SD Department of Environment & Natural Resources
Water Resources Assistance Program
Total Maximum Daily Load

Punished Woman's Lake Watershed
Codington County, South Dakota
April, 2000

This TMDL was developed in accordance with Section 303(d) of the federal Clean Water Act and guidance developed by the US Environmental Protection Agency. The 1996 303(d) Waterbody List identified Punished Woman's Lake as impaired due to sediment and nutrients. A TMDL had not yet been completed on Punished Woman's Lake before the 1998 303(d) list was finaled; therefore, Punished Woman's Lake was "rolled over" into the 1998 list. During this time, the Section 319 Implementation Project was initiated and completed. This TMDL addresses the water quality impairment of accumulated sediment and nutrients for Punished Woman's Lake.

TMDL Summary for Accumulated Sediment

Waterbody Name	**Punished Woman's Lake**
Hydrologic Unit Code (HUC)	07020001
TMDL Pollutant	**Sediment Delivery**
Water Quality Target	Reduce in-lake sedimentation by 50 percent.
TMDL Goal	Remove eight-inch outlet cap, allow banks to re-vegetate, and remove 421,000 cubic yards of sediment.
303(d) Status	Rollover from 1996 303(d) Waterbody List into 1998 303(d) Waterbody List
Impaired Beneficial Uses	Warmwater semi-permanent fish life propagation, immersion recreation, limited contact recreation.
Reference Document	Punished Woman's Lake Diagnostic/Feasibility Study Report, April, 1991

TMDL Summary for Excess Nutrients

Waterbody Name	**Punished Woman's Lake**
Hydrologic Unit Code (HUC)	07020001
TMDL Pollutant	**Excess Nutrients**
Water Quality Target	Reduce aquatic vegetation 50 percent by reducing in-lake nutrient-rich sediment by 15 percent.
TMDL Goal	Removal of 421,000 cubic yards of sediment by dredging. Increase depth to 12-15 feet in selected mid-lake areas.

303(d) Status	Roll over from 1996 303(d) Waterbody List into 1998 303(d) Waterbody List
Impaired Beneficial Uses	Warmwater semi-permanent fish life propagation, immersion recreation, limited contact recreation.
Reference Document	Punished Woman's Lake Diagnostic/Feasibility Study Report, April, 1991

I. Executive Summary:

- ***Waterbody Description and Impairments***

Punished Woman's Lake is a 477-acre lake located in northeastern Codington County South Dakota, immediately north of the town of South Shore and approximately 25 miles northeast of Watertown, South Dakota (Figure 1 of attachment). The Punished Woman's Lake watershed is comprised of 12,280 acres of generally hilly terrain. Excess sediment resulting in loss of water depth and excess nutrients resulting in aquatic macrophytes have reduced recreational uses of fishing, swimming, and boating. The average depth prior to implementation was 5.4 feet with a maximum depth of 8 feet. Sediment depth averaged 5.2 feet with most sediment located in the middle of the lake along its length and the deepest sediment located at the east end of the lake.

- ***Stakeholder Description***

Punished Woman's Lake Association South Shore, South Dakota Watertown, South Dakota Codington County, South Dakota Codington County Conservation District	SD Department of Environment & Natural Resources SD Department of Game, Fish & Parks

- ***Intent to Submit as a Clean Water Act Section 303(d) TMDL***

In accordance with Section 303(d) of the Clean Water Act, the South Dakota Department of Environment and Natural Resources submits for EPA, Region VIII review and approval, the sediment and nutrient total maximum daily loads (TMDLs) for Punished Woman's Lake as provided in this summary and attached documents. These TMDLs were established at levels necessary to meet the applicable water quality standards for sediment and nutrients with consideration of seasonal variation and a margin of safety. The designated use classifications that will be protected through implementation of the TMDLs by removal of the lake sediment include: warmwater semi-permanent fish life propagation, immersion recreation, and limited contact recreation.

II. Problem Characterization:

- ***Maps***

A map of Punished Woman's Lake, its watershed, and location in South Dakota is included as Figure 1 of the attachment.

- ***Waters Covered by TMDL***

Punished Woman's Lake is the benefactor of this TMDL.

- ***Rationale for Geographic Coverage***

Soils surrounding the lake are well drained and the lake is thought to have an extensive connection with the underlying aquifer. Soil types consist of 32% Buse, 32% Renshaw-Fordville, 26% Vienna-Lismore, and 11% Forman-Aastad-Buse. Landuse in the watershed is predominately rangeland (72%) and cropland (28%). Two major tributaries enter the lake, at the southwest and northeast ends, and five smaller intermittent streams enter the lake at various locations. Water inflows are generally limited to periods of runoff associated with snowmelt or rainstorm events. The lake outlet is located at the east end of the lake.

- ***Pollutant(s) of Concern***

Accumulated sediment
Excessive nutrients

- ***Use Impairments or Threats***

The beneficial uses of warmwater semi-permanent fish life propagation, immersion recreation and limited contact recreation were impaired by shallow water due to the accumulated sediment and to an increase in aquatic vegetation due to excessive nutrients. The lake mimicked a prairie slough more than a lake.

The restoration activity of removal of the outlet cap and dredging to remove nutrient-laden sediment was initiated by local concerns. The sediment removal portion of the project was funded by a combination of local, state, and federal dollars. A testament to use-impairment is the high level of local support to fund and locally manage the project from start to finish.

- ***Probable Sources***

The in-lake sediment deposition was a result of shoreline erosion and bank sloughing caused by construction of a eight-inch cap placed on the outlet structure in 1971. The elevated water levels and associated wave action resulted in the erosion and sloughing. In 1988, the South Dakota Board of Water Management granted permission to the Punished Woman's Lake Association to remove the eight-inch cap from the outlet structure. The cap was subsequently removed and bank sloughing ceased. Natural vegetation became reestablished along most bank areas previously devoid of cover, thus minimizing future sloughing and deposition of sediment into the lake. Water quality analysis from the Diagnostic/Feasibility study showed that the tributary waters did not exceed water quality standards for total solids, suspended solids, or dissolved solids.

A sediment survey conducted during the winter of 1987-88 found approximately 2.7 million cubic yards of soft sediment in the lake with deepest sediment (greater than 10 feet) located in the middle of the lake along most of its length and especially at the east end near the outlet.

The Diagnostic Feasibility study reported that between 75 and 80 percent of the lake contained pondweed (Potamogeton sp.) and that approximately 10 percent of the shoreline was covered with cattail (Typha latifolia) and bulrush (Scirpus sp.).

III. TMDL Endpoint:

- ***Description***

The TMDL for this waterbody consists of the removal of the eight-inch outlet cap and the removal of 421,000 cubic yards of accumulated inlake nutrient-rich sediment through dredging. Cap removal minimized future bank sloughing and dredging of nutrient-rich sediment resulted in a decrease in nutrients in attempts decrease aquatic vegetation and restore the impaired beneficial uses. The local sportsman's club requested that no emergent vegetation (cattail and bulrush) be removed from the shoreline of the lake. That request was honored during the project.

- ***Endpoint Link to Surface Water Quality Standards***

Since removal of the outlet cap, bank sloughing has largely ceased and natural vegetation has become reestablished on most of the banks, thus minimizing future sediment deposition to the lake. Removal of 421,000 cubic yards of nutrient-rich lake sediment has had a dramatic effect on designated beneficial uses and has lead to better water quality. The dredging deepened the lake in selected mid-lake area to 12 to 15 feet. This alone has improved immersion and limited contact recreational uses. As a result of the dredging, lake water clarity improved and suspended solids were reduced. It is likely that deepening large parts of the lake had the effect of reducing exposure of bottom sediments to wind and wave action, thereby reducing inorganic water turbidity which was formerly a major detriment to water clarity in Punished Woman's Lake due to its shallowness. It is anticipated that dissolved oxygen levels will increase and overall water temperatures decrease, thereby enhancing the lake's fishery. Water clarity has increased as shallow vegetation was eliminated and nutrient-bound sediment (primarily phosphorus) was removed. According to the local project coordinator, post-project observations showed that approximately 75 percent of the submergent vegetation (Potamogeton sp.) was removed from the lake as a result of the implementation project. The dredging activity also opened previously plugged groundwater connections as witnessed by the lake's continuous discharge without any inflow during extended dry climatic periods.

The phenomenon of discharge without inflow was not observed by local personnel prior to the implementation project.

IV. TMDL Analysis and Development:

- ***Data Sources***

Data sources include the 1991 Punished Woman's Lake Diagnostic Feasibility Study Report and two water quality reports: the 1977 State Lakes Preservation Committee's survey of lakes in the Coteau des Prairie, and a statewide survey conducted for the State of South Dakota in 1981. Also, water quality data collected during the implementation project and presented in the Punished Woman's Lake Final Report supported the water quality improvements listed above, and statewide surveys for the State of South Dakota conducted in 1981 and 1993.

- ***Analysis Techniques or Models***

During the Diagnostic/Feasibility study, water quality samples were collected according to Quality Control/Quality Assurance EPA approved methods. Laboratory analyses were conducted by the South Dakota State Health Laboratory in Pierre, South Dakota. Water quality data were loaded onto computer files and analyzed for trends. A minimum, mean, and maximum were calculated for each of the parameters measured.

Sediment surveys were conducted using the rebar technique of sediment probing. Elutriate samples of the sediment were collected and analyzed by the U.S. Army Corps of Engineers Laboratory in Omaha, Nebraska.

Amounts of sediment removed by dredging were calculated by readings of the nuclear density meter on board the dredge during operation.

In addition to water quality monitoring, data was collected to complete a comprehensive watershed landuse model. The AGNPS model was developed by the United States Department of Agriculture (Young et al, 1986) to provide comparative values for forty acre cells in a watershed. The model identifies the possible scenarios for reducing phosphorus in the watershed, targeting the sources for the load allocations.

- ***Seasonality***

Seasonality is not a factor as there are no seasonally related loadings to the lake and the goals of aquatic vegetation and sediment removal have been met.

- ***Margin of Safety***

Since removal of the outlet cap, bank sloughing largely has ceased and natural vegetation has become reestablished on most of the banks, thus minimizing

future sediment deposition to the lake. Removal of 15 percent of the inlake sediment resulted in a 75 percent decrease in aquatic vegetation in Punished Woman's Lake, a 25 percent gain over that listed for the TMDL.

AGNPS modeling identified 34 cells (non-feedlot) as potentially significant in terms of nutrient and/or sediment yield, and four feedlots as potentially significant. Any incorporation of Best management Practices to control these potential sources would provide for a greater margin of safety for the lake.

V. Allocation of TMDL Loads or Responsibilities:

- ***Wasteload Allocation***

There are no point sources of pollutants that are of concern in this watershed. Therefore, the "wasteload allocation" component of this TMDL is considered a zero value. The TMDL is considered wholly included within the "load allocation" component.

- ***Load Allocation***

The load allocation for accumulated sediment in Punished Woman's Lake primarily was a result of bank sloughing due to construction of a eight-inch cap on the outlet of the lake that raised the lake level above the established shoreline. The cap subsequently has been removed. The aquatic vegetation is a direct result of nutrient-laden sediment being deposited in the lake by bank sloughing.

As a component of the Diagnostic/Feasibility study, the AGNPS Model was used to assess the condition of the watershed with respect to nutrient and sediment outputs and the effects of feedlots on those parameters. The AGNPS model results indicated 34 cells (non-feedlot) as potentially significant in terms of nutrient and/or sediment yield. Additionally, four feedlots were identified as potentially significant. These cells should be field checked by qualified personnel of the Natural Resources Conservation Service before these areas are targeted for erosion or nutrient control strategies. Conservation practices such as conservation tillage, contour farming, contour strip-cropping, crop rotation, terraces, grassed waterways, animal waste management systems, and range and pasture management may be the most appropriate Best Management Practices in this watershed. Additional consultation with the Codington County Conservation District is recommended before specific Best Management Practices are chosen.

Bank stabilization efforts may be required on isolated areas that have not yet stabilized and have yet to be vegetated naturally.

- ***Allocation of Responsibility***

In 1991, the Department of Environment and Natural Resources produced a report of a Diagnostic/Feasibility study of Punished Woman's Lake conducted from 1988 through 1990. Based upon information available at that time, a recommendation was made to restore Punished Woman's Lake through selective dredging in areas with maximum sediment accumulation.

Information supplied by the local sponsors indicate the yearly totals in cubic yards of sediment removed from Punished Woman's Lake as follows:

Year	Dredged Material (cubic yards)
1990	60,000
1991	116,800
1992	75,334
1993	95,556
1994	73,310
TOTAL	**421,000**

VI. Schedule of Implementation:

The TMDL has already been implemented; therefore a schedule is not included.

VII. Post-Implementation Monitoring:

The Punished Woman's Lake Association is participating in the South Dakota Citizen's Monitoring Program to monitor the effectiveness of the TMDLs. The South Dakota Department of Environment and Natural Resources continues to monitor Punished Woman's Lake every two to four years as part of the Statewide Lakes Assessment Program.

VIII. Public Participation:

- ***Summary of Public Review***

The Diagnostic/Feasibility study was conducted from 1988 through 1990 and involved the cooperation of the South Dakota Department of Environment and Natural Resources, the town of South Shore, local residents, and the Punished Woman's Lake Association

Initial implementation funding was provided by Environmental Protection Agency Section 314/319 grants and supplemented with funds awarded by the Board of Water and Natural Resources of the South Dakota Department of Environment and Natural Resources.

The Punished Woman's Lake Association held numerous scoping meetings prior to and during the assessment and implementation phases of the project.

Pubic participation in the Punished Woman's Lake project are also documented in the following activities:

South Shore City Council, South Shore, South Dakota, 1990-1994 – Punished Woman's Lake Restoration Project.

South Dakota Division of Water Rights. Outlet elevation for Punished Woman's Lake set at 1844.5 feet msl, 1988. South Dakota Department of Environment and Natural Resources, Pierre, South Dakota.

South Dakota Department of Environment and Natural Resources. South Dakota Lakes Survey. 1981. Document presented geographical, physio-chemical, biotic, edaphic, and other descriptive information on Punished Woman's Lake.

Electronic media	***Mailings***	***Public Comments Received***
December, 1998 Assessment Summary added to department website **May 2000** TMDL Summary advertised on department website	**Interested parties** May 5, 2000 **Stakeholders** May 5, 2000 **Daily Newspapers** May 5, 2000	Comments received during project meetings and review of the draft report and findings were considered

IX. Supporting Development Document(s) (attached):

Stewart, W. C. and E. Stueven. March, 1994. 1993 South Dakota Lakes Assessment Final Report. South Dakota Department of Environment and Natural Resources, Division of Water Resources Management, Pierre, SD. p 558-562.

Punished Woman's Lake Final Report - WAITING FOR COPY OF REPORT

Punished Woman's Lake Diagnostic/Feasibility Study Report. April, 1991. Office of Water Resources Management, South Dakota Department of Water and Natural Resources. 57pp.

Koth, R. M. 1981. South Dakota Lakes Classification and Inventory Final Report. South Dakota Department of Water and Natural Resources, Office of Water Quality, Pierre, SD. 693pp.

State Lakes Preservation Committee. 1977. Classification, Preservation, Restoration of lakes in Northeastern South Dakota. South Dakota and Old West Regional Commission.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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February 7, 2001

Ref: 8EPR-EP

Steven M. Pirner, Secretary
Department of Environment & Natural Resources
Joe Foss Building
523 East Capitol
Pierre, SD 57501-3181

Re: TMDL Approvals
Blue Dog Lake
Clear Lake
Freeman Lake
Punished Woman Lake
Upper Lake Sharpe

Dear Mr. Pirner:

We have completed our review of the total maximum daily loads (TMDLs) as submitted by your office for the waterbodies listed in the enclosure to this letter. In accordance with the Clean Water Act (33 U.S.C. 1251 *et. seq.*), we approve all aspects of the TMDLs as developed for the water quality limited waterbodies as described in Section 303(d)(1).

Based on our review, we feel the separate TMDL elements listed in the enclosed review table adequately address the pollutants of concern, taking into consideration seasonal variation and a margin of safety. Please find enclosed a detailed review of these TMDLs.

For years, the State has sponsored an extensive clean lakes program. Through the lakes assessment and monitoring efforts associated with this program, priority waterbodies have been identified for cleanup. It is reasonable that these same priority waters have been a focus of the Section 319 nonpoint source projects as well as one of the priorities under the State's Section 303(d) TMDL efforts.

In the course of developing TMDLs for impaired waters, EPA has recognized that not all impairments are linked to water chemistry alone. Rather, EPA recognizes that *"Section 303(d) requires the States to identify all impaired waters regardless of whether the impairment is due to toxic pollutants, other chemical, heat, habitat, or other problems."* (see 57 Fed. Reg. 33040 for July 24, 1992). Further, EPA states that "*...in some situations water quality standards – particulary designated uses and biocriteria – can only be attained if nonchemical factors such as*

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hydrology, channel morphology, and habitat are also addressed. EPA recognizes that it is appropriate to use the TMDL process to establish control measures for quantifiable non-chemical parameters that are preventing the attainment of water quality standards." (see Guidance for Water Quality-based Decisions: The TMDL Process; USEPA; EPA 440/4-91-001, April 1991; pg. 4). We feel the State has developed TMDLs that are consistent with this guidance, taking a comprehensive view of the sources and causes of water quality impairment within each of the watersheds. For example, in several of the TMDLs, the State considered nonchemical factors such as lake depth and its relationship to the impaired uses. Further, we feel it is reasonable to use factors such as lake depth as surrogates to express the final endpoint of the TMDL.

Thank you for your submittal. If you have any questions concerning this approval, feel free to contact Vernon Berry of my staff at 303/312-6234.

Sincerely,

Max H. Dodson
Assistant Regional Administrator
Office of Ecosystems Protection and
Remediation

Enclosure

Enclosure

APPROVED TMDLS

Waterbody Name*	TMDL Parameter/ Pollutant	Water Quality Goal/Endpoint	TMDL	Section 303(d)1 or 303(d)3 TMDL	Supporting Documentation (not an exhaustive list of supporting documents)
Blue Dog Lake*	phosphorus	TSI $\leq$ 65	30% reduction in phosphorus loads	Section 303(d)(1)	■ Phase I Watershed Assessment Final Report, Blue Dog Lake, Day County, South Dakota (SD DENR, Sept. 1999) ■ Report on the Activities and Expenditures of the Blue Dog / Enemy Swim Lake Watershed Assessment Study (Day Conservation District, January 1999)
Clear Lake*	phosphorus	TSI $\leq$ 61	20% reduction in average annual tributary phosphorus loads	Section 303(d)(1)	■ Phase I Watershed Assessment Final Report, Clear Lake, Deuel County, South Dakota (SD DENR, June 1999)
	sediment	Increase average lake depth by 4 feet over 116 surface area acres	Remove 750,000 cubic yards of lake sediment	Section 303(d)(1)	
Freeman Lake*	nitrate	nitrate - 50 mg/L as a 30 day average nitrate - 88 mg/L as a daily maximum	reduce nitrate delivery to the lake by 33,000 Kg/year	Section 303(d)(1)	■ Water Quality Sample Results (SD DENR, 1979-1999) ■ Freeman Lake Watershed AGNPS Study Results ■ Saline-Seep Diagnosis, Control and Reclamation (USDA, Conservation Research Report No. 30, May, 1983)
	selenium	selenium - 5 μg/L as a 30 day average selenium - 20 μg/L as a daily maximum	reduce selenium delivery to the lake by 152.6 Kg/year	Section 303(d)(1)	

Waterbody Name*	TMDL Parameter/ Pollutant	Water Quality Goal/Endpoint	TMDL	Section 303(d)1 or 303(d)3 TMDL	Supporting Documentation (not an exhaustive list of supporting documents)
Punished Woman Lake*	sediment	Increase average lake depth in mid-lake area to 12 - 15 feet	■ 50% reduction of in-lake sediment ■ Remove 421,000 cubic yards of lake sediment	Section 303(d)(1)	■ 1993 South Dakota Lakes Assessment Final Report (SD DENR, March 1994) ■ Punished Woman's Lake Diagnostic / Reasibility Study Report (SD DWNR, April 1991) ■ South Dakota Lakes Classification and Inventory Final Report (SD DWNR, 1981) ■ Classification, Preservation, Resoration of lakes in Northeastern South Dakota (State Lakes Preservation Committee, 1977)
	nutrients	50% reduction of pondweed, cattail, and bulrush 15% reduction of in-lake sediment	Remove 421,000 cubic yards of lake sediment	Section 303(d)(1)	
Upper Lake Sharpe*	sediment	re-vegetate 45% of stream channel types F and G (Rosgen's Stream Channel Classification)	30% reduction of annual sediment delivery to Lake Sharpe by the year 2010	Section 303(d)(1)	■ Lower Bad River Basin Study Final Report (USDA, NRCS, revised June 1994) ■ Upper Bad River Basin Study (USDA, NRCS, October 1998) ■ Bad River Phase II Water Quality Project Final Report (Stanley County Conservation District, 1996) ■ Report on Factors Affecting Sediment Yield in the Pacific Southwest Area and Selection and Evaluation of Measures for Reduction of Erosion and Sediment Yield (Pacific Southwest Inter-Agency Committee, October 1968)

* An asterisk indicates the waterbody has been included on the State's Section 303(d) list of waterbodies in need of TMDLs.

■ TMDL Checklist ■

EPA Region VIII

State/Tribe: South Dakota
Waterbody Name: Blue Dog Lake, Day County
Point Source-control TMDL: Nonpoint Source-control TMDL: X (check one or both)
Date Received: December 12, 2000 Date Review completed: January 10, 2001 VEB

Review Criteria (All criteria must be met for approval)	Approved (check if yes)	Comments
■ **TMDLs result in maintaining and attaining water quality standards**	X	The waterbody classification uses which are addressed by this TMDL are warmwater marginal fish life propagation, immersion recreation, and limited contact recreation.
■ **Water Quality Standards Target**	X	Water quality targets were established based on trophic status. This is a reasonable approach because the trophic status of the waterbody relates to the uses of concern.
■ **TMDL**	X	The TMDL is expressed in terms of annual phosphorus load reduction. This is a reasonable way to express the TMDL for this lake because it provides an effective surrogate that reflects both aquatic life and recreational needs, and reflects the long response time of lakes of this type to pollutant controls within the watershed.
■ **Significant Sources Identified**	X	Significant sources were adequately identified in a categorical and/or individual source-by-source basis. All sources that need to be addressed through controls were identified.
■ **Technical Analysis**	X	Monitoring, empirical relationships, AGNPS modeling, and best professional judgement were used in identifying pollutant sources, and in identifying acceptable levels of pollutant control. This level of technical analysis is reasonable and appropriate because of the character of the pollutants, the type of land use practices, and the waterbody type.
■ **Margin of Safety and Seasonality**	X	An appropriate margin of safety is included by performing ongoing monitoring to assure water quality goals are achieved and by application of additional nonpoint source BMPs for croplands within the watershed. Seasonality was adequately considered by evaluating the cumulative impacts of the various seasons on water quality and by tailoring the BMPs to seasonal needs.
■ **Allocation**	X	The allocation for the TMDL was a "load allocation" attributed to nonpoint sources. Allocation was attributed to such sources as animal feeding areas and croplands.
■ **Public Review**	X	Public review and participation was conducted through meetings, electronic media, and mailings. The extent of public review is acceptable. Further, the review process sponsored by the State was adequate for purposes of developing a TMDL that will be implemented because of public acceptance.
■ **EPA approved Water Quality Standards**	X	Standards upon which this TMDL was based have been formally approved by the EPA. No tribal waters were involved in this TMDL.

■ TMDL Checklist ■

EPA Region VIII

State/Tribe: South Dakota
Waterbody Name: Clear Lake, Deuel County
Point Source-control TMDL: Nonpoint Source-control TMDL: X (check one or both)
Date Received: December 12, 2000 Date Review completed: January 10, 2001 VEB

Review Criteria (All criteria must be met for approval)	Approved (check if yes)	Comments
■ **TMDLs result in maintaining and attaining water quality standards**	X	The waterbody classification uses which are addressed by this TMDL are warmwater marginal fish life propagation, immersion recreation, and limited contact recreation.
■ **Water Quality Standards Target**	X	Water quality targets were established based on trophic status and lake depth. This is a reasonable approach since it relates to the trophic status of the waterbody as well as the physical nature of the lake, which in turn, relate to the uses of concern.
■ **TMDL**	X	The TMDL is expressed in terms of annual phosphorus load reduction and removal of lake sediment. This is a reasonable way to express the TMDL for this lake because it provides an effective surrogate that reflects both aquatic life and recreational needs.
■ **Significant Sources Identified**	X	Significant sources were adequately identified in a categorical and/or individual source-by-source basis. All sources that need to be addressed through controls were identified (including the removal of lake bottom sediments, if needed).
■ **Technical Analysis**	X	Monitoring, empirical relationships, AGNPS modeling, and best professional judgement were used in identifying pollutant sources, and in identifying acceptable levels of pollutant control. This level of technical analysis is reasonable and appropriate because of the character of the pollutants, the type of land use practices, and the waterbody type.
■ **Margin of Safety and Seasonality**	X	An appropriate margin of safety is included by augmenting the watershed land use controls with in-lake dredging, and urban BMPs for lawn fertilization. The in-lake dredging will further reduce the amount of available nutrients into the lake because of increased depth and provide further aquatic life habitat. Seasonality was adequately considered by evaluating the cumulative impacts of the various seasons on water quality and by tailoring the BMPs to seasonal needs.
■ **Allocation**	X	The allocation for the TMDL was a "load allocation" attributed to nonpoint sources. Allocation was attributed to such sources as animal feeding areas and croplands.
■ **Public Review**	X	Public review and participation was conducted through meetings, electronic media, and mailings. The extent of public review is acceptable. Further, the review process sponsored by the State was adequate for purposes of developing a TMDL that will be implemented because of public acceptance.
■ **EPA approved Water Quality Standards**	X	Standards upon which this TMDL was based have been formally approved by the EPA. No tribal waters were involved in this TMDL.

■ TMDL Checklist ■

EPA Region VIII

State/Tribe: South Dakota
Waterbody Name: Freeman Lake, Jackson County
Point Source-control TMDL: Nonpoint Source-control TMDL: X (check one or both)
Date Received: January 16, 2001 Date Review completed: January 30, 2001 VEB

Review Criteria (All criteria must be met for approval)	Approved (check if yes)	Comments
■ **TMDLs result in maintaining and attaining water quality standards**	X	The waterbody classification uses which are addressed by this TMDL are warmwater permanent fish life propagation, immersion recreation, limited contact recreation, and criteria for fish and wildlife propagation, recreation and stock watering.
■ **Water Quality Standards Target**	X	The 30-day average and daily maximum numeric standards for nitrate and selenium were used as quantified endpoints.
■ **TMDL**	X	The TMDLs are expressed in terms of annual nitrate load reduction, and annual selenium load reduction. These are reasonable ways to express the TMDLs for this lake because they provide effective surrogates that reflect both aquatic life and recreational needs, and reflect the long response time of lakes of this type to pollutant controls within the watershed.
■ **Significant Sources Identified**	X	Significant sources were adequately identified in a categorical and/or individual source-by-source basis. All sources that need to be addressed through controls were identified.
■ **Technical Analysis**	X	Monitoring, empirical relationships, AGNPS modeling, and best professional judgement were used in identifying pollutant sources, and in identifying acceptable levels of pollutant control. This level of technical analysis is reasonable and appropriate because of the character of the pollutants, the type of land use practices, and the waterbody type.
■ **Margin of Safety and Seasonality**	X	An appropriate margin of safety is included by performing ongoing monitoring to assure water quality goals are achieved and possibly by application of additional nonpoint source BMPs. Seasonality was adequately considered by evaluating the cumulative impacts of the various seasons on water quality and by tailoring the BMPs to seasonal needs.
■ **Allocation**	X	The allocation for the TMDL was a "load allocation" attributed to nonpoint sources. Allocation was attributed to saline seeps which are compounded by factors such as fallow croplands and poor surface drainage.
■ **Public Review**	X	Public review and participation was conducted through meetings, electronic media, and mailings. The extent of public review is acceptable. Further, the review process sponsored by the State was adequate for purposes of developing a TMDL that will be implemented because of public acceptance.
■ **EPA approved Water Quality Standards**	X	Standards upon which this TMDL was based have been formally approved by the EPA. No tribal waters were involved in this TMDL.

■ TMDL Checklist ■

EPA Region VIII

State/Tribe: South Dakota
Waterbody Name: Punished Woman Lake, Codington County
Point Source-control TMDL: Nonpoint Source-control TMDL: X (check one or both)
Date Received: December 12, 2000 Date Review completed: January 10, 2001 VEB

Review Criteria (All criteria must be met for approval)	Approved (check if yes)	Comments
■ **TMDLs result in maintaining and attaining water quality standards**	X	The waterbody classification uses which are addressed by this TMDL are warmwater semi-permanent fish life propagation, immersion recreation, and limited contact recreation.
■ **Water Quality Standards Target**	X	Water quality targets were established based on lake depth and reduction of in-lake aquatic vegetation and sediment. These are reasonable targets because they relate to the impaired uses of concern.
■ **TMDL**	X	The TMDL is expressed in terms sediment load reduction and removal of lake sediment. Lake depth is a particularly important factor related to both the recreational use and fisheries use of the lake.
■ **Significant Sources Identified**	X	Significant sources were adequately identified in a categorical and/or individual source-by-source basis. All sources that need to be addressed through controls were identified.
■ **Technical Analysis**	X	Monitoring, empirical relationships, AGNPS modeling, and best professional judgement were used in identifying pollutant sources, and in identifying acceptable levels of pollutant control. This level of technical analysis is reasonable and appropriate because of the character of the pollutants, the type of land use practices, and the waterbody type.
■ **Margin of Safety and Seasonality**	X	An appropriate margin of safety is included by performing ongoing monitoring to assure water quality goals are achieved and possibly by application of additional nonpoint source BMPs. Seasonality was adequately considered by evaluating the cumulative impacts of the various seasons on water quality and by tailoring the BMPs to seasonal needs.
■ **Allocation**	X	The allocation for the TMDL was a "load allocation" attributed to nonpoint sources. Allocation was attributed to such sources as shoreline erosion and bank sloughing.
■ **Public Review**	X	Public review and participation was conducted through meetings, electronic media, and mailings. The extent of public review is acceptable. Further, the review process sponsored by the State was adequate for purposes of developing a TMDL that will be implemented because of public acceptance.
■ **EPA approved Water Quality Standards**	X	Standards upon which this TMDL was based have been formally approved by the EPA. No tribal waters were involved in this TMDL.

■ TMDL Checklist ■

EPA Region VIII

State/Tribe: South Dakota
Waterbody Name: Upper Lake Sharpe, Jones & Stanley Counties
Point Source-control TMDL: Nonpoint Source-control TMDL: X (check one or both)
Date Received: December 12, 2000 Date Review completed: January 10, 2001 VEB

Review Criteria (All criteria must be met for approval)	Approved (check if yes)	Comments
■ **TMDLs result in maintaining and attaining water quality standards**	X	The waterbody classification uses which are addressed by this TMDL are coldwater permanent fish life propagation, immersion recreation, and limited contact recreation.
■ **Water Quality Standards Target**	X	Water quality targets were established based on re-vegetation of Bad River channels (i.e., F & G types according to Rosgen's Stream Channel Classification) flowing into the lake. This is a reasonable approach because the majority of sediment delivered to the lake originates in the Bad River watershed. This target relates to the uses of concern in the lake.
■ **TMDL**	X	The TMDL is expressed in terms of annual sediment load reduction. This is a reasonable way to express the TMDL for this lake because the measure reflects both aquatic life and recreational needs and reflects the long response time of lakes of this type to pollutant controls within the watershed.
■ **Significant Sources Identified**	X	Significant sources were adequately identified in a categorical and/or individual source-by-source basis. All sources that need to be addressed through controls were identified.
■ **Technical Analysis**	X	Monitoring, empirical relationships, modeling (e.g., PSIAC, USLE, EGEM), and best professional judgement were used in identifying pollutant sources, and in identifying acceptable levels of pollutant control. This level of technical analysis is reasonable and appropriate because of the character of the pollutants, the type of land use practices, and the waterbody type.
■ **Margin of Safety and Seasonality**	X	An appropriate margin of safety is included by performing ongoing monitoring to assure water quality goals are achieved and by application of additional nonpoint source BMPs (e.g., improved grazing management) within the Bad River and Antelope Creek watersheds. Seasonality was adequately considered by evaluating the cumulative impacts of the various seasons on water quality and by tailoring the BMPs to seasonal needs.
■ **Allocation**	X	The allocation for the TMDL was a "load allocation" attributed to nonpoint sources. Allocation was attributed to such sources as gully and channel erosion from poor landuse management practices (e.g., grazing).
■ **Public Review**	X	Public review and participation was conducted through meetings, electronic media, and mailings. The extent of public review is acceptable. Further, the review process sponsored by the State was adequate for purposes of developing a TMDL that will be implemented because of public acceptance.
■ **EPA approved Water Quality Standards**	X	Standards upon which this TMDL was based have been formally approved by the EPA. No tribal waters were involved in this TMDL.