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TITLE PAGE

WaterSMART: Water and Energy Efficiency
Grant Program

PROJECT TITLE:

Improving Fort Shaw Irrigation District Water Efficiency
to
Improve Sun River Flow Phase II

APPLICANT:

Fort Shaw Irrigation District
P.O. Box 154
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PROJECT MANAGER

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e. TECHNICAL PROPOSAL

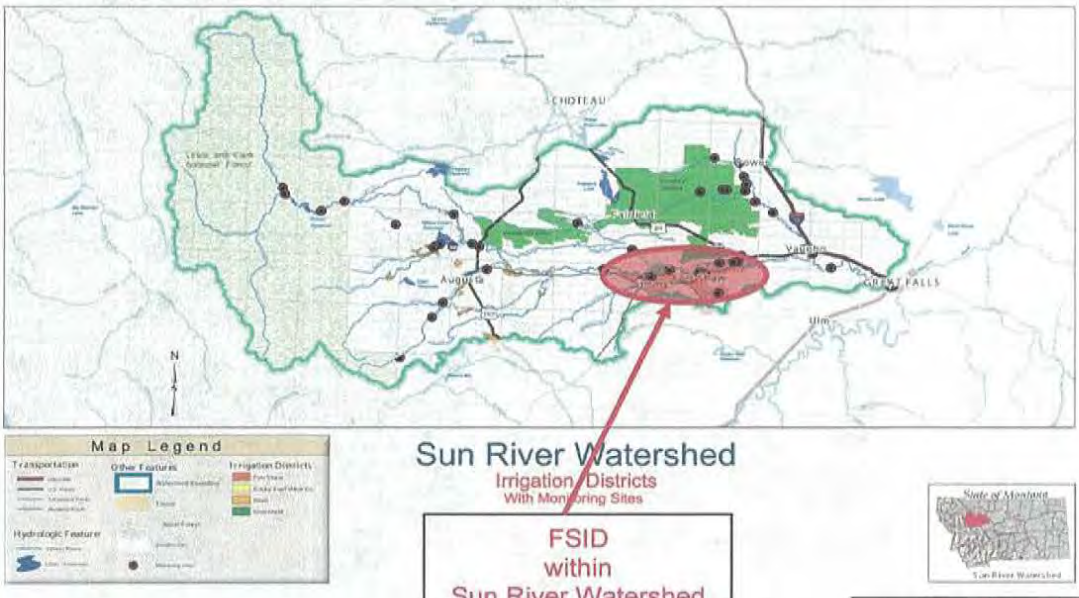
(1) Technical Proposal: Executive Summary

- **Date**: January 7, 2013
- **Applicant**: Fort Shaw Irrigation District
- **City**: Fort Shaw
- **County**: Cascade
- **State**: Montana

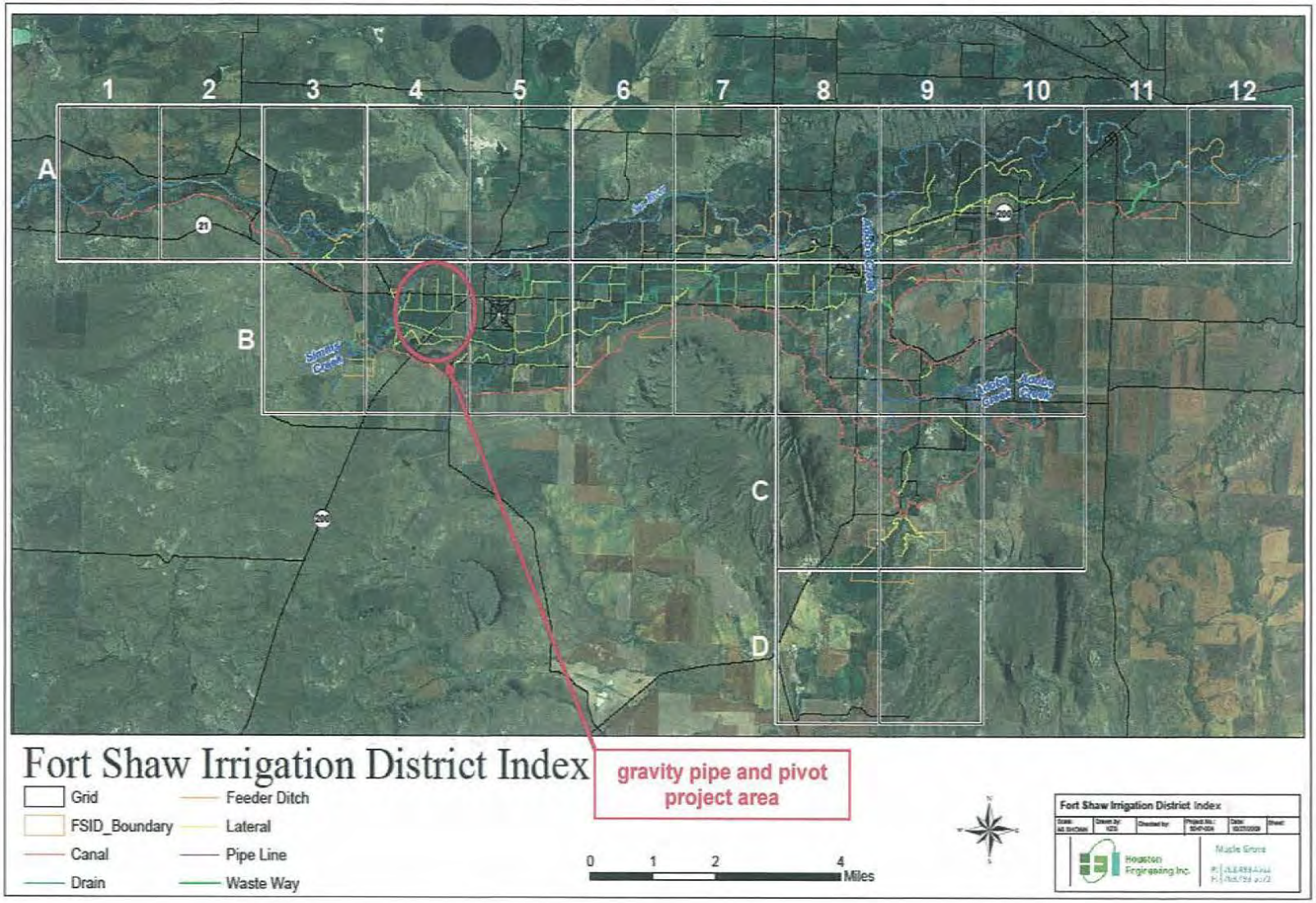
- **Project summary:** Task Area A - Water Conservation.
  The Fort Shaw Irrigation District (FSID or District) is an aging Bureau of Reclamation (BoR) facility with many needs that will be addressed in this proposal. The project proposal will take the most antiquated and wasteful delivery systems and upgrade them to improve water management and reduce energy costs for producers while improving instream flows in the Sun River. The water savings will be 7 additional cfs (3,000 acre-feet) over the summer to the Sun River, which has recently gone dry below the District's headworks on numerous occasions over the past ten years. This will be accomplished by replacing 10,800 feet of a very leaky open ditch and flood irrigation with a gravity pipeline and pivot irrigation.
- **Project length**: one year
- **Estimated completion** June 30, 2014

(2) Technical Proposal: Background Data –

- **Geographic location - state and watershed map:**



Fort Shaw Irrigation District's map



Sun River Watershed/County Boundary Map

The Fort Shaw Irrigation District (FSID or District) is located 20 miles northwest of Great Falls, Montana, and involves the irrigation of agricultural crops (wheat, barley, alfalfa and grass) on more than 11,000 acres on 177 small farms. The irrigation project was originally completed in 1908 with a small rehabilitation program completed in 1961.

In 1982, the Bureau of Reclamation (BoR) reviewed the District's infrastructure status that identified many areas in immediate need of repair to enhance the District's efficiencies. An important part of that report listed the opportunity to improve the delivery system by converting open ditches to pipelines to improving water management. Some of these pipelines could also conserve energy through gravity delivery to on-farm irrigation systems. Because of the small size of the district and low net return from the crops, improvements to the project in the past have been minimal.

Water is supplied to the project from the Sun River to the Fort Shaw Canal, utilizing a rock overflow dam as a diversion structure. The water flows from the river by gravity through the main canal and into the distribution system. The Fort Shaw canal is 16 miles in length and the distribution laterals total 85 miles in length. The canal capacity is 225 cfs.

As the water diverted from the Sun River makes its way across the project, project inefficiencies and major seeps in the canals have an estimated total district efficiency of only 46% as identified from a 1982 BoR review. This loss is readily noticed in the loss of acreage from the boggy areas and areas with high salinity. This loss of delivery water impacts the small farmers, fisheries, wildlife and recreation in the area.

Willow Creek Dam and Reservoir with 32,000 acre-feet storage is the only facility for the

District to supplement the Sun River stream flows as needed. This reservoir can be critical to the water supplies of the district during dry years. The Greenfields Irrigation District of the Sun River project operates the reservoir.

A hydromet station at the headworks measures all inflows to the district. Water measurement devices have also been installed at three other key locations. Water Inventory Data Estimation:

- Diverted from Sun River = 45,000 acre-feet
- Delivered to farm units = 20,000 acre-feet
- Operation spills, seepage, evaporation, and transportation losses = 25,000 acre-feet
- On-farm efficiency is estimated at 50-75% depending upon soils and type of irrigation

All assessed lands within the district are taxed $17.50 for 2 acre/feet.

Gravity irrigation with contour ditches is the most common method of irrigation used in the area. Pumping water to through gated pipe is fast becoming a common tool for many farm operations which has saved water but increased operational costs. Several pivots have been installed recently as a means to increase efficiency. Some irrigators are evaluating gravity sprinkler systems as a possible alternative.

Soils throughout the irrigation district vary significantly. Those in the alluvial valley floor have medium to heavy textures and are underlain with sands and gravels. The old river terraces adjacent to the alluvium have medium gravelly-textured profiles. Soils adjacent to Shaw and Square Buttes are composed of silty clay loams and clay loams underlain by shale and sandstone parent materials. Drainage is a problem in the areas with heavier soils with some of the land having gone out of production.

Past twelve years of improvements working with BoR and many other watershed partners include:

- 1998 - Hydromet station at headworks and three key sites on main canal
- 1999 - Headwork gates automated allow for remote monitoring and operation
- 2000-2010 - Canal lining with "canal lining" on 6,000 feet of main canal
- 2000- 2010 - Replacement of 35 farm turnouts with larger size and that allow for measurements
- 2000-2010 - Replaced 2,000 feet of open canal with PVC piped system
- 2002 - Installed a ¾ mile pipeline that replaced 5 miles of open canal
- 2011 - Have replaced over 2,000 feet of open canal with PVC piped system and in the process of changing an additional 3,000 feet of canal with PVC.

BoR in each of these projects assisted District in design, NEPA review, and project oversight.

Operation and Maintenance Program - Since the District has very limited funds, past attempts to incorporate some of the BoR ideas have not taken place. Even previous grants with matching loan requirements were limited due to funding. Starting in 1997, in cooperation with local, state and federal grants and in-kind assistance, the district started an ambitious water conservation and management program. This has included the

automation of the headworks, water measurement at several key locations, canal lining, a siphon to eliminate five miles of canal, landowner education programs, district board education programs and district staff education programs. The result has been a savings of 20,000 acre-feet of water annually that has been utilized to improve Sun River flows and sustain the district to meet the demands of its producers in the ongoing droughts of this region.

(3) Technical Proposal: Technical Project Description

The overall goal of this project is to conserve energy and improve the irrigation efficiency of the District to benefit the entire Sun River Watershed. This will be accomplished by replacing 10,800 feet of open ditch with gravity pipeline system and flood irrigation with pivots, conserving water, and reducing losses so they may be utilized for reuse by the irrigation district in water short years, save water for the basin to allow more water for fisheries, drinking. Water savings was calculated by using current delivery of 3,900 acre-feet through A-2-9 canal system for 636 acres that will be reduced to 1,300 acre-feet in a closed pipe system. Specifically, the District will:

Objective 1 - Improve irrigation efficiency of the District by 5% (3,000 acre/feet)

Task 1 - Bureau of Reclamation complete NEPA and NHPA Aug - Sep 2013
- Bureau of Reclamation with District assistance will complete a detailed environmental and historic compliance review for the proposed project.

Task 2 - Final engineering, review and certification of design Oct - Nov 2013
- District and BoR will work closely on final designs of project this major project to meet all state and federal requirements

Task 3 - Install 10,800 feet of PVC pipe Nov - Dec 2013
- Solicit and award material bids for PVC pipe
- FSID 3-person crew assist excavator dig trench, place bedding material, lay pipe, and pack around pipe
- FSID excavator digs trench, place bedding material and help pack material
- FSID dozer fills in trench
- FSID 3-person crew hook headgates, farm turnouts, and vents to PVC pipe
- FSID manager oversee construction phase

Task 4 - Install 6 pivots for 481 acres Nov - Dec 2013
- Solicit and award material bids for pivots
- Contractor install pivots

Task 5 - Reporting, compliance review and monitoring Aug 2013 - June 2014
- FSID manager bid materials, get permits, track funds, and file reports
- FSID and BoR project compliance review
- FSID test system for successful installation
- SRWG staff monitors water quantity in the Sun River for two years to track project success

Results - Better water management, reduced energy by eliminating irrigation pump costs and water savings of approximately 3,000 acre-feet per year which will improve water quantity in the Sun River.

(4) Technical Proposal: Evaluation Criteria

Evaluation Criterion A: Water Conservation
- Subcriterion No. 1 - Water Conservation
- Subcriterion No. 1(a)—Quantifiable Water Savings:

Describe the amount of water saved. For projects that conserve water, state the estimated amount of water conserved in acre-feet per year that will result as a direct benefit from this project. Please provide sufficient detail supporting the estimate, including all supporting calculations. Please also include the following:

• What is the applicant's average annual acre-feet of water supply?

- 54,000 acre-feet is diverted from Sun River
- 20,000 acre-feet is delivered to farms

- 3,900 acre-feet measured entering A-2-9 system currently being delivered to 636 acres with only 1,300 acre-feet required for on-farm use. Loss of almost 3,000 acre-feet.

• Where is that water currently going (i.e., back to the stream, spilled at the end of the ditch, seeping into the ground, etc.)?

- 34,000 acre-feet is spills, seepage, evaporation, and transportation losses
  - 15,000 is operational spills into Sun River
  - 19,000 is delivery losses from evaporation and seeps into ground

• Where will the conserved water go?

- 3,000 acre-feet will be conserved from improved water management with savings to be left in the Sun River increasing summer flows by approximately 7 cfs. This 7 cfs is crucial when current river flows reach as low as 30 cfs, which is almost half of the desired bare minimum flows of 50 cfs that the watershed partners are trying to maintain.

- Subcriterion No. 2—Percentage of Total Supply:

- **Describe the percentage of total water supply conserved:** State the applicant's total average annual water supply in acre-feet. Explain how this calculation was made.

- 54,000 acre-feet is diverted over the entire irrigation season that is measured in the canal just below the headworks where water is diverted from the Sun River.
- 20,000 acre-feet delivered to the farms is measured at each farm turnout

- Subcriterion No. 3—Reasonableness of Costs:
Please include information related to the total project cost, annual acre-feet conserved (or better managed), and the expected life of the improvement. Use the following calculation:

$$\frac{\$788,329}{3,000 \text{ acre-feet} \times 40 \text{ years} = 120,000 \text{ acre-feet}}$$

Relating to a $6.57 per acre-foot cost

The above calculation does not include the energy savings by converting to gravity irrigation and major water management improvement this project will benefit for almost 636 irrigated acres of the district.

- For all projects involving physical improvements, specify the expected life of the improvement in number of years.

  - Life expectancy of buried PVC pipe and pivots per NRCS field guide specification is approximately 25 years however past actual experience is closer to 40 years.

Evaluation Criterion E: Other Contributions to Water Supply Sustainability

(1) Will the project make water available to address a specific concern? Example:

- Will the project address water supply shortages due to climate variability and/or heightened competition for finite water supplies (e.g. population growth or drought)

  - The Sun River Watershed water rights are over three times average available water supply using known state water right records. The water conflict for this limited water supply become even more heightened in drought years which have been fairly frequent in the past ten years. In the past ten years the snowmelt and in-turn water runoff has been coming off sooner due to climate change making it less available for the irrigators and the aquatic life. Any water savings like this project that is beneficial for the District and the river need to be installed as soon as possible to help reduce water wars.

- Will the project market water to other users? If so, what is the significance (e.g., stretch water supplies in a water-short basin)?

  - The water will not be marketed to other users but will be part of a team effort to better share this limited resource in the water-short basin.

- Will the project make additional water available for Indian tribes?

  - No.

- Will the project help address an issue that could potentially result in an interruption to the water supply if unresolved? (e.g., will the project benefit endangered species)?

  - No, the water will not benefit any endangered species unless you count the limited farmers in this area as endangered. But it will help improve flows in the Sun River that will benefit other water users including the fisheries.

- Will the project generally make more water available in the water basin where the proposed work is located?

  - Yes, the project will benefit a segment of the Sun River that routinely gets too low in the summer to sustain any aquatic life. Even the small amount of 10 cfs may be enough to help turn around the low numbers of fish in this stretch of the Sun River. Fish numbers are approximately 40 per mile and should be around 400 per mile.

(2) Does the project promote and encourage collaboration among parties?

- Is there widespread support for the project?

  - Yes, there is widespread support for this project. The Sun River Watershed Group (SRWG) that is a key part of this project is comprised of over 40 different groups and agencies including recreational, communities, businesses, other irrigation projects and state and federal agencies. For over 15 years the SRWG has worked hard to bring together these diverse groups to help solve natural resource issues. There have been many successes storing including the other FSID projects that have conserved annually almost 20,000 acre-feet of water.

- What is the significance of the collaboration/support?

  - When the SRWG was formed 15 years ago the area was in turmoil with irrigators fighting irrigators and irrigators fighting recreationists over the limited supply of this very important resource. Through hard-work and MANY meetings, the SRWG partners now work on solutions rather than pollution. To keep this team effort moving forward, the Sun River Watershed Group is pursuing water saving projects like this one to reduce the annual water demands so the extra water can be shared for instream flows and be available during drought years for irrigation.

- Will the project help prevent a water-related crisis or conflict?

  - Yes, the project will help divert a water related crisis in this watershed. Even though the SRWG has brought people together to solve local problems through local solutions there is a long ways to go. Getting this segment of the river to above 50 cfs is just the first step in meeting the water demands (see attachment #7 on page 28 for Sun River flow data). If there is going to be a healthy fisheries, the flow in the river must be raised to 130 cfs. This and many other projects being

pursued will help reach that goal and reduce the chance of a fragile relationship between water users from failing.

This will also eliminate friction between FSID water users because of current infrastructure limitations this project will eliminate. The project will install a pipe prior to adequate distribution to approximately 636 acres of the FSID water users.

(3) Will the project increase awareness of water and/or energy conservation and efficiency efforts?

- Will the project serve as an example of water and/or energy conservation and efficiency within a community?

  - Yes, the project will serve as another example of teamwork, conserving energy and water conservation. By continuing to find ways to conserve water the community will see first-hand that the District is not giving up on ways to help other water users. By eliminating the irrigation pumps the gravity irrigation system will save energy and money for individual producers which will also be another example of how this project will benefit society.

- Will the project increase the capability of future water conservation or energy efficiency efforts for use by others?

  - Yes, the project will increase the capability of water conservation efforts for use of others, primarily recreationists, communities and fish. The project will also save energy by converting a whole are to gravity irrigation.

- Does the project integrate water and energy components?

  - Yes, the project does integrate those two components by saving water and elimination of pumping water by converting to gravity irrigation.

Evaluation Criterion F: Implementation and Results
- Subcriterion No. 1 -- Project Planning

(1) Identify any district-wide, or system-wide, planning that provides support for the proposed project.

- The District completed a Water Management and Water Conservation Plan on May 13, 2009. The District prepared this plan as a management tool to improve the efficient use of available water, prioritize projects, improve water quality in the Sun River, improve the agricultural economy within the district, and fulfill the water conservation planning requirements stipulated in the Reclamation Reform Act of 1982. On page 15 in the plan, selected conservation measures to improve water management and water savings included this project.

(2) Identify and describe any engineering or design work performed specifically in

support of the proposed project.

- Initial design has been accomplished but final engineering work still needs to be completed prior to construction beginning. See attachment #5 on page 26 that shows maps of pipeline layout.

(3) Describe how the project conforms to and meets the goals of any applicable State or regional plans, and identify any aspect of the project that implements a feature of an existing water plan.

- Montana has a state water plan that can be seen on the web at: http://www.dnrc.mt.gov/wrd/water_mgmt/montana_state_waterplan/default.asp Part II of the plan includes "Subsection: Agriculture Water Use Efficiency". See attachment #8 on page 29. That subsection describes the need to improve efficiency so agriculture can withstand periods of drought; improve performance of aging irrigation facilities; and improved water quality. This project fits the state plan by accomplishing water conservation as a tool to improve flows in the state waters.

- The project also fits the Sun River Watershed Group's water management efforts as prioritized in a Sun River Special Study which was completed in 2012 and funded by Reclamation. See attachment #10 on page 36 for "Executive Summary" of Sun River Special Study report.

- Subcriterion No. 2 -- Readiness to Proceed

(1) Are all necessary plans/designs complete? Are there any delays expected to result from environmental compliance?

- Not all design work has been completed yet but will be easily accomplished within two months of getting green light for the project to begin. The District and BoR have completed several other projects and are fully prepared to easily complete design and environmental compliance review.

- There are not any expected delays from environmental compliance review.

(2) Describe the implementation plan of the proposed project.

- The stages of project implementation include:
  - #1 - BoR work on design, NEPA and NHPA Aug - Sep 2013
  - # 2 - BoR and District complete final engineering design Oct - Nov 2013
  - # 3 - Install PVC pipe and pivots - Nov - Dec 2013
  - # 4 - Reporting, compliance review and monitoring - Aug 2013 - Jun 2014

(3) Explain any permits that will be required and the process for obtaining such permits.

- Permits and the process required to obtain include:
  - No permits will be required for this project.

- Subcriterion No. 3 -- Performance Measures

Provide a brief summary describing the performance measure that will be used to quantify actual benefits upon project completion.

- Performance measures to document project benefits include the District comparing water delivered through the A-2-9 system and on-farm prior and after installing pipeline and the SRWG measuring flows in the Sun River at Simms, which is below FSID diversion point, for two years to comparing prior and post data changes that will occur after pipeline installed.

Evaluation Criterion G: Connection to Reclamation Project Activities

(1) How is the proposed project connected to Reclamation project activities?

- The BoR built the FSID as part of the Sun River project in 1908. Another part of the Sun River project is the Greenfields Irrigation District which this project will benefit also by increasing water availability to the river. BoR continues to be a major partner in District water conservation projects by providing people resources to find best ideas for the SRWG team effort.

(2) Does the applicant receive Reclamation project water?

- Yes. FSID was a BoR built project.

(3) Is the project on Reclamation project lands or involving Reclamation facilities?

- Yes to BoR lands and BoR facilities.

(4) Is the project in the same basin as a Reclamation project or activity?

- Yes to same basin as a BoR project - the Sun River project.

(5) Will the proposed work contribute water to a basin where a Reclamation project is located?

- Yes, work will contribute water to same basin where BoR project is located.

- 3,000 acre-feet will be conserved eliminating a very wasteful delivery system and replacing with a PVC pipe. The water saved will be left in the Sun River increasing summer flows by approximately 7 cfs. This 7 cfs is crucial when current river flows reach as low as 30 cfs, which is almost half of the desired bare minimum flows of 50 cfs that the watershed partners are trying to maintain.

f. Performance Measure for Quantifying Post-Project Benefits

Estimated water savings of approximately 3,000 acre/feet annually will benefit the infrastructure reliability of water for the irrigation district while improving water quantity for all other uses in the basin.

Pre-project: Flow measurements into the A-2-9 system have already been taken to identify potential savings.

Post-project: Gauges on the Sun River, flow measurements on the A-2-9 canal, flow measurements on the wastewater by the District and SRWG will help track all water savings. See attachment #7 on page 28 for Sun River flow data.

g. Environmental Compliance

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

- The project will have minor air disturbance during construction phase as the earth work of trenching and back-filling occurs. This will be minimized by reducing the length of time project is in construction phase.
- With extensive farming in this area, no animal habitat impacts are expected

(2) Are you aware of any species listed or proposed to be listed as a Federal endangered or threatened species, or designated Critical Habitat in the project area? If so, would they be affected by any activities associated with the proposed project?

- There are no species either listed or proposed to be listed in this area

(3) Are there wetlands or other surface waters inside the project boundaries that potentially fall under Federal Clean Water Act jurisdiction as "waters of the United States?" If so, please describe and estimate any impacts the project may have.

- There are no wetlands that will be impacted by the project.

(4) When was the water delivery system constructed?

- FSID delivery system was constructed in 1908

(5) Will the 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.

- The original delivery system is in disrepair and this will eliminate the need for its repair. Reclamation has reviewed the infrastructure in this area and has allowed projects like this to proceed.

(6) 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.

- Cultural resource areas within the district do exist. Previous inventories by the Bureau of Reclamation have located and identified the resources that should not be disturbed. All regulatory compliance requirements are not completed at this time; however they will be completed prior to initiation of this project. Fort Shaw Irrigation District will work closely with Reclamation to achieve compliance with both National Environmental Policy Act (NEPA) and National Historic Preservation Act (NHPA).

(7) Are there any known archeological sites in the proposed project area?

- There are no known archeological sites where this work will be accomplished

(8) Will the project have a disproportionately high and adverse effect on low income or minority populations?

- The project will have a beneficial impact on low income families as it improves their ability to increase production on what is currently waste land due to seeps

(9) Will the project limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands?

- There are no Indian sacred sites in this area

(10) Will the project contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area?

- There are noxious weeds in the area but FSID staff takes proactive approached to controlling the weeds and will take extra precaution not to move equipment through known old patch sites that may still have weed seeds. After construction the sites will be monitored for new weed infestations that can be controlled immediately.

h. Required Permits or Approvals

No permits required for this project.

i. FUNDING PLAN AND LETTERS OF COMMITMENT -

The District contributions to this project are $118,792 cash and in-kind services of labor and equipment to install pipe. SRWG will contribute $20,000 in-kind services to monitor instream flow changes over two years from this project. Producers will contribute $450,000 to install five pivots. Program grant funds for $199,537 are requested. Total project cost is $788,329.

The Sun River Watershed Group has agreed to assist through cash match and in-kind services the monitoring program. See attachment # 2 on page 23 for commitment of these resources.

The three producers have agreed to assist through cash match and in-kind services to improve irrigation practices on 636 acres. See attachment # 3 on page 24 for commitment of these resources.

These non-Reclamation funds and in-kind services exceed the 50% match required from this Challenge Grant program.

Table 2. Summary of non-Federal and Federal funding sources

Funding Sources	**Funding Amount**
Non-Federal Entities	
1. FSID in-kind & cash match	$118,792
2. Producers cash match	$450,000
3. SRWG in-kind	$ 20,000
Non-Federal Subtotal:	$588,792
Other Federal Entities	
1. None	
Other Federal Subtotal:	-0-
Requested Reclamation Funding:	$199,537
Total Project Funding	$788,329

j. Official Resolution

- See attachment #1 on page 22 for FSID resolution to commit $118,792 in-kind and cash support to accomplish project within one-year.

k. Budget Proposal:

(1) General Requirements

Task 1 - BoR or contract work on designs, NEPA and NHPA
- BoR with District for compliance work for the proposed project.
  - BoR or contract resources to accomplish - $44,047 - Grant
  - FSID labor, District manager - 100 hours x $30/hour = $3,000 - In-kind

Task 2 - Install 10,800 feet of PVC pipe
- *FSID prepare and award bid for PVC pipe, vents, gates, & turnouts*
  - FSID labor, District manager and secretary .....= $1,600 - In-kind
    - 40 hours @ $30/hour
    - 40 hours @ $10/hour
  - Buy PVC pipe, 10,800 feet of 8"-24" pipe - $139,940 - Grant
  - Buy headgates, field turnouts, vents - $ 13,550 - Grant
  - Buy pipe bedding material 2,400 yards @ $2.50/yard = $6,000 - cash match
  - *FSID crew dig trench, pack, lay pipe and refill*
  - FSID labor to accomplish core work
    - 1,200 total hours for 3 people @ $15/hour .....= $18,000 - In-kind
  - FSID labor, District manager - to oversee proper installation
    - 140 hours @ $30/hour ..... = $ 4,200 - In-kind
  - FSID excavator to dig trench and place pipe bedding material
    - 320 hours @ $140/hour ..... = $44,800 - In-kind
  - FSID truck to haul pipe bedding material
    - 165 hours @ $40/hour .....= $ 6,600 - In-kind
  - FSID dozer to backfill and pack trench
    - 140 hours @ $60/hour ..... = $ 8,400 - In-kind

Task 3 - Install new pivots
- Producers buy pivots to upgrade on-farm irrigation = $450,000 cash match

Task 4 - Reporting, compliance review and monitoring
- FSID District manager and secretary accomplish required grant and project monthly and final reporting and billing
  - FSID labor, District manager and secretary
    - 100 hours @ $30/hour ..... = $ 3,000 - In-kind
    - 225 hours @ $10/hour ..... = $ 2,250 - In-kind
  - BoR or contractor for final project inspection ..... = $ 2,000 - Grant
  - SRWG technician travel and labor to monitor flow over 2 years
    - 500 hours @ $40/hour ..... = $20,000 - In-kind

Other expenses - contingency and indirect
- Construction materials contingency @ 10% of materials grant costs
  - $153,490 total direct grant costs @ 10% .....= $15,349 - cash match
- Indirect costs of FSID in-kind costs may incur including postage, paper, and incidental labor
  - $111,850 FSID @ 5% of direct costs.....= $5,593 - In-kind

TOTALS **$588,792 match** $199,537 Grant

(2) Budget Table

BUDGET ITEM DESCRIPTION	COMPUTATION		RECIPIENT/ PARTNERS COST SHARE	RECLAMATION FUNDING	TOTAL COST
	Unit/price	Quantity			
SALARIES AND WAGES					
- Employee 1 - worker	$15/hour	400	$ 6,000	$ 0	$ 6,000
- Employee 2 - worker	$15/hour	400	$ 6,000	$ 0	$ 6,000
- Employee 3 - worker	$15/hour	400	$ 6,000	$ 0	$ 6,000
- Employee 4 - oversight	$30/hour	140	$ 4,200	$ 0	$ 4,200
EQUIPMENT					
- Excavator - dig trench& place pipe	$140/ hour	320	$ 44,800	$ 0	$ 44,800
- Dozer - shape canal refill trench	$60/hour	140	$ 8,400	$ 0	$ 8,400
- truck - haul fill	$40/hour	165	$ 6,600	$ 0	$ 6,600
SUPPLIES/MATERIALS					
- 24" PVC pipe	$24.00/ foot	2,550	$	$ 61,200	$ 61,200
- 21" PVC pipe	$18.00/ foot	1,350	$ 0	$ 24,300	$ 24,300
- 18" PVC pipe	$14.00/ foot	1,340	$ 0	$ 18,760	$ 18,760
- 15" PVC pipe	$ 10.00/ foot	1,720	$ 0	$ 17,200	$ 17,200
- 12" PVC pipe	$ 6.00/ foot	2,170	$ 0	$ 13,020	$ 13,020
- 10" PVC pipe	$ 4.00/ foot	450	$ 0	$ 1,800	$ 1,800
- 8" PVC pipe	$ 3.00/ foot	1,220	$ 0	$ 3,660	$ 3,660
- Tees & elbow	$500/ea	10	$ 0	$ 5,000	$ 5,000
- valves	$950/each	9	$ 0	$ 8,550	$ 8,550
- Gravel for pipe bedding	$ 2.50/yard	2,400	$ 6,000	$ 0	$ 6,000
- pivots	$450,000	All 5	$ 450,000	$ 0	$ 450,000
CONTRACTUAL					
- NONE					
OTHER					
Reporting	$10.00/ hour	265	$ 2,650	$ 0	$ 2,650
Compliance & reporting	$30.00/hour	240	$ 7,200	$ 0	$ 7,200
Monitoring -labor + travel	$40.00/ hr	500	$ 20,000	$ 0	$ 20,000
Engineering/NEPA/NHPA - USBR or contract	30% material costs	$153,490	$ 0	$ 46,047	$ 46,047
TOTAL DIRECT COSTS			**$ 567,850**	**$ 199,537**	**$ 767,387**
Contingency funds - 10%	10% direct	$ 153,490	$ 15,349	$ 0	$ 15,349
INDIRECT COSTS -_5_%	5% of direct	$ 111,850	$ 5,593	$ 0	$ 5,593
TOTAL PROJECT COSTS			**$ 588,792**	**$ 199,537**	**$ 788,329**

(3) Budget Narrative

Salaries & Wages

- FSID Program manager, Rich Boyle
  - $30/hour for all work
    - 140 hours for project crew oversight
    - 240 hours assisting BoR in compliance review, design and permitting
- FSID laborers - 3 person crew
  - $15/hour for pipe installation
    - 1,200 total hours to dig trench, pack, lay pipe, & refill
- FSID secretary
  - $10/hour - 265 hours to help manager with grant reports and material bids

Fringe Benefits - NONE

Travel - NONE

Equipment

- FSID excavators dig trench, lay pipe, bedding material, help backfill, dig canal
  - $140/hour which is going rate in this area
    - 320 hours for all tasks
- FSID truck to deliver pipe bedding material to the trench and canal project
  - $40/hour which is going rate in this area
    - 165 hours for all tasks
- FSID dozer to backfill trench and shape canal
  - $60/hour which is going rate in this area
    - 140 hours for all tasks

Materials & Supplies

- All materials below are for construction purposes and were estimated by acquiring quotes from local distributors
  - PVC pipe - 10,800 feet ..... .= $139,940
  - Major parts including inlet, outlet, turnouts, and elbows .....= $13,550
  - Gravel for pipe and canal @ $2.50/yard x 2,400 yards ..... = $6,000
  - 5 pivots for gravity irrigation ..... = $450,000

Contractual

- FSID will contract with BoR or private for NEPA, NHPA, final engineer design and project inspection estimated at 30% of materials costs ($153,490) = $46,047

Environmental and Regulatory Compliance Costs

- Part of BoR or private contractual costs listed above

Reporting

- FSID Program manager, Rich Boyle
  - $30/hour for all work

- 100 hours assisting in compliance review, permitting and project reporting
- FSID secretary
  - $10 hour for all work
    - 225 hours to specifically help with writing financial, program performance, semi-annual and final reports

Other

- SRWG technician, Alan Rollo
  - $40/hour for all monitoring work
    - 500 hours - monitoring flow over 2 years

Indirect Costs

- 5% rate FSID is using for any remaining costs not listed above including postage, paper, copies and other labor. 5% x $111,850 = $5,593

Contingency Costs

- 10% of materials contingencies costs to take in account inflation and/or possible material price increases. 10% x $153,490 = $15,349

Total costs

- Entire project .....= $788,329
- Non-federal cost-share with $117,443 indirect and $471,349 cash = $588,792
- Federal cost-share .....= $199,537

(4). **BUDGET FORM** – SF-424C, Budget Information

OMB Approval No. 0348-0041

BUDGET INFORMATION - Construction Programs

NOTE: Certain Federal assistance programs require additional computations to arrive at the Federal share of project costs eligible for participation. If such is the case, you will be notified.

COST CLASSIFICATION	a. Total Cost	b. Costs Not Allowable for Participation	c. Total Allowable Costs (Columns a-b)
1. Administrative and legal expenses	$ 9,850 .00	$ .00	$ 9,850 .00
2. Land, structures, rights-of-way, appraisals, etc.	$ 14,047 .00	$ .00	$ 14,047 .00
3. Relocation expenses and payments	$ 0 .00	$ .00	$ 0 .00
4. Architectural and engineering fees	$ 30,000 .00	$ .00	$ 30,000 .00
5. Other architectural and engineering fees	$ 0 .00	$ .00	$ 0 .00
6. Project inspection fees	$ 2,000 .00	$ .00	$ 2,000 .00
7. Site work	$ 22,200 .00	$ .00	$ 22,200 .00
8. Demolition and removal	$ 0 .00	$ .00	$ 0 .00
9. Construction	$ 609,490 .00	$ .00	$ 609,490 .00
10. Equipment	$ 59,800 .00	$ .00	$ 59,800 .00
11. Miscellaneous	$ 25,593 .00	$ .00	$ 25,593 .00
12. SUBTOTAL *(sum of lines 1-11)*	$ 772,980 .00	$ 0.00	$ 772,980 .00
13. Contingencies	$ 15,349 .00	$ .00	$ 15,349 .00
14. SUBTOTAL	$ 788,329 .00	$ 0.00	$ 788,329 .00
15. Project (program) income	$ 0 .00	$ .00	$ 0 .00
16. TOTAL PROJECT COSTS *(subtract #15 from #14)*	$ 788,329 .00	$ 0.00	$ 788,329 .00
FEDERAL FUNDING			
17. Federal assistance requested, calculate as follows: (Consult Federal agency for Federal percentage share.) Enter the resulting Federal share.	Enter eligible costs from line 16c Multiply X _____%		$ 0.00

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Prescribed by OMB Circular A-102

RESOLUTION

Fort Shaw Irrigation District
Board of Commissioners
Fort Shaw, MT 59443

RESOLUTION SPONSORING
BUREAU OF RECLAMATION 2013 WATER SMART GRANT
FOR GRAVITY IRRIGATION/WATER CONSERVATION

WHEREAS, Fort Shaw Irrigation District's infrastructure is in dire need of immediate and long-term improvements to conserve water and enhance delivery to water users, and

WHEREAS, Fort Shaw Irrigation District's overall infrastructure is in need of many improvements to improve its water management for this and future generations, therefore

BE IT RESOLVED, the Fort Shaw Irrigation District's Board of Commissioners has reviewed and authorizes the board chairman to pursue a Bureau of Reclamation 2013 WaterSMART grant for a gravity irrigation and water conservation project; and

BE IT FURTHER RESOLVED, the Fort Shaw Irrigation District's Board of Commissioners by the authority given to it by the State of Montana is committing the necessary resources and funds to complete the infrastructure project by June 30, 2014.

Dated this 8th day of January, 2013.

President

Attest:

Attachment #2

a non-profit organization benefiting all water users in the basin
816 Grizzly Drive Great Falls, Montana 59404 406-727-4437

January 8, 2013

Bureau of Reclamation
Acquisition Operations Group
Attn: Michelle Maher
Mail Code: 84-27810
P.O. Box 25004
Denver, CO 80225

RE: Letter of Commitment

Dear Bureau of Reclamation:

The Sun River Watershed Group is writing this Letter of Commitment for Fort Shaw Irrigation District's 2013 Reclamation WaterSMARTgrant application. The Sun River Watershed Group (SRWG) and the Fort Shaw Irrigation District (FSID) have been engaged for more than 15 years on several activities to improve the overall health of this basin. FSID's past and current irrigation project's compliment the overall efforts of the watershed program.

We will commit $20,000 of in-kind resources to monitor water quantity before and after project accomplishments to document any improvements.

The key enhancements of this project will be improved water quantity in the Sun River from more efficient use of the basin's limited water supply. This is a perfect fit of projects with positive goals under the SRWG's work-plan. The SRWG will assist FSID in a monitoring program to ensure this project actually meets these goals.

Call me at 406-727-4437 if have any questions concerning this project.

Sincerely,

Alan Rollo, Coordinator
Sun River Watershed Group

Cc: FSID

January 8, 2013

Bureau of Reclamation
Acquisition Operations Group
Attn: Michelle Maher
Mail Code: 84-27810
P.O. Box 25004
Denver, CO 80225

RE: Letter of Commitment

Dear Bureau of Reclamation:

We, Orville Skogen, Trevor McGurran, and Todd Klick are writing this Letter of Commitment for Fort Shaw Irrigation District's 2013 Reclamation WaterSMARTgrant application. We have been working with Fort Shaw Irrigation District (FSID) for more than 10 years to find a solution to irrigating these lands while conserving energy.

We will commit $450,000 of cash resources to install more efficient irrigation systems.

This project will benefit our lands while helping the overall water conservation efforts of many projects in the District.

Call us if have any questions concerning this project.

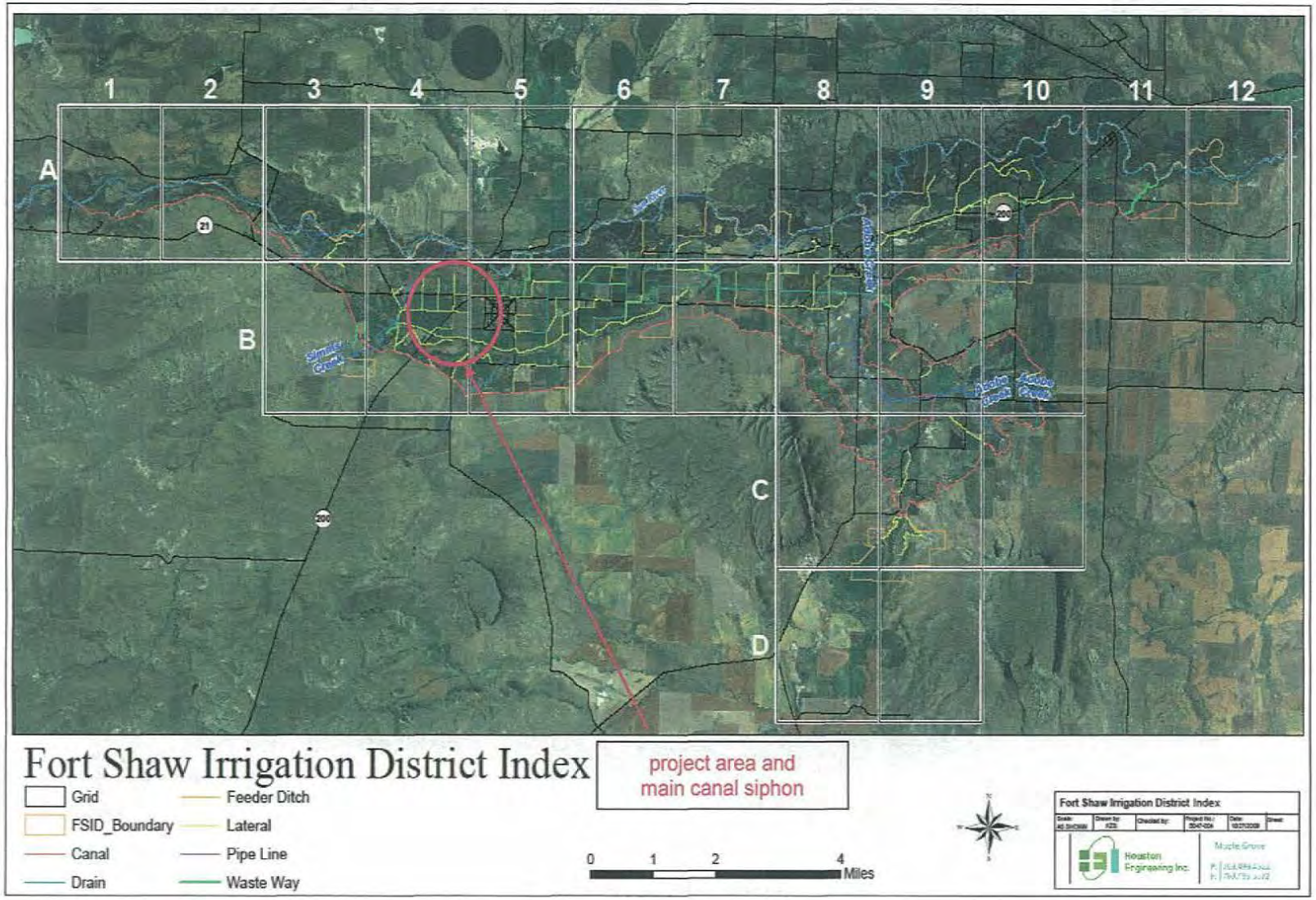
Sincerely,

Orville Skogen Trevor McGurran Todd Klick

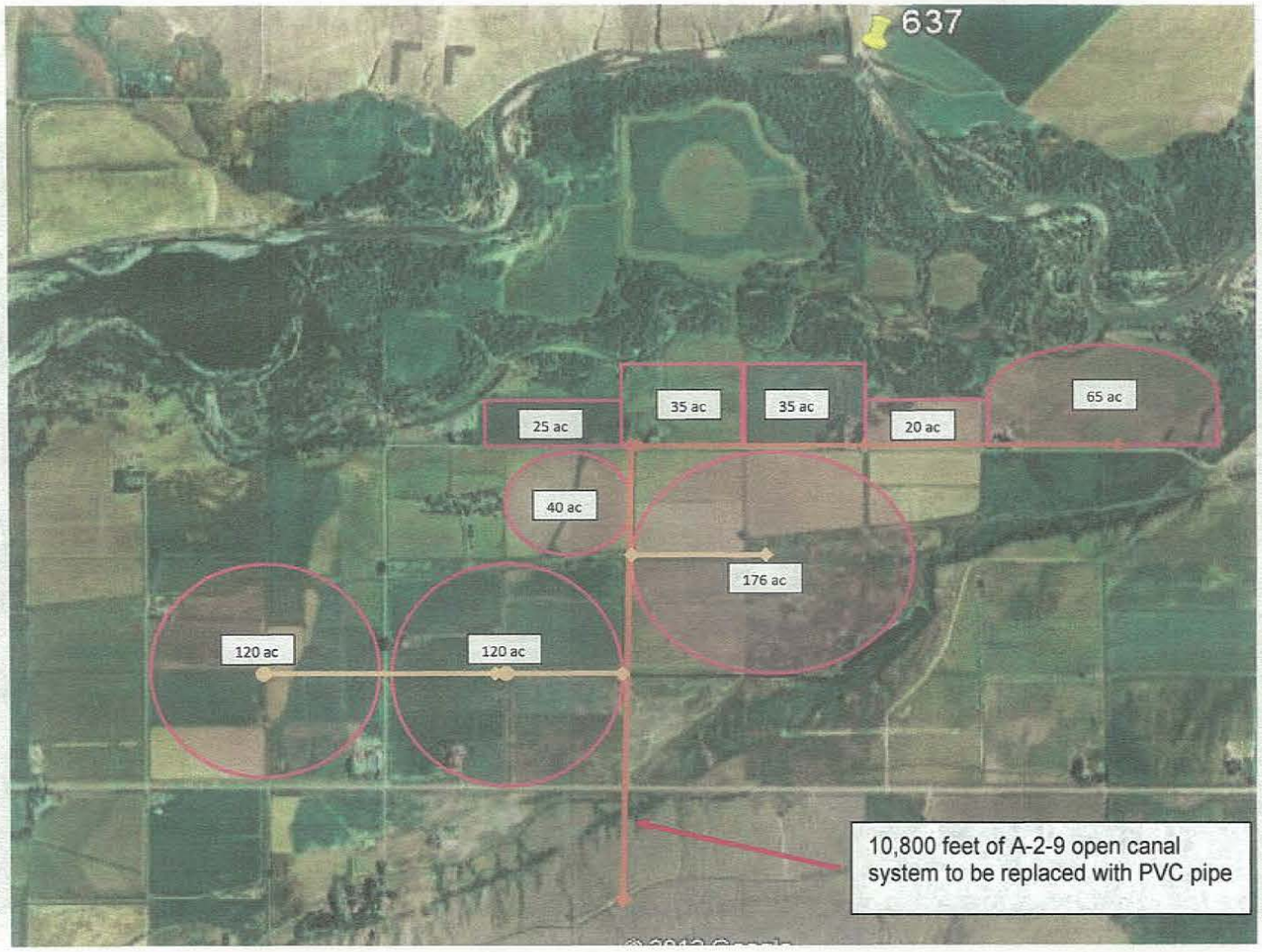
Cc: FSID

Attachment #4

Fort Shaw Irrigation District layout and project location



Proposed pipeline and pivot project



TROUT UNLIMITED
Laura Ziemer
Director, Montana Water Project

January 16, 2013

Bureau of Reclamation
Acquisition Operations Group
Attn: Michelle Maher
Mail Code: 84-27810
P.O. Box 25004
Denver, CO 80225

Re: Trout Unlimited's Support for Fort Shaw Irrigation District's WaterSmart Proposal

Dear Ms. Maher,

Trout Unlimited (TU) has been an active member of the Sun River Watershed Group for over a dozen years. During these last dozen years, TU has had extensive discussions with Sun River Watershed Group members about ways to improve agricultural operations within the watershed, while also improving the health of the Sun River. TU writes now to express its support for Fort Shaw Irrigation District's proposed project that does just that.

With the help of Reclamation, the Sun River Watershed has engaged in detailed project assessment and cost-effectiveness comparisons on a wide array of potential projects to accomplish this goal. The project proposed by the Fort Shaw Irrigation District in its 2013 WaterSmart request, *"Improving Fort Shaw Irrigation District Water Efficiency to Improve Sun River Flow, Phase II,"* is one of the projects that meets these carefully-considered criteria. This proposed project will address long-standing infrastructure needs while making a substantial contribution to restoring Sun River flows.

Please don't hesitate to contact me at lziemer@tu.org or (406) 522-7291 ext 103 if I can be of assistance to you in your effort to ensure that WaterSmart funds are awarded to high-value projects with benefits to agriculture, watershed health, and rural communities.

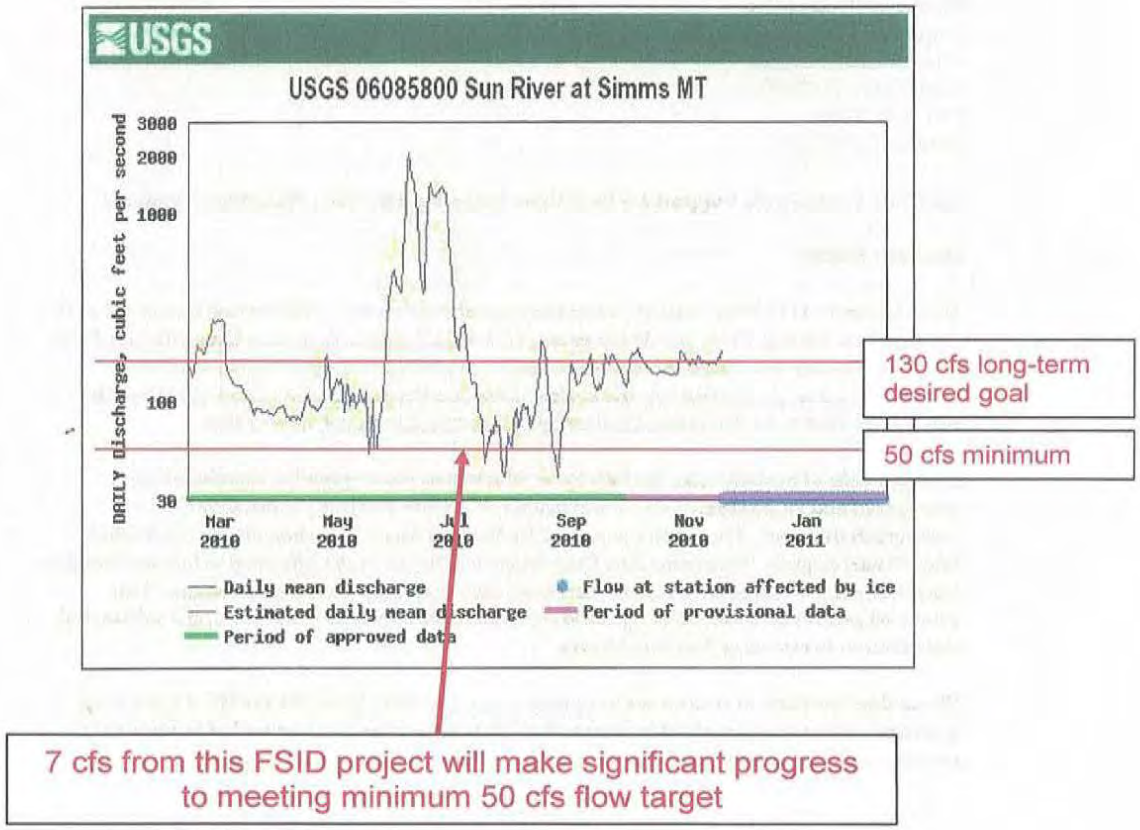
Yours truly,

Laura Ziemer

Cc: Rich Boyle, Fort Shaw Irrigation District Manager
Alan Rollo, Sun River Watershed Group Coordinator

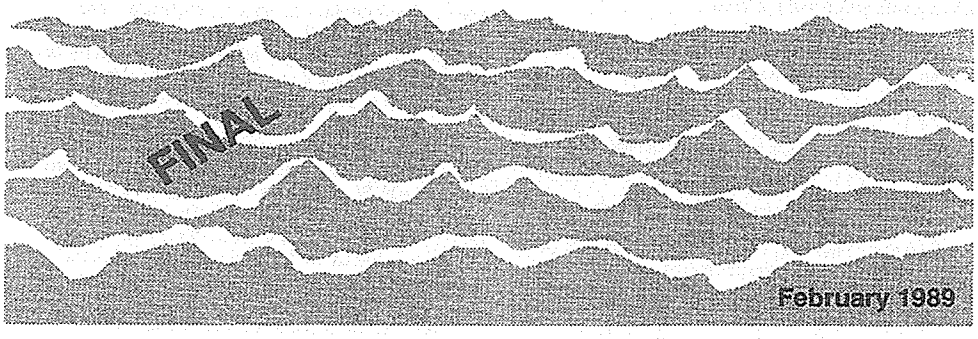
Trout Unlimited: America's Leading Coldwater Fisheries Conservation Organization
321 East Main Street, Suite 411, Bozeman, MT 59715
(406) 522-7291 ext. 103 • Fax: (406) 522-7695 • email: lziemer@tu.org • www.tu.org

USGS flow data in Sun River at Simms BELOW FSID headgate used to track lower Sun River flow conditions (50 desired bare minimum flow)



MONTANA WATER PLAN

Management Section



Subsection: Agricultural Water Use Efficiency

WATER RESOURCES DIVISION • DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION
1520 EAST SIXTH AVENUE • HELENA, MONTANA 59620 - 2301 • (406) 444-6637

INTRODUCTION

Agriculture is Montana's largest business, providing about one-third of the total state income from primary industries. Irrigation contributes roughly one-quarter of agricultural income and, importantly, stabilizes agricultural production during the all-too-frequent dry years. Satisfying agriculture's vital demand for irrigation water requires the development and extension of water supplies through a combination of management strategies, including water storage. Another method is to improve the efficiency with which water is used.

The benefits of improved agricultural water use efficiency are diverse and include:

1. Improved ability to withstand periods of drought.
2. Increased irrigated acreage through the use of saved water.
3. Improved performance of aging irrigation facilities.
4. Increased irrigators' profits when the benefits of more efficient water use (increased crop production and sometimes decreased operating costs) are greater than the investment cost.
5. Reduced soil erosion and improved water quality.
6. Help in meeting the needs of current water users once the prior reserved rights of Indian tribes and the federal government are quantified and put to use.

Along with these benefits, improving water use efficiency may be important in terms of interstate water allocation. The U.S. Supreme Court has indicated that state conservation efforts will be considered if it is called upon to divide the waters of interstate rivers. The Court could decide to award smaller shares to states making no effort to increase water use efficiency, reasoning that these states could meet their future needs by saving more water.

BACKGROUND

Any strategy to improve agricultural water use efficiency must reflect an appreciation of several difficulties. First, because each irrigation situation is different, improving water use efficiency requires a case-by-case consideration of a number of complex geologic, hydrologic, and economic factors. Second, irrigation efficiency improvements can be very expensive. Third, water uses within a basin can be extremely interdependent. One irrigator's return flows or recharge to ground water can be another irrigator's water supply. Therefore, improving the efficiency of one water user could adversely affect the water supply of others. Fourth, while Montana law protects water users from adverse effects caused by other people's changes in water use, the law does not clearly establish who owns the right to water saved without adverse effects to others.

A number of options are already available to overcome some of these problems. The Montana Cooperative Extension Service, local conservation districts, and a number of other state and federal agencies provide technical assistance and information on water conservation measures. The Montana University System also supports research to improve our understanding of the complex factors that affect irrigation efficiency. Research may also help develop improved irrigation practices and technologies.

Funding assistance is available for irrigation efficiency improvements from a number of sources. These sources include the U. S. Agricultural Stabilization and Conservation Service, Farmers Home Administration, Soil Conservation Service, and the Montana Water Development Program administered by the Department of Natural Resources and Conservation (DNRC).

Given that one irrigator's water losses can be another irrigator's water supply, improvements in water use efficiency may adversely affect some water users. In light of this, the law provides potentially affected parties the right to object to certain changes in water use. Accordingly, the objective of increased water use efficiency is not to reduce the amount of water that is later reused. Rather, it is to decrease losses such as: (1) water used by weeds or other unwanted vegetation; (2) evaporation of standing water; (3) water that is not consumed but becomes inaccessible for reuse; or (4) water that becomes unusable because its quality has deteriorated.

The final difficulty stems from the fact that our water law is not clear on the question of who holds the right to salvaged water. In Montana, water rights are based on the amount of water historically put to beneficial use. If an irrigator decreases his use over time because of improved efficiencies, the legal status of the water no longer needed can be called into question. By one interpretation, this part of the water right would be considered abandoned and the water would go to the next junior user. Obviously, this would not encourage increased efficiency. Under a second interpretation, an irrigator who increases his efficiency retains the right to the salvaged water, so long as other water users would not be adversely affected by the change in water use. The irrigator may then have the option to expand

his irrigated acreage, sell, or otherwise benefit from the right to the salvaged water. Using this interpretation, an irrigator may be rewarded, rather than penalized, for becoming more efficient.

STATE WATER PLAN POLICY STATEMENT

Voluntary improvements in agricultural water use efficiency that expand water supplies for agriculture and other uses should be encouraged. Where improvements in water use would adversely affect other existing beneficial uses, such improvements should not be allowed.

ISSUES AND RECOMMENDATIONS

Issues

To encourage voluntary improvements in agricultural water use efficiency, three groups of issues must be successfully addressed.

1. Adequate information and educational opportunities must be readily available to irrigators, and research must be continued. How difficult is it for irrigators to obtain this information? Is it presented in a manner that is clear and persuasive? Are there adequate data for evaluating applications for water right changes in terms of adverse effects upon other water users? Is improving irrigation technologies and practices receiving adequate priority in the competition for agricultural research dollars?
2. Funding assistance may be necessary for those wishing to improve irrigation efficiency. Are existing programs capable of meeting future demands for funding? Are the kinds and levels of support adequate? Should the state Water Development Program give special consideration to irrigation efficiency-improving proposals? Are other sources of funding available, particularly for the rehabilitation and betterment of aging irrigation projects?
3. Laws clarifying who owns the right to salvaged water must be enacted to provide clear incentives for more efficient use. But when an irrigator increases efficiency, how will the amount of water salvaged be determined? Will it include water that otherwise would have been return flows? How will other water users be protected from adverse effects? Should restrictions be placed on how the saved water can be used?

Recommendations

In response to these issues, the following recommendations have been adopted:

1. The adequacy and effectiveness of existing information and research programs should be evaluated. Information should be provided to the state's irrigation districts and other organized irrigation associations on the availability of technical and financial assistance for improving irrigation efficiency. Further, these entities should be informed of their option under state law for the use of salvaged water.
2. Support for federal programs providing financial and other local level assistance to irrigators should be maintained. Special consideration should be given in the state Water Development Program for projects that would improve the efficiency of existing irrigation systems. Funds from the federal Pick-Sloan Missouri Basin Program should be allocated for use in the rehabilitation and betterment of irrigation projects.
3. The law should clearly provide that if an irrigator salvages water, he maintains the right to use the water. However, salvaged water must be defined to include only water that has not been available for reuse by other water users.

PLAN IMPLEMENTATION

Legislative Action

To provide effective financial support, the legislature should adopt a resolution urging Congress to authorize and appropriate funds from the Pick-Sloan Missouri Basin Program for the rehabilitation of irrigation projects. Such funding can be justified as compensation for water development projects promised to Montana under the 1944 Flood Control Act, but never received.

Legislation also should be passed that clarifies the rights of water users to salvaged water. Such legislation should carefully define "salvaged water" to include only the saved water that otherwise would have become consumed or unusable for other existing appropriators. The use of salvaged water for a different purpose, in a different place, from a different point of diversion, or from a different source of storage would require a change in water right in accordance with Montana law.

Administrative Action

To improve education and research on irrigation efficiency, the DNRC, in cooperation with the Montana Cooperative Extension Service and the U.S. Soil Conservation Service, should evaluate the effectiveness of existing research and public education programs. A report should be prepared to the State Water Plan Advisory Council that sets forth recommendations for any improvements in these programs.

The state's irrigation districts and other organized agricultural water user groups should be informed of available technical and financial assistance for improving irrigation efficiency. They should also be informed of the opportunity to use salvaged water if the legislation recommended above is enacted.

To assure continued federal government support for improving agricultural water use efficiency, the DNRC should continue to monitor and support federal funding for programs or projects that improve agricultural water use. In addition, the Water Development Program should give special consideration to project proposals that improve the efficiency of existing irrigation projects. The Governor's Office and the DNRC should also pursue all administrative and intergovernmental channels available to obtain Pick-Sloan funding for irrigation project rehabilitation.

Financial Requirements and Funding Strategies

It is anticipated that the administrative actions can be accomplished with current levels of funding.

Time Schedule

Activity	Responsibility	Deadline
A. Development and Implementation Tasks		
1. Draft Legislation	DNRC	January 1989
2. Enact Legislation	Legislature	April 1989
3. Contact irrigation districts and water users' associations	DNRC	May 1989
4. Complete evaluation report on irrigation efficiency information and research	DNRC	September 1989
B. Ongoing Tasks		
1. Rank irrigation efficiency project proposals to the Water Development Program	DNRC	
2. Monitor and support federal funding, including Pick-Sloan Program Funding	DNRC/Governor's Office	

Attachment #9

SUN RIVER PROJECT

FORT SHAW IRRIGATION DISTRICT

WATER MANAGEMENT AND WATER CONSERVATION PLAN

May 13, 2009

Prepared by: FSID Board and manager, Alan Kinkaid

CONTENTS

INTRODUCTION: The Fort Shaw Irrigation District prepared this water management and conservation plan as a management tool to improve the efficient use of available water, prioritize projects, improve water quality in the Sun River, improve the agricultural economy within the district, and fulfill the water conservation planning requirements stipulated in the Reclamation Reform Act of 1982.

I. DESCRIPTION OF THE DISTRICT

A. **HISTORY** - Irrigation in this area began shortly after the establishment of Fort Shaw in 1867 as a means to supply water for the fort's fields and gardens. The Reclamation Act was proclaimed June 27, 1902 and appropriated receipts from the sale of public lands to construction of irrigation works for reclamation of arid lands. As part of the pursuit of irrigated lands, in 1903 the Reclamation Service made the first reconnaissance of the Sun River Project area. The Fort Shaw lands included 29,842 acres of which approximately 16,000 acres were considered irrigable. Of these acres, the Indian School utilized some. As the Reclamation Service moved to withdraw lands for future projects, the Sun River Project was considered a secondary project at that time. On February 26, 1906, the Secretary of Interior authorized the Sun River Project, which included Fort Shaw Irrigation District (FSID) and Greenfields Irrigation District (GID). On June 9, 1906, Congress approved a bill providing for the disposition on the non-school lands to the settlement, subject to withdrawal by the Reclamation Service as needed for the irrigation project. The Reclamation Service moved to withdraw the Fort Shaw lands from settlement on September 20, 1906. The Fort Shaw unit was selected as the first component of the Sun River Project to be undertaken. Construction began May 1907 and was completed in July 1908. The first water was delivered in 1909. The FSID operates and maintains the division facilities, which is still owned by Bureau of Reclamation (Reclamation). Division headquarters are in Fort Shaw, Montana.

B. **PHYSICAL CHARACTERISTICS** - The FSID is located within the bounds of the Fort Shaw Division of the Reclamation Sun River Project, Montana located in central Montana (See attachment #1 for area maps). The FSID is located south of the Sun River and surrounds the towns of Simms, Fort Shaw, and Sun River. It now contains approximately 11,500 irrigable acres on 177 small farms.

Water is supplied to the project from the Sun River to the Fort Shaw Canal, utilizing a rock overflow dam as a diversion structure. The water flows from the river by gravity through the main canal and into the distribution system. The main Fort Shaw canal is 16 miles in length and the distribution laterals total 85 miles in length. The initial capacity of the main canal was about 225 cfs. The table below shows approximate carrying capacity of primary structures within FSID.

Main Canal	Siphon	A-Canal	C-Canal	D-Canal	K-Ditch
235	195	85	35	70	35

Sun River Watershed Special Study - Executive Summary page

Executive Summary

In 2009, Reclamation, in consultation with the Sun River Watershed Group (SWRG), initiated the Sun River Special Study. The Special Study is an inventory and analysis of proposed measures that could be implemented to improve streamflow in the Sun River while maintaining or improving irrigated agriculture production. The study identifies a procedure by which water savings can be allocated between improved streamflow in the Sun River and irrigation needs. Although the purpose of the Special Study was not to fund projects, it does identify steps that can be taken towards implementing projects.

The Special Study identifies potential projects that might save water and provide shared benefits to agriculture and instream flow. This includes projects identified in previous studies, and those brought forth during the Special Study. The potential projects identified were placed into four categories:

1. Those that improve delivery system efficiencies
2. Reservoirs, which would include new reservoirs or improvements to existing reservoirs
3. On-farm efficiency improvements
4. Other water management measures

Information was compiled on the identified projects and the projects with the best potential were compared and ranked. The ranking did not strictly order the projects from highest to lowest, but partitioned projects into three groups based on when it might realistically be possible to implement the projects. Group 1 projects were those that ranked high and which the group could pursue now or in the near future. The second group of potential projects consisted of those which the group considered to be good projects overall, but where there was a lot more work to be done before the projects could be implemented. The third group consisted of projects that might have some potential, but were complex, possibly expensive and not workable at this time, but could still be considered in future work planning.

The last section of the report outlines a plan for further evaluating and implementing the projects. Basic procedures that might be followed, from feasibility studies through project construction, are identified. Because every project is different, this implementation plan is general rather than project specific. An important component of any project selected would be to develop a plan for sharing the saved water between irrigation and instream uses.

This Special Study has identified a number of projects that have the potential to conserve water, and provide shared benefits to irrigators and instream flow in the Sun River. Although no one project will solve all of the low-flow problems in the watershed, taken together, these projects might be enough to produce shared benefits and to increase Sun River instream flows at key locations, and during critical times. Implementing these projects will require a commitment from group members and working together as a team to obtain the necessary funding for design, authorization, and construction. Continued success of the project will require follow-through with operation and maintenance long after the projects are constructed. Developing agreements among parties that allow for sharing a project's water-saving benefits between irrigation and instream uses will be critical to the success of these projects, and for achieving the goals of the Special Study.

The Special Study identifies projects and recommends a path for achieving the goals of improving Sun River flows and agricultural productivity. While the Special Study was in progress, the FSID and SRWG pursued an available opportunity to fund and implement a water conservation project with shared benefits. This project is presented in the report as an example of how future projects could be implemented to achieve Special Study goals.