre, SD 57501-3181**

Sincerely,

Cheryl F. Frost
Secretary
Water Rights Program
(605) 773-3352

NOTE: On check or money order, please specify your permit number. This will insure proper handling of the fee.

MAP NOT TO SCALE
THIS IS NOT AN OFFICIAL WETLAND MAP



Duplicate
Water Permit No. 6080-3

Timothy L. Schaal
December 15, 1999

STATE OF SOUTH DAKOTA

WATER LICENSE NO. 6080-3

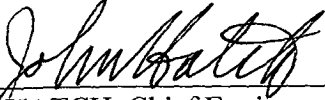
(1) Melvin Kolb, 37353 118th St., Westport SD 57481 made Application No. 6080-3, May 20, 1998 for a water permit to impound 40.6 acre-feet of water from runoff through Willow Creek drainage, McPherson County, South Dakota for fish & wildlife propagation and livestock watering purposes. Permit No. 6080-3, with a priority date of May 20, 1998 was approved July 13, 1998 and issued to the applicant for diversion of water with construction of the described water supply system to be completed on or before July 13, 2003 and for the application to beneficial use of said water on or before July 13, 2007.

The permit holder submitted a *Notice of Completion of Works and Application of Water to Beneficial Use* on February 2, 1999. The *Notice* stated the diversion system was completed and the water placed to beneficial use on January 14, 1999.

(2) It is certified that the permit holder has complied with the provisions of South Dakota State Law relating to completion of the construction of the storage dam and is entitled to impound 40.6 acre-feet of water for beneficial use with sufficient water annually to maintain the water level to the outlet elevation of 1509.0 feet mean sea level. The location of the storage dam is 825 feet north and 530 feet west of the southeast corner of Section 31-T127N-R66W (SE ¼ SE ¼)

(3) The permit holder has complied with the provisions of South Dakota State Law relating to the application of water to beneficial use.

(4) Pursuant to South Dakota Water Law 46-5-30.1 Melvin Kolb, 37353 118th St, Westport SD 57481 the holder and/or owner of Water Right No. 6080-3 is issued a license to appropriate water, the right to impound 40.6 acre-feet of water from runoff water through the Willow Creek drainage with sufficient water annually to maintain the water level to the outlet elevation of 1509.0 feet mean sea level with a priority date of May 20, 1998 from the location specified in (2) of this license for fish & wildlife propagation and livestock water purposes. This license is subject to any limitations or qualifications listed in Water Right No. 6080-3 and subject to South Dakota State Law.



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

JAN 6 2000

date





**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

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

JAN 6 2000

6080-3

Melvin Kolb
37353 118th St.
Westport, SD 57481

Dear Mr. Kolb:

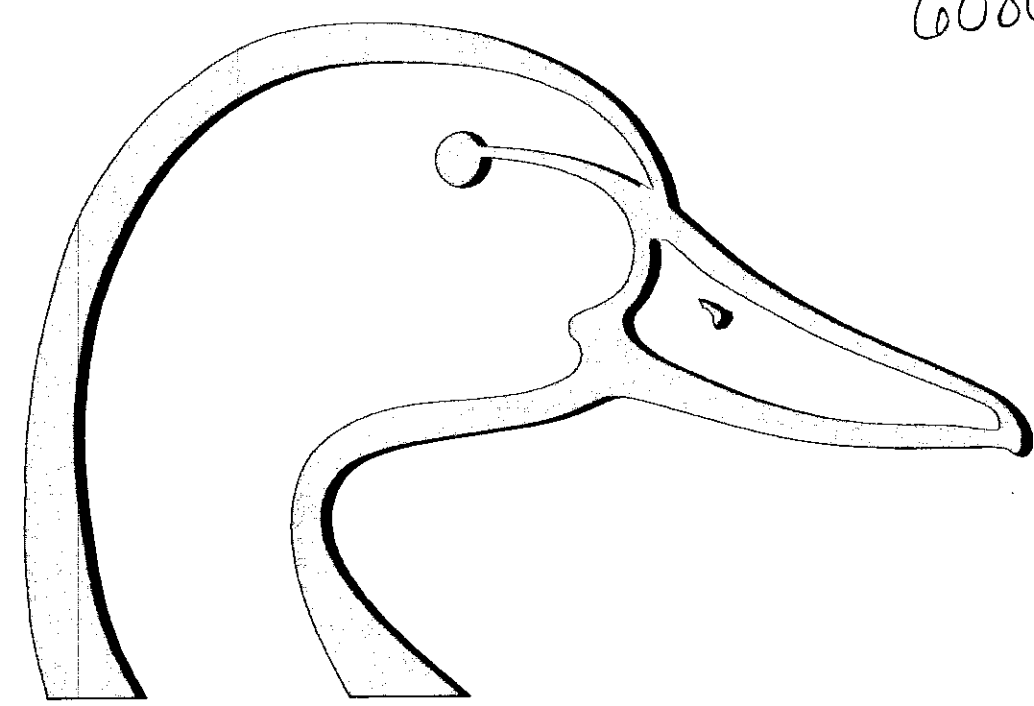
Enclosed is Water License No. 6080-3 and Receipt No. 416329 for \$50.00 which was assessed for an investigation and issuance of the license. Water License No. 6080-3 is the final document which completes the process of obtaining a water right.

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

Very truly yours,

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

ks
enclosures



DUCKS UNLIMITED

SPECIFICATIONS

GENERAL CONDITIONS	101
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- 1 LOCATION MAPS
- 2 PROJECT TOPOGRAPHY
- 3 SITE PLAN AND PROFILE
- 4 WATER CONTROL STRUCTURE - PLAN & PROFILE
- 5 X-SECTIONS, CABLE CONCRETE LAYOUT
- 6 RISER & MISCELLANEOUS DETAILS

ESTIMATED QUANTITIES

MOBILIZATION	1 L.S.
SITE PREPARATION	500 CY-P
EXCAVATION	
OVERFLOW EXCAVATION	1282 CY-P
STRUCTURE EXCAVATION	403 CY-P
CHANNEL EXCAVATION	56 CY-P
TOTAL	1741 CY-P
*EMBANKMENT	
DAM EMBANKMENT	2371 CY-S
STRUCTURE BACKFILL	464 CY-P
TOTAL	2835 CY-S*
WATER CONTROL STRUCTURE INSTALLATION	1 L.S.
WATER CONTROL STRUCTURE AND	
CULVERT APPURTENANCES	INC.
CULVERT INSTALLATION (30" CMP)	54 L.F.
RIPRAP PLACEMENT (CLASS 1)	159 CY-P
CABLE CONCRETE MAT MATERIAL	4800 SF-P
CABLE CONCRETE MAT INSTALLATION	4800 SF-P
**GROUT PLACEMENT IN RIPRAP	66 CY

DUCKS UNLIMITED

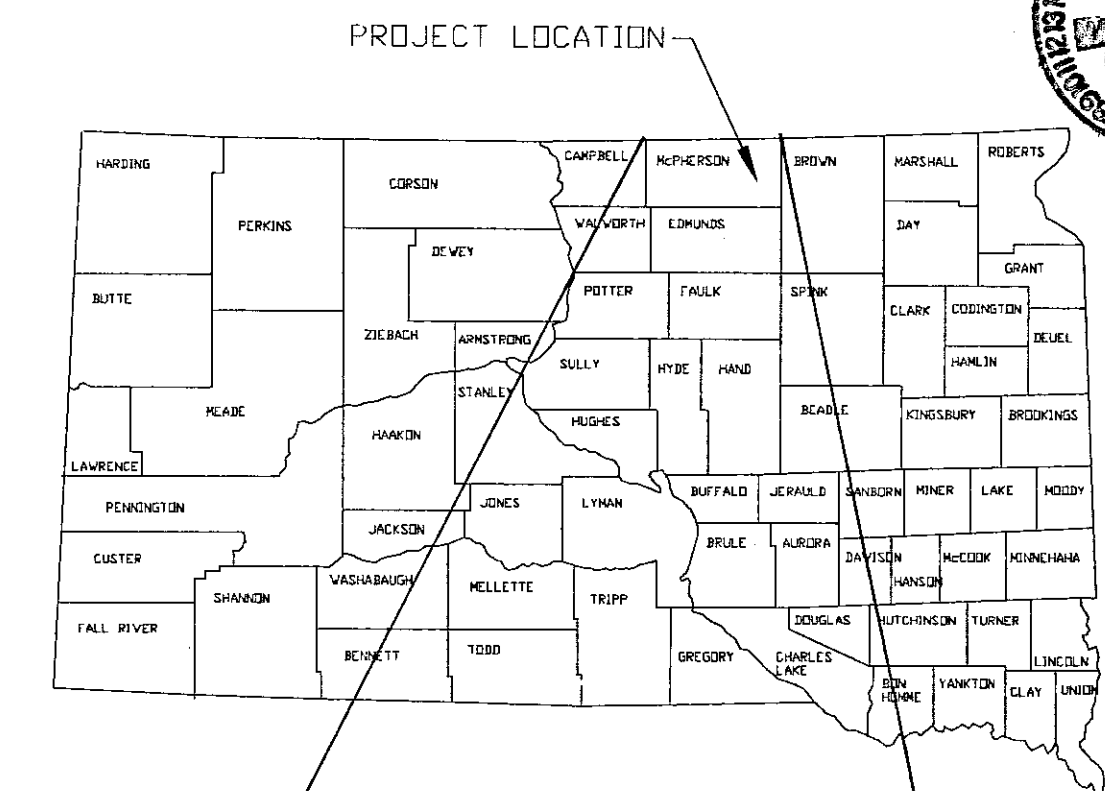
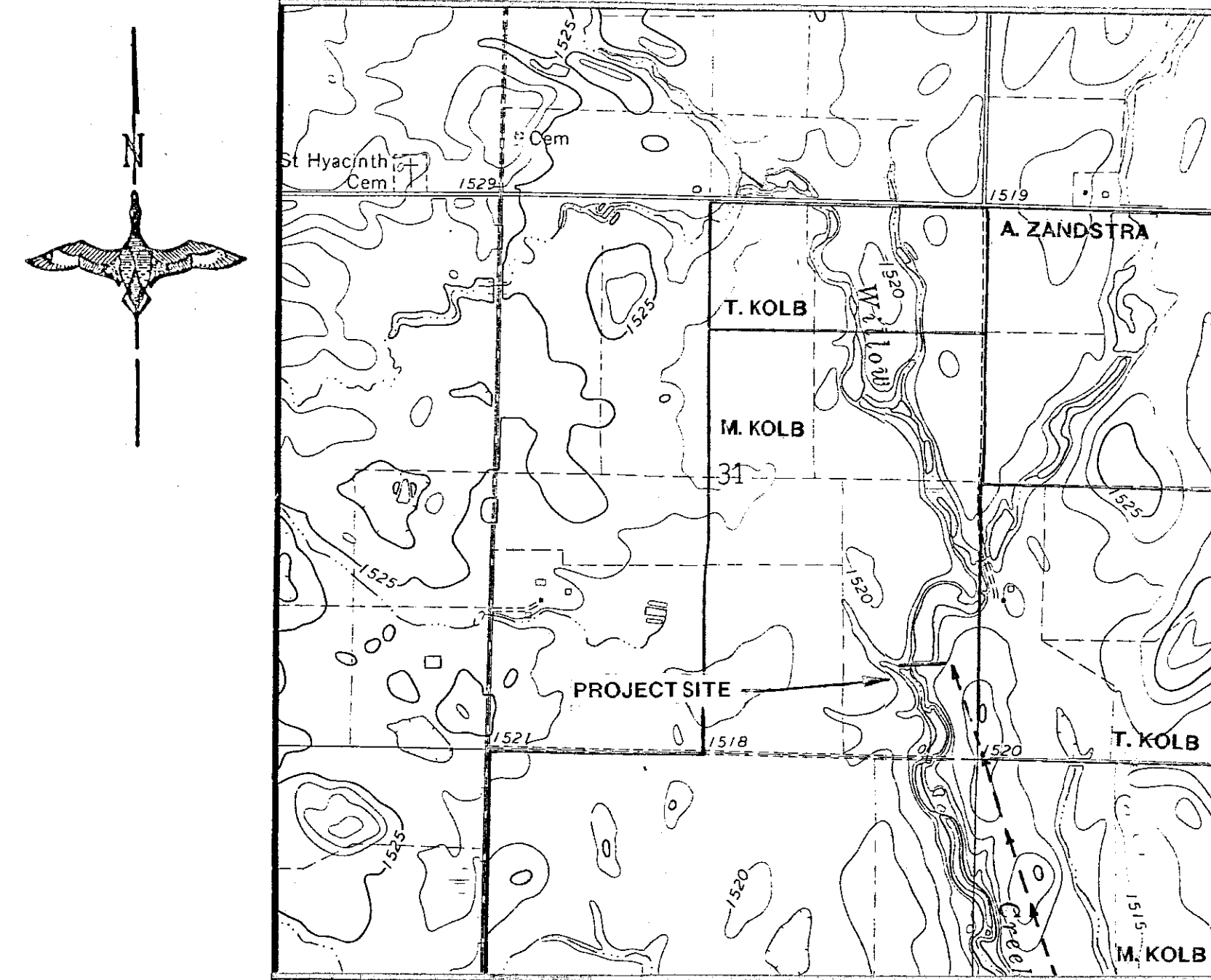
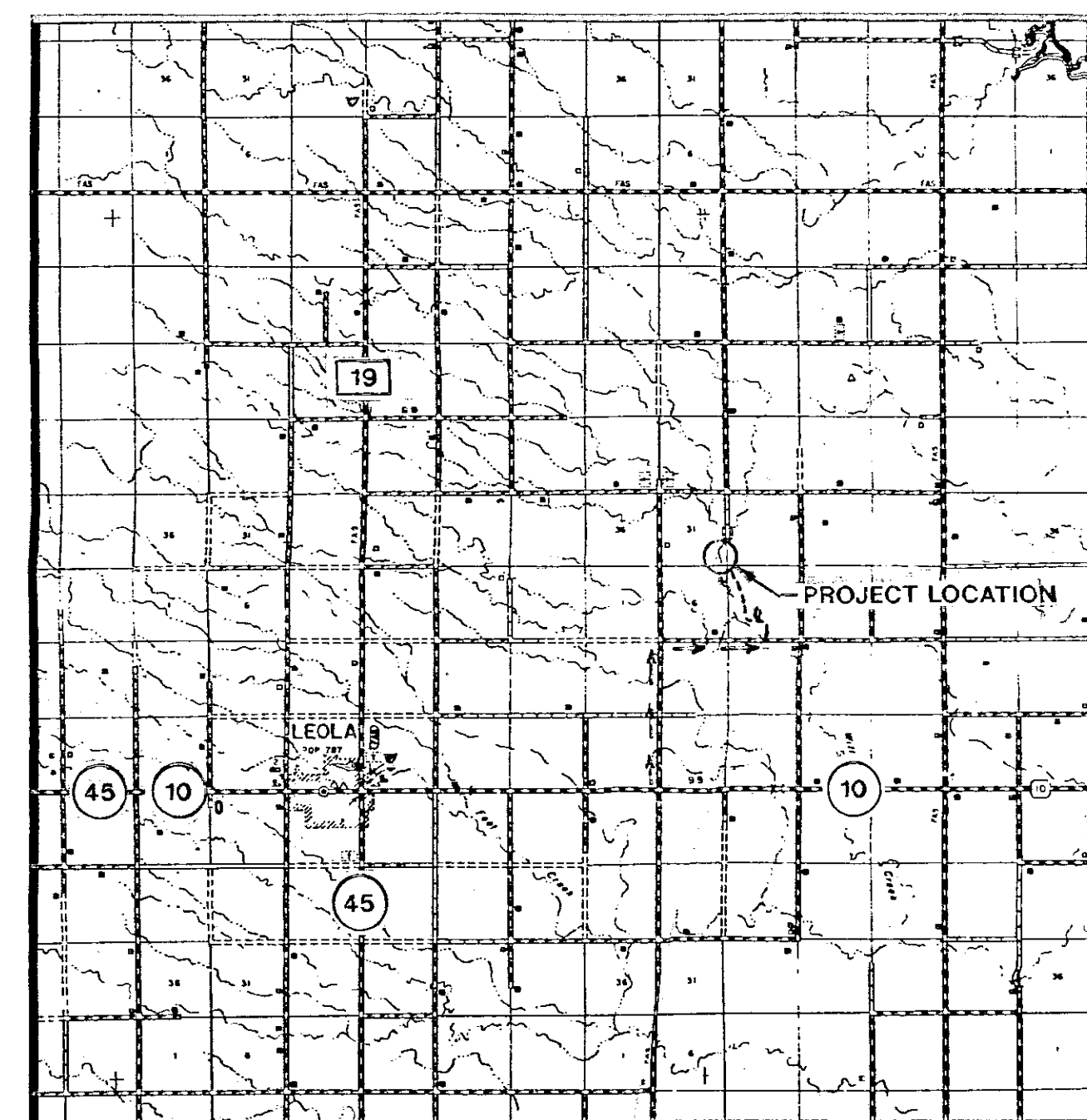
PROJECT

KOLB DAM

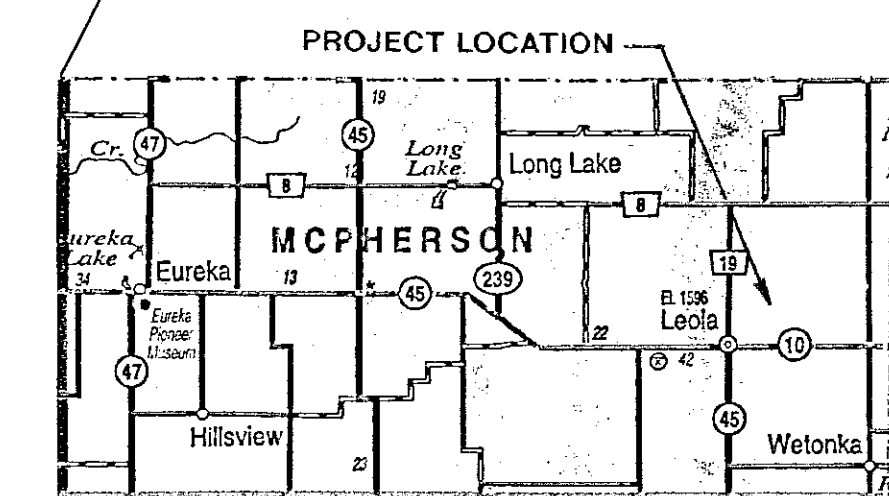
SECTION 31, TOWNSHIP 127 NORTH, RANGE 66 WEST
MCPHERSON COUNTY, SOUTH DAKOTA

IN COOPERATION WITH

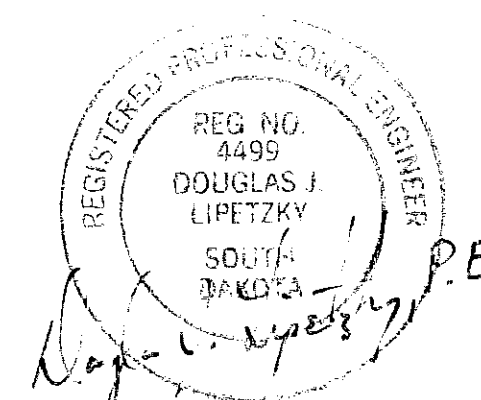
U.S. FISH AND WILDLIFE SERVICE



SOUTH DAKOTA



MCPHERSON COUNTY



AGENCY CONTACT: BRIAN WEHAUSEN
USF&WS - SAND LAKE NWR
605-885-6320

LANDOWNER CONTACT: MELVIN KOLB
LEOLA, SD
605-439-3325

DUCKS UNLIMITED INC. GREAT PLAINS REGIONAL OFFICE DATE: 3-10-1998	PROJECT NO. SD-0168-001 KOLB DAM LOCATION MAPS	DESIGNED BY: DJL DRAWN BY: TSP SURVEYED BY: GLJ CHECKED BY: BRK
	SHEET NO. 1 OF 6 APPROVED BY: <i>Douglas J. Lipetzky, P.E.</i>	APPROVED BY:

6080-3



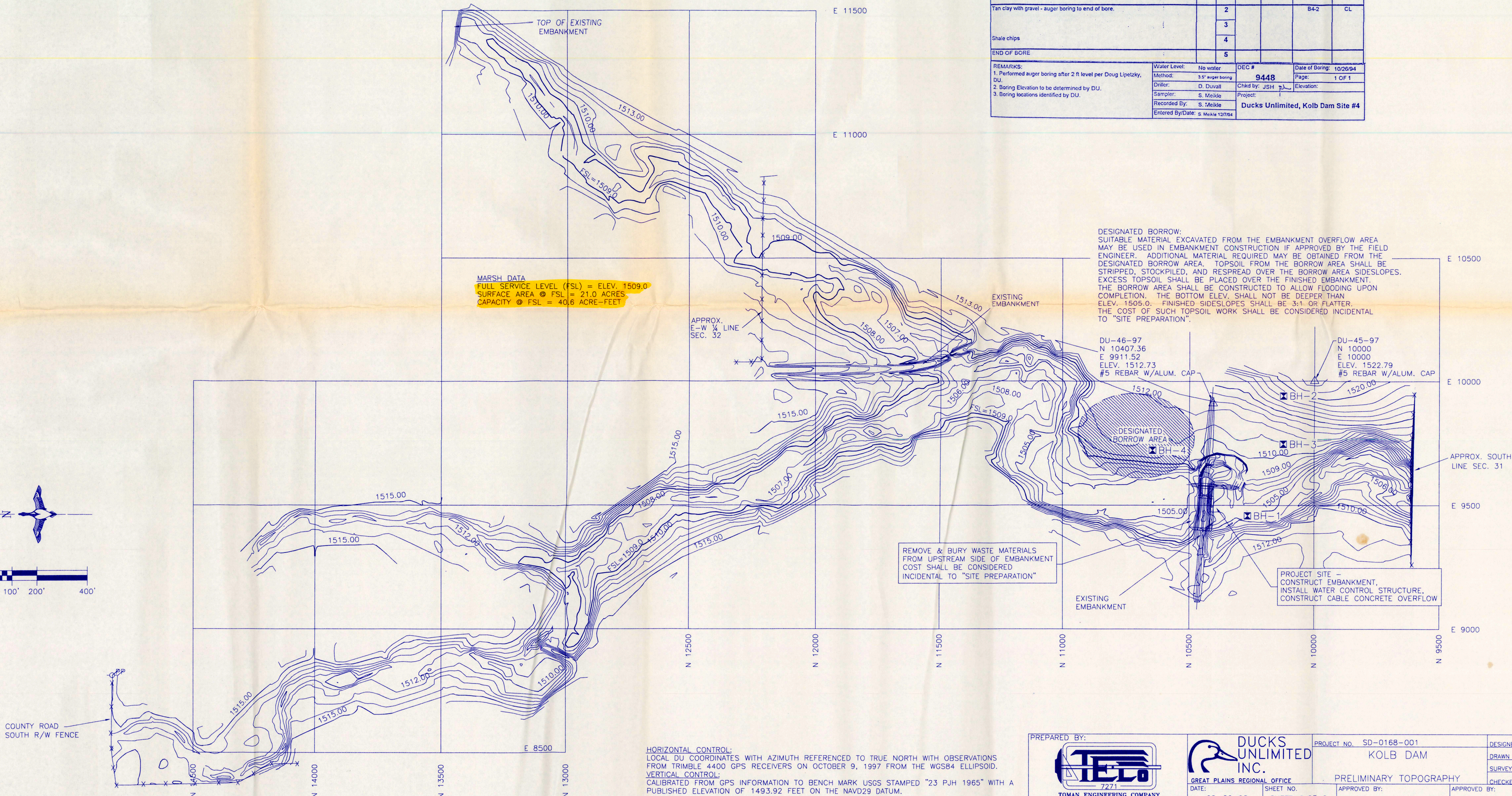
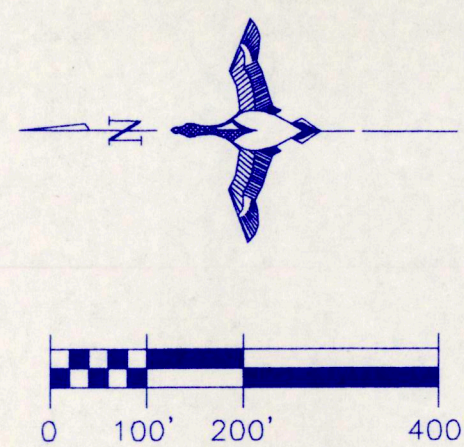
SOIL BORING LOG							Boring #
Dakota Environmental Consultants, Inc. P.O. Box 636 Huron, SD 57350 (605) 352-5610							B1
Soil Description	WL	Depth	Qu	N	Sample ID	USCS	
Topsoil, silty clay, medium sand in tip.		0		5	B1-0	CL	
		1					
Silty clay with sand		2		10	B1-1	CL	
Tan clay, soft, dry		3			B1-2	CL	
Soft gray clay with sand pockets		4		23	B1-3	CL	
Soft gray clay, dry, stratified		5			B1-4	CL	
Hard gray clay, wet		6		34 Blows in 10"	B1-5	CL	
Gray clay, dry		7			B1-6	CL	
Wet stiff clay, 3" layer. Dry hard clay with shale.		8					
Auger to 10 ft, dry shale.		9					
END OF BORE		10					
REMARKS: 1. Split spoon sampler SPT performed in 1.5 ft increments. 2. Boring Elevation to be determined by DU. 3. Boring locations identified by DU.							
Water Level: No water Method: 3.5" SSA/Split Spoon Driller: D. Duval Sampler: S. Meikle Recorded By: S. Meikle Entered By/Date: S. Meikle 12/7/94							
DEC # 9448 Date of Boring: 10/26/94 Page: 1 OF 1 Project: Ducks Unlimited, Kolb Dam Site #1							

SOIL BORING LOG							Boring #
Dakota Environmental Consultants, Inc. P.O. Box 636 Huron, SD 57350 (605) 352-5610							B2
Soil Description	WL	Depth	Qu	N	Sample ID	USCS	
Topsoil, silty clay.		0			B2-0.5	CL	
Clay with shale and gravel.		1					
		2					
END OF BORE		3					
REMARKS: 1. Pushed split spoon into earth. 2. Boring Elevation to be determined by DU. 3. Boring locations identified by DU.							
Water Level: No water Method: Split Spoon Driller: D. Duval Sampler: S. Meikle Recorded By: S. Meikle Entered By/Date: S. Meikle 12/7/94							
DEC # 9448 Date of Boring: 10/26/94 Page: 1 OF 1 Project: Ducks Unlimited, Kolb Dam Site #2							

SOIL BORING LOG							Boring #
Dakota Environmental Consultants, Inc. P.O. Box 636 Huron, SD 57350 (605) 352-5610							B3
Soil Description	WL	Depth	Qu	N	Sample ID	USCS	
Topsoil.		0					
Sandy clay, dry.		1			B3-1	CL	
		2					
Rock layer.		3					
		4					
END OF BORE		5					
REMARKS: 1. Performed auger boring per Doug Lipetzky, DU. 2. Boring Elevation to be determined by DU. 3. Boring locations identified by DU.							
Water Level: No water Method: 3" Auger Boring Driller: D. Duval Sampler: S. Meikle Recorded By: S. Meikle Entered By/Date: S. Meikle 12/7/94							
DEC # 9448 Date of Boring: 10/26/94 Page: 1 OF 1 Project: Ducks Unlimited, Kolb Dam Site #3							

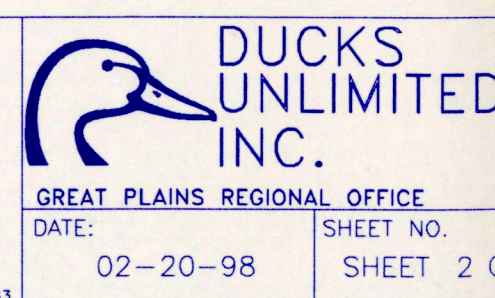
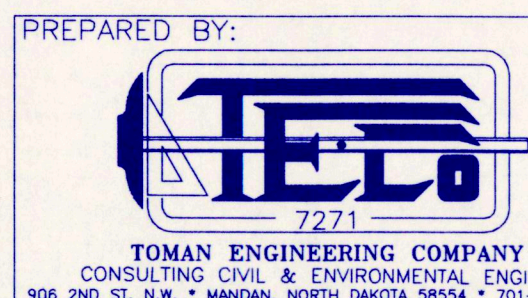
THE BORINGS DONE ON THIS PROJECT REPRESENT THE SOILS FOUND AT THE LOCATIONS OF THE BORINGS ONLY. SOILS MAY VARY BETWEEN LOCATIONS AND OTHER AREAS OF THE PROJECT SITE NOT DRILLED. A COMPLETE GEOTECHNICAL ENGINEERING REPORT IS AVAILABLE FOR REVIEW AT DUCKS UNLIMITED'S GREAT PLAINS REGIONAL OFFICE. THE CONTRACTOR WARRANTS THAT SITE CONDITIONS HAVE BEEN EXAMINED AS REQUIRED BY SECTION 101.203 EXAMINATION OF SITE CONDITIONS OF THE GENERAL CONDITIONS PRIOR TO BIDDING OR CONSTRUCTING THIS PROJECT. NO ADJUSTMENTS TO THE CONTRACT WILL BE MADE DUE TO CHANGED SITE CONDITIONS.

SOIL BORING LOG							Boring #
Dakota Environmental Consultants, Inc. P.O. Box 636 Huron, SD 57350 (605) 352-5610							B4
Soil Description	WL	Depth	Qu	N	Sample ID	USCS	
Silty clay/sand topsoil - split spoon sample		0				CL	
Silty clay.		1				CL	
Tan clay with gravel - auger boring to end of bore.		2			B4-2	CL	
		3					
Shale chips		4					
END OF BORE		5					
REMARKS: 1. Performed auger boring after 2 ft level per Doug Lipetzky, DU. 2. Boring Elevation to be determined by DU. 3. Boring locations identified by DU.							
Water Level: No water Method: 3" Auger Boring Driller: D. Duval Sampler: S. Meikle Recorded By: S. Meikle Entered By/Date: S. Meikle 12/7/94							
DEC # 9448 Date of Boring: 10/26/94 Page: 1 OF 1 Project: Ducks Unlimited, Kolb Dam Site #4							

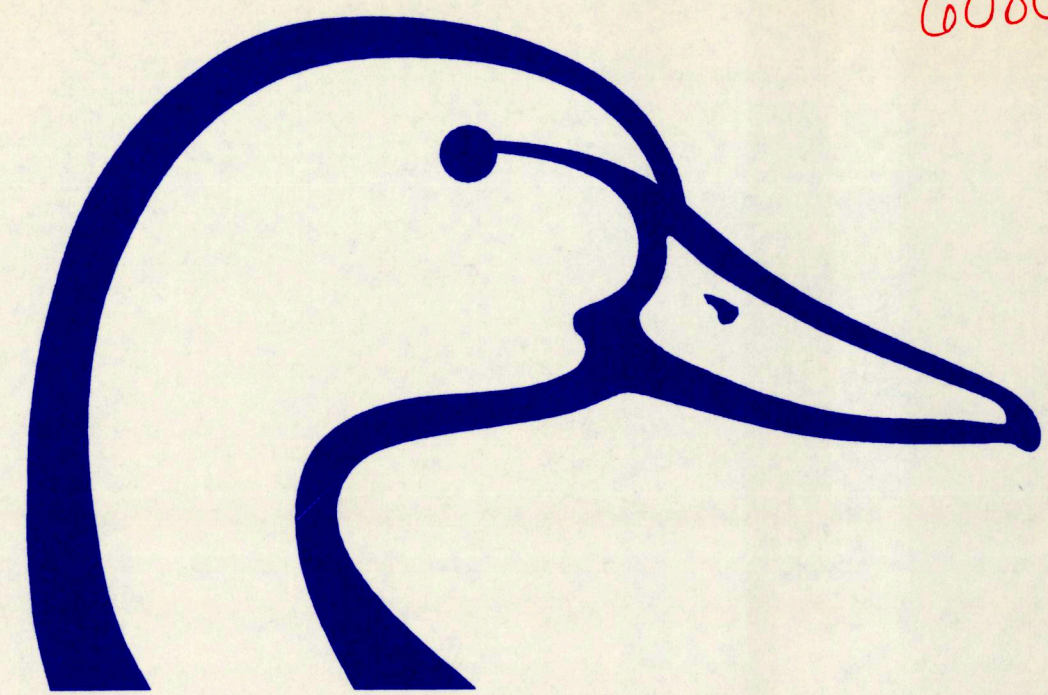


DWGNAME: 7271-2.dwg PLOT DATE: 02/19/98 PLOT TIME: 13:23:10 TOWAN #4

HORIZONTAL CONTROL:
LOCAL DU COORDINATES WITH AZIMUTH REFERENCED TO TRUE NORTH WITH OBSERVATIONS FROM TRIMBLE 4400 GPS RECEIVERS ON OCTOBER 9, 1997 FROM THE WGS84 ELLIPSOID.
VERTICAL CONTROL:
CALIBRATED FROM GPS INFORMATION TO BENCH MARK USGS STAMPED "23 PJH 1965" WITH A PUBLISHED ELEVATION OF 1493.92 FEET ON THE NAVD29 DATUM.



PROJECT NO. SD-0168-001	DESIGNED BY: DJL
KOLB DAM	DRAWN BY: KB
PRELIMINARY TOPOGRAPHY	SURVEYED BY:
APPROVED BY:	CHECKED BY:
APPROVED BY:	



6080-3

DUCKS UNLIMITED

SPECIFICATIONS

GENERAL CONDITIONS	101
MOBILIZATION	201
SITE PREPARATION	202
EXCAVATION	203
EMBANKMENT CONSTRUCTION	204
WATER	205
WATER CONTROL	
STRUCTURE INSTALLATION	206
WATER CONTROL STRUCTURE	
& CULVERT APPURTENANCES	206A
CULVERT INSTALLATION	207
CAST-IN-PLACE	
REINFORCED CONCRETE	208
RIPRAP PLACEMENT	209
CABLE CONCRETE MAT MATERIALS	502
CABLE CONCRETE MAT INSTALLATION	502
GROUT PLACEMENT IN RIPRAP	506

PLAN INDEX

- 1 LOCATION MAPS
- 2 PROJECT TOPOGRAPHY
- 3 SITE PLAN AND PROFILE
- 4 WATER CONTROL STRUCTURE - PLAN & PROFILE
- 5 X-SECTIONS, CABLE CONCRETE LAYOUT
- 6 RISER & MISCELLANEOUS DETAILS

ESTIMATED QUANTITIES

MOBILIZATION	1 L.S.
SITE PREPARATION	500 CY-P
EXCAVATION	
OVERFLOW EXCAVATION	1282 CY-P
STRUCTURE EXCAVATION	403 CY-P
CHANNEL EXCAVATION	56 CY-P
TOTAL	1741 CY-P
*EMBANKMENT	
DAM EMBANKMENT	2371 CY-S
STRUCTURE BACKFILL	464 CY-P
TOTAL	2835 CY-S*
WATER CONTROL STRUCTURE INSTALLATION	1 L.S.
WATER CONTROL STRUCTURE AND CULVERT APPURTENANCES	INC.
CULVERT INSTALLATION (30" CMP)	54 L.F.
RIPRAP PLACEMENT (CLASS I)	159 CY-P
CABLE CONCRETE MAT MATERIAL	4800 SF-P
CABLE CONCRETE MAT INSTALLATION	4800 SF-P
**GROUT PLACEMENT IN RIPRAP	66 CY

- * EMBANKMENT QUANTITY INCLUDES 15% SHRINKAGE FACTOR
** GROUT QUANTITY IS ESTIMATED. ACTUAL QUANTITY USED WILL BE PAID

DUCKS UNLIMITED

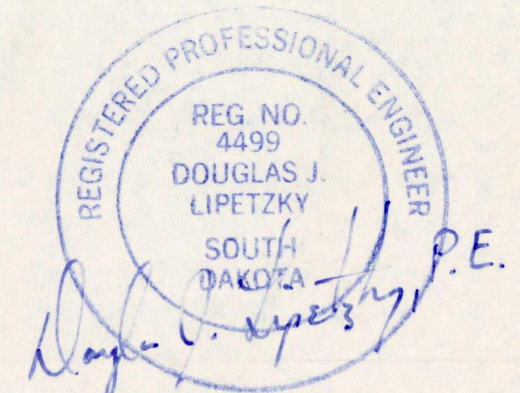
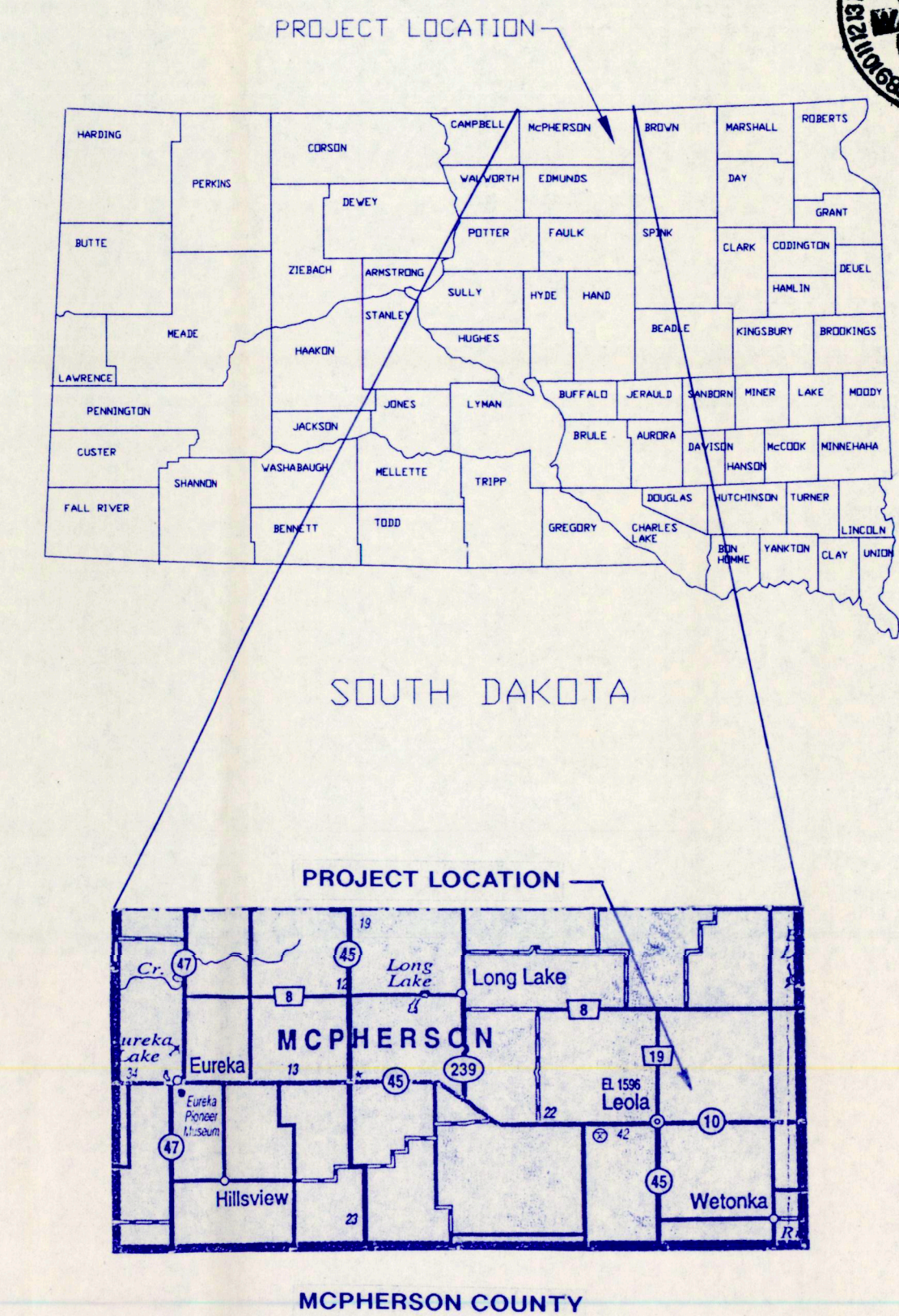
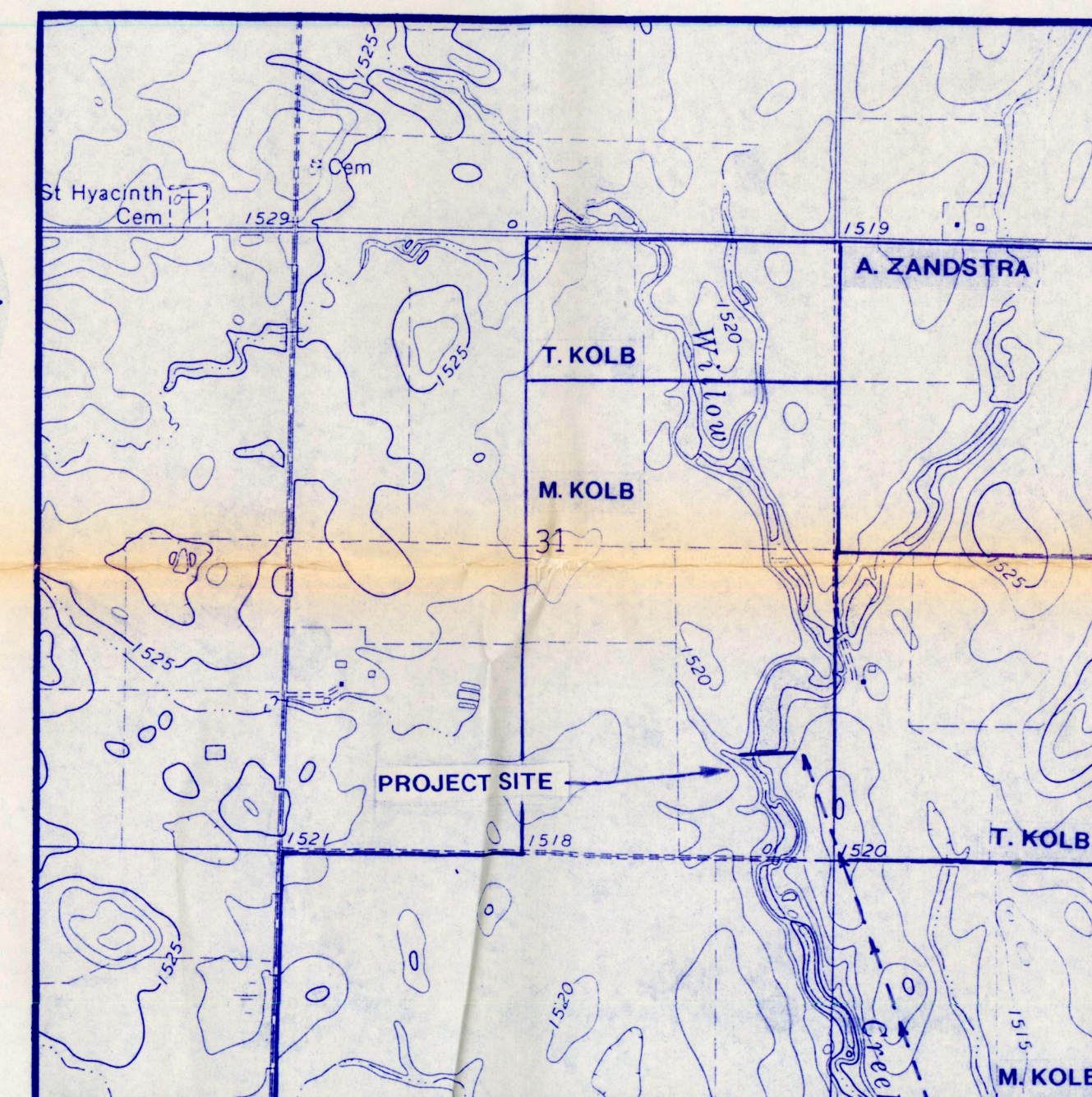
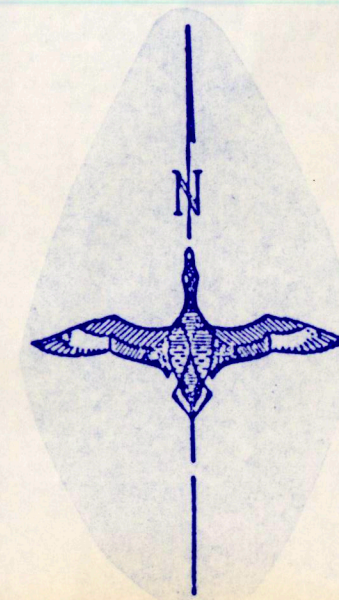
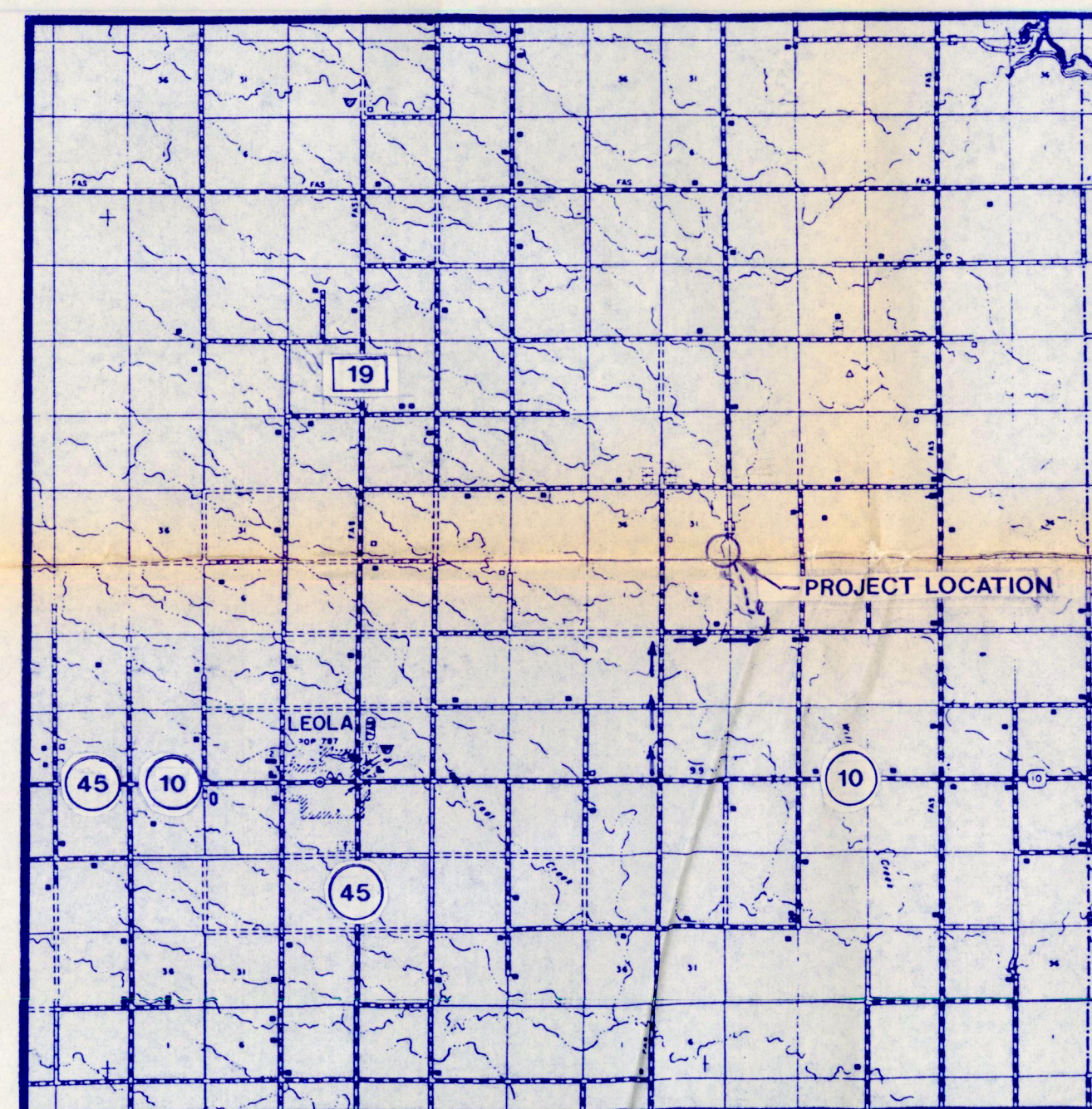
PROJECT

KOLB DAM

SECTION 31, TOWNSHIP 127 NORTH, RANGE 66 WEST
MCPHERSON COUNTY, SOUTH DAKOTA

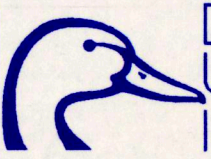
IN COOPERATION WITH

U.S. FISH AND WILDLIFE SERVICE

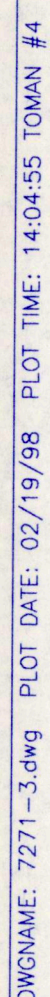


AGENCY CONTACT: BRIAN WEHAUSEN
USE&WS - SAND LAKE NWR
605-885-6320

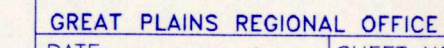
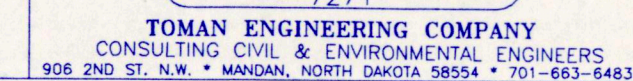
LANDOWNER CONTACT: MELVIN KOLB
LEOLA, SD
605-439-3325

	DUCKS UNLIMITED INC.	PROJECT NO. SD-0168-001	DESIGNED BY: DJL
	GREAT PLAINS REGIONAL OFFICE	KOLB DAM	DRAWN BY: TSP
DATE: 3-10-1998	SHEET NO. 1 OF 6	APPROVED BY: Douglas J. Lipetzky, P.E.	SURVEYED BY: GLJ
			CHECKED BY: BRK

6080-3



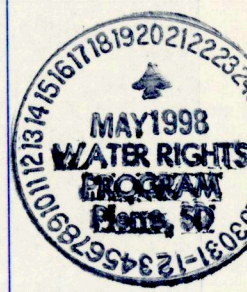
SCALE"
1" = 30' HORIZ
1" = 3' VERT



APPROVED BY:

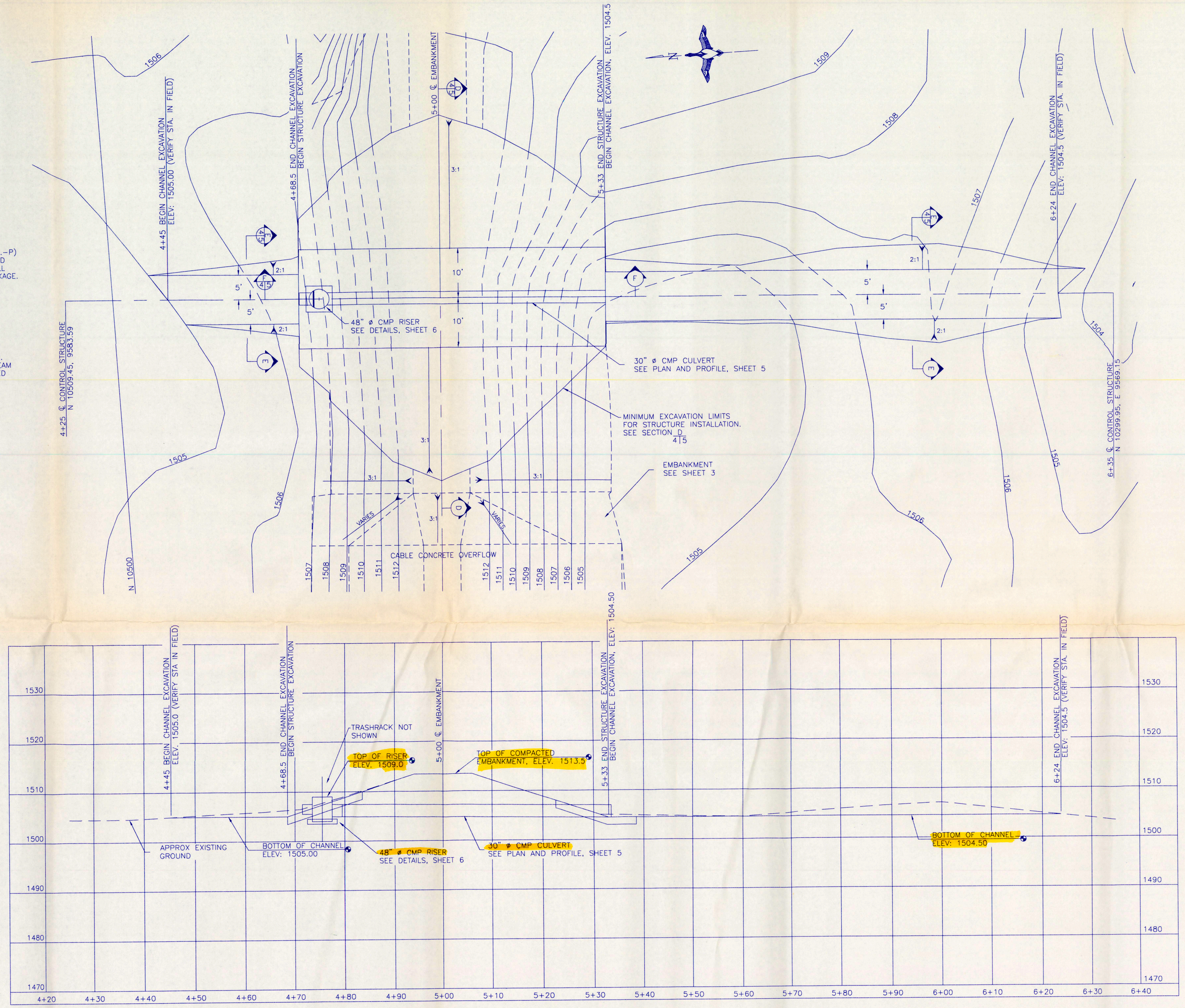
CHECKED BY: ORIS
BY: _____

608D-3



STRUCTURE AND CHANNEL EXCAVATION
THE EXCAVATION REQUIRED FOR THE STRUCTURE INSTALLATION (403 C.Y.-P) AND CHANNEL EXCAVATION (56 C.Y.-P) SHALL BE PAID FOR AT UNIT BID PRICE BASED ON PLAN QUANTITY. BACKFILL FOR THE STRUCTURE SHALL BE PAID FOR AS "EMBANKMENT CONSTRUCTION", INCLUDING 15% SHRINKAGE.

STRUCTURE INSTALLATION
THE EXISTING EMBANKMENT SHALL BE EXCAVATED TO THE LIMITS SHOWN FOR INSTALLATION OF THE NEW WATER CONTROL STRUCTURE. SUCH EXCAVATION WILL BE PAID FOR BASED ON A PLAN QUANTITY OF 403 C.Y.-P. SUITABLE EXCAVATED MATERIAL APPROVED BY THE D.U. FIELD ENGINEER MAY BE REUSED FOR EMBANKMENT CONSTRUCTION. MATERIAL DEEMED UNSUITABLE SHALL BE WASTED ALONG THE DOWNSTREAM TOE OF THE EMBANKMENT. ADDITIONAL EMBANKMENT MATERIAL REQUIRED SHALL BE OBTAINED FROM THE DESIGNATED BORROW AREA SHOWN AND SPECIFIED ON SHEET 2.



STRUCTURE & PROFILE
SCALE: 1" = 10'
HORIZ & VERT

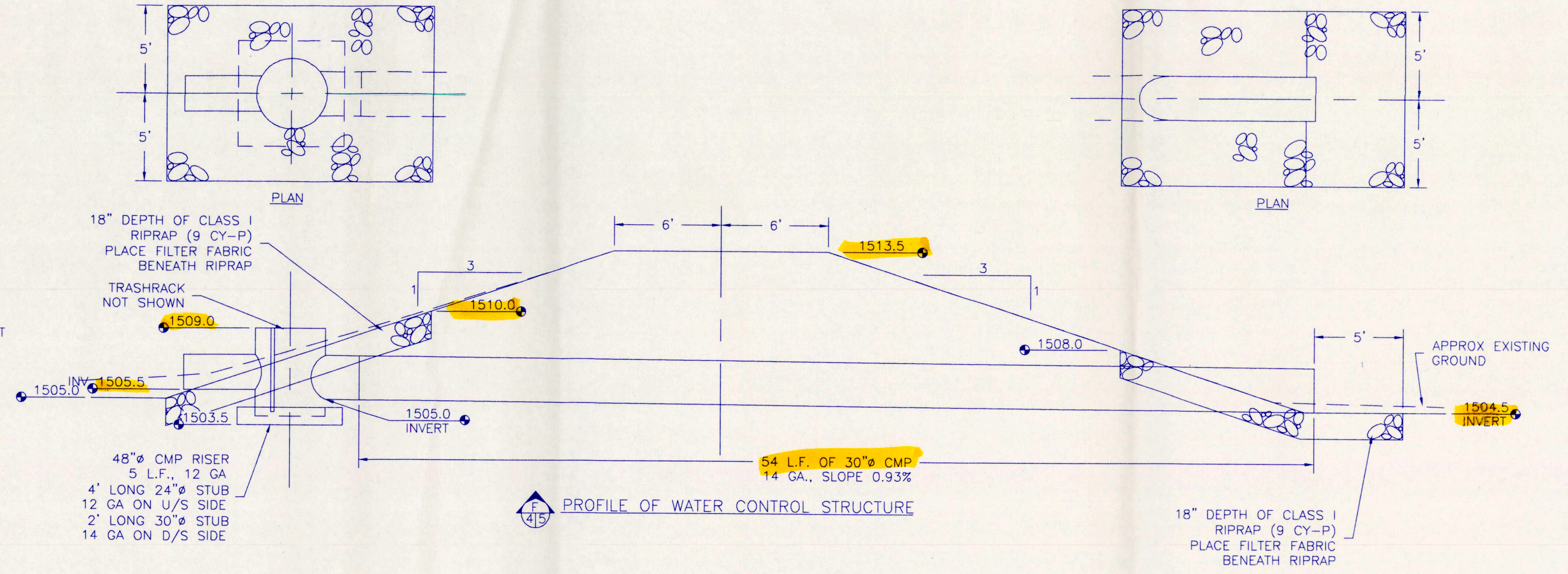
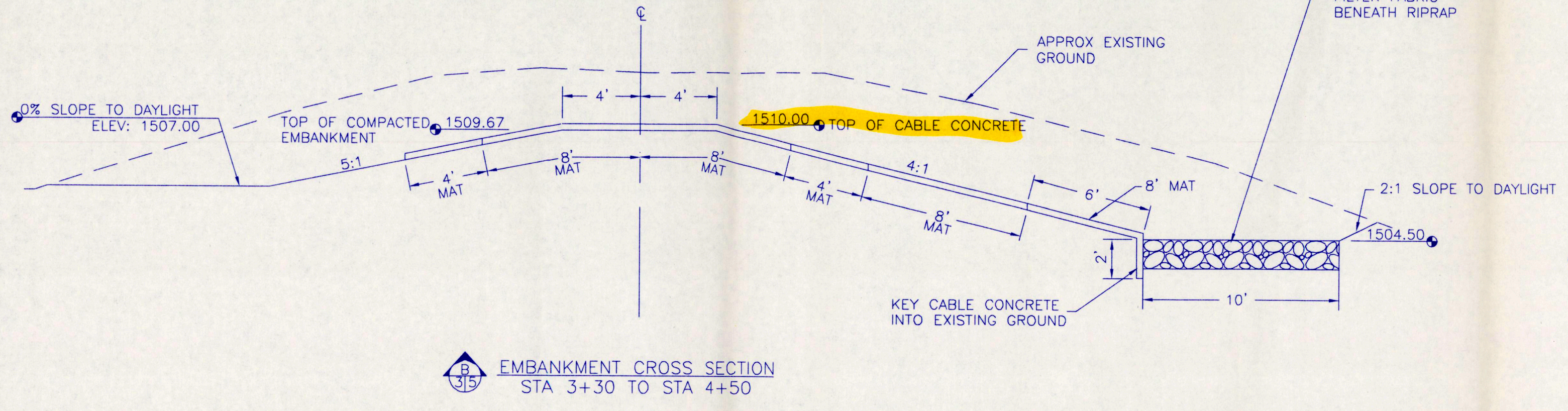
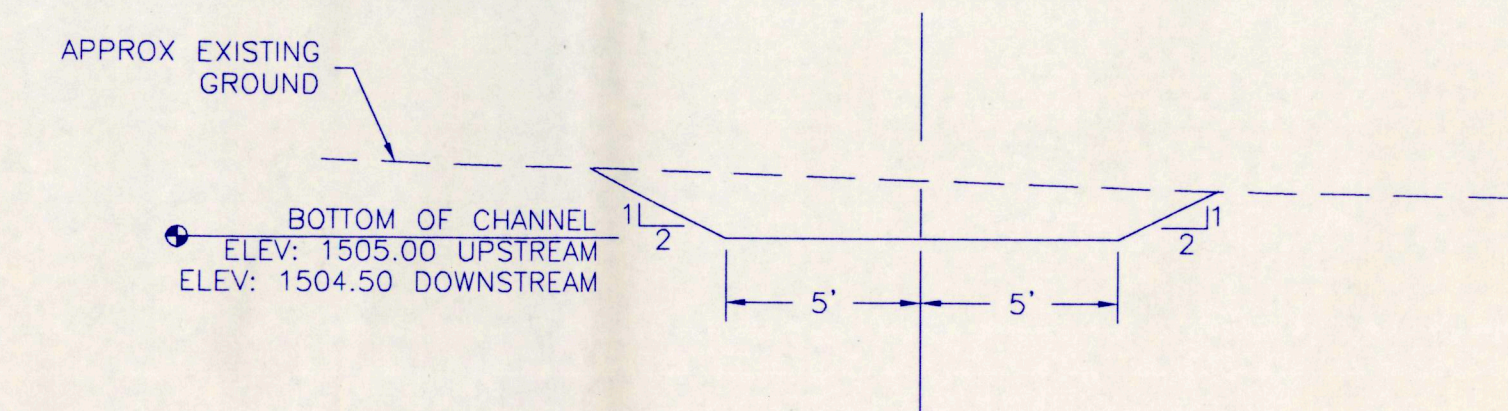
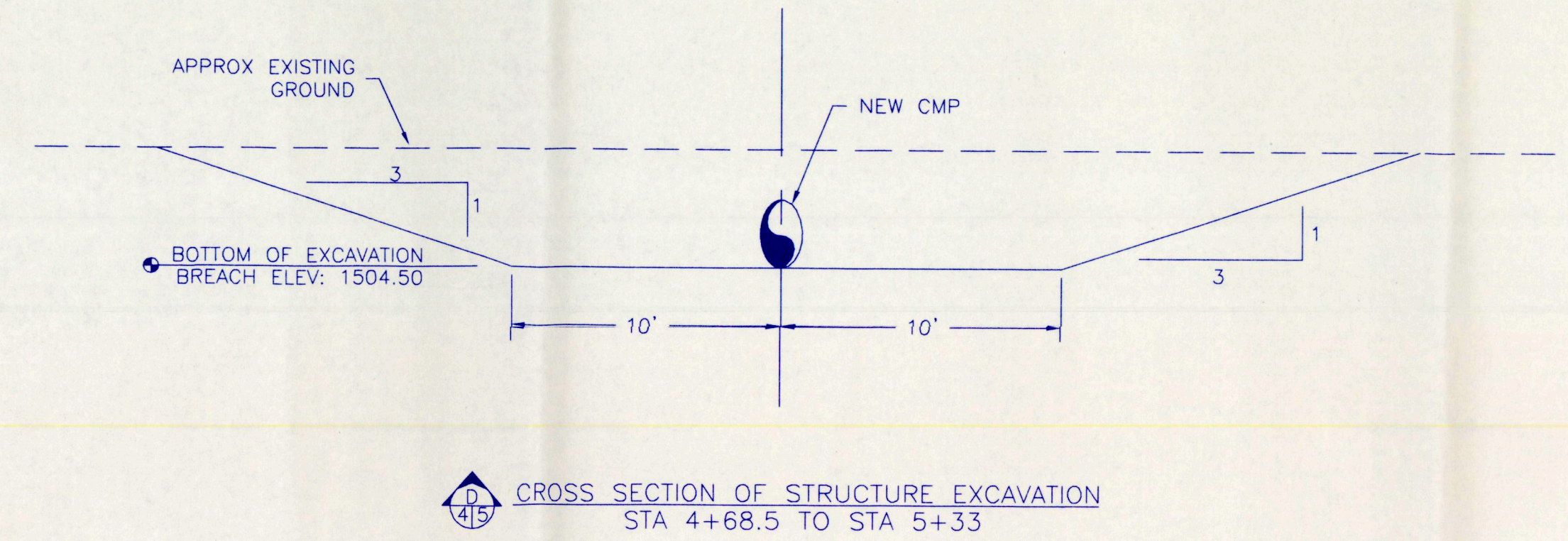
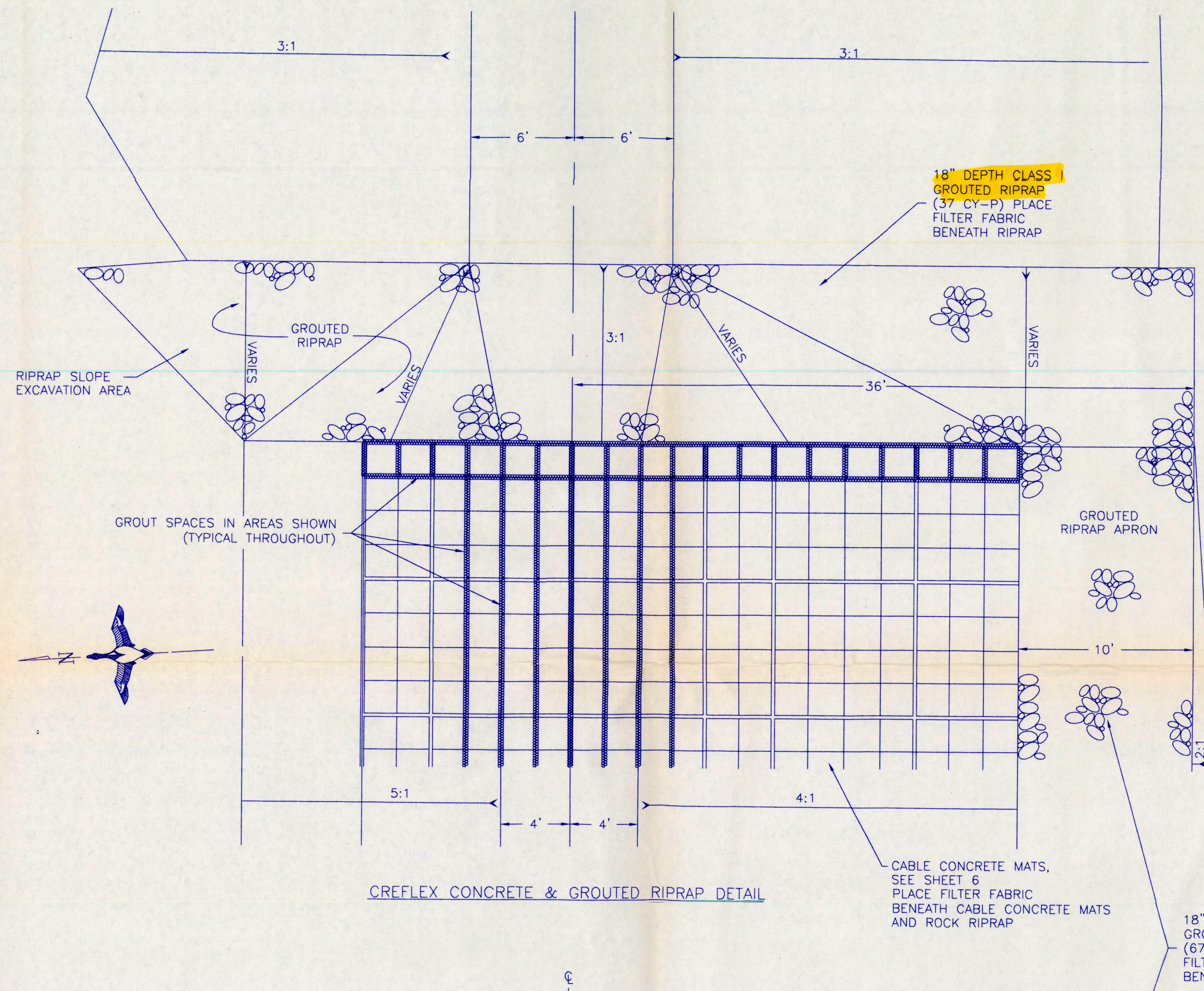
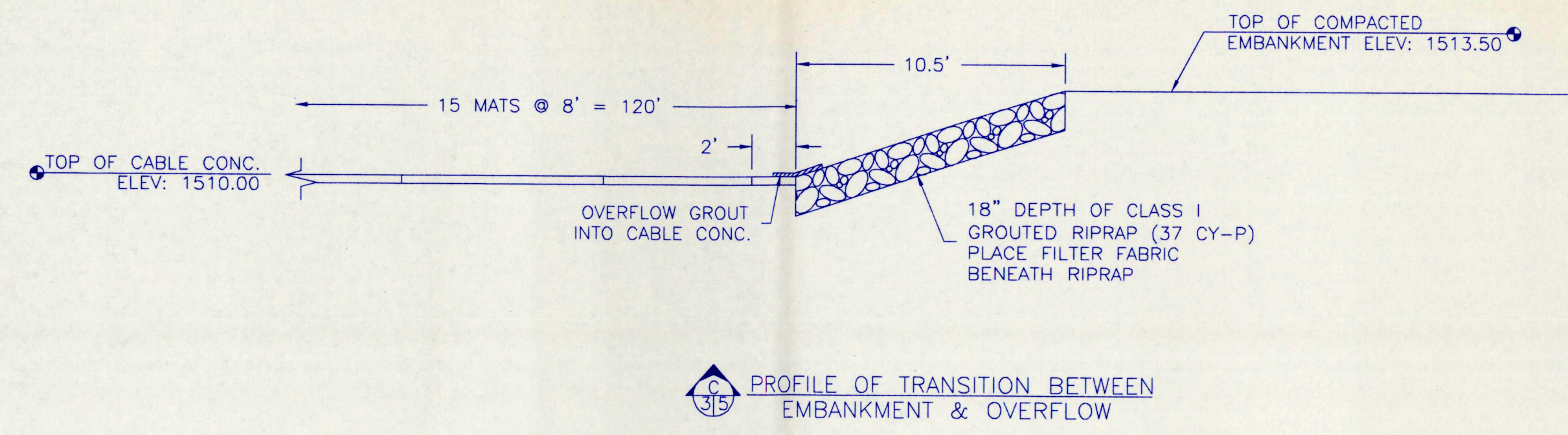
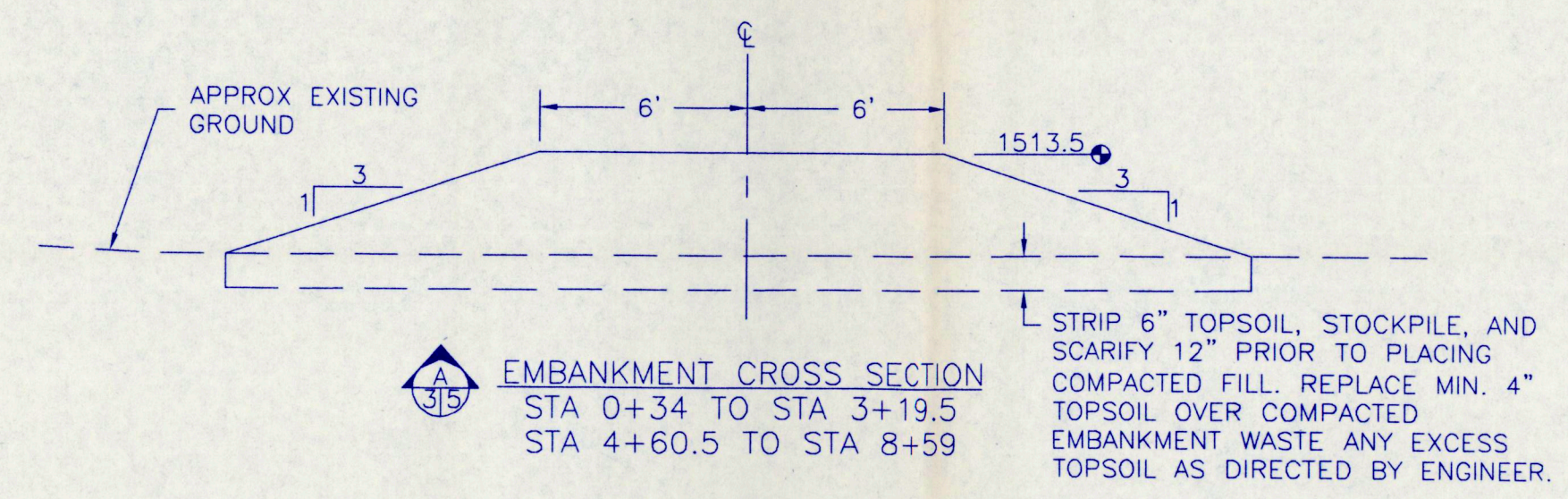
PREPARED BY:
TECO
TOMAN ENGINEERING COMPANY
CONSULTING CIVIL & ENVIRONMENTAL ENGINEERS
908 2ND ST. N.W. • MANITOWISH, NORTH DAKOTA 58554 • 701-693-8483

DUCKS UNLIMITED INC.
GREAT PLAINS REGIONAL OFFICE
DATE: 02-20-98
SHEET NO. SHEET 4 OF 6

PROJECT NO. SD-0168-001	DESIGNED BY: DJL
KOLB DAM STRUCTURE	DRAWN BY: AM
PLAN & PROFILE	SURVEYED BY:
APPROVED BY:	CHECKED BY: BRK
APPROVED BY:	

02/19/98 PLOT TIME: 14:12:20 TOMAN #4

6080-3



ALL CROSS SECTIONS AND PROFILES SCALE: 1" = 5' HORIZ & VERT

PREPARED BY: TOMAN ENGINEERING COMPANY CONSULTING CIVIL & ENVIRONMENTAL ENGINEERS 908 2ND ST. N.W. • MINNAPOLIS, NORTH DAKOTA 58004 • 701-663-6463	DESIGNED BY: DJL DRAWN BY: AM SURVEYED BY: CHECKED BY: BRK	PROJECT NO. SD-0168-001 KOLB DAM CROSS SECTIONS & PROFILES	DATE: 02-20-98 SHEET NO. 5 OF 6 APPROVED BY:
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