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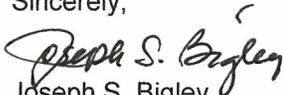
Dear Stacy:

Attached, please find my final reimbursement request (Claim for Reimbursement) for the ACRE grant awarded to us this year for the micro-hydro project and the accompanying Final Project Report (2 copies). The project is complete and we've generated 7,629 KWH this year. The system is not operating at the current time; having to shut-off the ditch for the winter. I've included both invoices and a copy of cancelled checks on my bank statement as proof of payment as required by the contract.

Of course, this project turned out to be more work than originally anticipated and while we didn't generate as much power this year as I would of liked; a lot was learned that should help increase output next year. Overall, I'm very satisfied with the project, as I hope you and your agency are. Without the help and support of this grant program, this project would not of been accomplished.

Again, thanks for your support and help! As always, should you have any comments, suggestions or questions, please don't hesitate to drop me an email or give me a call.

Sincerely,


Joseph S. Bigley
Manager

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Final Project Report

a. Project Overview: The project installed a structure in an irrigation ditch to provide a means of diverting water to be used not only for irrigation but for generating hydro electric power from the same 1.0 cfs of water rights. A 750 foot - eight inch pipeline was installed from the Ecklar Ditch with a drop of approximately 110 feet to an irrigation pond. At the bottom of the pipeline just before the pond; a “pump” house was built containing two hydro electric turbines and associated electrical generating equipment. Two electrical lines were run from the power generating equipment to the LPEA (La Plata Electric Association, the local power company) electric meter and connected to the power grid. The LPEA meter was changed to a “NET” meter. Power was generated from the hydro electric turbine driven by 1.0 cfs from the Ecklar Ditch and then used for field irrigation and watering of livestock.

b. Lessons learned and recommendations:

- ◆ Consistency of water supply was a challenge. Water to irrigate does not require the same consistency of supply as is needed for hydro electric power generation. Power generation is dependent on the amount of pressure generated and works best with a consistent supply. Breaks in the ditch, upstream ditch partner usage, blockages and source water levels all affect the amount of water in the ditch, and hence, the amount of pressure generated. In order to maintain maximum power generation, I found it necessary to gauge the amount of water in the ditch and adjust the pressure nozzles on a daily basis. I also found it necessary to spend several days “repairing” the upstream Ecklar ditch to maximize water flow so I could obtain my full 1.0 cfs.
- ◆ I think it is important to have “hydro electric power generation” added to “approved uses” of water rights in advance. This will eliminate any tense moments with upstream ditch partners. This requires a water rights attorney and should be a part of project costs. It cost me \$2,000 for an uncontested change in my water rights and I am still in the process of having the change made.
- ◆ Most electrical contractors are not familiar with this type of power generation and how to wire for same. The project was delayed due to the original electrical contractor (who agreed to do the work) backed out of the project at the last minute saying he was not familiar with what we were trying to do and didn’t feel comfortable with the job. Finding another electrical contractor was not easy and eventually had to turn to the turbine vendor for recommendations.
- ◆ Original estimates were for 8.0 kwh generated while the turbines are running (the theoretical maximum for the turbines selected). As you will see in the cost/benefit analysis; actual maximum was 6.1 kwh and there is a significant amount of time when substantially less power is generated due to water supply inconsistencies. However, with the experience gained this year, I expect to generate a maximum of 7.0 kwh once the system is “tuned” and expect to have less power “down” times. Any estimates for power generation should take into considerations these factors.

c. Cost/benefit analysis covering the first 3 months of operation and projections for the first year of operations: See the Cost Benefit Analysis Worksheet attached to this report for a detailed analysis. For analysis purposes, power generation is grouped into four categories that averages the KWH (Kilo Watts/Hour) for each day. The timeframe for the first 3 months of operation includes 14 days of non-operation due to the Ecklar Ditch being shut-off on November

1 for the winter. The balance of the operating period generated 7,629.6 KWH. Taking into consideration power usage (which actually is a savings) and income generated from NET metering, the system generated \$541.75 for the three months. Making some adjustments due to the experience garnered this year, it is expected that we will generate 21,600 KWH in 2009. Again, taking into consideration power usage (for the full year since NET metering is billed on an annual basis) and NET metered power, it is expected we will produce \$1,655.18 for the full year of 2009. These calculations do not take into consideration any tax consequences.

With the 2009 expected income generation above and the installation/equipment costs associated with getting the system up and running of \$38,468.79, the system payback is 23.2 years. When the funding provided by the USDA ACRE grant is taken into account (\$29,532.49), the payback period is 5.4 years.

Based on this analysis, the project is very worthwhile when grant funding is provided. Without grant funding, this project probably does not make sense.

d. Notable successes and/or accomplishments:

- ◆ The first successful hydro electric power generation project in the region; per LPEA even though they have had several applications.
- ◆ Obtained the full amount of water through the Ecklar Ditch as allocated at the Elk View Ranch property line for the first time in at least three years.

e. Before and after pictures: BEFORE



e. Before and after pictures: AFTER



f. Final accounting of project expenditures:
i. Funds from CAVADB Energy Grants Program
ii. Matching cash and in-kind contributions

The attached Final Accounting Worksheet provides an analysis of Expenses by Category, Funding Sources (including Grant funding, matching cash and in-kind contributions) and Budget/Actual Comparisons for each Reimbursement Request and for the total project. The project was \$1,109.21, or 2.8% under budget when accounted for on a cash basis (\$38,468.79 spent versus budgeted expenses of \$39,578). The split of ACRE funding and the matching funds was determined by calculating the original percentage split and carrying the amounts forward for expenditures.

Elk View Ranch
Cost Benefit Analysis Worksheet

Three Month Usage Experience - August 15 to November 15

(Note: Ecklar ditch was shut-off on November 1 for winter)

<u>Power Generation</u> <u>(KiloWatts/Hour Average)</u>	<u>Number of</u> <u>Days</u>	<u>Percent</u>	<u>Total</u> <u>KWH</u>
6.10	35	38.04%	5,124.00
3.00	24	26.09%	1,728.00
1.80	18	19.57%	777.60
0.00	15	16.30%	0.00
Totals	92	100.00%	7,629.60

<u>Power Usage/Income</u>	<u>KWH Used/</u> <u>Generated</u>	<u>Average KWH</u>	<u>Rate</u>	<u>Savings/</u> <u>Income</u>
Usage	2,428.80	1.100	\$0.101	\$245.31
"Net" Income	5,200.80	2.355	\$0.057	\$296.45
Total	7,629.60	3.455		\$541.75

Estimated Cost Benefit Analysis for 2009

(Approximate dates of operation: May 1 to November 1)

184 days

<u>Power Generation</u> <u>(KiloWatts/Hour Average)</u>	<u>Number of</u> <u>Days</u>	<u>Percent</u>	<u>Total</u> <u>KWH</u>
7.00	92	50.00%	15,456.00
4.00	50	27.17%	4,800.00
2.00	28	15.22%	1,344.00
0.00	14	7.61%	0.00
Totals	184	100.00%	21,600.00

<u>Power Usage/Income</u>	<u>KWH Used/</u> <u>Generated</u>	<u>Average KWH</u>	<u>Rate</u>	<u>Savings/</u> <u>Income</u>
Usage (full year)	9,636.00	1.100	\$0.101	\$973.24
"Net" Income (balance of KWH)	11,964.00	2.709	\$0.057	\$681.95
Total	21,600.00	3.809		\$1,655.18

Installation Costs - Total Capital	\$38,468.79	Payback (yrs.)	23.2
Installation Costs less USDA Grant	\$8,936.30	Payback (yrs.)	5.4

Elk View Ranch
Final Accounting Worksheet

<u>Expenses by Category</u>	<u>May Report</u>	<u>June Report</u>	<u>Aug. Report</u>	<u>Nov. Report</u>	<u>Total</u>	<u>Total Project</u>
	<u>Cash Expense</u>	<u>Cash Expense</u>	<u>Cash Expense</u>	<u>Cash Expense</u>	<u>Cash</u>	<u>In-Kind</u>
					<u>Expenses</u>	<u>Contribution</u>
Consultant Fees			\$175.00		\$175.00	
Salaries & Personnel	\$1,040.00	\$5,195.00	\$3,969.67	\$522.50	\$10,727.17	\$3,175.00
Supplies	\$1,915.34	\$8,311.04	\$1,455.42		\$11,681.80	
Equipment Costs	\$8,000.00		\$5,384.82	\$2,500.00	\$15,884.82	
Report Production Costs					\$0.00	\$437.50
Total	\$10,955.34	\$13,506.04	\$10,984.91	\$3,022.50	\$38,468.79	\$3,612.50

<u>Funding Source</u>						
USDA ACRE Grant Amount	\$8,250.00	\$10,368.92	\$8,238.68	\$2,674.89	\$29,532.49	
RealTime Matching Amount	\$2,705.34	\$3,137.12	\$2,746.23	\$347.61	\$8,936.30	\$3,612.50
Total	\$10,955.34	\$13,506.04	\$10,984.91	\$3,022.50	\$38,468.79	\$3,612.50

<u>Budget/Actual Comparison</u>	<u>Budgeted</u>		<u>Actual</u>		<u>Cash</u>	<u>Budget/Actual</u>
	<u>Funding</u>	<u>Percent</u>	<u>Expenses</u>	<u>Percent</u>	<u>Percent</u>	<u>Variance</u>
USDA ACRE Funding	\$30,385.00	76.77%	\$29,532.49	70.18%	76.77%	-\$852.51
RealTime Matching Funds	\$9,193.00	23.23%	\$8,936.30	21.24%	23.23%	-\$256.70
RealTime In-Kind Contribution	\$0.00		\$3,612.50	8.58%		\$3,612.50
Total Cash	\$39,578.00		\$38,468.79			-\$1,109.21
Total Expenses (cash+in-kind)	\$39,578.00	100.00%	\$42,081.29	100.00%	100.00%	