

**Project:** Fox Canal Water Conservation Project  
**Proposed by:** Loss Creek Irrigation Company, PO Box 188, Circleville, Utah 84723  
**Project Manager:** Jade Dalton  
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(435) 616-3081

**Project Description:** Fox Canal is an irrigation diversion (50 cfs) from the Sevier River that provides irrigation water for 1400 acres of agricultural production, including alfalfa, hay, pasture and dairy farm. The Fox Canal is not currently metered. This project would provide flow metering at two locations: 1) at the diversion from the river into the canal; and 2) at a split in the canal downstream of the diversion. Metering would conserve water by allowing only the irrigation right to be diverted. In past years additional water has been diverted due to lack of measuring the correct volume. The conserved water would remain in the Sevier River providing instream habitat for aquatic species, recreation opportunities and water for downstream users.

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## 1. Executive Summary

Loss Creek Irrigation Company is proposing to install concrete headwalls and flowmeters on the two diversions associated with Fox Canal. Fox Canal is an irrigation diversion (50 cfs) from the Sevier River that provides irrigation water for 1400 acres of agricultural production, including alfalfa, hay, pasture and dairy farm. The Fox Canal is not currently metered. This project would provide flow metering at two locations: 1) at the diversion from the river into the canal; and 2) at a split in the canal downstream of the diversion. Metering would conserve water by allowing only the irrigation right to be diverted. In past years additional water has been diverted due to lack of measuring the correct volume. The conserved water would remain in the Sevier River providing instream habitat for aquatic species, recreation opportunities and water for downstream users.

The project cost is \$151,630. The funding requested is \$75,000 with the remaining \$76,630 being provided by the Loss Creek Irrigation Company.

## 2. Background Data

Currently, Fox Canal, an earthen irrigation supply canal, diverts 50 CFS for irrigation from the Sevier River. The total estimated flow at the diversion is 50 cfs. Further down the canal there is a second diversion that diverts water from the Fox Canal to another distribution canal. From that diversion point on there is a total estimated flow of 25 cfs in the Fox Canal.

The Fox Canal provides irrigation water for 1400 acres through an irrigation water right. The 1400 acres is comprised of 5 users who operate ranches (pasture, grass hay), hay farms (alfalfa) and dairy farm.

It is difficult to estimate the flow rate in the canal, as the canal is not metered. Additionally, the canal is earthen, which does not provide a uniform cross section shape to use for flow calculations. Metering the water diversions will allow for the flow to be accurately maintained at the water right level with no additional water being inadvertently diverted due to lack of adequate measuring.

Currently, the Fox Canal is an earthen canal extending 6020 ft (4820 ft for the 50 cfs flow and then an additional 1200 ft for the 25 cfs flow). The Loss Creek Irrigation Company is planning to pipe the canal in the future. The individual farms have converted to sprinkler and gated pipe irrigation distribution, with only 200 acres remaining in earthen delivery ditches and wildland flood systems. The remaining 200 acres will be converted to sprinkler distribution through NRCS EQIP funding by the individual producer as part of the larger conservation plan laid out by the Loss Creek Irrigation Company.

## 3. Project Location

The Fox Canal Water Conservation Project is located approximately 2.5 miles southwest of the town of Circleville (Piute County), Utah. The proposed project is at the diversion of the Fox Canal from the Sevier River (HUC 1603000106) and at the split in the Fox Canal delivery

(approximately 4820 ft from the diversion point). The latitude and longitude for the project location are: 38°08'23.03" 112°18'13.12".

The project is located in the upper Sevier River. This allows for the conserved water to remain instream for a longer distance providing more benefits to habitat, producers, and other users. If, instead, the instream water was provided near the mouth of the Sevier River, it would only be in channel for a short reach providing less benefits than the proposed project.

The environmental will benefit through increased in-stream flow which will provide for improved aquatic and fish habitat, as well as enhanced riparian areas for habitat use by waterfowl and song birds. Additionally, Lake Sevier, located at the mouth of the Sevier River downstream of the project, will benefit from a decrease in streamflow diversion from the Sevier River. The shallow lake is intermittent, primarily dry due to irrigation diversions.

#### 4. Technical Project Description

The project is needed to conserve water in the over-allocated Sevier River, particularly downstream in intermittent Lake Sevier. The project need will be accomplished by accurately measuring irrigation diversions. Historically, water was potentially diverted in excess due to the lack of accurate real-time water measuring. By installing the concrete headwalls and metering devices at the primary diversion from the Sevier River and the diversion from Fox Canal, water in excess of the water right will not be diverted inadvertently. The excess water will not be diverted, but remain in stream in the Sevier River.

The project will reconfigure the existing canal at the diversion point from Fox Canal. The reconfiguration will allow for installation of a grated concrete head wall and the flowmeter. The flowmeter will be able to measure at the head wall which will allow for a consistent cross section for metering.

Downstream along Fox Canal, a second diverts from Fox Canal. At this location two concrete headwalls with grates will be installed in Fox Canal, one upstream and one downstream of the canal diversion. This will allow for installation of a second flowmeter and accurate measurements for the flow remaining in Fox Canal, and therefore the second diversion.

Project Milestones are listed in the following table with completion dates.

<b>Milestone</b>	<b>Start Date</b>	<b>Completion Date</b>
Environmental Compliance (CE documentation)	May 2020	August 2020
Cultural Resource Survey	May 2020	July 2020
Concrete headwall installation	August 2020	December 2020
Water Meters--Installation and Calibration	November 2020	March 2021
On-going monitoring and maintenance (as needed)	March 2021	March 2031

The Loss Creek Irrigation Company plans to provide the additional funds to implement this project. The Irrigation Company will provide in kind labor to install the meters and concrete headwalls. The requested funding will purchase supplies and pay for environmental compliance. The Loss Creek Irrigation Company has already committed this cost share amount.

## 5. Evaluation Criteria

### Evaluation Criterion A-Project Benefits (35 points)

- *Describe the expected benefits and outcomes of implementing the proposed project.*

- *What are the benefits to the applicant's water supply delivery system?*

By metering the flow diversions excess water will not be diverted. Diversions can be closely managed to match demand, conserving additional water.

- *If other benefits are expected, explain those as well. Consider the following:*

- *Extent to which the proposed project improves overall water supply and reliability.*

By conserving water, it allows more water to stay in the Sevier River to service other irrigation diversions. This provides more reliable water for all irrigators in the Sevier River Watershed.

- *The expected geographic scope of benefits from the proposed project (e.g. local, subbasin, basin).*

As the project conserves water and reduces diversions from the Sevier River, the Sevier River watershed benefits from the presence of additional water instream.

- *Extent to which the proposed project will increase collaboration and information sharing among water managers in the region.*

Working together, irrigators can conserve more water and use the limited water resource more efficiently. Information can be shared with other water managers about the success of limiting diversions through use of water meters.

- *Any anticipated positive impacts/benefits to local sectors and economies (e.g. agricultural, environment, recreation, and tourism).*

Leaving more water instream, benefits other agricultural users, the environment including aquatic and riparian habitats, recreation along the river corridor and opportunities for tourism associated with the Sevier River.

- *Extent of which project will complement work done in coordination with NRCS in that area (e.g. with direct connection to the district's water supply). Describe any on-farm efficiency work that is currently being completed or is anticipated to be completed in the future using NRCS assistance through EQIP or other programs.*

Of the 1400 acres within the Loss Creek Irrigation Company, over 1200 acres have been converted to sprinkler irrigation from wildland flood systems. Most of these conversions

have occurred in partnership with NRCS through the EQIP funds. The remaining 200 acres is scheduled for conversion to sprinkler irrigation in the next 3 years.

#### Evaluation Criterion B-Planning Efforts Supporting the Project (35 points)

- *Describe how your project is supported by an existing planning effort.*
  - *Does the proposed project implement a goal or address a need or a problem identified in the existing planning effort.*

Loss Creek Irrigation Company has been striving to make their Irrigation Company more efficient and conserve water within the distribution area for the past 20 years. To this end the Irrigation Company has identified a number of actions which will conserve water and improve irrigation efficiency (see attached conservation plan for the Irrigation Company). These actions include: converting wildland flood to sprinkler irrigation, piping Fox Canal and adding flowmeters to monitor diversion rates. Through the implementation of all of these projects, the Irrigation Company estimates the conservation of 12% of its current diversion.

Additionally, the Irrigation Company has worked with the NRCS to help plan and design Fox Canal to include piping and flowmeters. NRCS has provided calculations on water conservation for each of the projects. The metering is estimated to conserve 3% of the diversion with the piping and sprinkler irrigation conversion conserving an additional 9%.

- *Explained how the proposed project has been determined as a priority in the existing planning efforts, as opposed to other potential project/measures.*

The proposed project is one of the three main projects identified by Loss Creek Irrigation Company to conserve water and improve irrigation efficiency. The Irrigation Company identified these three projects as providing the most conservation for the cost investment. Also, these three projects are expected to be reasonable maintenance for long-term operation of the irrigation system.

#### Evaluation Criterion C-Project Implementation (10 points)

- *Describe the implementation plan for the proposed project. Please include an estimated project schedule that shows stages and the duration of the proposed work including major tasks, milestones and dates.*

The proposed project will be implemented in three phases. The first phase will begin on April 1, 2020 and include environmental compliance and cultural resource survey. The second phase will begin on August 1, 2020 and will include the dewatering of the canal and construction of the three headwalls. The third phase will begin at the end of the headwall construction (approximately October 1, 2020), and will consist of installing the flowmeters. Once active the flowmeters will be used long-term to manage the flow rates of the diversions.

- *Describe any permits that shall be required, along with the process for obtaining such permits.*

The proposed project is not anticipated to require any permits. A Clean Water Act Section 404 (removal-fill) permit from the Army Corps of Engineers and Section 401 (clean water) certification are not anticipated at this time.

- *Identify and describe any engineering or design work performed specifically in support of the proposed project.*

Design work has been completed by the Loss Creek Irrigation Company in partnership with an irrigation supply company.

- *Describe any new policies or administrative actions required to implement the project.*

No new policies or administrative actions are required to implement the proposed project.

- *Describe how the environmental compliance estimate was developed. Have the compliance costs been discussed with the local Reclamation office.*

Rabe Consulting was consulted regarding the extent of the environmental compliance needed. Rabe Consulting has more than 20 years of experience working with the Bureau of Reclamation on water conservation projects and cost recovery agreements. Rabe Consulting provided cost estimates for the CE documentation and cultural resource survey and report.

#### Evaluation Criterion D-Nexus to Reclamation (10 points)

- *Is the proposed project connected to a Reclamation project or activity?*

The proposed project is not connected to a Reclamation project or activity.

#### Evaluation Criterion E-Department of the Interior and Bureau of Reclamation

*The proposed project promotes and is consistent with the following Department of Interior and Bureau of Reclamation priorities:*

- Department Priorities:
  - Utilize science to identify best practices to manage land and water resources and adapt to changes in the environment.
- Reclamation Priorities:
  - Increase Water Supplies, Storage, and Reliability under WIIN and other Authorities
  - Leverage Science and Technology to Improve Water Supply Reliability to Communities
  - Address Ongoing Drought
  - Improve Water Supplies for Tribal and Rural Communities

## 6. Project Budget

The total project costs are \$151,630 with \$75,000 of this being requested through the WaterSMART Grants: Small-Scale Water Efficiency Project grant program. The remaining \$76,630 will be provided by the Loss Creek Irrigation Company (see attached letter).

None of the project expenses were incurred prior to July 1, 2019. Project costs for environmental compliance (CE documentation) cultural resource survey may be incurred prior to project award, but after April 1, 2020. This budget line item is \$15,000.

The Irrigation Company has committed to providing in-kind labor to install the concrete headwalls and water meters. In-kind labor will include heavy equipment, heavy equipment operation, manual labor, and surveying (\$70,830). Additionally, the Irrigation Company will provide for the administrative costs associated with the project (\$5800, which is 9.2% of the total project costs).

**Table 1**

Source	Amount
Costs to be reimbursed with the requested Federal funding	\$ 75,000
Costs to be paid by the applicant	\$ 76,630
Value of third-party contributions	\$ 0
<b>TOTAL PROJECT COSTS</b>	<b>\$151,630</b>

**Table 2**

BUDGET ITEM DESCRIPTION	COMPUTATION		QUANTITY TYPE	TOTAL COST
	\$/Unit	Quantity		
<b>Salaries and Wages</b>				
Heavy Equip Operator	\$65.00	320	hour	\$20,800
Manual Labor	\$45.00	260	hours	\$11,700
Survey/Design	\$95.00	136	hours	\$12,920
<b>Fringe Benefits</b>				
N/A				
<b>Travel</b>				
N/A				
<b>Equipment</b>				
Excavator	\$75.00	240	hour	\$18,000
Dump Truck	\$65.00	50	hour	\$ 3,250
Frontend Loader	\$72.00	30	hour	\$ 2,160
Mobilization Fee	\$2100.00	3	Per equipment	\$ 700
<b>Supplies and Equipment</b>				
Flowmeters	\$8,000	2	Flowmeter	\$16,000
Concrete/Rebar	\$33,000	1	Concrete and Rebar	\$33,000
Forms and incidental fittings	\$6,000	1	Forms and incidental fittings	\$ 6,000
<b>Contractual/Construction</b>				
Rabe Consulting—	\$5,000	1	CE Documentation	\$ 5,000



Environmental Compliance				
Rabe Consulting— Cultural Survey	\$10,000	1	Cultural Field Survey and Report	\$ 10,000
<b>Other</b>				
BOR environmental review	\$5,000	1	Review of environmental compliance documents	\$ 5,000
<b>TOTAL DIRECT COSTS</b>				<b>\$164,200</b>
<b>Indirect Costs</b>				
Administrative Costs	9.2%	\$164,200		\$ 5,800
<b>TOTAL ESTIMATED PROJECT COSTS</b>				<b>\$170,000</b>

Budget Narrative

*Salaries and Wages*

In-kind wages were calculated for heavy equipment operators and manual laborers. The in-kind rates are average wage rates for the Circleville, Utah area.

*Fringe Benefits*

The Fringe Benefits line item is not applicable as the salaries are based on in-kind hourly rates and do not have associated fringe benefits.

*Travel*

The Travel line item is not applicable to this project, as this project does not require any travel.

*Equipment*

Heavy equipment for the project will include excavators, front end loaders and dump trucks.

*Materials and Supplies*

The materials and supplies for the project include concrete, rebar, metal grating, and flowmeters. Additional incidental supplies, such as wood forms and trowels, will also be purchased. The two flowmeters are \$8000 each for a total of \$16,000. The concrete and rebar are sufficient to construct 3 headwalls (approximately 16 ft by 6 ft by 1 ft).

*Contractual*

There are no Contractual costs aside from the Environmental and Regulatory Compliance Costs.

*Third-Party In-Kind Contributions*

This project does not include third-party in-kind contributions.

*Environmental and Regulatory Compliance Costs*

Rabe Consulting will provide compliance with the National Environmental Protection Act (NEPA) through documentation for the Categorical Exclusion (CE) and compliance with the

National Historic Preservation Act (NHPA) through a cultural resource survey, documentation of the potentially historic canal and a cultural resource survey report for \$15,000. A Clean Water Act Section 404 (removal-fill) permit from the Army Corps of Engineers and Section 401 (clean water) certification are not anticipated at this time.

Bureau of Reclamation will provide review of the environmental compliance documentation for \$5,000 through a cost-recovery agreement.

#### *Other Expenses*

Aside from the Bureau of Reclamation environmental compliance review, there are no budget line items in the Other Expenses category.

#### *Indirect Costs*

Loss Creek Irrigation Company will provide for administrative costs, including but not limited to project management, expense tracking, and project reporting. The Irrigation Company expects the value of the indirect costs to be 9.2% of the direct costs (9.2% of \$164,200), which totals \$5,800.

### 7. Environmental and Cultural Resources Compliance

Rabe Consulting will provide compliance with the National Environmental Protection Act (NEPA) through documentation for the Categorical Exclusion (CE) and compliance with the National Historic Preservation Act (NHPA) through a cultural resource survey, documentation of the potentially historic canal and a cultural resource survey report. The CE categories for the

### 8. Required Permits and Approvals

A Clean Water Act Section 404 (removal-fill) permit from the Army Corps of Engineers and Section 401 (clean water) certification are not anticipated at this time. No additional permits are anticipated.

### 9. Official Resolution

Please find the attached Official Resolution from the Loss Creek Irrigation Company.

Loss Creek Irrigation  
P.O. Box 188  
Circleville, UT 84723

March 2, 2020

Bureau of Reclamation  
WaterSMART Grant

To Whom it May Concern,

The board of directors has reviewed and supports the application for the WaterSMART Grant BOR-DO-20-F006. The board also supports Jade Dalton to sign for the irrigation company; he has the proper authority to sign in behalf of the company. Loss Creek Irrigation has the ability to provide funds for equipment and operation, plus labor and other fees totaling in the amount of \$76,630. The board will work with Bureau of Reclamation to meet grant deadlines, etc.

Sincerely,

A handwritten signature in black ink that reads "Michael Dalton". The signature is written in a cursive style with a large initial "M".

Michael Dalton for Lost Creek Irrigation

*Loss Creek Irrigation Company*

# Water Conservation Plan

Updated January 1, 2020

The Loss Creek Irrigation Company is committed to water conservation within their service area. The Irrigation Company recognizes the importance of conservation and wise use of a limited resource, water. To that end, the Irrigation Company prioritizes and evaluates water conservation projects and practices each year, starting in 2001. The list below includes projects which have been completed and considered with their conservation amounts and priority. Each project is then developed funded and implemented as time and resources allow.

<b>Project</b>	<b>Completion Status</b>	<b>Priority</b>	<b>Water Conservation</b>
West Canal (diverts 30 cfs)	completed 2010		
Kingston Canal (diverts 28 cfs)	completed 2010		
Conversion to sprinkler irrigation (1200 acres)	completed		
Piping of Fox Canal	in progress	High	8% of 50 cfs
Flowmetering of Fox Canal	in progress	High	3% of 50 cfs
Conversion to sprinkler irrigation (remaining 200 acres)	in progress	High	1% of 50 cfs
Researching and reviewing new conservation practices	ongoing	Moderate	
Evaluating additional water conservation projects	Ongoing	Moderate	



Natural Resources Conservation Service  
Panguitch Field Office  
225 E Center St  
Panguitch, UT 84759

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Design Report for: Fox Canal Piping Project 2019 CTA  
Contract Number: CTA  
Designed by: David Schick  
Title: Soil Conservationist  
Date: 12/05/2019

### **Project Overview**

This project is located south of the town of Circleville. The planned project is to pipe the Fox Canal from its diversion from the Sevier River to a point where the canal was piped in the past. Total estimated flow of the canal at the diversion point is about 50 CFS. Further down the canal there is a second diversion that diverts water from the Fox Canal to another canal. From that diversion point on there is a total estimated flow of 25 CFS. The planned project is to install 4,820 ft. of 60" ADS pipe from the diversion point in the Sevier River to the second diversion point. From the second diversion point to the existing pipeline 1,200 ft. of 48" ADS will be used. Total pipeline length will be 6,020 ft. The pipeline will daylight prior to the second diversion and prior to the point of the existing pipeline. Grizzly screens will be installed at both daylight points and at the start of the pipeline to prevent debris from entering the pipeline. Cement head walls will be installed at the start of the pipeline and at each daylight point to prevent soil from eroding around the pipeline.

### **Soils Overview**

The soils in the area of the canal are UT 636 – 56 – Grimm Sandy Loam and UT 636 – 65 – Henrieville Sandy Loam. Both soils are limited in their ability to hold water. Saturated Hydraulic Conductivity (ksat) values for both soils are between 2 and 6 in/hr. The average width of the canal is between 10 to 15 feet. The length of the section of canal to be piped is 6,020 ft. To estimate the surface area of the canal bottom, an average width of 13 ft was used. The area of the bottom of the canal is estimated to be 78,260 ft<sup>2</sup> (13 ft. x 6,020 ft.). To calculate the estimated water loss a ksat of 2 in/hr was used because over time the canal will have silted in and algae growth would have occurred which would most likely decrease the amount of water lost. The calculation to estimate water loss is as follows:

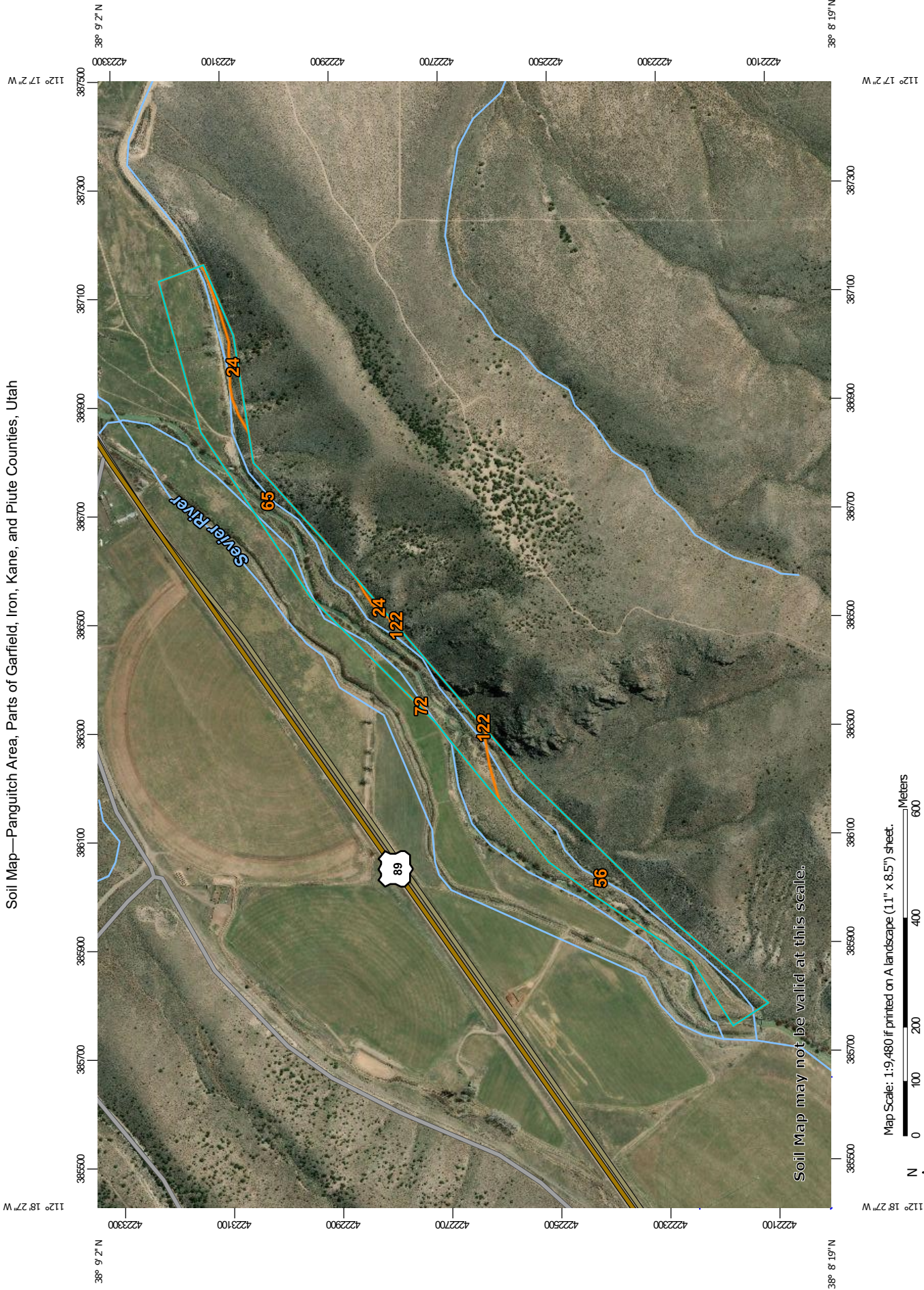
$$(78,260 \text{ ft}^2 \times 2 \text{ in/hr}) / 12 \text{ in} = (13,043 \text{ cuft/hr}) / 3600 = 3.6 \text{ Cubic Feet per Second (CFS)}.$$

Estimated water loss for the canal is 3.6 CFS. This number will vary depending on the width of the canal and actual ksat values.

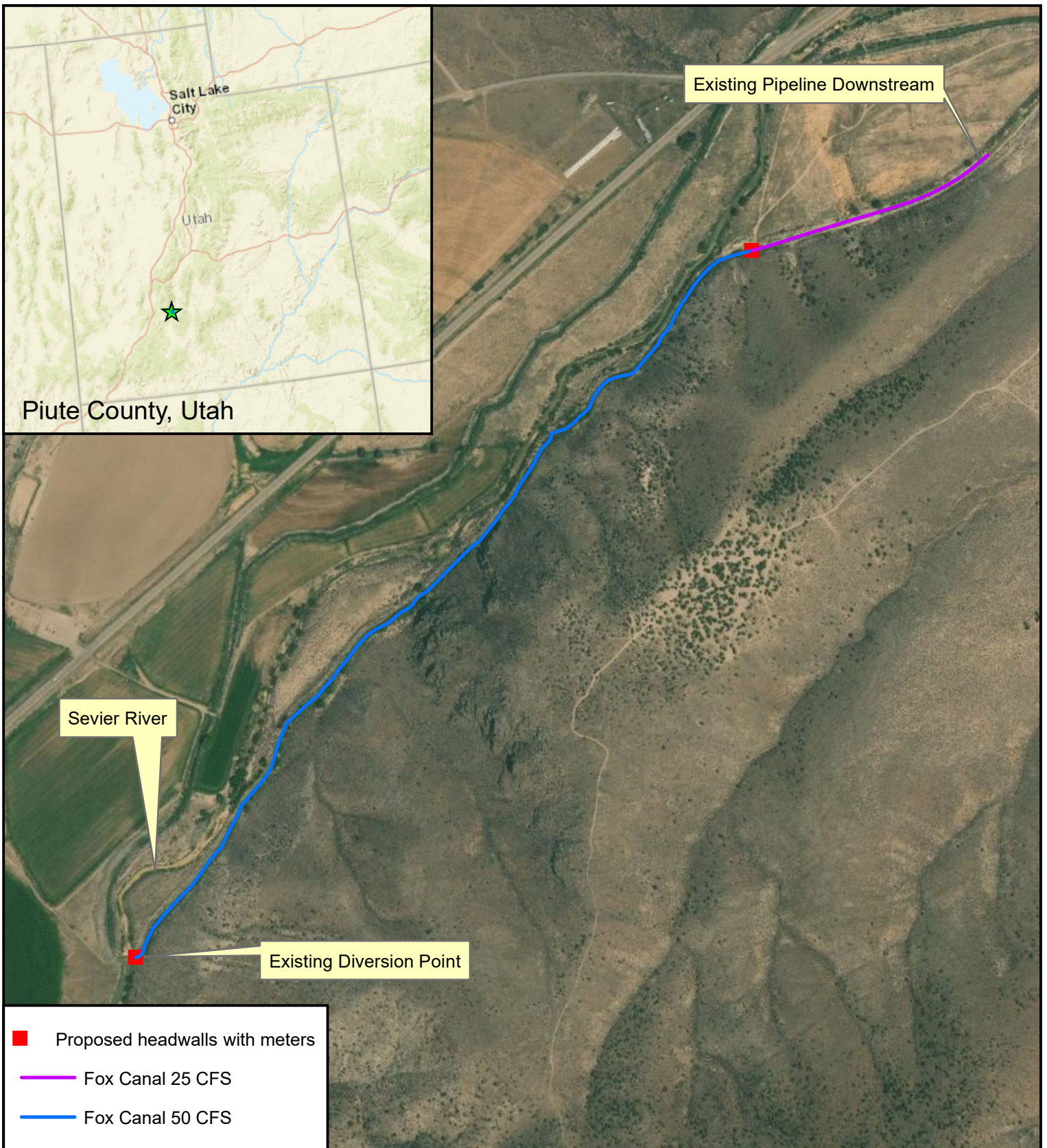




Soil Map—Panguitch Area, Parts of Garfield, Iron, Kane, and Piute Counties, Utah



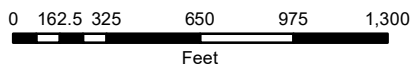




**Fox Canal Water Conservation Project**

**Figure #1: Loss Creek Irrigation Company Project Location**

Created By: M. Solus  
Created On: February 2020



Service Layer Credits:  
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community  
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