

WaterSMART:

Water and Energy Efficiency Grant for FY2012

**Automation of Check Structures on
V Line Canal**

Fallon, Nevada

**Truckee-Carson Irrigation District
P.O. Box 1356
Fallon, Nevada 89407**

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Table of Contents

COVER PAGE	SF 424
ASSURANCES	SF 424D
TITLE PAGE	1
TABLE OF CONTENTS	2
PART I – TECHNICAL PROPOSAL AND EVALUATION CRITERIA	4
EXECUTIVE SUMMARY	4
BACKGROUND DATA	5
TECHNICAL PROJECT DESCRIPTION	7
WATER CONSERVATION	8
QUANTIFIABLE WATER SAVINGS	8
IMPROVED WATER MANAGEMENT	9
PERCENTAGE OF TOTAL SUPPLY	9
REASONABLENESS OF COSTS	9
ENERGY-WATER NEXUS	10
BENEFITS TO ENDANGERED SPECIES	10
WATER MARKETING	11
OTHER CONTRIBUTIONS TO WATER SUPPLY SUSTAINABILITY	11
IMPLEMENTATION AND RESULTS	11
READINESS TO PROCEED	11
PERFORMANCE MEASURES	13
CONNECTION TO RECLAMATION PROJECT ACTIVITIES	13
PART II. PERFORMANCE MEASURE FOR QUANTIFYING POST-PROJECT BENEFITS	14
PART III. ENVIRONMENTAL COMPLIANCE	15
PART IV. REQUIRED PERMITS OR APPROVALS	18
PART V. FUNDING PLAN AND LETTERS OF COMMITMENT	19
PART VI. OFFICIAL RESOLUTION	20
PART VII – BUDGET PROPOSAL	21
BUDGET WORKSHEET	21
BUDGET NARRATIVE	24
BUDGET FORM – SF-424C	27

APPENDIX A – AREA MAPS 28
APPENDIX B - GRAPH OF SHORTAGES ON S LINE 33
APPENDIX B - RESOLUTION 2012-1..... ERROR! BOOKMARK NOT DEFINED.4

TECHNICAL PROPOSAL AND EVALUATION CRITERIA

Executive Summary:

December 13, 2011

Truckee-Carson Irrigation District
P. O. Box 1356
Fallon, Churchill, Nevada

The project includes components that accomplish the goals established in Tasks A, B and C.

Task A – Water Conservation of the project is accomplished by reducing releases of stored water in the upstream reservoir, Lake Lahontan. The V Line canal supplies water for 1,528 water righted parcels in the Newlands Project with a total of 52,291 water righted acres.

Task A – Improved Water Management will involve the installation of SCADA and automation at each check structure along the V Line Canal. This will allow TCID to better manage 100% of the average 550 cfs flow in the V Line Canal.

Task B – Energy-Water Nexus of the project will use renewable energy for the operation of the electrical components of the SCADA and automated structures in the form of solar net-metering. Also with the upgrading of the check structures to SCADA that allows for better water management through remote control, the use of fossil fuels will be reduced as a person will not have to drive to these structures several times a day to make changes in the gate elevations or to pull boards.

Task C – Benefits to Endangered Species will be realized through reduced releases in Lahontan which allows for more storage of Carson River water and less water will be required from the Truckee River. The Truckee River water flows into Pyramid Lake and benefits the needs for habitat and spawning for the federally listed threatened and endangered species of fish, Lahontan Cut-throat Trout and Cui-Uui, respectively.

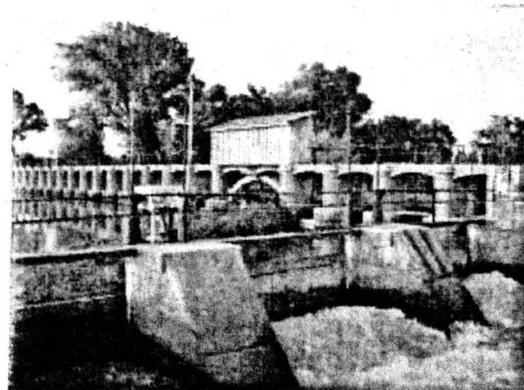
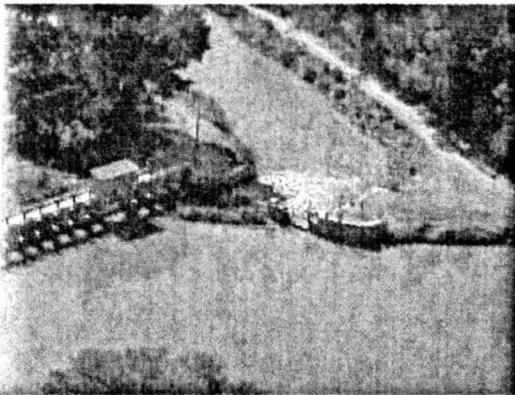
Summary:

This project satisfies the goals of Task A and Task B which indirectly effects Task C. Under Task A - Water Conservation, SCADA and Automation, the District will be able to control and monitor the flow of water in the V Line during delivery of irrigation water. It will provide water conservation and efficient water management by reducing spills, over-delivery and seepage. The District will meet the goals and objectives of Task B - Energy-Water Nexus, as each check structure will employ the use of renewable energy with solar-electric panels to improve energy efficiency. The objectives of Task C – Benefits to Endangered Species, will be indirectly met because all water conserved through better management is less water that will be needed from the source of water. That source being the Truckee River which feeds Pyramid Lake. Any water that is not needed by the Newlands Project is water left in the river to improve the spawning habitat of the Truckee River below Derby Dam. Pyramid Lake is home to two endangered fish species, both use the Truckee River to spawn.

Background Data:

The maps of the area of the V Line Canal are located in **Appendix A**. The V Line Canal is located in Churchill County, Nevada, and passes within a quarter of a mile from the northwest boundary of the city limits of Fallon, Nevada. It is approximately 11 miles in length and begins at the Headworks at Carson Diversion Dam, Fallon, Churchill County, Nevada.

The District encompasses approximately 120,000 acres of which 73,686 acres are water-righted. The District's average annual water supply is 300,000 acre-feet for approximately 59,868 irrigated acres in both the Carson Division and the Truckee Division. The water stored in Lahontan Reservoir is fed by the Carson River and the Truckee Canal via Derby Dam on the Truckee River. The District encompasses approximately 120,000 acres of which 73,686 acres are water-righted. The District's average annual water supply is 300,000 acre-feet for approximately 59,868 irrigated acres in both the Carson Division and the Truckee Division.



Photos of the V Line Headworks located at Carson Diversion Dam.

The Carson Division consists of the water rights supported by the Lahontan Reservoir. The Truckee Division is supported entirely by diversions off the Truckee River into the Truckee Canal. This project is within the Carson Division and that Division serves approximately 1800 water users. The total water released from Lahontan for the 2011 water season was 342,900 acre feet that includes precautionary draw downs early 2011 because of the extraordinary amount of snow pack. . The projected demand for the 2012 water year for the Carson Division is 200,237 acre feet of water. Last year, in 2011, it was a 100% allocation year with no shortfalls within the Carson Division. At this point in time there is plenty of water in the reservoir, but there is no snow pack on the Sierras from which the water supply will be replenished.

The primary use of irrigation water is for crops that support the cattle and dairy industries in the Fallon and Fernley area. Water is primarily used to flood irrigate crops. The major crops are alfalfa and corn with some grain crops. Most crops are harvested to provide food for livestock. The irrigated acres that are not in crops for livestock are in local gardens and farms that grow food crops for the local area. Some of these crops are on organic farms.

The water delivery system for the Project consists of two major diversion dams, and approximately 391 miles of canals, laterals, and sublaterals, as well as 345 miles of drains, located in the Truckee and Carson Divisions of the Newlands Project as shown on the Project map in Appendix A. The water delivery system provides water through canal and lateral turnouts to an estimated 1,500 farm head gates.

Approximately 20 miles downstream from Reno, water for project purposes is diverted from the Truckee River into the Truckee Canal at Derby Dam. The dam is a concrete gate structure 31 feet high with an embankment wing. It has a hydraulic height of 15 feet and controls diversions of up to 1,500 cfs into the Truckee Canal through nine slide gates, 13 slide gates and one 25-foot hinged drop gate control the flow into the river.

The Truckee Canal extends approximately 32.5 miles from Derby Dam on the Truckee River to Lahontan Dam on the Carson River. The canal has a designed carrying capacity of 1,200 cfs at the head; however, the current operating capacity is approximately 350 cfs. The Truckee Canal serves approximately 2,000 acres of irrigated lands, which comprise the Truckee Division, either directly or through laterals and sub-laterals. The Truckee Canal also delivers water to Lahontan Reservoir to supplement the flow of the Carson River and provide more reliable water service to Carson Division lands.

Carson Diversion Dam (Diversion Dam) is located on the Carson River about five miles downstream from Lahontan Dam and is the major diversion point for irrigation water to serve the lands in the Carson Division. The dam is a 23-foot high concrete gate structure with a hydraulic height of 14 feet and a crest length of 241 feet. The two major diversions from Diversion Dam are the T Line canal, regulated by two slide gates and serving lands north of the river, and the V Line canal, regulated by three slide gates and serving lands south of the river. The flow of the Carson River is regulated by 17 slide gates and one 25-foot drop gate. Project facilities below Diversion Dam are primarily distribution facilities within the Carson Division to serve approximately 55,791 irrigated acres. In addition, there are drainage facilities to handle return flows.

The diversion to lands south of the Carson River is the V Line canal. There are several other designated canal systems south of the river including the A, L, S, G, D, and E Line canals, which are fed either directly or indirectly from the V Line canal. Two regulating reservoirs, Harmon and the S-Line Reservoirs, are currently utilized in the area south of the river. In addition to Diversion Dam there are two other diversion dams on the Carson River: Coleman Dam, which diverts water to the S Line canal, and Sagouspe Dam, which diverts water to the D Line canal. Of the 391 miles of canals and laterals, about 7 percent, or 27 miles are lined. The lined sections are in the main Truckee Canal, the D-Line, T-Line, L1, L8, S5, S7, S8, S17, and V11 in the Carson Division, and the TC-4, TC-5, TC-6 in the Truckee Division. In the Truckee Division, the TC-3 lateral is in pipe. A number of canals have been lined with clay including the A-Line, S-Line, and S-6.

The District currently operates three hydroelectric power plants during the irrigation season. The power produced supplies power to the City of Fallon through NV Energy and Utah Associated Municipal Power Systems (UAMPS). This proposal will employ solar power, for the first time, using net metering. Solar power has been used but only in areas that do not have access to shore power. Using batteries to store energy is expensive and requires more maintenance. The automation on the V Line Canal would have access to line power but the solar panels would be used to produce power for the grid. This would allow the solar power produced to be applied as credits to the District's electric bill when the solar panels create more energy than the automation is using. The District's office and shop facilities are on the "net metering" program and were installed 2011.

The Newlands Project was one of the first reclamation projects in the United States. In 1926 the Truckee-Carson Irrigation District contracted with Reclamation to provide for the operations and maintenance of the Newlands Project. Since that time the cost of the Project has been paid off and the District continues, under contract with Reclamation, to operate and maintain the Newlands Project. The working relationship between Reclamation and the District has been long and continues to this day. We currently have one grant from Reclamation to Upgrade Measuring Devices off the Truckee canal, R11AP20142. This grant was a Water Conservation Field Services Program grant awarded in April of 2011. The last funding grant the District had before the Truckee Canal with the Bureau of Reclamation was with the Water 2025 Program FOA#04FC204041. That project was to automate Gilpin Wasteway to allow the dewatering of the Truckee Canal in the event of an emergency downstream in the Fernley area. The grant was for 300,000 dollars and was awarded in 2005.

Technical Project Description:

Automation of the V Line Canal

There are seven checks on the V Line Canal that are to be automated. They are the V-C2 through the V-C8. The automation at the V-C2 is currently under construction so will not be included in this project. However, the work, material and equipment that are required for the automation of the V-C2 will be used as a baseline for the construction of the other six check structures.

This proposal, to install automation at six check structures, will allow the District to manage the water in the V Line Canal more efficiently, provide an element of public safety to residents along the V Line Canal, while using renewable energy to power the automation. This makes the automation project “self-supporting” as it applies to energy. To provide some detail to this project the plan is to construct each check structure’s automation feature according to the following requirements.

- Obtain necessary permissions, permits and environmental compliance requirements for the project as a whole and individual check structures
- Maintain a specific level of flow at each check structure
- Ability to monitor and change the flow level remotely
- Alarms that will call phone number(s) when conditions change
Loss of line power High flow condition Low flow condition
Obstruction in gate that prevents opening or closing
Obstruction or problem
- On site concrete building to house hardware required for remote monitoring and operation of automation
- Connection to line power for gate operation
- Connection to meter for line power credits from solar panel
- Connection to telephone line for alarms
- Two gates with automatic and remote access for operation on the V-C3 through the V-C5
- One gate with automatic and remote access for operation on the V-C6 through the V-C8
- Documentation of as-builts, to include photos, electrical schematics, programming, and drawings
- Integration of operation and maintenance into current SOP and EAP for the V Line Canal

To save time and money, work on the automation of each check structure will be completed in phases and performed simultaneously. In that, some of the construction can only be conducted when there is no water in the canal, when there must be water in the canal, or work that can be done whether or not there is water in the canal.

- Work to be done Off Season (no water in the canal):
Construction of slide gates and the installation of operators, gear boxes, and line power.
Testing of the operation of the gates via computer as well as the alarm status for each check structure
- Work to be done In Season (water in the canal):
Testing of SCADA to monitor water flows
Testing of alarm status for each check structure in watered-up condition.
- Work to be done In or Off Season
Installation and testing of solar panels at each concrete building
Obtain permissions, permits and NEPA studies
Construction of concrete buildings
Trenching and installation of conduits for electrical and comm lines to gates and concrete building.
Construction of box for hardware that will provide remote monitoring and operation to and from gates and sensors and to and from computer interfaces
Install programming into hardware for the monitoring, operation, and alarms for each check structure
Document project through drawings, schematics, and photos
Progress reports

The project will be monitored and managed with the use of project management software, Microsoft Project. This would allow the District to provide regular and timely reporting to meet the requirements of the grant funds as well as Reclamation.

Water Conservation:

This project has a component for quantifiable water savings through the component of improved water management so both A.1(a) and (b) will be addressed.

Quantifiable Water Savings:

The installation of automation on the Check structures of the V Line will reduce the amount of releases from Lahontan Reservoir. This would equate to approximately 3,445 acre feet per year of water savings. This figure was calculated by comparing the amount of water that was projected for delivery requirements to the amount of water that released from Lahontan to meet the demand. Without automation the bays would be kept higher than needed and the water would be released to meet downstream needs the bays would be too low. More water would be released to catch-up to the demand but because of the lack of consistency more water was release in the effort to play catch-up which was always a day behind the actual demand. A spread sheet was developed that accounts for the water shortages and overages. The month of August suffered with the most shortages at 2,639 acre feet. See **Appendix B** for a graph that depicts the shortages that resulted in the S Line because of water being held back in the V Line.

By automating the check structures on the V Line a constant amount of water would be set for each check structure. With a consistent flow there would be no fluctuations of releases to play the catch-up game.

The average annual acre-feet of water supplied by Lahontan Reservoir is 300,000 acre-feet. Last year approximately 342,800 acre feet of water was released from Lahontan. Last year because of the large snow pack the early months of the water season saw precautionary draw downs of the reservoir. Therefore, last years annual numbers will not be used. The average amount of releases from Lahontan in a 100% year is about 253,075 acre feet. Of those releases about 183,000 acre feet are needed to meet the demands of deliveries that come from the V Line. With a savings of 3,445 acre feet that would leave that much more stored in Lahontan reservoir and that much less water that would be supplemented from the Truckee River off the Truckee Canal.

This project will use SCADA and automation to provide the above mentioned water savings through better water management. The average water savings was determined by the comparing the projected demand to actual flows. For the month of August there was a shortage of 2,639 acre feet. **Appendix B** has a copy of the records for this last year for the month of August. The ability to hold a constant flow in the bays at each check will reduce the amount of water that is currently being held upstream in the V Line with the big bays and allow the water to flow downstream to meet the downstream requirements and reduce the shortages that are currently being met by releasing more water from the reservoir.

This water savings can be easily determined by the creation of the same spreadsheet that was used to provide the support for the water savings stated above.

Improved Water Management:

Improved water management is the ultimate purpose of this project through the automation of the check structures on the V Line Canal. The amount of water that was diverted off the Carson River to the V Line Canal, in 2010, was 237,263 acre feet, which is 79 percent of the maximum allowed storage in Lahontan Reservoir. Using the formula suggested in the application:

$$\frac{\text{Estimated Amount of Water Better Managed}}{\text{Average Annual Water Supply}} = \text{Percentage of Water Better Managed}$$

$$\frac{237,263 \text{ acre feet}}{300,000 \text{ acre feet}} = 79 \%$$

Percentage of Total Supply:

Using the figure calculated in section above in the Water Conservation section of approximately 3,445 acre feet being reduced in releases as a result of this project, then the percentage of conserved water relative to total water supply is 1 percent. This number seems insignificant but combined with more efficiently managed water, public safety, and the use of renewable energy the benefits out weigh the amount of water conserved.

$$3,445/300,000 \text{ acre feet} = 1\%$$

Reasonableness of Costs:

The total cost of the project is \$208,043.17 and the amount of acre feet of water better managed is 237,263 acre feet as calculated in section Improved Water Managed. The technology changes rapidly in this computer age, but when you start with the latest technologies, the project should

have an expected life of ten or more years. When you consider that the Newlands Project is over 100 years old, ten years may be too conservative. Using the calculation from the application:

Total Project Cost
(Acre-Feet Conserved, and Better Managed x Improvement Life)

$$\frac{\$208,043.17}{237,263 \times 10} = .09$$

FUNDING SOURCE	FUNDING AMOUNT
Truckee-Carson Irrigation Dist.	\$104,536.77
Reclamation Funding	\$103,506.40
TOTAL PROJECT FUNDING:	\$208,043.17

Energy-Water Nexus:

The District will install a solar panel on the roof of each check structure’s concrete building. The solar panel will be connected to the grid through an inverter. It is estimated that the solar panel will provide approximately 1kw of power to the grid. The electrical demand of the automation will be approximately 18kw per month per check during the water season. It is expected that the solar panel will produce enough power to offset the power usage of the automation, making each check structure self-sustaining. Net metering is something that has never been done before in the District until recently. In 2011 the TCID office and shop facilities had a solar net metering facility installed. The District has three hydro electric power plants, two are located at Lahontan Dam and one is on the V Line Canal and is considered the first check structure on the V Line Canal, VC1 or 26 Foot Drop Hydro Plant. Hydro power is not new to the District but the use of solar panels to do net metering will take advantage of the abundant sunshine in the Fallon area and will provide power to the grid year around and not just during the irrigation season.

With the installation of SCADA at each check structure it will provide the ability to control the bay elevation remotely thereby reducing the use of fossil fuels with the use of a truck to drive to the check structure to manually adjust the bay elevations several times a day per structure.

Benefits to Endangered Species:

The Newlands Project relies upon storage in Lahontan Reservoir for irrigation. Lahontan Reservoir is fed by two sources of water, the Carson River and the Truckee River through diversions into the Truckee Canal. Diversions off the Truckee River are managed by the Operating Criteria and Procedures (OCAP) through the Bureau of Reclamation. All demand for irrigation water in the Truckee Division is met through the Truckee Canal. The Truckee Canal diverts water off the Truckee River at Derby Dam and flows to Lahontan Reservoir. The amount of water that is allowed to flow into Lahontan is managed throughout the year and depends upon several things. One is the amount of water that the Carson River provides and the amount of water that is used during an irrigation season or demand. The demand is based upon the irrigated acres and the maximum allowable diversions and is usually 300,000 acre feet per year. Diversions from the Truckee River will not be allowed as long as the reservoir has enough water to meet the demand. The more efficiently the water is managed below the dam the less the reservoir will need from the Truckee River.

The Truckee River terminates in Pyramid Lake and is the spawning grounds for the Lahontan Cutthroat Trout, a threatened species, and the cui-ui fish, an endangered species. The Pyramid Lake Indian Tribe watch over the water in the Truckee River very closely and will insure that the benefit from any amount of conservation or better water management in the Newlands Project will go to benefit the endangered and threatened species of fish as well as the habitat of their spawning grounds on the Truckee River.

Water Marketing:

The Newlands Project does not have any water marketing elements.

Other Contributions to Water Supply Sustainability:

This project is supported and encouraged by the Lahontan Basin Area office of the Bureau of Reclamation. The automation of the check structures will provide an element of public safety that is a growing concern of Urbanized Canals. The V Line Canal is a major canal in the Newlands project that averages 600 cfs of flow throughout the Water Season. Over the years there has been development of neighborhoods and community services along this canal. If there is an overtopping incident or break in the canal the consequences would be very serious, not only to the public but to the agricultural community and economy. The automation programming will consist of programming developed by the District to maintain consistent and steady flows, automatically, and call cell phone numbers in the event of a power outage, high flows, low flows, and a gate obstruction. In the event of any of those emergency conditions, a lap top computer can be used to immediately adjust the flows at any check structure to accommodate the emergency. If there is a power outage there are several mobile generators that can be set up to allow the automation to work without power. The element of public safety more than justifies the automation of the V Line Canal project.

Implementation and Results:

Project Planning:

This project is consistent with the Water Conservation Plan developed by the Truckee-Carson Irrigation District under the direction of the Bureau of Reclamation. The automation of all six checks on the Truckee Canal is listed in the table of priorities of the five-year plan on the 2010 Project Improvement Plan.

The programs and computer systems required by the automation system have been developed by the District and are unique to the Newlands Project. The Irrigation Training and Research Complex (ITRC) of Cal Poly have provided guidance and support during the District's technological growth and development and the District will continue to use their services.

Readiness to Proceed:

There are eight check structures located on the V Line Canal, Reference **Appendix A**. V-C1 is the hydro plant called the 26 Foot Drop, V-C2 is the first check structure with automation already started and almost complete. The check structures called the V-C3 through the V-C8 are the check structures that will be automated with the awarding of this grant. All necessary plans and designs are complete and we expect no delay for environmental compliance.

The project has been divided into three groups of major tasks; development tasks, documentation, and construction tasks. The use of project management software will facilitate the development of this project as well as each task in each group. The writing of this grant is

integrated into the development group of tasks. The reporting requirements will be part of the documentation group of tasks, and each phase will be a separate task in the construction group of tasks.

There will be three phases of construction, Phase I will consist of construction that must be completed with no water in the canal. Phase II will consist of construction that can be done with water in the canal, and Phase III will be construction that can be done with or without water in the canal. The tasks and phases should breakdown as follows:

Development Tasks

Submit plans and designs to BOR for approval and NEPA compliance upon notification of grant award.

Develop a chart and progress report in project management software

Develop plan for installation of solar panels with electrical contractor and NV Energy

Documentation Tasks:

NEPA Documents

Standard designs for gates

Electrical schematics

Document Programs required for alarms and automation

Wiring diagrams for hardware located in Block building with photos

Monthly Progress reports to BOR for project and grant reporting

Update SOP and EAP for the V Line Canal as Automation becomes operational

Construction Tasks:

Phase I – No water in Canal Nov 2012- March 2013:

- Install gates and drives to three check structures

Phase II – Water in Canal Sept. 2012

- Install solar panels on four concrete structures

Phase II – Water in or out of Canal Sept. 2012

- Construct three block buildings at each check structure.
- Construct three boxes that contain hardware and programming for the check structures
- Dig trenches and/or set conduits for wiring both electrical and communication

Phase I – No water in Canal Nov. 2013- March 2014:

- Install gates and drives to three check structures
- Test operation of gates and alarms with automation that was installed during the water season

Phase II – Water in Canal March 2013 – Sept. 2014

- Install solar panels in four concrete structures
- Verify operation of automation in the checks, fix any anomalies

Phase II – Water in or out of Canal 2013

- Construct three block buildings at each check structure.
- Construct three boxes that contain hardware and programming for the check structures
- Dig trenches and/or set conduits for wiring both electrical and communication

Applications must be done for each solar panel installed as well as an inspection done by an electrical contractor. The District will contract the electrical design and installation for the solar panels with a licensed electrical contractor

Performance Measures:

The District employs performance measures currently as a condition of OCAP. The District will monitor the performance and output of the solar panels via net metering with NV Energy. The meters will be able to provide the output for each check structure's solar panel.

The District will monitor the diversions off the V Line Head and compare that with the deliveries off the V Line Canal to determine if there is a reduction in shortages and overages. A spread sheet has been developed by the scheduling department that will be done at the end of each water season.

Connection to Reclamation Project Activities:

The project to automate the check structures on the V Line Canal has been requested by the Bureau of Reclamation because the V Line Canal is considered an Urbanized Canal. The automation will increase the level of safety required by the Bureau and the community of Fallon. The Newlands Project was one of Reclamations first projects and was begun in 1906. The District has since paid off the construction cost of the Project but still is contracted by the Bureau of Reclamation to operate and maintain the project. The Newlands Project's facilities are considered to be the property of the United States through the Department of Interior and the Bureau of Reclamation. The project is located in the Lahontan Basin Area under the Mid-Pacific Region. The Bureau that oversees the District activities, as they are related to the Newlands Project, works out of the Carson City office. The Contracting Officer is the Regional Director located in Sacramento.

**PERFORMANCE MEASURE FOR QUANTIFYING POST-PROJECT
BENEFITS:**

The District will monitor the flows at the head of the V Line Canal as it currently does. That water will be compared to the deliveries that are made off the V Line Canal either directly or indirectly through the other laterals that branch off the V Line Canal before the V-C8. A spreadsheet will be developed as the project is implemented to compare one year's data with the previous years. The water season ends in the Carson Division in November. Therefore, data for the end of the project in September of 2013 will not be available until the end of November or December. Timely reports will be made to the local Bureau as the project is progressing.

ENVIRONMENTAL COMPLIANCE:

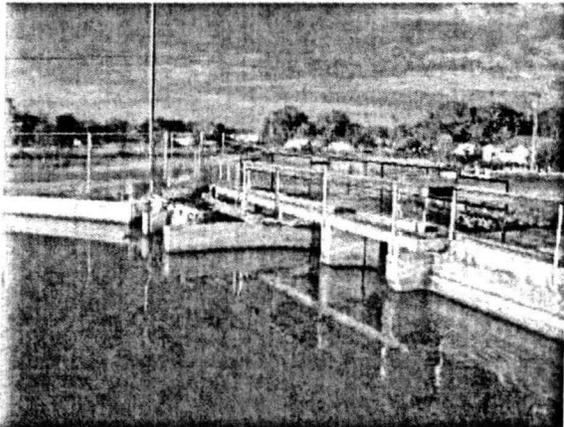
This project should not impact the environment in a negative way. All work will be conducted within the easement of the V Line Canal. The only part of the project that will disturb the earth will be trenching for the electrical and communication lines. Before any trenching is done the BOR will be notified and permits and authorization will be obtained. No impact to water, air or animal habitat.

The District is not aware of any species listed or proposed to be listed as a Federal endangered or threatened species, nor any designated Critical Habitat in the project area.

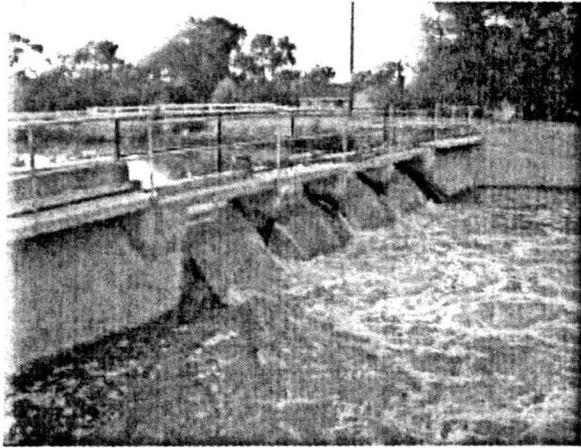
The water in the V Line Canal falls under the Federal Clean Water Act as “waters of the “United States”. The waters in the V Line eventually reach the Stillwater National Wildlife Refuge wetlands. The automation of the check structures will not negatively impact the water that eventually flows to the wetlands in Stillwater.

The water delivery system of the Newlands Project began construction in 1906. The Truckee Carson Irrigation District (District) was chartered in 1918 and the first contract with Reclamation was made in 1926.

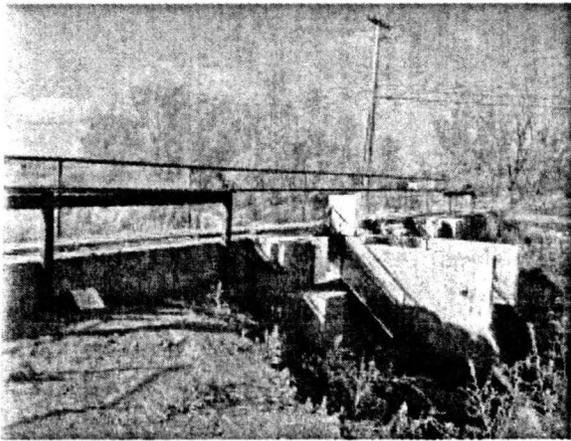
This project will modify the features of each check structure. The following is the current configuration and an estimate of past modifications.



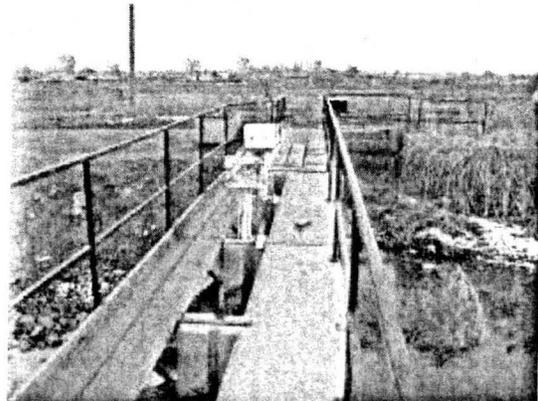
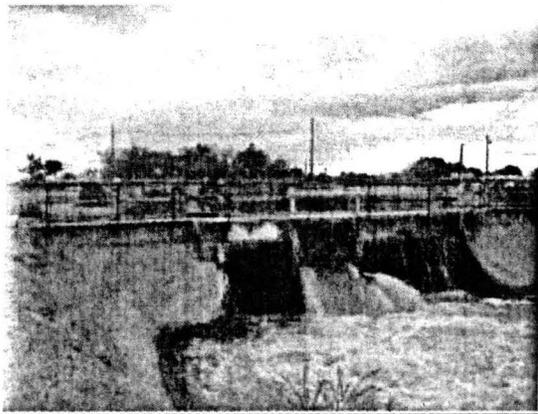
- **V-C3** - There are presently two radial gates on the VC3. Those gates were installed in 1988 and are operated by a SCADA system. Metal handrails were installed in 1995



- **V-C4 and V-C5** – consists of original construction (1906) with four bays that can only be adjusted, opened or closed by manually pulling boards. This structure was last modified in 2004 with the installation of metal handrails and new walkboards to provide better safety for District personnel. There is no power to either of these structures.



- **V-C6** – This structure was upgraded with SCADA devices in 1988 that controls the flow of water that is diverted into the L Line Canal at this point. There is currently one radial gate at this structure that is operated electrically. The radial gate was installed at the same time as the SCADA.



- **V-C7 and V-C8** – These two structures are of similar configuration. They are original construction (1906) with only modifications done to the handrails and any wood has been replaced as needed.

Since the Newlands Project is over 100 years old there are parts that are eligible for listing on the National Register of Historic Places. However, the District has been required to operate and maintain the facilities to provide for the best and efficient use of the water. This does require

modernization and the use of available technology whenever possible.

There are no known archeological sites in the proposed project area.

The proposed project will not have a high or disproportionate adverse effect on low income or minority populations.

The proposed project will not limit access to ceremonial use of Indian sacred sites. This project may have an indirect impact on tribal lands in that the V Line Canal becomes the S Line Canal after the VC8 and the S Line Canal passes through the Fallon Paiute Shoshone Tribe's (FPST) reservation. The S Line Canal is also the source for water to the reservation farm lands in the Stillwater area via the R Line Canal. So it could be argued that any water better managed effects the FPST.

The proposed project will not contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area.

REQUIRED PERMITS OR APPROVALS:

The facilities in the Newlands Project are still held in the name of the Federal government through the Bureau of Reclamation. Permits, NEPA and SHPO processes through the BOR will be completed prior to the start of the project. The local area office located in Carson City has been notified and the process will begin upon notification of receiving grant award.

FUNDING PLAN AND LETTERS OF COMMITMENT:

The non-Reclamation share of the proposed project will be funded entirely by the District through the 10% Conservation portion of O&M fees that are collected via the County assessor office from the water users. In accordance with the O&M Contract with the Bureau of Reclamation 10% of the O&M fees must be set aside for Conservation projects. In accordance with the 2010 Water Conservation Plan this automation project is part of the continuing efforts of the District towards water conservation and management and will be the cost-share funding source for the District.

Table 1: Summary of non-Federal and Federal funding sources

FUNDING SOURCE	FUNDING AMOUNT
Truckee-Carson Irrigation Dist.	\$104,536.77
Reclamation Funding	\$103,506.40
TOTAL PROJECT FUNDING:	\$208,043.17

OFFICIAL RESOLUTION:

On January 9th of 2012, the Board of Directors of the Truckee Carson Irrigation District approved unanimously to support a resolution in the support of the WaterSmart program, reference **Appendix C**. It was signed by the President of the Board of Directors and the signature and official stamp from the Secretary of the Board of Directors. The resolution was adopted before the completion of this application therefore at the next regular meeting; the Board members will review this grant application to confirm their support.

BUDGET PROPOSAL:

The District will be responsible for 50% of the total cost of the automation of the V Line Canal.

Table 2: Budget Worksheet

BUDGET ITEM DESCRIPTION	COMPUTATION		RECIPIENT FUNDING	OTHER FUNDING	RECLAMATION FUNDING	TOTAL COST
	\$/Unit and Unit	Qty				
1. SALARIES AND WAGES -- Position title x hourly wage/salary x est. hours for assisted activity. Describe this information for each position.						
2012-2013:						
Deputy Project Manager	80,000.00	5%	4,000.00			\$4,000.00
Hydro Foreman	57,970.00	5%	2,898.50			\$2,898.50
Office Manager	48,000.00	5%	2,400.00			\$2,400.00
2012-2013:						
Manual Labor	13.53	240	3,247.20			\$3,247.20
Maintenance Workers	16.88	120	2,025.80			\$2,025.80
Excavator Operator	22.32	42	937.44			\$937.44
Welder	22.00	120	2,640.00			\$2,640.00
Information/Automation Tech	22.81	936	21,350.16			\$21,350.16
2013-2014:						
Deputy Project Manager	82,400.00	5%	4,120.00			\$4,120.00
Hydro Foreman	59,709.10	5%	2,985.46			\$2,985.46
Office Manager	49,440.00	5%	2,472.00			\$2,472.00
2013-2014:						
Manual Labor	13.94	240	3,344.62			\$3,344.62
Maintenance Workers	17.39	120	2,086.37			\$2,086.37
Excavator Operator	22.99	42	965.56			\$965.56
Welder	22.66	120	2,719.20			\$2,719.20
Information/Automation Tech	23.49	936	21,990.66			\$21,990.66
2. FRINGE BENEFITS -- Explain the type of fringe benefits and how are they applied to various categories of personnel.						
2012-2013:						
Manpower Labor	6.23	240			1,495.20	\$1,495.20
District Labor	20%	\$36,251.90	7,250.38			\$7,250.38
2013-2014:						
Manpower Labor	6.42	240			1,540.80	\$1,540.80
District Labor	20%	\$33,578.41	6,715.68			\$6,715.68
3. TRAVEL -- dates; location of travel; method of travel x estimated cost; who will travel						
Lodging 3 pers. for 3 days	9	65.00			585.00	\$585.00
Per Diem 3 pers. for 5 days	15	35.00			525.00	\$525.00

ClearSCADA Training	3	1,890.00			5,670.00	\$5,670.00
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4. EQUIPMENT – Leased Equipment use rate + hourly wage/salary x est. hours for assisted activity - Describe equipment to be purchased, unit price, # of units for all equipment to be purchased or leased for assisted activity. Do not list contractor supplied equipment here.

1 Ton Service Truck	\$19.90	6	119.4			\$119.40
Pick-Up Trucks	\$16.50	249	4,108.5			\$4,108.50
Excavator	\$64.00	30	1,920.0			\$1,920.00
Tool Truck	\$18.50	120	2,220.0			\$2,220.00

5. SUPPLIES/MATERIALS – Describe all major types of supplies/materials, unit price, # of units, etc., to be used on this assisted activity.

Relay, 8 Pin DPDT	14.40	36			\$518.40	\$518.40
Socket, 8 Pin, 16 amp	7.88	24			\$189.12	\$189.12
Socket, Relay 8 Pin	2.41	24			\$57.84	\$57.84
Enclosure, Inner Panel	39.74	6			\$238.44	\$238.44
Wire Solid 12AWG	121.73	6			\$730.38	\$730.38
Wire Solid 12AWG	121.73	6			\$730.38	\$730.38
Wire Solid 12AWG	121.73	6			\$730.38	\$730.38
Wire Solid 12AWG	121.73	6			\$730.38	\$730.38
Wire Solid 12AWG	121.73	6			\$730.38	\$730.38
Wire Solid 12AWG	121.73	6			\$730.38	\$730.38
Lever Arm, Rod, 1-0in	24.17	36			\$870.12	\$870.12
Switch, Limit SPDT	142.65	36			\$5,135.40	\$5,135.40
Switch, Selector, 30mm	36.59	12			\$439.08	\$439.08
Switch, Selector, 30mm	34.34	12			\$412.08	\$412.08
Contact Block, 30mm	27.86	24			\$668.64	\$668.64
Wire Solid 12AWG	121.73	6			\$730.38	\$730.38
Wire Solid 12AWG	121.73	6			\$730.38	\$730.38
Wire Solid 12AWG	121.73	6			\$730.38	\$730.38
Enclosure, NEMA 3r	221.18	6			\$1,327.08	\$1,327.08
Relay, 8 Pin DPDT, 15 amp	17.93	24			\$430.32	\$430.32
Relay, Overload	60.98	6			\$365.88	\$365.88
IEC Mini Contactor	132.80	12			\$1,593.60	\$1,593.60
IEC Contact Block	12.25	24			\$294.00	\$294.00
Din Mounting Track 35mm	7.41	12			\$88.92	\$88.92
Programmable Logic Control	199.00	6			\$1,194.00	\$1,194.00
PLC Hardware	20.00	6			\$120.00	\$120.00
Wire, Stranded	66.11	6			\$396.66	\$396.66
Wire, Stranded	66.11	6			\$396.66	\$396.66
Wire, Stranded	66.11	6			\$396.66	\$396.66
Wire, Stranded	66.11	6			\$396.66	\$396.66
Wire, Stranded	66.11	6			\$396.66	\$396.66
Wire, Stranded	66.11	6			\$396.66	\$396.66
Wire, Stranded	66.11	6			\$396.66	\$396.66
Wire, Stranded	66.11	6			\$396.66	\$396.66
Wire, Stranded	66.11	6			\$396.66	\$396.66

Wire, Stranded	66.11	6			\$396.66	\$396.66
Wire, Stranded	60.80	6			\$364.80	\$364.80
Wire, Stranded	60.80	6			\$364.80	\$364.80
Wire, Stranded	60.80	6			\$364.80	\$364.80
Alarm Dialer	98.00	6			\$588.00	\$588.00
Power Supply	189.00	6			\$1,134.00	\$1,134.00
Cabinet Hardware	20.00	6			\$120.00	\$120.00
Gear Motor, 220v, 3/4 HP	798.48	12			\$9,581.76	\$9,581.76
2" EMT Tubing	17.85	30			\$535.50	\$535.50
90 Degree Elbow	5.75	120			\$690.00	\$690.00
45 Degree Elbow	5.75	24			\$138.00	\$138.00
2" Steel Couplers	2.04	120			\$244.80	\$244.80
3/4" EMT Tubing	4.30	30			\$129.00	\$129.00
3/4" 90 Degree Elbow	1.78	30			\$53.40	\$53.40
3/4" Steel Couplers	0.35	30			\$10.50	\$10.50
Screws, Clamps, Assorted	100.00	6			\$600.00	\$600.00
Solar Panels	1000.00	10			\$10,000.00	\$10,000.00
Concrete	85.00	63			\$5,355.00	\$5,355.00
Lumber Various sizes	176.04	6			\$1,056.24	\$1,056.24
Steel HR Angle, HR flat, HR Door angles	1939.85	6			\$11,639.10	\$11,639.10

6. CONTRACTUAL/CONSTRUCTION -- Explain any contracts or sub-Agreements that will be awarded, why needed. Explain contractor qualifications and how the contractor will be selected.

SCADA Pack, 350, 32 Bit controller	1,684.50	1			\$1,684.50	\$1,684.50
Modem Cable RS232	35.25	1			\$35.25	\$35.25
Fuse Kit for SCADA Pack 300 Series	33.00	1			\$33.00	\$33.00
ClearSCADA 2010 Server License 1,500 pt.	5,950.00	1			\$5,950.00	\$5,950.00
Annual Support for ClearSCADA	892.00	1			\$892.00	\$892.00
Integrator for Installation of System	140.00	40			\$5,600.00	\$5,600.00
Travel Expenses for Integrator	1,000.00	5			\$5,000.00	\$5,000.00
Licensed Electrical Contractor	Installation of Net Metering for solar panels				3,000.00	\$3,000.00

7. ENVIRONMENTAL and REGULATORY COMPLIANCE COSTS -- Reference cost incurred by Reclamation or the applicant in complying with environmental regulations applicable to this Program, which include NEPA, ESA, NHPA etc.

NEPA	2%	\$4,039.67			4,039.67	\$4,039.67
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8. OTHER -- List any other cost elements necessary for your project; such as extra reporting, or contingencies in a construction contract.

Microsoft Project	4	100			\$400.00	\$400.00
Contingencies	1%	\$2,019.84	2,019.84			\$2,019.84
TOTAL DIRECT COSTS--			104,536.77		103,506.40	208,043.17

9. INDIRECT COSTS -- What is the percentage rate%. If you do not have a Federally-approved Indirect Cost Rate Agreement or if unapproved rates are used - Explain Why.						
None						\$0.00
TOTAL PROJECT/ACTIVITY COSTS			\$104,536.77		\$103,506.40	\$208,043.17

Budget Narrative:

Salaries and Wages:

Key personnel employed by the District for this project include:

Deputy Project Manager – Walter Winder 5% of time, \$4,000

Hydro Foreman – Kelly Cecil 5% of time, \$2,898.45

Office Manager – Kate Rutan 5% of time, \$2,400

Manual Labor – 13.53 p/hr.

The manual labor is furnished through Manpower. They provide the majority of the unskilled labor for this project. Their rate has a 46% mark-up, or \$6.23 p/hr, that is paid to Manpower.

Maintenance Worker – 16.88 p/hr.

The Maintenance Workers are experienced TCID employees that provide direction to the unskilled labor at the work site. They are used in the Construction tasks of the project to construct the concrete building and any needed gate construction. There is usually one experienced worker per site and one site is under construction at any given time.

Excavator Operator – 22.32 p/hr.

The equipment operator is an experience equipment operator working for TCID and can operate more than one piece of heavy equipment required for the construction tasks of the project.

Welder – 22.00 p/hr.

On this project the welder is responsible for the installation of the doors and roofs of the concrete building that will be constructed at each check structure. He also is training in the automation electronics, so he will be assisting the Automation Technician. He is an employee of the District.

Information/Automation Technician – 22.81 p/hr.

The information/automation tech is an employee of the District and wears many hats. He developed the programming for the automation and alarms, he installs all the electrical wiring and comm lines, and monitors the testing and activation of the automation. It was difficult to estimate the amount of hours he would be spending on this project as it would be very intermittent at some times and constant at others. Therefore, his time was estimated at 15% per year.

The District employees are part of a collective bargaining unit and negotiate compensation packages on a yearly basis that become effective on July 1st each year. A 3% pay increase was added to the first year of this project and another 3% increase was added for the second year. The budget Worksheet reflects the 3% increase for the District Employees but not for the Manpower personnel for 2012. For the next year, 2013, of the project the 3% increase is included for both the Manpower and District employees.

Fringe Benefits:

The fringe benefits costs for the Manpower workers are a flat 46% of their salary. This is paid to Manpower and they in turn pay the hourly wage and benefits for each Manpower employee. The District is then billed, the hourly rate plus 46%. The fringe benefits for District employees include health insurance, contributions to the Public Employees Retirement System, and paid time off. The fixed rate of 20% is the rate that the District uses for billing purposes.

Travel:

The District does not anticipate that there will be any travel other than local travel to and from the work site. The cost of local travel is included in the equipment fee associated with this project. The Contractor used for the Solar consultation will have travel cost broke out in his quote.

Equipment:

All the equipment listed on the Budget Worksheet is District property. A work order to install automation was the basis to determine the equipment that is required as well as the labor and materials. The rates that are listed are normal rental fees that are charged by the District for billing purposes. The rental fees were taken off the FEMA list for reasonable charges allowed for reimbursement for the year 2010.

Materials and Supplies:

The listed supplies and materials on the Budget worksheet were determined using a work order for the installation of the automation on the V-C2. However, the addition of solar panels and the upgrade to the ClearScada was not part of the install at the V-C2. The ClearSCADA can be used anywhere in the District with the addition of the SCADAPack Hardware that is used for water monitoring purposes only.

Contractual:

The upgrade to the present SCADA system will be provided by Sage Designs, Inc. They provided a Quote for the ClearSCADA system that will allow our current system to go from 250 Input/Outputs to 1500 Input/Outputs. An integrator is included to set up the new system and provide training in operation and maintenance of the upgraded SCADA. The Budget Worksheet itemizes the materials and cost of the integration plus travel expenses.

In order to use net metering with the local power company (NV Energy) the design and installation must be done under the supervision of a licensed electrical contractor. The cost for that approval will be a flat fee of \$3,000. The District will do the design and the installation.

Environmental and Regulatory Compliance Costs:

The Newlands Project is operated and maintained by the District. The facilities and easements are held by the United States Government through the Bureau of Reclamation. To meet the requirement of Reclamation the project will comply with the requirements as determined by Reclamation for NEPA, permits, and approvals. That cost was estimated to be 2 percent of the total cost of the project.

Reporting:

The District will be using project management software to satisfy the reporting requirements of the local area Bureau. The cost of that software is included in the cost of the project. The Office

Manager will be responsible for submitting the reports as well as the quarterly and final reporting required by the grant process.

Other: None

Indirect Costs: None

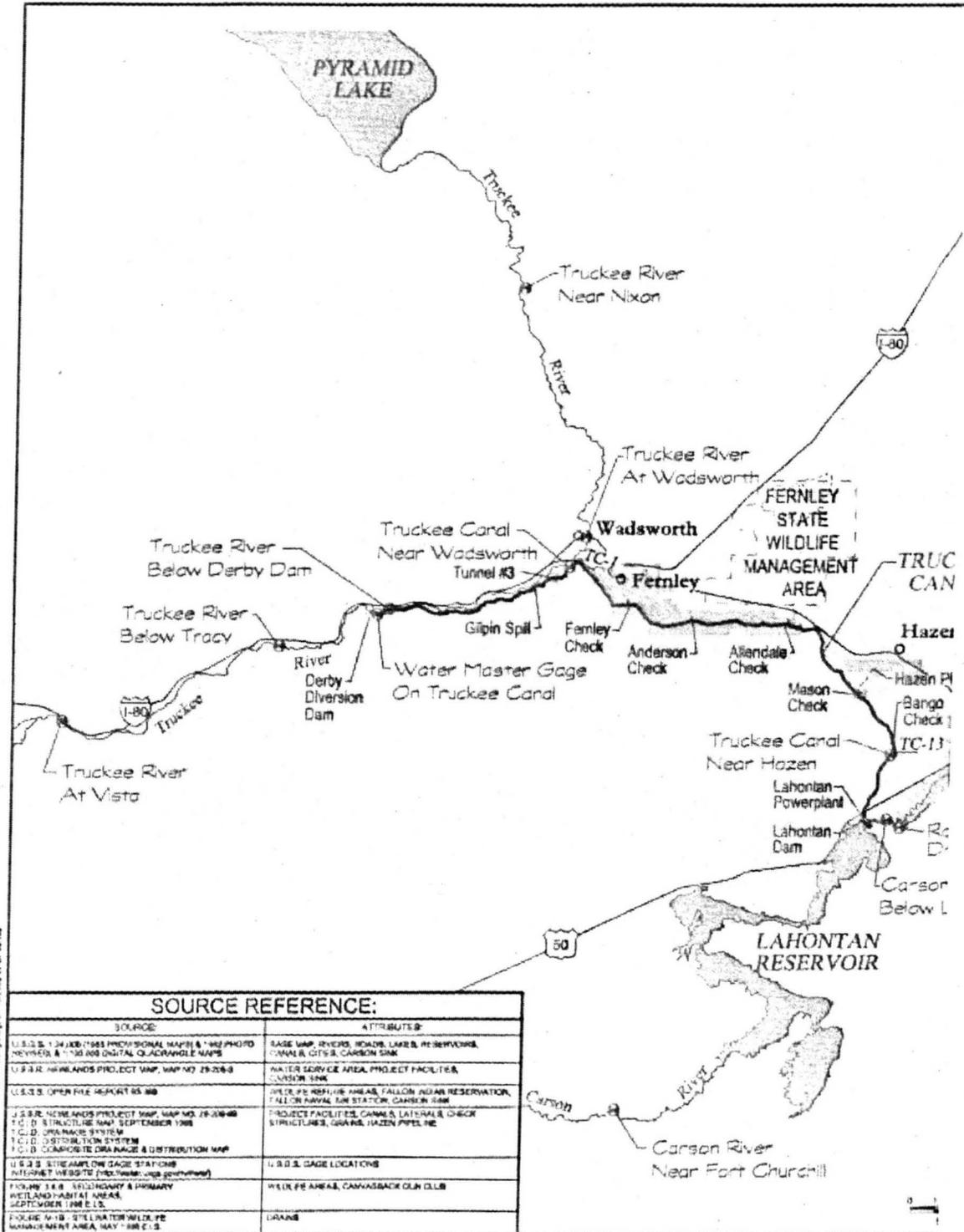
Contingency Costs:

The District included a contingency cost of 1 percent of the total cost of the project because this is a construction project. The District has completed automation projects on check structures throughout the Project and feels confident in its proposed budgets. However, the solar net metering is something new so a 1% contingency was added.

Total Costs:

FUNDING SOURCE	FUNDING AMOUNT
Truckee-Carson Irrigation Dist.	\$104,536.77
Reclamation Funding	\$103,506.40
TOTAL PROJECT FUNDING:	\$208,043.17

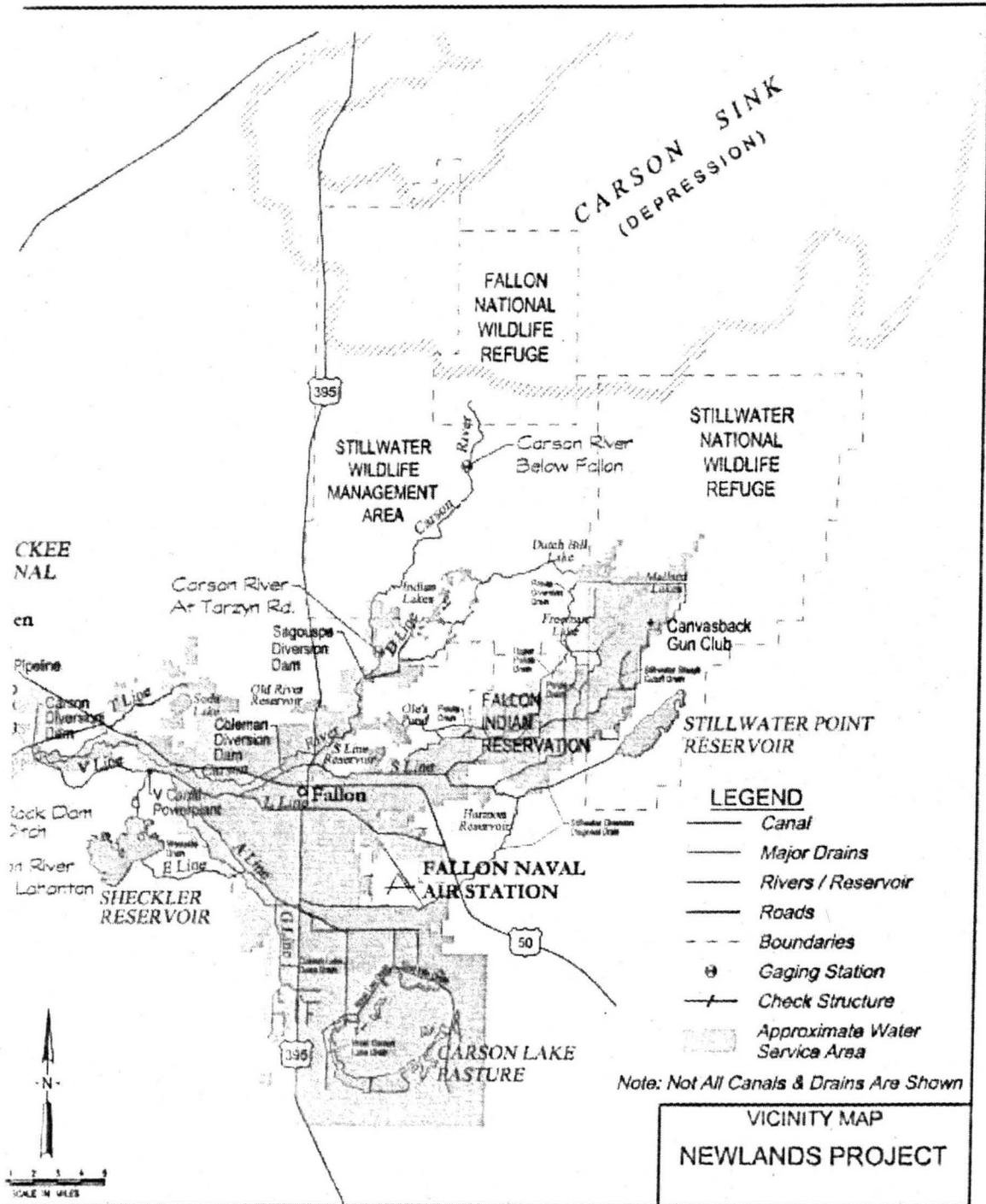
Appendix A – Area Maps



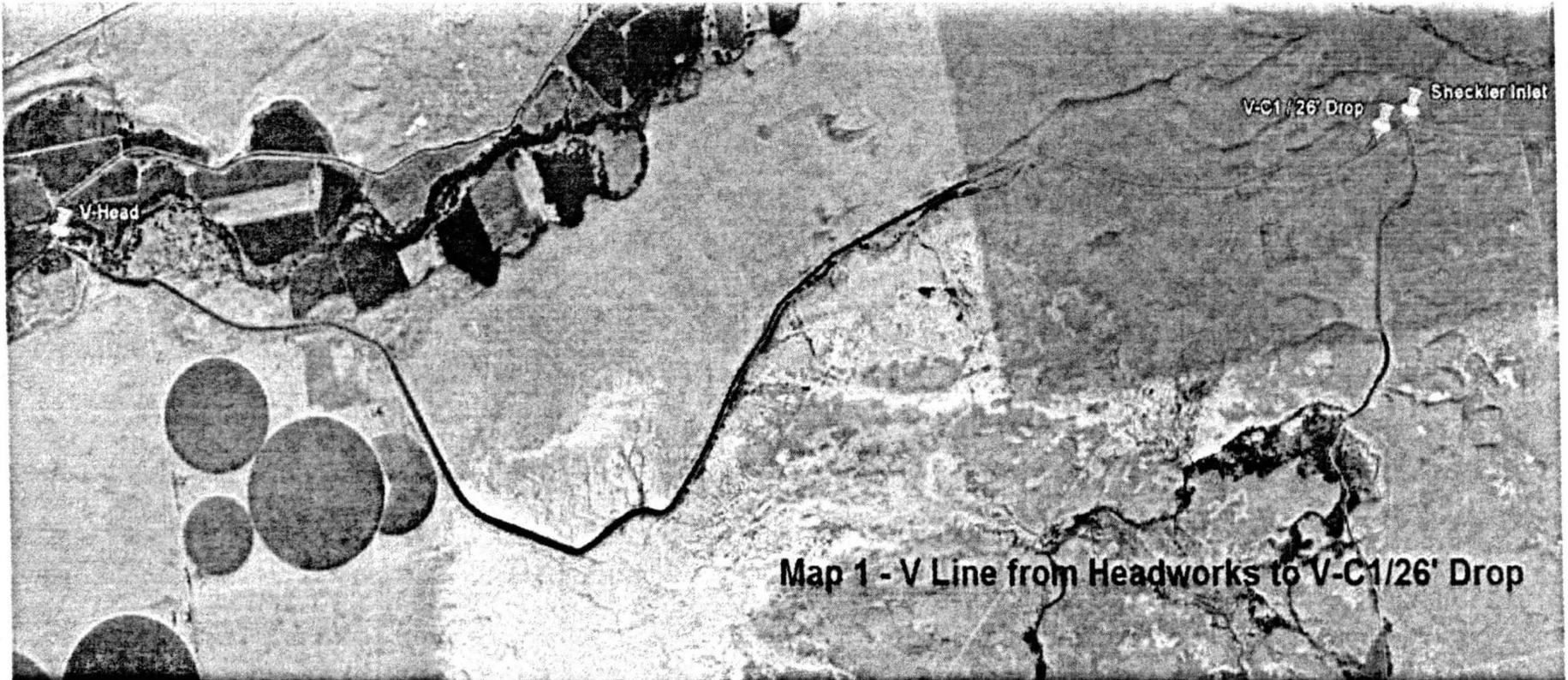
SOURCE REFERENCE:

SOURCE	ATTRIBUTE
U.S.G.S. 1:24,000 1988 PHOTOGRAPHIC MAPS & 1:50,000 DIGITAL QUADRANGLE MAPS	BASE MAP, RIVERS, ROADS, LAKES, RESERVOIRS, CANALS, GTS'S, CARSON DAM
U.S.G.S. HAWLANDS PROJECT MAP, MAP NO. 29-208-8	WATER SERVICE AREA, PROJECT FACILITIES, CARSON DAM
U.S.G.S. OPEN FILE REPORT 65-80	WATER SERVICE AREA, FALLON NEAR RESERVOIR, FALLON NEAR STATION, CARSON DAM
U.S.G.S. HAWLANDS PROJECT MAP, MAP NO. 29-208-8	PROJECT FACILITIES, CANALS, LATERALS, CHECK STRUCTURES, CANALS, HAZEN PIPELINE
U.S.G.S. CANALS TO ORANGE & DISTRIBUTION MAP	U.S.G.S. GAGE LOCATIONS
U.S.G.S. STEAMFLOW GAGE STATIONS INTERNET WEBSITE (http://water.usgs.gov/nwdata/)	WATER SERVICE AREA, CANALS, CARSON DAM
FIGURE 3-4-8 SECONDARY & PRIMARY WETLAND HABITAT AREAS, SEPTEMBER 1992 E.L.S.	CANALS
FIGURE 3-4-8 STELLA-TORWILDE PE MANAGEMENT AREA, MAY 1992 E.L.S.	

Appendix A



Appendix A



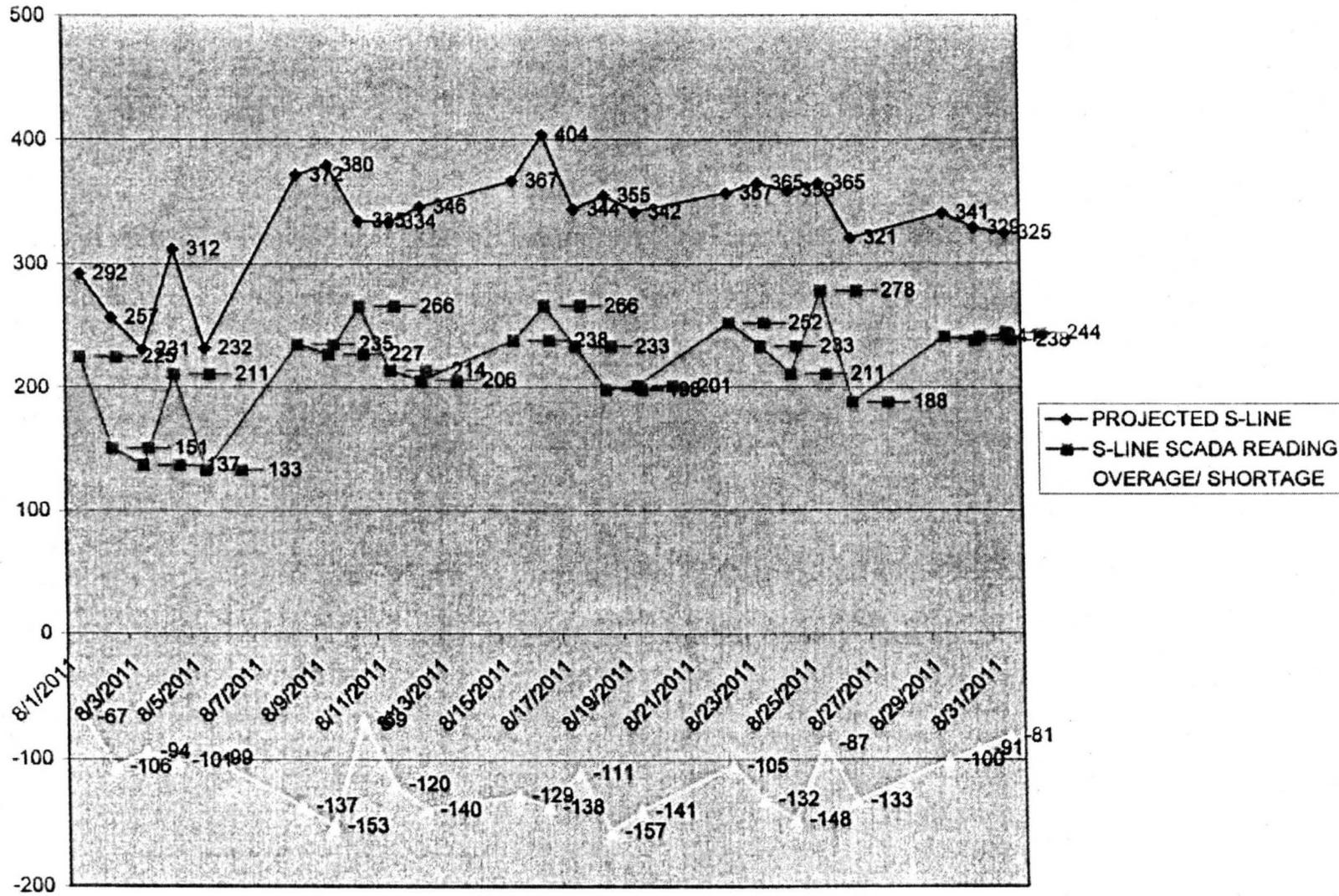
Appendix A



Appendix A



Appendix B



Appendix C

**TRUCKEE-CARSON IRRIGATION DISTRICT
RESOLUTION No. 2012-2**

**AUTHORIZING THE
TRUCKEE-CARSON IRRIGATION DISTRICT
TO ENTER INTO AN AGREEMENT
FOR AUTOMATION OF DISTRICT FACILITIES
IN A GRANT OFFERED UNDER
WATERSMART
WATER AND ENERGY EFFICIENCY GRANTS- FY 2012**

At a regular meeting of the Board of Directors of the Truckee-Carson Irrigation District, held at the office of TCID, on the 9th day of January, 2012, the following resolution was approved and adopted:

IT IS HEREBY RESOLVED that the Truckee-Carson Irrigation District is authorized to participate for processing an application to WaterSMART under the Water and Energy Efficiency Grant Program.

IT IS HEREBY FURTHER RESOLVED that if this project is selected for a WaterSMART Grant the District will negotiate and execute a Cooperative Agreement with Reclamation to fund at least 50% of the project costs and provide documentation showing the sources of non-Reclamation funding that totals 50% of project costs.

PASSED, APPROVED, AND ADOPTED by the following Board members present at the regular meeting of the Board of Directors of the Truckee-Carson Irrigation District on the 9th of January, 2012.

Present:

Ernest C. Schank
Eric Olsen

Ray Peterson
Bob Oakden

David Stix Jr.
Lester deBraga

AYES: 6 NAYS: 0 ABSTENTIONS: 0 ABSENT: 1 Richard Harriman

BY: Ernest C. Schank
Ernest C. Schank
President, Truckee-Carson Irrigation
District

ATTEST:

Ray Peterson
Secretary