# IDAHO WATER RESOURCE BOARD

## MEETING NO. 7-16

## November 1-2, 2016

## Boise

# Media

# AGENDA

## IDAHO WATER RESOURCE BOARD

**C.L. "Butch" Otter**
*Governor*

**Roger W. Chase**
*Chairman*
Pocatello
District 4

**Jeff Raybould**
*Vice-Chairman*
St. Anthony
At Large

**Vince Alberdi**
*Secretary*
Kimberly
At Large

**Peter Van Der Meulen**
Hailey
At Large

**Charles "Chuck" Cuddy**
Orofino
At Large

**Albert Barker**
Boise
District 2

**John "Bert" Stevenson**
Rupert
District 3

**Dale Van Stone**
Hope
District 1

**Work Session for Board Meeting No. 7-16**
**November 1, 2016**
**8:00 a.m.**

Idaho Water Center
Conference Rooms B, C & D
322 East Front Street
BOISE

1. Roll Call
2. MHAFB Pipeline Update
3. Sustainability Policy Update
4. Water District #02 Grant Update
5. ESPA Recharge Update
6. Treasure Valley Recharge Study
7. Presentation by Ducks Unlimited
8. Priest Lake Water Management Study Update
9. Water Storage Studies Update
10. Lapwai Ground Water Monitoring Well
11. Adjourn

** The Board will break for lunch at approximately noon.*
*Water Supply Bank Committee will convene upon adjournment.*

Americans with Disabilities

The meeting will be held in facilities that meet the accessibility requirements of the Americans with Disabilities Act. If you require special accommodations to attend, participate in, or understand the meeting, please make advance arrangements by contacting Department staff by email jennifer.strange@idwr.idaho.gov or by phone at (208) 287-4800.

# Memorandum

To: Idaho Water Resource Board

From: Randy Broesch

Date: October 25, 2016

Re: Mountain Home Air Force Base Water Supply /Pipeline Project

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The following is a status report on the Mountain Home Air Force Base (MHAFB) Water Supply/Pipeline Project (Project). The Project involves efforts by the State of Idaho to assist the MHAFB in developing a sustainable water supply for their use.

**Project Concept**

The MHAFB currently relies on groundwater for its water supply, but diverts its water from a critical declining aquifer. The Idaho Water Resource Board (Board) intends to develop a pipeline and water treatment facility to deliver water from the Snake River to the MHAFB as an alternate water supply to their existing use of groundwater. In 2014, with support from the Governor and Idaho State Legislature, the Board purchased senior Snake River water rights from the Simplot Corporation to provide a water supply to the MHAFB. The surface water will be diverted out of the C.J. Strike Reservoir and delivered to the MHAFB where it will be treated and used for Domestic Commercial Municipal and Industrial (DCMI) purposes on the base. The Board is expected to retain the senior water rights and enter into a water utility service agreement with the MHAFB for the delivery of the DCMI water. The Board will undertake the financing, design, construction, and maintenance methods to bring the project to fruition. The Governor's office, the State Legislature, and the Board recognize and are committed to supporting the MHFAB as a $1 Billion annual economic generator in the local Idaho economy.

**Project Status**

Staff is coordinating regularly with the MHAFB, City of Mountain Home (City), and the Idaho Department of Environmental Quality (IDEQ). Coordination efforts continue to develop the project concept into greater detail.

MHAFB-The Core Action Group composed of IWRB staff and MHAFB Staff continue to meet regularly to exchange information to develop both the project concept for an environmental assessment and the administrative processes that are necessary to enter into a water utility service agreement.

City of Mountain Home-Board Members met with the City on August 29th to discuss their potential participation in the project. The City expressed their desire to be part of the project, and will continue seeking ways to finance and purchase Snake River water rights with the hopes of securing their participation in the project.

IDEQ-Staff has been coordinating with IDEQ to identify project requirements and processes to deliver the proposed project. IDEQ has highlighted the need to develop a facility plan report, identify raw water characteristics for the C.J. Strike Reservoir, completion of a pilot study, and preparing a preliminary engineering report. The completion of these items will lead to the design and construction of the proposed project.

Project Delivery Model- Staff has been researching available project delivery types that can accommodate a complex project with a sensitive time constraint. Project delivery models we are currently researching can

be categorized into 2 types: 1. Conventional design-bid-build and 2. Collaborative project delivery types (methods under this category include an array of design-build delivery types). Staff and Board Members have held 2 delivery model workshops with attendees including the purchasing department and the deputy attorney generals. The first workshop held was with the Water Design Build Council and the second was with staff's consultant Integrated Delivery Solutions (IDS). In the workshops, staff and the Board members learned about the various types of delivery models that are possible and assessed which models may suit the project best. Those in attendance at the workshops narrowed the potential delivery models to three options:

1. Conventional Design-Bid-Build with a separate procurement of the Operation of the Maintenance
2. Fixed Price Design-Build with a separate procurement for Operations and Maintenance
3. Design-Build-Operate

With the delivery models being screened down to three options, IDS recommended staff solicit a voluntary market sounding to get feedback from the open market about the delivery models being considered. The market sounding was advertised on October 7th and replies were due by October 21st. The responses provided in the market sounding will be one element of many being considered when developing a decision matrix for the ultimate selection of a delivery model. The decision matrix is planned to be developed in the month of November.

Owner's Representative-The need for an Owner's Representative has been highlighted to the Board in previous presentations. To recap, Staff is seeking expertise in the fields of water treatment and various delivery model executions to oversee the planning, design, and construction phases of the proposed project. Staff is currently preparing a solicitation to procure professional services of an Owner's Representative, and coordinating with internal contracting staff and the Attorney Generals Office to develop the RFQ and RFP processes. Staff anticipates the issuance of a solicitation for the Owner's Representative to be advertised by the end of November or the first part of December with the awarding of the Owner's Representative by the end of January or the first part of February.

Schedule -The following is an estimated timeline for milestones in the next 6-months:

| **6-Month Milestones** | **Date** |
|---|---|
| Issue RFQ/RFP for Owner's Representative | November 2016 |
| Begin Environmental Assessment (MHAFB & BLM Co-Lead) | November 2016 |
| Funding Resolution for Owner's Representative & Project Delivery Model Endorsement | January 2017 |
| Award Owner's Representative | February 2017 |
| Begin Preparing the Facility Plan Report | March 2017 |

**REQUIRED ACTIONS:** In the coming months staff will be issuing a solicitation for an Owner's Representative. In January's Board meeting, staff will be seeking both a funding resolution to finance the Owner's Representative and for an endorsement of the project delivery model from the Board.

TO: Idaho Water Resource Board (IWRB)

FROM: Neeley Miller, Planning & Projects Bureau

DATE: October 24, 2016

RE: State Water Plan Sustainability Section

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**ACTION TO BE CONSIDERED: Adoption of the Proposed Sustainability section**

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The Water Resource Planning Committee met on October 5, 2016 to review written comments and oral testimony received during the public comment period which commenced on Friday, May 20th through September 30, 2016.

One-hundred twenty comments were received in total. Sixty-two of the comments were received though written comment and fifty-eight comments were received though oral testimony at the public hearings shown below:

| Hearing # | Dates | Time | Location | City |
|---|---|---|---|---|
| 1 | June 7 | 6:30 pm | Idaho Water Center; Rm 602 C & D | Boise |
| 2 | June 13 | 6:30 pm | Community Campus, Minnie Moore Rm | Hailey |
| 3 | June 28 | 6:30 pm | CSI Campus, Shields Bldg., Rm 118 | Twin Falls |
| 4 | July 20 | 6:30 pm | Edgewater Resort | Sandpoint |
| 5 | August 23 | 6:30 pm | Red Lion | Lewiston |
| 6 | August 30 | 6:30 pm | City Council Chambers, City Annex | Idaho Falls |
| 7 | September 14 | 6:30 pm | City of Chubbuck, City Council Chambers | Chubbuck |

The Water Resource Planning Committee has recommended changes to the Proposed Sustainability section in response to the comments and testimony (see attached).

**Next Steps**

1. Board adopts Proposed Sustainability section by resolution.
2. Board submits Sustainability section, Board resolution, and cover letter from IWRB Chairman to the Governor, Pro Tem, Speaker, Natural Resources Committee chairs, Director of IDWR, and anyone else we think might want notice including committee members. It will also need to be

"distributed generally." The IWRB website would be a good place to do this (anywhere else?). This should be done no later than the first day of the legislative session. We should try to submit as early as we can after Board adoption. We will need to get a receipt from the Pro Tem and Speaker showing the date it was submitted to their offices.

3. Legislature has to act "by law" to "amend or reject" within 60 days. That means they have to pass a statute through both houses and secure a signature from the Governor. They can only deal with the changes submitted and cannot open the whole SWP.

**Attached:**

1) WRP recommended changes to the Proposed Sustainability section
2) A resolution for the Board to consider for the adoption of the Proposed Sustainability section
3) A draft letter from the IWRB Chairman submitting Sustainability Section to the Legislature

BEFORE THE IDAHO WATER RESOURCE BOARD

IN THE MATTER OF )
CHANGE TO THE ) A RESOLUTION
IDAHO STATE WATER PLAN )
_____)

WHEREAS, the Idaho Water Resource Board (Board), pursuant to its planning authorities in Article XV, Section 7 of the Idaho Constitution, and Idaho Code 42-1734, 1734A, and 1734B developed a proposed Sustainability section for the Idaho State Water Plan (Plan) adopted on November 28, 2012; and

WHEREAS, as required under Idaho Code 42-1734A, the Board has sought substantial public participation and comment on the proposed change to the Plan by providing a public comment period greater than 60 days, including opportunity for submission of written comments and for oral testimony at seven public hearings throughout the State; and

WHEREAS, the Board has reviewed the record of public comments consisting of oral testimony and written comments and has modified its proposed change to the Plan accordingly.

NOW, THEREFORE, BE IT RESOLVED that, having considered the proposed draft change to the Plan and the record of public comments , the Board hereby adopts the attached final version of the change to the Plan. The Board directs that the adopted change be submitted to the Idaho Legislature as required by Idaho Constitution Article XV, Section 7 and Idaho Code 42-1734B(6), and that copies also be provided to the Office of the Governor and Director of the Idaho Department of Water Resources and be published and distributed generally as required by Idaho Code 42-1734B(5).

DATED this 2nd day of November, 2016

_____
Roger Chase, Chairman
Idaho Water Resource Board

ATTEST_____
Vince Alberdi, Secretary

# 8. SUSTAINABILITY

Sustainability focuses on the overall stewardship of the State's water resources for the good of the people of the State of Idaho.

## 8A - SUSTAINABILITY OF IDAHO'S WATER RESOURCES

**Sustainability is the active stewardship of Idaho's water resources to satisfy current uses and assure future uses of this renewable resource in accordance with State law and policy.**

**Discussion:**

This Sustainability Policy depends upon the State's sovereignty over its water resources. Water is the foundation of Idaho's economy and culture; the lives and livelihoods of Idahoans depend on a reliable supply of water. Stewardship of Idaho's water resources begins with the realization that the water resources of the State are not inexhaustible and therefore it is necessary to manage, administer, and take action to sustain, ~~maintain, and~~ enhance ~~the resource~~ and protect the quality of the water resources. Stewardship, by necessity, also includes taking affirmative steps to address declining trends in the resource where those trends exist and to establish policies that will prevent future unsustainable declines. The goal must be overall stewardship of the State's water resources for the good of the people of the State of Idaho.

The State of Idaho encompasses some of the most diverse and awe inspiring physical and geological features in the country. From the depths of Hells Canyon to the peak of Mount Borah, from sage brush deserts, to the extensive agricultural farm and ranch land, to alpine forests and meadows, to the cities and towns, the ecosystems of each of these varied areas all rely on the water resources of the State. The people of the State interact with and depend upon the water resources in these different landscapes in many different ways. Therefore, the water sustainability policy of the state of Idaho must embrace the diversity of the State, while recognizing the potential for a use or activity in one place to affect the water resources in another part of the State.

Sustainable water management strategies to meet current and future needs must be based on adequate knowledge regarding available supplies, existing use, trends, competing economic and social demands, and future needs. Planning and management actions to promote water sustainability must be designed and implemented to ensure that existing water rights are protected and the economic vitality of Idaho is optimized.

The goal of sustainable use of water resources of the State must recognize that the goals of sustainable economic growth and protection of existing ~~rights~~rights must coexist and are enhanced by measures that protect and maintain surface and ground water resources and the

aquatic, riparian, fish and wildlife, recreational, and human resources that depend on these water resources. Recognizing these needs will promote economic and environmental security and enhance the quality of life for the people of the State of Idaho.

**Implementation Strategies:**

- Ensure that all actions taken toward a sustainable water future protect and respect private property rights, both in the land and water rights
- Inventory Idaho's water supply, current uses, and future water supply needs
- Evaluate long-term and short-term trends in water availability for present and future uses
- Identify areas where present water supplies are either inadequate for present uses or not sustainable, and develop management plans to address supply in an appropriate timeframe respecting private property rights
- Identify management alternatives and projects that optimize existing and future water supplies without compromising water quality
- Prioritize and implement management alternatives and projects where competing demands and future needs are most critical
- Enhance water transfer mechanisms in Idaho law, policy and regulations to allow future economic opportunities to utilize existing water supplies, while protecting existing uses
- Utilize the Idaho Water Resource Board's Funding Program and prioritize allocation of funds for projects that ensure water sustainability across the state
- Utilize the state protected river system and the Idaho Water Resource Board minimum stream flow water rights to sustain water supplies for fisheries and recreational opportunities.
- Educate the public about water uses and the needs for water conservation measures
- Identify water conservation measures that water users, municipalities, governmental agencies and other entities can undertake to help protect the water resources of the State and provide guidance to those entities on best practices to implement those conservation measures
- Recognize that conservation measures may reduce water supplies utilized by others in other parts of the resource
- Identify measures and provide funding for aquifer stabilization strategies, including managed recharge, throughout the state with due regard to the priorities of basin specific Comprehensive Aquifer Management Plans
- Pursue enhancement of surface water storage supply as a mechanism for meeting Idaho's future water needs
- Recognize weather modification may help to achieve water sustainability goals
- Cooperate with flood control entities to ensure flood control actions are consistent with water sustainability.

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- Use a grassroots approach to identify problems and developing optimal solutions. The needs of individual basins must be taken into consideration in how the resource should be managed while recognizing the potential for decisions in one basin to affect the resources of another basin. An integrated and collaborative approach to water resource management is critical for the sound and efficient use of Idaho's water resources. The State of Idaho when appropriate should work together with, water users, tribes, local communities, neighboring states, and the federal government to resolve water issues
- Protection of the quality of existing water supplies, particularly those ground water resources that are used for drinking water supplies, to ensure the vitality of local communities. This goal requires other state and local agencies to exercise their appropriate authorities to protect the water resources and to assist in meeting the goal of sustainable economic growth

**Milestones:**

- ~~Respect for~~ Protect and respect private property rights in accordance with State law and policy
- Identify number of basins where water supply and demand have been inventoried
- Identify number of basins where management alternatives have been identified and implemented to optimize existing and future water supplies, including surface water storage, ground water recharge, conservation measures and weather modification
- Obtain more accurate water supply, water measurement, and forecasting information
- Disseminate water supply forecasts and trends to water users in cooperation with other federal and state agencies
- Measure utilization of water bank and transfer procedures to allow sustainable use of the resource
- Determination and implementation of measures and policies to enhance the utility of the water bank and transfer procedures
- Financial programs and funding strategies that meet the future water resource needs of the State of Idaho. Secure funding and resources in cooperation with the Governor and legislature. Reliable on-going, long-term funding will be needed to enable and support active stewardship of Idaho's water resources.
- Basin aquifer stabilization - stabilization of ground water levels in basins where declines are occurring to restore and maintain sustainable aquifer levels
- Initiate and facilitate construction of additional surface water storage to meet current and future needs
- Use of adaptive management to identify and address uncertainties for success, including those related to data, modeling, and impacts of climate variability
- Balance water supply and demand – supply and demand must be in balance to support current and future use within a particular basin

- Consider impact of water use changes and water supply trends on future water availability
- Improve data management – accurate and abundant data is necessary to assist with ensuring stewardship of Idaho's water resources to satisfy current and future uses
- Coordination with State and local entities on measures to protect and enhance ground water and surface water resources so that these resources are available for use by the people of the State of Idaho

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The goal of sustainable use of water resources of the sState must recognize that the goals of sustainable economic growth and protection of existing rights must coexist with and are

enhanced by measures that protect and maintain surface and ground water resources and the aquatic, riparian, fish and wildlife, recreational, and human resources that depend on these water resources. Recognizing these needs will promote economic and environmental security and enhance the quality of life for the people of the State of Idaho.

**Implementation Strategies:**

- Ensure that all actions taken toward a sustainable water future protect and respect private property rights~~,~~ both in the land and water rights.
- Inventory Idaho's water supply, current uses, and future water supply needs.
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- Identify areas where present water supplies are either inadequate for present uses or not sustainable, and develop management plans to address supply in an appropriate time frame, while respecting private property rights.
- Identify management alternatives and projects that optimize existing and future water supplies without compromising water quality.
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- Enhance water transfer mechanisms in Idaho law, policy, and regulations to allow future economic opportunities to utilize existing water supplies, while protecting existing uses.
- Utilize the Idaho Water Resource Board's Funding Program and prioritize allocation of funds for projects that ensure water sustainability across the state.
- Utilize the state protected river system and the Idaho Water Resource Board minimum stream flow water rights to sustain water supplies for fisheries and recreational opportunities.
- Educate the public about water uses and the needs for water conservation measures.
- Identify water conservation measures that water users, municipalities, governmental agencies, and other entities can undertake to help protect the water resources of the sState and provide guidance to those entities on best practices to implement those conservation measures.
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- Use a grassroots approach to identify problems and develop~~ing~~ optimal solutions. The needs of individual basins must be taken into consideration in how the resource should be managed, while recognizing the potential for decisions in one basin to affect the resources of another basin. ~~-~~An integrated and collaborative approach to water resource management is critical for the sound and efficient use of Idaho's water resources. The State of Idaho, when appropriate, should work together with~~,~~ water users, tribes, local communities, neighboring states, ~~-~~and the federal government to resolve water issues.
- Protection of the quality of existing water supplies, particularly those ground water resources that are used for drinking water supplies, to ensure the vitality of local communities. ~~-~~This goal requires other state and local agencies to exercise their appropriate authorities to protect the water resource~~s~~ and to assist in meeting the goal of sustainable economic growth.

**Milestones:**

- Protect and respect private property rights in accordance with s~~S~~tate law and policy.
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- Identify number of basins where management alternatives have been identified and implemented to optimize existing and future water supplies, including surface water storage, ground water recharge, conservation measures, and weather modification.
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- Initiate and facilitate construction of additional surface water storage to meet current and future needs.
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- Balance water supply and demand~~—~~supply and demand must be in balance to support current and future use within a particular basin.
- Consider impact of water use changes and water supply trends on future water availability.

- Improve data management——accurate and abundant data is necessary to assist with ensuring stewardship of Idaho's water resources to satisfy current and future uses.
- Coordination with sState and local entities on measures to protect and enhance ground water and surface water resources so that these resources are available for use by the people of the State of Idaho.

**Memorandum**

To: Idaho Water Resource Board (IWRB)

From: Neeley Miller, IDWR Planning & Projects Bureau

Date: October 24, 2016

RE: WD 02 WaterSmart Grant Status Report: Phase-One & Phase-Two Complete

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Background

Water District 02 was created in July, 2012. The district provides for the administration of water rights from the Snake River between Milner Dam and Swan Falls Dam. Measurement and regulation of diversions in the district is one of a number of tools that the State can employ to help maintain the Idaho Water Resource Board's (IWRB) minimum in-stream flow at the Murphy Gage in accordance with the Swan Falls Agreement.

WaterSmart Phase-One

At the January 2013 meeting of the Idaho Water Resources Board (Board), Board members were briefed on the creation of WD02 and a coordinated effort among district water users and both IDWR and IWRB staff to secure cost share funding through a US Bureau of Reclamation (BOR) WaterSmart grant to assist with the installation of measuring devices and telemetry equipment for diversions in the district.

The IWRB WaterSmart proposal for phase-one received funding in the amount of $151,425. The total budget for phase-one was $352,152, with $200,726 coming from water users and $151,425 coming from the BOR. Installation and calibration of measurement devices was complete in the spring of 2016.

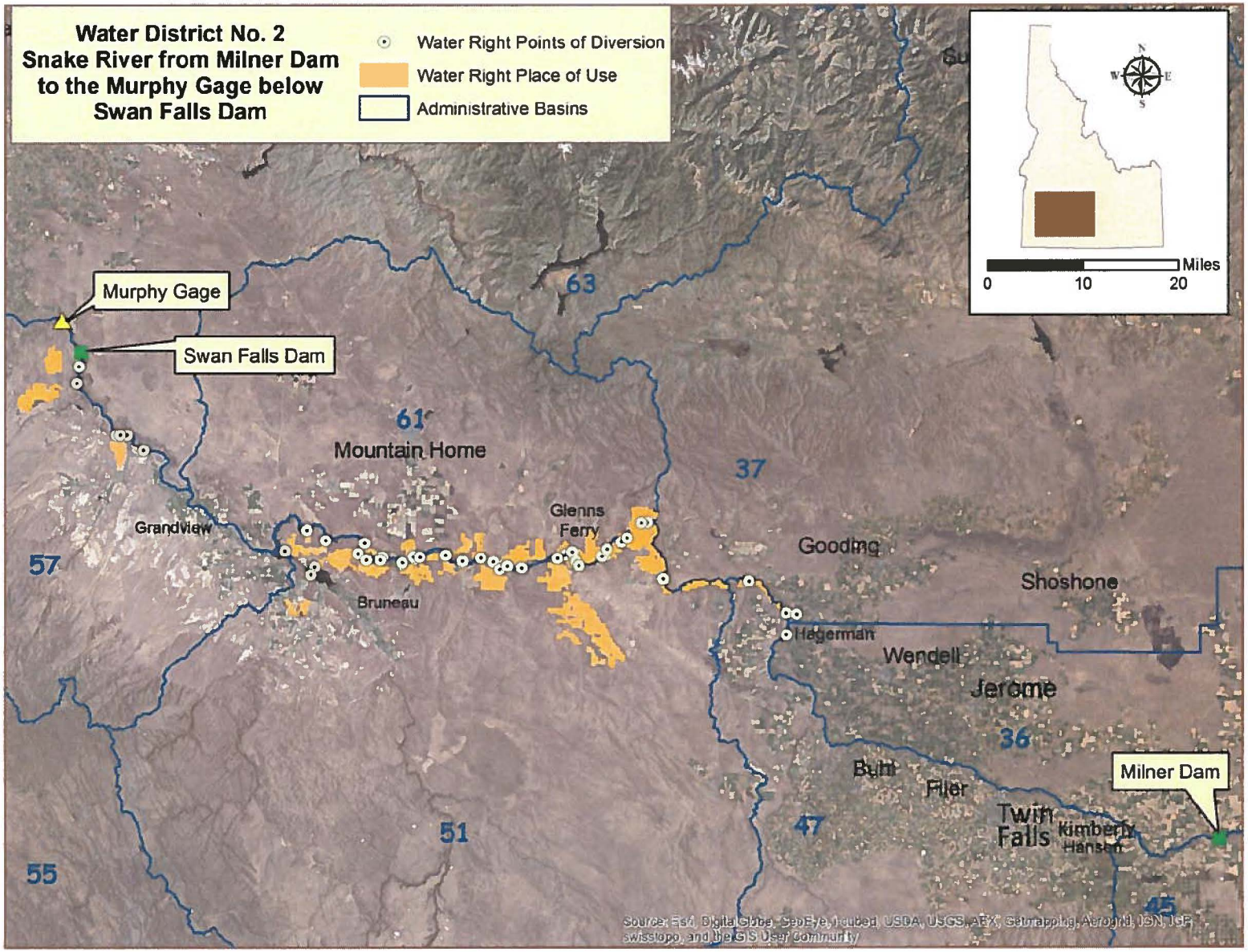
WaterSmart Phase-Two

At the January 2014 Board meeting, Board members were briefed on phase-two of this project. Board staff worked with WD02 and BOR to submit a second grant application in January 2014 to address many of the remaining diversions in the district.

The IWRB WaterSmart proposal for phase-two received funding in the amount of $295,176. The total budget for phase-two was $655,947, with $360,771 coming from water users and $295,176 coming from the BOR. Installation and calibration of equipment was completed in September 2016.

Attachments

1) Map of Water District 02, Snake River from Milner Damn to Murphy Gage, and 2) Phase-Two Final Performance Report




Map of Water District 02, Snake River from Milner Damn to Murphy Gage

# FINAL PERFORMANCE REPORT

Phase II: Irrigation Flow Measurement Device and Monitoring Project for Water District 02
WaterSMART Water and Energy Efficiency Grants

Agreement # R14AP00063

Idaho Water Resource Board (IWRB)
322 East Front Street
Boise, Idaho

## Purpose

The purpose of this performance report is to fulfill the commitment made by the Idaho Water Resource Board (IWRB) to the United States Department of Interior (DOI), under the terms and conditions of the July 2014 agreement, concerning performance under the Phase II Irrigation Flow Measurement and Device and Monitoring Project for Water District 02 WaterSMART Water and Energy Efficiency Grants (WEEG).

This grant was designed to be a dual phase project with Phase I completed. The objective of Phase II was to provide remaining water users in Water District 02 that were not included in the FY2013 grant an opportunity to benefit from the Bureau of Reclamation (BOR) cost share money, while improving water management in the district. Phase II included both small and large farms ranging from 12 acres to about 10,000 acres. Measurement and monitoring of water diversions from the Snake River in Water District 02 will improve management and regulation of the resource and is critical to:

1. Provide protection to minimum stream flow water rights established on the Snake River pursuant to the Swan Falls Agreement between the State of Idaho ("State") and the Idaho Power Company ("IPC");

2. Ensure that diversions are limited to authorized water rights limits, thereby limiting potential for excess diversions or deliveries and providing potential water savings;

3. Ensure that authorized water uses in areas of the Snake River basin tributary to the Snake River above Swan Falls are not prematurely curtailed in times of water shortage;

4. Provide an overall water budget of all water use within the water district that in turn will maximize the available water within the river reach.

5. Provide for protection and improved delivery of water supplies rented from the Upper Snake River Basin (Water District 01Rental Pool) and/or the Idaho Water Supply Bank ("WSB" or "Bank") that are delivered through Water District 02 for downstream purposes.

In total, work under this grant provided for the installation of measuring devices, primarily closed conduit ultrasonic and magnetic flow meters, on 76 irrigation diversions in the water district by the 2016 irrigation season. Phase I had 26 diversions and Phase II had 50 diversions. Diversions in the recently created Water District 02 have not historically been regulated and prior measurements of diversions have been limited. Accordingly, water users in this reach of the Snake River were not accustomed to water measurement, monitoring, or regulation. In addition to installing accurate measuring devices on the selected 76 diversions, the grant also provided monitoring and telemetry equipment at the largest diversions. This provides real time measurement data, minimizing efforts and cost to collect data.

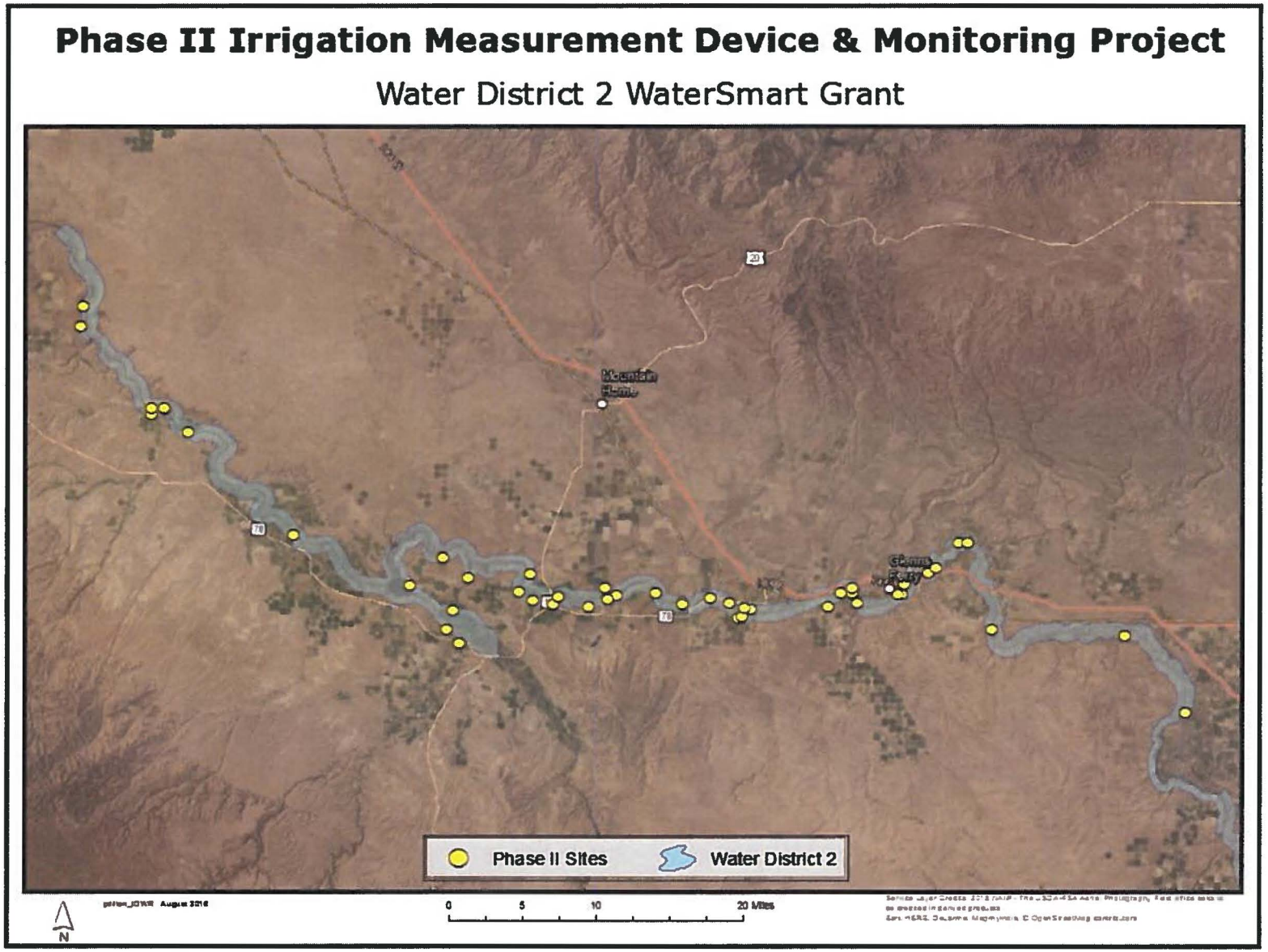



**Figure 1**. Location of irrigation diversions in Water District 2 being instrumented and measured under Phase II of the WaterSMART Grant.

## Proposed work for Phase-II

### Flow meters

All Phase II flow meters have been installed.

The ultrasonic flow meter used is the General Electric (GE) Panametric AT868 unit with a transducer frequency of either 0.5 or 1 Mega Hertz (MHz). Existing GE meters were installed and programmed by a GE representative and comply with the Idaho Department of Water Resources (IDWR) water measurement accuracy standard of ±2% for ultrasonic flow meters. This ultrasonic unit can measure up to two pipes at a time with one processing unit and an additional set of transducers.

The primary electromagnetic flow meter used is the Badger M-2000 which is available in sizes ranging from ¼" to 96" diameter and will measure flows ranging from 0.1 to 39 fps. The M-2000 exceeds IDWR's ±2% adopted accuracy standards. Stated manufacturer accuracy for the M-2000 meter is ±0.25%. Water District 02 staff has checked calibration and verified the accuracy of the installed flow meters using portable ultrasonic flow meters.

Water District 02 has a mix of GE, Badger, Fuji, and Octave flow meters from the IDWR approved flow meter list found on the IDWR website https://idwr.idaho.gov/files/water-measurement/approved-flow-meter-list.pdf . This list represents flow meters that have been tested by a third party laboratory for accuracy and precision. All flow meters on this list are required to pass this accuracy threshold adopted by IDWR.

### Telemetry

This project included radio telemetry to provide automatic data retrieval from remote locations. Originally the project objective was to use spread spectrum radios (900 MHz) not regulated by the Federal Communication Commission (FCC). After consulting with several Radio Frequency (RF) experts, it was determined that Very High Frequency (VHF) radios would provide the best coverage and RF continuity within the project area. Ritron radios paired with Campbell Scientific modems (lower cost than the spread spectrum technology) transmit data at a frequency of 160.11 MHz. This frequency requires FCC licensing and all required FCC licenses have been obtained. Upon obtaining an FCC license, use of the call signs and frequency must be proved upon within one year, meaning data transmitted for each call sign via the assigned frequency. All licenses have been completed or granted a 2 year extension by the FCC.

Installed telemetry equipment provides versatility to operate as a primary and/or slave type station allowing data to be transmitted directly from or passed through as a means of moving

data from difficult or remote locations within the network. Data transmitted by the remote measurement stations is received by one of two towers located in Hagerman or Grand View, Idaho. These towers have an antenna and base station telemetry equipment and are currently receiving data. IDWR is accessing this data through an internet connection with these towers. IDWR technicians are currently troubleshooting some RF connectivity issues at measurement locations with challenging terrain.

This telemetry network will enable the WaterMaster to more efficiently manage diversion data collection and provides a tool to help manage water district staff time. Efficient data access is necessary for proper water distribution, and will also provide annual diversion data for reporting, that has a consistent file structure and processing protocol.

Currently 20 Phase II sites and in total, 37 sites (75%) of WD02 sites slated for telemetry are transmitting data to IDWR. Another 7 sites are expected to transmit after minor adjustments to the network RF connectivity are made.

## Data management and Quality Assurance

With great effort put forth to measure and collect flow data, the management and quality of this data is a priority. Discharge data is to be used by the Water District 02 WaterMaster for regulatory purposes and having reliable data is critical to water resource management. This data is acquired by three methods; telemetry, manual downloads from datalogger, and totalized reading from flow meters. Both telemetered and manually downloaded data are processed in Aquarius Time-Series Software ("Aquarius"). Flow rate data is parsed from the IDWR network and automatically uploaded into Aquarius. Data is then quality checked, and reported. Currently 20 Phase II sites are automated into Aquarius and in total 34 (69%) of WD02 sites slated for telemetry are automating into Aquarius.
These reports will be automated to upload into DWR Central, which can be viewed by the users and public when logged in as a guest.
https://idwr.idaho.gov/apps/wm/DiversionDataApplication/Login.aspx
Data will be considered provisional until a second round of quality assurance and control is applied and labeled final. Totalized flow meter readings are recorded in the Water Measurement Information System (WMIS). Data can be viewed by the public when logged in as a guest. https://idwr.idaho.gov/apps/wm/wmis/.

## Performance Report for Phase II Project Completion

All Phase II telemetry stations (500 acres and larger) are complete and capable of transmitting data through the telemetry network. Photos of equipment and setup are provided for each site to illustrate the grant money used and Phase II site completion. These stations are equipped with the following equipment:

- IDWR approved flow meter [Magnetic, Acoustic Doppler Current Profiler (ADCP) or Ultrasonic]
- Campbell Scientific datalogger (CR1000, CR800 or CR200X)
- Campbell Scientific RF500M radio modem
- Ritron DTX-145 radio (160.11MHz)
- Directional Yagi antenna or Omni multi directional antenna
- AC/DC power supply with battery backup or solar DC power supply

## STATIONS TRANSMITTING VIA RADIO TELEMETRY:

Below are the sites that have radio, modem, and dataloggers installed, programmed, and wired. The antennas have been installed and the radio frequency has been tested through the network. Data is transmitting daily to the servers at IDWR state department in Boise through one of the transmission towers (Grand View or Hagerman). Once data arrives to the server, each site is processed in Aquarius and compiled into daily flow rates. Data will soon be reported in DWR Central for public access.

### Grindstone Butte
### Sailor Creek (ATN Holdings, LLC)

This station measures both Grindstone Butte and Sailor Creek Diversions. Grindstone Butte has a dual channel GE AT868 ultrasonic flow meter and Sailor Creek has a single channel GE AT868. The telemetry equipment is shared between these two stations. Work at this site is complete and data is actively transmitting to the IDWR network and automated to Aquarius.

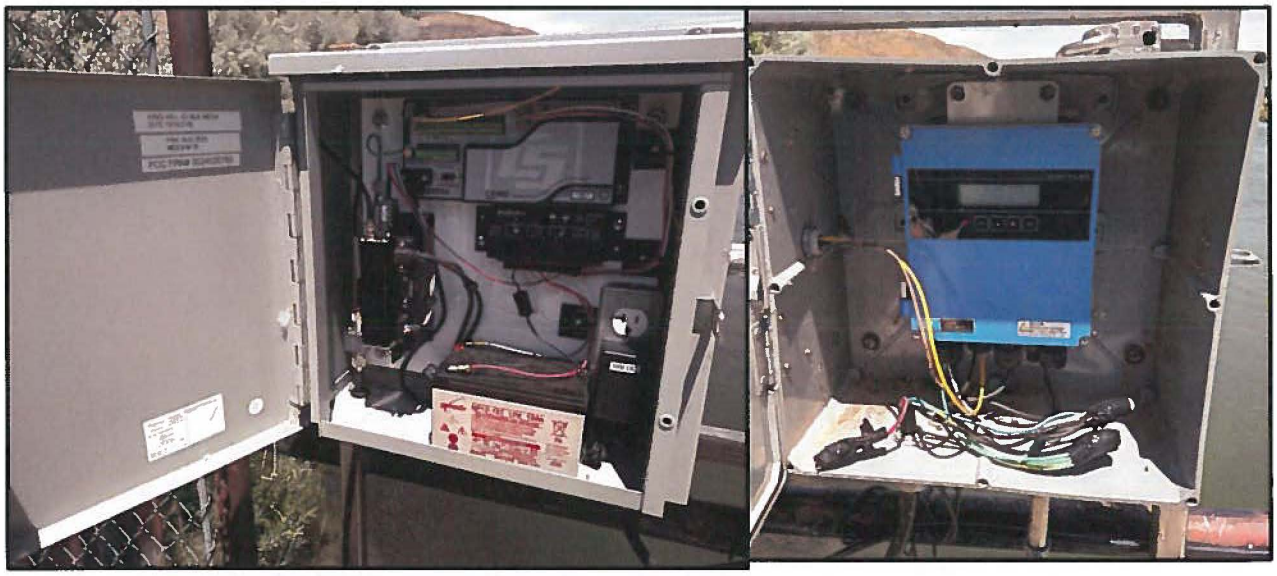
*Grindstone Butte and Sailor Creek flow meter and telemetry installation*

*Grindstone Butte and Sailor Creek 3db Omni antenna*

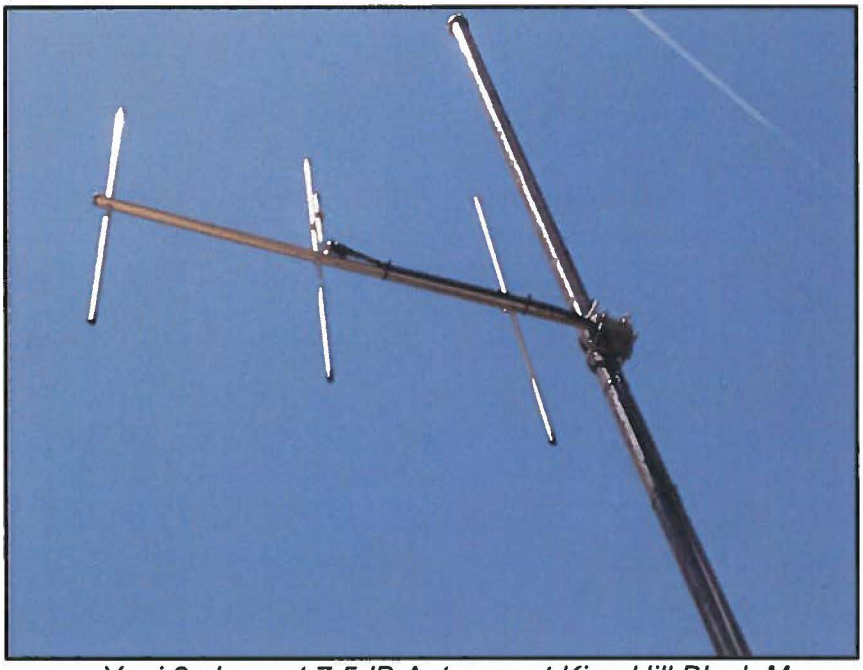
## King Hill Irrigation District (KHID)

The four KHID diversions have Fuji ultrasonic flow meters, dataloggers, and telemetry equipment installed. All work is complete at the King Hill diversions.

### King Hill Black Mesa



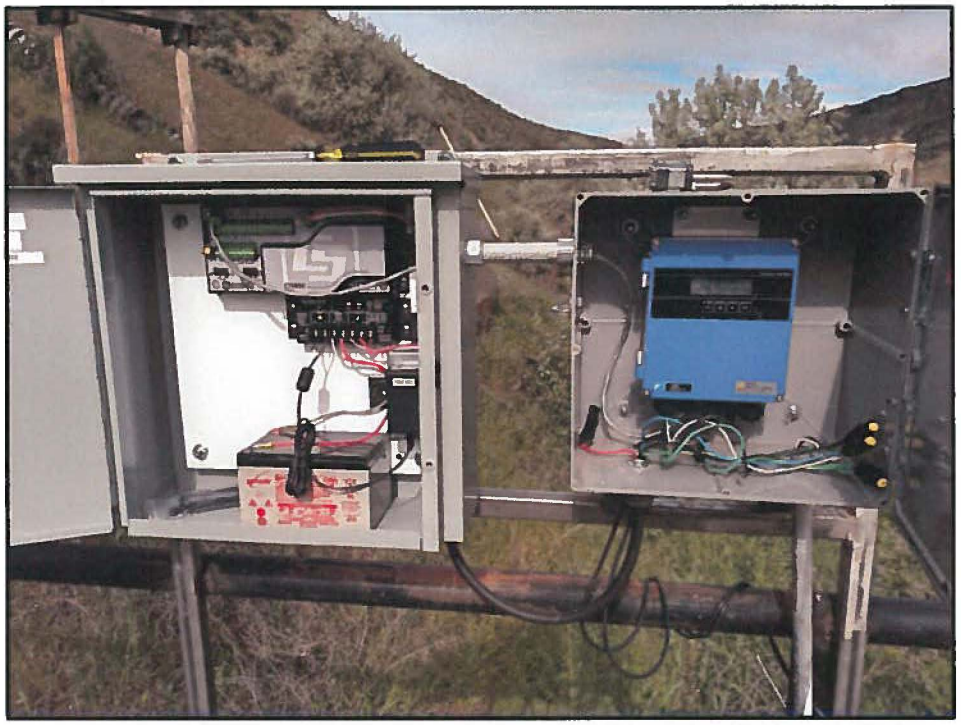
*Telemetry setup and Fuji Flow Meter at King Hill Black Mesa*



*Yagi 3 element 7.5dB Antenna at King Hill Black Mesa*

## King Hill Wiley

A Fuji ultrasonic flow meter, datalogger, and telemetry equipment have been installed. Work at this site is complete.



*Telemetry setup and Fuji Flow Meter at King Hill Wiley*

*Yagi 3 element 7.5 dB Antenna at King Hill Wiley*

## King Hill King Hill

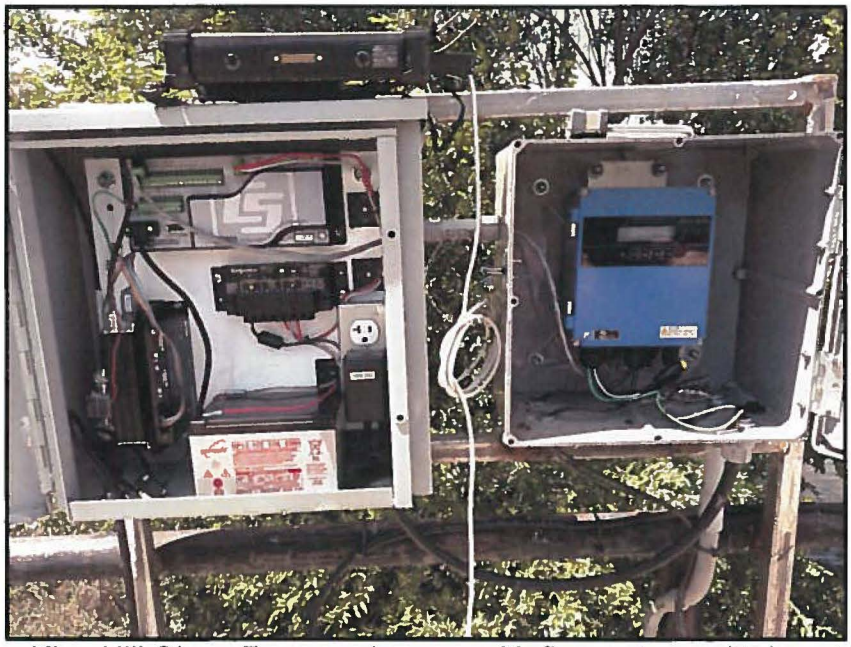
A Fuji ultrasonic flow meter, datalogger, and telemetry equipment have been installed. Work at this site is complete.

*Telemetry setup and Fuji Flow Meter at King Hill King Hill*

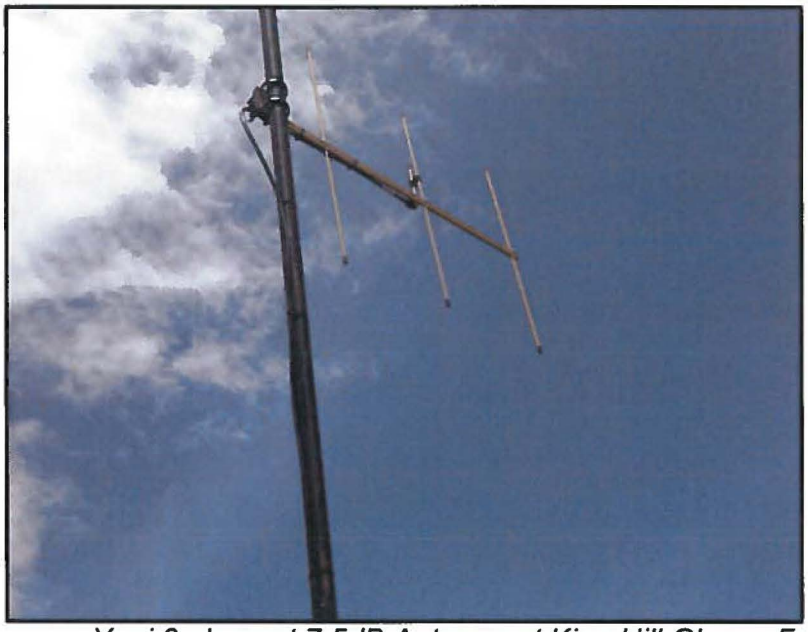
*Yagi 3 element 7.5 dB Antenna at King Hill Wiley*

## King Hill Glens Ferry

A Fuji ultrasonic flow meter, datalogger, and telemetry equipment have been installed. Work at this site is complete.



*King Hill Glens Ferry enclosures with flowmeter and telemetry equipment*



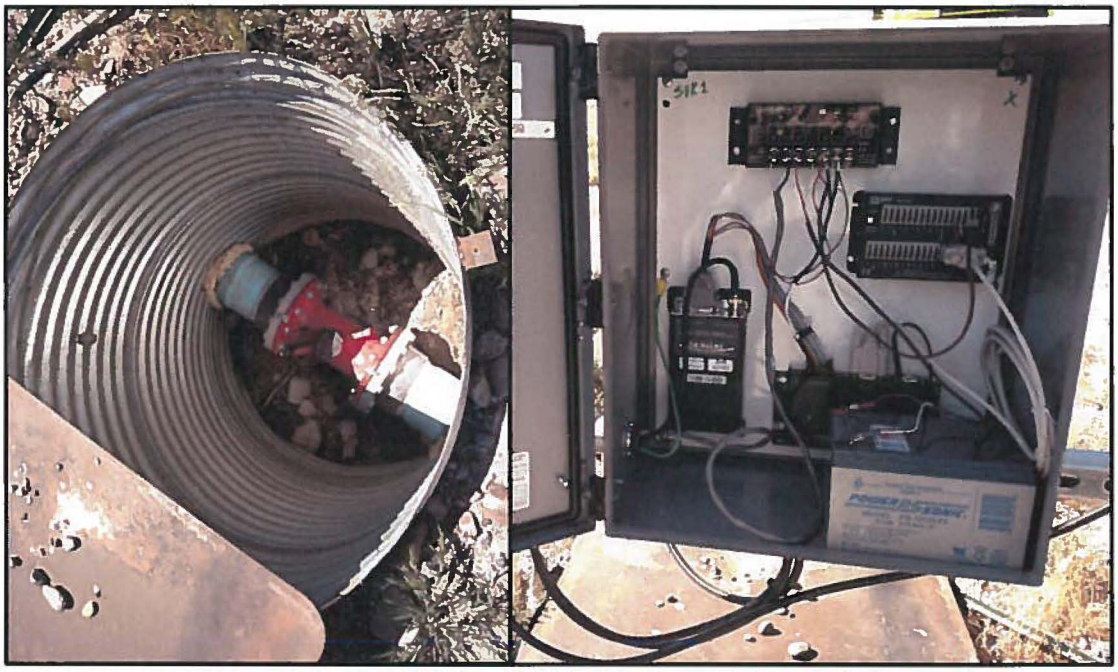
*Yagi 3 element 7.5dB Antenna at King Hill Glenns Ferry*

## SV Ranch LLC

SV Ranch has three diversions and four flow meters, 3 dataloggers, and telemetry equipment installed. All work is complete.

## SV Ranch 1

This diversion has a 10" Octave ultrasonic flow meter, datalogger, and telemetry equipment.



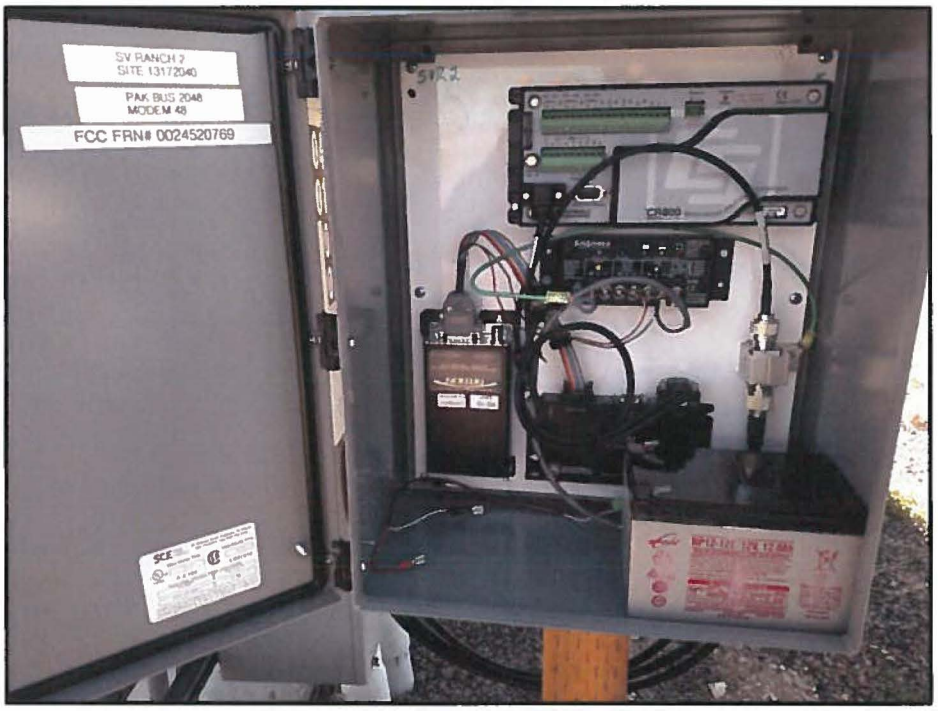
*SV Ranch 1 Telemetry Network Setup*

*SV Ranch 1 Yagi 3 element 7.5dB Directional Antenna*

## SV Ranch 2

SV2 has two Fuji ultrasonic flow meters. This site is actively transmitting data to IDWR and is automated to Aquarius.

*SV Ranch 2 - Two Fuji flow meters for dual penstock*



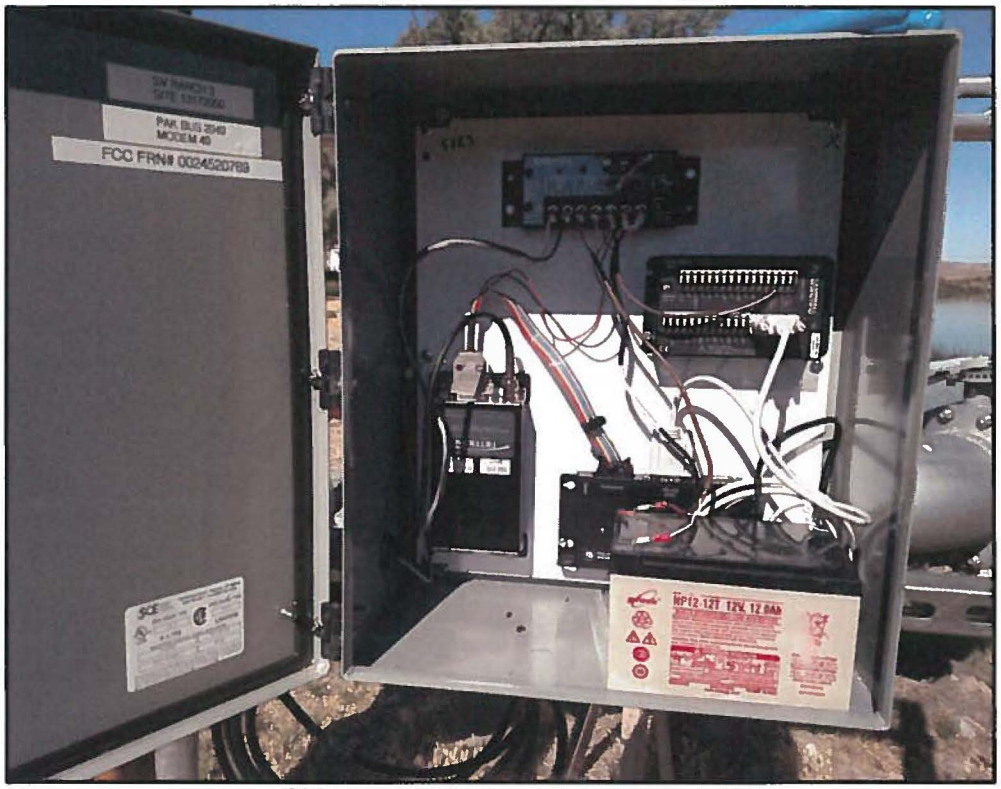

*SV Ranch 2 – Datalogger and telemetry equipment*

*SV Ranch 2 Yagi 3 element 7.5dB Directional Antenna*

### SV Ranch 3

This diversion has a 10" Octave ultrasonic meter, datalogger, and telemetry equipment installed.

*SV Ranch 3 with Octave flow meter on right (red)*

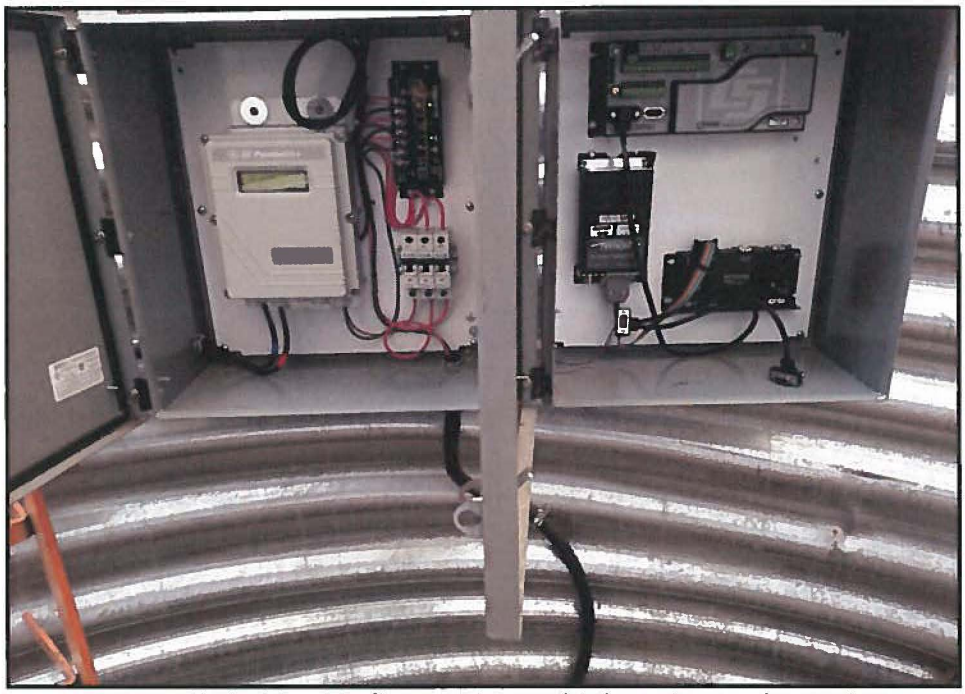



*SV Ranch 3 Telemetry Network Setup*

*SV Ranch 3 Yagi 3 element 7.5 dB Directional Antenna*

## Dale Van Es (Falcon Butte)

This site has a GE AT868 flow meter, telemetry equipment, and datalogger installed. Work at this site is complete and data is actively transmitting to the IDWR network and automated to Aquarius.



*Dale Van Es flow meter and telemetry equipment*

*Dale Van Es CMP, solar panel, and Yagi 3 element 7.5dB antenna*

## Dale Hooley

In total Dale Hooley has three diversions participating in this grant. One is telemetered; the other two are meter only. In this section only the telemetry site is described. The other two sites are described in the stations with flow meter only (non-telemetry) section of this report.

## Dale Hooley

This diversion has a Fuji ultrasonic flow meter, datalogger (CR800), and telemetry equipment installed. Data is actively transmitting to the IDWR network and then automated to Aquarius. Work at this site is complete and data is actively transmitting to the IDWR network and automated to Aquarius

*Dale Hooley telemetry installation*

*Dale Hooley Yagi 3 element 7.5 dB antenna*

## Midnight Sun VIII LLC (AKA UBS Indian Hills)

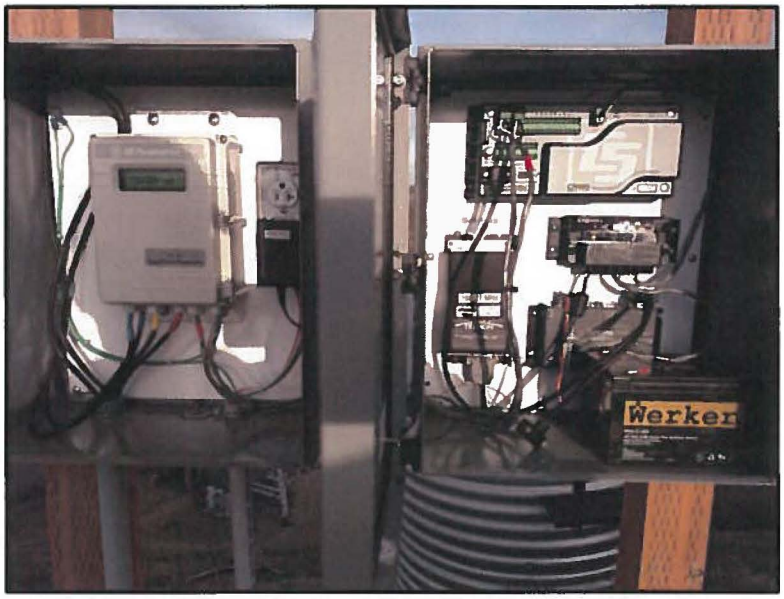
This site has a GE AT868 flow meter, telemetry equipment, and datalogger installed. Work at this site is complete and data is actively transmitting to the IDWR network and automated to Aquarius.

*Midnight Sun Dual channel flow meter with telemetry equipment installation*

*Midnight Sun Yagi 3 element 7.5 dB antenna*

## Eagle Creek North West LLC (AKA UBS Slick Ranch)

This site has a GE AT868 flow meter, telemetry equipment, and datalogger installed. Work at this site is complete and data is actively transmitting to the IDWR network and automated to Aquarius.



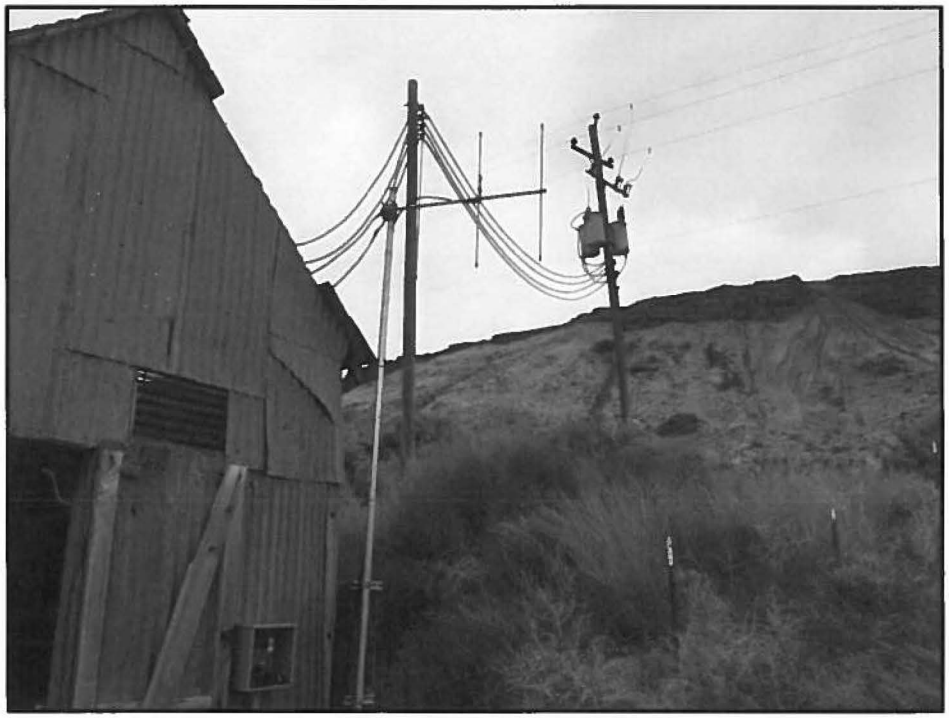

*Eagle Creek flow meter with telemetry equipment installation*

*Eagle Creek Yagi 3 element 7.5 dB antenna*

## West Indian Cove Water Company

A Fuji ultrasonic flow meter, datalogger, and telemetry equipment have been installed. Work at this site is complete and data is actively transmitting to the IDWR network and automated to Aquarius.

*West Indian Cove flow meter*



*West Indian Cove Yagi 3 element 7.5 dB antenna*

## Robert Meyer

This site has two dual channel GE AT868 flow meters, telemetry equipment, and antenna. This site is actively transmitting data to the IDWR network and data is being automated to Aquarius.

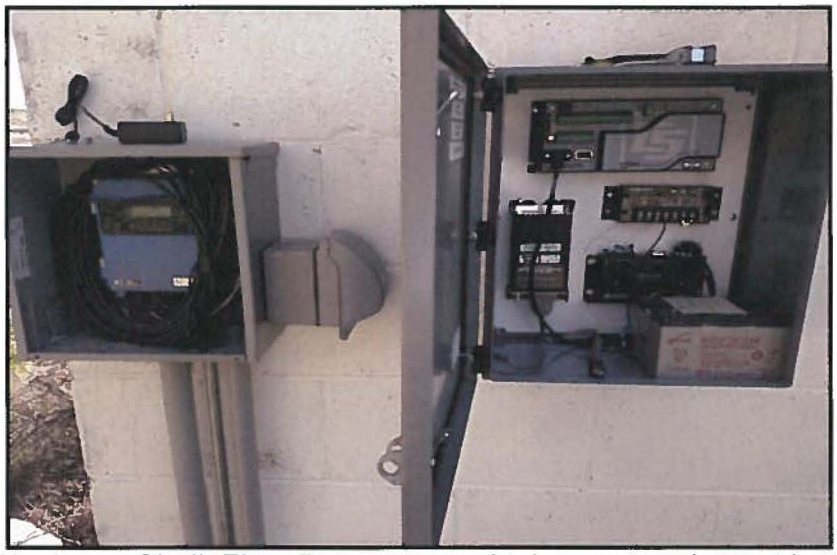
*Robert Meyers flow meter installation and telemetry enclosure*

*Robert Meyers Yagi 3 element 7.5 dB antenna*

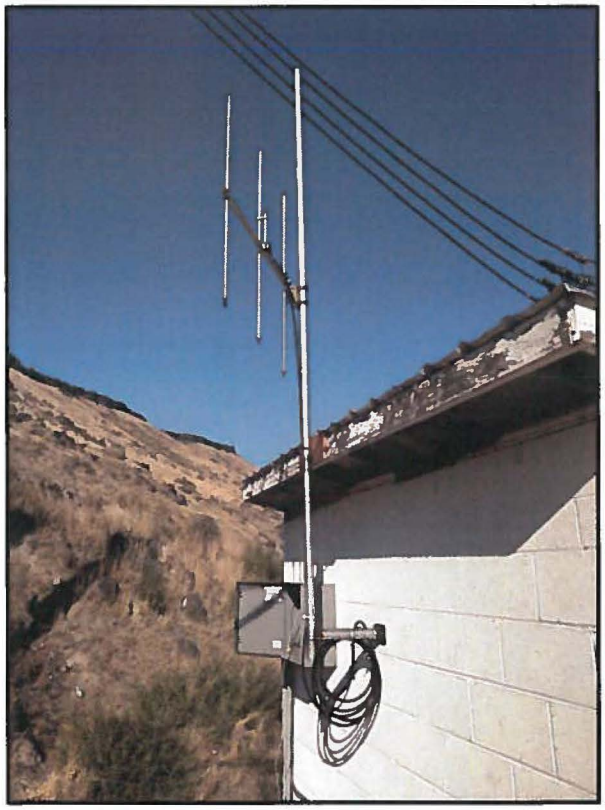
## Blanksma Land & Storage (AKA Chalk Flats and Dunes)

Fuji ultrasonic flow meters and telemetry equipment have been installed at both pump stations. All work is complete at these diversions.

### Blanksma Chalk Flats



*Blanksma Chalk Flats flow meter and telemetry equipment installation*



*Blanksma Chalk Flats Yagi 3 element 7.5 dB antenna*

## Blanksma Dunes

This site is actively transmitting data to the IDWR network and data is being automated to Aquarius.

*Blanksma Dunes Flow Meter and Telemetery Equipment*

*Blanksma Dunes Yagi 3 element 7.5 dB antenna*

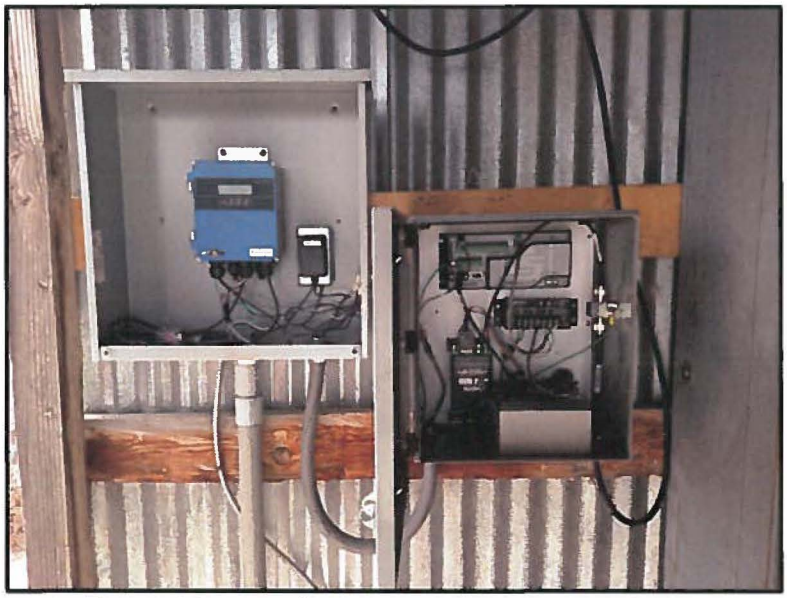
## Donna and Emma (and Robert) Bledsoe

This diversion shares a data logger and telemetry equipment with the Blanksma Chalk Flats pump station. See Blanksma Chalk Flats above for image of telemetry equipment and antenna.

*Bledsoe Flow Meter Installation*

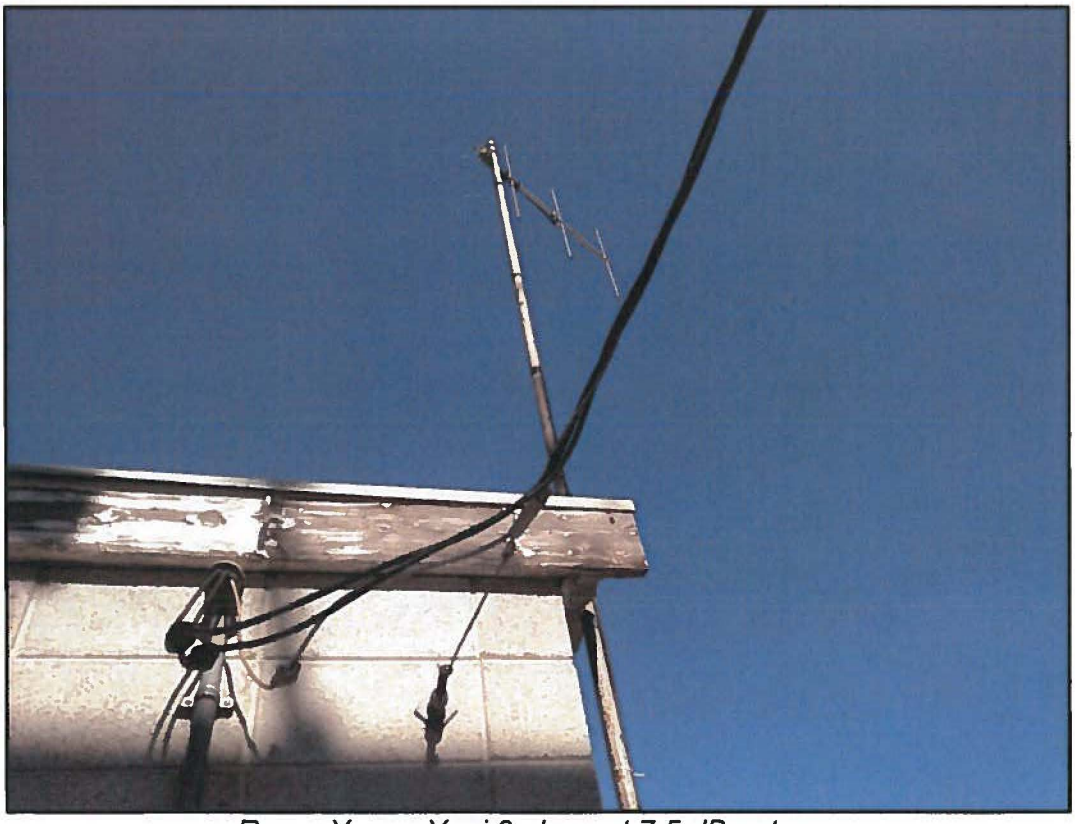
## Roger Young, Jacob & Clay Atkins

A Fuji ultrasonic flow meter, datalogger, and telemetry hardware have been installed. Work at this site is complete and data is actively transmitting to the IDWR network and automated to Aquarius.



*Roger Young telemetry equipment installation*

*Roger Young flow meter installation*

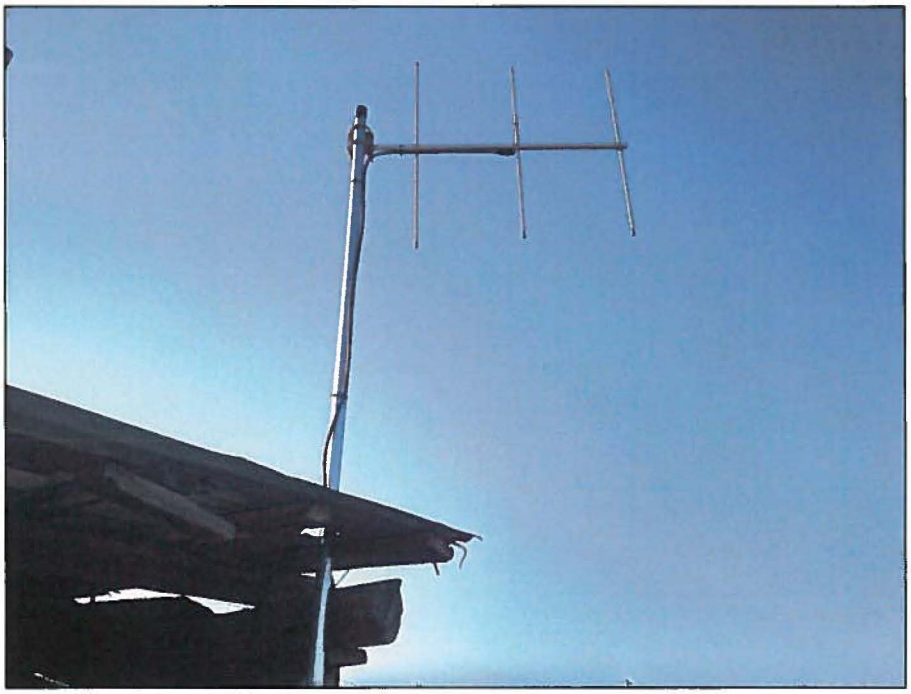


*Roger Young Yagi 3 element 7.5 dB antenna*

## Quey Johns

A GE AT868 flow meter, telemetry equipment and a datalogger have been installed. . Work at this site is complete and data is actively transmitting to the IDWR network and automated to Aquarius.

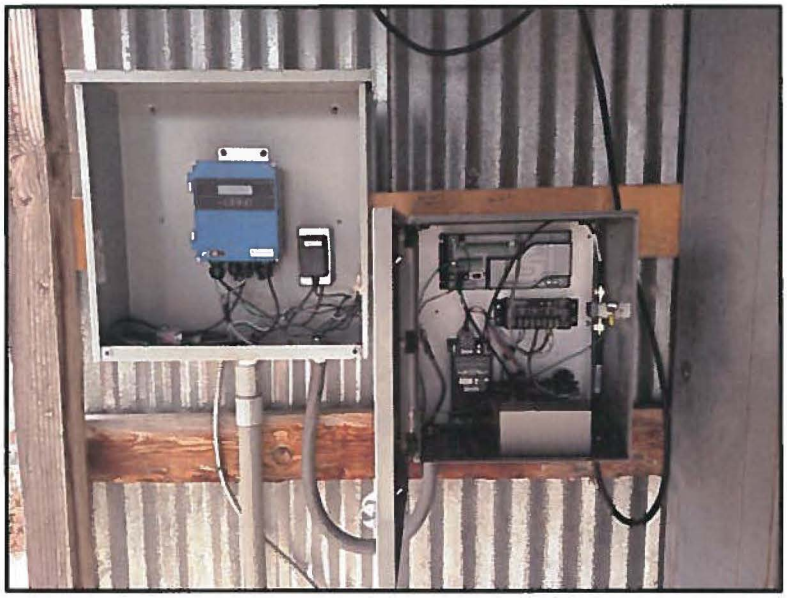
*Quey Johns flow meter and telemetry equipment installation*



*Quey Johns Yagi 3 element 7.5 dB antenna*

## Gingerich Brothers Farms (Rudy Gingerich)

A Fuji ultrasonic flow meter, datalogger, and telemetry hardware have been installed. Work at this site is complete and data is actively transmitting to the IDWR network and automated to Aquarius.

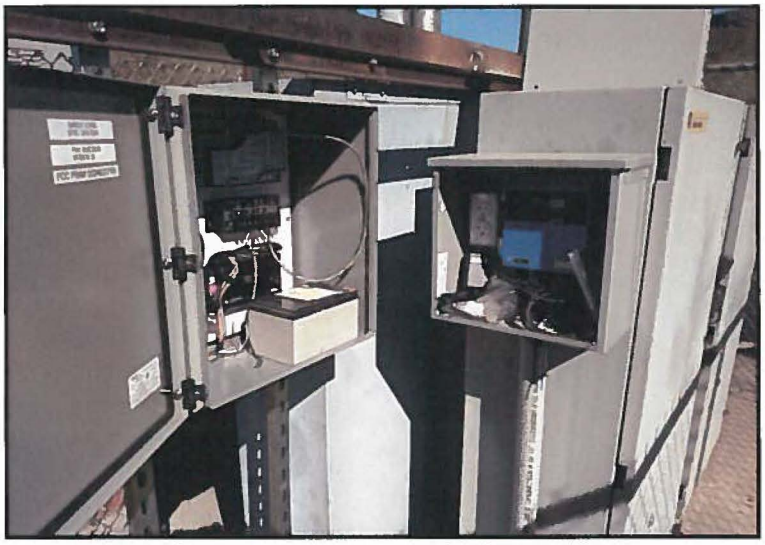


*Gingerich Brothers flow meter and telemetry equipment*

*Gingerich Brothers Yagi 3 element 7.5 dB antenna*

## Wilson & Wilson Company Inc (Eagle Cove)

A Fuji ultrasonic flow meter, datalogger, and telemetry hardware have been installed. Work at this site is complete and data is actively transmitting to the IDWR network and automated to Aquarius.

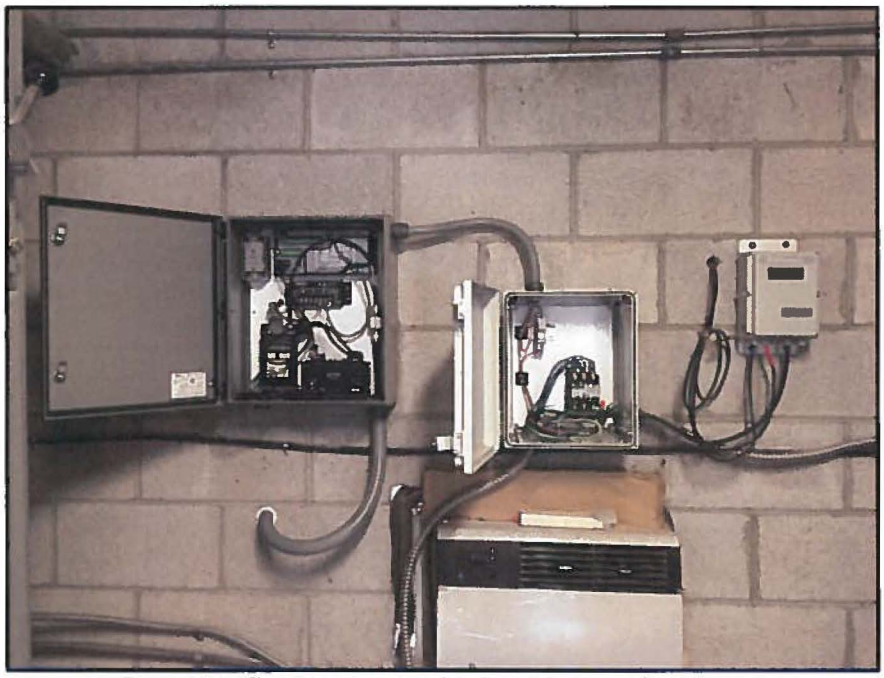


*Eagle Cove flow meter and telemetry equipment*

*Eagle Cove Yagi 3 element 7.5 dB antenna*

## Deruyter Properties LP

A GE AT868 ultrasonic flow meter, datalogger, and telemetry equipment have been installed. All work is complete and data is actively transmitting to the IDWR network and automated to Aquarius.



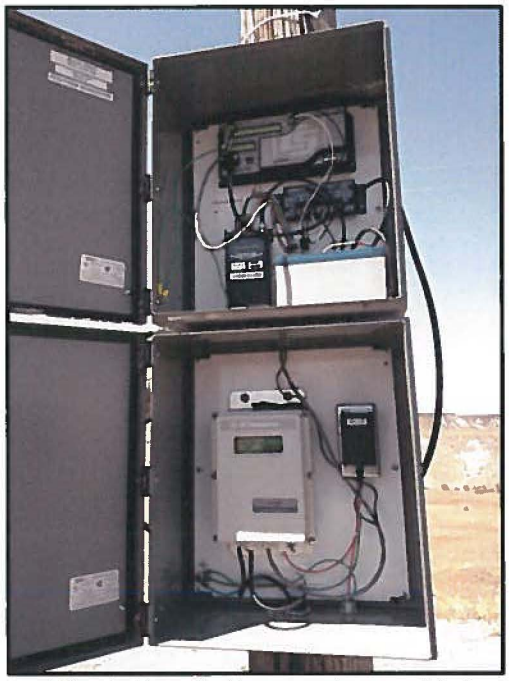
*Deryuter flow meter and telemetry equipment*

*Deryuter Yagi 3 element 7.5 dB antenna*

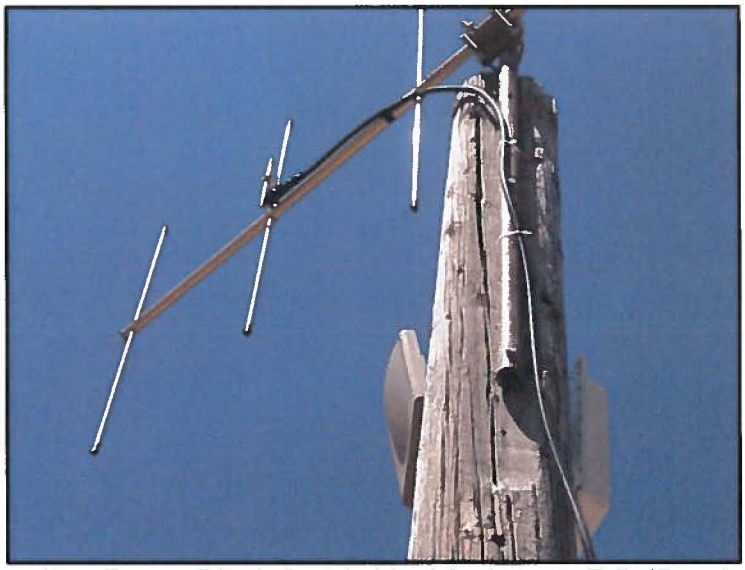
## Murphy Land Company LLC (Owyhee Farms)

There are four diversions with the Murphy Land Company participating in this grant. GE AT868 flow meters, dataloggers and telemetry equipment have been installed at all four stations. All work is complete and data is actively transmitting to the IDWR network and automated to Aquarius.

### Owyhee Farms Black Sands

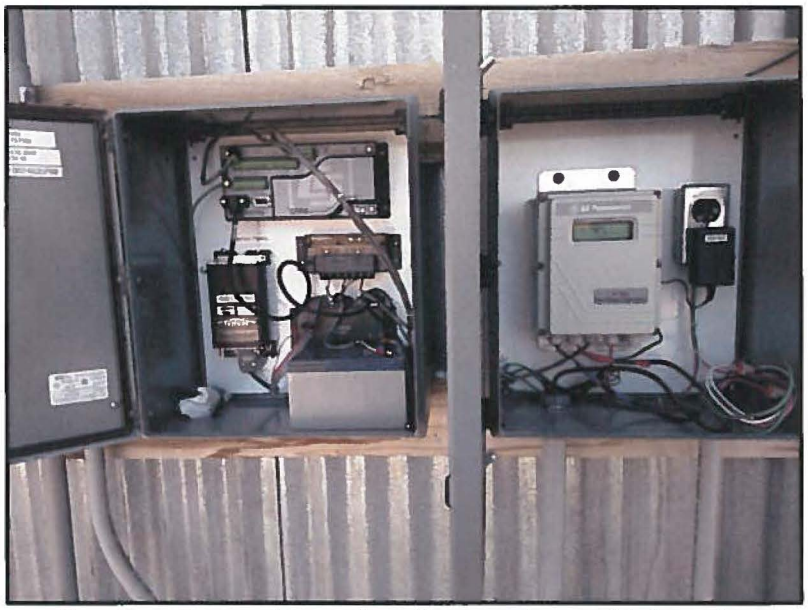


*Owyhee Farms Black Sands flow meter and telemetry equipment*

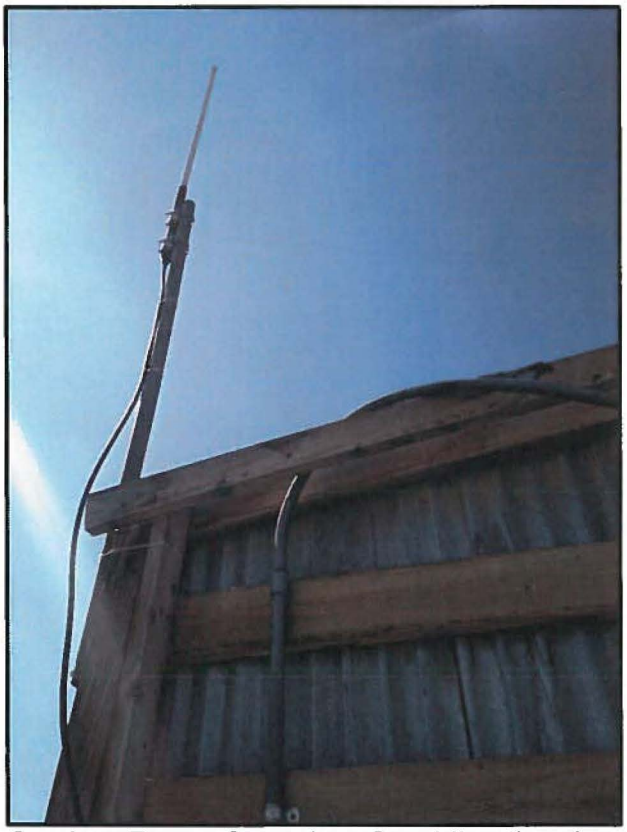


*Owyhee Farms Black Sands Yagi 3 element 7.5 dB antenna*

## Owyhee Farms Cove Arm

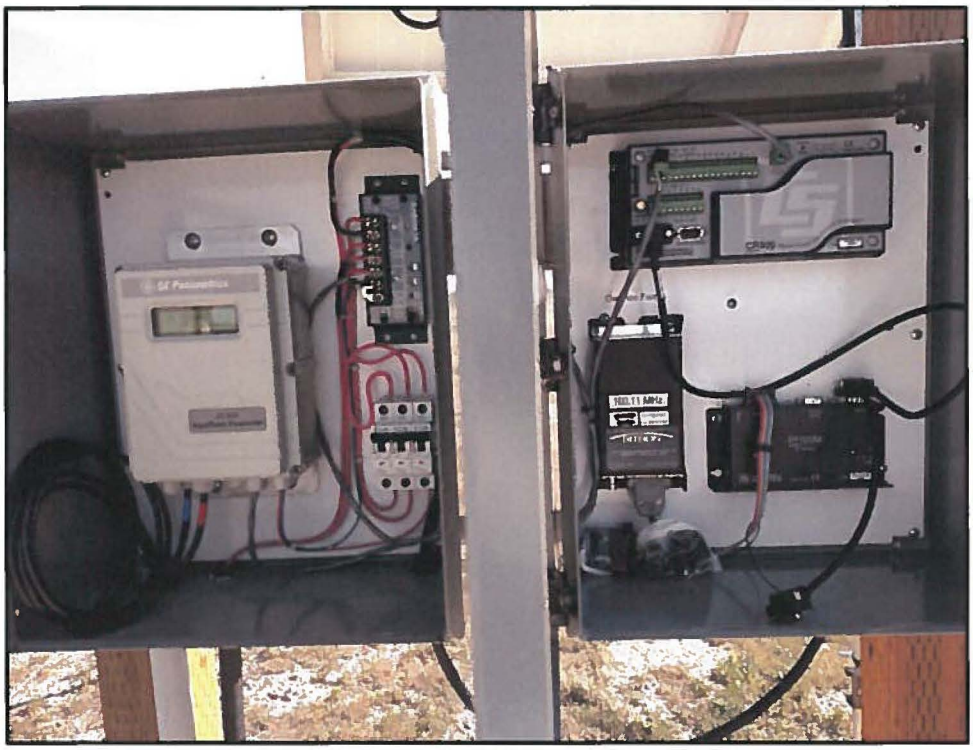


*Owyhee Farms Cove Arm flow meter and telemetry equipment*



*Owyhee Farms Cove Arm Omnidirectional antenna*

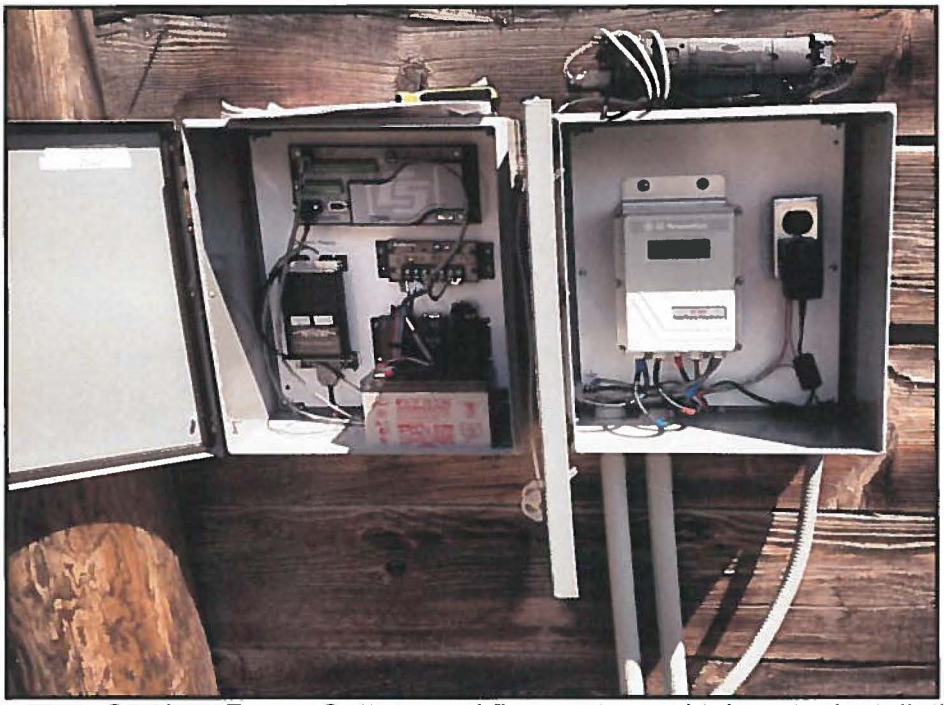
## Owyhee Farms Snake River



*Owyhee Farms Snake River flow meter and telemetry equipment*

*Owyhee Farms Snake River Yagi 3 element 7.5 dB antenna*

## Owyhee Farms Cottonwood



*Owyhee Farms Cottonwood flow meter and telemetry installation*

*Owyhee Farms Cottonwood Yagi 3 element 7.5 dB antenna*

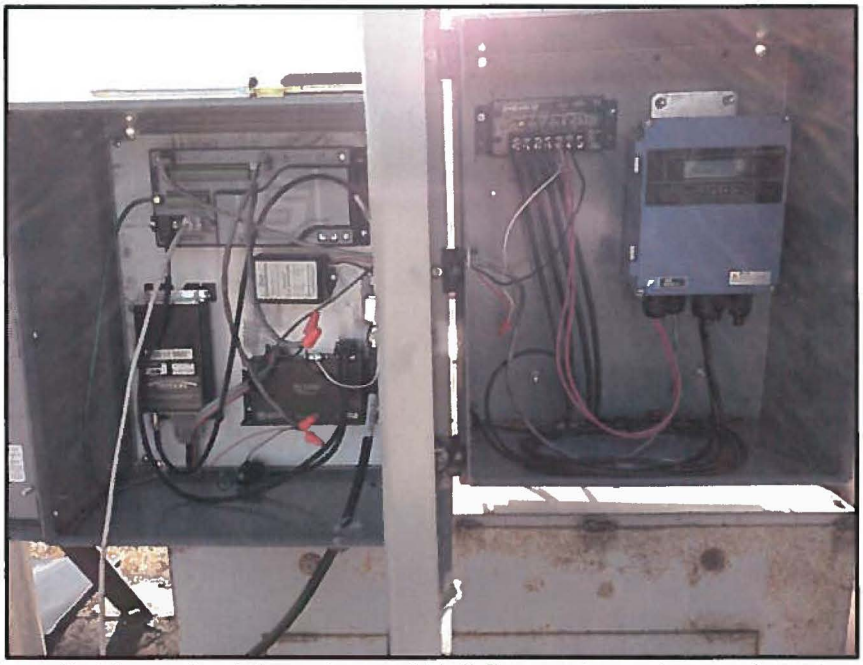
## Frank Tiegs LLC (AKA Triple C)

A GE AT868 ultrasonic flow meter, datalogger, and telemetry equipment have been installed. All work is complete and data is actively transmitting to the IDWR network and automated to Aquarius. This site is a major relay for diversions in this reach of the river.

*Triple C Yagi 5 element 9 dB antenna (left) and flow meter and telemetry installation (right)*

## Donald Schiermeier (AKA Schiermeier)

This site is equipped with a Fuji ultrasonic flow meter, datalogger, and telemetry equipment. Schiermeier is a relay site for Simplot 3, Jacks Creek, Owyhee Farms Cottonwood, and Owyhee farms Cove Arm. Data is transmitting to the IDWR network and will be automated to Aquarius.

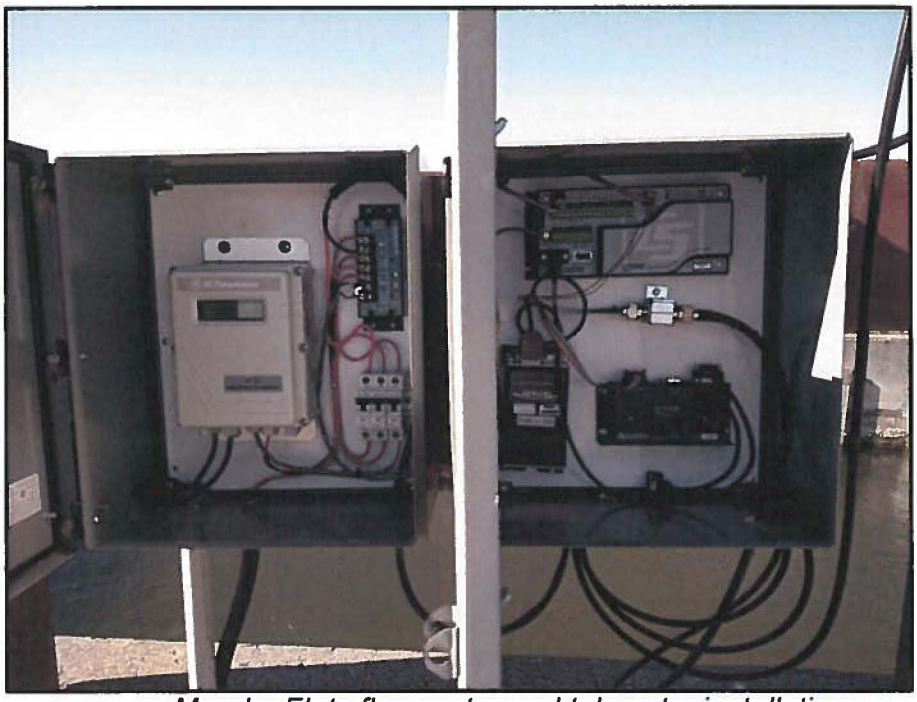


*Schiermeier telemetry and Fuji flowmeter setup and enclosures*

*Schiermeier antenna and solar panel setup*

## Murphy Flats Water Company

This site is equipped with a GE AT868 flow meter, datalogger and telemetry equipment. Murphy Flats is a relay for Dale Van Es. Data is transmitting to the IDWR network and automated to Aquarius.



*Murphy Flats flow meter and telemetry installation*

*Murphy Flats Yagi 3 element antenna and solar panel*

## STATIONS WITH FLOW METER ONLY (NON-TELEMETRY)

### Dale Hooley

#### Dale Hooley Farms

This diversion has a Netafim 10" Octave Ultrasonic installed and all work is complete.

#### Dale Hooley VFD

This diversion is near the Bruneau Dunes State Park and has a Netafim 12" Octave Ultrasonic flow meter installed. All work is complete.

*Dale Hooley VFD flow meter installation (red)*

## Greg Mellum

A Badger M2000 flow meter was installed, calibrated, and captured flow data for the 2016 irrigation season.

*Mellum Badger meter (left). Ryan Johnson Badger meter (right)*

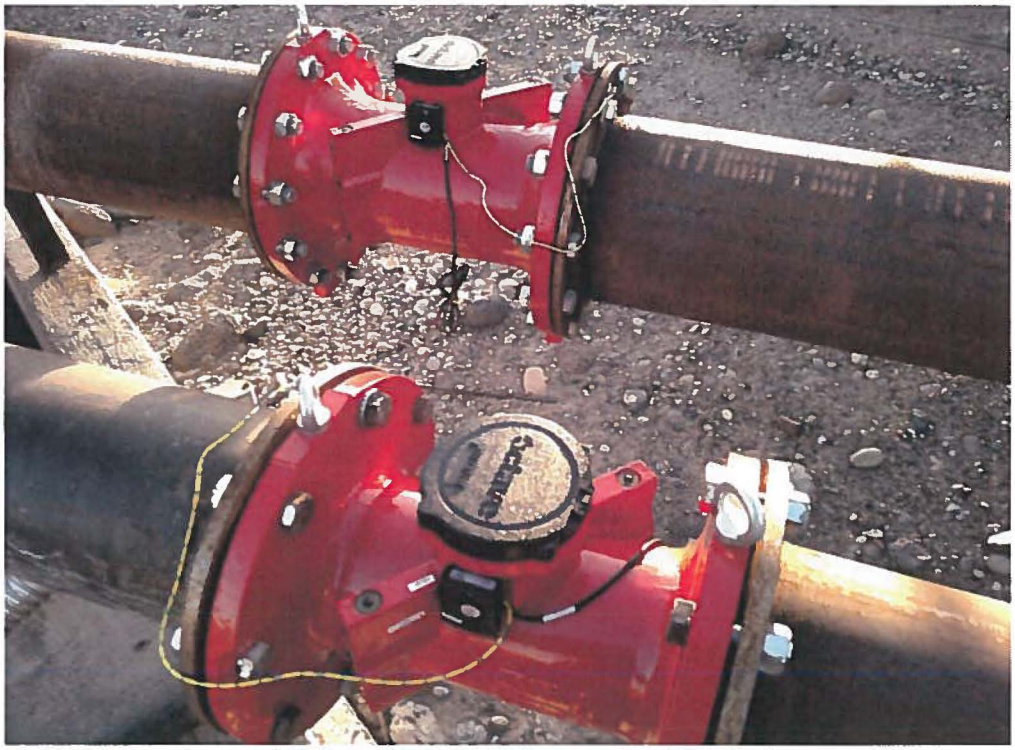
## TR Investments (TRI)

A 6" Growsmart by Lindsay Magnetic IM 3000 flow meter has been installed and all work is complete at this diversion.

*TRI flow meter installation*

## Walker Plow LLP (Joy Jones)

Two Octave Ultrasonic flow meters (one 8" and one 10") and a CR800 datalogger have been installed and all work is complete at this diversion.



*Walker Plow LLP flow meter installation*

## James Wolfe (Wolf Bros)

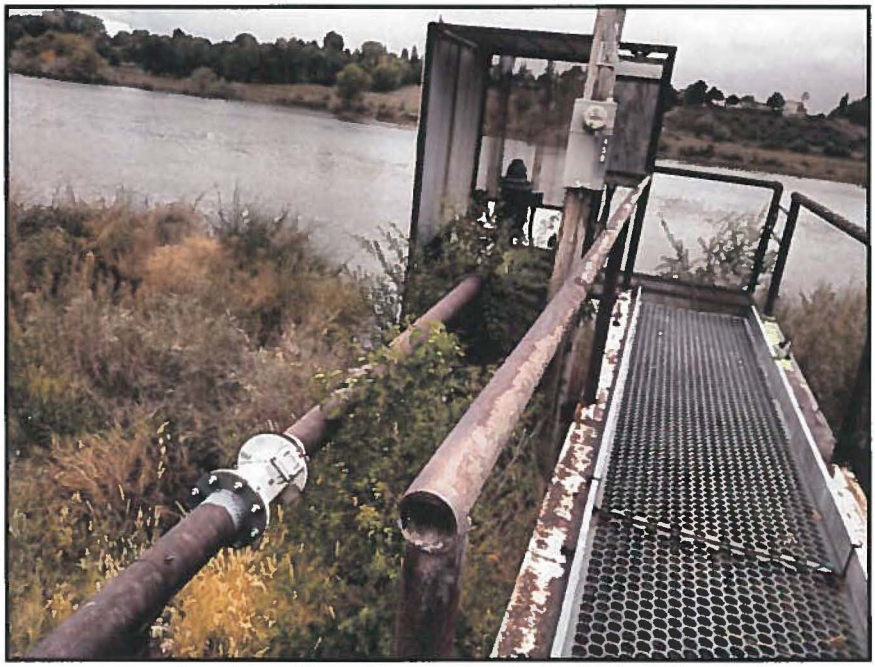
There are two 8" Octave ultrasonic flow meters installed at the two diversions for James Wolfe and all work is complete.

*Wolf Bros Pump #1*

*Wolf Bros Pump #2*

## Louis Jeffery

This site has a Seametrics AG2000 flow meter installed and all work is complete at this diversion.

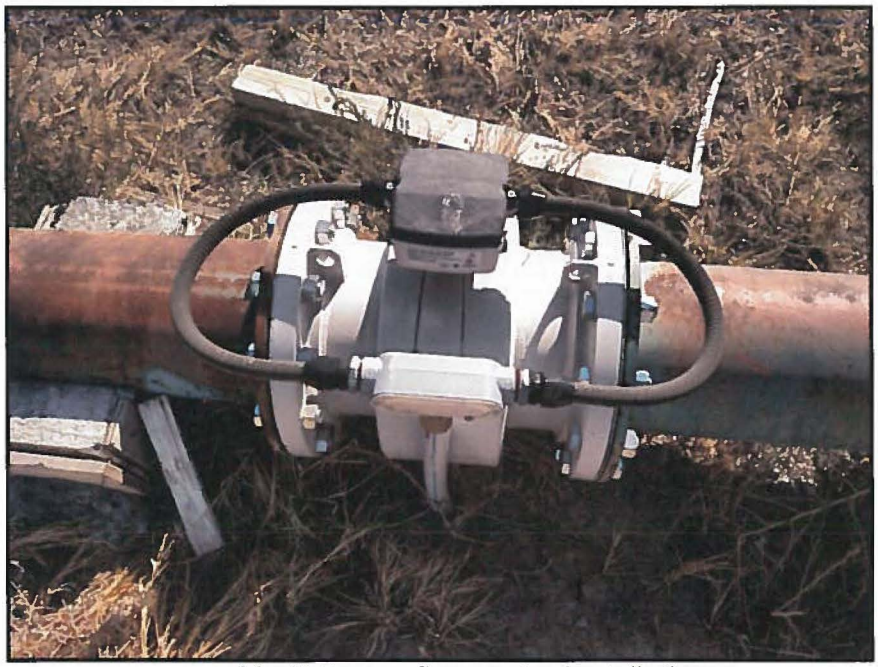


*Louis Jeffery flow meter installation (lower left)*

## Merrill Brown

A 10" Siemens Sitrans MagFlo5000 and CR200X datalogger have been installed andall work is comlete at this diversion.

*Merill Brown flow meter display and datalogger setup in protective housing*



*Merill Brown flow meter installation*

## Leland Shetler (Neva Hamilton)

A Growsmart IM3000 magnetic flow meter was installed and all work is complete at this diversion.

*Leeland Shetler IM3000 flow meter installation*

## Peter and Jane Sturdivant (Billingsley Bay Farms)

A Seametrics AG2000 flow meter was installed and all work is complete at this diversion

*Billingsly Bay Farms Seametrics flow meter*

## Gardner Brown

A 4 inch Badger M2000 flow meter has been installed and all work is complete.

*Gardner Brown Flow meter installation*

*Gardner Brown Flow meter display*

## Rockin S Ranch

A 10" Seametrics AG2000 flow meter was installed and all work is complete at this diversion.

*Rockin S Ranch Seametrics flow meter*

## Rivendale, LLC

A 8" Seametrics AG2000 flow meter was installed and all work is complete at this diversion.

*Rivendale Seametrics flow meter*

## Sherwin Sunberg

A GE Panametrics AT868 flow meter was installed and all work is complete at this diversion.

*Sherwin Sundberg GE AT868 flow meter installation*

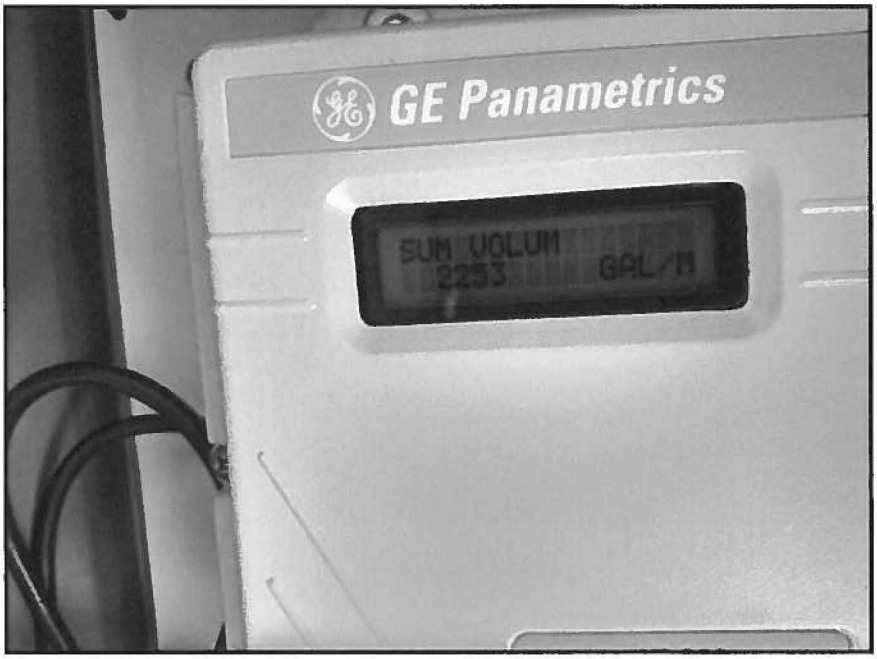
## David Ayarra Jr. Trust

The user has opted out of the WaterSmart Grant, and will install a flow meter next year. User acknowledged no water would be diverted without an approved flow meter.

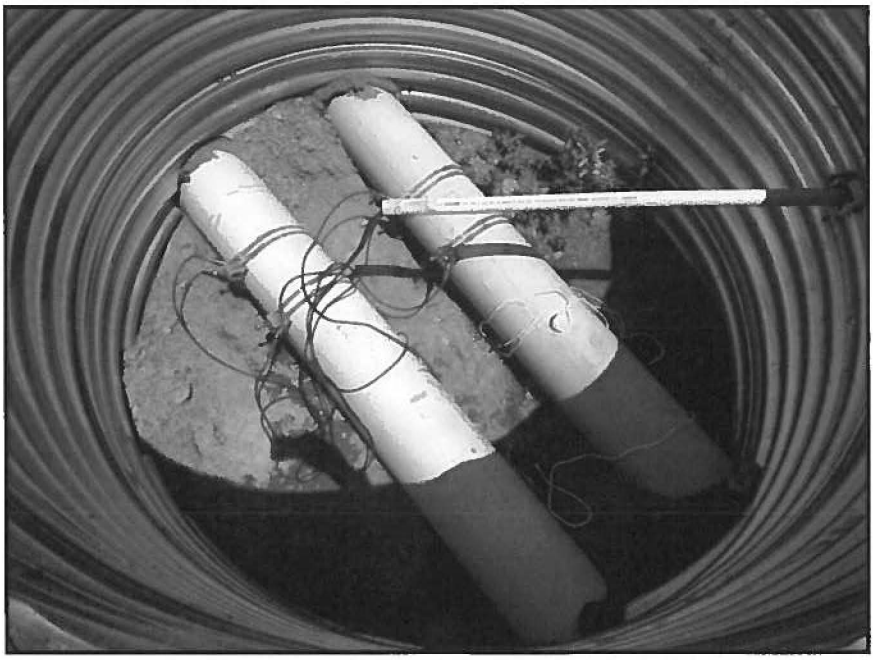
*The Arraya Jr. diversion will have a flow meter for 2017 irrigation season*

## Edge Water Ranches & Alonzo Leavell (AKA Wolfe Brothers)

This diversion has a dual channel GE AT868 flow meter and a CR800 datalogger installed and all work is complete.




*Edge Water Ranch GE AT868 flow meter*



*Edge Water Ranch transducer installation.*

## Verlin Gingerich

An Octave ultrasonic flow meter has been installed and all work is complete at this diversion.

*Verlin Gingerich flow meter installation*

## William Wolfe (AKA Hisel)

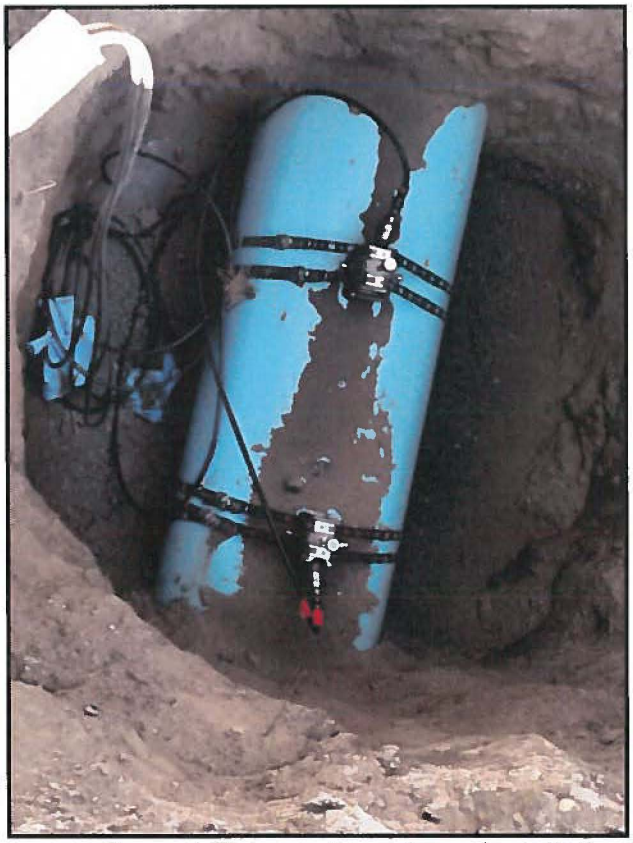
A GE AT868 flow meter and datalogger have been installed and all work is complete at this diversion.


*William Wolfe datalogger installation*

## Conrad Thomas

A GE AT868 flow meter was installed and all work is complete at this diversion

*Conrad Thomas flowmeter display*



*Conrad Thomas transducer installation*

# Memorandum

To: Idaho Water Resource Board

From: Wesley Hipke

Date: October 25th, 2016

Re: ESPA Managed Recharge Program Status Report

## Progress/Status of ESPA Managed Recharge Program

## Contents

# I. Introduction

The Idaho Water Resource Board (IWRB) has been tasked with developing a managed recharge program in the Eastern Snake Plain Aquifer (ESPA) capable of recharging 250,000 acre-feet per year (af/yr) to stabilize the ESPA. The ESPA has been losing approximately 200,000 acre-feet annually from aquifer storage since the 1950s resulting in declining groundwater levels and spring flows from the aquifer. Stabilizing the ESPA is critical to maintaining the minimum flow requirements on the Snake River and reducing conflicts between the water users.

The IWRB's strategy is to utilize natural flow in the Snake River that would otherwise leave the ESPA area. IWRB currently has a 1980 recharge water right (approximately 1,200 cfs) that authorizes diversion of water from the Snake River above the Milner Pool (Milner) including the Henry's Fork and the South Fork.

Other entities are also conducting recharge in the Eastern Snake River Plain in response to commitments set forth in a settlement between the Idaho Surface Water Coalition and the Idaho Ground Water Association. The majority of the water used for this recharge is from water stored in the Eastern Snake River Reservoir System referred to as storage water.

# II. ESPA Managed Recharge

The IWRB's goal of recharging an average of 250,000 af/yr in the ESPA has been affirmed through a number of actions. The ESPA Comprehensive Aquifer Management Plan (CAMP) set a long-term target of 150,000 to 250,000 af/yr for managed aquifer recharge. The 250,000 af/yr target was also included in the 2015 SWC-IGWA Settlement Agreement. In 2016, the Idaho Legislature passed and approved Senate Concurrent Resolution 136, which reaffirmed the importance of the program and directed the IWRB to develop managed recharge capacity for an average of 250,000 acre-feet annually in the ESPA by December 31, 2024.

Three primary elements of the IWRB's ESPA recharge implementation strategy are to:

- Utilize Snake River natural flow that would otherwise leave the ESPA area.
- Assist canal operators and other entities with infrastructure improvements that will allow recharge water to be delivered during the winter months.
- Develop and maximize the recharge capacity of managed recharge sites.

Under the IWRB's Program, only natural flow from the Snake River is used for managed recharge. The recharge season generally coincides with the end and start of the irrigation season, however, this period can vary if water is available on the "shoulders" of the irrigation season and flood releases in the spring of the year.

The IWRB's 1980 recharge water right is "in priority" during different periods of the year upstream of Minidoka Dam (Upper Valley) and downstream of Minidoka Dam (Lower Valley).

The irrigation season in the Eastern Snake River Plain has historically been between April and October. After irrigation diversions have stopped, water passing below Milner Dam is generally available for recharge under the IWRB's water right in the Lower Valley. IWRB managed recharge in the Upper Valley is dependent on flood control releases by the Bureau of Reclamation (BOR) from the reservoir system. The amount of water released for flood control varies significantly from year to year and releases only occur approximately fifty percent of the years, usually between the months of April through June. Occasionally, a limited amount of water is released to reduce flood risk in the months of February and March.

Entities using storage water for managed recharge generally use the existing canal systems before or after the irrigation season or at specific off-canal recharge sites during the irrigation season.

## III. 2016/2017 Recharge Season Update

The official start of IWRB managed recharge for the 2016/2017 Season was October 26 in the Lower Valley. A summary of the projected activates for the entities in the Lower Valley conducting IWRB managed recharge this season is provided below:

**Twin Falls Canal Company** (TFCC)

- Irrigation deliveries ended on October 24th.
- TFCC began IWRB recharge on October 26th, after conducting canal maintenance and cleaning the weir to improve measurement of winter recharge volumes.
- TFCC plans to recharge until the start of the 2017 irrigation season (usually in the later part of March).
- TFCC is capable of recharging between 20 to 50 cfs. The diversion rate is dependent on the volume of water diverted by the Southwest Irrigation District (SWID) from Murtaugh Lake for recharge. SWID can only divert water from Murtaugh Lake when temperatures are above freezing.

**Southwest Irrigation District** (SWID)

- On October 26th, 2016, SWID began diverting water from the Milner Pool and delivering IWRB recharge through their Cassia pipeline system (approximately 25 cfs).
- SWID is in the process of installing a new pipeline (discussed in detail in the projects section). Work on the current pumping station associated with the new pipeline project could limit SWID's ability to conduct IWRB recharge this fall.
- SWID plans to recharge until work on the pumping station begins or freezing conditions, whichever comes first.

- At this time, SWID is not planning to conduct IWRB managed recharge in the spring but will re-assess its capabilities based on the progress of pipeline construction over the winter.

**North Side Canal Company** (NSCC)

- NSCC started conducting IWRB managed recharge on October 26th to Wilson Lake and Goose Lake.
- NSCC is planning to continue recharge approximately 100 cfs until they have to shut down due to freezing conditions.
- At this time, North Side is not planning to conduct managed recharge in the spring due to scheduled maintenance at the Hazelton A hydro plant.

**American Falls Reservoir District 2** (AFRD2)

- AFRD2 plans to begin IWRB managed recharge October 28th if required canal maintenance is complete.
- AFRD2 plans to divert approximately 200 cfs to the MP 31 Recharge Site while the new headgate is under construction. Construction at the headgate is scheduled to be complete by December 15th, at which time AFRD2 plans to divert 400 cfs to the site.
- After freezing conditions subside (approximately the end of February) on the Milner-Gooding Canal and if water is available, AFRD2 will divert approximately 200 cfs to the Shoshone Recharge Site.

Figure 1 provides a summary of the projected IWRB managed recharge for the 2016/2017 season. The projections allow for maintenance and construction schedules for the entities conducting IWRB managed recharge in the Lower Valley. The projection shown in Figure 1 reflects the predicted available water for recharge will be limited to the minimum flow of 500 cfs. In the spring of 2017, the maximum recharge capacity is estimated to be 600 cfs. If the maximum recharge capacity is utilized the total volume of IWRB managed recharge would increase to over 113,000 af.

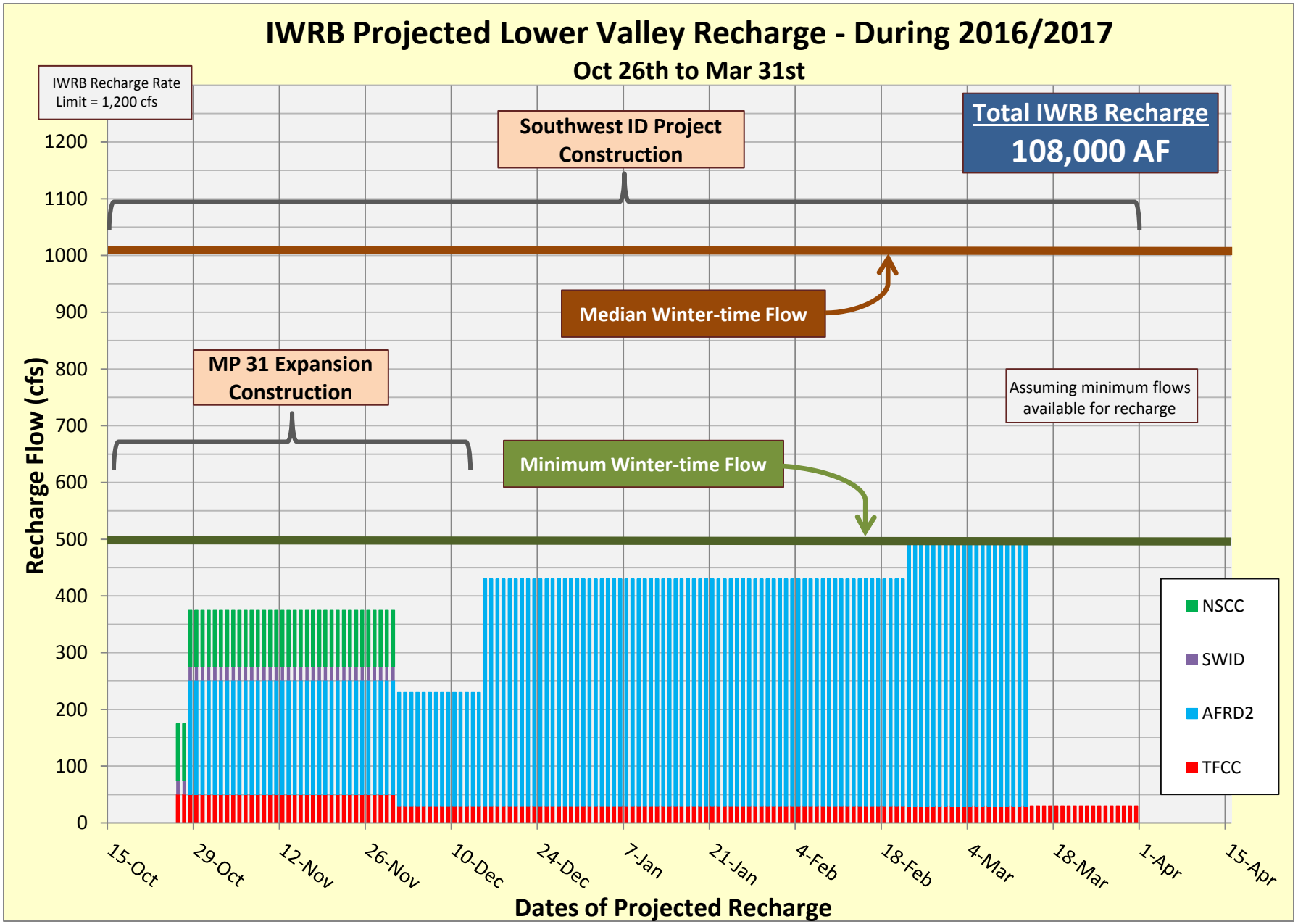



**Figure 1.** Projected IWRB Managed Recharge for 2016/2017 recharge season.

## IV. IWRB ESPA Recharge Projects

A number of projects have been undertaken to enhance the IWRB's ability to recharge in the ESPA. The following summary is a brief overview of the projects the IWRB is currently undertaking to meet the managed recharge goal of an average 250,000 af/yr.

For managed recharge projects involving infrastructure improvements to which the IWRB provided funding, a Memorandum of Intent (MOI) was developed to establish a long-term agreement (twenty years) between the IWRB and the entity implementing the project. The MOI acknowledges: 1) the IWRB provided financial assistance for a project; and 2) the entity agrees to deliver the IWRB's recharge water as compensation for financial assistance from the IWRB.

**ESPA Managed Recharge Infrastructure Project Summary**

In the Lower Valley, the IWRB is currently working with various canal companies to complete additional construction projects totaling almost $3 million this fiscal year (July 2016 through June 2017). The IWRB is also investing over $1.3 million to evaluate, design, and construct potential managed recharge related projects in the Upper Valley over the next year. Initial evaluations in the Upper Valley are required to determine the managed recharge potential and will likely lead to additional construction projects within the next two years.

A summary of the current IWRB projects is provided below.

**Lower Valley - Current Project Status**

1. American Falls Reservoir District 2 (AFRD2)/Milner-Gooding Canal:

   **Dietrich Drop Hydropower Plant** – The Dietrich Drop hydro plant is located on the Milner-Gooding Canal between the MP31 and the Shoshone Recharge Site. IWRB approved a resolution in March 2016, authorizing expenditure up to $1,500,000 for the design and construction of the required infrastructure improvements to allow for the delivery of winter-time recharge past the hydro plant. Project scoping, geotechnical investigations and a site survey were completed in April of this year. Due to the complexity of isolating the facility from winter-time flows AFRD2 is currently developing project alternatives. Depending on the alternatives developed by AFRD2, the tentative plan is to complete design by the winter/spring of 2017 and begin construction in the fall of 2017.

   If recharge water is delivered to the Shoshone Site, appropriate measures will be taken to safely run water past the Dietrich Drop hydro facility.

**Expansion of the MP31 Recharge Site** – A new headgate and check dam are under construction to increase diversion capacity to the MP31 Recharge Site from 250 cfs to 400 cfs. The IWRB passed a resolution in July 2015 authorizing the expenditure of up to $200,000 for design and a resolution in July of 2016 for up to $1.8 million for the construction and oversight of the new structures. The construction contractor was selected on Sept. 1st and construction began in October. The project is scheduled to be complete on December 15th.

A temporary check dam has been constructed to maintain operation of the current headgate while construction progresses on the new headgate and check dam. Approximately 200 cfs will be delivered during the construction period. Upon completion of the new headgate, up to 400 cfs will be diverted into the MP 31 site and water will be delivered to the Shoshone Site depending on weather conditions and water availability.

2. <u>North Side Canal Company (NSCC):</u>

**Winter Recharge Infrastructure Improvements to Wilson Lake –** The IWRB has been assisting the NSCC develop and implement infrastructure improvements to allow delivery of IWRB recharge water from the Milner Pool to Wilson Lake over the winter months while protecting the four (4) hydroelectric plants on the Main Canal system. A resolution was passed by the IWRB in January 2016 to authorize expenditure up to $274,000 for the design of the required infrastructure improvements, and in July 2016 authorized $4,800,000 for the construction and oversight of the project. The 80% design for the project was completed in August.

The hydroelectric plants have conduit exemptions, an exemption from having a Federal Energy Regulatory Commission (FERC) license. Some of the infrastructure improvements are in the vicinity of the hydroelectric plants, therefore, FERC must be consulted to determine if an amendment to the existing exceptions are required (a amendment determination). If no amendment is required the infrastructure improvements would fall under the existing conduit exemptions requiring no additional actions by FERC (a maintenance determination).

NSCC is working with the hydroelectric plant operators to prepare a submittal to FERC incorporating the requested letters from Idaho Fish and Game and US Fish and Wildlife Service. The tentative plan is to complete design and schedule completion of construction in the fall of 2017.

3. Southwest Irrigation District (SWID):

**Cassia Pipeline Winter Recharge** – A group of irrigators within SWID (Buckhorn LLC) is working with SWID to develop a new pipeline to deliver water for conversion projects during the irrigation season and conduct managed recharge through injection wells during the winter months. Buckhorn contracted with Rumsey Engineering to design the new system. While Buckhorn LLC is funding the construction of the pipeline, the IWRB is assisting with funding the construction of infrastructure improvements that would allow for IWRB recharge through the winter months when the IWRB water right is in priority below Minidoka. The project would increase IWRB recharge capacity by 54 cfs (approximately 13,000 af/yr). A resolution was passed by the IWRB in July 2016 authorized $600,000 for the construction the recharge portion of the project. Construction began on the pipeline project in September of this year.

4. Big Wood Canal Company (BWCC):

**Richfield Managed Recharge Site –** The proposed site would be supplied from the Dietrich Canal. The Dietrich Canal can receive water from the Big Wood and Little Wood Rivers. The proposed site is a rough lava basin covering approximately 62 acres and is located in an area of significant depth to water (over 300 ft.) and high five-year retention (40%). A resolution was passed by the IWRB in September 2016 authorizing $46,100 for a survey to determine the actual size and identify further work that would be required to develop a viable managed recharge site. Work began on the project in October and preliminary results are scheduled to be complete in December of this year.

**Proposed Projects**

1. City of Gooding:

**Gooding Managed Recharge Site –** The City of Gooding currently has a recharge site with an approved Groundwater Quality Monitoring Program. The City is proposing to increase the recharge capacity of the site by adding check structures to increase the recharge capacity of the site. The proposed site is a rough basin/channel in lava covering approximately 80 acres. The proposed recharge site is in an area of significant depth to water (over 125 ft.) and a five-year retention of 25%. A survey is necessary to determine the location, size, and number of check structures that would be required to optimize the site for managed recharge.

**Upper Valley - Current Project Status**

1. Fremont-Madison Irrigation District (FMID):

   **Expansion of the Egin Lakes Recharge Area** – FMID, in cooperation with Egin Bench Canal Co. is proposing to develop a new managed recharge site in the Qualyes Lake area. A resolution was passed by the IWRB in September 2016 authorizing $20,000 for an evaluation of the Qualyes Lake area to determine the size and capacity of the recharge site along with the basic requirements to develop the site including an easement with the Bureau of Land Management.

2. South Fork Canals (SFC):

   **Potential Managed Recharge Sites** – Numerous canals in the South Fork area are evaluating potential recharge sites. IWRB staff has worked with the Great Feeder on behalf of the Harrison, Rudy, and Burgess Canals, the Enterprize Canal, and Farmers Friend Canal to distingiush potential managed recharge sites that fit IWRB parameters. A resolution was passed by the IWRB in September 2016 authorizing $166,000 to conduct an evaluation of up to nine potential recharge sites. The evaluations will provide the necessary information to determine the feasibility of developing the sites into viable managed recharge locations.

3. New Sweden Irrigation District (NSID):

   **Managed Recharge Evaluation** – Published investigations and site visits by staff have identified numerous potential managed recharge sites within the NSID area. NSID has been able to conducted recharge for the IWRB on a limited bases in the past. The current the NSID system has very limited excess capacity to deliver managed recharge water during the irrigation season. An evaluation is being proposed to determine the infrastructure improvements that would be required to increase the capacity of the NSID system to transport recharge water and an assessment of the potential off-canal recharge sites within the system. A resolution was passed by the IWRB in September 2016 authorizing $39,000 for a preliminary investigations to provide critical information to scope the complete evaluation of the NSID system for conducting managed recharge. The initial data was collected while water was still flowing in the canal with this preliminary work scheduled to be complete in the winter of 2016.

4. Butte Market Lake Canal Company (BMLCC):

   **Managed Recharge Site Identification** – Published investigations and site visits by staff have identified potential managed recharge areas within the BMLCC system. The basic hydrological conditions in the BLMCC area vary significantly with depth to water ranging from less than 10 ft. to over 300 ft. and the five-year retention ranging from 20% to 54%. Besides the varying hydrological conditions, the potential recharge areas have various attributes and challenges that the site identification analysis will provide the necessary information to determine if the sites are economically feasible. A resolution was passed by the IWRB in September 2016 authorizing $39,000 to conduct an evaluation of the BMLCC system and detailed evaluations of the most feasible recharge sites.

5. Woodville Canal Company (WCC):

   **Potential Managed Recharge Sites** – The proposed site is a rough basin in gravel pit covering approximately 15 acres. The proposed recharge site is in an area with a depth to water of over 100 ft. and the five-year retention is around 25%. A resolution was passed by the IWRB in September 2016 authorizing $17,000 to conduct an evaluation a proposed managed recharge site.

# V. ESPA Monitoring and Measurement Program

A monitoring and measurement program has been developed to assess results and impacts of recharge activities, and address regulatory requirements. The program consists of regional and site-specific monitoring to measure groundwater levels, surface water flows, recharge diversions, and water quality.

## Recharge Water Quality Monitoring Program

Water quality monitoring is required if injection wells or land application methods are used to conduct managed recharge. Injection wells are permitted under IDWR's Underground Injection Control Program (UIC). Any other recharge conducted through land application methods (usually basins) requires a Groundwater Quality Monitoring Program approved by the Idaho Department of Water Quality (IDEQ). In both cases, the recharge activity must meet specific standards to ensure the groundwater is protected and meets Idaho's Ground Water Quality Rule (IDAPA 58.01.11).

The Southwest Irrigation District (SWID) is the only entity that is currently using injection wells to conduct IWRB recharge. SWID has obtained injection well permits under IDWR's UIC program and is accountable for meeting the requirements under those permits. The MP 31 and Shoshone Recharge Sites are classified as land application. The IWRB has obtained IDEQ approved Groundwater Quality Monitoring Programs for both of those sites.

The groundwater monitoring plans for the MP 31 and Shoshone Recharge Sites consist of:

- Approved monitoring schedule, dedicated sampling points, and a full suite of chemical, biological and physical elements that are analyzed to determine the source water and groundwater quality. Currently 130 constituents are analyzed along with the collection of field parameters.
- Idaho Bureau of Labs (IBL) is currently under a 5-year contract (started in Dec. 2014) to conduct the water quality sampling.

A new monitor well was installed at the MP 31 Recharge Site in October to enhance our water quality and water level monitoring at this site. As per the IDEQ approved Groundwater Water Quality Monitoring Program, the pre-recharge water quality sampling was conducted on October 19$^{th}$ for the MP 31 Recharge Site. A minimum of monthly sampling will continue while recharge is occurring at the site. Sampling was also conducted at the Shoshone Recharge Site to provide general baseline data.

## Recharge Monitoring Program

The Recharge Monitoring Program is designed to verify the volume of IWRB recharge water delivered and to quantify the impact individual areas/sites have on the water level of the aquifer. The following provides a summary of the ongoing work for this program.

- Verification of Recharge Deliveries - Flow Measurements:
    - Staff is working with the various entities that conduct managed recharge for the IWRB to ensure the appropriate monitoring is in place during recharge activities.
    - Staff continues to develop partnerships and work with numerous entites concerning quality assurance and control of recharge flow measurements.
- Verifing the Impacts of IWRB Managed Recharge:
    - An evaluation of the effects of recharge at the MP31 Recharge site including the response in the aquifer and tracer testing is estimated to be complete by this fall.
    - A new monitor well is to be installed at the MP31 Recharge Site in November.
    - Conduct a new tracer test at the MP31 Recharge Site to better delineate the impact of recharge from the site.

## ESPA Regional Monitoring Program

IDWR's Hydrology Section (Hydrology) oversees the ESPA Regional Monitoring Program. Hydrology is actively expanding the existing monitoring program to respond to the need for more detailed information about the ESPA. The section is also accountable for the input and analysis of the data and for managing improvements to the ESPA groundwater flow model. The program requires management of an extensive monitoring network for:

- Groundwater measurements (384 sites)
- Stream gages
    - IDWR (33 sites)
    - USGS (35 sites)
- Spring flow measurements (64 sites)
- Return flow measurements (75 sites)

The following provides a summary of the ongoing work for this program:

- Fall 2016 ESPA synoptic water level measurements are underway.
- Transducer installationed in SWC agreement "Sentinel Wells" (15 wells).
- IDWR modeling staff is continuing to identify key areas in the ESPA where increased monitoring will improve the results of the model.
- Staff is continuing the work to expanding groundwater monitoring networks into tributary basins.

# VI. Recharge Delivery Conveyance Summary

To accommodate the difference in water availability for IWRB managed recharge in the Upper and Lower Valleys, separate conveyance payment structures were developed. At this time, there are no plans to alter the conveyance payment structures for the 2016/2017 recharge season.

## Upper Valley ESPA Recharge

The following payment structure was adopted by the IWRB for conveyance of the IWRB recharge water in the Upper Valley:

1) **Base Rate** – determined by 5-year aquifer retention zone in which the contracted canal company or irrigation district is located using ESPAM2.1:
   - Greater than 40% retained in aquifer at 5 years $6.00/af delivered
   - 20% to 40% retained in aquifer at 5 years $5.00/af delivered
   - 15% to Less than 20% retained in aquifer at 5 years $4.00/af delivered
2) **Added Incentive for Delivery** – $1.00/af when recharge is conducted at least 75% of the time that IWRB recharge right is in priority and IWRB issues a Notice to Proceed.
3) **Added Winter-time Incentive for Delivery** – $1.00/af when IWRB recharge right is conducted between December 1$^{st}$ and March 30$^{th}$ and IWRB has issued a Notice to proceed.

## Lower Valley ESPA Recharge

The payment structure for conveyance of the IWRB's recharge water stipulated in the 5-year conveyance contracts for the entities that recharge the IWRB's water is outlined in Table 3.

The following entities executed 5-year conveyance contracts in 2014:

- Twin Falls Canal Company (TFCC)
- American Falls Reservoir District 2 (ARFD2)
- Southwest Irrigation District (SWID)
- North Side Canal Company (NSCC)
- Big Wood Canal Company (BWCC)

| Table 1. Lower Valley ESPA Payment Structure | | |
|---|---|---|
| **Number of Days Recharge Water Delivered*** | **Payment Rate per AF Delivered** | An incentivized payment structure was adopted in 2014 to encourage canals to divert recharge water as long as possible during the non-irrigation season.<br><br>* Number of days between the date the recharge permit turns on in fall and the date it turns off following spring. |
| 1-to-25 days | $3/AF | |
| 26-to-50 days | $5/AF | |
| 51-to-80 days | $7/AF | |
| 81-to-120 days | $10/AF | |
| More than 120 days | $14/AF | |

# Memorandum

To: Idaho Water Resource Board

From: Wesley Hipke

Date: October 25th, 2016

Re: Treasure Valley Managed Recharge Feasibility Study

## I. Introduction

The Idaho Water Resource Board (IWRB) is commissioning the Treasure Valley Managed Recharge Study ("Study") to obtain a better understanding of the feasibility of using managed recharge within the Treasure Valley as a viable water management tool. The study will assess the volume of water available for recharge and the managed recharge potential throughout the Treasure Valley Study Area (as depicted on Figure 1). The completed study will provide a tool for the IWRB and water managers in the Treasure Valley to determine if managed recharge is an appropriate water management tool to address their specific water management challenges.

## II. Background

The Idaho Water Resource Board (IWRB) is responsible for formulating and implementing the State Water Plan for optimum development of the water resources in the public interest. Within the Treasure Valley, historically upstream mountain snowpack has provided a storage mechanism to retain wintertime precipitation and release it in the spring and summer. As demand grew, this natural storage mechanism has been augmented with man-made reservoirs for additional surface water storage. The demand for water is expected to continue to grow considering the large metropolitan area within the Treasure Valley. Boise, Nampa, and Meridian were one of the fastest growing metro areas in 2014 according to the U.S. Census Bureau.

The projected increase in growth within the Treasure Valley will present challenges concerning water supply. This issue could be further compounded considering the finite volume of groundwater and surface water supplies becoming increasingly variable. When water is available, strategies need to be developed on how best to manage the water. The Treasure Valley water system is a complex system of dynamic interconnection between surface water and groundwater. The connection between these waters is a critical element in determining strategies that will meet the future water needs of the Treasure Valley.

The IWRB is employing a science-based approach to develop plans and associated projects that will address the uncertainties in the Treasure Valley's future water supply. One of the water management tools being considered for the Treasure Valley is managed recharge. Managed

recharge has been used to address a variety of issues throughout the West, including aquifer replenishment, aquifer storage for future recovery, water quality improvement of the recharged water and/or groundwater, and increasing aquifer discharge to surface water supplies. Managed recharge can be adapted to address a variety of concerns taking into account uncertain and changing future conditions.

Within the Treasure Valley, managed recharge could be used to capture water that would otherwise flow out of the state, assist in keeping the aquifer in balance, and develop additional water supply for future demand. Three key components of a successful managed recharge program that need to be addressed are the availability of the supply/sources of water for recharge, identification of locations with the hydrogeological properties that are conducive for managed recharge, and the fate of the recharge water meeting management goals.

## III. Treasure Valley Managed Recharge Feasibility Study

The proposed Treasure Valley Managed Recharge Feasibility Study (Study) has been designed to assess the potential and viability for managed recharge in the Treasure Valley. The Study will address recharge issues such as the volume and timing of available water, the potential physical locations for recharge, fate of the water recharged, and potential infrastructure cost. Included in the assessment will be cost estimates for developing the infrastructure required for the areas with the greatest potential for managed recharge sites. The final product is to be a technical report documenting all data, analysis, and results from the Study.

The Study is estimated to cost $200,000 and require between a year to two years to complete. Staff is recommending using the State's RFP process to find a suitable firm (Contractor) to conduct the Study. A summary of the key task involved in the study are provided below.

### A. Analysis of Water Availability for Managed Recharge

The Contractor will conduct a water availability analysis that determines the potential sources of water available for Managed Recharge within the study area. Potential source waters will minimally include surface water and reuse of treated wastewater. The analysis will include the volume and availability of water taking into account the timing of availability and the location that the water would be available for managed recharge. This analysis must take into account the physical supply and the legal access of the water. The Contractor will analyze the available data to determine the volume, timing, and location of water that could be used for managed recharge.

## B. Managed Recharge Physical Feasibility Analysis

The Contractor will conduct an analysis of the study area to determine the physical feasibility of conducting managed recharge. The intent of the analysis is to distinguish areas within the Treasure Valley that have similar physical characteristics concerning managed recharge. Key elements that are to be included in this characterization are:

- Depth to groundwater
- Infiltration rate
- Hydraulic conductivity
- Aquifer capacity
- Retention time of recharged water in the aquifer.

This portion of the Study will also include an assessment of other potentially limiting factors to managed recharge such as:

- Increased landslide risk due to potential managed recharge
- Urbanization/limited land space
- Positive and negative effects managed recharge could have on water quality issues
- Positive and negative effects managed recharge could have on an area due to changes in groundwater levels.

The Contractor will analyze the available data to assess the physical capacity of the Treasure Valley to conduct managed recharge. The analyses will identify and rank "areas" of managed recharge capacity based on hydrogeological parameters, depth to groundwater, estimated retention time of the recharge water, and potential infiltration rates. The ranking of the areas will also include potentially limiting factors to managed recharge. The analyses will also include identification of potential perched aquifers and the affect they could have on the movement of recharge waters to the aquifer.

## C. Infrastructure Requirements to Develop Managed Recharge Areas

The Contractor will conduct an analysis to determine the infrastructure and associated costs that would be required to develop recharge sites in the highest potential areas for conducting managed recharge. This analysis will include alternatives for infrastructure development and associated cost estimates for the alternatives. The following assumptions will be incorporated in the analysis:

- The analysis will incorporate the finds from the previous task,
- The infrastructure estimates will be conducted on a minimum of three (3) areas. The specific areas will be determined in consultation with IWRB staff,
- Current infrastructure will be incorporated into the analysis where applicable

- The Contractor will conduct Class 5 cost estimates for the required infrastructure improvements to conduct managed recharge in the specified areas.

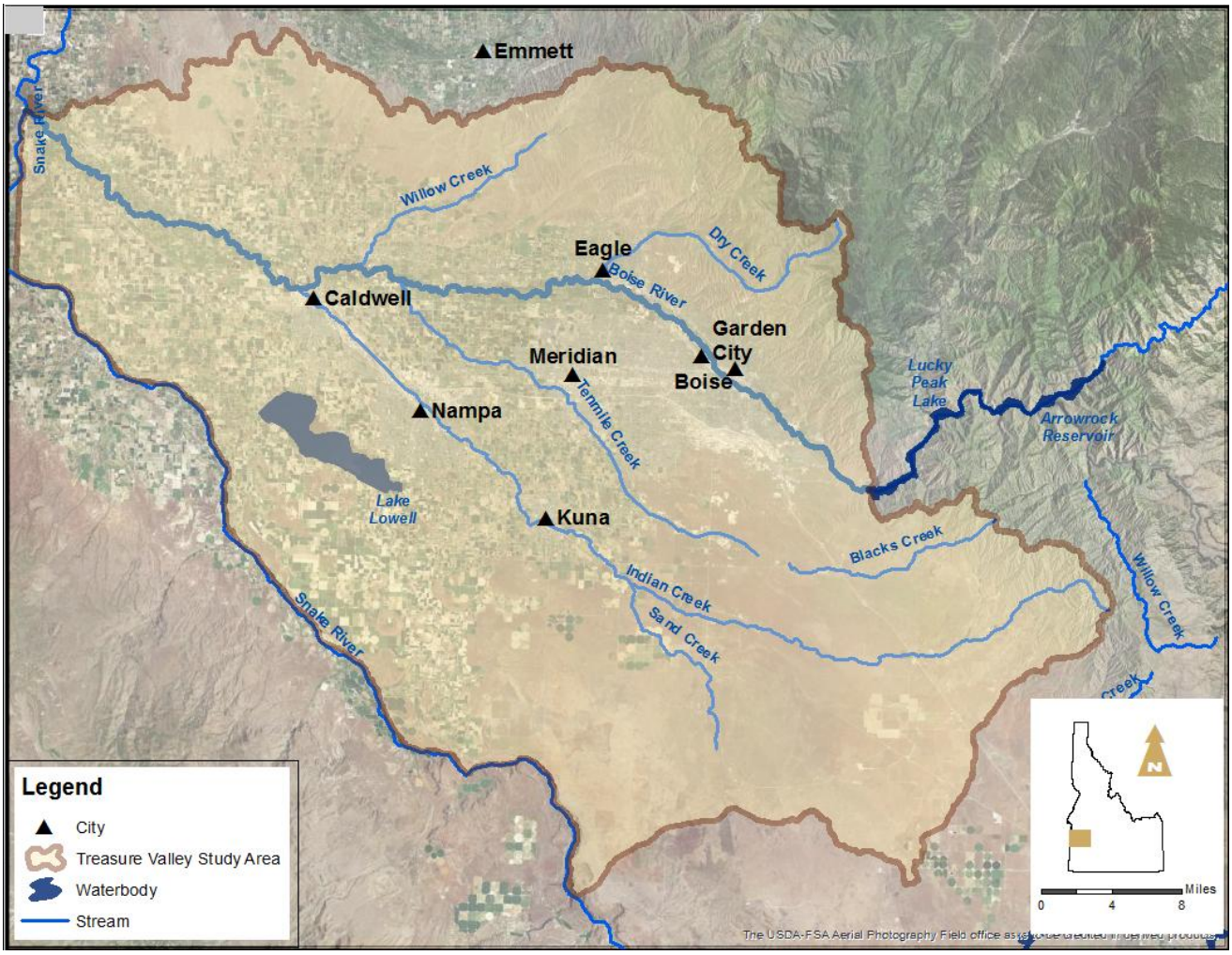



**Figure 1. Treasure Valley Study Area**

**BEFORE THE IDAHO WATER RESOURCE BOARD**

| | |
|---|---|
| IN THE MATTER OF WATER SUSTAINABILITY AND TREASURE VALLEY RECHARGE | A RESOLUTION TO APPROVE FUNDS FOR TREASURE VALLEY MANAGED RECHARGE FEASIBILITY STUDY |

WHEREAS, House Bill 547 passed and approved by the 2014 Legislature allocates $5 million annually through 2019 from the Cigarette Tax to the Idaho Water Resource Board's (IWRB) Secondary Aquifer Planning, Management, and Implementation Fund (Secondary Aquifer Fund) for statewide aquifer stabilization; and

WHEREAS, Senate Bill 1402 passed and approved by the 2016 Legislature allocated $5 million ongoing to the General Fund and $2.5 million in Economic Recovery Reserve Funds to the IWRB's Secondary Aquifer Fund for statewide water sustainability and aquifer stabilization; and

WHEREAS, many aquifers across Idaho are declining or have existing or potential conjunctive administration water use conflicts, including the Wood River, the Mountain Home Aquifer, the Treasure Valley Aquifer, the Palouse Basin Aquifer, the Rathdrum Prairie Aquifer and others; and

WHEREAS, Governor Otter directed the Idaho Water Resource Board to develop a water sustainability policy and support water sustainability and aquifer stabilization projects across Idaho to address declining ground water levels, existing or potential conjunctive administration water use conflicts, alternative water supplies and long-term water management needs; and

WHEREAS, the Idaho State Water Plan states that aquifer recharge may be an appropriate means for enhancing ground and surface water supplies, optimizing existing water supplies to meet demand and should be promoted and encouraged; and

WHEREAS, the 2016 Idaho Legislature passed and approved Senate Concurrent Resolution 137 directing the IWRB to address statewide aquifer stabilization and sustainability projects including aquifer recharge studies for the Treasure Valley Aquifer; and

WHEREAS, on May 20, 2016, the IWRB adopted the Secondary Aquifer Fund Fiscal Year 2017 Budget which included $200,000 for a Treasure Valley Managed Recharge Feasibility Study (Feasibility Study) to assess whether managed recharge has the potential to enhance water supplies or provide other water management benefits in the Treasure Valley; and

NOW THEREFORE BE IT RESOLVED that the IWRB authorizes expenditures not to exceed $200,000 from the Secondary Aquifer Fund, for a Treasure Valley Managed Recharge Feasibility Study; and

NOW THEREFORE BE IT RESOLVED that the IWRB authorizes its chairman or designee, Brian Patton, to execute the necessary agreements or contracts to complete the Feasibility Study.

DATED this 2nd day of November 2016.

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ROGER W. CHASE, Chairman
Idaho Water Resource Board

ATTEST _____
VINCE ALBERDI, Secretary

**MATERIALS MAY BE PROVIDED AT THE**

**IWRB MEETING**

# Memorandum

To: Idaho Water Resource Board

From: Cynthia Bridge Clark

Date: October 24, 2016

Re: Priest Lake Water Management Study & Priest River Outflow Gage

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**Background:**

- The Idaho Department of Water Resources (IDWR) owns the Priest lake Dam (dam) which was constructed in 1951 as an outlet control structure to maintain lake levels and downstream flows in the Priest River in accordance with Idaho Code §70-507. Idaho Code §70-507 authorizes the director of IDWR to contract operation and maintenance of the dam, and requires that the water surface level of Priest Lake be maintained at 3.0 feet on the USGS Priest Lake Outlet gage (located upstream of the dam) after run-off of the winter snowpack until the close of the main recreational season.
- As a result of limited water supply and drought conditions in northern Idaho in 2015, it was difficult to maintain required pool levels and downstream flow in the Priest River during the recreational season.
- The IWRB subsequently authorized expenditure of up to $300,000 from the Revolving Development Account to complete the Priest Lake Water Management Study (study) to evaluate strategies to meet long-term water management objectives for the Priest Lake and Priest River system. The study includes development of alternatives to maintain required lake levels and river flow through improved operation of the Priest Lake Outlet Dam, increased water storage in the lake, and potential modifications to the dam. The study will also include options to improve conditions of the Priest Lake Thorofare and rehabilitation of the associated Breakwater structure. General elements of the study include the following:

    1) Analysis are of hydrologic conditions;
    2) Identification of necessary improvements for water supply forecasting and monitoring (gaging);
    3) Identification of potential impacts or benefits to shoreline property owners, water quality, and fish and wildlife;
    4) Engineering analysis of potential improvements to the Priest Lake outlet structure; and
    5) Engineering analysis of potential improvements to the breakwater structure to promote sustainability of the Thorofare channel.

**Project Status:**

Study RFP: A Request for Proposals was issued to solicit consultant services to complete the study. The proposal submittal period closed on October 14, 2016. Five proposals were submitted and are being considered by an evaluation team. Interviews of the top candidates will be held in early November. A defined project schedule will be provided once a consultant has been selected.

Priest River Outflow Gage:

- IDWR hydrology staff has identified the need for improved streamflow data on the Priest River in locations that would assist with water supply forecasting, operation of the outlet dam and measurement of outflows from the dam.
- The USGS currently operates the Priest Lake Outlet Gage upstream of the dam which is used to monitor lake levels. Until 2006, the USGS operated a streamflow gage approximately four miles downstream of the dam which measured flow in the Priest River and could be used to generally determine outflow from the dam. The closest operational streamflow gage is now located 45 miles downstream of the dam which reflects flows in the Priest River that include inflow from tributary streams below the dam.
- Installation of a gage below the dam but upstream of tributary inflows is recommended to provide accurate reservoir outflow data and to assist with reservoir and dam operations. The USGS is prepared to enter into a Joint Funding Agreement (JFA) with the IWRB for installation, operation and maintenance, and publication of data collected for a new streamflow gage to be located on the Priest River, as close to the downstream side of the dam as practicable.
- The total estimated cost of installation plus operation and maintenance (O&M) for a new gage for Fiscal Year (FY) 2017 is $24,500. The annual O&M costs in subsequent years are estimated to be $16,400.
- The IDWR Safety of Dams Program secured a FEMA grant in the amount of $7,500 to assist with installation expenses for the new Priest River Outflow Gage. Therefore, the total remaining expenses for installation and O&M in FY 2017 are $17,000. The USGS expects to share costs associated with the O&M in subsequent years, though the amount will be defined on an annual basis.
- A resolution is provided for the IWRB's consideration to authorize funding from the Revolving Development Account for the following: 1) to authorize funding in the amount of $17,000 for the remaining installation and O&M costs for FY 2017; and 2) to authorize annual cost-share funding not to exceed $10,000 for O&M expenses for the new Outflow gage beginning in FY 2018.

**REQUIRED ACTIONS:** A resolution to authorize funding for the new Priest River Outflow Gage below Priest Lake Dam is provided for the IWRB's consideration.

# Memorandum

To: Idaho Water Resource Board

From: Cynthia Bridge Clark,

Date: October 24, 2016

Re: Status of Storage Water Studies

The following is a status report on the surface water storage studies initiated by the Idaho Water Resource Board (IWRB). An update will be provided by staff at the upcoming IWRB Work Session on November 1, 2016.

**Weiser-Galloway Project**

Background:

- Operations Analysis: The analysis was performed by the U.S. Army Corps of Engineers (Corps) through a Planning Assistance to States (PAS) agreement with the Idaho Water Resource Board (IWRB). It is an evaluation of different operation scenarios for a dam on the Weiser River to optimize hydropower, reduce flood risk, provide recreation, provide additional water supply for the basin, and provide flows for anadromous fish recovery efforts. Results from this analysis have not been finalized as they are being incorporated with additional analysis being performed under the Galloway Reservoir Size Optimization Study (below).
- Galloway Reservoir Size Optimization Study: This study utilizes data generated from the Operations Analysis models (hydrologic, hydraulic, flood, operational, water demands, and hydropower) to optimize the conceptual design layout of the dam and revise construction costs. The intent is to provide a more refined project design while leveraging the project expertise of the technical study team who performed the Operations Analysis and previous PAS studies. Preliminary results are scheduled to be available for initial review by IDWR in November, 2016.
- Evaluation of Weiser River Trail: The Galloway Dam and Reservoir project as proposed would impact approximately 15 miles of the Weiser River Trail (WRT). This evaluation will seek public input to identify impacts and benefits of potential alternative trail alignments for the WRT. Additional work on this study has been held pending results of the Operations Analysis and Reservoir Size Optimization Study.
- Federal Energy Regulatory Commission (FERC) preliminary permit: In accordance with preliminary permit requirements, Progress Report No. 4 was filed on October 1, 2016.

Status:

- Upon completion of review of the preliminary results from the Reservoir Optimization Study, a planning summary report will be prepared to present the findings and conclusions of the studies that will allow the IWRB to assess how the project should move forward in the future. Staff has begun preparing the summary report and is planning a release date in early 2017 and will report findings at an upcoming IWRB meeting.

**REQUIRED ACTIONS:** No action is required by the IWRB at this time.

**Boise River Feasibility Study**

Background:

- The US Army Corps of Engineers (Corps) and IWRB entered into a Federal Cost Share Agreement (FCSA) in 2013 to complete a full feasibility study of alternatives to address flood risk and water supply needs in the Treasure Valley. The feasibility study built on results from the 2010 *Water Storage Screening Analysis* and 2011 *Preliminary Analysis of the Arrowrock Site.*
- The feasibility study was initiated with a planning workshop between the Corps and IWRB to identify a range of initial alternatives for flood risk management and water supply enhancement followed by a public scoping effort to identify additional alternatives capable of solving multiple water resource problems.
- A number of measures were evaluated, and either eliminated or ranked through an analysis and screening process. Measures considered included the Arrowrock Dam raise, managed aquifer recharge, upgraded irrigation headgates, replacement of push-up dams, bridge upgrades, controlled flooding of pits/ponds, temporary conveyance of water in the floodplain, flow split structure, and other non-structural measures.
- The Corps held regular meetings with state and federal agencies to evaluate the potential impacts related to each measure and worked with the cooperating agencies to coordinate the environmental evaluation and compliance process.
- The Arrowrock Dam raise was identified as having the greatest potential to provide significant flood risk reduction and water supply benefits. Detailed reservoir modeling, cost engineering, real estate impacts analysis and Environmental Impacts Statement (EIS) activities were performed on the Arrowrock Dam for heights ranging from 30 to 74 feet. The analysis also incorporated several downstream flood risk measures. The Corps coordinated modeling and engineering analyses with the US Bureau of Reclamation (Reclamation), the facility owner, and worked with local county and highway district authorities to develop mitigation alternatives associated roadways impacted by the Arrowrock Dam raise.
- Results of the hydrologic and economic modeling indicated that costs exceeded benefits of the dam raise options. Based on these results, Corps involvement in the raise of Arrowrock Dam is not viable at this time.
- On May 18, 2016, the Corps presented these results to the IWRB Water Storage Projects Committee. The IWRB was asked to consider whether to terminate the study and finalize work products or to request approval from the Corps Headquarters to reformulate the study to evaluate other options with sufficient flood risk reduction benefits and water supply benefits relative to project costs to justify ongoing Corps involvement. Reformulation would require a revision of the study schedule, budget and scope.
- At the Committee meeting, Reclamation also discussed options for studying a raise of Anderson Ranch Dam under its feasibility study authority. Given the common interest in the viability of new storage to satisfy multiple resource needs, the Committee requested that the Corps and Reclamation investigate options for coordination between the two agencies and to identify potential reformulation measures for IWRB consideration at a later date.

- On August 12, 2016, representatives from the Corps, Reclamation, and the IWRB met in Boise to discuss progress on the IWRB's request for additional information about the steps required to continue study of new storage. The two federal agencies reported on a number of topics:
    1) They summarized the outcome of several workshops between the two agencies intended to identify options for a collaborative approach to performing a feasibility study with the state, clarify agency authorities and decision making frameworks, and to identify future projects.
    2) They provided a summary of additional measures that could be evaluated if the study were re-scoped or reformulated (e.g. 10 ft raise of Arrowrock, 4 ft raise of Luck Peak Pool, etc.)
    3) They discussed potential next steps: termination of the Boise Feasibility study with the Corps; continuation of the study of new storage options with Reclamation as the lead agency; execution of cooperating agreements between the federal agencies; and utilization of existing appraisal and feasibility work and transfer of information between agencies.

Status:

- Based on the questions and discussion at the August 12 meeting, agency representatives and IDWR staff continued to review options for additional study in the Treasure Valley. Reclamation agreed to generate a draft scope of work and potential cost for a feasibility study of a combination of a small raise of Anderson Ranch Dam, small raise of Arrowrock Dam potential Dam, and/or a raise of the Lucky Peak reservoir pool.
- A meeting of the IWRB Water Storage Projects Committee is scheduled for November 18, 2016. Reclamation will present details of a draft scope of work for a reformulated feasibility study and the Committee will discuss options for termination of the study with the Corps.

**REQUIRED ACTIONS:** No action is required by the IWRB at this time.

**Island Park Reservoir Enlargement Project**

Background:

- The Henrys Fork Basin Study, completed by the US Bureau of Reclamation (Reclamation) in 2014 in partnership with the IWRB, identified a potential project to increase surface water storage in the basin through an enlargement of the Island Park Reservoir.
- The Basin Study provided a conceptual level analysis of a proposal to increase the operational water surface elevation of the reservoir 1 to 4 feet resulting in approximately 30,000 acre-feet of additional storage water. The additional water would be captured and stored using existing reservoir space currently reserved for flood flows. The relative construction cost was estimated to be $6.4 million with limited required modifications to the dam and reservoir:
    - Minimal modifications to the existing embankment dam.
    - Modification of the emergency spillway to provide additional discharge capacity (offset current flood surcharge space in the reservoir).
    - Increase in the height of the bladder on the Operational Spillway.
    - Possible modifications to the dike adjacent to the embankment dam.

- The 2014 Idaho Legislature passed House Bill No. 479 appropriating $2.5 million to pursue an enlargement of the Island Park Reservoir.
- In order to better understand the viability of the proposal, several threshold issues were identified for further study by IDWR/IWRB and Reclamation staff including: 1) a more detailed assessment of potential impacts to land and real estate resulting from a raise in reservoir pool elevation; 2) refinement of the hydrologic analysis of reservoir yield; and 3) analysis of potential dam safety constraints.
- With authorization from the IWRB, staff initiated the Island Park Land and Real Estate Assessment (Assessment) to evaluate and quantify impacts. The Assessment consists of two parts: 1) collection of airborne lidar and orthoimagery to provide high resolution elevation data and geometrically corrected aerial imagery for the project area; and 2) evaluation and quantification of potential impacts to land, real estate, roads, utilities, easements, and other appurtenant structures resulting from a 1 to 4 foot raise of the reservoir water surface elevation, as well as estimated associated costs. The elevation data and imagery collected in part one will be used to evaluate these impacts.
- Airborne lidar and orthoimagery for the entire Island Park reservoir, including surrounding lands and islands within the reservoir, was collected in the spring of 2016. The processed data and imagery was submitted to IDWR/IWRB staff and is publicly available on the Idaho Lidar Consortium website.

Status:

- To complete the second part of the Assessment, staff has developed a scope of work with a local consultant to complete the quantification of impacts at one foot intervals up to a maximum of a four foot increase in the operating water surface elevation, and to compile and report the findings.
- The IWRB passed a resolution in July 2014 authorizing expenditure of funds up $100,000 for the Assessment and for advisory services to assist with coordination between the IWRB and Reclamation as needed. A portion of these funds ($55,570) were spent to collect the lidar and orthoimagery.
- A resolution is before the IWRB to authorize expenditure of an additional $100,000 to hire a consultant to complete the Assessment.

**REQUIRED ACTIONS:** A resolution is provided for IWRB consideration to authorize expenditure of up to $100,000 from the Revolving Development Account to complete the Assessment.

**MATERIALS MAY BE PROVIDED AT THE**

**IWRB MEETING**