

# **WaterSMART**

## **Water and Energy Efficiency Grants for FY 2012**

**FOA No. R12SF80049**

**Funding Group II**

### **Moroni Irrigation Company Improvements**

**Moroni, Utah**

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# TECHNICAL PROPOSAL

## Executive Summary

*The executive summary should include:*

- *The date, applicant name, city, county, and state.*
- *A one paragraph project summary that specifies the work proposed, including how project funds will be used to accomplish specific project activities and briefly identifies how the proposed project contributes to accomplishing the goals of this FOA (see Section III.B, "Eligible Projects" in the FOA).*

Start Date: July 1, 2012

Applicant: Moroni Irrigation Company

Location: Moroni City, Sanpete County, Utah

Project Title: Moroni Irrigation Company Improvements

### Project Summary:

The purpose of the project is to pipe the main transmission facilities. Water will be conserved from eliminating seepage and evaporation losses in the transmission facilities and by water users converting from food to sprinkler irrigation.

Moroni City is located in the center of Utah in Sanpete County. The county has experienced water shortages for many years. As population is expected to increase, the current water shortages are anticipated to worsen within the county. The Sanpete Water Resources Master Plan identifies that water shortages are as high as 30% on average years and may reach 50% on dry years. Water managers and planners have been aware of the county water resources limitation for years and several projects have been implemented to improve water conservation, management and sustainability. However, much work still needs to be done to ensure water users have an adequate supply of water.

The Moroni Irrigation Company has been identified as one of the top priorities for the county because improvements to the conveyance system have the potential to conserve nearly 3,000 acre-feet of water. Moroni Irrigation Company's conveyance system needs improvements to conserve water and better serve the needs of the water users in the region. The system is currently composed of two main ditches, one canal, and many small distribution ditches. The canal is lined with concrete that is broken and deteriorated. Most of the water is diverted from the San Pitch River and used for agricultural purposes by farmers near Moroni City. The total combined length of the three main conveyance facilities is approximately 12.5 miles. The long and relatively flat slope of the canal and ditches causes a significant amount of water loss through seepage and evaporation.

An engineering field study in 2007 by Jones and DeMille Engineering reported that a total of 2,860 acre-feet of water is lost to seepage and evaporation on average years. The significant water losses have a negative impact on company shareholders, Moroni City, and the general local economy. In addition to high water losses, vegetation encroachment and sedimentation has resulted in high maintenance costs. Safety and liability concerns of children drowning along portions of the canal and ditch system have increased with new homes built near the canal.

To improve the current transmission system, the Moroni Irrigation Company is seeking financial assistance to replace the 12.5 miles of open ditches and canals with pipelines to conserve water, increase public safety, and reduce maintenance and operation costs. Replacing open ditches with pipe will fall under Task Area A, but there will be additional benefits that will apply to Task B by reducing or eliminating pumping cost to individual farmers, and Task C by installing fish screens at diversion structures.

Length of Time: 24 Months

Completion Date: June 30, 2014

## **Background Data**

### **Location**

*Provide a map of the area showing the geographic location (include the State, county, and direction from nearest town).*

The proposed project is located near Moroni, Sanpete County, Utah. A project location map is shown in Figure 1.

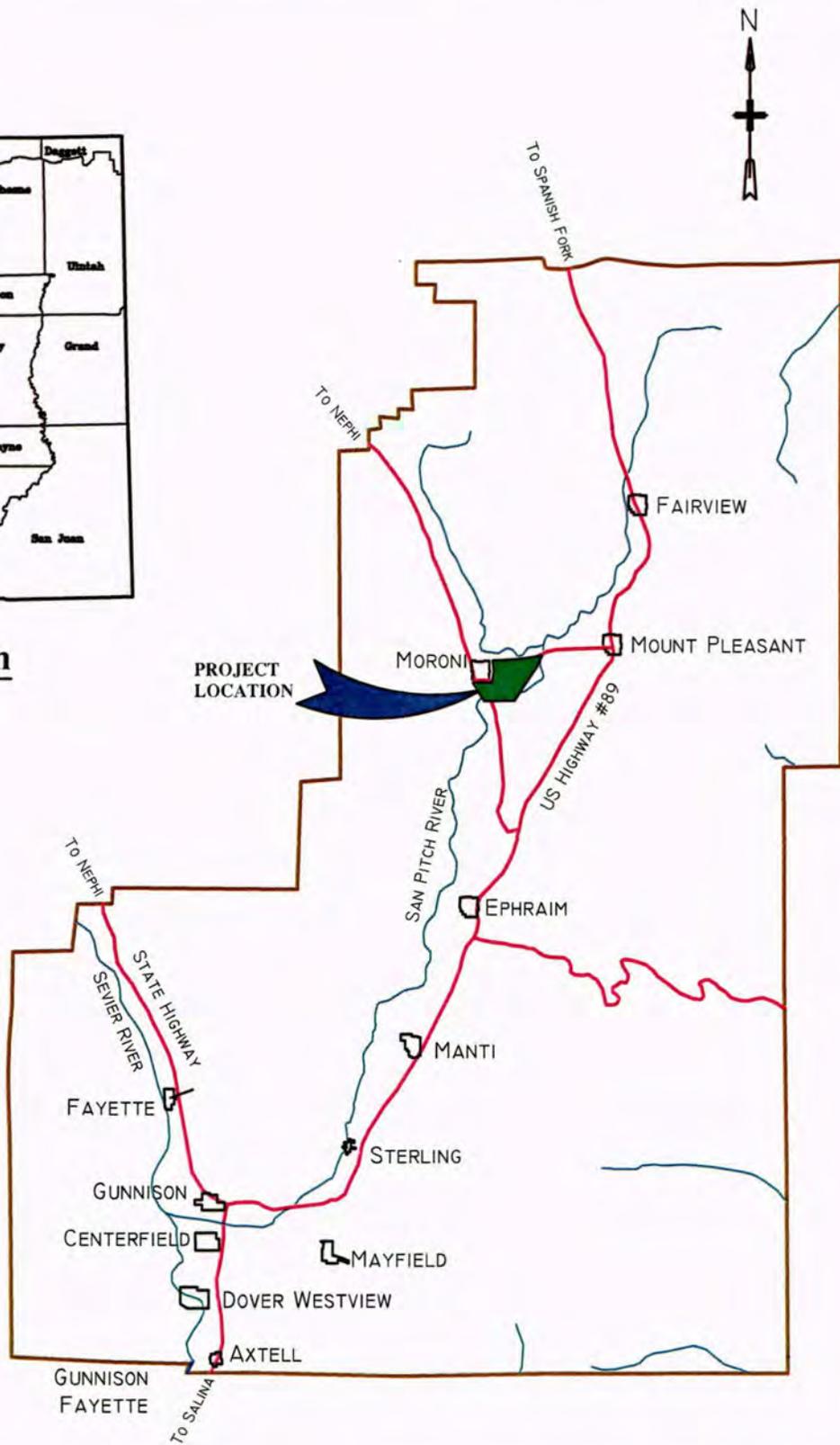
### **Applicant's Water Supply**

*As applicable, describe the source of water supply, the water rights involved, current water uses (i.e., agricultural, municipal, domestic, or industrial), the number of water users served, and the current and projected water demand. Also, identify potential shortfalls in water supply. If water is primarily used for irrigation, describe major crops and total acres served.*

Moroni Irrigation Company's system is composed of two main ditches, City Ditch and Spring Ditch, and one Canal. Water supply for the Canal and City Ditch are diverted from the San Pitch River. The Spring Ditch collects runoff and water from springs originating from the mountains to the east of Moroni City. Water conveyed from the Canal and City Spring is used only for agricultural purposes. Water conveyed from City Ditch serves both Moroni City residents and farms, with approximately 20% of the water serving residential lawns and gardens and 80% of the water serving farms. Moroni Irrigation Company's water rights are shown in Table 1.



**State of Utah**



DATE: JANUARY 10, 2012  
 SCALE:  
 Location Map.dwg  
 H:\CLIENT\1-South Utah Area\Sanpete Co\Moroni Irrigation\WatersMART 2012  
 LAYOUT: Location Map (2)

MORONI IRRIGATION COMPANY  
 WATERSMART 2012

FIGURE I  
 PROJECT LOCATION MAP

**Table 1: Water Rights**

<b>Owner</b>	<b>Source</b>	<b>Flow (cfs)</b>	<b>Water Right</b>
Moroni Irrigation Co.	San Pitch River	39.03	65-3192
Moroni Irrigation Co.	San Pitch River	0.322	65-1875

The company provides irrigation to approximately 2,190 acres of agricultural farms. The major crops include alfalfa and grain. The company also provides a portion of the secondary water for the 2,000 residents in Moroni City.

**Describe Water Delivery System**

*In addition, describe the applicant's water delivery system as appropriate. For agricultural systems, please include the miles of canals, miles of laterals, and existing irrigation improvements (i.e., type, miles, and acres). For municipal systems, please include the number of connections and/or number of water users served and any other relevant information describing the system.*

Moroni Irrigation Company currently maintains approximately 12.5 miles of open ditches and canals. The ditches are earth lined open waterways. The Canal is concrete lined; however, the concrete is broken and deteriorated. Vegetation encroachment and sedimentation has resulted in high maintenance costs and reduced the conveyance capacity. There are many areas of the Canal where misaligned concrete lining catches debris and causes overflow. According to the canal operators, the concrete lining has become more of a burden than a benefit. Several areas of the ditch and canal system pose a risk to public property and public safety. The City Ditch runs adjacent to State Route 116 for approximately 2 miles. This section has previously failed causing water and debris to enter the roadway creating a hazardous condition to motorists. Consistent overflow caused by debris blocking the flow path has become a large concern for the irrigation company as more and more homes continue to be developed near the ditches and canals.

There are several small distribution ditches that convey water from the main transmission system. Small sections of the distribution system are piped, but the vast majority of the delivery system is earth lined or concrete lined canals, where the concrete is broken. This project proposes piping the main transmission system and will likely encourage individuals to pipe portions of the distribution system. Currently, approximately 95% of shareholders flood irrigate their fields. On a shareholders meeting held December 6, 2011, a survey was taken and approximately 60% of shareholders are going to convert to pressurized sprinkler systems after this project is implemented. Many of the shareholders have already begun the planning process with NRCS.

In addition, the poor condition of the conveyance system has caused significant water loss due to seepage and evaporation. The length and flow loss for each main transmission line is shown in Table 2. A total of 2,190 acres are irrigated for agricultural purposes.

**Table 2: Reach Length**

<b>Reach</b>	<b>Reach Length (ft)</b>
Canal	20,500
City Ditch	20,500
Spring Ditch	25,300
<b>Total</b>	<b>66,300</b>

**Renewable Energy or Energy Efficiency**

*If the application includes renewable energy or energy efficiency elements, describe existing energy sources and current energy uses.*

Some irrigators use pumps to divert the water from the ditches and irrigate their fields. By replacing the ditches and canal with pipe, the need for pumping would be reduced or eliminated.

**Prior Work with Reclamation**

*Identify any past working relationships with Reclamation. This should include the date(s), description of prior relationships with Reclamation, and a description of the project(s).*

There has not been any direct working relationship with Reclamation on any of Moroni Irrigation Company's facilities. However, Reclamation has been working with Sanpete County for over 70 years to develop additional water supplies for Sanpete County. The Gooseberry Narrows Project would have improved the water supply in the San Pitch River. Unfortunately, over 70 years of effort by Reclamation and Sanpete County has not seen the completion of this project. The Central Utah Project (CUP) was also to provide additional water to Sanpete County. The CUP has not provided water to Sanpete County as promised and there are currently no plans to provide water to Sanpete County from the CUP.

**Technical Project Description**

*The technical project description should describe the work in detail, including specific activities that will be accomplished as a result of this project. This description shall have sufficient detail to permit a comprehensive evaluation of the proposal.*

The proposed improvements to the Moroni Irrigation Company conveyance facilities include installing pipelines to replace the open waterway facilities. This would include the installation of approximately 12.5 miles of pipeline. As part of the project, the diversion structures on the San Pitch River would have to be rehabilitated. Both diversions on the San Pitch are old and deteriorating. The high flows during the 2011 spring nearly caused the diversion structures to fail.

Once the diversion structures are replaced, the appropriate flow measurement equipment will be installed to measure the total amount of water diverted. The new diversion structures could be configured to allow fish passage and prevent fish from getting into the transmission system. Converting the main open ditches into pipelines is estimated to save approximately 36% of the water that is currently being used. This savings will be equivalent to approximately 3,000 acre-feet of water on average. The savings would be accomplished from a combination of eliminating evaporation losses and seepage losses. Additional water conservation would be realized by piping the distribution ditches and conversion from flood to sprinkler irrigation.

Pipe sizes will range from 16-inch to 30-inch in diameter. It is anticipated that the pipe installed will be HDPE and will be installed along the alignment of the existing open waterways, which will allow the irrigation company to use existing easements and ROW. The new pipelines will not require pumps or pressure reducing valves for proper operation.

An estimated project construction cost and schedule that shows the stages and duration of the proposed work, including major milestones and dates is shown in Appendix A – Budget & Schedule. A preliminary design of the proposed pipe system has been completed so that accurate cost estimates could be submitted for this application. A figure showing the proposed improvements is shown in Appendix C – Feasibility Report. However, the system configuration may change if a more effective solution can be found during design. The cost estimate presented in the feasibility report has been updated to reflect current material costs. Construction drawings and specifications will be prepared immediately after funding is awarded.

## **Evaluation Criteria**

*The Evaluation Criteria portion of your application should thoroughly address each of the following criterion and subcriterion in the order presented to assist in the complete and accurate evaluation of your proposal. (Note: it is suggested that applicants copy and paste the below criteria and subcriteria into their applications to ensure that all necessary information is adequately addressed). Applications will be evaluated against the Evaluation Criteria (listed below), which comprise 100 points of the total evaluation weight. Please note that projects may be prioritized to ensure balance among the program Task Areas and to ensure that the projects address the goals of the WaterSMART program.*

### **Evaluation Criteria A: Water Conservation**

*Up to 32 points may be awarded for a proposal that will conserve water and improve efficiency. Points will be allocated to give consideration for projects that are expected to result in significant water savings.*

#### **Subcriterion No. A.1—Water Conservation**

*For projects with quantifiable and sustained water savings, please respond to Subcriterion No. 1(a)—Quantifiable Water Savings described in this subsection. If the project does not result in quantifiable water savings but will improve water management, please respond to Subcriterion No. 1(b)—Improved Water Management described in this subsection. If the project has separate*

*components that will result in both quantifiable water savings and improved water management, an applicant may respond to both Subcriteria No. A.1 (a) and (b). However, an applicant is limited to 20 points total under both Subcriteria No. A.1 (a) and (b).*

**Subcriterion No. A.1(a) – Quantifiable Water Savings**

*Up to 20 points may be allocated based on the quantifiable water savings expected as a result of the project.*

***Describe the amount of water saved.*** *For projects that conserve water, please state the estimated amount of water to be conserved (in acre-feet per year) as a direct result of this project. Please provide sufficient detail supporting how the estimate was determined, including all supporting calculations. Please be sure to consider the questions associated with your project type (listed in the FOA) when determining the estimated water savings, along with the necessary support needed for a full review of your proposal.*

*In addition, all applicants should be sure to address the following:*

- *What is the applicant's average annual acre-feet of water supply?*
- *Where is that water currently going (i.e., back to the stream, spilled at the end of the ditch, seeping into the ground, etc.)?*
- *Where will the conserved water go?*

***Please address the following questions according to the type of project you propose for funding***

- ***Canal Lining/Piping:*** *Canal lining/piping projects can provide water savings when irrigation delivery systems experience significant losses due to canal seepage. Applicants proposing lining/piping projects should address the following:*
  - *How has the estimated average annual water savings that will result from the project been determined? Please provide all relevant calculations, assumptions, and supporting data.*
  - *How have average annual canal seepage losses been determined? Have ponding and/or inflow/outflow tests been conducted to determine seepage rates under varying conditions? If so, please provide detailed descriptions of testing methods and all results. If not, please provide an explanation of the method(s) used to calculate seepage losses. All estimates should be supported with multiple sets of data/measurements from representative sections of canals.*
  - *What are the expected post-project seepage/leakage losses and how were these estimates determined? (e.g. can data specific to the type of material being used in the project be provided?)*
  - *What are the anticipated annual transit loss reductions in terms of acre-feet per mile for the overall project and for each section of canal included in the project?*
  - *How will actual canal loss seepage reductions be verified?*
  - *Include a detailed description of the materials being used.*

The Moroni Irrigation Company suspected that a significant amount of water loss was occurring in portions of the existing conveyance system. To verify this, the irrigation company hired an engineering firm in 2006 to determine the amount of water loss due to seepage and evaporation in the system. The engineering firm took several field measurements during July and August of 2006. The flow diverted into each conveyance system was measured using the two existing 48-foot Parshall flumes and the existing 36-foot weir. The flows diverted out of the system were also

measure using the existing diversion weirs. The total water diverted into the canal or ditch was than subtracted from the total water diverted by the irrigators to obtain the amount of water lost to seepage and evaporation. A flow loss percentage was calculated and the average flow loss is presented for each reach. The results were prepared and reported by Jones & DeMille Engineering in 2007, the complete report is shown in Appendix C.

**Table 3: Estimated Percentage of Flow Loss Due to Seepage and Evaporation**

Reach	Reach Length (feet)	Flow Loss
Canal	20,500	35%
City Ditch	20,500	32%
Spring Ditch	25,300	50%
<b>Total</b>	<b>66,300</b>	

To estimate the total amount of water that would be conserved on an average year, diversion records from 2000 to 2010 were used as reported by the San Pitch River Commissioner. Based on the previous diversion records and field study by a registered professional engineer in 2006, the average annual water savings would be **3,000 acre-feet**. On average the irrigation company diverted 8,300 acre-feet of water. This indicates that on average approximately 36% of the total water diverted is lost to seepage or evaporation. This is equal to about **239 acre-feet/mile**. Diversion records for the past 10 years are shown in Table 4.

**Table 4: Estimated Annual Water Losses in Acre-Feet**

Year	City Ditch Diversions	Spring Ditch Diversions	Canal Diversions	Total Diversions	Total Loss
2000	3,360	1,202	4,779	9,341	3,349
2001	2,661	1,256	4,024	7,941	2,888
2002	2,504	936	3,740	7,180	2,578
2003	2,138	989	4,101	7,228	2,614
2004	2,756	1,694	4,287	8,737	3,229
2005	3,136	1,214	4,431	8,781	3,161
2006	2,768	1,168	3,970	7,906	2,859
2007	2,806	1,001	4,238	8,045	2,882
2008	3,545	1,075	4,287	8,907	3,172
2009	3,415	1,112	4,621	9,148	3,266
2010	2,760	1,235	4,271	8,266	2,996
<b>Average</b>	<b>2,895</b>	<b>1,171</b>	<b>4,250</b>	<b>8,316</b>	<b>3,000</b>

Assuming an average of 3,000 acre-feet per year would be conserved and used for agricultural purposes, the conserved water would irrigate approximately 1,000 acres of crops. An alfalfa farm can expect to produce about \$600 worth of crops per acre on an annual basis. This would be an annual economic benefit of \$600,000 for the small rural community.

In addition, seepage from the conveyance system makes portions of farm lands too marshy for growing alfalfa, which decreases productivity and reduces potential revenue to local farmers. Piping the existing conveyance system would allow for better water management and improve productivity. Furthermore, most farmers currently flood-irrigate and are likely to convert to sprinkler irrigation once the open waterways are piped and become pressurized.

The estimate of water conserved will be verified post project by simply comparing the amount of water diverted versus the amount of water used by the famers (Inflow/Outflow Test). The project will install measurement facilities at the diversion structures and at individual turnouts.

Although, not directly part of this project, the project will facilitate conversion from flood to sprinkler irrigation. This will improve efficiency and conserve additional water. Approximately 95% of the land is currently food irrigated. Approximately 60% of the shareholders have indicated they will convert to sprinkler if the project is built.

The conserved water will stay in the San Pitch River for use by downstream water users. Downstream users experience greater shortages due to lower priority water rights.

**Subcriterion No. A.1(b) – Improved Water Management**

*Up to 5 points may be awarded if the proposal will improve water management through measurement, automation, advanced water measurement systems, through implementation of a renewable energy project, or through other approaches where water savings are not quantifiable.*

*Describe the amount of water better managed. For projects that improve water management but which may not result in measurable water savings, state the amount of water expected to be better managed, in acre-feet per year and as a percentage of the average annual water supply. (The average annual water supply is the amount actually diverted, pumped, or released from storage, on average, each year. This does not refer to the applicant's total water right or potential water supply.) Please use the following formula:*

$$\frac{\text{Estimated Amount of Water Better Managed}}{\text{Average Annual Water Supply}} = \frac{8,300 \text{ acre-feet}}{8,300 \text{ acre-feet}} = 100\%$$

All water diverted by the Moroni Irrigation Company will be better managed because all water will be conveyed through a pipe network instead of open ditches and the canal. Meters will be installed to main lines and turnouts, which will improve the system operator's ability to manage the water. The meters will allow for an accurate accounting of where all the water is going within the system. These accurate measurements will allow operators to easily detect water leaks and ensure that irrigators are not over watering their fields.

**Subcriterion No. A.2 – Percentage of Total Supply**

*Up to 8 additional points may be allocated based on the percentage of the applicant’s total average water supply that will be conserved directly as a result of the project.*

*Provide the percentage of total water supply conserved: State the applicant’s total average annual water supply in acre-feet. Please use the following formula:*

$$\frac{\text{Estimated Amount of Water Conserved}}{\text{Average Annual Water Supply}} = \frac{3,000 \text{ acre-feet}}{8,300 \text{ acre-feet}} = 36\%$$

Based on actual diversion records and seepage testing, it is anticipated that 36% of the total average annual water supply will be conserved.

**Subcriterion No. A.3 – Reasonableness of Costs**

*Up to 4 additional points may be awarded for the reasonableness of the cost for the benefits gained.*

*Please include information related to the total project cost, annual acre-feet conserved (or better managed), and the expected life of the improvement. Use the following calculation:*

$$\frac{\text{Total Project Cost}}{(\text{Acre-Foot Conserved, or Better Managed} \times \text{Improvement Life})}$$

*Failure to include this required calculation will result in no score for this section.*

*For all projects involving physical improvements, specify the expected life of the improvement in number of years and provide support for the expectation (e.g. manufacturer’s guarantee, industry accepted life-expectancy, description of corrosion mitigation for ferrous pipe and fittings, etc.)*

*Failure to provide this information may result in a reduced score for this section.*

All the water used by Moroni Irrigation Company will be better managed through the system. In addition, the project will conserve approximately 3,000 acre-feet of water annually. It is anticipated that the pipe used will be HDPE, which has an industry accepted life-expectancy of 50 years. Corrosion resistant fittings will be used to increase life expectancy of all fittings and appurtenances.

$$\frac{\text{Total Project Cost}}{\text{AF Conserved or Better Managed} \times \text{Improvement life}} = \frac{\$5,500,000}{(3000+8300)*50} = \$9.73$$

The calculation yields a cost of \$9.73 for every acre-foot per year of water conserved and better managed.

## **Evaluation Criteria B: Energy Water Nexus**

*Up to 16 points may be awarded based on the extent to which the project increases the use of renewable energy or otherwise results in increased energy efficiency.*

*For projects that include construction or installation of renewable energy components, please respond to Subcriterion No. B.1— Implementing Renewable Energy Projects Related to Water Management and Delivery. If the project does not implement a renewable energy project but will increase energy efficiency, please respond to Subcriterion No. B.2 — Increasing Energy Efficiency in Water Management. If the project has separate components that will result in both implementing a renewable energy project and increasing energy efficiency, an applicant may respond to both. However, an applicant may receive no more than 16 points total under both Subcriterion No. B.1 and B.2.*

### **Subcriterion No. B.1 – Implementing Renewable Energy Projects Related to Water Management and Delivery**

*Up to 16 points may be awarded for projects that include construction or installation of renewable energy components (i.e., hydroelectric units, solar-electric facilities, wind energy systems, or facilities that otherwise enable the use of renewable energy). Projects such as small-scale solar resulting in minimal energy savings or production will be considered under Subcriterion No. 2 below.*

Subcriterion No. B.1 is not applicable to this project.

### **Subcriterion No. B.2 – Increasing Energy Efficiency in Water Management**

*If the project is not implementing a renewable energy component, as described in Subcriterion No. B.1 above, up to 4 points may be awarded for projects that address energy demands by retrofitting equipment to increase energy efficiency and/or through water conservation improvements that result in reduced pumping or diversions.*

*Describe any energy efficiencies that are expected to result from implementation of the water conservation or water management project (e.g., reduced pumping). Please provide sufficient detail supporting the calculation of any energy savings expected to result from water conservation improvements.*

- *Please describe the current pumping requirements and the types of pumps (e.g., size) currently being used. How would the proposed project impact the current pumping requirements?*
- *Please indicate whether your energy savings estimates originates from the point of diversion, or whether the estimate is based upon an alternate site of origin.*
- *Does the calculation include the energy required to treat the water?*

By converting all the conveyance system open ditches into pressurized pipes, the project will reduce the need for individual water users to pump water to irrigate their fields. Although, most irrigators currently flood irrigate their fields and very few use pumps to sprinkle irrigate, most farmers will likely convert to sprinkler after the project is implemented. This conversion from flood to sprinkler will further improve water efficiency without causing an adverse effect caused by high energy consumption.

Power supply to meter turnouts will be evaluated during the engineering design phase. However, it is anticipated that power to meters will be supplied using solar panels. The solar panels would be small and only need to supply enough energy for the meter display unit. This would eliminate the need to run power to each turnout, which will significantly reduce the construction costs.

### **Evaluation Criteria C: Benefits to Endangered Species**

*Up to 12 points may be awarded for projects that will benefit federally-recognized candidate species or up to 12 points may be awarded for projects expected to accelerate the recovery of threatened species or engendered species, or addressing designated critical habitat.*

*Projects that benefit both federally-listed endangered species and federally-recognized candidate species will receive additional consideration under this criterion. Please see <<http://www.fws.gov/endangered/index.html>> for a complete listing of federally-listed threatened or endangered species and federally-recognized candidate species in your area.*

*For projects that will directly benefit federally-recognized candidate species, please include the following elements:*

- *Relationship of the species to water supply*
- *Extent to which the proposed project would reduce the likelihood of listing or would otherwise improve the status of the species*

On the website listed above, there are four federally recognized endangered species in Sanpete County, Utah; the Humpback Chub, Colorado Pikeminnow, Bonytail Chub, and the Razerback Sucker. These species are normally associated with the Colorado River Basin.

According to the Utah State Water Plan - Sevier River Basin, the Least Chub is listed as an endangered species. The Least Chub is only found in the Bonneville Basin, particularly in the Salt Lake, Utah Lake, and Sevier Lake. The Spotted Frog is listed as a federally-candidate species. The Spotted Frog population exists near riparian areas in the San Pitch drainage basin.

The water conserved would remain in the river and directly increase the flows in the San Pitch River. This would directly increase water in the Sevier Lake, which is usually dry, and improve the habitat for the Least Chub. In addition, the Spotted Frog population would benefit from increases in water supply in the San Pitch River as additional water would improve riparian areas surrounding the river.

### **Evaluation Criteria D: Water Marketing**

*Up to 12 points may be awarded for projects that propose water marketing elements, with maximum points for projects that establish a new water market.*

*Note: Water marketing does **not** include an entity selling conserved water to an existing customer. This criterion is intended for the situation where an entity that is conserving water uses water marketing to make the conserved water available to meet other existing water supply needs or uses.*

**Briefly describe any water marketing elements included in the proposed project. Include the following elements:**

- *Estimate amount of water to be marketed*
- *A detailed description of the mechanism through which water will be marketed (e.g., individual sale, contribution to an existing market, the creation of a new water market, or construction of a recharge facility)*
- *Number of users, types of water use, etc. in the water market*
- *A description of any legal issues pertaining to water marketing (e.g., restrictions under reclamation law or contracts, individual project authorities, or State water laws)*
- *Estimated duration of the water market*

State laws prohibit the sale or lease of water rights that are designated for a specific plot of land, unless the land itself is sold and taken out of production. As such, the water conserved will not be available to lease or sale.

### **Evaluation Criteria E: Other Contributions to Water Supply Sustainability**

*Up to 14 points may be awarded for projects that contribute to a more sustainable water supply in ways not covered by other criteria.*

*This criterion is intended to provide an opportunity for the applicant to explain any additional benefits of the proposed project within the water basin, including benefits to downstream water users or to the environment. Please provide sufficient explanation of the expected benefits and their significance, including any information about water supply conditions within the basin (e.g., is the river, aquifer or other source of supply over-allocated? Is there frequently tension or litigation over water in the basin? Are there endangered species within the basin or other factors that may lead to heightened competition for available water supplies among multiple water uses?) Is the possibility of future water conservation improvements by other water users enhanced by completion of this project?) Additional project benefits may include, but are not limited to, the following:*

#### **Will the Project Make Water Available to Address a Specific Concern?**

*For example:*

- *Will the project address water supply shortages due to climate variability and/or heightened competition for finite water supplies (e.g. population growth or drought)?*
- *Will the project market water to other users? If so, what is the significance of this (e.g., does this help stretch water supplies in a water-short basin)?*
- *Will the project make additional water available for Indian tribes?*
- *Will the project help to address an issue that could potentially result in an interruption to the water supply if unresolved? (e.g., will the project benefit endangered species to maintain an adequate water supply)?*
- *Will the project generally make more water available in the water basin where the proposed work is located?*

The Water Resources Master Plan for Sanpete County identifies that water shortages in the agricultural sectors are as high as 30% on normal years and 50% on dry years. Water shortages in the county have long been known to farmers and water providers. Several projects have been implemented that develop or conserve water in the past few years. The Sanpete Water Conservancy District is continually engaged in assisting water providers to plan and develop water conservation projects, but financial limitations are an obstacle to many agricultural water providers. Improvements to the Moroni Irrigation Company conveyance system would conserve approximately 3,000 acre-feet of water. The water rights owned by Moroni Irrigation Company have the highest priority on the San Pitch River, and water shortages typically occur for the downstream users, especially during drought periods. Climate variability and the lack of water storage limits the water supply available in the San Pitch basin. This project would improve the finite water supply and reduce the current and future shortages experienced by Moroni Irrigation Company and downstream water users on San Pitch River. In summary, this project would significantly improve the water supply for the Moroni Irrigation Company and improve the water supply for downstream water users. In addition, the water conserved would remain in the San Pitch River and would improve the habitat for the Least Chub and Spotted Frog (endangered/candidate species).

#### **Does the Project Promote and Encourage Collaboration among Parties?**

- *Is there widespread support for the project?*
- *What is the significance of the collaboration/support?*
- *Will the project help to prevent a water-related crisis or conflict?*

There is a widespread support for the project. The Sanpete Water Conservancy District supports the project and has identified this project as a high priority in Sanpete County due to the large potential for water conservation. Many water users show interest in converting to sprinkler irrigation if the project is implemented, which would further increase the amount of water conserved. The project would increase the water supply in the county and reduce potential for water related conflict with downstream water uses due to post project water supply increases.

#### **Expediting of Future On-Farm Irrigation Improvements**

*Will the proposed WaterSMART Grant project help to expedite future on-farm irrigation improvements, including future on-farm improvements that may be eligible for Natural Resources Conservation Service (NRCS) funding? If so, please address the following:*

***Note:** On-farm water conservation improvements that complement the water delivery improvement projects selected through this FOA may be considered for NRCS funding and technical assistance in FY 2012 to the extent such assistance is available. Complementing NRCS Farm Bill programs include the Environmental Quality Incentive Program (EQIP) and Agricultural Water Enhancement Program (AWEP), which are the primary programs that address water quantity and water quality conservation practices. For more information, including application deadlines and a description of available funding, please contact your local NRCS office or visit <http://www.nrcs.usda.gov> for further contact information in your area.*

- *Include a detailed listing of the fields and acreage that may be improved in the future.*
- *Describe in detail the on-farm improvements that can be made as a result of this project. Include discussion of any planned or ongoing efforts by farmers/ranchers that receive water from the applicant.*
- *Provide a detailed explanation of how the proposed WaterSMART Grant project would help to expedite such on-farm efficiency improvements.*
- *Fully describe the on-farm water conservation or water use efficiency benefits that would result from the enabled on-farm component of this project. Estimate the potential on-farm water savings that could result in acre-feet per year. Include support or backup documentation for any calculations or assumptions.*
- *Projects that include significant on-farm irrigation improvements should demonstrate the eligibility, commitment, and number or percentage of shareholders who plan to participate in any available NRCS funding programs. Applicants should provide letters of intent from farmers/ranchers in the affected project areas.*
- *Describe the extent to which this project complements an existing or newly awarded AWEP project.*

Approximately 95% of the shareholders flood-irrigate their fields. By piping the conveyance system, the irrigators will be able to sprinkle irrigate their farms without having to use, or with limited use of pumps. At the annual shareholders meeting held in December 2011, about 60% of shareholders indicated interest in converting to sprinklers after the project is implemented. The total acreage that flood irrigates is approximately 2,000 acres. If the project is implemented, about 1,200 acres of land would convert to sprinkler irrigation.

The general rule for flood irrigation is that 50% of the water is depleted and the other 50% returns to the natural drainage. Thus, a flood irrigation system has a 50% efficiency. By converting from flood to sprinkler irrigation, it is anticipated that the irrigation system would be about 75% efficient. This increase in efficiency would result in an on-farm water savings of about 2,000 acre-feet of water per year.

This project would indirectly conserve 2,000 acre-feet for on-farm improvements and directly conserve 3,000 acre-feet for replacing the transmission ditches and canal. This would be a **total savings of 5,000 acre-feet** of water per year.

Funding from NRCS may be available for farmers wanting to convert from flood to sprinkler systems. NRCS has indicated that AWEP funding will not be available in 2012. EQIP and watershed protection grants may be available and will be carefully evaluated during the design of the project. Moroni Irrigation Company will provide assistance to shareholders wanting to acquire NRCS assistance for near-farm (laterals) and on farm improvements. Some shareholders have already begun coordination with NRCS.

### **Will the Project Increase Awareness of Water and/or Energy Conservation and Efficiency Efforts?**

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

- *Will the project increase the capability of future water conservation or energy efficiency efforts for use by others?*
- *Does the project integrate water and energy components?*

As previously described, the project will eliminate or reduce pumping requirements for irrigators that are currently using a sprinkler system. In addition, the project will facilitate flood irrigators to convert to sprinkler system without the need of pumps, which will eliminate future energy requirements while improving water efficiency. Little sprinkler irrigation occurs in the immediate area of the project. The proposed project will encourage and increase the capability for future water conservation.

## **Evaluation Criteria F: Implementation and Results**

*Up to 10 points may be awarded for the following:*

### **Subcriterion No. F.1 – Project Planning**

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

*Does the project have a Water Conservation Plan, System Optimization Review (SOR), and/or district or geographic area drought contingency plans in place? Please self-certify, or provide copies, where appropriate to verify there is a water conservation plan, SOR, and/or district or geographic area drought contingency plans in place.*

Moroni Irrigation Company does not have a Water Conservation Plan. A feasibility report for this project was prepared by Jones & DeMille Engineering in 2007. The Sanpete Water Conservancy District has a Water Management and Conservation Plan which includes conservation policies for the county. In addition, the conservancy district is in the process of updating the Sanpete County Water Resources Master Plan, which will further evaluate projects that have the potential to develop or conserve water. A specific water conservation plan will be prepared for Moroni Irrigation Company before construction begins as part of the requirements by the Utah Division of Water Resources for closing the loan for the project.

*Provide the following information regarding project planning:*

*(1) Identify any district-wide, or system-wide, planning that provides support for the proposed project. This could include a Water Conservation Plan, SOR, or other planning efforts done to determine the priority of this project in relation to other potential projects.*

- Sanpete Water Conservancy District Water Management and Conservation Plan.
- Sanpete County Water Resources Master Plan prepared in 2000.

The Water Resources Master Plan is currently being updated by the Sanpete Water Conservancy District and the Moroni Irrigation Company improvements have been identified as a high priority project.

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

A feasibility report for the proposed project was prepared in 2007 by Jones & DeMille Engineering. The report is enclosed in Appendix C of this application. The proposed system was briefly reviewed and the cost estimate was updated to ensure that funding numbers would be accurate.

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

The Utah State Water Plan emphasizes water conservation and efficient management of developed water supplies as key strategies in providing for the present and future water needs in the state. In addition, this project meets the goals of reducing water shortages in Sanpete County as described in the Sanpete County Water Management and Conservation Plan prepared by the Sanpete Water Conservancy District.

**Subcriterion No. F.2 – Readiness to Proceed**

*Points may be awarded based upon the extent to which the proposed project is capable of proceeding upon entering into a financial assistance agreement.*

*Describe the implementation plan of the proposed project. Please include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates. (Please note, under no circumstances may an applicant begin any ground disturbing activities—including grading, clearing, and other preliminary activities—on a project before environmental compliance is complete and Reclamation explicitly authorizes work to proceed).*

If funding is awarded through this application, the remaining funding will be secured from the Utah Division of Water Resources (See Appendix B). A loan application is currently on file with the Utah Division of Water Resources. The application is pending the award of a grant application. Once funding is secured, the design work will begin immediately thereafter. Construction would be anticipated to occur during the summer and fall of 2013. A detail schedule showing major tasks, milestones, and dates is shown in Appendix A.

*Please explain any permits that will be required, along with the process for obtaining such permits.*

Stream alteration permits and possible Section 404 permits will be required for reconstruction of diversion structures. These permits will be applied as part of the engineering design process and no complications are anticipated since the work would include replacing existing structures. There are no expected delays due to environmental compliance and a categorical exclusion is anticipated for NEPA compliance.

**Subcriterion No. F.3 – Performance Measures**

*Points may be awarded based on the description and development of performance measures to quantify actual project benefits upon completion of the project.*

*Provide a brief summary describing the performance measure that will be used to quantify actual benefits upon completion of the project (i.e., water saved, marketed, or better managed, or energy saved). For more information calculating performance measure, see Section VIII.A.1 “FY2012 WaterSMART Water and Energy Efficiency Grants: Performance Measures”*

*Note: All WaterSMART Grant applicants are required to propose a “performance measure” (a method of quantifying the actual benefits of their project once it is completed). A provision will be included in all assistance agreements with WaterSMART Grant recipients describing the performance measure, and requiring the recipient to quantify the actual project benefits in their final report to Reclamation upon completion of the project. If information regarding project benefits is not available immediately upon completion of the project, the financial assistance agreement may be modified to remain open until such information is available and until a Final Report is submitted. Quantification of project benefits is an important means to determine the relative effectiveness of various water management efforts, as well as the overall effectiveness of WaterSMART Grants.*

To calculate potential water savings, a physical measurement of seepage losses will be performed using an Inflow/Outflow test. The water will be measured flowing in and out of the conveyance system. At least two tests (early and late season) will be performed. The post project results will be compared to the existing losses estimated in 2007, which are shown in the feasibility report prepared by Jones & DeMille Engineering. It is anticipated that flow meters will be installed at the inlet and at turnout locations. Pre-project diversion records will be compared to post-project diversion records.

**Evaluation Criteria G: Connection to Reclamation Project Activities**

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

*How is the proposed project connected to Reclamation project activities?*

The Central Utah Project initially called for water to be delivered to the Sevier River Basin, including Sanpete County. However, shortly after the Central Utah Project Completion Act was enacted, Millard and Sevier Counties withdrew from the Central Utah Water Conservancy District. As a result, delivery of Central Utah Project water to Sanpete County was eliminated. The Central Utah Water Conservancy District worked with Reclamation to develop the Central Utah Project.

The Gooseberry Narrows Project has been proposed and evaluated as a possible solution to decrease water shortages in Sanpete County. Reclamation worked with Sanpete County to develop the Gooseberry Narrows Project. Unfortunately, over 70 years of effort has not seen the

completion of this project. The Gooseberry Narrows Project would have increased the water supply in the San Pitch drainage basin. Thus, benefiting the Moroni Irrigation Company.

The improvements proposed for the Moroni Irrigation Company will increase the water supply in the San Pitch drainage basin and decrease the impact caused by water delivery to Sanpete County being eliminated from the Central Utah Project and the failure to implement the Gooseberry Narrows Project.

*Does the applicant receive Reclamation project water?*

The project does not receive Reclamation water.

*Is the project on Reclamation project lands or involving Reclamation facilities?*

The proposed project does not involve Reclamation lands or facilities.

*Is the project in the same basin as a Reclamation project or activity?*

The Sanpete Project includes the Ephraim Division near Ephraim and the Spring City Division in the vicinity of Spring City. Facilities constructed by Reclamation are the Ephraim and Spring Tunnels. The tunnels provide water supply for irrigation to Ephraim Division (7,661 acres) and Spring City Division (7,085 acres). Both tunnels direct water into the Sevier River Basin. The same basin as the Moroni Irrigation Company proposed improvements.

*Will the proposed work contribute water to a basin where a Reclamation project is located?*

There will be no water contributed to a Reclamation basin from this project.

## **ENVIRONMENTAL COMPLIANCE**

*To allow Reclamation to assess the probable environmental impacts and costs associated with each application, all applicants must respond to the following list of questions focusing on the NEPA, ESA, and NHPA requirements. Please answer the following questions to the best of your knowledge. If any question is not applicable to the project, please explain why. Additional information about environmental compliance is provided in Section IV.D.4, "Budget Proposal," under the discussion of "Environmental and Regulatory Compliance Costs," and in Section VIII.B., "Overview of Environmental Compliance Requirements."*

*Note: Applicants proposing a Funding Group II project must address the environmental compliance questions for their entire project, not just the first one-year phase.*

*If you have any questions, please contact your regional or area Reclamation office (see <<http://www.usbr.gov/main/regions.html>>) with questions regarding ESA compliance issues. You*

may also contact Dean Marrone, WaterSMART Program Coordinator, at 303-445-3577, for further information.

*Note, if mitigation is required to lessen environmental impacts, the applicant may, at Reclamation's discretion, be required to report on progress and completion of these commitments. Reclamation will coordinate with the applicant to establish reporting requirements and intervals accordingly.*

*Under no circumstances may an applicant begin any ground-disturbing activities (including grading, clearing, and other preliminary activities) on a project before environmental compliance is complete and Reclamation explicitly authorizes work to proceed. This pertains to all components of the proposed project, including those that are part of the applicant's non-Federal cost share. Reclamation will provide a successful applicant with information once environmental compliance is complete. An applicant that proceeds before environmental compliance is complete may risk forfeiting Reclamation funding under this FOA.*

## **Environmental Questions**

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

The proposed pipe alignment will follow the existing ditches and canal. There will be minimal, short-term, impacts associated with installing the pipe. All land surface disturbances would be confined to the proposed pipe alignment area and small staging areas adjacent to the pipeline. All disturbed areas will be repaved, rehabilitated and/or reseeded as part of the restoration phase of construction.

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

According to the U.S. Fish and Wildlife Endangered Species report for Utah, various plants and animals were listed as endangered or threatened in Sanpete County. The proposed project will not have any negative effects on plants or animals listed.

- 3. Are there wetlands or other surface water inside the project boundaries that potentially fall under CWA jurisdiction as "waters of the United States?" If so, please describe and estimate any impacts the project may have.*

All facilities will be installed in currently disturbed areas. It is unknown whether the San Pitch River and adjacent areas would be classified as "Waters of the United States." However, if it is the impact would be temporary and very limited in aerial extent (less than 0.1 acres).

4. *When was the water delivery system constructed?*

It is unknown exactly when the ditch and canal systems were constructed, but the Moroni Irrigation Company water rights have a priority date of 1859. The various systems were likely constructed in the 1850's.

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

The open ditches and canal will be replaced with a pressurized pipe. Diversion structures are in poor condition and will have to be replaced or rehabilitated as part of the project. No other extensive alteration or modifications are anticipated.

6. *Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the Nation Register of Historic Places? A cultural resources specialist at your local Reclamation office or the State Historic Preservation Office can assist in answering this question.*

The cultural resources specialist position at our local Reclamation office is currently vacant. It is not anticipated that any items eligible for listing on the National Register of Historic Places will be affected by the project.

7. *Are there any known archeological sites in the proposed project area?*

There are no known sites in the area.

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

The project will not affect low income or minority populations.

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

The project will not affect tribal lands.

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

The project will not contribute to the spread of noxious weeds. Disturbed areas will be reseeded with native species.

## REQUIRED PERMITS OR APPROVALS

*Applicants must state in the application whether any permits or approvals are required and explain the plan for obtaining such permits or approvals. To complete a renewable energy project within the time frame required in this FOA, it is recommended that an applicant has commenced the necessary permitting process prior to applying.*

*Applicants proposing renewable energy components to Federal facilities should note that some power projects may require FERC permitting or a Reclamation Lease of Power Privilege. To discuss questions related to projects that propose renewable energy development, please contact Mr. Dean Marrone at 303-445-3577.*

*Note that improvements to Federal facilities that are implemented through any project awarded funding through this FOA must comply with additional requirements. The Federal government will continue to hold title to the Federal facility and any improvement that is integral to the existing operations of that facility. Please see Section III.H. Reclamation may also require additional approvals prior to award to ensure that any necessary easements, land use authorizations, or special permits can be approved consistent with the requirements of 43 CFR 429, and that the development will not impact or impair project operations or efficiency.*

***Explain whether any permits or approvals are required and explain the plan for obtaining such permits or approvals.***

Stream alteration permits and possible Section 404 permits will be required for the City Ditch and Canal diversions. Both diversions are located on the San Pitch River and are in poor condition. Stream alteration permits will be acquired from the Utah Division of Water Rights during the design phase of the project. A UDOT permit will be required to cross State Route 116 and State Route 132. The UDOT permits will be acquired by the construction contractor during construction. No major problems are anticipated with acquiring permits or approvals from state and federal agencies. All environmental compliance permits will be obtained in accordance to NEPA requirements.

## FUNDING PLAN AND LETTER OF COMMITMENT

*Describe how the non-Reclamation share of project costs will be obtained. Reclamation will use this information in making a determination of financial capability.*

### **Letter of Commitment**

*Project funding provided by a source other than the applicant shall be supported with letters of commitment from these additional sources. This is a **mandatory requirement**. Letters of commitment shall identify the following elements:*

- (1) The amount of funding commitment*
- (2) The date the funds will be available to the applicant*
- (3) Any time constraints on the availability of funds*
- (4) Any other contingencies associated with the funding commitment*

*Commitment letters from third party funding sources should be submitted with your project application. If commitment letters are not available at the time of the application submission, please provide a timeline for submission of all commitment letters. Cost share funding from sources outside the applicant's organization (e.g., loans or state grants), should be secured and available to the applicant prior to award.*

*Reclamation may approve an award prior to an applicant securing non-Federal cost-share funds if Reclamation determines that there is sufficient evidence and likelihood that the non-Federal funds will be available to the applicant by the start of the project.*

*Note: Applicants proposing a Funding Group II project are not required to have non-Federal cost share funding secured for the entire project at the time of award. Funding Group II applicants must demonstrate sufficient evidence that non-Federal cost-share for the first year of the project will be available by the start of that phase and must describe a plan and schedule for securing non-Federal funding for subsequent years of the project.*

Additional funding will be acquired from the Utah State Board of Water Resources. The application has been submitted and is on file pending an award of a grant to supplement the total project costs. A letter from the Board of Water Resources is shown in Appendix B, which states that the board has received and is reviewing the application. Letters of commitment from the board will be submitted as soon as available, but no later than July 1, 2012.

## **Funding Plan**

*The funding plan must include all project costs, as follows:*

*How you will make your contribution to the cost share requirement, such as monetary and/or in-kind contributions and source funds contributed by the applicant (e.g. reserve account, tax revenue, and/or assessments).*

The total project cost is \$5,500,000. Moroni Irrigation Company will apply for a loan from the Utah Board of Water Resources for \$4,000,000. The loan will be paid back with assessments to the water users. If the \$1,500,000 grant requested by this application is not approved, it is unlikely that this project will be implemented. The loan money should be available by the start of the project; however, the application is currently on file (See Appendix B) and an approval letter from the Division of Water Resources will be submitted by July 1, 2012.

Moroni Irrigation Company cannot afford to borrow all the money for the project. If a grant is awarded, Moroni Irrigation Company will finalize the loan from the Division of Water Resources and start working with NRCS and shareholders to obtain EQIP funds for near-farm and on-farm improvements.

*Describe any in-kind costs incurred before the anticipated project start date that you seek to include as project costs. Include:*

*(a) What project expenses have been incurred*

Engineering costs associated with preliminary design, review of feasibility report, and preparation of financial assistance applications.

*(b) How they benefitted the project*

It allowed the irrigation company to explore funding options and plan for the implementation of the project.

*(c) The amount of the expense*

The irrigation company signed a contract for \$8,000 with Franson Civil Engineers to complete the funding applications. The cost for the feasibility study, prepared by Jones & DeMille Engineering, for this project was \$10,000.

*(d) The date of cost incurrence*

Franson Civil Engineers has been assisting the Moroni Irrigation Company with funding applications since October 2010.

*Provide the identity and amount of funding to be provided by funding partners, as well as the required letters of commitment.*

The total of \$4,000,000 will be provided by the Utah Division of Water Resources. The letters of commitment will be submitted as soon as a decision is made by the Division of Water Resources, but no later than July 1, 2012.

*Describe any funding requested or received from other Federal partners. Note: Other sources of Federal funding may not be counted towards the applicant's 50-percent cost share unless otherwise allowed by statute.*

No other applications for funds have been requested from other Federal funding agencies. Individual shareholders will likely request EQIP grants from NRCS if this grant is awarded. *Describe any pending funding requests that have not yet been approved, and explain how the project will be affected if such funding is denied.*

An application to the Board of Water Resources has been submitted. If the Board of Water Resources denies funding, the project will not be able to proceed.

## Non-Federal and Federal Funding Sources

Please include the following chart to summarize your non-Federal and other Federal funding sources. Denote in-kind contributions with an asterisk (\*). Please ensure that the total Federal funding (Reclamation and all other Federal sources) does not exceed 50 percent of the total estimated project cost.

**Table 5: Funding Sources**

<b>Funding Sources</b>	<b>Funding Amount</b>
<b>Non-Federal Entities</b>	
1. Utah Board of Water Resources	\$4,000,000
<b>Non-Federal Subtotal</b>	\$4,000,000
<b>Other Federal Entities</b>	
1. N/A	
<b>Other Federal Subtotal</b>	\$0
<b>Requested Reclamation Funding</b>	\$1,500,000
<b>Total Project Funding</b>	<b>\$5,500,000</b>

## OFFICIAL RESOLUTION

Include an official resolution adopted by the applicant's board of directors or governing body, or for state government entities, an official authorized to commit the applicant to the financial and legal obligations associated with receipt of WaterSMART Grant financial assistance, verifying:

- The identity of the official with legal authority to enter into agreement
- The board of directors, governing body, or appropriate official who has reviewed and supports the application submitted
- The capability of the applicant to provide the amount of funding and/or in-kind contributions specified in the funding plan
- That the applicant will work with Reclamation to meet established deadlines for entering into a cooperative agreement

**An official resolution meeting the requirements set forth above is mandatory.** If the applicant is unable to submit the official resolution by the application deadline because of the timing of board meetings or other justifiable reasons, the official resolution may be submitted up to 30 days after the application deadline.

Official resolution is shown in the next page.

# OFFICIAL RESOLUTION OF THE MORONI IRRIGATION COMPANY

## RESOLUTION # 1

**WHEREAS**, the United States Department of the Interior, Bureau of Reclamation has announced the *WaterSMART Water and Energy Efficiency Grants* in order to prevent water supply crises and ease conflict in the western United States, and has requested proposals from eligible entities to be included in the WaterSMART Program, and

**WHEREAS**, the Moroni Irrigation Company has need for funding to complete an irrigation project that will upgrade a conveyance system so that water can be conserved and efficiently delivered to the water users.

**NOW, THEREFORE, BE IT RESOLVED** that the Moroni Irrigation Company Board of Directors agrees and verifies that:

1. The application has been reviewed and supports the application submitted;
2. The Moroni Irrigation Company is capable of providing the amount of funding as specified in the funding plan; and
3. If selected for a WaterSMART Grant, the applicant will work with Reclamation to meet established deadlines for entering into a cooperative agreement.

DATED: 1-17-12

  
\_\_\_\_\_  
Reed Rawlings  
President, Moroni Irrigation Company

ATTEST:

  
\_\_\_\_\_  
Layne Jensen, P.E.  
Project Manager, Franson Civil Engineers

# BUDGET PROPOSAL

## General Requirements

Include a project budget that estimates all costs (not just costs to be borne by Reclamation). Include the value of in-kind contributions of goods and services and sources of funds provided to complete the project. The proposal must clearly delineate between Reclamation and applicant contributions.

## Budget Proposal

The project budget shall include detailed information on the categories listed below (in the Budget Narrative Section) and must clearly identify all project costs and the funding source(s) (i.e. Reclamation or other funding sources). Unit costs shall be provided for all budget items including the cost of work to be provided by contractors. **Lump sum costs are not acceptable.** Additionally, applicants shall include a narrative description of the items included in the project budget. It is strongly advised that applicants use the budget format (below) or a similar format that provides this information.

**Table 6: Budget Proposal**

BUDGET ITEM DESCRIPTION	COMPUTATION		RECIPIENT FUNDING	RECLAMATION FUNDING	TOTAL COST
	\$/Unit	Quantity			
CONTRACTUAL/ <sup>1</sup> CONSTRUCTION					
Engineering	See Appendix A		\$493,000	\$200,000	\$693,000
Construction	See Appendix A		\$3,416,000	\$1,271,000	\$4,687,000
ENVIRONMENTAL AND REGULATORY COMPLIANCE <sup>2</sup>			\$65,000	\$27,000	\$92,000
OTHER					
Reporting	\$100/hr	200 hrs	\$20,000		\$20,000
Legal	\$200/hr	40 hrs	\$6,000	\$2,000	\$8,000
<b>TOTAL DIRECT COSTS</b>			\$4,000,000	\$1,500,000	\$5,500,000
INDIRECT COSTS - 0%					
<b>TOTAL PROJECT COSTS</b>			\$4,000,000	\$1,500,000	\$5,500,000

A more detailed cost estimate for engineering and construction is shown in Appendix A.

<sup>1</sup> Contracts should be broken out into specific line items. You may attach a separate, detailed budget for each contract to adequately address all contractor budget items.

<sup>2</sup> Environmental and regulatory compliance should be at least 1-2 percent unless a justification is provided for a lesser amount.

## Budget Narrative

*Submission of a budget narrative is mandatory. An award will not be made to any applicant who fails to fully disclose this information. The Budget Narrative provides a discussion of, or explanation for, items included in the budget proposal. The types of information to describe in the narrative include, but are not limited, to those listed in the following subsections.*

## Salaries and Wages

*Indicate program manager and other key personnel by name and title. Other personnel may be indicated by title alone. For all positions, indicate salaries and wages, estimated hours or percent of time, and rate of compensation proposed. The labor rates should identify the direct labor rate separate from the fringe rate or fringe cost for each category. All labor estimates, including any proposed subcontractors, shall be allocated to specific tasks as outlined in the recipient's technical project description. Labor rates and proposed hours shall be displayed for each task.*

*Clearly identify any proposed salary increases and the effective date.*

*Generally, salaries of administrative and/or clerical personnel will be included as a portion of the stated indirect costs. If these salaries can be adequately documented as direct costs, they should be included in this section; however, a justification should be included in the budget narrative.*

The billing rates for Franson Civil Engineers are as follows:

**Table 7: Billing Rates for Franson Civil Engineers  
Effective January 1, 2012**

<b>Personnel Classification</b>	<b>Fee Schedule (\$/hour)</b>
Principal – Jay Franson	\$149
Project Manager – Layne Jensen	\$130
Senior Engineer	\$115
Staff Engineer	\$101
Senior Field Manager	\$101
Engineer 1	\$91
Senior Designer	\$89
Reports Writer/Editor	\$81
Designer	\$80
Engineering Assistant	\$77
Engineering Intern	\$75
CAD Operator	\$72
Technician	\$59
Office Assistant	\$55
Clerk	\$49

See Appendix A for the full engineering manpower and cost estimate for all design work and construction management tasks.

Construction contractors have not yet bid on this project; therefore, no salary and wage data are available for construction. The construction cost estimate is based on the engineer's estimate of probable construction costs.

### **Fringe Benefits**

*Indicate rates/amounts, what costs are included in this category, and the basis of the rate computations. Indicate whether these rates are used for application purposes only or whether they are fixed or provisional rates for billing purposes. Federally approved rate agreements are acceptable for compliance with this item.*

No Fringe Costs are included. The basis of the billing rate computation shown in the Salary and Wages section for Franson Civil Engineers' is as follows:

**Table 8: Breakdown of Franson Civil Engineers Billing Rate**

Average Billable Rate	\$88.00
Wage Percent	30%
Benefits	15%
Overhead	40%
Profit	15%

### **Travel**

*Include purpose of trip, destination, number of persons traveling, length of stay, and all travel costs including airfare (basis for rate used), per diem, lodging, and miscellaneous travel expenses. For local travel, include mileage and rate of compensation.*

There will be no lodging or per diem expenses. The engineer will visit the site during the design phase and periodically visit the site during construction. Charges related to travel will be only result of travel by vehicle for site visits and construction observation. The charge will be at the federal approved rate of \$0.65 per mile. The total direct expenses for traveling are shown in the engineering manpower estimate enclosed in Appendix A.

### **Equipment**

*Itemize costs of all equipment having a value of over \$500 and include information as to the need for this equipment, as well as how the equipment was priced if being purchased for the agreement. If equipment is being rented, specify the number of hours and the hourly rate. Local rental rates are only accepted for equipment actually being rented or leased for the project. If equipment currently owned by the applicant is proposed for use under the proposed project, and the cost to use that equipment is being included in the budget as in-kind cost share, provide the rates and hours for each piece of equipment owned and budgeted. These should be ownership rates developed by the recipient for each piece of equipment. If these rates are not available, the*

*U.S. Army Corp of Engineer's recommended equipment rates for the region are acceptable. Blue book, Federal Emergency Management Agency (FEMA), and other data bases should not be used.*

Not included.

### **Material and Supplies**

*Itemize supplies by major category, unit price, quantity, and purpose, such as whether the items are needed for office use, research, or construction. Identify how these costs were estimated (i.e., quotes, past experience, engineering estimates or other methodology).*

Cost for materials and supplies are included in the engineering manpower estimate shown in Appendix A. These costs are for printing and copying construction drawings, specifications, reports, letters, permits and other documents related to the project. The cost for printing is as follows:

Copy/print – 8.5x11	\$0.04/copy or print
Copies – 11x17	\$0.08/copy or print
Color Copy/Print	\$0.25/copy or print
Oversize copies (up to 24"x36")	\$3.00/copy
Plotter Usage	
11"x17"	\$2.00/plot
24"x36"	\$3.00/plot
36"x48"	\$4.00/plot
42"x60"	\$5.00/plot

### **Contractual**

*Identify all work that will be accomplished by subrecipients, consultants, or contractors, including a breakdown of all tasks to be completed, and a detailed budget estimate of time, rates, supplies, and materials that will be required for each task. If a subrecipient, consultant, or contractor is proposed and approved at time of award, no other approvals will be required. Any changes or additions will require a request for approval. Identify how the budgeted costs for subrecipients, consultants, or contractors were determined to be fair and reasonable.*

Two portions of the project will use consultants and contractors. First, Franson Civil Engineers will be retained to provide design engineering services. Second, a construction contractor will be solicited to provide construction services. Detailed cost estimates for engineering and construction services are shown in Appendix A.

### **Environmental and Regulatory Compliance Costs**

*Applicants must include a line item in their budget to cover environmental compliance costs. "Environmental compliance costs" refer to costs incurred by Reclamation or the recipient in complying with environmental regulations applicable to a WaterSMART Grant, including costs associated with any required documentation of environmental compliance, analyses, permits, or approvals. Applicable Federal environmental laws could include NEPA, ESA, NHPA, and the*

*CWA, and other regulations depending on the project. Such costs may include, but are not limited to:*

- *The cost incurred by Reclamation to determine the level of environmental compliance required for the project*
- *The cost incurred by Reclamation, the recipient, or a consultant to prepare any necessary environmental compliance documents or reports*
- *The cost incurred by Reclamation to review any environmental compliance documents prepared by a consultant*
- *The cost incurred by the recipient in acquiring any required approvals or permits, or in implementing any required mitigation measures*

*The amount of the line item should be based on the actual expected environmental compliance costs for the project. However, the minimum amount budgeted for environmental compliance should be equal to at least 1-2 percent of the total project costs. If the amount budgeted is less than 1-2 percent of the total project costs, you must include a compelling explanation of why less than 1-2 percent was budgeted.*

*How environmental compliance activities will be performed (e.g., by Reclamation, the applicant, or a consultant) and how the environmental compliance funds will be spent, will be determined pursuant to subsequent agreement between Reclamation and the applicant. If any portion of the funds budgeted for environmental compliance is not required for compliance activities, such funds may be reallocated to the project, if appropriate.*

Environmental costs are expected to be minimal and 2% was used as a cost estimate.

## **Reporting**

*Recipients are required to report on the status of their project on a regular basis. Failure to comply with reporting requirements may result in the recipient being removed from consideration for funding under future funding opportunities. Include a line item for reporting costs (including final project and evaluation costs).*

A total of \$20,000 was budgeted for coordination with Reclamation. This amount would include the costs to create a final construction report and finalize repayment agreements, quarterly construction reports, annual project performance reports, and to coordinate requests for reimbursement.

## **Other**

*Any other expenses not included in the above categories shall be listed in this category, along with a description of the item and what it will be used for. No profit or fee will be allowed.*

Not included.

**Indirect Costs**

*Show the proposed rate, cost base, and proposed amount for allowable indirect costs based on the applicable OMB circular cost principles (see Section III.E., "Cost Sharing Requirement") for the recipient's organization. It is not acceptable to simply incorporate indirect rates within other direct cost line items.*

*If the recipient has separate rates for recovery of labor overhead and general and administrative costs, each rate shall be shown. The applicant should propose rates for evaluation purposes, which will be used as fixed or ceiling rates in any resulting award. Include a copy of any federally approved indirect cost rate agreement. If a federally approved indirect rate agreement is not available, provide supporting documentation for the rate. This can include a recent recommendation by a qualified certified public accountant (CPA) along with support for the rate calculation.*

*If you do not have a federally approved indirect cost rate agreement, or if unapproved rates are used, explain why, and include the computational basis for the indirect expense pool and corresponding allocation base for each rate. Information on "Preparing and Submitting Indirect Cost Proposals" is available from Interior, the National Business Center, and Indirect Cost Services, at <http://www.aqd.nbc.gov/services/ICS.aspx>.*

Not included.

**Contingency Costs**

*All proposed contingency line-items must be supported by a rationale. Further, in most cases, contingency cost estimates are limited to 10 percent of projected construction costs.*

Not included.

**Total Cost**

*Indicate total amount of project costs, including the Federal and non-Federal cost-share amounts.*

The estimated total project cost is \$5,500,000.

**Budget Form**

*In addition to the above-described budget information, the applicant must complete an SF-424A, Budget Information—Nonconstruction Programs, or an SF-424C, Budget Information—Construction Programs.*

Forms SF-424C and SF-424D are enclosed with the application for federal assistance SF-424.

**Appendix A**  
**Budget & Schedule**

## Moroni Irrigation Company Improvements

PROBABLE COST OPINION

ITEM DESCRIPTION	QUANTITY	UNIT	UNIT COST	TOTAL COST
<b>Canal</b>				
Mobilization	1	EA	\$60,000.00	\$60,000
32" Dia. DR 32.5, HDPE Pipe	4,000	LF	\$82.00	\$328,000
28" Dia. DR 32.5, HDPE Pipe	5,050	LF	\$65.00	\$328,300
24" Dia. DR 32.5, HDPE Pipe	9,000	LF	\$50.00	\$450,000
20" Dia. DR 32.5, HDPE Pipe	2,800	LF	\$37.00	\$103,600
Tracer Wire	20,850	LF	\$0.20	\$4,200
State Road Crossing	35	LF	\$250.00	\$8,800
Class "C" Roadway Repair	600	SY	\$10.00	\$6,000
Inlet Flow Control & Measurement	1	CY	\$20,000.00	\$20,000
Settling Basin w/ Sluice	1	EA	\$40,000.00	\$40,000
Outlet Structures	20	EA	\$4,000.00	\$80,000
Inline Control Valves	4	EA	\$5,000.00	\$20,000
Air Valves	11	EA	\$4,000.00	\$44,000
Demolition & Removal	20,850	LF	\$2.50	\$52,100
Imported Backfill	5,200	CY	\$15.00	\$78,000
Seeding	5	AC	\$500.00	\$2,500
			<b>Subtotal</b>	<b>\$1,625,500</b>
<b>City Ditch</b>				
Mobilization	1	EA	\$60,000.00	\$60,000
26" Dia. DR 32.5, HDPE Pipe	9,400	LF	\$57.00	\$535,800
24" Dia. DR 32.5, HDPE Pipe	11,800	LF	\$50.00	\$590,000
12" Dia. DR 32.5, HDPE Pipe	2,350	LF	\$21.00	\$49,350
Tracer Wire	21,200	LF	\$0.20	\$4,240
State Road Crossing	35	LF	\$250.00	\$8,750
Class "C" Roadway Repair	600	SY	\$10.00	\$6,000
Inlet Structure (Concrete Work, Headgates, Flow Measurement)	1	EA	\$40,000.00	\$40,000
Outlet Structures	24	EA	\$4,000.00	\$96,000
Inline Control Valves	4	EA	\$5,000.00	\$20,000
Air Valves	11	EA	\$4,000.00	\$44,000
Demolition & Removal	21,200	LF	\$1.50	\$31,800
Imported Backfill	4,000	CY	\$15.00	\$60,000
Seeding	5	AC	\$500.00	\$2,500
			<b>Subtotal</b>	<b>\$1,548,440</b>
<b>Spring Ditch</b>				
Mobilization	1	EA	\$60,000.00	\$60,000
24" Dia. DR 32.5, HDPE Pipe	10,800	LF	\$50.00	\$540,000
18" Dia. DR 32.5, HDPE Pipe	12,400	LF	\$31.00	\$384,400
16" Dia. DR 32.5, HDPE Pipe	2,900	LF	\$27.00	\$78,300
Tracer Wire	26,100	LF	\$0.20	\$5,220
State Road Crossing	70	LF	\$250.00	\$17,500
Class "C" Roadway Repair	1,200	SY	\$10.00	\$12,000
Inlet Structure (Concrete Work, Headgates, Flow Measurement)	1	EA	\$30,000.00	\$30,000
Outlet Structures	42	EA	\$4,000.00	\$168,000
Inline Control Valves	4	EA	\$5,000.00	\$20,000
Air Valves	14	EA	\$4,000.00	\$56,000
Demolition & Removal	26,100	LF	\$1.25	\$32,625
Imported Backfill	5,000	CY	\$15.00	\$75,000
Seeding	6	AC	\$500.00	\$3,000
			<b>Subtotal</b>	<b>\$1,482,045</b>
<b>Construction Subtotal</b>				<b>\$4,655,985</b>
<b>Moroni Irrigation Company Administration &amp; Legal/Bonding</b>				<b>\$8,000</b>
<b>Environmental Compliance &amp; Permits (2%)</b>				<b>\$93,000</b>
<b>Engineering Design &amp; Construction Management (15%)</b>				<b>\$698,000</b>
<b>Reporting &amp; Coordination with Reclamation</b>				<b>\$20,000</b>
<b>Total</b>				<b>\$5,474,985</b>

Total (Round) **\$5,500,000**

**Moroni Irrigation Company Improvements**  
Engineering Manpower Cost Estimate

Task Description	Hours By Personnel Category								Total Hours	Total Labor Charges	Other Direct Costs	Total Fee
	1 Principal	2 Project Manager	3 Senior Engineer	4 Staff Engineer	6 Engineer I	7 Designer	14 Office Assistant	15 Clerk				
<b>Phase 1 - Project Management &amp; Coordination</b>												
Task 1. Project Management	50	100					30	10	190	\$22,590	\$50	\$22,640
Task 2. Client Coordination Meetings	60	60							120	\$16,740	\$400	\$17,140
Task 3. Funding Acquisition		20	20	20	40				100	\$10,560	\$50	\$10,610
Task 4. Reporting & Coordination	5	40		20	20	20	80	20	205	\$16,945	\$200	\$17,145
Task 5. Coordination with Division of Water Resources	10	40					10	10	70	\$7,730	\$100	\$7,830
Task 6. Environmental Compliance	10	20	30	30	30	40	10		170	\$17,410	\$100	\$17,510
Task 7. Permits Acquisitions	5	20		10	30	40	10		115	\$11,195	\$3,000	\$14,195
Task 8. Loan Closing & Legal Coordination	5	40				40	10		95	\$10,055	\$8,000	\$18,055
<b>SUBTOTAL</b>	<b>145</b>	<b>340</b>	<b>50</b>	<b>80</b>	<b>120</b>	<b>140</b>	<b>150</b>	<b>40</b>	<b>1,065</b>	<b>\$113,225</b>	<b>\$11,900</b>	<b>\$125,125</b>
<b>Phase 2 - Engineering Design</b>												
Task 1. Design Team Management	100	200					20	10	330	\$42,490	\$50	\$42,540
Task 2. Site Visits		40		40	40				120	\$12,880	\$1,000	\$13,880
Task 3. Design Criteria Contract	3	20		20	20		10		73	\$7,437	\$0	\$7,437
Task 4. Coordination with Client & Shareholders		120		80	80		20		300	\$32,060	\$2,000	\$34,060
Task 5. Hydraulic Design and Model		20	20	40	60	40	20		200	\$19,060	\$0	\$19,060
Task 6. Construction Drawings		20	80	80	100	450	20		750	\$70,130	\$300	\$70,430
Task 7. Construction Specifications		20	40	60	80	40	20		260	\$25,200	\$300	\$25,500
Task 8. Bid & Award Coordination		10	40	60	20		20	20	170	\$15,860	\$500	\$16,360
<b>SUBTOTAL</b>	<b>103</b>	<b>450</b>	<b>180</b>	<b>380</b>	<b>400</b>	<b>530</b>	<b>130</b>	<b>30</b>	<b>2,203</b>	<b>\$225,117</b>	<b>\$4,150</b>	<b>\$229,267</b>
<b>Phase 3 - Construction Management</b>												
Task 1. Construction Team Management	100	200					20		320	\$42,000	\$0	\$42,000
Task 2. On-Site Observation and Documentation		40		1600	40			5	1,685	\$170,685	\$20,000	\$190,685
Task 3. Submittal Reviews		20	80	40	40				180	\$19,480	\$0	\$19,480
Task 4. Contractor Coordination		50	40	200					290	\$31,300	\$500	\$31,800
Task 5. Record Drawings Preparation	10	20		40		80	80		230	\$19,650	\$0	\$19,650
Task 6. Final Report to Reclamation	10	40	20	30			40	10	150	\$14,710	\$50	\$14,760
Task 7. O&M Manual	10	20	5	40	40	40	10	30	195	\$17,925	\$50	\$17,975
Task 8. Project Closeout	10	10	5	20			40	10	95	\$8,075	\$0	\$8,075
<b>SUBTOTAL</b>	<b>140</b>	<b>400</b>	<b>150</b>	<b>1970</b>	<b>120</b>	<b>120</b>	<b>190</b>	<b>55</b>	<b>3,145</b>	<b>\$323,825</b>	<b>\$20,600</b>	<b>\$344,425</b>
<b>Project Totals</b>	<b>388</b>	<b>1190</b>	<b>380</b>	<b>2430</b>	<b>640</b>	<b>790</b>	<b>470</b>	<b>125</b>	<b>6,413</b>	<b>\$662,167</b>	<b>\$36,650</b>	<b>\$698,817</b>

**Moroni Irrigation Company Improvements**  
PROJECT SCHEDULE

Phase	2012												2013								2014						
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	JAN	FEB	MAR	APR	MAY
<b>Submit WaterSMART Application</b>	■																										
<b>WaterSMART Grant Awarded (Anticipated)</b>					■	■																					
<b>Submit Loan Application to Division of Water Resources</b>		■																									
<b>Division of Water Resources Loan Approved (Anticipated)</b>					■	■																					
<b>Phase 1 - Project Management and Coordination</b>					■	■	■	■	■	■	■	■	■	■													
- Project Management					■	■	■	■	■	■	■	■	■	■													
- Client Coordination Meetings					■	■	■	■	■	■	■	■	■	■													
- Funding Acquisition Coordination					■	■	■	■	■	■	■	■	■	■													
- Reporting & Coordination with Reclamation					■	■	■	■	■	■	■	■	■	■													
- Coordination with Division of Water Resources					■	■	■	■	■	■	■	■	■	■													
- Environmental Compliance					■	■	■	■	■	■	■	■	■	■													
- Permits Acquisitions					■	■	■	■	■	■	■	■	■	■													
- Loan Closing & Legal Coordination					■	■	■	■	■	■	■	■	■	■													
<b>Phase 2 - Engineering Design</b>																											
- Design Team Management																											
- Site Visits																											
- Design Criteria Contract																											
- Coordination with Client & Shareholders																											
- Hydraulic Design and Model																											
- Construction Drawings & Specifications																											
- State Review and Approval																											
- Bid and Award Coordination																											
<b>Phase 3 - Construction Management</b>																											
- Construction Team Management																											
- On-Site Observation & Documentation																											
- Submittal Reviews																											
- Contractor Coordination																											
- Record Drawings Preparation																											
- Final Report to Reclamation																											
- O&M Manual																											
- Project Closeout																											

**Appendix B**  
**Letter from**  
**Utah Division of Water Resources**



GARY R. HERBERT  
Governor

CRAIG BELL  
Lieutenant Governor

# State of Utah

## DEPARTMENT OF NATURAL RESOURCES

MICHAEL R. STYLER  
Executive Director

### Division of Water Resources

DENNIS J. STRONG  
Division Director

January 12, 2012

Layne Jensen, P.E.  
Franson Civil Engineers  
1276 South 820 East, Suite 100  
American Fork, UT 84003

Mr. Jensen:

This letter is to acknowledge that we have an application on file from the Moroni Irrigation Company for financial assistance from the Utah Board of Water Resources. The company seeks to replace Spring Ditch, City Ditch and one canal with buried pipe. It is our intent to prepare a feasibility report for the company's proposed project to be presented to the board for authorization.

The board provides low interest rate loans to qualified project sponsors, but because the board has many requests for financial assistance, any board action on the feasibility report will be subject to availability of funds.

If you have any questions concerning the application or the board's funding process, please call me at 801-538-7249.

Sincerely,

Joel R. Williams, P.E.  
Water Resources Engineer

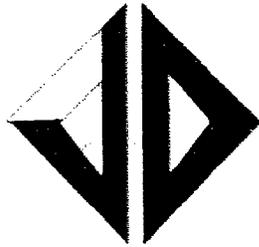


**Appendix C**  
**Project Feasibility Report**

# Central Utah Project Section 206

## Moroni Irrigation Company Improvements Feasibility Report

APRIL 2007



*Jones & DeMille Engineering*

1535 South 100 West  
Richfield, UT 84701  
PH: 435-896-8266  
FAX: 435-896-8268  
[0606-131]

## 1.0 EXECUTIVE SUMMARY

Moroni Irrigation Company's irrigation water transmission system needs improvements to conserve water and better serve the needs of the users. Problems with the Company's existing irrigation system include:

1. Long, relatively flat, canal and ditch water supply system.
2. Significant portion of broken, misaligned concrete ditch lining.
3. High amount of water seepage in the canal and ditches.
4. Vegetation encroachment and sedimentation which result in high maintenance costs.
5. Safety and liability concerns along portions of the canal and ditch system.
6. Significant annual water loss that negatively impacts shareholders, Moroni City, and the general economy.

It is recommended that the improvements listed in **Appendix C** be constructed for the estimated cost of \$5,330,000. The proposed project will significantly reduce the current problems with the irrigation water supply system.

## 2.0 ADMINISTRATIVE INFORMATION

**Project Name & Number:**

Moroni Irrigation Improvements, Project No. 0606-131

**Moroni Irrigation Company Contact:**

Reed Rawlings (President)  
Moroni Irrigation Company  
P.O. Box 321  
Moroni, UT, 84646

**Technical Contact:**

Darin Robinson  
Jones and DeMille Engineering  
1535 South 100 West  
Richfield, Utah 84701

**Approval for Submittal:**

\_\_\_\_\_  
Reed Rawlings, (Moroni Irr. Co. President)

\_\_\_\_\_  
Date

\_\_\_\_\_  
Ed Sunderland, Chairman  
Sanpete Water Conservancy District

\_\_\_\_\_  
Date

### **3.0 INTRODUCTION**

The Company is a non-profit organization. The irrigation system currently is composed of two ditches, City Ditch and Spring Ditch, and one canal. Water in the Canal and City Ditch is diverted from the San Pitch River. The Spring Ditch collects runoff and water from springs originating from the mountains to the east. The water transmitted by the Canal and Spring Ditch is used solely for crop production. City Ditch serves both Moroni City Residents and farms, with 20.3% of the water serving residential lawns and gardens and 79.7% of the water serving farms. The Moroni Irrigation Company has known it has significant water loss in its canal system for some time. The recent drought has made the problem even more apparent. The Company requested a study of the existing irrigation water supply facilities to explore improvement alternatives and the likely corresponding water conservation benefits.

#### **STUDY PURPOSE**

The purpose of the study is to:

1. Evaluate the existing canal and ditch system.
2. Determine the most deficient areas of the transmission system.
3. Provide improvements alternatives or possible project phases.
4. Meet Sanpete Water Conservancy District (SWCD) and Central Utah Project Completion Act (CUPCA) funding application requirements.

### **4.0 PROJECT NEED**

The Company shareholders have been experiencing significant water losses translating to reduced crop yields. The water loss is quantified in Section 5, Water Conservation or Development of this report. The current water system is composed of 12.5 miles of concrete lined and earth lined open waterways. Much of the concrete lining is broken and deteriorating; this along with vegetation encroachment and sedimentation has resulted in high maintenance costs. The majority of the concrete lining has become more of a hindrance than a help. There are many areas of the ditch where misaligned concrete lining catches debris which has caused overflows. The condition of the concrete lining also affects carrying capacity. The following pictures represent the City Ditch and Canal condition.



Figure 1. City Ditch



Figure 2. City Ditch



Figure 3. Canal

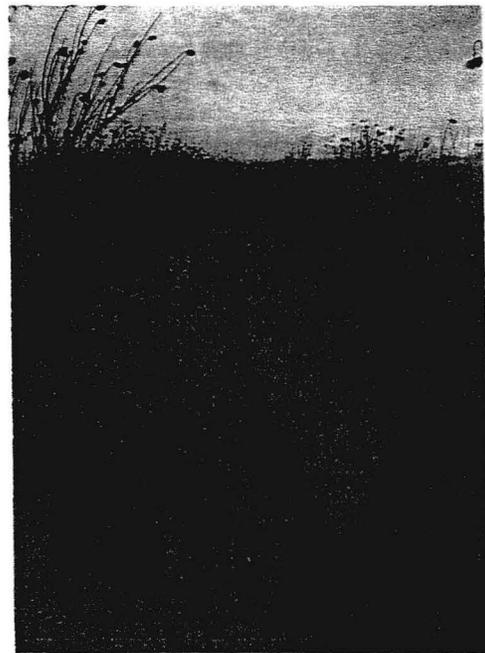


Figure 4. Canal

There are several areas of the ditch and canal system that pose a risk to public property and public safety. City Ditch parallels State Route 116 for approximately two miles. This section of ditch bank has failed once in the past causing debris and water to enter the roadway. This debris and water is a serious hazard to motorists and a major concern for the canal company. Most recent ditch overflows have resulted from debris becoming lodged in misaligned concrete lining. This situation is a threat to public safety and increases the Company liability in potential property damaged as a result of ditch overflow. As land uses change in areas adjacent to the canal and ditch system homes are being built near the canal and ditches, increasing the liability and safety risk.

The need for the project is further justified in Section 5 of this report.

## 5.0 PROJECT EVALUATION

The project will be evaluated based upon Sanpete County Conservancy District (SWCD) and Central Utah Project Completion Act, Section 206 (CUPCA). The proposed project is divided into phases of which would likely be completed during one project, however, they could be completed one at a time depending upon affordability. The following table summarizes the phases.

**Table 5.1** Project Phase Summary

Phase No.	Reach	Proposed Pipeline Length (ft)
1	Canal	20,500
2	City Ditch	20,500
3	Spring Ditch	25,300
<b>TOTAL:</b>		<b>66,300</b>

### WATER CONSERVATION OR DEVELOPMENT

The Company has suspected significant amount of water loss in portions of the existing canal and ditch system due to seepage and evaporation. Flow through the canal was measured at several points in an effort to determine the loss for each canal or ditch system. Flow measurements for each system were taken during the months of July and August of 2006. The flow diverted into each system was measured using the existing weirs and recorded. With a known flow being diverted into the Canal and City Ditch systems the amount of water

diverted from the canal or ditch was then measured using existing weirs and totaled. The total amount of water diverted from the canal or ditch was then subtracted from the amount diverted into the system to obtain the amount of water lost to seepage and evaporation. For Spring Ditch the flow at the head of the ditch was measured using an existing weir then the depth of the water in the ditch was measured. This depth along with the flow area, slope of the ditch, and a Manning roughness was used to approximate the flow of water in the ditch. The loss for Spring Ditch was the flow at the head of the ditch minus the flow at the measurement location because no diversions were in between the measurement locations. Exhibit 1 in **Appendix A** shows where the canal and ditch reaches are located. Table 5.2 summarizes the average flow losses. More complete tables with the flow measurements are included in **Appendix B**.

**Table 5.2** Estimated Percent of Flow Loss Due to Seepage and Evaporation

Reach	Reach Length (ft)	Flow Loss
Canal	20,500	35%
City Ditch	20,500	32%
Spring Ditch	25,300	50%

Table 5.3 summarizes the average daily water losses based on percent of flow loss in Table 5.2.

**Table 5.3** Estimated Water loss per Reach

Reach	Length (ft)	Flow Loss	Estimated Annual Loss (acre-feet) <sup>(1)</sup>
Canal	20,500	35%	1390
City Ditch	20,500	32%	886
Spring Ditch	25,300	50%	584
<b>Totals:</b>	<b>66,300</b>		<b>2860</b>

(1)The total estimated annual water loss is based on the 2006 water year's mean daily discharge for each system (see Appendix C for daily averages).

It is estimated that the completion of the proposed project would result in conservation of 2860 acre-feet of water per year. There will be an estimated 180 acre-feet of additional water available to Moroni City water users, thus conserving that amount of valuable Moroni City culinary water. In an effort to be conservative an average annual estimated water conservation of 2800 acre-feet per year will be used for the remainder of this report.

## **LIFE EXPECTANCY**

The proposed project improvements consist of construction materials with a useful life of fifty to one hundred years. The pipelines will be equipped with flushing ports to aid in maintaining full design capacity of the pipeline, further ensuring the useful life of the pipeline. Proper construction techniques of the proposed project will ensure that the overall project life expectancy will exceed 25 years.

## **BENEFIT VERSUS COST**

The estimated cost of the project is \$5,330,000. Assuming an average water conservation of 2,800 acre-feet per year, approximately 2,620 acre-feet would be used for agricultural purposes and 180 acre-feet would be used for outdoor irrigation in Moroni City. It is difficult to assign benefit value to the water used in Moroni City however, it is assumed that the benefit value of the water used in Moroni will be equal or higher per acre-foot than the water used for agricultural purposes. In an effort to simplify the benefit cost analysis all the conserved water will be applied to agricultural uses. The 2,620 acre-feet of water conserved annually is enough to irrigate approximately 870 acres of crops. A well managed alfalfa farm can expect to raise a minimum of \$500 dollars of crop per acre, per year, which translates to \$435,000 in annual benefit. Without taking inflation or interest into account, over a twenty year period the net benefit is \$8,700,000, resulting in a benefit cost (B/C) ratio of 1.6.

## **PUBLIC INTEREST**

~~The Moroni Irrigation Company is considered a mutual irrigation company.~~  
Approximately seven percent of the Moroni Irrigation Company's water stock is owned by citizens of Moroni City for irrigation of lawns and gardens by means of a secondary pressurized irrigation system. Moroni City has taken over ownership and has upgraded the existing pressurized irrigation system. Any improvements made to the City Ditch delivery system will benefit the Moroni City pressurized irrigation system. The benefits will also be felt by the City's culinary water system by reducing summer demand on valuable culinary water.

## **TECHNICAL FEASIBILITY**

Based on preliminary review, the proposed project is technically feasible.

## **ENVIRONMENTAL FEASIBILITY**

The proposed project improvements are located on privately owned lands or within road right-of-way corridors. The majority of the land that will be temporarily disturbed, to place the pipe, is cultivated or pasture land or roadway shoulder areas both of which have been previously disturbed. Environmental effects will be minimal because the majority of the pipe will be installed in the existing ditch or canal. The pipeline corridor will likely need to be surveyed for items of historical significance. Also the affected portions of the canal and ditches will likely need to be inventoried due to the age of the canal and ditches. Beyond that there are no known identified environmental issues and there will not likely be any required permits. It is anticipated that a categorical exclusion will be granted for the project.

## **INSTITUTIONAL FEASIBILITY**

The Company has preliminary support from water shareholders users. After funding for the project is prioritized, and a loan payback schedule determined, the Company can determine final support for the project. There are no additional known issues related to institutional feasibility.

## **PUBLIC SAFETY**

There is some risk of children drowning in the open canal especially as new homes are built near the canal. In addition, City Ditch parallels State Route 116 for approximately two miles. This section of ditch bank has failed once in the past causing debris and water to enter the roadway. This debris and water is a serious hazard to motorists and a major concern for the canal company. Completion of the proposed project will definitely reduce the risk of property damage and reduce the risk of loss of life or public health-related problems.

## **PROJECT EFFECTS**

### **Total Affected Acreage**

The total estimated farm and municipal area positively affected by the proposed project is 870 acres. Some agricultural ground will be temporarily negatively affected by construction of the pipeline.

## **Environmental Compliance**

Environmental issues have not been specifically identified at this point. The issues will be mitigated to meet environmental compliance guidelines required by the funding agencies should the Project go forth.

## **Affected Agencies**

Moroni City and the Moroni Irrigation Company will be positively affected by the project. Completion of the project will result in more, less expensive water for the City's lawn and garden pressurized irrigation system. Up to 180 acre-feet of valuable culinary well water will be conserved annually.

## **6.0 SUMMARY AND RECOMMENDATIONS**

It is recommended that all three systems (The Canal, City Ditch, and Spring Ditch) be replaced with buried pipe for a total estimated cost of \$5,330,000. The proposed improvements will benefit the Company shareholders, Moroni City, and the general economy in the area. The project components are listed in the engineer's opinion of probable cost outlined in **Appendix C**.

# Appendix A



# Appendix B

### City Ditch

Location of flow diverted from City Ditch	Measurement Device	Weir Length (in)	7/17/2006		8/7/2006	
			Head or Flow Depth (ft)	Flow (cfs)	Head (ft)	Flow (cfs)
NF 1	1 ft Parshall Flume				0.28	0.06
NF 1	Weir	18	0.28	0.72	0.22	0.51
NF 2	Weir	18	0.26	0.64	0.20	0.44
City Diversion	Weir	18	0.28	0.72	0.23	0.54
SW 1	Weir	3	0.26	1.31	0.24	1.16
SW 2	Weir					

Total Flow Diverted out of City Ditch: 3.39 2.70  
 Flow Diverted into City Ditch (cfs): 5.00 3.92  
 Seepage (cfs): 1.61 1.22  
**Seepage loss as % of Total Flow: 32.14% 31.10%**

### Spring Ditch

Location	Measurement Device	Weir Length (in)	7/17/2006 & 7/25/2006		8/10/2006	
			Head or Flow Depth (ft)	Flow (cfs)	Head (ft)	Flow (cfs)
SD 1	Pipe		1.00		1.00	
SD 2	Trap. Channel		0.74	2.09	0.068	1.78
SD 3	Trap. Channel		0.60	1.15	0.050	0.81

Difference in Flow (cfs): 0.94 0.97  
 Flow Diverted into Canal (cfs): 2.09 1.78  
 Seepage (cfs): 1.15 0.81  
**Seepage loss as % of Total Flow: 55.02% 45.51%**

### Canal

Location	Measurement Device	Weir Length (in)	7/18/2006		8/8/2006	
			Head (ft)	Flow (cfs)	Head (ft)	Flow (cfs)
SE 1&2	Weir	36	0.26	0.646	0.25	0.61
SE 3&4	Weir	36	0.24	1.16	0.25	1.23
Canal 1&2	Weir	36	0.25	1.23	0.230	1.02
Canal 3	Weir	36	0.26	1.16	0.23	0.53
Canal 4	Weir	36	0.24	0.646	0.2	0.88

Total Flow Diverted out of Canal (cfs): 4.84 4.27  
 Flow Diverted into Canal (cfs): 7.15 6.77  
 Seepage (cfs): 2.31 2.50  
**Seepage loss as % of Total Flow: 32.28% 36.93%**

Utah Division of Water Rights  
Distribution System Daily Records

SAN PITCH RIVER MORONI SPRING DITCH

COMMON DESCRIPTION:  
DIVERTING WORKS:  
MEASURING DEVICE:  
RECORDS RATING: Unrated

SPRING DITCH

CALENDAR YEAR 2006 Mean daily discharge in CFS

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
01					1.83	4.03	3.02	2.28	2.46	3.02	1.61	
02					1.83	4.03	3.02	2.28	2.46	3.02	1.61	
03					1.83	4.03	3.02	2.28	2.46	3.02	1.61	
04					1.83	4.03	3.02	2.28	2.46	3.02	1.61	
05					1.83	4.03	3.02	2.28	2.46	3.02	1.61	
06					4.03	4.03	3.02	2.28	2.46	3.02	1.61	
07					4.03	4.03	3.02	2.28	2.46	3.02	1.61	
08					4.03	4.03	3.02	2.64	2.46	3.02	1.61	
09					4.03	4.03	3.02	2.64	2.46	3.02	1.61	
10					4.03	4.03	3.02	2.64	2.46	3.02	1.61	
11					4.03	4.03	3.02	2.64	2.46	3.41	1.61	
12					4.03	4.03	3.02	2.64	2.46	3.41	1.61	
13					4.03	4.03	3.02	2.64	2.46	3.41	1.61	
14					4.03	3.62	3.02	2.64	2.46	3.41	1.61	
15					4.03	3.62	3.02	2.64	2.46	3.41	1.61	
16					4.46	3.62	2.28	2.64	2.46	3.41		
17					4.46	3.62	2.28	2.64	2.46	3.41		
18					4.46	3.62	2.28	2.64	2.46	3.41		
19					4.46	3.62	2.28	2.64	2.46	1.61		
20				1.00	4.46	3.62	2.28	2.64	2.46	1.61		
21				1.00	4.46	3.62	2.28	2.64	2.46	1.61		
22				1.83	4.46	3.62	2.28	2.64	2.46	1.61		
23				1.83	4.46	3.62	2.28	2.46	2.46	1.61		
24				1.83	4.46	3.62	2.28	2.46	2.46	1.61		
25				1.83	4.46	3.62	2.28	2.46	2.46	1.61		
26				1.83	4.46	3.62	2.28	2.46	2.46	1.61		
27				1.83	4.46	3.62	2.28	2.46	3.02	1.61		
28				1.83	4.46	3.62	2.28	2.46	3.02	1.61		
29				1.83	4.03	3.02	2.28	2.46	3.02	1.61		
30				1.83	4.03	3.02	2.28	2.46	3.02	1.61		
31					4.03		2.28	2.46		1.61		
Mean				1.68	3.86	3.76	2.64	2.51	2.53	2.53	1.61	
Min				1.00	1.83	3.02	2.28	2.28	2.46	1.61	1.61	
Max				1.83	4.46	4.03	3.02	2.64	3.02	3.41	1.61	
Acft				36.63	237.06	223.60	162.21	154.12	150.82	155.52	47.90	

Annual ACFT Total: 1167.87

Utah Division of Water Rights  
Distribution System Daily Records

SAN PITCH RIVER MORONI CANAL IRRIGATION CO

COMMON DESCRIPTION:  
DIVERGING WORKS:  
MEASURING DEVICE:  
RECORDS RATING: Unrated

CANAL

CALENDAR YEAR 2006 Mean daily discharge in CFS

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
01					13.07	16.00	10.38	7.15	7.53	9.11	2.39	
02					13.07	16.00	10.38	7.15	7.53	9.11	2.39	
03					13.07	16.00	10.38	7.15	7.53	9.11	2.39	
04					13.07	16.00	10.38	7.15	7.53	9.11	2.39	
05					13.07	16.00	11.25	7.15	7.53	9.11	2.39	
06					16.00	16.00	10.38	7.15	7.53	9.11	2.39	
07					16.00	16.00	10.38	7.15	7.53	9.11	2.39	
08					16.00	16.00	10.38	7.15	7.53	7.91	2.39	
09					16.00	16.00	10.38	7.15	7.53	7.91	2.39	
10					16.00	16.00	10.38	7.15	7.53	7.91	2.39	
11					16.00	13.55	10.38	7.15	7.53	7.91	2.39	
12					16.00	13.55	10.38	7.15	7.53	7.91	2.39	
13					16.00	13.55	10.38	7.15	7.53	7.91	2.39	
14					16.00	13.55	10.38	7.15	7.53	7.91	2.39	
15					16.00	13.55	10.38	7.15	7.53	7.91	2.39	
16					16.00	13.55	9.95	7.15	7.53	7.91		
17					16.00	13.55	9.95	7.15	7.53	7.91		
18					16.00	13.55	9.95	7.15	7.53	7.91		
19					16.00	13.55	9.95	7.15	7.53	7.15		
20				2.00	16.00	13.55	9.95	7.15	7.53	7.15		
21				2.00	16.00	13.55	9.95	7.15	7.53	7.15		
22				12.15	16.00	13.55	9.95	7.15	7.53	7.15		
23				12.15	16.00	13.55	9.95	7.15	7.53	2.39		
24				12.15	16.00	13.55	9.95	7.15	7.53	2.39		
25				12.15	16.00	13.55	7.15	7.15	7.53	2.39		
26				12.15	16.00	13.55	7.15	7.15	7.53	2.39		
27				12.15	16.00	10.38	7.15	7.15	9.11	2.39		
28				12.15	16.00	10.38	7.15	7.15	9.11	2.39		
29				13.07	16.00	10.38	7.15	7.15	9.11	2.39		
30				13.07	16.00	10.38	7.15	7.15	9.11	2.39		
31					16.00		7.15	7.15		2.39		
Mean				10.47	15.53	13.94	9.55	7.15	7.74	6.48	2.39	
Min				2.00	13.07	10.38	7.15	7.15	7.53	2.39	2.39	
Max				13.07	16.00	16.00	11.25	7.15	9.11	9.11	2.39	
Acft				228.48	954.74	829.73	587.44	439.64	460.60	398.46	71.11	

Annual ACFT Total: 3970.19

# Appendix C

JONES & DEMILLE ENGINEERING  
 1535 SOUTH 100 WEST  
 RICHFIELD UT 84701

ENGINEER'S OPINION OF PROBABLE COST

PROJECT: Moroni Irrigation Feasibility Study  
 OWNER: Moroni Irrigation Company

PROJ #: 0606-131  
 DATE: 5-Apr-07  
 SHEET: 1 of 1  
 BY: Darin Robinson & Garrick Willden

**CANAL**

ITEM #	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
1	Mobilization	1	L.S.	\$ 65,000.00	\$ 65,000.00
2	32" Dia. DR 32.5, HDPE Pipe	4000	L.F.	\$ 61.00	\$ 244,000.00
3	28" Dia. DR 32.5, HDPE Pipe	5050	L.F.	\$ 51.00	\$ 257,550.00
4	24" Dia. DR 32.5, HDPE Pipe	9000	L.F.	\$ 42.00	\$ 378,000.00
5	20" Dia. DR 32.5, HDPE Pipe	2800	L.F.	\$ 35.00	\$ 98,000.00
6	Tracer Wire	20850	L.F.	\$ 0.20	\$ 4,170.00
7	State Road Crossing	35	L.F.	\$ 250.00	\$ 8,750.00
8	Class "C" Roadway Repair	600	S.Y.	\$ 10.00	\$ 6,000.00
9	Inlet Flow Control & Measurement	1	L.S.	\$ 20,000.00	\$ 20,000.00
10	Settling Basin w/ Sluice	1	L.S.	\$ 40,000.00	\$ 40,000.00
11	Outlet Structures	20	EACH	\$ 4,000.00	\$ 80,000.00
12	Inline Control Valves	4	EACH	\$ 5,000.00	\$ 20,000.00
13	Air Valves	11	EACH	\$ 4,000.00	\$ 44,000.00
14	Demolition & Removal	20850	L.F.	\$ 2.50	\$ 52,125.00
15	Imported Backfill	5200	C.Y.	\$ 15.00	\$ 78,000.00
16	Seeding	5	ACRE	\$ 500.00	\$ 2,500.00
17	Construction Contingency	1	L.S.	\$ 211,905.00	\$ 211,905.00
<b>SUBTOTAL CONSTRUCTION</b>					<b>\$ 1,610,000.00</b>

**CITY DITCH**

ITEM #	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
1	Mobilization	1	L.S.	\$ 64,000.00	\$ 64,000.00
2	26" Dia. DR 32.5, HDPE Pipe	9400	L.F.	\$ 46.00	\$ 432,400.00
3	24" Dia. DR 32.5, HDPE Pipe	11800	L.F.	\$ 42.00	\$ 495,600.00
4	12" Dia. DR 32.5, HDPE Pipe	2350	L.F.	\$ 22.00	\$ 51,700.00
5	Tracer Wire	21200	L.F.	\$ 0.20	\$ 4,240.00
6	State Road Crossing	35	L.F.	\$ 250.00	\$ 8,750.00
7	Class "C" Roadway Repair	600	S.Y.	\$ 10.00	\$ 6,000.00
8	Inlet Structure (Concrete Work, Headgates, Flow Measurement)	1	L.S.	\$ 40,000.00	\$ 40,000.00
9	Outlet Structures	24	EACH	\$ 4,000.00	\$ 96,000.00
10	Inline Control Valves	4	EACH	\$ 5,000.00	\$ 20,000.00
11	Air Valves	11	EACH	\$ 4,000.00	\$ 44,000.00
12	Demolition & Removal	21200	L.F.	\$ 1.50	\$ 31,800.00
13	Imported Backfill	4000	C.Y.	\$ 15.00	\$ 60,000.00
14	Seeding	5	ACRE	\$ 500.00	\$ 2,500.00
15	Construction Contingency	1	L.S.	\$ 203,010.00	\$ 203,010.00
<b>SUBTOTAL CONSTRUCTION</b>					<b>\$ 1,560,000.00</b>

**SPRING DITCH**

ITEM #	ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
1	Mobilization	1	L.S.	\$ 59,000.00	\$ 59,000.00
2	24" Dia. DR 32.5, HDPE Pipe	10800	L.F.	\$ 42.00	\$ 453,600.00
3	18" Dia. DR 32.5, HDPE Pipe	12400	L.F.	\$ 29.00	\$ 359,600.00
4	16" Dia. DR 32.5, HDPE Pipe	2900	L.F.	\$ 26.00	\$ 75,400.00
5	Tracer Wire	26100	L.F.	\$ 0.20	\$ 5,220.00
6	State Road Crossing	70	L.F.	\$ 250.00	\$ 17,500.00
7	Class "C" Roadway Repair	1200	S.Y.	\$ 10.00	\$ 12,000.00
8	Inlet Structure (Concrete Work, Headgates, Flow Measurement)	1	L.S.	\$ 30,000.00	\$ 30,000.00
9	Outlet Structures	42	EACH	\$ 4,000.00	\$ 168,000.00
10	Inline Control Valves	4	EACH	\$ 5,000.00	\$ 20,000.00
11	Air Valves	14	EACH	\$ 4,000.00	\$ 56,000.00
12	Demolition & Removal	26100	L.F.	\$ 1.25	\$ 32,625.00
13	Imported Backfill	5000	C.Y.	\$ 15.00	\$ 75,000.00
14	Seeding	6	ACRE	\$ 500.00	\$ 3,000.00
15	Construction Contingency	1	L.S.	\$ 203,055.00	\$ 203,055.00
<b>SUBTOTAL CONSTRUCTION</b>					<b>\$ 1,570,000.00</b>

**TOTAL CONSTRUCTION \$ 4,740,000.00**

ITEM	COST
Canal Construction	\$ 1,610,000.00
City Ditch Construction	\$ 1,560,000.00
Spring Ditch Construction	\$ 1,570,000.00
<b>CONSTRUCTION TOTAL</b>	<b>\$ 4,740,000.00</b>
Moroni Irr. Administration & Legal/Bonding	\$ 48,000.00
Permits & Environmental	\$ 45,000.00
Design Engineering	\$ 260,000.00
Construction Engineering	\$ 190,000.00
Easement Acquisition, ROW Maps, Surveys	\$ 47,000.00
<b>TOTAL</b>	<b>\$ 5,330,000.00</b>