COLORADO
Colorado Water Conservation Board
Department of Natural Resources

Last Updated: June 2020

Colorado Water Conservation Board

Water Plan Grant Application

Instructions

To receive funding for a Water Plan Grant, applicant must demonstrate how the project, activity, or process (collectively referred to as "project") funded by the CWCB will help meet the measurable objectives and critical actions in the Water Plan. Grant guidelines are available on the CWCB website.

If you have questions, please contact CWCB at (303) 866-3441 or email the following staff to assist you with applications in the following areas:

Water Storage Projects	Matthew.Stearns@state.co.us
Conservation, Land Use Planning	Kevin.Reidy@state.co.us
Engagement & Innovation Activities	Ben.Wade@state.co.us
Agricultural Projects	Alexander.Funk@state.co.us
Environmental & Recreation Projects	Chris.Sturm@state.co.us

FINAL SUBMISSION: Submit all application materials in one email to *waterplan.grants@state.co.us*
in the original file formats [Application (word); Statement of Work (word); Budget/Schedule (excel)]. Please do not combine documents. In the subject line, please include the funding category and name of the project.

Water Project Summary

Name of Applicant	Mark Harris, General Manager
Name of Water Project	Vinelands Power Plant (replacement of Grand Valley Power Plant)

CWP Grant Request Amount	$200,000
Other Funding Sources – Private funding	$2,878,750
Other Funding Sources – Endangered Species Recovery Program	$1,500,000
Other Funding Sources – Colorado Water Trust – Walton Foundation	$425,000
Other Funding Sources –Species Conservation Trust Fund	$600,000
Other Funding Sources – Grand Valley Fund	1,000,000
Other Funding Sources – USBR - WaterSmart	964,852
Other Funding Sources – CWCB Loan	1,231,398
Applicant Funding Contribution	$

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Total Project Cost	$ 8,800,000

Applicant & Grantee Information
Name of Grantee(s) Grand Valley Water Users Association
Mailing Address 1147 24 Road Grand Junction, CO
FEIN -
Organization Contact: Mark Harris
Position/Title: General Manager
Email: mharris@gvwua.com
Phone: (970) 242-5065
Grant Management Contact: Mark Harris
Position/Title; General Manager
Email; mharris@gvwua.com
Phone: (970)242-5065
Name of Applicant (if different than grantee)
Mailing Address
Position/Title
Email
Phone
Description of Grantee/Applicant
Provide a brief description of the grantee's organization (100 words or less).

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The Bureau of Reclamation's Grand Valley Project is co-managed by the Grand Valley Water Users Association and Orchard Mesa Irrigation District. The Association was officially formed in 1905. It is a private incorporated not-for-profit ditch company. The Orchard Mesa Irrigation District was formed under the Colorado Irrigation District Law of 1903. In 1921, district was given the option to be governed under the Irrigation District law of 1921 (CRS 37-42-101 thru 141), which the District chose to do. The District is currently governed under the Irrigation District Law of 1921

The Grand Valley Project was one of the first six projects to be authorized by the Reclamation Act of June 17 1902 and

Type of Eligible Entity (check one)	
	Public (Government): Municipalities, enterprises, counties, and State of Colorado agencies. Federal agencies are encouraged to work with local entities. Federal agencies are eligible, but only if they can make a compelling case for why a local partner cannot be the grant recipient.
	Public (Districts): Authorities, Title 32/special districts (conservancy, conservation, and irrigation districts), and water activity enterprises.
X	**Private Incorporated:** Mutual ditch companies, homeowners associations, corporations.
	Private Individuals, Partnerships, and Sole Proprietors: Private parties may be eligible for funding.
	Non-governmental organizations (NGO): Organization that is not part of the government and is non-profit in nature.
	Covered Entity: As defined in Section 37-60-126 Colorado Revised Statutes.

Type of Water Project (check all that apply)	
	Study
X	Construction
	Identified Projects and Processes (IPP)
	Other

Category of Water Project (check the primary category that applies and include relevant tasks)	

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	Water Storage - Projects that facilitate the development of additional storage, artificial aquifer recharge, and dredging existing reservoirs to restore the reservoirs' full decreed capacity and Multi-beneficial projects and those projects identified in basin implementation plans to address the water supply and demand gap.. *Applicable Exhibit A Task(s):*	
	Conservation and Land Use Planning - Activities and projects that implement long-term strategies for conservation, land use, and drought planning. *Applicable Exhibit A Task(s):*	
	Engagement & Innovation - Activities and projects that support water education, outreach, and innovation efforts. Please fill out the Supplemental Application on the website. *Applicable Exhibit A Task(s):*	
	Agricultural - Projects that provide technical assistance and improve agricultural efficiency. *Applicable Exhibit A Task(s):*	
X	Environmental & Recreation - Projects that promote watershed health, environmental health, and recreation. *Applicable Exhibit A Task(s):*	
	Other	Explain:

Location of Water Project

Please provide the general county and coordinates of the proposed project below in **decimal degrees**. The Applicant shall also provide, in Exhibit C, a site map if applicable.

County/Counties	Mesa
Latitude	39° 6'5.49"N
Longitude	108°20'43.74"W

Water Project Overview

Please provide a summary of the proposed water project (200 words or less). Include a description of the project and what the CWP Grant funding will be used for specifically (e.g., studies, permitting process, construction). Provide a description of the water supply source to be utilized or the water body affected by the project, where applicable. Include details such as acres under irrigation, types of crops irrigated, number of residential and commercial taps, length of ditch improvements, length of pipe installed, and area of habitat improvements, where applicable. If this project addresses multiple purposes or spans multiple basins, please explain.
The Applicant shall also provide, in Exhibit A, a detailed Statement of Work, Budget, Other Funding Sources/Amounts and Schedule.

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Orchard Mesa Irrigation District and Grand Valley Water Users Association are planning to replace the aging Grand Valley hydropower plant. The existing power plant was built in the early 1930s by the United States through the Bureau of Reclamation near the town of Palisade, in western Colorado. The power plant has received very few upgrades since that time and is at the end of its useful life. Replacement of the plant with an enhanced facility and operations assures the continued long-term reliability of providing renewable energy and ensures water security for the Grand Valley agricultural irrigators and communities. Studies for the power plant have been underway since 2014. The CWP Grant funding will be used for construction of the power plant.

The primary 400 cfs water right for the power plant is held by the United States. The power plant protects over 19,000 acre-feet per year of water (average value between 2011 and 2019 as reported by the State of Colorado) to benefit the natural environment. After generating hydropower, flows from the power plant return to the Colorado River at the beginning of the "15-Mile Reach", a reach designated as critical habitat for endangered fish by the U.S. Fish and Wildlife Service that is susceptible to extremely low flows due to increased water demand. In other words, the Grand Valley Power Plant increases flows in the river in a reach that is susceptible to low flows because of its senior water rights. Without the Grand Valley Power Plant operating, the flows in the Colorado River would be 19,000 acre-feet less on an average annual basis.

Increased flows in the Colorado River improves water quality conditions and the food base for aquatic life and decreases predation and crowding stress on native and endangered fish. Increased flows in the Colorado River also enhances recreational opportunities in a highly used recreational tubing and rafting part of the river. Protection of instream flows is tracked, recorded, and reported by the State of Colorado. Benefits to aquatic life are tracked, studied, and reported by the U.S. Fish and Wildlife Service, Colorado Parks and Wildlife, and the Upper Colorado River Endangered Fish Recovery Program. The Grand Valley Power Plant has been instrumental in the creation of several recent innovative water stewardship agreements, including agreements with the Colorado Water Trust, increasing streamflows in the Colorado River.

Measurable Results	
To catalog measurable results achieved with the CWP Grant funds, please provide any of the following values as applicable:	
	New Storage Created (acre-feet)
	New Annual Water Supplies Developed or Conserved (acre-feet), Consumptive or Nonconsumptive
	Existing Storage Preserved or Enhanced (acre-feet)
	Length of Stream Restored or Protected (linear feet)
	Efficiency Savings (indicate acre-feet/year OR dollars/year)
Enhanced flows Colorado River15-Mile Reach	Area of Restored or Preserved Habitat (acres)
	Quantity of Water Shared through Alternative Transfer Mechanisms
	Number of Coloradans Impacted by Incorporating Water-Saving Actions into Land Use Planning

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	Number of Coloradans Impacted by Engagement Activity	
	Other	Explain:

Water Project Justification

Provide a description of how this water project supports the goals of Colorado's Water Plan, the most recent Statewide Water Supply Initiative, and the applicable Roundtable Basin Implementation Plan and Education Action Plan. The Applicant is required to reference specific needs, goals, themes, or Identified Projects and Processes (IPPs), including citations (e.g. document, chapters, sections, or page numbers).

The proposed water project shall be evaluated based upon how well the proposal conforms to Colorado's Water Plan Framework for State of Colorado Support for a Water Project (CWP, Section 9.4, pp. 9-43 to 9-44;)

The Grand Valley Power Plant ensures that water is delivered to more than 32,700 acres of irrigated land, ensuring the production of Colorado Palisade peaches, grapes, corn, dry beans, alfalfa, grass hay, pasture, small grain and seed crops, fruits, vegetables and a variety of truck crops.

The Grand Valley Power Plant operations provide a means to protect river flows for the endangered fish and are an important element in assuring Endangered Species Act compliance for more than 1,200 water diverters in both eastern and western Colorado. In other words, more than 1,200 water projects could not divert water without the protection of the endangered fish.

Related Studies

Please provide a list of any related studies, including if the water project is complementary to or assists in the implementation of other CWCB programs.

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Firm	Date	Type of Study
Electrical Machinery	December 2013	Alternative Presentation/ Component Quote
AECOM	April 2015	Feasibility Study
HDR	April 2015	Engineering Service Proposal
SGM	April 2015	Scoping Review
Wattera	April 2015	State of Qualifications
AECOM	April 2015	Technical Proposal
Sorenson Engineering	April 2015/2015	Feasibility Study/Rebuild Proposal
Sorenson Engineering	October 2020	Supporting Design Report

Previous CWCB Grants, Loans or Other Funding

List all previous or current CWCB grants (including WSRF) awarded to both the Applicant and Grantee. Include: 1) Applicant name; 2) Water activity name; 3) Approving RT(s); 4) CWCB board meeting date; 5) Contract number or purchase order; 6) Percentage of other CWCB funding for your overall project.

All grants and loans related to the Colorado River Basin RT BIP

1. Roller Dam and Related Facilities Master Plans 1 and 2 (complete)

CWCB $83,000
Water SMART $40,000
GVWUA/OMID $99,000

2. Upper Canyon Improvement Project (complete)

CWCB Grant $300,000
CWCB Loan $150,000
WaterSMART $300,000
GVWUA/OMID $200,000

3. Dam and Canyon Electrical Project Phase 1 (complete)

CWCB $60,000
Colo River District $50,000
GVWUA/OMID $40,000

4. Dam and Canyon Electrical Project Phase 2 (in Progress)

CWCB Water Plan $100,000
WaterSMART $178,000
GVWUA/OMID $50,000

Taxpayer Bill of Rights

The Taxpayer Bill of Rights (TABOR) may limit the amount of grant money an entity can receive. Please describe any relevant TABOR issues that may affect your application.

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Tabor does not apply.

Submittal Checklist	
	I acknowledge the Grantee will be able to contract with CWCB using the Standard Contract.
Exhibit A	
	Statement of Work(1)
	Budget & Schedule(1) For budget see p. 18 of CWCB Loan app narrative, for schedule, see p 15 of the CWCB loan app narrative.
	Engineer's statement of probable cost (projects over $100,000) See attached Excel spreadsheet.
	Letters of Matching and/or Pending 3rd Party Commitments(1)
Exhibit C	
	Map (if applicable)(1) See attached Supporting Design report
	Photos/Drawings/Reports See attached Supporting Design report
	Letters of Support (Optional)
	Certificate of Insurance (General, Auto, & Workers' Comp.) (2)
	Certificate of Good Standing with Colorado Secretary of State(2)
	W-9(2)
	Independent Contractor Form(2) (If applicant is individual, not company/organization)
Engagement & Innovation Grant Applicants ONLY	
	Engagement & Innovation Supplemental Application(1)

(1) Required with application.
(2) Required for contracting. While optional at the time of this application, submission can expedite contracting upon CWCB Board approval.

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ENGAGEMENT & INNOVATION GRANT FUND SUPPLEMENTAL APPLICATION

Introduction & Purpose

Colorado's Water Plan calls for an outreach, education, public engagement, and innovation grant fund in Chapter 9.5.

The overall goal of the Engagement & Innovation Grant Fund is to enhance Colorado's water communication, outreach, education, and public engagement efforts; advance Colorado's water supply planning process; and support a statewide water innovation ecosystem.

The grant fund aims to engage the public to promote well-informed community discourse regarding balanced water solutions statewide. The grant fund aims to support water innovation in Colorado. The grant fund prioritizes measuring and evaluating the success of programs, projects, and initiatives. The grant fund prioritizes efforts designed using research, data, and best practices. The grant fund prioritizes a commitment to collaboration and community engagement. The grant fund will support local and statewide efforts.

The grant fund is divided into two tracks: engagement and innovation. The Engagement Track supports education, outreach, communication, and public participation efforts related to water. The Innovation Track supports efforts that advance the water innovation ecosystem in Colorado.

Application Questions

*The grant fund request is referred to as "project" in this application.

Overview (answer for both tracks)
In a few sentences, what is the overall goal of this project? How does it achieve the stated purpose of this grant fund (above)?
Who is/are the target audience(s)? How will you reach them? How will you involve the community?
Describe how the project is collaborative or engages a diverse group of stakeholders. Who are the partners in the project? Do you have other funding partners or sources?

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Overview (answer for both tracks)
Describe how you plan to measure and evaluate the success and impact of the project?
What research, evidence, and data support your project?
Describe potential short- and long-term challenges with this project.

Please fill out the applicable questions for either the Engagement Track or Innovation Track, unless your project contains elements in both tracks. If a question does not relate to your project, just leave it blank. Please answer each question that relates to your project. Please reference the relevant documents and use chapters and page numbers (Colorado's Water Plan, Basin Implementation Plan, PEPO Education Action Plan, etc.).

Engagement Track
Describe how the project achieves the education, outreach, and public engagement measurable objective set forth in Colorado's Water Plan to "significantly improve the level of public awareness and engagement regarding water issues statewide by 2020, as determined by water awareness surveys."
Describe how the project achieves the other measurable objectives and critical goals and actions laid out in Colorado's Water Plan around the supply and demand gap; conservation; land use; agriculture; storage; watershed health, environment, and recreation; funding; and additional.
Describe how the project achieves the education, outreach, and public engagement goals set forth in the applicable Basin Implementation Plan(s).

Describe how the project achieves the basin roundtable's PEPO Education Action Plans.

Innovation Track
Describe how the project enhances water innovation efforts and supports a water innovation ecosystem in Colorado.
Describe how the project engages/leverages Colorado's innovation community to help solve our state's water challenges.
Describe how the project helps advance or develop a solution to a water need identified through TAP-IN and other water innovation challenges. What is the problem/need/challenge?
Describe how this project impacts current or emerging trends; technologies; clusters, sectors, or groups in water innovation.

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Water Plan Grant - Exhibit A

Statement Of Work	
Date:	**December 18, 2020**
Name of Grantee:	**Grand Valley Water Users Association**
Name of Water Project:	**Vinelands Hydroelectric Power Plant**
Funding Source:	

Water Project Overview:

Orchard Mesa Irrigation District and Grand Valley Water Users Association are planning to replace the aging Grand Valley hydropower plant. The existing power plant was built in the early 1930s by the United States through the Bureau of Reclamation near the town of Palisade, in western Colorado. The power plant has received very few upgrades since that time and is at the end of its useful life. Replacement of the plant with an enhanced facility and operations assures the continued long-term reliability of providing renewable energy and ensures water security for the Grand Valley agricultural irrigators and communities. Studies for the power plant have been underway since 2014. The CWP Grant funding will be used for construction of the power plant.

Project Objectives:

Replacement of the plant with an enhanced facility and operations assures the continued long-term reliability of providing renewable energy and ensures water security for the Grand Valley agricultural irrigators and communities.

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Tasks
Task 1 – Power Purchase Agreement with Holy Cross Electric
Description of Task:
Power Purchase Agreement with Holy Cross Electric – This is the entity who is purchasing the power generated by the hydropower plant.
Method/Procedure:
Negotiation process
Deliverable:
Signed contract

Tasks
Task 2 – Complete Interconnect Agreement
Description of Task:
Complete Interconnect Agreement with XCEL Energy – The hydropower plant is in Xcel Energy service area. Holy Cross Electric's service area extends along I-70 from about Rulison to Minturn, Colorado. Xcel Energy will connect the new hydropower plant to the Holy Cross service area. An Interconnect Agreement allows the hydropower plant to connect to Xcel Energy's transmission lines
Method/Procedure:
Negotiation process
Deliverable:
Signed contract

Tasks
Task 3 – Complete Lease of Power Privilege Contract
Description of Task:
This contract permits GVWUA and OMID to use Grand Valley Project facilities and land, as well as the United State's water right.
Method/Procedure:

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Tasks
Negotiation process
Deliverable:
Signed contract

Tasks
Task 4 – Complete necessary National Environmental Policy Act compliance
Description of Task:
The act of issuing a LOPP contract to the Irrigators requires Reclamation to complete the necessary NEPA compliance activities. Reclamation will be preparing an Environmental Assessment to provide the NEPA compliance.
Method/Procedure:
Negotiation process
Deliverable:
Signed contract
Task 5 – Order long-lead items
Description of Task:
The turbine, generator and penstock pipe are long-lead items. Placing order for this equipment is necessary to achieve the project schedule.
Method/Procedure:
Equipment order, submittal and approval.
Deliverable:
Order for materials.

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Tasks
Task 6 – Mobilize to Site
Description of Task:
Contractor will mobilize all necessary equipment to the site, set up temporary office and utilities to support construction.
Method/Procedure:
Site setup
Deliverable:
All equipment on site, construction office set up
Task 7 – Construct facility
Description of Task:
Construction activities include, Excavate Powerhouse, Excavate Intake, Excavate Penstock, Install Intake Gate, Install Station Service (new transformer), Construct Powerhouse, Construct Intake, Place and Weld Penstock, Erect Powerhouse Building, Install Turbine and Generator, Mechanical/electrical auxiliaries, Install New Step-up Transformer
Method/Procedure:
Construction activities
Deliverable:
Completed tasks.
Task 8 – Conduct required system studies and install new interconnect
Description of Task:
This will involve construction of a transmission line from the new powerplant to the nearest Xcel Substation, approximately 0.5 miles away.
Method/Procedure:

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Tasks
Construction activities
Deliverable:
Completed interconnect
Task 9 – Test and commissioning
Description of Task:
Conduct performance test to make sure equipment meets specs and operated as intended.
Method/Procedure:
Conduct tests
Deliverable:
Completed tasks.

Budget and Schedule
This Statement of Work shall be accompanied by a combined Budget and Schedule that reflects the Tasks identified in the Statement of Work and shall be submitted to CWCB in excel format.

Reporting Requirements
Progress Reports: The applicant shall provide the CWCB a progress report every 6 months, beginning from the date of issuance of a purchase order, or the execution of a contract. The progress report shall describe the status of the tasks identified in the statement of work, including a description of any major issues that have occurred and any corrective action taken to address these issues.

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Reporting Requirements

Final Report: At completion of the project, the applicant shall provide the CWCB a Final Report on the applicant's letterhead that:

- Summarizes the project and how the project was completed.
- Describes any obstacles encountered, and how these obstacles were overcome.
- Confirms that all matching commitments have been fulfilled.
- Includes photographs, summaries of meetings and engineering reports/designs.

The CWCB will pay out the last 10% of the budget when the Final Report is completed to the satisfaction of CWCB staff. Once the Final Report has been accepted, and final payment has been issued, the purchase order or grant will be closed without any further payment.

Payment

Payment will be made based on actual expenditures and must include invoices for all work completed. The request for payment must include a description of the work accomplished by task, an estimate of the percent completion for individual tasks and the entire Project in relation to the percentage of budget spent, identification of any major issues, and proposed or implemented corrective actions.

Costs incurred prior to the effective date of this contract are not reimbursable. The last 10% of the entire grant will be paid out when the final deliverable has been received. All products, data and information developed as a result of this contract must be provided to CWCB in hard copy and electronic format as part of the project documentation.

Performance Measures

Performance measures for this contract shall include the following:
(a) Performance standards and evaluation: Grantee will produce detailed deliverables for each task as specified. Grantee shall maintain receipts for all project expenses and documentation of the minimum in-kind contributions (if applicable) per the budget in Exhibit B. Per Water Plan Grant Guidelines, the CWCB will pay out the last 10% of the budget when the Final Report is completed to the satisfaction of CWCB staff. Once the Final Report has been accepted, and final payment has been issued, the purchase order or grant will be closed without any further payment.
(b) Accountability: Per Water Plan Grant Guidelines full documentation of project progress must be submitted with each invoice for reimbursement. Grantee must confirm that all grant conditions have been complied with on each invoice. In addition, per Water Plan Grant Guidelines, Progress Reports must be submitted at least once every 6 months. A Final Report must be submitted and approved before final project payment.
(c) Monitoring Requirements: Grantee is responsible for ongoing monitoring of project progress per Exhibit A. Progress shall be detailed in each invoice and in each Progress Report, as detailed above. Additional inspections or field consultations will be arranged as may be necessary.
(d) Noncompliance Resolution: Payment will be withheld if grantee is not current on all grant conditions. Flagrant disregard for grant conditions will result in a stop work order and cancellation of the Grant Agreement.

Vinelands Hydro Summary Costs 10-6-20

Bid Item	Description	Qty	Unit	Totals
1	**Division 1 - Direct Job Expenses**			
	MSH Project Deveoplment	1	LS	$ 8,092
	MSH Project Manager during construction	1	LS	$ 101,147
	MSH Superintendent during construction	1	LS	$ 72,826
	MSH Subsistance (Crew and Mangement)	1	LS	$ 323,125
	Equipment Fuel, oil, gease, and manintenance	1	LS	$ 68,650
	Forklift, air compressor, dust control, light plants, welder	1	LS	$ 72,151
	Office Trailer, connex, garbabge dumpster, tempoary toilets, water, copies	1	LS	$ 32,350
	Cell phone, Temporary Internet, Computers	1	LS	$ 4,900
	Mobe and Demobe equipment	1	LS	$ 48,589
	Temporary electricity charges	1	LS	$ 10,000
	Safety Equipment	1	LS	$ 2,500
	Continous jobsite cleanup	1	LS	$ 23,858
	Surveying	1	LS	$ 15,000
	Misc. Hardware	1	LS	$ 10,000
	Sorenson Engineering Design	1	LS	$ 500,000
	Sorenson Engineering On-Site Engineering and Testing	1	LS	$ 370,000
	Sorenson E+O Policy	1	LS	$ 17,137
	Sorenson Development Cost	1	LS	$ 150,000
2	**Division 2 - Sitework**			$ -
	Excavation and Grading	1	LS	$ 717,413
	Cofferdam	1	LS	$ 22,560
	Dewatering	1	LS	$ 102,328
	Site BMP's	1	LS	$ 4,000
	Road Maintenance	1	LS	$ 10,000
	Crane Pads	1	LS	$ 6,180
	Snow Removal	1	LS	$ 9,361
	Reseeding	1	LS	$ 2,400
	PH Trench Drain	1	LS	$ 7,815
	Bollards	1	LS	$ 8,572
	Oil / Water Seperator	1	LS	$ 17,494
3	**Division 3 - Concrete**			$ -
	Concrete Form, place and strip	1	LS	$ 307,437
	Concrete	1	LS	$ 419,369
	Pump Concrete			
	Cold Weather Protection	1	LS	$ 23,560
	Rebar	1	LS	$ 346,560
	Sales Tax on Material	1	LS	$ 6,000
5	**Division 5 - Misc. Metals**			$ -
	Intake Braces	1	LS	$ 2,081
8	**Division 8 - Doors, Hardware and Windows**			$ -
	Overhead Door and Man Doors	1	LS	$ 9,290
9	**Division 9 - Finishes**			$ -
	Painting Turbine/Generator and Misc Metals	1	LS	$ 27,822
10	**Division 10 - Specialty Items**			$ -
	Signage and Fire Extingushers	1	LS	$ 1,921
13	**Division 13 - Pre-Engineered Building**			$ -
	Pre-Engineered Metal Building	1	LS	$ 100,824
	Powerhouse Propane Tanks and Heaters	1	LS	$ 18,251
14	**Division 14 - Turbine Installation & Canal Gates**			$ -
	Purchase Turbine and Generator	1	LS	$ 1,660,000
	Turbine Ancilary Parts and Taxes	1	LS	$ 15,000
	Turbine Oil	1	LS	$ 10,000
	Terrif on Turbine	1	LS	$ 100,000
15	**Division 15 - Mechanical**			$ -
	Riverside (Install Turbine and Generator, Stop Log Gates)	1	LS	$ 703,600
	Outside Rent Crane for Turbine Installation	1	LS	$ 69,000
	Purchase Penstock	1	LS	$ 262,500
	Intake Reducer with vent stack	1	LS	$ 40,500
	Penstock Welding	1	LS	$ 24,000
	Penstock Weld Testing	1	LS	$ 8,000
	Penstock Heat Shrink Wrap / Paint joists / Assist with setting Penstock	1	LS	$ 19,159
16	**Division 16 - Electrical**			$ -
	Engineering	1	LS	$ 10,000
	Controls and Switchgear	1	LS	$ 275,000
	Powerhouse Electrical	1	LS	$ 256,680
	Interconnect to public utility			$ 900,000
	Electrical Contingency	1	LS	$ 15,000
	Stand-by Generator	1	LS	$ 30,000
	Base Bid Total			**$ 8,400,000**

CWCB Loan Package

2.1 BACKGROUND

2.1.1 Purpose

The existing Grand Valley Power Plant (GVPP) was built in the early 1930s by the United States through the Bureau of Reclamation near the town of Palisade, Colorado at the lower end of the Orchard Mesa Power Canal and has received very few upgrades since that time and is at the end of its useful life. Public Serve Company of Colorado (PSCC) operated the GVPP between 1931 and 2011 under a lease agreement between the United States, Orchard Mesa Irrigation District (OMID), and the Grand Valley Water Users Association (GVWUA). In 2011 the lease of Power Privilege (LOPP) was amended, removing PSCC as a party to the contract. The operation and maintenance responsibility of the GVPP were assumed by OMID and GVWUA.

The continued functions of the existing GVPP by replacement by a new Vinelands Power Plant (new Power Plant) is critical to Colorado River operations being located at the beginning of the 15 Mile reach, critical habitat identified by the Upper Colorado River Endangered Fish Recovery Program (Recovery). Power plant operations are an important element in assuring Endangered Species Act (ESA) compliance for 2200 water diverters on both eastern and western Colorado. The power plant has been instrumental in the creation of several recent progressive water stewardship agreements. Replacing the existing GVPP with an enhanced facility and operations assures the continued use, and expansion, of these agreements for the benefit of all Colorado River and related water needs.

The power rights associated with Power Plant are part of the Cameo Call at the "Roller Dam" in Debeque Canyon operated by the GVWUA and OMID. Maintenance of the Cameo Call and the associated facilities are identified as a high priority by the Colorado Basin Roundtable Basin Implementation Plan (BIP). Since 2015 a suite of improvement projects have been undertaken at the Roller Dam, diversion structures, Canyon Canal, and the Orchard Mesa Siphon. The replacement of the GVPP is an integral part of these ongoing rehabilitation and replacement projects.

OMID, GVWUA, members of the Grand Valley Fund (Grand Valley Irrigation Company, Palisade Irrigation District, Mesa County Irrigation District, Ute Water Conservancy District, OMID, and GVWUA, and the many other supporters of this replacement project recognize its current importance and its increasing importance to the Grand Valley and the Colorado River Basin as climate, hydrology, and demographics continue to evolve. OMID and the GVWUA remain committed to securing and extending these multiple and ongoing benefits for all water users.

2.1.2 Study Area

The Grand Valley, located in west-central Colorado, Mesa County, is a broad valley about 12 miles wide and 35 miles long. The steep cliffs flanking its side have been cut by the Colorado River as it works its way to the Gulf of California. About midway through the Grand Valley the Colorado meets the Gunnison River near downtown Grand Junction. Fifteen miles upstream and to the east is the Town of Palisade. The GVPP is located adjacent to the District headquarters approximately 1mile south of the Town of Palisade on the south side of the Colorado River. The District's western boundary is the Gunnison River at the confluence with the Colorado near downtown Grand Junction.

The elevation of the irrigated area averages about 4700 feet above sea level.

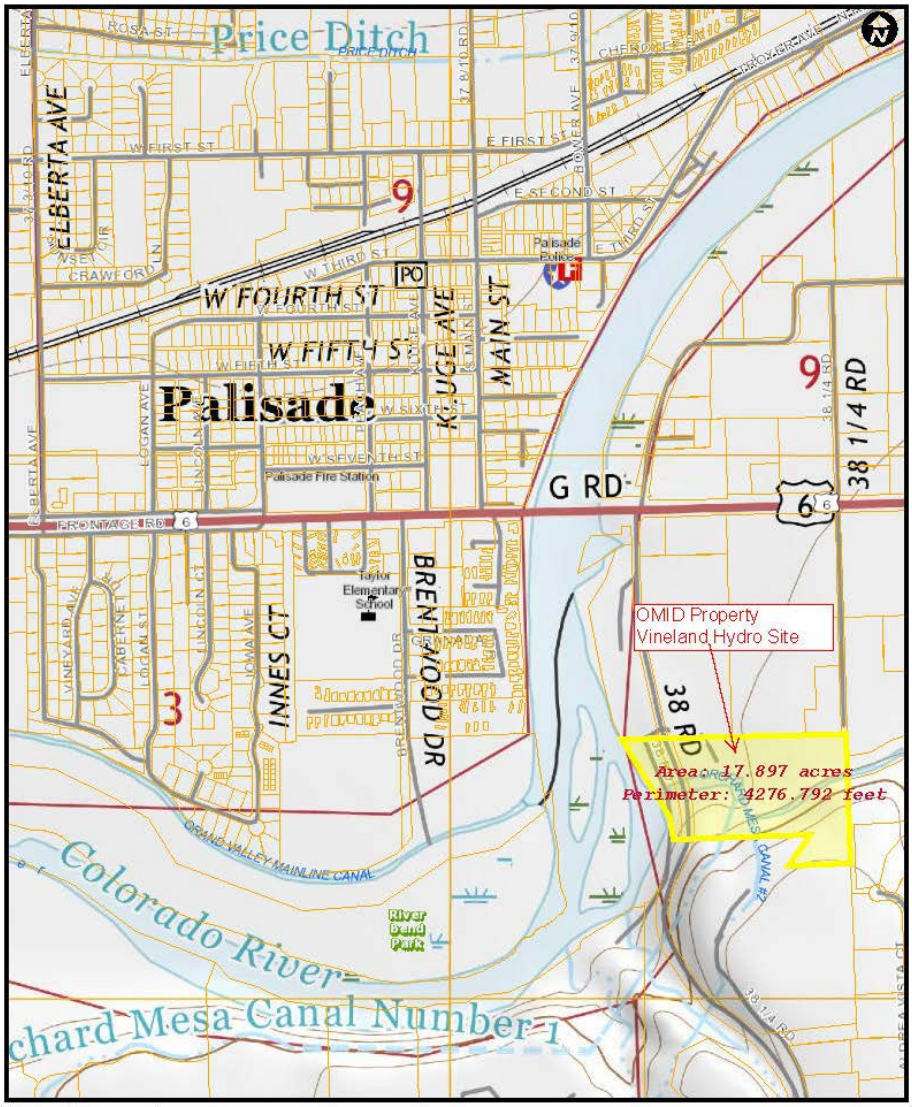


Figure 1 - Vinelands Hydro location map

The climate in the Grand Valley is that of mild winters and hot summers. Temperatures extremes can vary from occasional below zero in the coldest winters to above 100 degrees in the warmest part of the summer. The annual precipitation in the Grand Valley averages about 9.0 inches with most of the precipitation occurring during the spring and fall months. Table 1.1displays the annual precipitation, and Max and Min temperatures for a recent 11-year period at the nearby Grand Junction Regional Airport.

Climate Summary - Grand Junction Regional Airport			
2009 - 2019			
Year	Annual Precipitation (in)	Max Temp (F)	Min Temp (F)
2009	7.79	102	-16
2010	8.8	105	-9
2011	9.76	101	-9
2012	4.53	102	-5
2013	12.43	103	-12
2014	11.96	99	0
2015	13.25	101	-5
2016	8.83	104	-1
2017	5.08	102	-4
2018	8.21	102	7
2019	8.56	102	-4

Table 1

2.1.3 Previous studies -The Project Sponsors have had various engineering firms evaluate the GVPP and provide engineering proposals and feasibility studies for plant rehabilitation/rebuild.

Firm	Date	Type of Study
Electrical Machinery	December 2013	Alternative Presentation/ Component Quote
AECOM	April 2015	Feasibility Study
HDR	April 2015	Engineering Service Proposal
SGM	April 2015	Scoping Review
Wattera	April 2015	State of Qualifications
AECOM	April 2015	Technical Proposal
Sorenson Engineering	April 2015/2015	Feasibility Study/Rebuild Proposal
Sorenson Engineering	October 2020	Supporting Design Report

Table 2

2.2 SPONSORS

The fiscal and contractual responsibility for operation and maintenance of the GVPP lies equally with the Association and the District. The loan application and repayment responsibilities as outlined below are equally shared by both entities. A more detailed description of the sponsors follows.

District - The Orchard Mesa Irrigation District was formed under the Colorado Irrigation District Law of 1903. In 1921, districts were given the option to be governed under the Irrigation District law of 1921 (CRS 37-42-101 thru 141), which the District chose to do. The District is currently governed under the Irrigation District Law of 1921 and Article 43, Irrigation Districts of 1905, 1921 and Irrigation District Salinity Control Act (CRS 37-43-101 thru 211). The District was formed for the purpose of diverting, carrying and delivering irrigation water within the District's boundaries.

The District became a division of the U.S. Bureau of Reclamation's Grand Valley Project on March 19, 1921, through the Secretary of the Interior's approval under the Interior Department Appropriation Act for 1923 (42 Stat. S84). The Act authorized federal money for the reconstruction of the Orchard Mesa Division.

The District serves 9,200 acres and provides irrigation water to farms, vineyards, orchards, and subdivisions in the Grand Valley of Mesa County, east of the Town of Palisade, south of the Colorado River beginning at 39 1/2 Road. The northern boundary line follows the left bank of the Colorado River to the confluence of the Colorado and Gunnison Rivers near downtown Grand Junction, about 15 miles east of the GVPP. The southern boundary of the district is generally OMID Canal #2. The population within the District is about 15,500 and the population of the Grand Valley as a whole is around 100,000.

The District provides irrigation water to approximately 9,800 parcels in Mesa County, on the western slope of Colorado. The District receives monies through an annual assessment of the water users that is collected by Mesa County with property taxes. The 2019 estimated receipts from the assessments total $1,303,000. The OMID also receives interest income from cash reserves of about $116,000 annually. The District had total revenue on December 31, 2019, of about $2,015,000.

The major crops grown in the District include alfalfa, orchards, vineyards, corn/grain, pasture, grass lawns, and truck gardens. Most vineyards are irrigated with micro-spray or drip systems; orchards with a combination of gated pipe or micro-spray or drip; alfalfa and corn with gated pipe. There are some concrete and earthen siphon tube ditch systems.

Association - The Grand Valley Project was one of the first six projects to be authorized by the Reclamation Act of June 17 1902 and the Grand Valley Water Users Association (Association or GVWUA) was officially formed in 190S. It is a private incorporated not-for-profit ditch company. The Association is the managing entity for the

majority of the federally owned Grand Valley Project. These Grand Valley Project facilities include the Grand Valley Diversion Dam and headworks, also known as the Roller Dam or Cameo Diversion, on the Colorado River in Debeque Canyon; the Canyon Canal through Debeque Canyon; the 55-mile-long Government Highline Canal; 150 miles of project operated laterals; 100 miles of drainage ditches; and the GVPP. In recent years, approximately 130 miles of the laterals have been re-constructed into pressure piped laterals.

GVWUA first delivered water in 1917 to Reclamation's Grand Valley Project and since then has furnished a full supply of irrigation water to approximately 1,800 water users on 23,500 irrigated acres under the Government Highline Canal and 15,000 irrigated acres under the Mesa County, Palisade, and Orchard Mesa Districts and diverts the water for the Grand Valley Power Plant year-round. Water for the GVPP is diverted at the Roller Dam, flows through the Canyon Canal and is diverted to the District's Power Canal along with the District's irrigation water at the mouth of what's known as Tunnel No. 3. Water flows under the Colorado River through a 12 ft diameter pipe and is delivered to the GVPP and the District's irrigation pumping plant through the 4-mile-long Power Canal.

The District and Association share in the cost of the Canyon Canal operation under a 1955 agreement at 71.6% and 28.4%, respectively. The Association undertakes daily operation of the Roller Dam and Canyon Canal while day-to-day operation of the GVPP and other OMID facilities are carried out by the District. Each entity contributes 50% of the cost of operation and maintenance of the GVPP.

Revenue for Association operations is collected through assessments that are billed in December for the upcoming irrigation season based on allotments for individual parcels of land. Any excess usage of water from the previous season is included on the December bill. Revenue collected by the Association from annual assessments totals a little over $1M per year.

Major crops served by the Association include corn, dry beans, alfalfa, grass hay, pasture, small grain and seed crops, fruits, vegetables and a variety of truck crops.

2.3 WATER RIGHTS

The water for the GVPP is diverted from the Colorado River at the Roller Dam and is a part of what's known as the "Cameo Call." The Cameo Call along with water rights of the Shoshone Hydropower Plant upstream in Glenwood Canyon, control administration of the Colorado River basin within Colorado. The flows generated by the "Cameo Call" help provide water for recreational activities, environmental benefits, irrigation, power production, some domestic water, and aesthetics along the entire Colorado River. Flows generated by the Cameo Call also help to fulfill the State of Colorado's obligations under the Colorado River Compact and in maintaining water levels in Lake Powell. Water rights that comprise the Cameo Call are designated for irrigation, power production, and domestic use.

The GVPP is located at the beginning of the 15 Mile Reach designated as critical habitat and provides the legal mechanism to deliver surplus water from Green Mountain Reservoir for the endangered fish. Water rights for the GVPP are owned by the United States and put to beneficial use by the Association and District through the LOPP. The maximum water right of 800 cfs has an appropriation date of February 27, 1908, and was adjudicated in 1934. Depending on conditions, the Power Canal has a capacity of up to 800 cfs. Typically, during irrigation season up to 400 cfs may be used for power production while the remainder is used to power the hydraulic pumps delivering water to the District's irrigation canals. During the non-irrigation season, up to the Power Canal's capacity of about 800 cfs may be diverted solely for power production. Table 3 summarizes the water rights tied to the Cameo Diversion at the Roller Dam.

Owner	Amount	Adjudication Date	Appropriation Date	Use
GVWUA/USA	730	7/22/1912	2/27/1908	Irrigation
GVWUA/USA	400/800	1934	2/27/1908	Hydro-electric Power
GVWUA/USA	220	7/25/1941	2/27/1908	Domestic & Livestock
OMID	450	7/22/1912	10/25/1907	Irrigation
OMID	10.2	7/22/1912	10/1/1900	Irrigation
Palisade Irrigation District	80	7/22/1912	10/1/1889	Irrigation
Palisade Irrigation District	23.5	7/25/1941	6/1/1918	Irrigation
Palisade Irrigation District	40	7/22/1912	7/6/1903	Irrigation

Table 3

2.4 Project Description

2.4.1 Analysis of Alternatives

Under the No Action Alternative, the Sponsors would not build a new power plant and Reclamation would not issue an LOPP. Due to the unfavorable economics of rehabilitating the 90-year-old plant, the existing Grand Valley Powerplant would cease operations. The US Bureau of Reclamation would lose the ability to put their 400 summertime and 800 cfs wintertime power water right to beneficial use, thus putting the water rights at risk. Protection of the hydropower return flows and all other legally available water that can be delivered to the 15 Mile Reach via the powerplant would cease. The loss of these indirect deliveries to the 15-Mile Reach would make it extremely difficult for Reclamation to fulfill its obligations to the Upper Colorado Endangered Fish Recovery Program and threaten ESA compliance for over 2000 Colorado River water diverters.

Rebuilding the existing Grand Valley Power Plant was determined to not be economically viable due to design and permitting requirements. The revenue generated from the limited capacity of the existing power plant were not adequate to rebuild the powerplant to meet USBR requirements and were limited by design and capacity of the historical equipment. It has proven to be much more cost effective to build a replacement 4.5 KWh hydrogenating plant, adjacent the existing power plant, than to restore the existing plant to its original 3.5MWh capacity, and all our efforts in 2020 have been toward that end. Greater power plant capacity expands all the benefits associated with the Power Plant currently and in the future.

2.4.2 Selected Alternative

a. Under the proposed action the Sponsors would build a new power plant and Reclamation would execute an LOPP to permit GVWUA and OMID to construct, operate, and maintain a 4.5 MW hydropower plant and associated facilities adjacent to the retired Grand Valley Project Power plant. The applicant on the LOPP would be Grand Valley Water Users Association and Orchard Mesa Irrigation District. Water which previously flowed through the old powerplant would be directed into the new power plant. The pipeline from the power canal to the powerplant (penstock) would be buried from the power canal to the new power plant.

The new plant will, as does the current plant, operate under a Bureau of Reclamation License of Power Privilege exercising the use of and protecting the 400 cfs irrigation season and 800 cfs non-irrigation season US BOR power water right. The power right water along with any legally available water will be diverted at the GVWUA "Roller Dam" in Debeque Canyon into the Government Highline Canal (GHC) operated by the GVWUA and OMID and then diverted into the OMID "Power Canal" for carriage to the head of the Penstocks at the new plant. Portions of such water then being released from the plant's after bay will be available for Recovery's 15 Mile Reach, administration of the Orchard Mesa Check Case and the physical check itself, and other appropriate and allowable uses.

The new power plant will be operated by Grand Valley Hydro LLC (GVH LLC) ultimately comprised of OMID, GVWUA, and Sorenson Engineering. Initially the LLC will be owned by Sorenson Engineering (SE). After the first year of operation the Sponsors will secure a 20% ownership interest and after five years of operation the Sponsors will be 51% owners. Sorenson Engineering will build the facility, and retain a 49% ownership stake in the Plant. The new Plant will know as the Vinelands Power Plant.

GVH LLC is very close to a Power Purchase Agreement (PPA) with a regional power provider contain favorable terms and conditions making the new plant and GVH LLC economically and operationally feasible and sustainable.

The new Grand Valley Hydroelectric Project will be 4.5 MW and produce approximately 22,380 MWHrs of clean, non-carbon emitting energy annually. The project site is owned by the United States and Orchard Mesa Irrigation District. The project will be interconnected with Xcel Energy and the power wheeled to Holy Cross Energy. A general layout of the site is shown in Figure 2.

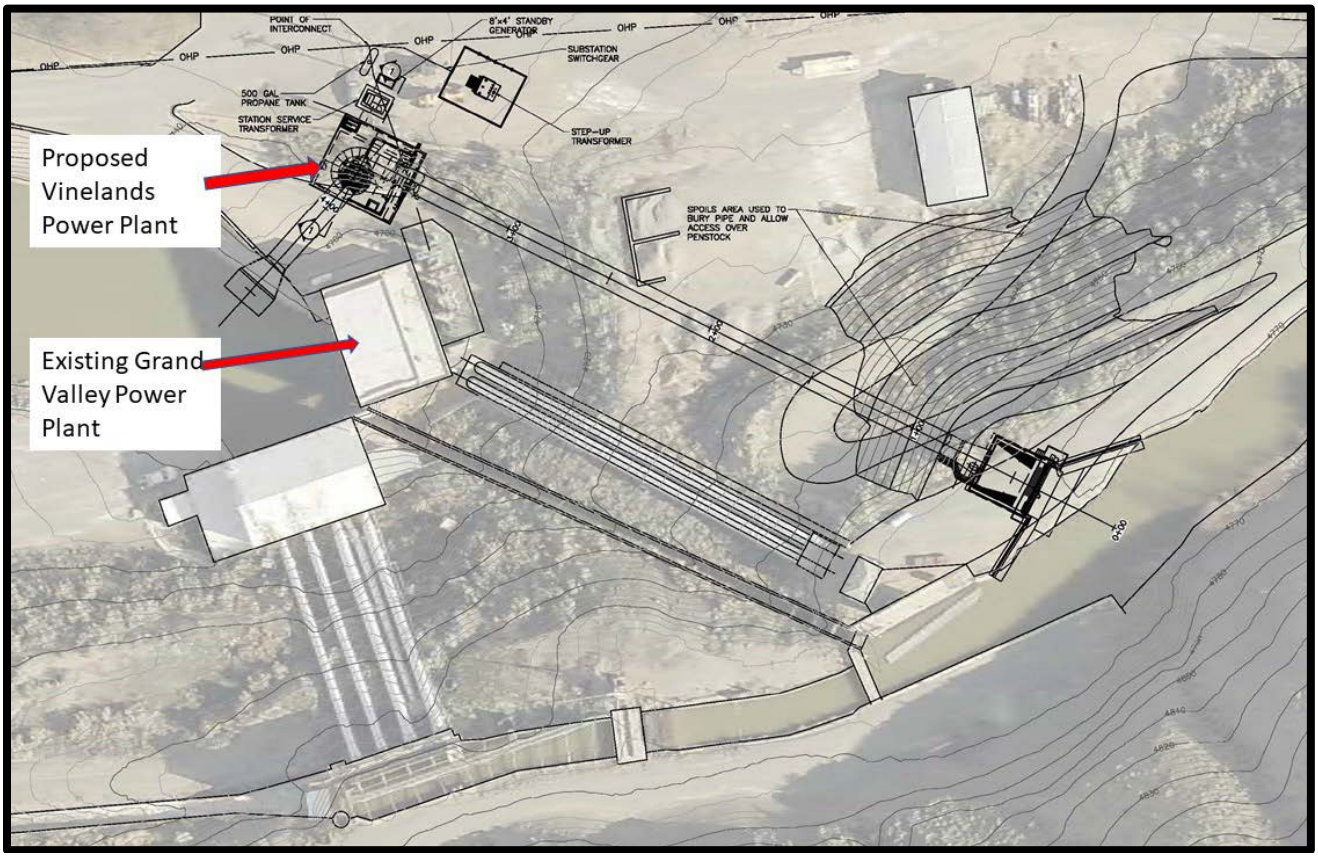


Figure 2 - General Layout of Vinerlands Power Plant

Existing Substation – The existing substation equipment is owned by OMID and is located on OMID property. The existing substation will be removed. A 2016 soil sampling was conducted and there were no Polychlorinated Biphenyl (PCB) and any Volatile Organic Compound (VOC) fell well below the EPAs Regional Screen Levels. Based on the sampling results, no further action concerning hazardous materials was recommended.

Canal System - Water is diverted from the Colorado River at the Grand Valley Diversion Dam into the Government High Line Canal approximately 23 miles Northeast of Grand Junction, Colorado. Approximately 4.6 miles below the diversion dam at the inlet of Tunnel #3, water for the Orchard Mesa Diversion is diverted from the Government High Line Canal. This water passes through the Orchard Mesa Siphon under the Colorado River and then through the Orchard Mesa Power Canal. The water quantity and quality will be unaltered by the hydroelectric power plant.

Siphon Bypass System - The existing, proven siphons will be used to automatically bypass flows in the event the hydroelectric facility shuts down for any reason. The proposed hydroelectric facility will not alter the siphon bypass system.

Intake Structure - The intake structure will be approximately 30’ long by 26’ wide section of new concrete to spread and slow the water. The water will then cross through a UHMW bar screen trashrack to remove debris. It will then enter the 120-inch-diameter penstock pipe which will deliver the water 275-feet-downstream to the powerhouse. Maximum pressure rise during an emergency shutdown is 20 psi. This was considered in the penstock design. A 24’ wide by 14’ high intake roller gate will be installed upstream of the trashrack. This will used to shut off flows to the hydroelectric facility for penstock maintenance.

The new intake structure will be adjacent to the existing intake structure. The existing structure will not be undercut during excavation for the new structure. The base elevation of both structures is 4756.20’.

The new western wing wall will tie into the edge of the existing structure. Dowel bars will be smooth round bars confirming to ASTM A 315/A 615M, Grade 60 or equivalent.

Ice management in this area has been a problem in the past. The OMID Manager, Max Schmidt has been successfully operating the existing facility (and ice management) since 2011 and will continue to do so with the proposed hydroelectric project. The proposed project is not anticipated to negatively impact ice management. The new trashrack will be constructed of UHMW to reduce potential ice issues.

Powerhouse - The powerhouse will be a 40’ wide by 36’ long steel building structure with a steel reinforced concrete foundation. The foundation will embed the turbine housing and steel draft tube. The draft tube extends approximately 65’ into the existing tailrace. The building will house the generator and mechanical/electrical auxiliaries. The building will be equipped with a roof access hatch to facilitate future maintenance.

Containment for any accidental spills inside the powerhouse will be contained by floor drains that go to an oil-water separator and sized according to NFPA 851 section 5.5.2.

Turbine - The turbine will be a vertical double regulated Kaplan. The Turbine will be of American/European design built in China, as will be the generator. The turbine manufacturer is represented by Far East Engineering of Boise, Idaho.

These Kaplan units have been installed in the United States by the Twin Falls Canal Company near Hansen Idaho, the Boise Project Board of Control in Ada County, Idaho, and the Uncompahgre Valley Water Users Association in Montrose, Colorado. Sorenson Engineering has ordered and installed 21 generation units from Mr. Lianggao Liu.

Turbine	Kaplan
Wicket Gates	Yes
Arrangement	Vertical
Rated Flow	800 cfs
Rated Head	75 ft
Speed	211 RPM
Rated Runway Speed	380 RPM

Generator-

Generator	Synchronous
Rated Speed	211 RPM
Rated Output	4.5 MW
Service Factor	0.9
Exciter	Brushless
Frequency	60 Hertz
Voltage	4,160 Volts

Mechanical Equipment - The turbine wicket gates will operate hydraulically. The hydraulic power unit will be of American make – with accumulators for black shutdown. The governor will be digital. The intake roller gate will be fitted with DC electric power by motor to drive the pinion gears. Level sensors (differential pressure) in the intake forebay will be utilized to provide information to the powerhouse PLC (programable logic controller) to maintain constant head in the upstream forebay and thus in the feeder canal.

Powerhouse Electrical Controls - The controls will be utility grade. The switchgear will be backed by 125 volt DC service battery system for operation of essential features during power outages, specifically turbine shutdown and maintenance of flow in the canal system including the bypass roller gate. The control panel will be fitted with an automatic telephone dialer to alert of alarm conditions. A dial in signal will allow remote monitoring of the plant including critical variables (bearing temperature, voltage etc.) from any telephone.

Transformers – There will be two new outdoor oil-insulated transformers to the side of the powerhouse. The step-up transformer will be 5 MVA, 4,160 volts to 13,200 volts. The station service transformer will be 480 volts.

The station service transformer has less than 50 gallons of oil, and the step-up transformer has approximately 1,200 gallons of oil. The U.S. Bureau of Reclamation design standard 3-32 (Transformer Fire Protection 2005), recommends compliance with FM Global datasheet 5-4. Both transformers will meet these separation requirements.

The transformers will have concrete retention areas with a storage volume at least 1.5 times the volume of oil within the transformer per U.S. Code of Federal Regulations, Title 40 (CFR 40), Parts 110 and 112.

Substation and Transmission Line - The power will be interconnected to Xcel Energy and sold to Holy Cross Energy. It may be possible to use the existing power lines from the existing power plant to connect to Xcel Energy's transmission system. If these power lines are insufficient, it may be necessary to upgrade the power line from the power plant to Xcel Energy's Palisade Substation, approximately 0.5 miles away. If it is not possible to upgrade the existing power line, a new transmission line would be constructed to the Palisade Substation. The transmission line will be constructed on 40-foot poles with a pole spacing of approximately 300 feet. The transmission line will follow the north power canal O&M road east to 38-3/8 Road. It will turn north and go up the east side of 38-3/8 Road to the existing Palisade Substation.

Figure 3 - Possible transmission line route

A switchyard will be constructed at the powerhouse with a transformer capable of stepping up the power generated at 4,160 V to the interconnection voltage of 13.2 kV.

Operation and Maintenance

The Sponsors would operate and maintain the proposed hydropower facility. Sorenson Engineering would provide overall management of the facility. The facility would be controlled within the plant by an isolated automated computer (unmanned) system fitted with a telephone dialer to allow remote monitoring of the plant, including critical variables (temperature, voltage, etc.). This dialer will automatically alert the operators of critical conditions, such as the generator turning on or off, changes in temperature of bearings, generator, and cooling water, and canal water intake levels.

HYDROLOGY

Daily flow data for the existing power plant is available from 2004 through 2019. This was refined because the deteriorating facility did not utilize the full water right available to the hydro. To correct this, theoretical canal flow data was calculated by applying the full water right to the historical Colorado River flows at Grand Valley Diversion Dam (power plant canal diversion). These two flow datasets were combined to create a more precise projection.

The total number of irrigated acres below the hydroelectric facility has remained constant over the past and is projected to remain constant in the future. Flows in the canal system will not be altered by the hydroelectric facility.

ENERGY PROJECTION

Historical diversions were used to estimate the energy available if the hydroelectric facility were in place during past years. The model utilizes the flow data described in the Hydrology Section above for each of the years evaluated. The average turbine efficiency will be approximately 88%, the generator efficiency will be approximately 95%. Table 4 shows the summary for the energy production. The average annual generation is 22,380 MWHrs.

Table 4

New Vinelands Hydroelectric Production (MWHrs)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual Total
2004	2,904	2,717	1,968	1,640	1,404	1,257	1,311	1,238	1,269	1,700	1,874	2,904	22,185
2005	2,904	2,623	1,968	1,647	1,443	1,318	1,379	1,358	1,380	1,740	1,874	2,904	22,539
2006	2,904	2,623	1,968	1,697	1,430	1,285	1,382	1,351	1,398	1,632	1,874	2,904	22,449
2007	2,904	2,623	1,968	1,708	1,568	1,345	1,424	1,483	1,586	1,531	1,874	2,904	22,919
2008	2,904	2,717	1,968	1,430	1,527	1,408	1,442	1,435	1,464	1,818	1,874	2,904	22,891
2009	2,904	2,623	1,968	1,744	1,481	1,382	1,425	1,403	1,416	1,763	1,874	2,904	22,887
2010	2,904	2,623	1,968	1,595	1,498	1,407	1,435	1,456	1,453	1,792	1,874	2,904	22,911
2011	2,904	2,623	1,968	1,437	1,501	1,299	1,417	1,397	1,467	1,732	1,874	2,904	22,524
2012	2,904	2,717	1,968	1,636	1,529	1,347	1,224	1,099	1,118	1,170	1,874	2,866	21,451
2013	2,904	2,623	1,968	262	1,318	1,336	1,297	1,398	1,477	1,824	1,874	2,904	21,185
2014	2,904	2,623	1,968	1,564	1,483	1,379	1,406	1,573	1,456	1,549	1,874	2,904	22,683
2015	2,904	2,623	1,968	1,768	1,607	1,488	1,446	1,394	1,513	1,856	1,874	2,904	23,345
2016	2,904	2,717	1,968	1,689	1,518	1,433	1,363	1,360	1,313	1,604	1,874	2,904	22,647
2017	2,904	2,623	1,968	1,594	1,439	1,368	1,349	1,358	1,462	1,392	1,874	2,904	22,237
2018	2,904	2,623	1,968	1,610	1,468	1,372	1,289	1,208	876	1,056	1,874	2,904	21,151
2019	2,904	2,623	1,968	1,257	1,449	1,324	1,377	1,324	1,412	1,695	1,874	2,904	22,111
Average	**2,904**	**2,647**	**1,968**	**1,517**	**1,479**	**1,359**	**1,373**	**1,365**	**1,379**	**1,616**	**1,874**	**2,902**	**22,382**

2.4.3 Cost Estimate

Table 5

Grand Valley Hydro Summary Costs 10-6-20

Bid Item	Description	Qty	Unit	Totals
1	**Division 1 - Direct Job Expenses**			
	MSH Project Deveoplment	1	LS	$ 8,092
	MSH Project Manager during construction	1	LS	$ 101,147
	MSH Superintendent during construction	1	LS	$ 72,826
	MSH Subsistance (Crew and Mangement)	1	LS	$ 323,125
	Equipment Fuel, oil, gease, and manintenance	1	LS	$ 68,650
	Forklift, air compressor, dust control, light plants, welder	1	LS	$ 72,151
	Office Trailer, connex, garbabge dumpster, tempoary toilets, water, copi	1	LS	$ 32,350
	Cell phone, Temporary Internet, Computers	1	LS	$ 4,900
	Mobe and Demobe equipment	1	LS	$ 48,589
	Temporary electricity charges	1	LS	$ 10,000
	Safety Equipment	1	LS	$ 2,500
	Continous jobsite cleanup	1	LS	$ 23,858
	Surveying	1	LS	$ 15,000
	Misc. Hardware	1	LS	$ 10,000
	Sorenson Engineering Design	1	LS	$ 500,000
	Sorenson Engineering On-Site Engineering and Testing	1	LS	$ 370,000
	Sorenson E+O Policy	1	LS	$ 17,137
	Sorenson Development Cost	1	LS	$ 150,000
2	**Division 2 - Sitework**			$ -
	Excavation and Grading	1	LS	$ 717,413
	Cofferdam	1	LS	$ 22,560
	Dewatering	1	LS	$ 102,328
	Site BMP's	1	LS	$ 4,000
	Road Maintenance	1	LS	$ 10,000
	Crane Pads	1	LS	$ 6,180
	Snow Removal	1	LS	$ 9,361
	Reseeding	1	LS	$ 2,400
	PH Trench Drain	1	LS	$ 7,815
	Bollards	1	LS	$ 8,572
	Oil / Water Seperator	1	LS	$ 17,494
3	**Division 3 - Concrete**			$ -
	Concrete Form, place and strip	1	LS	$ 307,437
	Concrete	1	LS	$ 419,369
	Pump Concrete			
	Cold Weather Protection	1	LS	$ 23,560
	Rebar	1	LS	$ 346,560
	Sales Tax on Material	1	LS	$ 6,000
5	**Division 5 - Misc. Metals**			$ -
	Intake Braces	1	LS	$ 2,081
8	**Division 8 - Doors, Hardware and Windows**			$ -
	Overhead Door and Man Doors	1	LS	$ 9,290
9	**Division 9 - Finishes**			$ -
	Painting Turbine/Generator and Misc Metals	1	LS	$ 27,822
10	**Division 10 - Specialty Items**			$ -
	Signage and Fire Extingushers	1	LS	$ 1,921
13	**Division 13 - Pre-Engineered Building**			$ -
	Pre-Engineered Metal Building	1	LS	$ 100,824
	Powerhouse Propane Tanks and Heaters	1	LS	$ 18,251
14	**Division 14 - Turbine Installation & Canal Gates**			$ -
	Purchase Turbine and Generator	1	LS	$ 1,660,000
	Turbine Ancilary Parts and Taxes	1	LS	$ 15,000
	Turbine Oil	1	LS	$ 10,000
	Terrif on Turbine	1	LS	$ 100,000
15	**Division 15 - Mechanical**			$ -
	Riverside (Install Turbine and Generator, Stop Log Gates)	1	LS	$ 703,600
	Outside Rent Crane for Turbine Installation	1	LS	$ 69,000
	Purchase Penstock	1	LS	$ 262,500
	Intake Reducer with vent stack	1	LS	$ 40,500
	Penstock Welding	1	LS	$ 24,000
	Penstock Weld Testing	1	LS	$ 8,000
	Penstock Heat Shrink Wrap / Paint joists / Assist with setting Penstock	1	LS	$ 19,159
16	**Division 16 - Electrical**			$ -
	Engineering	1	LS	$ 10,000
	Controls and Switchgear	1	LS	$ 275,000
	Powerhouse Electrical	1	LS	$ 256,680
	Interconnect to public utility			$ 900,000
	Electrical Contingency	1	LS	$ 15,000
	Stand-by Generator	1	LS	$ 30,000
	Base Bid Total			**$ 8,400,000**

2.4.4 Implementation Schedule

Task/Milestone	Start	Finish
Power Purchase Agreement with Holy Cross	June 2020	Nov 2020
Interconnect Agreement with XCEL Energy	July 2020	Nov 2020
Lease of Power Privilege with US Bureau of Reclamation	Aug 2020	Jul 2020
Order Turbine and Generator	Dec 2020	
Order Pipe	Mar 2021	
Mobilize to Site	Sept 2021	
Excavate Powerhouse	Nov 2021	Dec 2021
Excavate Intake	Dec 2021	Jan 2022
Excavate Penstock	Jan 2022	Feb 2022
Install Intake Gate	Mar 2022	Mar 2022
Install Station Service (new transformer)	Mar 2022	Mar 2022
Construct Powerhouse	Dec 2021	Oct 2022
Construct Intake	Jan 2022	Mar 2022
Place and Weld Penstock	Mar 2022	July 2022
Erect Powerhouse Building	June 2022	July 2022
Install Turbine and Generator	July 2022	Sept 2022
Mechanical/electrical auxiliaries	Mar 2022	Sept 2022
Install New Step-up Transformer (5MVA)	Aug 2022	Sept 2022
Install New Interconnect with XCEL Energy (recloser anticipated)	Aug 2022	Sept 2022
Testing and Commissioning		Oct 2022

Table 6

2.4.5 Impacts

Hydropower is increasingly being recognized for its reliable, carbon-free contributions to the grid – with projects like this on existing water infrastructure having minimal environmental impacts. Producing 22,380 MWHrs annually of carbon-free energy is the equivalent of offsetting approximately 35,000 tons of coal every year.

The Upper Colorado River Endangered Fish Recovery Program was established to help bring four species of endangered fish back from the brink of extinction. One of the Recovery Implementation Program's primary components are reliable river flows to the 15-Mile Reach which host fish on the Endangered Species List. The on-going operation of this power plant is critical to the delivery of water to the 15-Mile Reach of the Colorado River and the ongoing recovery of endangered fish species. The project will ensure the continued delivery of water to the hydroelectric facility which, because of its location and the water rights decreed for its operation, sustains critical river flows. The

power water right, which returns water to the river after passing through the power plant, is a crucial component of Reclamations activities to avoid jeopardizing the continued existence of four species of fish listed under the Endangered Species Act.

2.4.6 Institutional Feasibility

Sorenson Engineering is a partner in the new hydro plant. For tax purposes the arrangement that makes this project works for Sorenson, and consequently, the Sponsors, requires that Sorenson is 100% "at risk" for the first year. The Sponsors are purchasing an option to buy into the power plant before construction begins. Once the Option fee is paid, Sorenson must offer the Sponsors the opportunity to buy 20% interest in the power plant after 1 year of operation. Then after 5 years of operation, Sorenson must offer the Sponsors the option to buy an additional 31% interest. In the end, the Sponsors will own 51% of the power plant. The option 1 and option 2 amounts are fixed at the beginning of construction.

On day 1 of operation, the power plant is 100% owned by Grand Valley Hydro, LLC. However, until the Sponsors exercise their purchase options, Sorenson is the only member of the LLC. At year one, Sorenson will be 80% owner and Sponsors 20%. At five years, ownership will be 49% Sorenson, 51% Sponsors. This arrangement puts Sorenson "at risk" during the first year of operation as required by the IRS. It is this arrangement that makes the economics work for Sorenson.

The primary purpose of the Sponsors is to operate and maintain our irrigation systems. This power plant arrangement provides the necessary Sponsor control of the irrigation systems and provides a method to pay for and finance the new power plant without over extending our financial obligations.

2.5 Financial Feasibility Analysis

1. Loan amount, term and rate

Funds required	$1,231,398
Contingencies (30%)	368,602
Total loan required	$1,600,000
Term	20 years
Rate	2% per year

Table 7

2. Financing sources

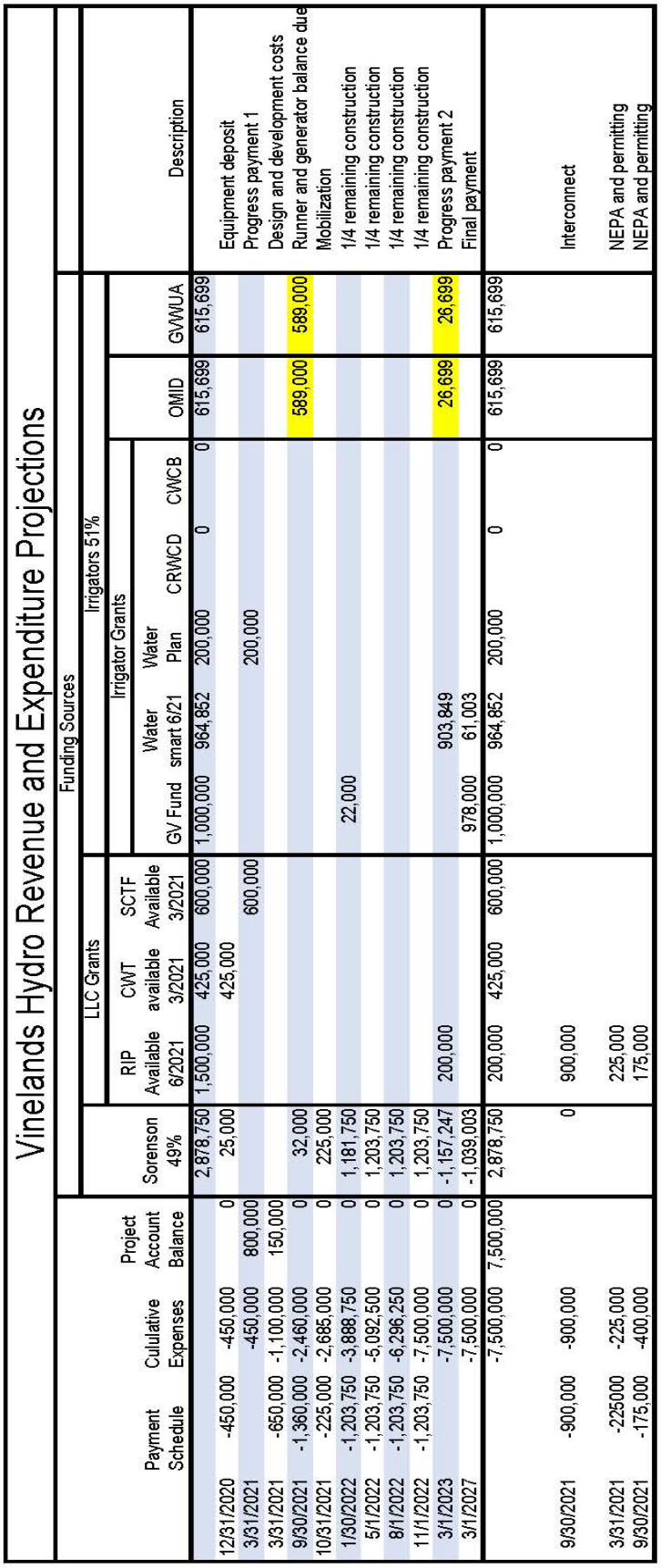
Vineland Power Plant Financing Sources	
$8,400, 000	Total project budget inc. design, construction, project management
1,500,000	Recovery Program Grant (secured and in progress)
600,000	CWCB Species Conservation Trust Fund Grant (secured and in progress)
425,000	Colorado Water Trust Grant (secured and in progress)
200,000	November 10 Alex Funk CWCB Water Plan contribution
2,878,750	Sorenson Engineering Cash for 49% equity in GVH LLC
$2,796,250	Required cash and debt by OMID and GVWUA required for construction scope
200,000	Remaining OMID and GVWUA regulatory compliance
200,000	Reaming OMID and GVWUA legal, professional, and administrative expenses
$3,196,250	Total OMID and GVWUA funding needs
$1,000,000	Grand Valley Fund (local irrigators plus Ute Water) grant to OMID and GVWUA
$964,852	Reclamation WaterSMART Grant (WEEG) we are optimistic
$1,231,398	Total loan required by both Sponsors without contingencies
$625,699	GVWUA loan without contingencies
$625,699	OMID loan without contingencies

Table 8

$858,000 due diligence cash expense and OMID and GVWUA in-kind costs are not included in the GVH LLC Power Plant budget outlined below and reimbursement **is not** being requested. Orchard Mesa Irrigation District (OMID) and the Grand Valley Water Users Association (GVWUA) have been working on plans to rehabilitate or replace the Grand Valley Power Plant since 2014. OMID and GVWUA have spent nearly $400,000 in cash reserves and over 3000 man-hours as of January 2020 to leverage $458,000 in accumulated Extraordinary Maintenance revenues generated by the existing power plant and held by the Bureau of Reclamation (BOR) to get the project to this point. OMID and the GVWUA expect to invest another $400,000 cash in the project and will continue to spend hundreds of hours working to make this Project a reality.

3. Revenue and Expenditure Projections

   Based upon Sorenson Engineering's experience with similar power plant across the west and particularly in western Colorado, Sorenson's financial involvement in the project provides confidence in the overall project costs. If contingencies are necessary, the payment amounts are financially feasible.



Vinelands Hydro Revenue and Expenditure Projections

Payment Schedule		Cululative Expenses	Project Account Balance	Sorenson 49%	Funding Sources: LLC Grants: RIP Available 6/2021	LLC Grants: CWT available 3/2021	LLC Grants: SCTF Available 3/2021	Irrigators 51%: Irrigator Grants: GV Fund	Water smart 6/21	Water Plan	CRWCD	CWCB	OMID	GVWUA	Description
				2,878,750	1,500,000	425,000	600,000	1,000,000	964,852	200,000	0	0	615,699	615,699	
12/31/2020	-450,000	-450,000	0	25,000		425,000									Equipment deposit
3/31/2021		-450,000	800,000				600,000			200,000					Progress payment 1
3/31/2021	-650,000	-1,100,000	150,000										589,000	589,000	Design and development costs
9/30/2021	-1,360,000	-2,460,000	0	32,000											Runner and generator balance due
10/31/2021	-225,000	-2,685,000	0	225,000											Mobilization
1/30/2022	-1,203,750	-3,888,750	0	1,181,750				22,000							1/4 remaining construction
5/1/2022	-1,203,750	-5,092,500	0	1,203,750											1/4 remaining construction
8/1/2022	-1,203,750	-6,296,250	0	1,203,750											1/4 remaining construction
11/1/2022	-1,203,750	-7,500,000	0	1,203,750											1/4 remaining construction
3/1/2023		-7,500,000	0	-1,157,247	200,000				903,849				26,699	26,699	Progress payment 2
3/1/2027		-7,500,000	0	-1,039,003				978,000	61,003						Final payment
		-7,500,000	7,500,000	2,878,750	200,000	425,000	600,000	1,000,000	964,852	200,000	0	0	615,699	615,699	
9/30/2021	-900,000	-900,000		0	900,000										Interconnect
3/31/2021	-225000	-225,000			225,000										NEPA and permitting
9/30/2021	-175,000	-400,000			175,000										NEPA and permitting

4. Loan Repayment Sources – Loan repayment will be accomplished through generation revenue. Net Annual Gross revenue is the revenue generated after operational cost and debt service, but before organization administrative expenses. Revenue generated by the new power plant was estimated using historical flow data rather than theoretical plant capacity. This should provide a conservative estimate of generation capacity. The historical flow data partially included water conservation efforts that can increase available capacity to the power plant, but with historical and on-going water conservation efforts, additional capacity to deliver water to the power plant will improve. As entities provide additional water to protect endangered fish flows, that water will be used to protect those deliveries, generate more hydropower and provide revenue stream protection.

Year	Year	Price per MWHr	Average Generation MWHr	Average Gross Revenue	Annual O&M	Debt Service	Net Annual Gross Revenue
1	2022	$39.07	22,380	$ 874,387	$ 284,000	$ 97,851	$ 492,536
2	2023	$40.05	22,380	$ 896,246	$ 289,680	$ 97,851	$ 508,716
3	2024	$41.05	22,380	$ 918,652	$ 295,474	$ 97,851	$ 525,328
4	2025	$42.07	22,380	$ 941,619	$ 301,383	$ 97,851	$ 542,385
5	2026	$43.13	22,380	$ 965,159	$ 307,411	$ 97,851	$ 559,898
6	2027	$44.20	22,380	$ 989,288	$ 313,559	$ 97,851	$ 577,878
7	2028	$45.31	22,380	$ 1,014,020	$ 319,830	$ 97,851	$ 596,340
8	2029	$46.44	22,380	$ 1,039,371	$ 326,227	$ 97,851	$ 615,293
9	2030	$47.60	22,380	$ 1,065,355	$ 332,751	$ 97,851	$ 634,753
10	2031	$48.79	22,380	$ 1,091,989	$ 339,406	$ 97,851	$ 654,732
11	2032	$50.01	22,380	$ 1,119,289	$ 346,194	$ 97,851	$ 675,244
12	2033	$51.26	22,380	$ 1,147,271	$ 353,118	$ 97,851	$ 696,302
13	2034	$52.54	22,380	$ 1,175,953	$ 360,181	$ 97,851	$ 717,921
14	2035	$53.86	22,380	$ 1,205,352	$ 367,384	$ 97,851	$ 740,117
15	2036	$55.20	22,380	$ 1,235,485	$ 374,732	$ 97,851	$ 762,903
16	2037	$56.59	22,380	$ 1,266,373	$ 382,227	$ 97,851	$ 786,295
17	2038	$58.00	22,380	$ 1,298,032	$ 389,871	$ 97,851	$ 810,310
18	2039	$59.45	22,380	$ 1,330,483	$ 397,669	$ 97,851	$ 834,963
19	2040	$60.94	22,380	$ 1,363,745	$ 405,622	$ 97,851	$ 860,272
20	2041	$62.46	22,380	$ 1,397,838	$ 413,734	$ 97,851	$ 886,253
21	2042	$64.02	22,380	$ 1,432,784	$ 422,009		$1,010,775
22	2043	$65.62	22,380	$ 1,468,604	$ 430,449		$1,038,155
23	2044	$67.26	22,380	$ 1,505,319	$ 439,058		$1,066,261
24	2045	$68.94	22,380	$ 1,542,952	$ 447,839		$1,095,113
25	2046	$70.67	22,380	$ 1,581,526	$ 456,796		$1,124,730
26	2047	$72.43	22,380	$ 1,621,064	$ 465,932		$1,155,132
27	2048	$74.24	22,380	$ 1,661,590	$ 475,251		$1,186,340
28	2049	$76.10	22,380	$ 1,703,130	$ 484,756		$1,218,374
29	2050	$78.00	22,380	$ 1,745,708	$ 494,451		$1,251,258
30	2051	$79.95	22,380	$ 1,789,351	$ 504,340		$1,285,011
O&M Escalation =			2%				
Revenue Escalation			2.5%				
Holy Cross Contract			20 year	Assume edxisting indecx after 2043			

Table 9

5. Financial Impacts - It has been the goal of the Orchard Mesa Irrigation District and Grand Valley Water Users Association Board of Directors since beginning this replacement project several years ago to do so in a way that does not jeopardize the financial well-being of either organization. Net revenue generated after expenses, appropriate reserves, and debt service can be used to assist in funding improvements in infrastructure appurtenant to the Roller Dam and Canyon Canal facilities that serve several Grand Valley irrigation companies in the Grand Valley and to the other infrastructure needs of the Orchard Mesa Irrigation District and the Grand Valley Water Users Association.

6. Tabor – Does not apply to the Sponsors.

7. Collateral – The revenue stream will be used as collateral.

8. Sponsor Credit worthiness – The last 3 years of financial reports are attached.