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# WATERSMART

**Water and Energy Efficiency Grants for Fiscal Year 2023**

**Funding Opportunity No. R23AS00008**

**Belle Fourche Irrigation District**

**Meade Lateral Pipeline**

**Newell, South Dakota**



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## Executive Summary

July 22, 2022, the Belle Fourche Irrigation District (BFID) is located in Butte County, South Dakota, with District offices in Newell, South Dakota. The BFID is a category A applicant. The Belle Fourche Unit is a Reclamation Facility owned by the United States and operated and maintained by the Belle Fourche Irrigation District (BFID). The Belle Fourche Irrigation District is located in Western South Dakota, Butte County, near the Wyoming and Montana borders. BFID intends on installing approximately 2000 feet of 21-inch and 2200 feet of 18-inch polyvinyl chloride pipe, elbows, air vent, valves, and farmer turnouts (FTO) on the Meade Lateral. Meade Lateral is a top priority for the District as the ditch is losing approximately 490 acre-feet of water per year which would remain in the Belle Fourche Reservoir for recreational use or other irrigation needs. This project is completed within two years, provided we can purchase all supplies and appurtenances. This project is expected to begin in October 2023 and be complete by April 2025.

## Project Location

The Belle Fourche Irrigation District is located in Butte County, South Dakota, with Newell, South Dakota district offices. This activity will take place on the Meade Lateral, situated at 44° 36' 42.77" N Latitude, -103° 17' 11.2812" W longitude, approximately 14 miles from headquarters in the town of Newell, South Dakota, and 6.25 miles from the nearest town of Vale, South Dakota.



## Technical Project Description

BFID intends to install approximately 4200 feet of polyvinyl chloride pipe to enclose an open earthen ditch. Crews will connect to a previously constructed pipeline by removing a 30-inch valve, shooting the ditch for the grade, and installing a 30 x 21-inch reducer and a flow meter. Approximately 2000 feet of 21-inch polyvinyl chloride (PVC) pipe and 2200 feet of 18-inch PVC valves, valve wells, flow meters, and appurtenances will be installed in the newly graded, packed, and bedded trench. Crews will install approximately 80 feet of pipe and appurtenances per day.

### E.1.1. Evaluation Criterion A—Quantifiable Water Savings (28 points)

*Up to 28 points may be awarded for this criterion. This criterion prioritizes projects that will conserve water and improve water use efficiency, supporting the goals of EO 14008. Points will be allocated based on the quantifiable water savings expected as a result of the project. Points will be allocated to give greater consideration to projects that are expected to result in more significant water savings.*

#### 1) Describe the amount of estimated water savings.

*For projects that conserve water, please state the estimated amount of water expected to be conserved (in acre-feet per year) as a direct result of this project. Please include a specific, quantifiable water savings estimate; do not include a range of potential water savings.*

By enclosing the earthen ditch, we will save approximately 490 acre-feet of water per year (2.8 cubic feet per day, Assuming a 4-month delivery season with a 15-foot wetted perimeter in the Keith silt loam and Altvan loam soils.

#### 2) Describe current losses:

*Please explain where the water that will be conserved is currently going and how it is being used. Consider the following:*

*i) Explain where current losses are going (e.g., back to the stream, spilled at the end of the ditch, seeping into the ground).*

Currently, the loss is seeping into the ground, and some is going out the end of the open ditch into Nine-Mile Creek.

*ii) If known, please explain how current losses are being used. For example, are current losses returning to the system for use by others? Are current losses entering an impaired groundwater table becoming unsuitable for future use?*

Currently, current losses are returning to the State of South Dakota. BFID cannot use the water that seeps or flows out at the end of the ditch, as this is the end of the project.

*iii) Are there any known benefits associated with where the current losses are going? For example, is seepage water providing additional habitat for fish or animal species?*

At this time, there are no known benefits.

**3) Describe the support/documentation of estimated water savings:**

*Please provide sufficient detail supporting how the estimate was determined, including all supporting calculations. Note: projects that do not provide sufficient supporting detail/calculations may not receive credit under this section. Please be sure to consider the questions associated with your project type (listed below) when determining the estimated water savings, along with the necessary support needed for a full review of your proposal.*

*In addition, please note that using visual observations alone to calculate water savings without additional documentation/data is insufficient to receive credit under this section. Further, the water savings must be the result of reducing or eliminating a current, ongoing loss, not the result of an expected future loss.*

By piping the Meade Lateral, we are enclosing the system and saving approximately 490 acre-feet water per year. The soil in this area is very sandy, and the ditch seeps. The construction of this pipeline will keep the water in the Belle Fourche Reservoir. When a landowner orders water, we have to send four additional acre-feet to provide the delivery as it disappears. Calculations for this saving are determined by soil type at a seepage rate of 2.8 cubic feet per day with a wetted perimeter of 15 feet and the assumption of a four-month delivery season or 120 days.

$$63000' \times 2.8 \frac{\text{ft}^3}{\text{ft}^2} = 176400 \frac{\text{ft}^3}{\text{day}}$$

$$\frac{176400 \text{ ft}^3}{\text{day}} \times \frac{1}{86400 \text{ sec}} = \frac{\text{ft}^3}{\text{day}} = 2.04 \frac{\text{ft}^3}{\text{sec}}$$

$$2.04 \frac{\text{ft}^3}{\text{sec}} = 4.08 \frac{\text{AF}}{\text{day}} \times 120 = 490\text{AF year}$$

**4) Please address the following questions according to the type of infrastructure improvement you are proposing for funding.**

*See Appendix A: Benefit Quantification and Performance Measure Guidance for additional guidance on quantifying water savings.*

**Canal lining/ Piping:**

*Canal lining/piping projects can save water when irrigation delivery systems experience significant losses due to canal seepage. Applicants proposing lining/piping projects should address:*

- ❖ *How has the estimated average annual water savings that will result from the project been determined? Please provide all relevant calculations, assumptions, and supporting data.*



$$63000' \times 2.8 \frac{\text{ft}^3}{\text{ft}^2} = 176400 \frac{\text{ft}^3}{\text{day}} \frac{176400 \text{ ft}^3}{\text{day}} \times \frac{1}{86400 \text{ sec}} = \frac{\text{ft}^3}{\text{day}} = 2.04 \frac{\text{ft}^3}{\text{sec}}$$
$$2.04 \frac{\text{ft}^3}{\text{sec}} = 4.08 \frac{\text{AF}}{\text{day}} \times 120 = 490 \text{AF year}$$

- ❖ *How have average annual canal seepage losses been determined? Have ponding and/or inflow/outflow tests been conducted to determine seepage rates under varying conditions? If so, please provide detailed descriptions of testing methods and all results. If not, please provide an explanation of the method(s) used to calculate seepage losses. All estimates should be supported with multiple sets of data/measurements from representative sections of canals.*
  - The ditch rider and watermaster have kept records of the water in the canal. They keep records of the amount of water ordered, the amount needed to make the delivery, and the loss from the beginning of the open ditch to the end. These records span a 5-year period where it was highly wet to semi-dry. The drier conditions tend to create a more significant water loss. BFID performed inflow/outflow tests to measure the transit loss in the Meade Lateral. In addition, permeability data for Keith silt loam and Altvan loam soils have calculated expected seepage loss. These calculations appear above. Both methods yielded a result within the margin of error.
- ❖ *What are the expected post-project seepage/leakage losses, and how were these estimates determined (e.g., can data specific to the type of material being used in the project be provided)?*
  - Projected water saving is 490 acre-feet of water per year. The closed system would prevent seepage and provide the BFID with accurate measurements and the ability to deliver. There would be no waste as the pipeline would stay primed, and only water needed would then be released. Zero operational loss as well.

- ❖ *What are the anticipated annual transit loss reductions in terms of acre-feet per mile for the overall project and each section of canal included in the project?*
  - BFID anticipates reducing the transit loss by 395-acre feet per mile.
- ❖ *How will actual canal loss seepage reductions be verified?*
  - The Ditch rider and watermaster will keep water records and measure water at the beginning of the pipeline and farmer turnouts.
- ❖ *Include a detailed description of the materials being used.*
  - All PVC PIP (Plastic Irrigation Pipe) shall be constructed from quality PVC resin, compounded to provide physical and mechanical properties that equal to or exceed cell class 12454 as defined in ASTM D1784, and be 100 PSI (elbows and tees included). PVC PIP will be a 21-inch and 18-inch diameter pipe with a bell that consists of an integral wall section with factory-installed, solid cross-section Rieber elastomeric gaskets for sealing, meeting ASTM F477 and ASTM3139 requirements. BFID will also order appurtenances such as elbows 18 inches, 22.5°, and 45°; several tees will be needed in various sizes such as 18x12 and 18X15, 21X4, 18x4 with elastomeric gaskets for sealing. Joint lubricant and glue shall be used as applicable recommendations of the manufacturer shall be followed. One Fernco coupling is 30 inches in diameter and made of elastomeric polyvinyl chloride(PVC), which is strong, resilient, and unaffected by soil conditions, ultraviolet rays, and fungus growth. Bedding sand shall be clean, granular, and homogeneous material composed mainly of mineral matter free of mud, silt, clay lumps or clods, vegetation, or debris. This mixture is used to keep its shape around the pipe after the foundation is packed, under Bureau of Reclamation specifications and from an approved quarry. Fresno’s resilient wedge valves incorporate a rubber-sealed wedge to prevent the buildup of sediment and will be installed in six places along with McCrometer magnetic flow meters in valve wells with lids BFID crews construct. Any bolts, nuts, and washers required will be high-strength, low-alloy, corrosion-resistant steel stock. Air vents made of cast aluminum, synthetic rubber seals, and a large orifice to provide maximum airflow will be installed to improve efficiency by relieving trapped air. Alfalfa risers are made of heavy-duty cast iron frame and cover for durability; they have a cast-in-place bronze bushing that will not pull out and brass screws that make it easy to operate with a precision ground seat to ensure a water-tight seal. Finally, once construction is finished, CRP (Conservation Reserve Program) approved and compliant native grass seeds will be used to reseed the reclaimed ground.

### **E.1.2. Evaluation Criterion B—Renewable Energy (20 points)**

*Up to 20 points may be awarded based on the extent to which the project increases the use of renewable energy or otherwise results in increased energy efficiency and reduced greenhouse gas emissions.*

### **E.1.2.2. Subcriterion No. B.2: Increasing Energy Efficiency in Water Management**

*Up to 10 points may be awarded for projects that address energy demands and reduce greenhouse gas emissions by retrofitting equipment to increase energy efficiency and/or through water conservation improvements that result in reduced pumping or diversions.*

- ❖ *Describe any energy efficiencies expected to result from the water conservation or water efficiency project (e.g., reduced pumping).*
  - Conversion of the open ditch system to a closed system pipeline will result in significant head pressure at the farmer's turnout. Converting the ditch will allow those with center pivots to either downsize or potentially not run the pump, saving energy.
- ❖ *If quantifiable energy savings is expected to result from the project, please provide sufficient details and supporting calculations. If quantifying energy savings, please state the estimated amount in kilowatt-hours per year.*
  - Energy savings would rely solely on affected producers and their irrigation practices; therefore cannot be calculated at this time.
- ❖ *How will the energy efficiency improvement combat/offset the impacts of climate change, including an expected reduction in greenhouse gas emissions?*
  - The less power generated, the fewer greenhouse gas emissions.
- ❖ *If the project results in reduced pumping, please describe the current pumping requirements and the types of pumps (e.g., size) currently being used. How would the proposed project impact the current pumping requirements and energy usage?*
  - If an increase in head pressure allows a pivot owner to forego a pump or downsize to a smaller pump, they will use less electricity, ultimately reducing the load on the power plant and leaving power for other uses.
- ❖ *Please indicate whether your energy savings estimate originates from the point of diversion or whether the estimate is based upon an alternate site of origin.*
  - Energy savings are based strictly upon the farmer and his practices. The BFID is a gravity-fed system.
- ❖ *Will the project result in reduced vehicle miles driven, reducing greenhouse gas emissions? Please provide supporting details and calculations.*
  - Piping the Meade Lateral would result in fewer miles driven, fewer chemicals being applied, and less heavy equipment usage. The ditch rider would not need to constantly check on the water to make sure the ditch is not plugged or overflowing. Also, by piping the ditch, the spray truck would not need to go out and spray the ditches with chemicals to prevent the growth of grass and other weeds. This activity would prevent the excavation and cleaning of the open earthen ditch as it would be sealed. Piping the Meade Lateral would reduce emissions.
- ❖ *Describe any renewable energy components that will result in minimal energy savings/production (e.g., installing small-scale solar as part of a SCADA system).*
  - The magnetic flow meters will use minimal rechargeable battery power with perhaps a solar panel to maintain the charge.



### **E.1.3. Evaluation Criterion C—Sustainability Benefits (20 points)**

*Up to 20 points may be awarded under this criterion. This criterion prioritizes projects that address a specific water and/or energy sustainability concern(s), including enhancing drought resilience, addressing climate change's current and future impacts, and resolving water-related conflicts in the region. In addition, this criterion focusing on the benefits associated with the project, including benefits to tribes, ecosystem benefits, and other benefits to water and/or energy supply sustainability.*

#### **Enhancing drought resiliency.**

*In addition to the separate WaterSMART Environmental Water Resources Projects NOFO, this NOFO places a priority on projects that enhance drought resiliency through this section and other sections above, consistent with the SECURE Water Act. Therefore, please provide information regarding how the project will enhance drought resilience by benefitting the water supply and ecosystem, including the following:*

- ❖ Does the project seek to improve ecological resiliency to climate change?
  - Conservation and land management have the potential to mitigate climate change; revising the infrastructure could assist during a drought due to high temperatures.
- ❖ Will water remain in the system for more extended periods? If so, provide details on current/future durations and any expected, resulting benefits (e.g., maintaining water temperatures or water levels).
  - By piping the lateral, the water will stay in the system longer. Farmers would use it instead of run-off/waste. This process would keep the water in the reservoir longer and create water savings for later use.
- ❖ Will the project benefit species (e.g., federally threatened or endangered, a federally recognized candidate species, a state-listed species, or a species of particular recreational or economic importance)? Please describe the species' relationship to the water supply and whether the species is adversely affected by a Reclamation project or is subject to a recovery plan or conservation plan under the Endangered Species Act (ESA).
  - Federally endangered species in Butte County, South Dakota, are the swift fox, the north American river Otter, whooping crane, Longnose sucker, and fine-scale dace. Closing the irrigation ditch would not affect these species.
- ❖ Please describe any other ecosystem benefits as a direct result of the project.
  - By piping the Meade Lateral, the ecosystem would be less saturated during the summer, decrease soil salinization, pests, weeds, and land degradation, and could have the potential to be used for farming. In addition, piping this ditch would eliminate the need for herbicides. Closing the open ditch would reduce the number of chemicals in the environment and limit exposure to mammals, fish, birds, insects, and humans.
- ❖ Will the project directly result in more efficient management of the water supply? For example, will the project provide greater flexibility to water managers, resulting in a more efficient use of water supplies?

- This project will increase the efficiency of water management on the South Canal, allowing for more accurate measurements and less waste. In addition, by making the system more efficient, it provides water for other needs.

### **Addressing a specific water and/or energy sustainability concern(s).**

*Will the project address a specific sustainability concern? Please address the following:*

- ❖ *Explain and provide details of the specific issue(s) in the area that impacts water sustainability, such as shortages due to drought and/or climate change, increased demand, or reduced deliveries.*
  - Climate change has created higher temperatures that have caused more significant amounts of evaporation that dry out soils and vegetation.
- ❖ *Explain and provide detail of the specific issue(s) in the area that is impacting energy sustainability, such as reliance on fossil fuels, pollution, or interruptions in service.*
  - South Dakota is 70% sustainable, which does not affect the area. BFID is a gravity system.
- ❖ *Please describe how the project will directly address the concern(s) stated above. For example, if experiencing shortages due to drought or climate change, how will the project directly address and confront the shortages?*
  - Keeping the water in the dam can be used later for another purpose.
- ❖ *Please address where any conserved water as a result of the project will go and how it will be used, including whether the conserved water will be used to offset groundwater pumping, used to reduce diversions, used to address shortages that impact diversions or reduce deliveries, made available for transfer, left in the river system, or used to meet another intended use.*
  - Water will remain in the dam and potentially be used by farmers.
- ❖ *Describe the mechanism that will be used, if necessary, to put the conserved water to its intended use.*
  - No mechanism is necessary.
- ❖ *Indicate the quantity of conserved water used for the intended purpose(s).*
  - 490 acre-feet per year.

### **Other project benefits.**

#### ***Combating the Climate Crisis:***

*EO 14008: "Tackling the Climate Crisis at Home and Abroad" focuses on increasing resilience to climate change and supporting climate-resilient development. For additional information on the impacts of climate change throughout the western United States, see <https://www.usbr.gov/climate/secure/docs/2021secure/2021SECUREReport.pdf>. Please describe how the project will address climate change, including:*

- **Please provide specific details and examples on how the project will address the impacts of climate change and help combat the climate crisis.**

BFID will conserve water lost to seep, evapotranspiration, and waste by converting the open earthen ditch into a pipe. In addition, the conserved water will remain in the dam for future use allowing for more recreational use.

- **Does this proposed project strengthen water supply sustainability to increase resilience to climate change?**

Conserving more water in the Belle Fourche Reservoir benefits the entire area. Fishing, boating, swimming, and family fun would be enjoyed at the reservoir during summer. Potentially, less water needed in the dam would allow more water to remain in the river and assist other producers with crops and livestock as well as natural wildlife in the area. Conservation would impact downstream users of the Missouri River Basin.

- **Will the proposed project establish and utilize a renewable energy source?**

Belle Fourche Irrigation District is a gravity-fed system; this does not pertain.

- **Will the project result in lower greenhouse gas emissions?**

Energy savings would rely solely on the affected producers and their irrigation practices; therefore cannot be calculated at this time.

#### *Disadvantaged or Underserved Communities:*

*EO 14008 and EO 13985 support environmental and economic justice by investing in underserved and disadvantaged communities and addressing the climate-related impacts to these communities, including impacts to public health, safety, and economic opportunities. Please describe how the project supports these Executive Orders, including:*

- **Does the proposed project directly serve and/or benefit a disadvantaged or historically underserved community? Benefits can include, but are not limited to: public health and safety through water quality improvements, new water supplies, new renewable energy sources, or economic growth opportunities.**

This project will affect a disadvantaged or historically underserved community. Belle Fourche Reservoir keeps the community going. Without it, there would be no water and no crops, and people would not stay in the area.

- **If the proposed project is providing benefits to a disadvantaged community, provide sufficient information to demonstrate that the community meets the disadvantaged community definition in Section 1015 of the Cooperative Watershed Act, which is defined as a community with an annual median household income that is less than 100 percent of the statewide annual median household income for the State, or the applicable state criteria for determining disadvantaged status.**

According to the census bureau, Butte county's poverty rate is 11.4%.

- **If the proposed project is providing benefits to an underserved community, provide sufficient information to demonstrate that the community meets the underserved definition in EO 13985, which includes populations sharing a**

**particular characteristic, as well as geographic communities that have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life.**

This area is less diverse than other counties in South Dakota, but this project would not affect the underserved community other than recreationally.

### ***Tribal Benefits:***

*The Department of the Interior is committed to strengthening tribal sovereignty and fulfilling Federal Tribal trust responsibilities. The President's memorandum "Tribal Consultation and Strengthening Nation-to-Nation Relationships" asserts the importance of honoring the Federal government's commitments to Tribal Nations. Please address the following, if applicable:*

- **Does the proposed project directly serve and/or benefit a Tribe? Will the projected increase water supply sustainability for an Indian Tribe? Will the project provide renewable energy for an Indian Tribe?**

This project will serve the Cheyenne River Sioux Tribe by allowing the BFID to conserve more water, making it available for the Cheyenne River.

- **Does the proposed project directly support tribal resilience to climate change and drought impacts or provide other Tribal benefits such as improved public health and safety through water quality improvements, new water supplies, or economic growth opportunities?**

Fewer chemicals used and less water would provide additional water to the downstream Tribes to assist with opportunities.

### ***Other Benefits:***

*Will the project address water and/or energy sustainability in other ways not described above? For example:*

- **Will the project assist States and water users in complying with interstate compacts?**

This project will help BFID use less water and not exceed water rights.

- **Will the project benefit multiple sectors and/or users (e.g., agriculture, municipal and industrial, environmental, recreation, or others)?**

This project will affect recreation as well as agriculture and the environment. Although these projects, over time, conserve water, this water is used for other purposes. In addition, by omitting the open ditch, we no longer need herbicides, so it is environmentally friendly.

- **Will the project benefit from a larger initiative to address sustainability?**

Eventually, this will benefit a larger initiative. The BFID tries to conserve as much water as possible to utilize in other ways and better prepare for drought.

- **Will the project help to prevent a water-related crisis or conflict? Is there frequently tension or litigation over water in the basin?**

At this time, there is no litigation or tension; however, in the future, anything is possible. BFID avoids exceeding the water rights and prevents waste to conserve as much water as possible.

#### **E.1.4. Evaluation Criterion D—Complementing On-Farm Irrigation Improvements (10 points)**

*Up to 10 points may be awarded for projects that describe in detail how they will complement on-farm irrigation improvements eligible for NRCS financial or technical assistance.*

- ❖ *If the proposed project will complement an on-farm improvement eligible for NRCS assistance, please address the following:*
  - Improving the irrigation district's water distribution would help the farmers. This project will complement a proposed activity if it is approved.
- ❖ *Describe any planned or ongoing projects by farmers/ranchers that receive water from the applicant to improve on-farm efficiencies.*
  - BFID has been working with NRCS to approve pivot and private farmer pipelines in the area. All these activities promote additional water savings.
- ❖ *Provide a detailed description of the on-farm efficiency improvements.*
  - The project will encourage the installation of center pivots and private farmer pipelines.
- ❖ *Have the farmers requested technical or financial assistance from NRCS for the on-farm efficiency projects, or do they plan to in the future?*
  - At this time, two applicants have applied for assistance, their identities are confidential for future projects, and several have applied in the past.
- ❖ *If available, provide documentation that the on-farm projects are eligible for NRCS assistance, that such assistance has or will be requested, and the number or percentage of farms that plan to participate in available NRCS programs.*
  - This information is unavailable at this time.
- ❖ *Describe how the proposed WaterSMART project would complement any ongoing or planned on-farm improvement.*
  - The proposed project would reduce, if not eliminate, the need for a pump on the pivots. The conversion would save energy and reduce emissions.
- ❖ *Will the proposed WaterSMART project directly facilitate the on-farm improvement? If so, how? For example, installing a pressurized pipe through WaterSMART can help support efficient on-farm irrigation practices, such as drip irrigation.*
  - Installing a pipeline and closing the system will improve on-farm activities. Farmers will not need as large of a pump if they need one to run the pivots. In addition, the pipeline would be pressurized to create savings.

- ❖ *Will the proposed WaterSMART project complement the on-farm project by maximizing efficiency in the area? If so, how?*
  - The proposed project will complement pivots and on-farm activities by pressurizing a system. This pressure would reduce the need for a pump on a pivot and perhaps eliminate it.
- ❖ *Describe the on-farm water conservation or water use efficiency benefits expected from any on-farm work.*
  - With the closed system, the pivots should use less water. Less water is less waste and more conservation. BFID is encouraging its members to apply for funding through NRCS to assist with conservation.
- ❖ *Estimate the potential on-farm water savings that could result in acre-feet per year. Include support or backup documentation for any calculations or assumptions.*
  - Potential water savings would be based on the individual farmer and their irrigation practices. However, BFID could not estimate this at this time.
- ❖ *Please provide a map of your water service area boundaries. If your project is selected for funding under this NOFO, this information will help NRCS identify the irrigated lands that may be approved for NRCS funding and technical assistance to complement funded WaterSMART projects.*
  - **Please see Attachment C**

### **E.1.5. Evaluation Criterion E—Planning and Implementation (8 points)**

*Up to 8 points may be awarded for these subcriteria*

#### **E.1.5.1. Subcriterion E.1— Project Planning**

*Points may be awarded for proposals and planning efforts that support the proposed project.*

- ❖ Does the applicant have a Water Conservation Plan and/or System Optimization Review (SOR) in place? Does the project address an adaptation strategy identified in a completed WaterSMART Basin Study? Please self-certify or provide copies of these plans where appropriate to verify that such a plan is in place. Including a specific excerpt or a link to the planning, document may also be considered where appropriate.
  - BFID is part of the Missouri River Basin conservation plan. Please see the link: [https://www.usbr.gov/gp/multimedia/publications/pick\\_sloan\\_overview.pdf](https://www.usbr.gov/gp/multimedia/publications/pick_sloan_overview.pdf)
- ❖ Provide the following information regarding project planning:
  - Identify any district-wide, or system-wide, planning that provides support for the proposed project. This could include a Water Conservation Plan, SOR, Drought Contingency Plan or other planning efforts done to determine the priority of this project in relation to other potential projects.  
BFID collaborates with NRCS and the local Watershed to conserve water and create ways of saving water. Currently, BFID is piping sections of the project to assist conservation

efforts. The drought contingency plan is based on the Missouri River Basin Pick-Sloan plan, which is flood control.

- Describe how the project conforms to and meets the goals of any applicable planning efforts and identify any aspect of the project that implements a feature of an existing water plan(s).

BFID's goals are to conserve water. Piping the Meade Lateral is part of the water conservation efforts. The pipeline will benefit farmers and assist them in conservation and energy savings.

- If applicable, provide a detailed description of how a project is addressing an adaptation strategy identified explicitly in a completed WaterSMART Basin Study or Water Management Options Pilot (e.g., a strategy to mitigate the impacts of water shortages resulting from climate change, drought, increased demands, or other causes)

Not Applicable at this time

**E.1.5.2. Subcriterion E.2— Readiness to Proceed**

*Points may be awarded based upon the extent to which the proposed project is capable of proceeding upon entering into a financial assistance agreement. Please note, if your project is selected, responses provided in this section will be used to develop the scope of work that will be included in the financial assistance agreement.*

*Applications that include a detailed project implementation plan (e.g., estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates) will receive the most points under this criterion.*

- ❖ Identify and provide a summary description of the major tasks necessary to complete the project. Note: please do not repeat the more detailed technical project description provided in Section D.2.2.2. Application Content. This section should focus on a summary of the major tasks to be accomplished as part of the project.
- ❖ Please also include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates. Milestones may include, but are not limited to, the following: complete environmental and cultural compliance; mobilization; begin construction/installation; construction/installation (50% complete); and construction/installation (100% complete). Was the expected environmental and cultural compliance timeline discussed with the local Reclamation Regional or Area Office?
  - The Bureau of Reclamation Regional office has already completed this project's environmental and cultural compliance in April of 2022.

Complete environmental and cultural compliance	03/01/2022	04/12/2022
Procure Materials and Mobilize	08/01/2023	10/30/2023

Excavation and installation of pipe	10/20/2023	04/01/2025
Installation of valves, valve wells, and measuring devices	10/20/2023	04/01/2025
Demobilize and reclaim the area	12/07/2023	04/30/2025
Project closeout and submit a final report	10/31/2024	04/25/2025

- ❖ Describe any permits that will be required, along with the process for obtaining such permits.
  - BFID has procured a ROW and submitted a preliminary project report to the Bureau of Reclamation. All permits are current.
- ❖ Identify and describe any engineering or design work explicitly performed in support of the proposed project.
  - BFID has completed a design drawing for the project.
- ❖ Describe any new policies or administrative actions required to implement the project.
  - No new policies will be implemented for this grant. The Board of Directors has approved and agreed to the terms of the grant if BFID is awarded the funds.

### **E.1.6. Evaluation Criterion F—Collaboration (6 points)**

*Up to 6 points may be awarded for projects that promote and encourage collaboration among parties in a way that helps increase the sustainability of the water supply.*

Please describe how the project promotes and encourages collaboration. Consider the following:

- ❖ Is there widespread support for the project? Please provide specific details regarding any support and/or partners involved in the project. What is the extent of their involvement in the process?
  - BFID Board of Directors, Bureau of Reclamation Rapid City Field office, and local landowners all support this project as it is a conservation effort. In addition, the Bureau of Reclamation oversees the BFID efforts and assists where needed as they are managing partners.
- ❖ What is the significance of collaboration/support?
  - It is very significant for BFID to support the Bureau of Reclamation and the landowners as it benefits everyone. With the support, BFID can apply for funding and get assistance with many issues that arise throughout the year.
- ❖ Will this project increase the possibility/likelihood of future water conservation improvements by other water users?
  - This project will encourage landowners to install pivots or private pipelines to distribute the water conservatively.
- ❖ Please attach any relevant supporting documents (e.g., letters of support or memorandum of understanding).



- Please see attachment D

### **E.1.7. Evaluation Criterion G— Additional Non-Federal Funding (4 points)**

*Up to 4 points may be awarded to proposals that provide non-Federal funding in excess of 50 percent of the project costs. State the percentage of non-Federal funding provided using the following calculation:*

Funding Sources	Percent of Total Project Cost	Total Cost by Source
Recipient Funding	50%	\$226,145.34
Reclamation Funding	50%	\$225,842.04
<b>TOTALS</b>	<b>100%</b>	<b>\$451,987.38</b>

### **E.1.8. Evaluation Criterion H— Nexus to Reclamation (4 Points)**

*Up to 4 points may be awarded if the proposed project is connected to a Reclamation project or Reclamation activity. No points will be awarded for proposals without connection to a Reclamation project or Reclamation activity.*

- ❖ **Describe the nexus between the proposed project and a Reclamation project or Reclamation activity. Please consider:**
  - Does the applicant have a water service, repayment, or operations and maintenance (O&M) contract with Reclamation?  
BFID is a Reclamation project receiving Reclamation water and has a repayment contract with the Bureau of Reclamation.
  - Will the proposed work benefit a Reclamation project area or activity?  
This project will benefit Reclamation as BFID is a managing partner.
  - Is the applicant a Tribe?  
BFID is not a Tribe.

## **Environmental and Cultural Resources Compliance**

### **Approvals and Permits**

#### **Environmental and Cultural Resource Considerations**

To allow Reclamation to assess the probable environmental and cultural resources impacts and costs associated with each application, all applicants should consider the following questions focusing on the NEPA, ESA, and NHPA requirements. Please answer the following questions to

the best of your knowledge. If any question is not applicable to the project, please explain why. The application should include the answers to:

- ❖ Will the proposed project impact the surrounding environment (e.g., soil [dust], air, water [quality and quantity], animal habitat)? Please briefly describe all earth-disturbing work and any work that will affect the project area's air, water, or animal habitat. Please also explain the impacts of such work on the surrounding environment and any steps that could be taken to minimize the impacts.

The ground will be excavated, and the earth moved from an existing open lateral; the pipe will be placed into the lateral and be bedded and backfilled. BFID intends to reclaim the land and repair the road, this will cause the soil to create dust, but it should be minimal as we will work in the fall and winter months to not affect the quality of the air in a manner unsuitable to the neighborhood. BFID plans to work in the fall to early winter to prevent any massive impact on the animals, air, soil, or water.

- ❖ Are you aware of any species listed or proposed to be listed as a Federal threatened or endangered species or designated critical habitat in the project area? If so, would they be affected by any activities associated with the proposed project?

The Northern Long-Eared Bat, suspected of reside in Western South Dakota wooded areas, is on the Federal Endangered Species list. Therefore, according to the Bureau of Reclamation, we are to do no work from March 1 to October 31. We do not intend to remove any trees, but just in case, our work would then begin after October 31, when they move on and hibernate.

- ❖ Are there wetlands or other surface waters inside the project boundaries that potentially fall under CWA jurisdiction as “Waters of the United States?” If so, please describe and estimate any impacts the proposed project may have.

Not applicable as there are no wetlands that will be affected in this area.

- ❖ When was the water delivery system constructed?

- The Belle Fourche Project was authorized by the Secretary of the Interior for construction on May 10, 1904. Surveys for the project began in 1903. The Bureau of Reclamation, then Reclamation Service, began construction of the facilities in 1905, and by 1908, construction was sufficient to begin delivering water to about 12,000 acres. The original project was completed in 1914. In 1949 the operation and maintenance responsibilities were transferred from Reclamation to the Belle Fourche Irrigation District (BFID). In 1985 the most recent rehabilitation and betterment (R&B) of the district facilities were done, and through the authorization of the R&B, the Belle Fourche Project became the Belle Fourche Unit as it was moved to fall under the Missouri Basin Pick-Sloan Plan. The Belle Fourche Dam serves water to 57,183 irrigable acres on the Belle Fourche Unit. The dam is an off-stream storage dam located on Owl Creek, with average inflows of 116,000 acre-feet. The water supply for the District is the Belle Fourche River, with a drainage area of 4,300 square miles above the Belle Fourche Diversion Dam located on the Belle Fourche River

near the town of Belle Fourche, South Dakota. The Diversion Dam diverts water into the Inlet Canal, which delivers water to the dam. Irrigable lands are served from the dam by North and South Canals, except for the lands along the Inlet Canal, which depend on diversions from the river or water from Keyhole Reservoir in Wyoming. Reclamation holds the water right for storage of water in the Belle Fourche Reservoir through the water rights laws of the State of South Dakota. The District is responsible for all operation and maintenance costs involving the dam and the distribution system, which has 66 miles of main canals (North and South Canals), 450 miles of laterals, and 232 miles of open drains. The Belle Fourche Irrigation District (BFID) is responsible for all dam operation and maintenance costs; for Reclamation facilities, project improvements funding is a budget problem.

- ❖ Will the proposed project result in any modification of or effects to, individual features of an irrigation system (e.g., headgates, canals, or flumes)? If so, State when those features were constructed and describe the nature and timing of any extensive alterations or modifications to those features completed previously.

No contributing features will be compromised during this project.

- ❖ Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places? A cultural resources specialist at your local Reclamation office or the State Historic Preservation Office can assist in answering this question.
  - The Belle Fourche Irrigation District is a historic district eligible for listing on the National Register of Historic Places. The District was determined eligible under Criterion A, at the state and local level, for the National Register on August 25, 2002 (SHPO File #020716005F). The District's period of significance is 1904 to 1949. Individual waterways are either contributing or non-contributing to the District's historical integrity. In consultation with the South Dakota State Historic Preservation Officer (SHPO) in 2002, it was determined that for a lateral to retain integrity, at least fifty percent of the lateral's length continues to exist in its original alignment and not be placed in the pipe. In addition, at least fifty percent of the historic structures associated with the lateral must remain and retain integrity. The Meade Lateral is not a contributing feature, therefore, it has lost integrity and is now considered non-contributing.
- ❖ Are there any known archeological sites in the proposed project area?
  - No archeological
- ❖ Will the proposed project have a disproportionately high and adverse effect on low income or minority populations?
  - This project should not affect the population or have any adverse effects.
- ❖ Will the proposed project limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands?
  - No

- ❖ Will the proposed project contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species in the area?
  - The proposed project will eliminate continued existence, and the spread as the ditch would be removed, preventing the weeds from spreading.

### **National Environmental Policy Act**

- ❖ During the NEPA process, a project's potential impacts are evaluated in context and in terms of intensity (e.g., will the proposed action affect the only native prairie in the county?).
  - This project will only affect the native prairie in Butte County.
- ❖ Will the proposed action reduce water supplied to a wetland by 1 percent? Or 95 percent?). The best source of information concerning the potentially significant issues in a project area is the local Reclamation staff with experience in evaluating effects in context and by intensity.
  - This project should not affect any wetland negatively.

### **National Historic Preservation Act**

- ❖ **The Bureau of Reclamation has approved the preliminary project.**

### **Endangered Species Act**

- ❖ **The Bureau of Reclamation has approved the preliminary project and sees no adverse effects.**

## Project Budget

### ❖ Budget proposal

BUDGET ITEM DESCRIPTION	COMPUTATION		Quantity Type	TOTAL COST
	\$/Unit	Quantity		
Salaries and Wages				\$86,114.08
Manager	\$26.52	206.0	hours	\$5,463.12
Foreman	\$24.06	430.0	hours	\$10,345.80
Administration	\$18.26	50.0	hours	\$913.00
Operator 1	\$22.99	424.0	hours	\$9,747.76
Operator 2	\$20.85	424.0	hours	\$8,840.40
Operator 3	\$19.50	392.0	hours	\$7,644.00
Truck Driver	\$18.00	400.0	hours	\$7,200.00
Truck Driver 2	\$19.23	400.0	hours	\$7,692.00
Labor (pipe Layer)	\$18.00	240.0	hours	\$4,320.00
Labor (pipe Layer)	\$17.45	400.0	hours	\$6,980.00
Laborer	\$15.00	300.0	hours	\$4,500.00
Laborer	\$15.00	280.0	hours	\$4,200.00
Laborer	\$19.50	424.0	hours	\$8,268.00
Fringe Benefits				\$22,506.50
Manager	\$5.02	206.0	hours	\$1,034.12
Foreman	\$6.40	430	hours	\$2,752.00
Administration	\$5.83	50.0	hours	\$291.50
Operator 1	\$6.30	424.0	hours	\$2,671.20
Operator 2	\$6.10	424.0	hours	\$2,586.40
Operator 3	\$5.95	392.0	hours	\$2,332.40
Truck Driver	\$5.78	400.0	hours	\$2,312.00
Truck Driver 2	\$5.92	400.0	hours	\$2,368.00
Labor (pipe Layer)	\$5.79	240.0	hours	\$1,389.60
Labor (pipe Layer)	\$1.79	400.0	hours	\$716.00
Laborer	\$5.48	300.0	hours	\$1,644.00
Laborer	\$5.47	280.0	hours	\$1,531.60
Laborer	\$2.07	424.0	hours	\$877.68
Use of District-owned Equipment				\$86,384.08
Case Backhoe	\$36.41	408	hours	\$14,855.28
Skid Steer case	\$21.37	408	hours	\$8,718.96
Cat Excavator	\$58.54	408	hours	\$23,884.32
Allis Chalmers Fork Lift	\$19.70	48	hours	\$945.60
Peterbilt/Trailer	\$53.73	40	hours	\$2,149.20
GMC Semi/Trailer	\$53.73	40	hours	\$2,149.20
GMC Dump Truck	\$50.67	100	hours	\$5,067.00
GMC Dump Truck	\$50.67	100	hours	\$5,067.00

Cat Dozer D6	\$51.44	408	hours	\$20,987.52
Rental of remote trench roller	\$640.00	4	weeks	\$2,560.00
Supplies and Materials Federal				\$222,842.04
Supplies and Materials District				\$31,140.68
Pipe Glue	\$86.27	4		\$345.08
Pipe Cleaner	\$67.10	4		\$268.40
Pipe Lubricant	\$51.36	20		\$1,027.20
21" x 18.7" PVC PIP Reducer 100 PSI	\$208.89	1		\$208.89
21 x 12 Tee 100 PSI	\$671.69	3		\$2,015.07
18 x 12 Tee 100 PSI	\$461.23	3		\$1,383.69
18 X 15 Tee 100 PSI	\$487.32	1		\$487.32
18" 22.5° Elbow 100 PSI	\$433.60	2		\$867.20
18.7" 45° Elbow 100 PSI	\$487.79	2		\$975.58
21" x 4" Tee	\$579.00	2		\$1,158.00
18" x 4" Tee	\$342.75	2		\$685.50
30" Fernco Coupling	\$1,700.00	1		\$1,700.00
4" Air Vent	\$339.00	6		\$2,034.00
12" Valves	\$2,214.00	4		\$8,856.00
18" Valves	\$3,812.00	2		\$7,624.00
12" Alfalfa Riser	\$302.00	4		\$1,208.00
Valve Wells	\$1,121.48	6		\$6,728.88
Valve Well Lids	\$312.20	6		\$1,873.20
30" x 21" Reducer 100PSI	\$1,936.00	1		\$1,936.00
Accessories for flanges	\$121.86	6		\$731.16
CRP Mix grassland	\$250.00	12		\$3,000.00
Pipe Bedding	\$9.95	189		\$1,880.55
21" 100 PSI PVC Pipe	\$45.96	2000		\$91,920.00
18" 100 PSI PVC Pipe	\$32.97	2200		\$72,534.00
Magnetic Flow meters	\$5,900.00	5		\$29,500.00
Ultra Mag 18" Flow Meter	\$9,035.00	1		\$9,035.00
Contingencies	\$4,000.00	1		\$4,000.00
Other				\$3,000.00

Environmental compliance/review	\$3,000.00	1		\$3,000.00
<b>TOTAL DIRECT COSTS</b>				<b>\$451,987.38</b>
Indirect Costs				
None				\$0.00
<b>TOTAL ESTIMATED PROJECT COSTS</b>				<b>\$451,987.38</b>
<b>Funding Sources</b>	<b>Percent of Total Project Cost</b>	<b>Total Cost by Source</b>		
Recipient Funding	50%	\$226,145.34		
Reclamation Funding	50%	\$225,842.04		
<b>TOTALS</b>	<b>100%</b>	<b>\$451,987.38</b>		

❖ **Budget Narrative**

- The in-kind match BFID will provide will include equipment, person-hours, and some materials and supplies. It is assumed to take 51 days to complete this project. Three days to mobilize the equipment, haul PVC pipe, and appurtenances to the Meade Lateral. Once the equipment is on location, BFID will shoot the ditch for grade and begin digging to create a foundation for the bedding and pipe according to specifications and the design drawing. BFID is confident that approximately 100 feet of pipe and appropriate appurtenances can be installed, taking approximately 42 days. Approximately six days will be reserved to install the magnetic flow meters, valves, valve wells, and alfalfa risers. Demobilization will take two days to clean up, remove all equipment and debris, repair the road and reseed the ground. All labor and fringe benefits listed in this proposal are based on actual wages and fringe benefits as of July 28, 2022. Labor and fringe benefits are approximately \$108,620.58 and are spent as follows:
  - Project Manager: Will be on location during the project to oversee the foreman and observe the status of work being done, as well as manage any budgetary issues that may arise—approximately 206 hours for a total of \$6,497.24.
  - Project Foreman: On location, the duration of the job to oversee all work is done accurately and safely. Foreman's total of 430 hours at his current pay rate with fringe

- benefits total \$13,097.80. Foreman is hands-on and assists the crew as well. In addition, he is responsible for the project and tracking all work done.
- Office Administration: Approximately 50 hours estimated for the Administration, \$1204.50 to document all hours, receipts, and equipment usage, and to file all quarterly reports promptly.
  - Operators: Utilized daily to operate the equipment, they will be on location 392 to 424 person-hours each for a combined total of \$33,822.16. Operators will shoot the ditch for the grade, lay approximately 100 feet of pipe daily, and install the valves, measuring devices, and valve wells in approximately 53 days.
  - Truck drivers: Haul all equipment, pipe, machinery, and other tasks needed to the location; they will also drive the dump trucks to haul the bedding for the pipeline. The truck drivers will also be used to install the pipe in the trench and perform other tasks. The estimated usage for two men is 400 hours each for \$19,572.00. Our employees are cross-trained, and these have CDLs.
  - Laborers: Used to lay pipe, keep the area clean and safe, and assist the foreman and operators as needed; estimated costs for these employees are \$34,426.88. These employees are used in the trench to compact the soil with the roller packer. Also, they clean and glue the pipe together and do all the foreman assigns them. In addition, they will help the operators with mobilization, demobilization and clean-up of the project.
  - BFID used the United States Army Corps of Engineers (USACE) ownership and operating schedule to determine the equipment hours and adjust them to our equipment.
  - Case backhoe-408 hours @ \$36.41 to backfill, move earth, and haul pipe on location for a total of \$14,855.28.
  - Case skid steer-408 hours @ \$21.37 used to load pipe backfill and disperse the pipe bedding for a total of \$8,718.96.
  - Caterpillar excavator-408 hours @ \$58.54 used to dig pipeline and valve wells-\$23,884.32.
  - Allis Chalmers forklift will be used with the skid steer to load pipe in the staging area for 48 hours- \$945.60.
  - Semi-trucks- will be used to haul all equipment and pipe to the location estimated usage is 40 hours each for a total of \$4,298.40.
  - Dump Trucks- BFID estimates the time to haul pipe bedding and gravel from District Headquarters or Centennial Quarry to the location as 100 hours per truck combined total-\$10,134.00.
  - Caterpillar D6 dozer-408 hours @ \$51.44 used to move earth-\$20,987.52.
  - Roller Packer- will be used to pack the bedding BFID will be renting it for four weeks for \$2,560.00.
  - BFID will provide the pipe glue, pipe cleaner and lubricant, an 18" ultra mag flow meter, and other contingencies with cash of \$31,140.68.



- District total in-kind and monetary match of \$226,145.34. All of these funds will be contributed by assessment income and savings accounts. All wages, fringe benefits, appurtenances, pipe, and supplies are based on costs as of today, July 28, 2022.
- Federal funds will be used to purchase 2000 feet of 21-inch PVC PIP at \$45.96 per foot for a total of \$91,9210.00 and 2200 feet of 18-inch PVC PIP at \$32.97 per foot for a total of \$72,534.00, elbows, tees, valves, alfalfa risers, air vents, and other appurtenances which cost \$58,388.04. Federal funds will also be used to pay for NEPA, NHPO, and ESA, the total federal funds requested through this funding opportunity are \$225,842.04

**Funding plan and letters of commitment**

**RESOLUTION FOR WATER AND ENERGY EFFICIENCY  
GRANT PROGRAM:**

**WaterSMART**

**Fiscal year 2023**

**Funding Opportunity No. R23AS00008**

**July 5, 2022**

**WHEREAS**, the Belle Fourche Irrigation District in Newell, South Dakota is a legally organized irrigation district in the State of South Dakota, and

**WHEREAS**, the District promotes, supports, and encourages water conservation, and

**WHEREAS**, the District urgently needs system improvements to maximize the utilization of a limited water supply and help sustain the viability of the project.

**THEREFORE, BE IT RESOLVED** that the Board of Directors of the Belle Fourche Irrigation District in South Dakota agrees and authorizes that:

1. The Board has reviewed and supports the application proposal to the WaterSMART: Water and Energy Efficiency Grant Fiscal Year 2023;
2. The Board authorizes the District Secretary, Tara Tennis, the legal authority to enter into the WaterSMART: Water and Energy Efficiency Grant Fiscal Year 2023;
3. The Belle Fourche Irrigation District in South Dakota is capable of providing the in-kind services and matching obligations, and
4. If selected for a Small-Scale Water Efficiency Grant, the applicant will work with Reclamation to meet established deadlines for entering into a cooperative agreement.

**X** Randy Oliver

Randy Oliver  
Chairman of the Board of Directors

**X** Joel Brunner

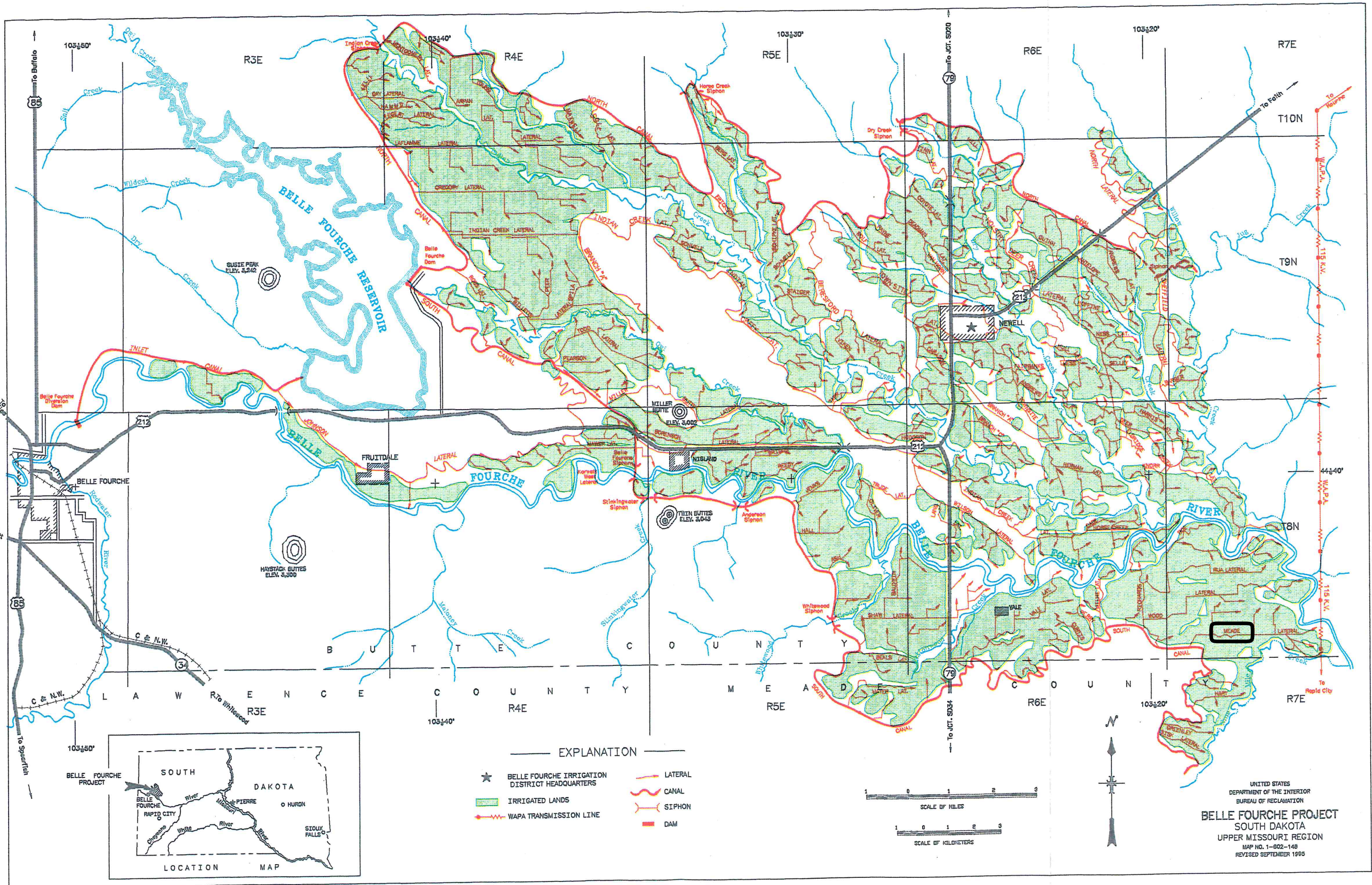
Joel Brunner  
Vice-Chairman of the Board of Directors

ATTESTED BY:

**X** Debra Steele

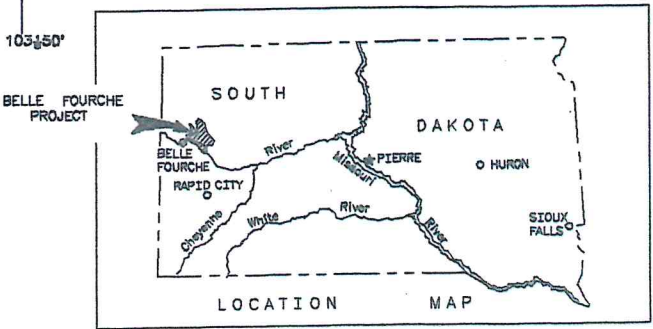
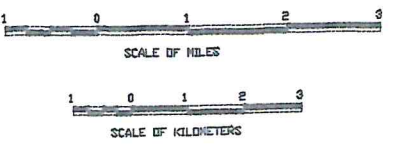
Debra Steele  
Secretary of the Board of Directors

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EXPLANATION

- ★ BELLE FOURCHE IRRIGATION DISTRICT HEADQUARTERS
- IRRIGATED LANDS
- WAPA TRANSMISSION LINE
- LATERAL
- CANAL
- SIPHON
- DAM



UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF RECLAMATION  
**BELLE FOURCHE PROJECT**  
SOUTH DAKOTA  
UPPER MISSOURI REGION  
MAP NO. 1-802-148  
REVISED SEPTEMBER 1965