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WaterSMART: Water and Energy Efficiency Grants for
FY2015 – Funding Group I

Santa Cruz Irrigation District No. 15

Shotcrete Lining of the N-Canal,
Installation of Variable Frequency Drive at Pump 15,
Wind Powered Alternative at Pump 15,
Refuge Outlet and Water Marketing

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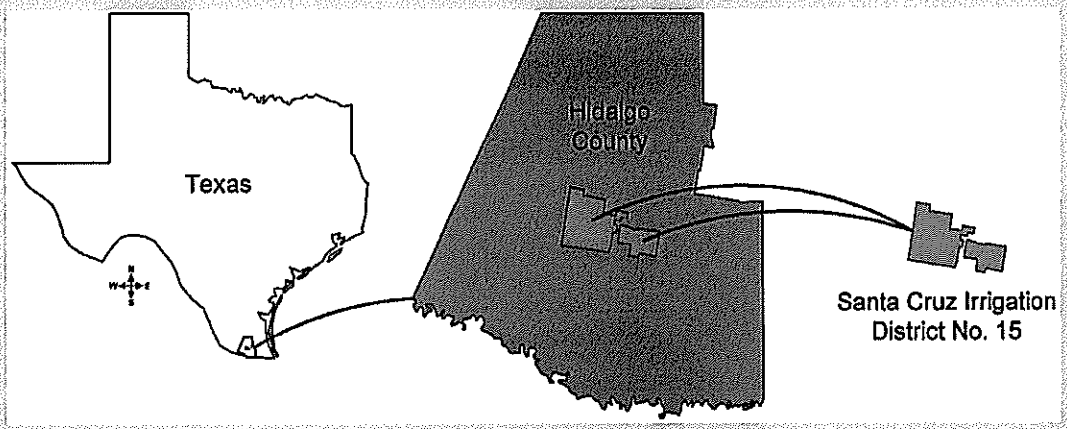

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(1) Technical Proposal: Executive Summary

Date: January 8, 2015
Applicant: Santa Cruz Irrigation District No. 15
601 FM 1945, Edinburg
Hidalgo County, Texas

The Santa Cruz Irrigation District No. 15 is proposing a Funding Group I Project to conserve water and energy. The project will result in conservation of 951 Ac.-Ft. per year of water and 222,680 KW-H per year of conventional energy. The Project accomplishes Task "A" Water Conservation by Shotcrete lining of 7,265 Ft. of the N-Canal resulting in the conservation of 951 Ac.-Ft. per year. Task "B" Energy Water Nexus is achieved in three ways. By simply conserving water, the District no longer has to pump the conserved water resulting in conservation of 136,204 KW-H per year. The addition of the VFD by Pump-15 will reduce recirculation and conserve 39,343 KW-H per year. The construction of a Wind Powered Auxiliary Lift Pump at Pump-15 will replace approximately 1,733 KW-H per year. The sum of the three Task "B" energy conservation items will amount to 177,280 KW-H per year of conventional electric energy that will be eliminated. With less water being lost to seepage in the canals and less water being pumped out of the Rio Grande and District Reservoirs, the reservoirs will be higher and have more water than before. This water will be available for use by local endangered and threatened species including the Ocelot and Jaguarundi, and various migratory birds that pass through the Rio Grande Valley, thereby accomplishing Task "C". The District is an active participant in the Lower Rio Grande Valley Watermaster System Water Markets. It actively markets excess allocation to water users in need and will add the conserved water to the list in order to satisfy Task "D". This project should be completed within 18 month of Contract execution. With an anticipated start date of October 2015, completion should occur by May 2017. All of the proposed construction will occur on District property. A portion of the project will be funded in the amount of $200,000, about 16%, by the Texas Water Development Board through its Agricultural Grants Program. An additional benefit of the Texas Water Development Program not required by the BOR is an education and outreach component. The District is requesting a Federal Share of 24%. The project may begin immediately upon Grant Agreement execution.

(2) Background Data

Santa Cruz Irrigation District No. 15 (the District) is located in the Lower Rio Grande Valley Region with its main office located in Edinburg, Texas. Figure 1 provides a general location map of the District as well as the proposed improvements. The District boundary encompasses 31,000 Ac. The District currently serves 21,000 Ac. of irrigated farmland where farmers grow predominately citrus, vegetables, and hay.

The District provides raw water to the potable water supplier of North Alamo Water Supply Corporation, is capable of supplying Sharyland WSC, and several out of District customers. The District has its water diverted from the Rio Grande by Hidalgo County Irrigation District No. 1 (HCID No. 1) and delivered to it at the southern boundary of the District. Table 1 provides a history of water diverted by the District from 2011 through 2013. The District diverted on average 32,000 Ac.-Ft. per year; of that, 2,400 Ac.-Ft. was for North Alamo Water Supply Corporation. The District has very little development and approximately 68% of it is actively being farmed. As a result, the District has very

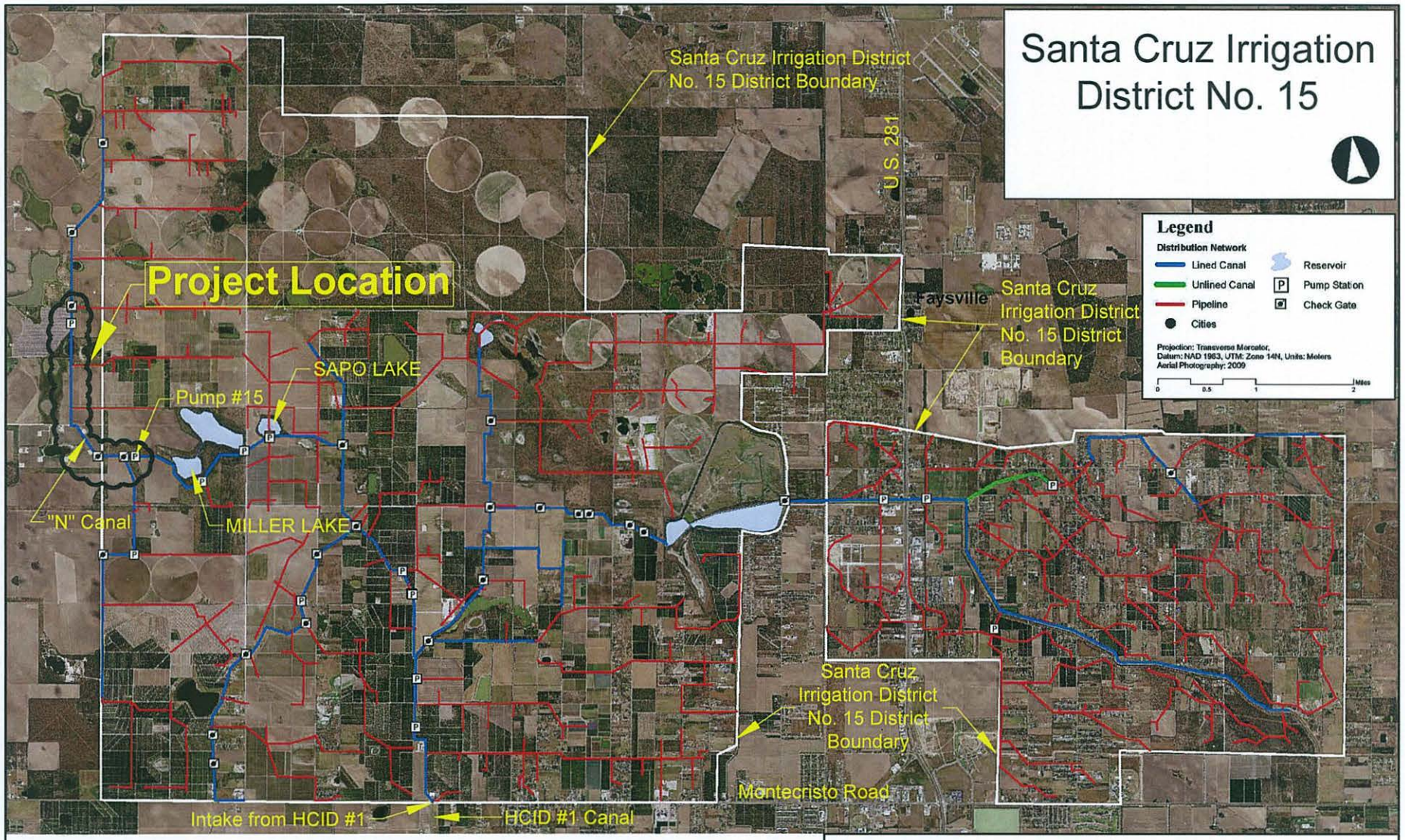

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Figure No. 1
District and Project Location Map

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little excess water yearly and has implemented its own District allocation program in order to ensure that District farmers have the water necessary each year. The District's allocation plan is shown in Appendix "A".

Table 1
Historical Diversions 2011 - 2013

	Total Metered at District #15	Total w/ HCID1 Losses @ 20%	Municipal Metered to NAWSC	Flood In District (estimated at 6" per Acre)	Flood Out of District (estimated at 6" per Acre)	Metered In District	Metered Out of District	Total Ag Water Delivered	In District Losses		In District Plus HCID #1 Losses	
	(Acre Feet)	(Acre Feet)	(Acre Feet)	(Acre Feet)	(Acre Feet)	(Acre Feet)	(Acre Feet)	(Acre Feet)	(Acre Feet)		(Acre Feet)	
2011	49,353	61,691	2,712	13,960	194	20,100	2,042	36,296	10,346	21%	22,684	37%
2012	42,707	53,384	2,236	13,691	323	18,802	1,680	34,496	5,976	14%	16,652	31%
2013	38,360	47,950	2,228	9,403	80	14,524	1,376	25,383	10,749	28%	20,339	42%
Average	**43,474**	**54,342**	**2,392**	**12,351**	**199**	**17,809**	**1,699**	**32,058**	**9,024**	**21%**	**19,892**	**37%**

All water right holders along the Rio Grande below Amistad Dam are part of the Lower Rio Grande Valley Watermaster System. The system is over allocated and is further complicated by the fact that the part of the US share of water is subject to a treaty with Mexico that allows Mexico to defer water deliveries up to five years in the amount of 350,000 Ac.-Ft. per year. The result is a system susceptible to extreme drought. The system has been adjudicated; therefore, irrigation water right holders are equally distributed available water after municipal and industrial water right holders have been accounted for. The US share is currently at 47.5% of its 3,390,000 Ac.-Ft. conservation capacity. The system is considered in the third year of a drought that began in 2012. The last drought, where reservoir levels sank this low lasted for nine (9) years, and was about ten (10) years ago. The area continues to grow, so water conservation improvements are imperative to long term resource management. Currently the District owns water rights to divert water from the Rio Grande in the amount not to exceed 75,080 Ac.-Ft. per year for irrigation purposes and delivers water to municipalities as well. Over the past three years, the District has diverted from the Rio Grande an average of 54,000 Ac.-Ft. for all purposes.

The District's delivery system begins with the HCID No. 1 delivery point located on the HCID No. 1 canal just south of Monte Cristo Road in Edinburg, TX (shown in Figure 1). The District maintains two reservoirs: the Sapo Reservoir is about 220 Ac.-Ft. and the Miller Reservoir is approximately 900 Ac.-Ft. Both reservoirs are located about five (5) miles north of the delivery point along the District's Main Canal. West of the District's reservoirs, one and a half (1.5) miles of main canal lead to the Pump-15 Lift Station which the District utilizes to fill the N-Canal. The District's Pump-15 Lift Station consists of three electric driven pumps. Two of the electric pumps are rated for about 12 CFS and the other about 21 CFS. The District's delivery system includes over 37 miles of open canal and over 70 miles of underground pipeline. Pump-15 Lift Station is about 60 years old and not very efficient.

The District changed managers in 2013. Prior management did not pursue system improvements, thus; there is no record of working with the Bureau of Reclamation in recent history. Current management, however, recognizes the need and benefit of water and energy conservation for the District and has utilized a Texas Water Development Board Agricultural Conservation grant to assist with the completion of this project. The District looks forward to a long relationship with the Bureau to accomplish water and energy conservation projects in the future.

(3) Technical Project Description

(a) General Description

This project consists of water and energy conservation and other components that meet the goals of the 2015 WaterSMART Funding Opportunity Announcement. The first component of the project is the Shotcrete lining of 7,265 LF of the N-Canal to conserve 951 Ac.-Ft. per year. The second component of the project is the installation of a Variable Frequency Drive (VFD) at Pump-15, the pump that supplies the N-Canal to improve the efficiency of the existing pump by saving 39,343 KW-H per year. The third component is the construction of a Wind Powered Pump at Pump-15 to augment the conventional electric power pump, which will save 1,733 KW-H per year.

The first component of the project is to Shotcrete line the N-Canal to accomplish Task "A", water conservation. This canal serves the most actively farmed area of the District which has no development and multiple thousand plus tracts of irrigated land. The canal is an old lined canal that is cracked and missing in many areas. Because of the size and volume of water it conveys, it was impractical to place it into a pipeline. Water losses include seepage into the ground and evaporation from the surface. This grant will at least conserve the water lost to seepage. Seepage tests were performed on the canal to establish the losses due to seepage. The N-Canal operates approximately 85% of the time or about 310 days out of the year due to the various vegetables grown in the area throughout the year. For this grant it was assumed that the N-Canal was full 310 days of the year.

The water conservation estimate assumes 310 days of seepage and a water depth of 3.92'. The result is about 951 Ac.-Ft. in lost water annually that will be conserved upon lining the canal. The Water Conservation estimate is presented in Table 2. The detailed test results are provided in Appendix "B". The measured seepage loss was 2.25 Ac.-Ft. per day based on an average depth of 3.15', once this was extrapolated based on the normal operating depth of 3.92' the calculated loss per day was 2.57 Ac.-Ft. per day or 757 Ac.-Ft. per year. When the estimated 30% losses through the HCID #1 and SCID No. 15 were taken into account the lining would save approximately 951 Ac.-Ft. per year. Figure 2.1 is an aerial view of the proposed canal to be lined. Figure 2.2 provides cross sections of the N-Canal and the proposed lining. Figure 2.3 and Figure 2.4 are views of the existing N-Canal lining on the day of the test. Figure 2.5 is the evaporation bucket used during the seepage testing of the canal.

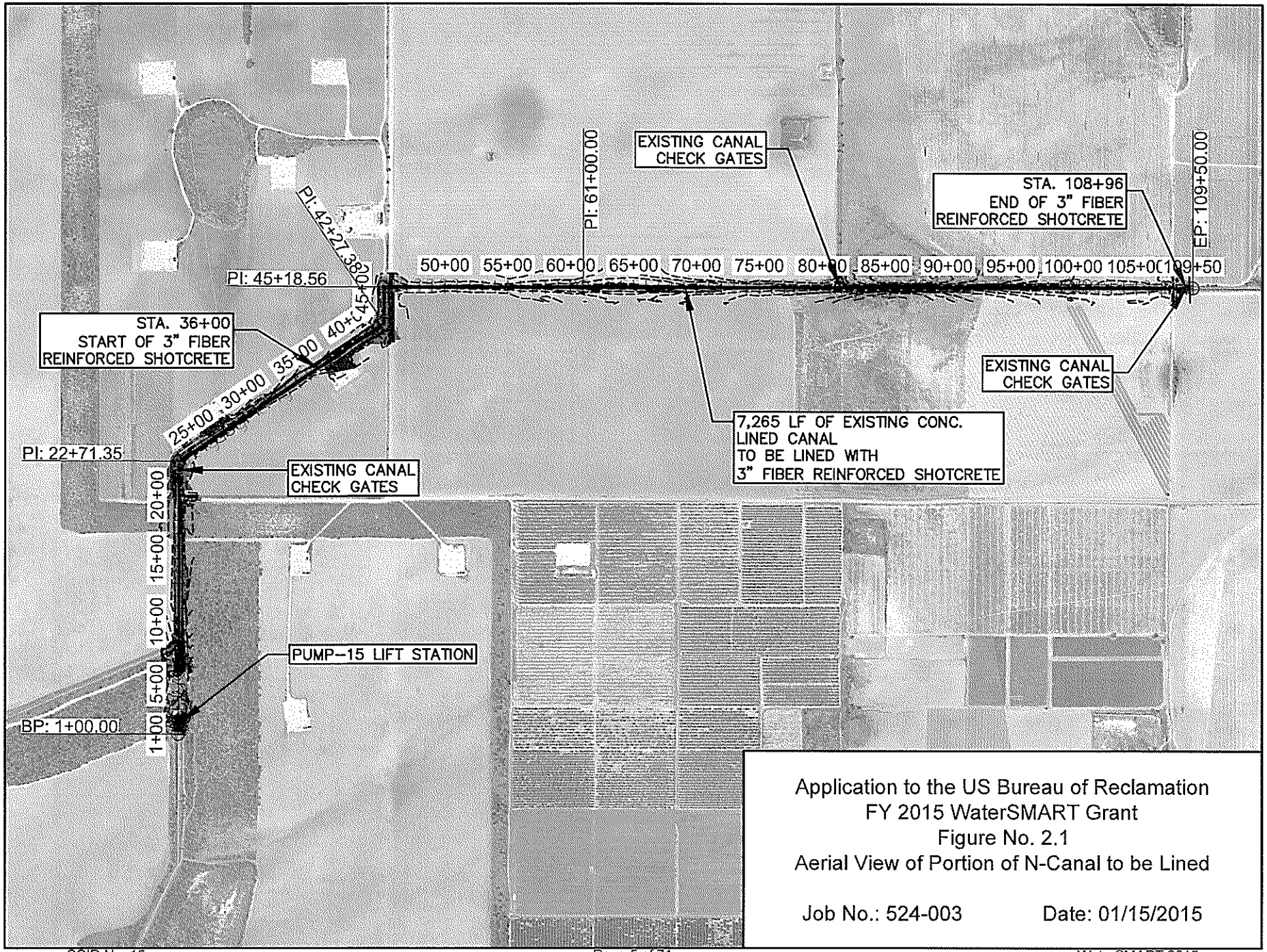

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Figure No. 2.1
Aerial View of Portion of N-Canal to be Lined

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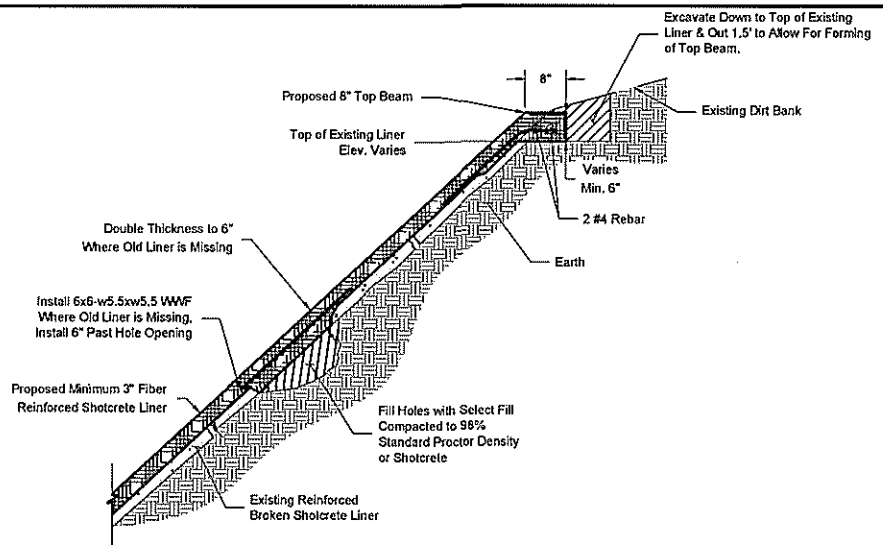
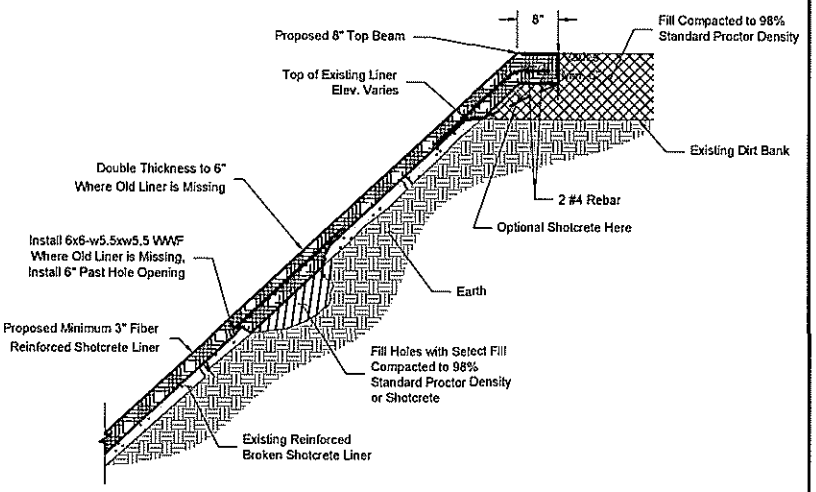
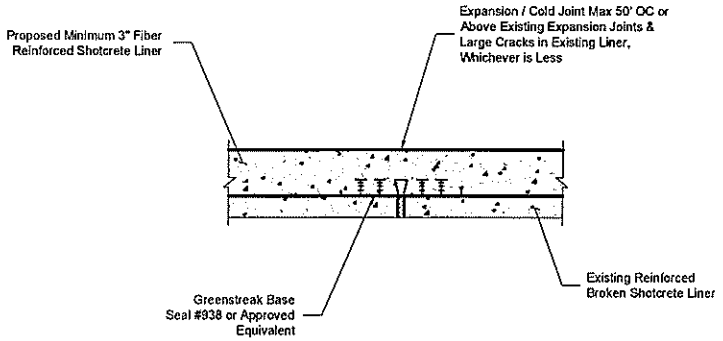


FIBER REINFORCED SHOTCRETE LINER DETAIL
CANAL BANK ABOVE EXISTING LINER
SCALE: 1"=3'



FIBER REINFORCED SHOTCRETE LINER DETAIL
NEW SHOTCRETE BEAM > 6" ABOVE EXISITING LINER
SCALE: 1"=1'



EXPANSION / COLD JOINT DETAIL
NTS

Note:
End each day's operations at expansion joint.

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Figure No. 2.2
X-Section of N-Canal and Proposed Lining

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Table 2
Water Conservation Estimate

N-Canal Length	8,700	Feet
N-Canal Length to be Lined	7,265	Feet
Percent Lined	84%	
Average Depth	3.92	Feet
Measured Seepage @ 3.15' Depth	2.25	Ac.-Ft./day
Total Canal Losses when operating @ 3.92' Depth	2.57	Ac.-Ft./day
Number of Days operating per year	310	Days
Operating Seepage Losses	797	Ac.-Ft.
Estimated Losses through HCID No. 1 & SCID No. 15 to N-Canal	30%	
Total Water Conservation Estimate	951	Ac.-Ft.

Figure 2.3 & Figure 2.4 Existing Canal Liner

Figure 2.5 Seepage Test

A second component of this project is the addition of a VFD to a pump at the Pump-15 Lift Station. The Pump-15 Pumps lift water out of the Miller Lake storage reservoir and pump it into the N-Canal. Figure 3.1 is an aerial view of the proposed Pump-15 improvements. Figure 3.2 is a photograph of the existing Pump-15 Lift Station. The re-circulated water can be seeing flowing back into the canal via the pipe on the left hand side of the picture. Currently, the constant speed of the smallest Pump-15 pumps is more than what is required by the canal on many days. The excess water is recirculated needlessly and energy is wasted by lifting it multiple times. The VFD will allow the pump speed to be reduced so only the required flow is lifted. The VFD, for proper operation, will need to climate-controlled; so a small insulated 10' x 10' CMU building will need to be constructed to house the VFD next to the existing Pump-15 Lift Station.

Table 3 provides a review of the average amount of water that was recirculated over the previous three years. It was estimated from District records that 4,500 Ac. were irrigated out of the N-Canal and Pump-15 Pump. The amount of water irrigated over this period was 6,463 Ac.-Ft. which equates to a flow of 4,717 GPM, the smallest pump at a minimum pumps an estimated 5,386 GPM. The difference between these two flow rates (668 GPM) is the estimated recirculated water. This information is shown in Table 3.

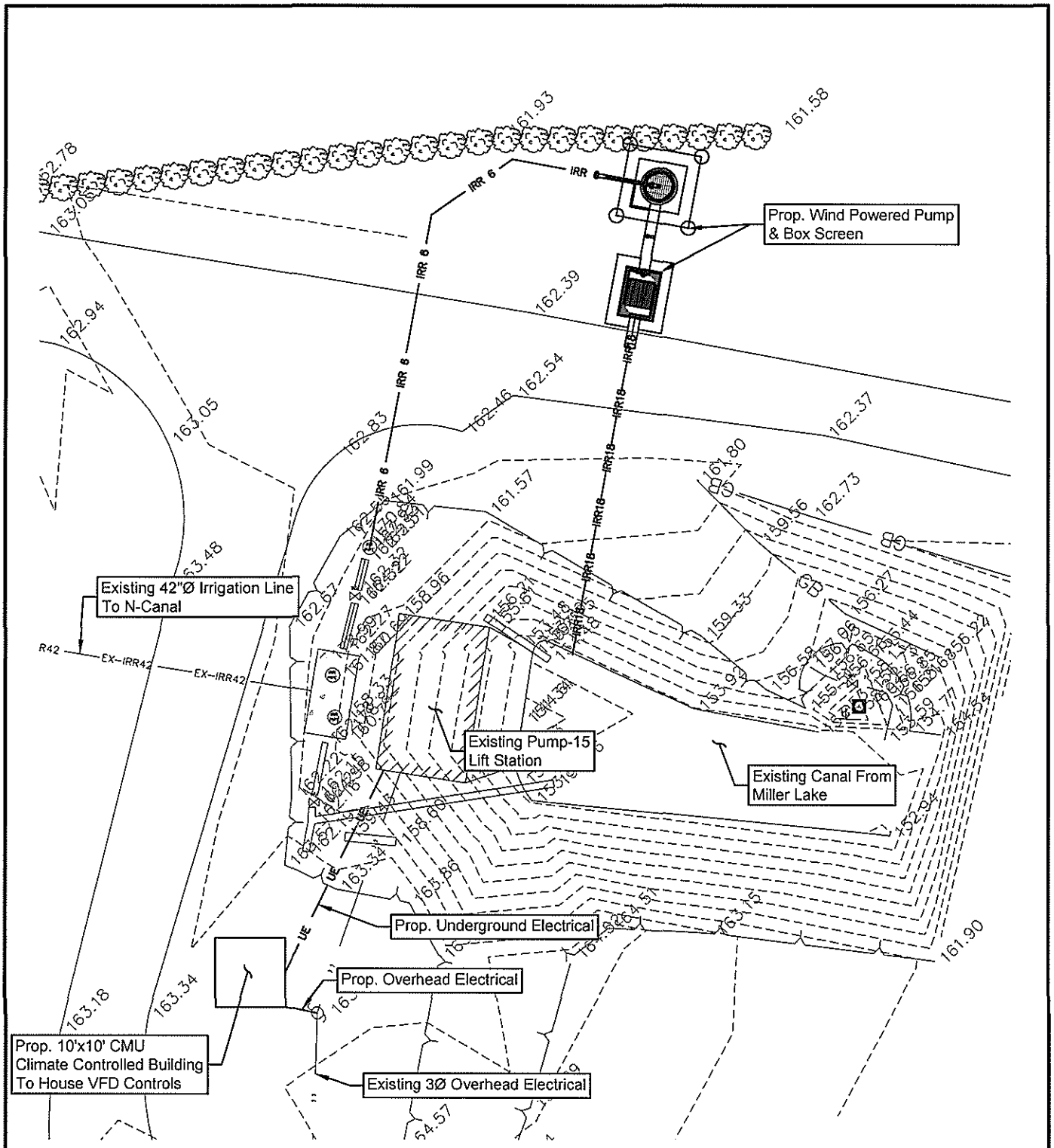

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Figure No. 3.1
Proposed Pump-15 VFD Installation Improvements

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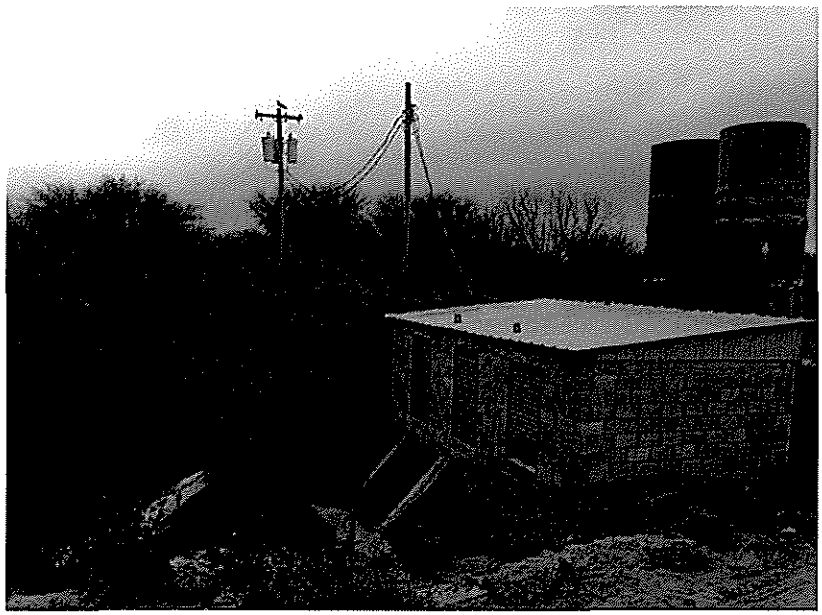


Figure 3.2 Existing Pump-15 Lift Station

Table 3
Pump-15 Recirculation & Energy Consumption

Land Watered by the N-Canal	4,500	Ac.
Percent of Total Irrigated Ac. in District	21%	
Average Annual Volume of Water used for In-District Ag (Table 1)	30,160	Ac.-Ft.
Proportional Volume of Water used for land watered off of N-Canal	6,463	Ac.-Ft.
Number of Days per Year N-Canal is in use	310	Days
Average annual flow in N-Canal	10.5	CFS
	4,717	GPM
Minimum Pumping Capacity at Pump-15	12	CFS
	5,386	GPM
Average annual recirculation at Pump-15	1.5	CFS
	668	GPM
Estimated Annual Energy Consumption at Pump-15	317,030	KW-H/year
Estimated Annual Energy used on Recirculation at Pump-15	39,343	KW-H/year
Percent of Energy at Pump-15 used on Recirculation	12%	
Annual Estimated Consumption per Acre Foot Irrigated	49.05	KW-H / Ac.-Ft.
Annual Estimated Electricity Cost per Ac.-Ft. Irrigated	$6.38	$ / Ac.-Ft.

Considering the acreage watered and the duration the pumps ran it was determined that the average N-Canal demand was 4,717 GPM and the minimum the station can pump is 5,386 GPM. Considering the lift is about twenty-one feet from the Miller Lake to the N-Canal, and assuming a 50% wire to water efficiency, an annual energy consumption of 317,030 KW-H was estimated. With approximately 668 GPM being recirculated, the annual energy lost to recirculation was estimated at 39,343 KW-H, which could be saved by the installation of the VFD. The VFD would be able to allow the speed of the 21 CFS pump to be lowered so that it could pump at 4,717 GPM and eliminate the recirculation at Pump-15.

A third component of the project is the addition of a wind powered pump at the Pump-15 Lift Station. The renewable powered pump will accomplish Task "B" by lifting, water from Miller Lake to the N-Canal anytime the wind is blowing, so it will always perform useful work replacing conventional power. It is expected that the wind powered pump will be able to move 81 Ac.-Ft. per year without any associated energy costs. This amounts to 1.25% of the total water pumped at Pump-15.

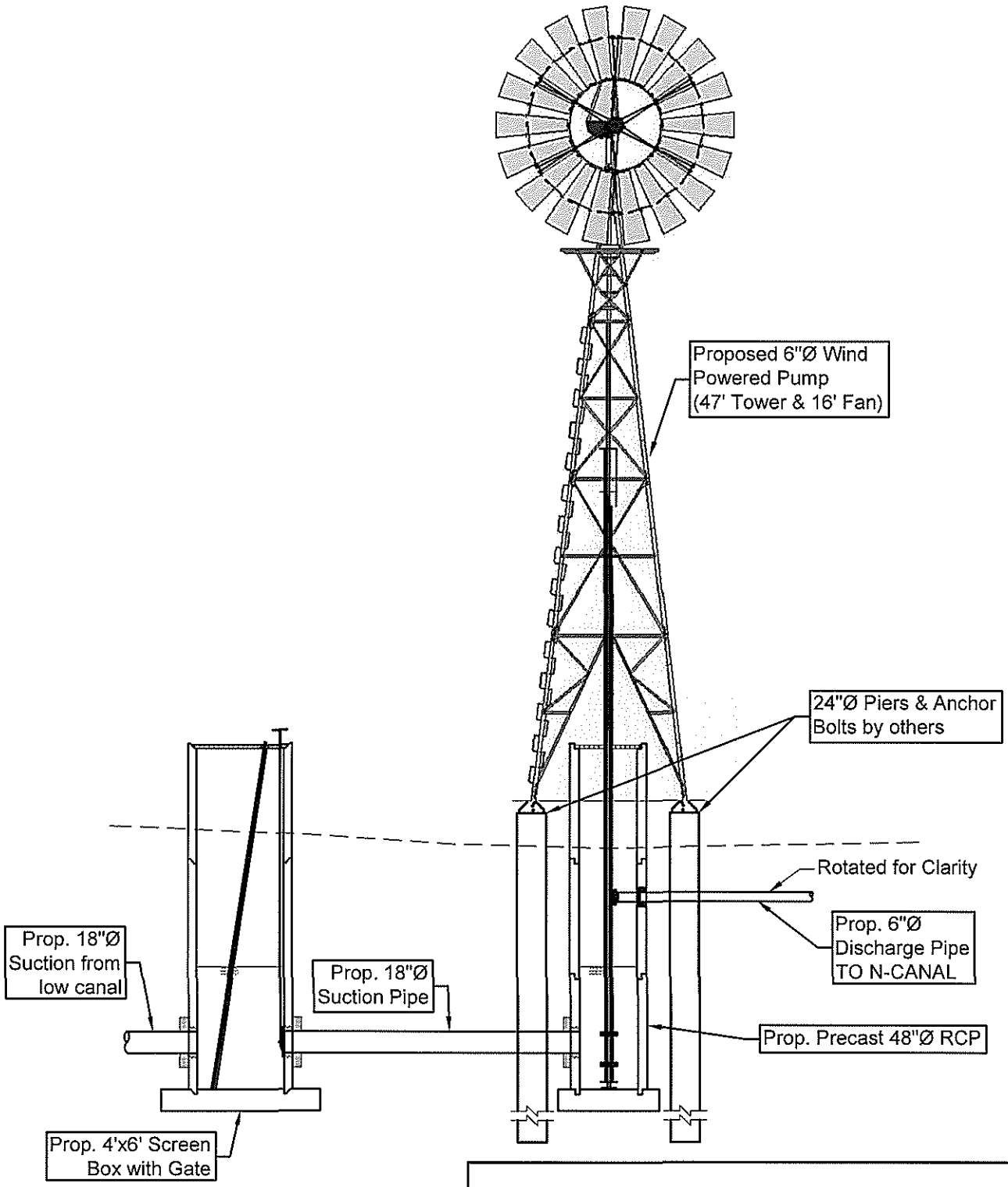
Figure 4.1 shows the proposed Wind Powered Pump to be installed at the Pump-15 Lift Station. Appendix "C" provides detailed information on the Aermotor Wind Powered Pump. The pump is the largest Wind Powered Pump that Aermotor makes and can pump an average of 72,000 gallons per day with a peak pump rate of about 90 gallons per minute when the wind is blowing between 15-20 mph. There will be a 47 ft tall tower with a 16 ft diameter fan. The total average water production is expected to be 26,280,000 gallons per year or about 81 Ac.-Ft. per year. The wind powered pump will be placed in a 4' diameter wet well with screen fed from the Miller Lake canal by an 18" diameter PVC pipe. A 6" PVC discharge will be used and it will discharge into the N-Canal. The District will need to periodically clean the screen to keep foulants out of the pump. A structural engineer will design the mounting system to attach the tower to the concrete base. Figure 4.2 is a layout of the Pump-15 Lift Station showing how the Wind Powered Pump will be arranged into the site. The pump will operate anytime the wind is blowing hard enough to provide adequate power, which in south Texas will be the majority of the time. It will also have a brake to protect it in times of bad weather or no need.

(4) Technical Proposal: Evaluation Criteria

Evaluation Criterion A – Water Conservation

Subcriterion No. A.1 – Quantifiable Water Savings:
The water saved as a result of the Shotcrete lining of the N-Canal is projected to be 951 Ac.-Ft. per year (see Table 2). Seepage in the canal was determined by a seepage test that resulted in an average loss of 2.57 Ac.-Ft. per day in the N-Canal when full and 951 Ac.-Ft. per year. Appendix "B" provides the results of the seepage test. Table 2 provides a breakdown of how the losses were calculated. In general, the N-Canal service area is about 4,500 Ac. Most all of the area is actively irrigated.

From 2011-2013, the District irrigated approximately 4,500 Ac. (Table 3). In most years, the canal was full about 310 days of the year. The resulting annual loss, as outlined in Table 2, is 951 Ac.-Ft. per year.



Wind Powered Pump Profile
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Figure No. 4.1
Proposed Wind Powered Pump

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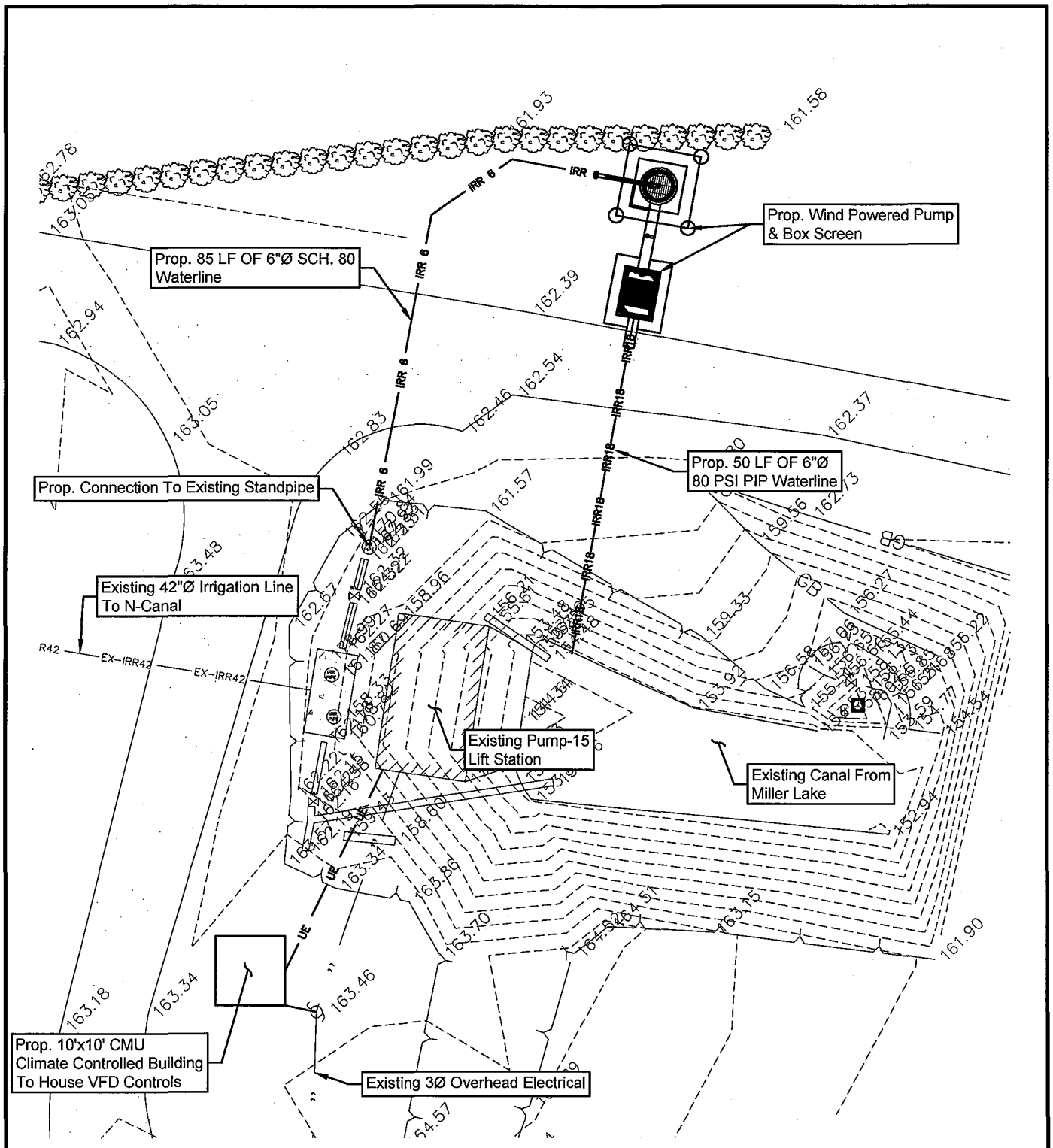

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Figure No. 4.2
Proposed Wind Powered Pump Layout

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Subcriterion No. A.2 – Percentage of Total Supply:
Table 4 provides the Quantifiable Water Savings expressed as a percentage of Total Supply. From 2011-2013, out of the 54,000 Ac.-Ft. diverted by the District, 47,000 were for use in the District and can be considered the District's Total Supply. The Annual Water Savings expressed as a percentage of the District's Total Supply is 2.0%. If one considers Water Savings as a percentage of the N-Canal Service Area, and the N-Canal Service Area will operate for 310 days at 20.85 Ac.-Ft. per day, the annual water savings expressed as a percent of supply is 14.7%.

Table 4
Quantifiable Water Savings

Estimated Annual Water Savings (from Table 2)	951	Acre Feet
Average Annual Diversions (From Table 1)	54,342	Acre Feet
Less Customer Diversions (From Table 1)	(7,150)	Acre Feet
Annual District Supply	47,192	Acre Feet
Annual Water Savings expressed as a percent of Total Supply	**2.0%**	
Consider Water Savings as a percent of N-Canal Service Area		
Pump-15 and N-Canal Irrigation Rate (from Table 3)	20.85	Ac.Ft./day
Average Year Number of Days operating (From Table 2)	310	days
Annual Estimated flow through N-Canal	6,463	Acre Feet
Annual Water Savings expressed as a percent of Total Deliveries through N-Canal	**14.7%**	

Evaluation Criterion B – Energy-Water Nexus

The District accomplishes Task "B" in three ways. First and further described in the following section, Subcriterion B.1, is by construction of a Wind Powered Auxillary Pump-15 Lift Pump. In addition, the District will accomplish energy conservation by not pumping conserved water from the Rio Grande to the N-Canal (70 Ft.), and by installation of the VFD at the Pump-15 Lift Station. The latter two are described more thoroughly in Subcriterion B.2. It is the District's hope that any points not under B1 may be offset by points awarded under B2 for a full 16 points.

Subcriterion No. B.1 – Implementing Renewable Energy Projects Related to Water Management and Delivery:
The District will implement a renewable energy project utilizing wind energy to provide a wind powered pump at the existing Pump-15 Lift Station. The wind powered pump will lift water from lower Miller Lake Storage Reservoir to the N-Canal.

The water is currently lifted by electric pumps. The Wind Powered Pump will pump 81 Ac.-Ft. per year. Table 5 displays the estimated output of water and energy that will be conserved by not having to pump 81 Ac.-Ft. per year at the Pump-15 Lift Station. The information is pulled from Aermotor Pump Company. Pertinent data is included in Appendix "C".

The Wind Powered Pump does not have any energy needs. The environmental benefits are that the wind power will replace some of the pumping energy currently provided by conventional electric powered pumps.

Subcriterion No. B.2 – Increasing Energy Efficiency in Water Management:
The Project will result in energy conservation by not pumping the conserved water at from the HCID #1 River Pump Station up the N-Canal, approximately 70 Ft. of lift. Table 5 outlines the energy conserved from not pumping the water. Converting this into electric energy can be performed by assuming a lift of 70 feet and a wire to water efficiency of 50% (typical for a motor 85% efficient and an aging pump 60% proficient). The energy conserved by not pumping the conserved 951 Ac.-Ft. per year is, 136,204 KW-H per year.

Installation of a VFD at the Pump-15 Lift Station will result in significant energy savings. The Pump-15 Lift Station, from Table 3, utilizes 49.05 KW-H per Ac.-Ft. pumped. As displayed in Table 3, in an average year, the Pump-15 Pump, pumps 6,463 Ac.-Ft. per year consuming approximately 317,030 KW-H per year, 39,343 KW-H of which is recirculated water. Once this station is upgraded, only the water needed by the N-Canal will be lifted at the Pump-15 Lift Station reducing the annual energy consumption to approximately 277,687 KW-H per year.

A summary of Energy Conservation is provided at the bottom of Table 5. The total conventional energy conserved by construction of all three components of the project—Lining the N-Canal, Installation of a VFD at Pump-15 Lift Station, and Construction of the Pump-15 Wind Powered Pump—is projected is expected to be in excess of 177,280 KW-H per year.

Table 5
Energy Water Nexus

Subcriterion B.1 - Renewable Energy		
Annual Water Production	26,280,000	gallons
	81	Ac. Ft.
Average Flow Rate	50	GPM
Total Lift	21	Ft.
Equivalent Power Production	0.20	KW
Annual Wind Energy Production	1,733	KW-H/year
Average Daily Production	4.75	KW-H/day
Subcriterion B.2 - Increase in Energy Efficiency		
Energy Conserved from not pumping conserved water		
Conserved Water from lining canal	951	Ac.-Ft./year
	590	GPM
Total Lift from Anzalduas Pool to N-Canal	70	Ft.
Assumed Wire to Water Efficiency	50%	
Power Conserved	15.55	KW
Annual Energy Conserved	136,204	KW-H/year
Average Daily Energy Conserved	373.16	KW-H/day
Energy Conservation from Installation of VFD at Pump-15 Lift Station		
Annual Water Recirculated @ 310 days/year of pumping	450,947,059	gallons
	916	Ac. Ft.
Average Flow Rate	668	GPM
Total Lift	21	Ft.
Assumed Wire to Water Efficiency	50%	
Power Conserved	5	KW
Annual Energy Conserved	39,343	KW-H/year
Average Daily Energy Conserved	127	KW-H/day
Summary of Energy Conservation		
Annual Wind Energy Production	1,733	KW-H/year
Energy Conserved by not pumping conserved water	136,204	KW-H/year
Net Energy Conserved by Installing VFD at Pump-15	39,343	KW-H/year
Total Conventional Energy Conserved	**177,280**	**KW-H/year**

Evaluation Criterion C – Benefits to Endangered Species

The proposed project includes the conservation of 951 Ac.-Ft. of water that will not be lost to seepage but will remain in rivers and reservoirs where it will be available for entities like the USFWS to supply water to various ponds in the Lower Rio Grande Valley National Wildlife Refuge (LRGVNWR). The Refuge manages habitats supporting 19 federally threatened and endangered species including two federally listed endangered cat species, the Ocelot and Jaguarundi. More water in these reservoirs to be utilized by these endangered species along with migratory birds that pass through the Rio Grande Valley will have a positive impact on their habitat and the regional ecosystem. In addition, the excess water which will attract these animals to the various reservoirs will attract tourists visiting local refuges and bird watching sites and will positively impact the economy of the region.

Evaluation Criterion D – Water Marketing

The magnitude and frequency of water supply shortages within the region are severe. Texas Water Development Board's Rio Grande Regional Water Planning Group (Region M) estimates population in the eight county region is expected to grow from 1.7 million in 2010 to 4 million in 2060, the water supply shortage is expected to reach a staggering 592,084 Ac.-Ft. per year by 2060, which would result in 35% of water demands being unmet.

The District actively participates in the regional water Marketing. The Rio Grande Watermaster Operation serves as a water bank for water right holders within its jurisdiction. Contracts are made between users to transfer water allocation and the Watermaster Office accounts for those contracts. The District has sold 4,200 Ac.-Ft. in allocation over the past three years to users in need.

Evaluation Criterion E – Other Contributions to Water Supply Sustainability

Subcriterion E.1 – Addressing Adaptation Strategies in a WaterSMART Basin Study

The "Lower Rio Grande Basin Study" was completed in December 2013 by the BOR in cooperation with the Rio Grande Regional Water Authority (RGRWA). The District is a member of the RGRWA. The Basin Study refers to the 2010 Region M Plan, "Rio Grande Regional Water Plan", dated October 1, 2010 to reiterate that Irrigation Conveyance System Conservation as one of the water management strategies that will result in the greatest amount of water for further use when compared to 15 other strategies. This lining of the N-Canal is an Irrigation Conveyance System Conservation Project. By conserving this water the District will help satisfy a demand for water that is currently experiencing a shortage such as municipal water which relies on Agricultural Water to be able to move down the Rio Grande in periods of extreme draught..

The Basin Study ultimately chose one water management strategy out of the 15 identified that did not use the Rio Grande as a source and was cost effective; desalination of blackish groundwater (DBG). The District's project conserves Rio Grande water through irrigation conveyance conservation, making conserved water available to others.

Subcriterion E.2 – Expediting Future On-Farm Improvements

The District has not proposed nor identified on-farm improvements. Installing the VFD at Pump-15 and lining of the N-Canal will allow for more efficient on farm improvements. The canal can remain for those that choose to install drip systems without losing as much water every time they're full. In addition, areas surrounding the Pump-15 site are in the process of being planted into Citrus Groves by Paramount Citrus and they have stated a need to irrigate, the greater operating range of the Pump-15 Lift Station will continue to make watering in the area more efficient for all parties involved.

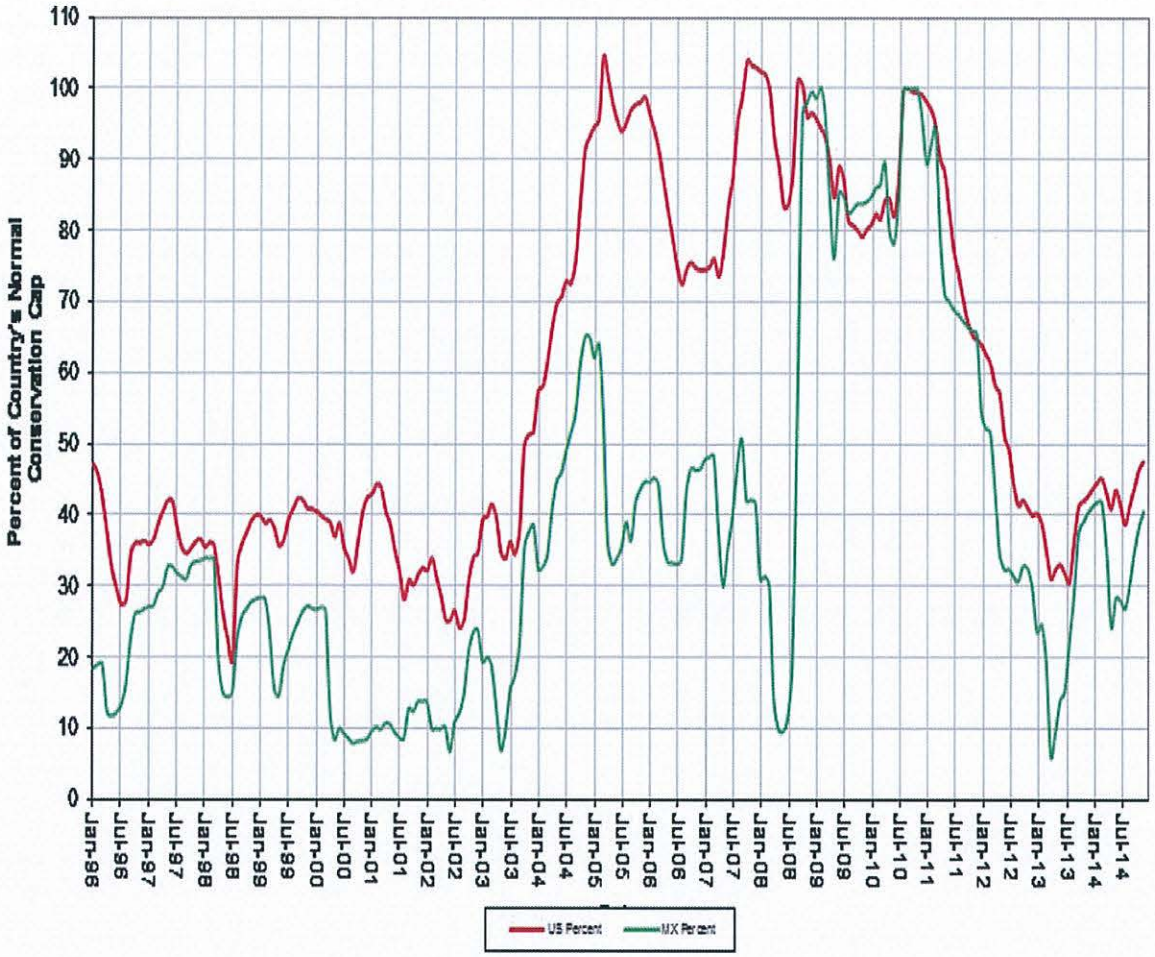
Subcriterion E.3 – Building Drought Resiliency:

In recent years, total water demand in the study area has exceeded available supplies. Not only has supply been insufficient, but also inconsistent due to increasingly frequent periods of drought and the failure of Mexico to honor international treaty obligations, that require its contribution of inflows into the Rio Grande (Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande, Treaty Between the United States of America and Mexico, February 1944). A large portion of the water which flows into the Falcon and Amistad Reservoirs (managed by the International Boundary Water Commission) is contributed by runoff from Mexico. The 1944 U.S.-Mexico Water Treaty dictates that Mexico contributes 350,000 Ac.-Ft. per year to the Falcon and Amistad system. The Treaty, however, allows Mexico up to five (5) years to repay the water debt that can amount up to 1,750,000 Ac.-Ft. Compounded by the fact that the Watershed is within a semi-arid environment and the water rights have been over adjudicated, the potential for extended drought is high. The Lower Rio Grande Valley Watermaster System is currently at 47.5% of conservation storage capacity in the third year of a drought that began in 2012. The last time the reservoir storage dropped below 50%, it lasted for nine (9) years and ended in 2004. Figure 5 is a graph of the Amistad-Falcon Storage Conditions from 1996 to present.

A 2009 GAO Study found that "Federal efforts to meet drinking water and wastewater needs in the border region have been ineffective" in part from lack of a comprehensive assessment of needs in the region and a lack of coordinated policies and processes between Federal agencies (United States Government Accountability Office, Rural Water Infrastructure, Report to the Chairman, Committee on Agriculture, House of Representatives, 2009).

In 2010, the net demand for all users exceeded available supplies by 368,356 Ac.-Ft., all of which was borne by supply and demand imbalances in the irrigation sector. By 2060, net demand will exceed existing supplies by 592,084 Ac.-Ft., this time driven by imbalances for all water user groups, with municipal demand contributing the majority. In 2010, water shortages resulted in 24.8 percent of demand going unmet. According to current projections in the 2011 Region M Plan (http://www.riograndewaterplan.org/water plan.php), by 2060, 35.2 percent of demand will be unmet.

Figure 5
Amistad-Falcon Percent of Conservation Capacity



Source – International Boundary & Water Commission

Recently, droughts in 2009 contributed to losses of $19 million for south Texas farmers. Dry land farming was most affected, although irrigated agriculture lost nearly $1.5 million (Santa Ana, R., "Drought losses top $19 million in Lower Rio Grande Valley" AgriLife NEWS, Texas A&M University, November 13, 2009). Other reports have estimated the annual regional impact of agricultural water shortages costs the local economy $135 million and 4,130 jobs (J.R.C. Robinson et al. /Water Policy 12 (2010) 114-128 Mitigating water shortages in a multiple risk environment). The economic impacts of unmet irrigation water demands directly contribute to reduced economic activity in other sectors and the slowing or reversal of job growth in the region. In the long term, an economic slowdown could result in water districts forgoing projects that could increase efficiency and provide adequate service to all users. With the shift to urbanization in the region, while continuing to rely on existing scarce supplies, these impacts can be expected to intensify in the future.

Subcriterion E.4 – Other Water Supply Sustainability Benefits:
All the Lower Rio Grande Valley Water Right holders have a collective interest in water conservation. Water conserved is available for future use or remains in the Rio Grande system to be marketed or distributed to other users. In addition, conserved water results in power conservation. For example, since the District is a non-profit public entity, power cost savings and conservation efforts will benefit all the end users including the farmers, customers of North Alamo Water Supply Corporation, businesses and all wholesale customers of the municipal suppliers. This project will impact several hundred thousand people and will reduce the demand for the surface water supplies of the Rio Grande. The Rio Grande system is widely considered an over-allocated system.

The District was awarded a grant from the Texas Water Development Board through its Agricultural Grant Program to Shotcrete line 4,765 LF of the N-Canal. One of the goals of that program is to provide education and outreach. The following is a description of the proposed Education and Outreach Program developed for that grant. If awarded the Bureau grant, the District will add a renewable energy component to the Education and Outreach Program.

The District will conduct a seminar on Project Conservation and renewable energy. The District will conduct a one day seminar for its Board of Directors, Staff and Producers to report on the water and energy conservation from this project.

The District will also visit an irrigation district in the area that currently uses alternative energy to provide water to its customers. The proposed schedule is as follows:

Day 1 – Morning – Report on water and energy conservation success of the N-Canal lining and wind powered pump installation.
Day 1 – Afternoon – Visit to HCWID No. 3 to review their books as to how much water their wind powered pump has produced in the last 2 years.

The seminar should occur around July 2016.

Evaluation Criterion F – Implementation and Results

Subcriterion No. F. 1 – Project Planning:
Due to the recent change in management, the District is currently developing a formal Water Conservation Plan to submit to the TWDB, however, the District currently has their own voluntary allocation plan implemented to assist District farmers in conserving water and making sure there is enough water for the District's needs. Each year farmers are encouraged to sign up for participation. The Distict's Allocation Policy is included as Appendix "A". The District is completing their Texas Water Development Board project which is also devoted to water and energy conservation. The District has completed engineering and design and expects construction to begin around February 1, 2015. This preliminary engineering is necessary to deliver an adequate budget proposal as well as water and energy conservation projections. The proposed works will improve sustainable water supplies for the 21st century. The "Region M Regional Water Plan," that includes this District, states the following;

"What is clear, though, is that improving Irrigation District systems that convey water from the Rio Grande to both farms and cities is the most economical means of stretching limited water supplies to meet all needs."

The Lower Rio Grande Valley water system is unique from other systems in that water saved in the agricultural process remains in the water users' account for agricultural usage in the following year. Furthermore, state law mandates that irrigation rights for land placed into subdivisions must be made available to the potable water retailer where the subdivision is located and those water rights must be available for sale to that entity or other similar entities in the area.

Subcriterion No. F. 2 – Readiness to Proceed:
The topographic survey and majority of the shotcrete lining design have already been completed for the canal lining and the TWDB portion will begin construction in February 2015. Other preliminary designs are completed and are quite simple and can be finished within 90 days of award. Environmental compliance will be easily achievable because all tasks to be completed will take place in previously disturbed areas. The project schedule is designed to implement the components as quickly as possible. The District can begin construction of the projects within 90 days. The construction schedule will only be limited by irrigation demands. No permits are anticipated for this project.

Success and completion of the project can only be hindered by climactic conditions. If the current drought continues, the marketing component will be easily achieved.

The project will be completed according to the following schedule:

Table 6
Project Schedule

Phase I - TWDB Portion of N-Canal Lining

Date	Description of Work
Friday, August 22, 2014	Project Start Date Begin surveying and Construction Plans.
Friday, November 07, 2014	Construction plans completed. Advertise for Shotcrete Bids.
Monday, February 02, 2015	Begin Construction
Friday, March 27, 2015	Construction completed on first 4,765 LF of shotcrete liner
Tuesday, September 1, 2015	Submit First Annual Report
Monday, July 18, 2016	Conduct Seminar on Project Conservation and Renewable Energy Options
Thursday, September 1, 2016	Submit Second Annual Report
Friday, September 1, 2017	Submit Final Annual Report

Phase II - BOR Portion of N-Canal Lining, Wind Powered Pump, and VFD Installation

Date	Description of Work
January-15	Submit Bureau of Reclamation Grant
October-15	Begin surveying and Construction Plans.
January-16	Plans Completed and Advertise for Bids
March-16	Begin Construction
July-16	Construction completed.

Subcriterion No. F. 3 – Performance Measures:
A new seepage test will be conducted on the lined N-Canal. It will be tested upon completion to verify there is no measureable leakage. The wind powered pump will be tested to quantify actual water produced which translates into energy saved. The District will compare energy consumption at the Pump-15 Lift Station to document efficiency improvement. Finally, the water marketing will be documented once the sales have been completed.

Subcriterion F.4 – Reasonableness of Cost:

Table 7 provides an analysis of the Reasonableness of Cost. Considering a design of life of 50 years, typical for canals and pipelines, the Reasonableness of the total Capital Cost divided by the savings of 951 Ac.-Ft. per year and 50 years yields a cost of $26/Ac.-Ft./yr. If the capital cost is reduced by the present value of the annual power cost savings of $724,199.09 per year, considering a rate return of 2% reduces the capital cost to $525,800.91 resulting in reasonableness of cost of $11/Ac.-Ft./yr.

Table 7
Reasonableness of Cost

Overall Project Cost	$1,250,000	
Expected Project Life	50	years
Water Conservation	951	Ac.-Ft.
Reasonableness of Cost	**$26**	**/Ac.-Ft./year**
Reasonableness of Cost considering Energy Savings.		
Anticipated Energy Cost Savings from not pumping conserved water		
Annual energy conservation	136,204	KW-H/Year
Long Term Power Cost at SCID No. 15	$0.13	per KW-H
Power Cost Savings to SCID No. 15	$17,706.54	per year
Anticipated Energy Savings From Installation of VFD @ Pump-15		
Annual energy conservation due to VFD @ Pump-15	39,343	KW-H/Year
Long Term Power Cost at Pump-15	$0.13	per KW-H
Power Cost Savings at Pump-15	$5,114.54	per year
Anticipated Energy Savings at Pump-15 with New Wind Pump		
Annual energy conservation from Wind Pump	1,733	KW-H/Year
Long Term Power Cost at Pump-15	$0.13	per KWH
Power Cost Savings from Wind Pump	$225.26	per year
Total Power cost Savings per Year	$23,046.34	
Present Value of Power Cost Savings assuming 2% @ 50 Years	$724,199.09	
Overall Project Cost reduced by Present Value of Power Cost Savings	$525,800.91	
Expected Project Life	50	years
Water Conservation	951	Ac.-Ft.
Reasonableness of Cost after considering Power Cost Savings	**$11**	**/Ac.Ft./year**

Evaluation Criterion G – Additional Non-Federal Funding

The Texas Water Development Board will fund $200,000 of the project and the District will fund the remainder resulting in total Non-Federal Funding of 76%.

$$\frac{\text{Non-Federal Funding}}{\text{Total Project Cost}} = \frac{\$950,000}{\$1,250,000} = 76\%$$

Evaluation Criterion H – Connection to Reclamation Project Activities

There are many users in the Lower Rio Grande Valley that have received funding from the US Bureau of Reclamation (BOR) for water conservation projects. All water conserved in the basin affects other users and all users are connected via the common source of water. The BOR is heavily invested in the local Basin.

The Bureau of Reclamation completed its "Lower Rio Grande Basin Study" in December of 2013 in cooperation with Rio Grande Regional Water Authority (RGRWA) and its 53 member entities, and in collaboration with the Texas Region M Planning Group (Region M), Texas Water Development Board, Texas Commission on Environmental Quality (TCEQ), and International Boundary and Water Commission are conducting a Basin Study (Study) to evaluate the impacts of climate variability and change on water supply imbalances within an eight county region along the U.S./Mexico border in south Texas. The eight county area of RGRWA includes Hidalgo County and the District is a member of the RGRWA.

(5) Environmental Compliance

a) The project will briefly result in dust from the construction. The impact will be reduced by sprinkling the work areas to minimize dust.
b) Most of the District's facilities were constructed in the 1950s.
c) There will be no modification to existing features.
d) There are no Historical Markers affected by this project.
e) There are no known archeological sites in the project area.
f) The project will not have a disproportionally high and adverse impact on low or minority populations. On the contrary, the project will have a positive impact on low income and minority population by reducing cost of service to municipal water suppliers and their customers. It will also increase the overall water supply to an area with a low income and minority population.
g) There are no tribal lands in the project area.
h) The project will not contribute to the continued existence or spread of noxious weeds or non-native invasive species.

(6) Required Permits or Approvals

None anticipated.

(7) Official Resolution

The District adopted an Official Resolution at their meeting on January 5, 2015. A copy of the Resolution is included as Appendix "D". The Resolution authorizes the General Manager to apply for the Grant.

(8) Project Budget

a) Funding Plan and Letters of Commitment:

The District was awarded an Agricultural Conservation Grant from the Texas Water Development Board in the amount of $200,000 to line the N-Canal. We are requesting $300,000 from the Bureau of Reclamation, leaving a balance of $750,000, to be funded by the District. A letter from the Texas Water Development Board indicating award of the grant is included as Appendix "E". The District has its share of the project cost ($750,000) in cash, as evidenced by the excerpt from their audit, included as Appendix "G". Table 8, Funding Plan, indicates the funding plan by source and the percentage from each source.

Table 8
Funding Plan

Funding Source	Total Funding Amount	% of Total
Non-Federal entities		
Texas Water Development Board	200,000	16%
District (Applicant)	750,000	60%
Non-Federal Subtotal:	**950,000**	**76%**
Other Federal entities		
None	-	-
Other Federal Subtotal:	-	-
Requested Reclamation Funding:	300,000	24%
Total Project Funding:	**1,250,000**	**100%**

b) Budget Proposal & Narrative

Table 9 provides a Budget for the project. A Budget Narrative for each item and how it was developed is included in this section. In addition, supporting cost information is provided in Appendix "H". Table 9 provides a line item number for each item in the budget that is described in this narrative with the reference number noted in Appendix "G" where useful.

The District personnel involved in this project along with their salaries and fringe costs are detailed in Table 9.1. The General Manager, Mr. Jose Hinojosa, has been District Manager for one and a half years. Prior to working at District 15 he worked for the City of Brownsville, TX for over twenty years and various projects for the City. The Construction foreman is Mr. Carlos de la Rosa. Mr. de la Rosa has also been with the District about two years and has over twenty years in construction and maintenance. The District also plans to utilize one crew leader, one operator and two laborers to complete the portions of the work they will construct with District forces. The fringe costs, as outlined in Table 9.1, include Social Security at 6.2%, Medicare at 1.45%, Unemployment at 0.3% and Workers Compensation at 5.8%. Paid leave is calculated

on the basis of four weeks leave per year. The total Fringe Benefit for each person is provided and utilized throughout Table 9.0.

The Equipment the District plans to use for this project is detailed in Table 9.2. Equipment rates are based on the "Construction Equipment Ownership and Operating Expenses Schedule, Region VI" by the US Army Corps of Engineers, November 2011. Table 9.2 provides the description of each piece of equipment, the US Army Corps of Engineers (COE) ID Number and the COE Equipment Conditions. The operation conditions and the operator and standby rates are provided in the Table 9.1 and used through Table 9.0, in the budget. The Manager's and Construction Foreman's vehicles are calculated on the basis of the federal vehicle mileage rate.

The first component of the project is shotcrete lining of the N-Canal. The project budget includes nine (9) 40 hour weeks for the District to complete their portion, using District forces. The section of canal to be lined is 7,265 feet long, the District will clean the grass off of the existing canal bank, and patch existing holes in the liner prior to a sub-contractor installing the 3" shotcrete liner. The District estimates they can clean and patch about 1,000 feet per week, resulting in about 7 ½ weeks; allowing for a few conflicts or unexpected repairs we estimated nine weeks, 40 hours per week or 360 hours.

The construction crew time (1.03-1.06) is budgeted at the full 360 hours. The Construction Foreman, Carlos de la Rosa's, time (1.02) is budgeted at about one half of the crew time to manage the construction operation. The General Manager, Jose Hinojosa's, time (1.01) is budgeted at 25% of the crew time to document time and expenses and coordinate orders and deliveries. District Fringe Costs (1.11-1.16) are directly taken from Table 9.1 and are based on the time provided for in 1.01 – 1.06. The Foreman's truck mileage is estimated at 175 miles per week (1.22) this accounts for checking on the jobsite at least once per day. The Manager's truck mileage is estimated at 35 miles per week (1.21) this accounts for checking on the jobsite at least once per week. The Crew truck time (1.23) was estimated at 20% of the construction time for travel to and from the project site as well as to deliver materials and supplies. The standby time for the trucks is the balance of time to equal a 40 hour week (1.23s). The backhoe (1.24) is expected to be operating about 50% of the time and be on standby the other 50% of the time (1.24s). The concrete for the District to repair existing liner holes (1.31) price was determined per CY based on the price of sack-mix concrete from local hardware stores and is shown in Appendix "G". The price per SF to shotcrete line the canal (1.41) is based off of a recent bid to line the 4,765 LF of canal that was part of the TWDB contract. The price per SF from the Bid Opening was $7.00 per SF and includes reinforcement, cleaning of the canal, forming, and material & installation.

Ferris, Flinn & Medina, LLC will provide surveying and engineering services to construct the project. Services include surveying the canal right of way for boundary and topography. Revising the set of construction plans to design lining and grade, construction staking for the proposed lining, and if needed assistance throughout construction with developing quotations and specifications for soliciting proposals for materials and supplies. Item 1.51-1.56 reflects the amount of time that will be required to provide the engineering and surveying support. Item 1.61 is for geotechnical

materials testing of the shotcrete as required. A budget of 2% of construction is appropriate. The total estimated cost for this portion of the project is $911,865.23.

The second item to be constructed is the installation of the VFD at the Pump-15 Lift Station. The District will contract with an outside construction contractor to perform the electrical installation for the climate controlled room as well as the VFD itself. The District labor will however, build the 10'x10' CMU climate controlled room. The District will clear the site, pour the foundation, lay the CMU walls and reinforcement, and pour the concrete roof. The District estimates they can prep the site and form the foundation in a week. One week is anticipated to pour the foundation let it cure. One week will be required to lay the CMU and fill the cells with concrete. Another week is expected to form and pour the roof, resulting in about 4 weeks at 40 hours per week or 160 hours.

The construction crew time (2.03-2.06) is budgeted at the full 160 hours. The Construction Foreman, Carlos de la Rosa's, time (2.02) is budgeted at about one half of the crew time to manage the construction operation. The General Manager, Jose Hinojosa's, time (2.01) is budgeted at 25% of the crew time to document time and expenses and coordinate orders and deliveries and manage the electrical contractor's contract. District Fringe Costs (2.11-2.16) are directly taken from Table 9.1 and are based on the time provided for in 2.01 – 2.06. The Foreman's truck mileage is estimated at 175 miles per week (2.22) this accounts for checking on the jobsite at least once per day. The Manager's truck mileage is estimated at 35 miles per week (2.21) this accounts for checking on the jobsite at least once per week.
The Crew truck time (2.23) was estimated at 20% of the construction time for travel to and from the project site as well as to deliver materials and supplies. The standby time for the trucks is the balance of time to equal a 40 hour week (2.23s). The backhoe (2.24) is expected to be operating about 50% of the time and be on standby the other 50% of the time (2.24s). The current market price of concrete (2.31 & 2.33) to be delivered to the job site is about $150.00 per cubic yard based on the prices quoted during the bidding of the TWDB Shotcrete Lining. Adding a hundred dollars to the value covers the cost of reinforcing steel to be included in the concrete. Item 2.32 price per SF of the CMU walls is based on 450 CMU blocks at $1.50 per block, and 1 CY of concrete to fill the voids which rounds up to $1,000.00. It was estimated from prices on other similar projects that the price of various materials and mortar ingredients would cost another $1,000.00. The cost of installation of a VFD and electrical installation (2.41) is based on the cost the District recently paid to have one installed at another location, increased to accommodate supplying electrical to the climate controlled building.

Ferris, Flinn & Medina, LLC will provide surveying and engineering services to construct the project. Services include surveying the site around the existing Pump-15 Lift Station for topography. Revising the set of construction plans to design the building layout and site plan, construction staking for the proposed location of the building and if needed assistance throughout construction with developing quotations and specifications for soliciting proposals for materials and supplies. Ferris, Flinn, & Medina will also subcontract a structural engineer to design the building and an electrical engineer to design VFD and required electrical controls. Item 2.51-1.58 reflects the amount of time that will be required to provide the engineering and surveying support. Item 2.61 is for geotechnical investigation and materials testing of the concrete as required. A budget

of 5% of construction is appropriate. The total estimated cost for this portion of the project is $140,417.25.

The third component of the project is the Wind Powered Pump-15 Auxiliary Lift Pump. The project budget includes six (6) 40 hour weeks for the District to complete the project, using District forces. The District will install the wetwell, box screen, pump foundation, erect pump and tower, and discharge line. The District estimates they can excavate and form the foundations in about a week, pour them and set the RCP and Boxes in a week, fill and compact in a week, drill the foundation piers and assemble the tower in two weeks, and install the discharge line in a week, resulting in about 6 weeks at 40 hours per week or 240 hours.

The construction crew time (3.03-3.06) is budgeted at the full 240 hours. The Construction Foreman, Carlos de la Rosa's, time (3.02) is budgeted at about one half of the crew time to manage the construction operation. The General Manager, Jose Hinojosa's, time (3.01) is budgeted at 25% of the crew time to document time and expenses and coordinate orders and deliveries. District Fringe Costs (3.11-3.16) are directly taken from Table 9.1 and are based on the time provided for in 3.01 – 3.06. The Foreman's truck mileage is estimated at 175 miles per week (3.22) this accounts for checking on the jobsite at least once per day. The Manager's truck mileage is estimated at 35 miles per week (3.21) this accounts for checking on the jobsite at least once per week. The Crew truck time (3.23) was estimated at 20% of the construction time for travel to and from the project site as well as to deliver materials and supplies. The standby time for the trucks is the balance of time to equal a 40 hour week (3.23s). The excavator (3.24) is expected to be operating about 50% of the time and be on standby the other 50% of the time (3.24s). The backhoe (3.25) is expected to be operating about 50% of the time and be on standby the other 50% of the time (3.25s). The price for the wind powered pump (3.31) was rounded to the nearest $10,000 to take into account shipping, and the information is shown in Appendix "H". The price for the 6" PVC and 18" PVC was based on quotes from local vendors and are attached in Appendix "H" (3.32-3.34). The cost per LF for the 48" RCP and 4'x6' (3.34-3.35) box were rounded to the nearest $25 to account for only needing 16' of each. The current prices from CAPA concrete are shown in Appendix "G". The current market price of concrete to be delivered to the job site for the foundations and piers (3.36-3.37) is about $150.00 per cubic yard based on the prices quoted during the bidding of the TWDB Shotcrete Lining. Adding a hundred dollars to the value covers the cost of reinforcing steel to be included in the concrete. The price for the grating (3.38) is based off of a quote received by United Irrigation District for a similar project in Mission, TX in 2014. The District will contract out the drilling of the foundation piers (3.41) to an experienced driller. Recent jobs involving drilled piers with casings were used for the estimate since it is expected the soil will be fairly sandy an estimate of $2,000 per hole is appropriate and includes drilling, crane for lifting casing, and a pump truck to place the concrete.

Ferris, Flinn & Medina, LLC will provide surveying and engineering services to construct the project. Services include surveying the canal right of way for boundary and topography. Revising the set of construction plans to design the windmill and wet wells, construction staking for the proposed windmill and if needed assistance throughout construction with developing quotations and specifications for soliciting proposals for materials and supplies. FFM will also sub-contract a structural engineer to design the foundation piers and wet well & box screen foundations. Item 3.51-3.57 reflects the

amount of time that will be required to provide the engineering and surveying support. Item 3.61 is for geotechnical investigation and materials testing of the concrete as required. A budget of 5% of construction is appropriate. The total estimated cost for this portion of the project is $120,880.23.

The anticipated reporting for the project is estimated in item 4.01 through 4.23. This includes seepage testing of the lining to verify and document the water savings. The reporting will also cover reporting requirements by the Texas Water Development Board (TWDB). FFM will assist the District as needed with the reporting.

An education and outreach component was developed for the TWDB. Items 5.01-5.11 are the District's labor and fringe cost to accomplish the seminar proposed for the TWDB grant objectives. The Manager is expected to drive 50 miles (5.21) to accomplish this task at various sites. FFM will assist with development and presentation at the seminar. FFM level of effort is expected to be as itemized in 6.31-6.33.

Item 6 is for Environmental & Regulatory Compliance Cost. The District has included in its budget 1% of the total project cost, itemized in items 1-5. The amount budgeted for Environmental and Regulatory Compliance is in excess of $11,000. There are no anticipated compliance costs since all work is to be performed on District land which is previously disturbed. However, the Texas Historical Commission will be consulted. Development of the submitted data is included in the 1%.

Item 7 is an estimate of 3.85% inflation that rounds the total project cost to $1,250,000. There will inevitably be some inflation between preparation of this application and the construction of the project.

c) Continued Procurement

Santa Cruz Irrigation District No. 15 is a public entity operated under the Texas Water Code and Subject to those procurement standards. Construction proposals and materials over $25,000 will require quotations from three different suppliers and contractors. Materials and construction contracts over $75,000 will require utilization of the public bid process including advertisement in a newspaper of general circulation twice at least 3 weeks prior to the bid date. The fact that the District follows the Texas Water Code should give the BOR confidence that the District is obtaining the best prices possible.

d) Indirect Costs

There are no indirect costs proposed for this project.

e) Budget Form

Budget Form SF424C.

Table 9
Budget

Item	Description	Qty	Units	Unit Price	Total Price
1. Shotcrete Lining of the N-Canal					
District Salary and Wages					
1.01	General Manager	90	hours	$29.80	$2,682.00
1.02	Foreman	180	hours	$13.38	$2,408.40
1.03	Crew Leader 1	360	hours	$10.25	$3,690.00
1.04	Operator 1	360	hours	$10.00	$3,600.00
1.05	Laborer 1	360	hours	$7.75	$2,790.00
1.06	Laborer 2	360	hours	$7.75	$2,790.00
District Fringe Benefit Cost					
1.11	General Manager	90	hours	$6.92	$623.01
1.12	Foreman	180	hours	$3.11	$559.45
1.13	Crew Leader 1	360	hours	$2.44	$878.61
1.14	Operator 1	360	hours	$2.38	$857.70
1.15	Laborer 1	360	hours	$1.86	$669.54
1.16	Laborer 2	360	hours	$1.86	$669.54
District Equipment					
1.21	Manager's Truck	315	miles	$0.575	$181.13
1.22	Construction Foreman's Truck	1575	miles	$0.575	$905.63
1.23	Crew Truck	72	hours	$9.38	$675.36
1.23s	Crew Truck Standby	288	hours	$1.59	$457.92
1.24	Case 590 K Backhoe	180	hours	$26.86	$4,834.80
1.24s	Case 590 K Backhoe Standby	180	hours	$4.47	$804.60
Supplies/Materials					
1.31	Concrete to repair holes in existing liner	100	C.Y.	$150.00	$15,000.00
Contractual/Construction					
Independent contractor to shotcrete line N-Canal.					
1.41	Shotcrete Lining of N-Canal w/ 3" of shotcrete	117,400	S.F.	$7.00	$821,800.00
Engineering and Surveying Services to line N- Canal by Ferris, Flinn & Medina, LLC					
1.51	Registered Engineer	80	hours	$120.00	$9,600.00
1.52	Sr. Cad Technician	160	hours	$75.00	$12,000.00
1.53	Administrative Assistant	20	hours	$55.00	$1,100.00
1.54	Registered Surveyor	15	hours	$110.00	$1,650.00
1.55	Sr. Party Chief	30	hours	$70.00	$2,100.00
1.56	Instrument Man	30	hours	$40.00	$1,200.00
Independent Geotechnical Contractor					
1.61	Geotechnical Testing @	2.00%	of	$866,877.68	$17,337.55
	Subtotal Shotcrete Lining of the N-Canal				**$911,865.23**

2. Installation of VFD at Pump-15

District Salary and Wages					
2.01	General Manager	40	hours	$29.80	$1,192.00
2.02	Foreman	80	hours	$13.38	$1,070.40
2.03	Crew Leader 1	160	hours	$10.25	$1,640.00
2.04	Operator 1	160	hours	$10.00	$1,600.00
2.05	Laborer 1	160	hours	$7.75	$1,240.00
2.06	Laborer 2	160	hours	$7.75	$1,240.00
District Fringe Benefit Cost					
2.11	General Manager	40	hours	$6.92	$276.89
2.12	Foreman	80	hours	$3.11	$248.65
2.13	Crew Leader 1	160	hours	$2.44	$390.49
2.14	Operator 1	160	hours	$2.38	$381.20
2.15	Laborer 1	160	hours	$1.86	$297.58
2.16	Laborer 2	160	hours	$1.86	$297.58
District Equipment					
2.21	Manager's Truck	140	miles	$0.575	$80.50
2.22	Construction Foreman's Truck	700	miles	$0.575	$402.50
2.23	Crew Truck	32	hours	$9.38	$300.16
2.23s	Crew Truck Standby	128	hours	$1.59	$203.52
2.24	Case 590 K Backhoe	80	hours	$26.86	$2,148.80
2.24s	Case 590 K Backhoe Standby	80	hours	$4.47	$357.60
2.25	Generator	80	hours	$2.33	$186.40
2.25s	Generator Standby	80	hours	$0.42	$33.60
Supplies/Materials					
2.31	Reinforced concrete for building slab.	6	C.Y.	$250.000	$1,500.00
2.32	8"x8"x16" CMU w/ reinforcing	400	S.F.	$5.000	$2,000.00
2.33	Reinforced Concrete for building roof.	2	C.Y.	$250.000	$500.00
Contractual/Construction					
Electrical Contractor to connect electrical & install VFD					
2.41	Electrical installation of VFD, A/C, and connection at building	1	LS	$75,000.00	$75,000.00
Engineering and Surveying Services to Construct Building & VFD by Ferris, Flinn & Medina, LLC					
2.51	Registered Engineer	80	hours	$120.00	$9,600.00
2.52	Sr. Cad Technician	240	hours	$75.00	$18,000.00
2.53	Administrative Assistant	30	hours	$55.00	$1,650.00
2.54	Registered Surveyor	15	hours	$110.00	$1,650.00
2.55	Sr. Party Chief	30	hours	$70.00	$2,100.00
2.56	Instrument Man	30	hours	$40.00	$1,200.00
2.57	Structural Engineer	40	hours	$125.00	$5,000.00
2.58	Electrical Engineer	40	hours	$100.00	$4,000.00
Independent Geotechnical Contractor					

2.61	Geotechnical Investigation and Testing @	5.00%	of	$92,587.86	$4,629.39

	Subtotal Installation of VFD at Pump-15	**$140,417.25**

3. Construction of the Wind Powered Pump-15 Auxiliary Pump

District Salary and Wages					
3.01	General Manager	60	hours	$29.80	$1,788.00
3.02	Foreman	120	hours	$13.38	$1,605.60
3.03	Crew Leader 1	240	hours	$10.25	$2,460.00
3.04	Operator 1	240	hours	$10.00	$2,400.00
3.05	Laborer 1	240	hours	$7.75	$1,860.00
3.06	Laborer 2	240	hours	$7.75	$1,860.00
District Fringe Benefit Cost					
3.11	General Manager	60	hours	$6.92	$415.34
3.12	Foreman	120	hours	$3.11	$372.97
3.13	Crew Leader 1	240	hours	$2.44	$585.74
3.14	Operator 1	240	hours	$2.38	$571.80
3.15	Laborer 1	240	hours	$1.86	$446.36
3.16	Laborer 2	240	hours	$1.86	$446.36
District Equipment					
3.21	Manager's Truck	210	miles	$0.575	$120.75
3.22	Construction Foreman's Truck	1050	miles	$0.575	$603.75
3.23	Crew Truck	48	hours	$9.38	$450.24
3.23s	Crew Truck Standby	192	hours	$1.59	$305.28
3.24	JD 200 LC Excavator	120	hours	$39.93	$4,791.60
3.24s	JD 200 LC Excavator Standby	120	hours	$8.64	$1,036.80
3.25	Case 590 K Backhoe	120	hours	$26.86	$3,223.20
3.25s	Case 590 K Backhoe Standby	120	hours	$4.47	$536.40
3.26	BPR 30/38-D3 Compactor	80	hours	$9.83	$786.40
3.26s	BPR 30/38-D3 Compactor Standby	160	hours	$2.04	$326.40
3.27	Generator	80	hours	$2.33	$186.40
3.27s	Generator Standby	80	hours	$0.42	$33.60
Supplies/Materials					
3.31	Wind Powered Pump	1	LS	$30,000.00	$30,000.00
3.32	6" PVC Pipe C900	85	L.F.	$15.98	$1,358.30
3.33	6" PVC Fittings and Vales	1	Lot	$1,000.00	$1,000.00
3.34	18" PVC 80 PSI PIP Pipe	50	L.F.	$12.15	$607.50
3.35	48" RCP for wet well	16	L.F.	$125.00	$2,000.00
3.36	4'x6' Box Culvert	16	L.F.	$225.00	$3,600.00
3.37	Reinforced concrete for drilled piers	14	C.Y.	$250.00	$3,500.00
3.38	Reinforced concrete for slabs	7	C.Y.	$250.00	$1,750.00
3.39	Grating for barscreen and wet well	1	LS	$5,000.00	$5,000.00

Contractual/Construction

Independent contractor to drill piers for wind powered pump foundation

3.41	Drilling piers for wind powered pump foundation	4	Ea.	$2,000.00	$8,000.00

Engineering and Surveying Services to Construct Windmill by Ferris, Flinn & Medina, LLC

3.51	Registered Engineer	80	hours	$120.00	$9,600.00
3.52	Sr. Cad Technician	160	hours	$75.00	$12,000.00
3.53	Administrative Assistant	20	hours	$55.00	$1,100.00
3.54	Registered Surveyor	15	hours	$110.00	$1,650.00
3.55	Sr. Party Chief	30	hours	$70.00	$2,100.00
3.56	Instrument Man	30	hours	$40.00	$1,200.00
3.57	Structural Engineer	40	hours	$125.00	$5,000.00

Independent Geotechnical Contractor

3.61	Geotechnical Investigation & Testing @	5.00%	of	$84,028.79	$4,201.44

Subtotal Wind Powered Pump-15 Auxiliary Pump	**$120,880.23**

4. Reporting

District Hourly Labor Cost

4.01	General Manager	40	hours	$26.27	$1,050.61

District Fringe Benefit Cost

4.11	General Manager	40	hours	$10.60	$424.08

Professional Engineering Services

4.21	Registered Engineer	40	hours	$140.00	$5,600.00
4.22	Sr. Cad Technician	20	hours	$75.00	$1,500.00
4.23	Administrative Assistant	20	hours	$55.00	$1,100.00

Total Reporting	**$9,674.69**

5. Seminar on Project Conservation and Renewable Energy

District Hourly Labor Cost

5.01	General Manager	40	hours	$26.27	$1,050.61

District Fringe Benefit Cost

5.11	General Manager	40	hours	$10.60	$424.08

Mileage

5.21	Manager's Truck	50	miles	$0.000	$0.00

Professional Engineering Services

5.31	Registered Engineer	40	hours	$120.00	$4,800.00
5.32	Sr. Cad Technician	20	hours	$75.00	$1,500.00
5.33	Administrative Assistant	20	hours	$55.00	$1,100.00

Total Seminar	**$8,874.69**

6. Environmental & Regulatory Compliance @	**1%**	**of**	**$1,191,712.10**
Total Environmental & Regulatory Compliance			**$11,917.12**
7. Inflation @	**3.85%**	**of**	**$1,203,629.22** **$46,370.78**
Total Project Budget			**$1,250,000.00**

Table 9.1
Santa Cruz Irrigation District No. 15
Salary, Wage and Fringe Details

Position	Hourly Rate	Fringe Benefits Cost per Hour	Total Hourly Rate w/ Benefits
General Manager	$29.800	$6.922	$36.722
Construction Foreman	$13.380	$3.108	$16.488
Crew Leader 1	$10.250	$2.441	$12.691
Operator 1	$10.000	$2.383	$12.383
Laborer 1	$7.750	$1.860	$9.610
Laborer 2	$7.750	$1.860	$9.610

Fringe Benefits Breakdown by the Hour

Position	Soc. Security @ 6.2%	Paid Leave @ Four Weeks	Uniforms @ $0.055 Hour	
General Manager	$1.848	$2.825		
Construction Foreman	$0.830	$1.268		
Crew Leader 1	$0.636	$0.976	$0.055	
Operator 1	$0.620	$0.953	$0.055	
Laborer 1	$0.481	$0.739	$0.055	
Laborer 2	$0.481	$0.739	$0.055	

Position	Medicare @ 1.45%	Unemployment @ 0.3%	Worker's Comp. @ various	*Worker's Comp. Rate @*
General Manager	$0.432	$0.089	$1.728	*5.80%*
Construction Foreman	$0.194	$0.040	$0.776	*5.80%*
Crew Leader 1	$0.149	$0.031	$0.595	*5.80%*
Operator 1	$0.145	$0.030	$0.580	*5.80%*
Laborer 1	$0.112	$0.023	$0.450	*5.80%*
Laborer 2	$0.112	$0.023	$0.450	*5.80%*
Total Working Hours per Year with Four Weeks Leave				1,920.00

Table 9.2
Equipment Rate Schedule

District Equipment Description	COE ID No.	COE Equipment Description	COE Total Hourly Rate ($/ HR)	
			Operating	Standby
Crew Truck (F-350)	T50XX021	Truck, Highway, Crew, 1 Ton Pickup, 4x2	9.38	1.59
Linkbelt Model 130 LX	H25LB003	Hydraulic Excavator Crawler 27,100 Lbs., 0.50 Bucket, 18'2" Max Digging Depth	39.93	8.64
JD 410G Backhoe (Equivalent to COE Case 580 Super M Series 2)	L50CS005	Loader/Backhoe, Wheel 1.0 CY Front End Bucket, 24" DIP, 6.2 CF, 14.25 Digging Depth, 4x4	26.86	4.47
Bomag Compactor, Vibroplate, 25.6" x 35.4" Plate, Reversible, 11,250 Lbs Impact	C10BO008	Bomag Compactor, Vibroplate, 25.6" x 35.4" Plate, Reversible, 11,250 Lbs Impact	9.83	2.04
Generator (On Shop truck)	G10XX004	Generator Set, Portable, 5KW	2.33	0.42
Construction Foreman's Vehicle	Use Federal Mileage Rate for Vehicle per Mile		0.575	per mile
Manager's Vehicle	Use Federal Mileage Rate for Vehicle per Mile		0.575	per mile

Appendix "A"

District Allocation Plan

ORDER EXTENDING
TEMPORARY WATER ALLOCATION SYSTEM
(6/99)

WHEREAS, the Santa Cruz Irrigation District (the District) is dependent on the Rio Grande River for domestic and irrigation water for the users in the District; and

WHEREAS, the catchment area for water for the lower portion of the Rio Grande River has received lower than normal rainfall over the last several years; and

WHEREAS, during such years the Watermaster for the Rio Grande River has provided the District a smaller than normal monthly water allocations due to the lack of water in storage; and

WHEREAS, prior to November of 1995, the District used a "first come, first served" policy with respect to water delivery; and

WHEREAS, the Board of Directors is of the opinion that a "first come, first served" water allocation policy is unworkable in the present water crisis; and

WHEREAS, the Board of Directors adopted a Temporary Water Allocation system on November 11, 1995 and has extended such system since that time; and

WHEREAS, the Board of Directors is of the opinion that it is in the best interest of the water users in the District to extend the Temporary Water Allocation System indefinitely with an annual reaffirmation by all participants in the System and a continuing opportunity for persons who have not previously participated in the System to enroll to receive a share of new water that the District receives, provided that such new users comply with the same requirements as all other participants.

NOW, THEREFORE, the Board of Directors of the Santa Cruz Irrigation District No. 15 of Hidalgo County, Texas hereby makes the following findings:

1. The present situation with respect to the availability of water from the Rio Grande River for domestic and agricultural use constitutes a temporary water crisis. It is reasonably foreseeable that the District will not have sufficient water during the present fiscal year to supply the needs of all its users and perhaps into subsequent fiscal years.

2. It is in the best interest of the water users of the District to utilize a water allocation system that insures that each participant receives a specified amount of water per irrigable acre.

3. The District has previously agreed to allocate a portion of the District's annual water allocation to North Alamo Water Supply corporation (NAWSC) to insure potable water service to residents of the District. the Board of Directors finds that 1,000 acre feet of the current water rights should be reserved for such use during the current fiscal year. The Board of Directors finds that there is no other user who requires such type of water rights directly from the District.

4. The District has an agreement with Hidalgo County Irrigation District No. 1 for delivery of water from the Rio Grande River to the District. Pursuant to such agreement, up to twenty-five percent (25%) of all water extracted from the river is presumed lost in transportation. Accordingly, the Board of Directors finds that twenty percent of the current allocation will be lost in transport and unavailable for sale to water users. In addition, losses within the District are currently estimated at an additional twenty percent of the total water diverted from the river.

5. Pursuant to the Texas Water Code, the District is not obligated to provide water to any person who fails to pay the flat rate assessment imposed on the land for which the person seeks water or who fails to abide by the reasonable regulations imposed by the District.

6. The Board of Directors finds that a water allocation system relying on principles of "first come, first served" will be inequitable during the present water crisis in that users will not be able to plan their water use due to the uncertainty of when the District's current allotment will be totally consumed.

7. The Board of Directors finds that a water allocation system should be implemented with the following characteristics:

a) It should be temporary so that it is only in effect while a water crisis exists.

b) It should allocate irrigation water proportionately to each user based on the irritable acres as determined by the flat rate assessment.

c) It should require that all persons who seek water to pay any outstanding flat rate assessments within a short time and that all other assessments be paid when due.

d) It should require that all persons who seek water to annually pay a non-refundable deposit of $9.00 per irrigible acre subject to the flat rate assessment to reserve water for their use, such deposit being a prepayment of water delivery charges.

e) It should provide for reallocation of water that has not been reserved for use by others.

f) It should provide for transferability of use from one tract of land to another tract within the District at the request of the owner or operator, provided that the tracts are owned by the same owner or leased by the same operator.

g) It should permit users to acquire water allocations outside the District for use in the District subject to payment of water delivery charges and deduction for water loss during transportation and to allow transfer of such allocations.

B. Triggering conditions —

ACCORDINGLY, the Board of Directors of Santa Cruz Irrigation District No. 15 hereby adopts the following Order:

District shall

IT IS ORDERED that each landowner and/or operator of lands in the District shall maintain the allocation of water previously allocated less all water charged against such allocation. The District staff shall maintain such records of water allocations on a prorata basis to all participants in accordance with prior orders. Further, the District staff shall maintain records of water use by all participants including water losses.

IT IS FURTHER ORDERED that any person who desires to participate in future water allocations shall pay a non-refundable deposit of $9.00 for each participating irrigible acre noted on the District's flat rate records and shall be eligible for any allocation occurring after such payment, provided the participant has complied with all of the conditions set out herein. In no event shall the new participant be eligible for any allocation of water made prior to payment of the deposit, except to the extent that the participant had previously paid a deposit or the Board of Directors determines there are extenuating circumstances.

IT IS FURTHER ORDERED that the District shall not be required to delivery any water to nor make any new allocations of water for any irrigible acre as to which the flat rate, special assessment, work orders or any other amounts due the District have remained unpaid for thirty (30) days after the due date.

IT IS FURTHER ORDERED that the District shall not be required to deliver any water to nor make any new allocations of water for any participant whose water charges, work orders or any other amounts due the District have remained unpaid for thirty (30) days after the due date.

IT IS FURTHER ORDERED that the District may, in its discretion, reduce a participant's water allocation by the amount of water that such participant has failed to pay when the water charges have remained unpaid for more than six months after the due date.

IT IS FURTHER ORDERED that the District may, in its discretion, reduce a participant's water allocation at the then existing rate of charge per acre foot of allocation where such participant has failed to pay for work orders or other amounts due the District and such sum has remained unpaid for more than six months after the due date, provided this provision shall not be used to pay for taxes or assessments due the District.

Bill?

IT IS FURTHER ORDERED that the water allocation provided to any participant for each irrigible acre above shall be suspended if the flat rate assessments or any other assessments or taxes or any other charges by the District are not paid when due. During the period of such suspension, the water allocation to such irrigible acre shall not be available for use nor shall such acre be eligible for any new allocations of irrigation water as hereinafter provided.

IT IS FURTHER ORDERED that the District shall not make any new water allocations to any participant who has an accumulated allocation of 3.0 acre feet per irrigable acre, provided that any participant who owns or uses multiple tracts of land shall be responsible for requesting transfer of water allocations between such tracts to equalize such allocations on all such tracts. The District shall maintain copies of all current water allocations for examination and review by any participant or the public.

IT IS FURTHER ORDERED that any participant who fails to use his, her or its water allocation on any tract during any two calendar years shall forfeit the water allocation for such tract as of January 1st of the following year, provided that partial use during such two year period shall preserve that participant's water allocation.

IT IS FURTHER ORDERED that participation in future water allocations shall be forfeited if a non-refundable deposit of $9.00 for each participating irrigible acre is not paid to the District as of 5 P.M. on or before October 31 of each calendar year.

IT IS FURTHER ORDERED that the General Manager of the District, with the prior approval of or at the direction of the Board of Directors, shall periodically allocate on a prorata basis to all participating irrigible acres all forfeited water allocations and all new water allocations received from the Rio Grande Watermaster as may be deemed appropriate.

District Manager

IT IS FURTHER ORDERED that water allocations may be transferred from any non-forfeited irrigible acre in the District to any other non-forfeited irrigible acre in the District at the written request of the owner or operator, provided that the tracts are owned by the same owner or leased by the same operator.

IT IS FURTHER ORDERED that water allocations shall not be transferred to any land outside the District boundaries.

IT IS FURTHER ORDERED that any water allocations secured from sources outside the District are not subject to this temporary water allocation system and shall be delivered upon presentation of proper documentation of their existence in accordance with existing District policies and subject to the then applicable deduction for loss in transportation.

IT IS FURTHER ORDERED THAT, notwithstanding any other provision herein, water allocated to an owner or operator may be used on any tract of land that such owner or operator owns or leases and operates within the boundaries of the district provided that the flat rate assessment on both tracts is current at the time of use.

IT IS FURTHER ORDERED that this Order shall remain in effect until an order canceling the Temporary Water Allocation system is entered by the Board of Directors of the District. This Order may be amended or modified as may be necessary in the discretion of the Board of Directors.

IT IS FURTHER ORDERED that any person who believes that there are extenuating circumstances that would justify a waiver of any provision of this Order or of other rules and regulations of the District may make written application to the Board of Directors who, upon notice, may in their discretion grant such waiver.

IT IS FURTHER ORDERED that the temporary water allocation system created by this Order be subject to the rules, regulations and orders of the Water Master and subject to the availability of water in the Rio Grande River.

This order was considered and adopted by majority vote of the Board of Directors of Santa Cruz Irrigation District No. 15 at a regular meeting held on the 21st day of June, 1999 at 7:00 P.M.

SIGNED this 21st day of June, 1999.

ENFORCEMENT

Not Included

IT IS FURTHER ORDERED that any person who willfully opens, closes, changes or interferes with any head gate or uses water in violation of section 11.083 of the Texas Water Code may be assessed an administrative penalty up to $5000 a day under section 11.80421 of the Texas Water Code. Additionally, if the violator is taking, diverting or appropriating state water, the violator may be assessed a civil penalty in court of up to $5000 a day. The violator may be sued for (OVER)

ORDER AMENDING
TEMPORARY WATER ALLOCATION SYSTEM ORDER
(November 10, 1997)

WHEREAS, the Santa Cruz Irrigation District (the District) has implemented a Temporary Water Allocation System by Order of the Board of Directors adopted on Saturday, November 11, 1995, amended on several different dates since then and scheduled to expire on August 31, 1998; and

WHEREAS, the amount of water in the District's water account with the Rio Grande Watermaster is substantially below normal, making it impossible to return to a first come, first served basis; and

WHEREAS, the Board of Directors has determined that corrections should be made to the Order entered on September 8, 1997 due to an unintended error in such Order;

NOW, THEREFORE, the Board of Directors of the Santa Cruz Irrigation District No. 15 of Hidalgo County, Texas hereby **ORDERS** that the Order Amending Temporary Water Allocation System adopted on September 8, 1997 be and is hereby corrected by deleting the prior order in its entirety and substituting in its stead the following Corrected Order:

CORRECTED ORDER AMENDING
TEMPORARY WATER ALLOCATION SYSTEM ORDER
(September 8, 1997)

WHEREAS, the Santa Cruz Irrigation District (the District) has implemented a Temporary Water Allocation System by Order of the Board of Directors adopted on Saturday, November 11, 1995 and scheduled to expire on August 31, 1997; and

WHEREAS, the amount of water in the District's water account with the Rio Grande Watermaster is substantially below normal, making it

impossible to return to a first come, first served basis and necessitating an extension of the Temporary Water Allocation System; and

WHEREAS, the Board of Directors has determined that an extension of the Temporary Water Allocation System should permit all persons who wish to participate in this System to enlist and become entitled to receive a proportionate share of any new water that the District receives from the Watermaster, provided that they comply with the same requirements as the initial participants; and

WHEREAS, the Board of Directors has further determined that all existing water users should reaffirm their intentions to utilize water for the next twelve months and that other minor changes should be made to the Temporary Water Allocation System;

NOW, THEREFORE, the Board of Directors of the Santa Cruz Irrigation District No. 15 of Hidalgo County, Texas hereby makes the following finding:makes the following finding:

1. It is in the best interest of the water users in the District to extend the Temporary Water Allocation System until August 31, 1998 with a reaffirmation by all persons who have qualified to participate in the System and a continuing opportunity for persons who have not previously participated in the System to enroll to receive a share of new water that the District receives, provided that such new users comply with the same requirements as all other participants.

ACCORDINGLY, the Board of Directors of the Santa Cruz Irrigation District No. 15 hereby adopts the following Order:

IT IS ORDERED that the Order adopted on November 11, 1995 establishing a Temporary Water Allocation System is hereby amended by adding a new section to read as follows:

IT IS FURTHER ORDERED that no additional water allocation for a current participant in the Temporary Water Allocation System shall be made after October 31, 1997 unless a new non-refundable deposit of $9.00 for each irrigible acre is paid to the District after September 8, 1997 and before 5 P.M. on October 31, 1997, provided that any participant who has paid a non-refundable deposit of $9.00 per irrigible acre on or after January 1, 1997 but has not used such deposit as of August 25, 1997, shall not be required to pay a new deposit.

IT IS FURTHER ORDERED that any owner or other person or entity who has participated in the Temporary Water Allocation System prior to September 8, 1997 but fails to pay the non-refundable deposit required by the previous paragraph may apply in writing to the Board of Directors for reinstatement of the privilege upon proof of extenuating circumstances and tender of the deposit due; the Board of Directors shall consider such application promptly and advise the applicant of its determination.

IT IS FURTHER ORDERED that the District shall not be required to deliver any water to nor make any new allocations of water for any irrigible acre as to which the flat rate, special assessment, work orders or any other amounts due the District have remained unpaid for thirty (30) days after the due date.

IT IS FURTHER ORDERED that the District shall not be required to deliver any water to nor make any new allocations of water for any participant whose water charges, work orders or any other amounts due the District have remained unpaid for thirty (30) days after the due date.

IT IS FURTHER ORDERED that the District may, in its discretion,

reduce a participant's water allocation by the amount of water that such participant has failed to pay where the water charges have remained unpaid for more than six months after the due date.

IT IS FURTHER ORDERED that the District may, in its discretion, reduce a participant's water allocation at the rate of $30.00 per acre foot of allocation where such participant has failed to pay for work orders or other amounts due the District and such sum has remained unpaid for more than six months after the due date, provided that provision shall not be used to pay for taxes or assessments due the District.

IT IS FURTHER ORDERED that the District shall not make any new water allocations to any participant who has an allocation of 3.0 acre feet per irrigible acre, provided that any participant who owns or uses multiple tracts of land shall be responsible for requesting transfer of water allocations between such tracts to equalize such allocations on all such tracts. The District shall maintain copies of current water allocations for examination and review by participants.

IT IS FURTHER ORDERED that any participant who fails to use his, her or its water allocation on any tract during any two calendar years shall forfeit the water allocation for such tract as of January 1st of the following year, provided that partial use during such two year period shall preserve that participant's water allocation.

IT IS FURTHER ORDERED that the Temporary Water Allocation System, adopted on November 1, 1995 and extended by previous Orders until August 31, 1997, is hereby extended and shall remain in effect until August 31, 1998.

This Order adopting a Corrected Order for September 8, 1997 was considered and adopted by majority vote of the Board of Directors of Santa Cruz Irrigation District No. 15 at a special meeting held on November 10, 1997 at 7:00 P.M.

SIGNED this ____ day of November, 1997.

ROY C. GARZA, President

ATTEST:

BLANCA SOTO, Secretary

Appendix "B"

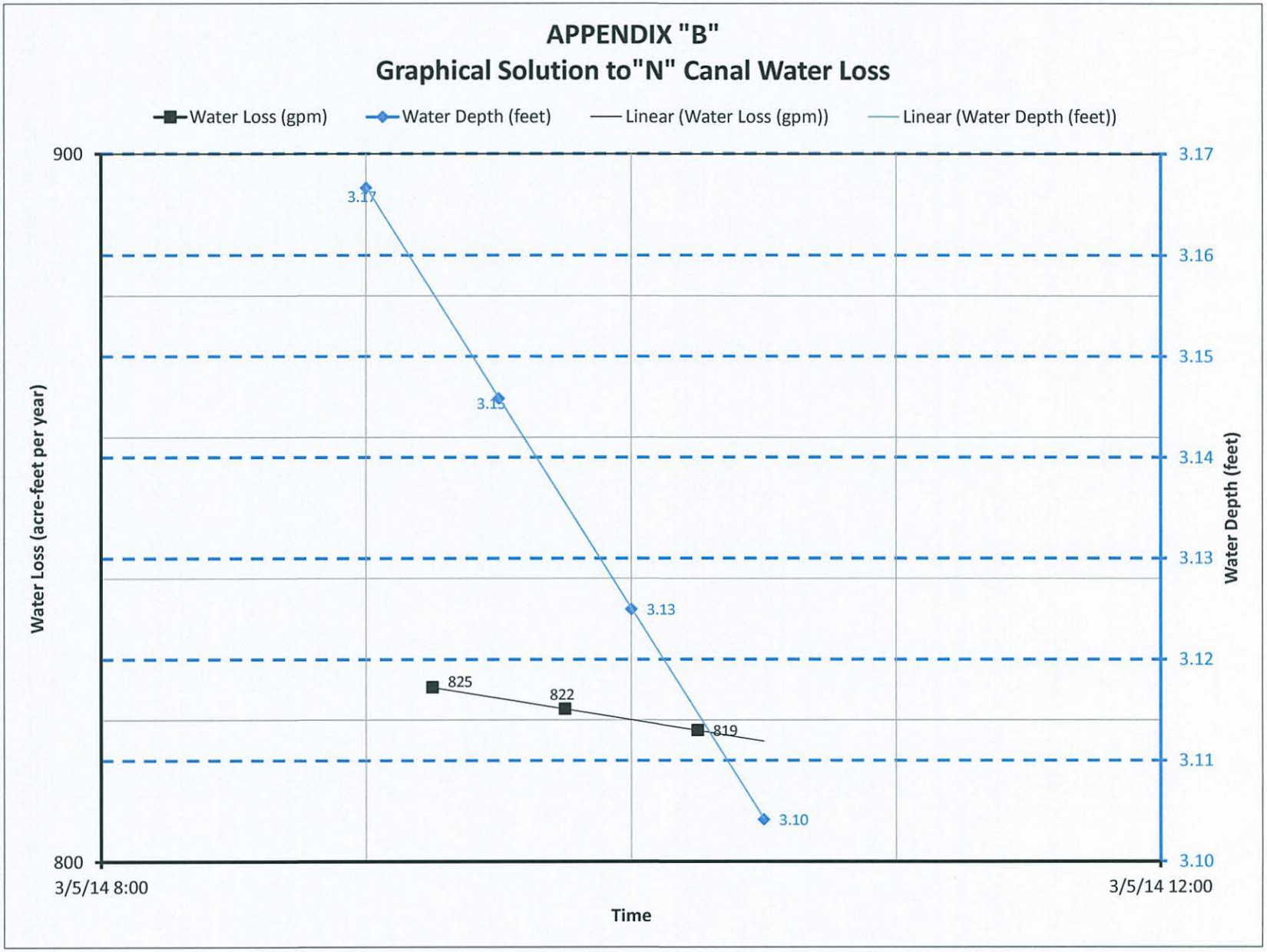
Water Conservation Estimate

APPENDIX "B"

Test Results for "N" CANAL

Date & Time	Distance from Bottom of Concrete Walkway to Water Surface (feet)	Water Depth (Distance from top of concrete walkway to bottom of canal=5.25 feet)	Volume in Canal (gallons)	Water Loss (gpm)	Cumulative Water Loss (gpm)	Water Loss (Acre Feet Per Year)	Notes
3/5/14 9:00	2.08	3.17	1,682,938				
3/5/14 9:15				511	511	825	
3/5/14 9:30	2.10	3.15	1,667,601				
3/5/14 9:45				509	510	822	
3/5/14 10:00	2.13	3.13	1,652,320				
3/5/14 10:15				507	509	819	
3/5/14 10:30	2.15	3.10	1,637,096				
Times in italics are averages of actual reading times to plot water loss between two time periods.							

Estimated Loss per year (acre feet) @ normal operating depth of 3.92' & full 310 days per year.		**797**
Canal Perimeter	17.75	feet
Canal Length	8700	feet
	1.65	mile(s)
Cost of Canal Lining	7.00	$/Square Foot
Water Loss per foot of Canal	0.09	Ac.-Ft./Foot Yr
Total Area of Canal Liner	154,425.00	Square Feet
Square Feet of Liner per Mile of Canal	93,720.00	Square Feet/ Mile
Cost of Liner per Mile of Canal	656,040.00	$/Mile
Estimated Efficiency of New Lining System	85.00%	
Estimated losses through HCID #1 & SCID #15's System to this canal	30.00%	
Total estimated water lost per year (acre feet) @ normal operating depth of 3.92'		**1139**
The Pro-rated Water Loss This Project	**951**	**Acre-Ft/Yr**


APPENDIX "B"
Graphical Solution to"N" Canal Water Loss
Water Loss (gpm)
Water Depth (feet)
Linear (Water Loss (gpm))
Linear (Water Depth (feet))
900
800
3.17
3.16
3.15
3.14
3.13
3.12
3.11
3.10
3.17
3.15
3.13
3.10
825
822
819
Water Loss (acre-feet per year)
Water Depth (feet)
3/5/14 8:00
3/5/14 12:00
Time

Appendix "C"

Aermotor Wind Powered Pump

(800) 854-1656 sales@aermotorwindmill.com

Windmills, Towers, Pumps, Rods, and Replacement Parts

Look to Aermotor as your best source for complete windmills and genuine Aermotor replacement parts. Everything is manufactured in the USA and available through a worldwide network of dealers and water well drillers.

Aermotor Replacement Parts

Click to see Replacement Parts

Aermotor Windmill Component Repair

There comes a time in a windmill's life when the smart solution is a new Aermotor Basic Motor. Assembled at the factory, this is an excellent way to extend your investment.

Part	Description	X	A	B	D	E	F
875	Basic Motor	$1646	$1748	$2455	$3954	$5216	$6740
	Bearing for #802 Pitman Arms	$15	$21	$35	$40	$54	$69
	Special Taps for Aermotor Hubs	$58	$64	$78	$158	$158	$185
	Box of Bolts for 799 Wheel Assembly	$35	$40	$58	$80	$95	$128
	20 Brake Kit	$277	$280	$448	$580	$712	$1180

Aermotor Complete Windmills

Complete windmills do not include a tower or stub tower.

Model	Wheel Diameter (feet)	Strokes (inches)	Price	Weight
X	6	5 & 3 3/4	$2880	200lbs
A	8	7 1/8 & 5 1/2	$2980	350lbs
B	10	9 1/4 & 7 1/4	$4350	640lbs
D	12	11 1/2 & 8 1/4	$7320	1090lbs
E	14	13 1/2 & 9 3/4	$10550	1735lbs
F	16	14 7/8 & 11 3/8	$13820	2380lbs

Aermotor Windmill Components

Complete windmills do not include a tower or stub tower.

Part #	Description	6' (X)	LBS	8' (A)	LBS	10' (B)	LBS	12' (D)	LBS	14' (E)	LBS	16' (F)	LBS
32	Vane Assembly w/Hardware	$219	8	$258	13	$364	19	$592	42	$740	60	$1094	100
664	1/2 Pipe Base Assembly	$339	17	$388	21	$498	43	$615	70	$1176	105	$1506	145
747	Tailbone Assembly	$235	15	$300	24	$406	48	$667	80	$1054	120	$1330	195
799	Wheel Assembly	$650	60	$960	125	$1480	210	$2370	373	$3612	625	$4976	802
881	Crated Motor	$1895	100	$1990	167	$2856	320	$4476	525	$5856	825	$7802	1138

*Add $100 for Hot-Dipped Wheel

Aermotor 4-Post Steel Towers

Includes Stub Tower, Platform, and Anchor Posts.

6' Mill – 2 X 2 X 3/16

Tower Height	Price	Weight
21'	$2450	445lbs
27'	$2860	500lbs
33'	$3370	660lbs
40'	$3940	775lbs
47'	$4620	930lbs

8' Mill – 2 X 2 X 3/16

Tower Height	Price	Weight
21'	$2450	445lbs
27'	$2860	500lbs
33'	$3370	660lbs
40'	$3940	775lbs
47'	$4620	930lbs

10' Mill – 2 1/2 X 2 1/2 X 3/16

Tower Height	Price	Weight
21'	$2910	509lbs
27'	$3640	539lbs
33'	$3820	730lbs
40'	$4480	860lbs
47'	$5250	995lbs

12' Mill – 2 1/2 X 2 1/2 X 3/16

Tower Height	Price	Weight
27'	$4320	780lbs
33'	$4500	963lbs
40'	$5280	1140lbs
47'	$6110	1440lbs

14' Mill – 3 X 3 X 3/16

Tower Height	Price	Weight
27'	$4390	900lbs
33'	$5060	1090lbs
40'	$5500	1300lbs
47'	$7590	1590lbs

16' Mill – 3 X 3 X 1/4

Tower Height	Price	Weight
33'	$6600	1420lbs
40'	$7425	1780lbs
47'	$9070	2210lbs

Aermotor Stub Towers

3' Stub Towers do not have platform
4' Stub Towers for 6' or 8' mills include regular platform
4' Stub Towers for 12' or 14' mills include oiling platform
5' Stub Towers for 10' mills include regular platform
7' Stub Towers for 6', 8', or 10' mills include regular platform
7' Stub Towers for 12', 14', or 16' mills include regular & oiling platform

6' Mill

Stub Height	Price	Weight
3'	$208	36lbs
4'	$750	38lbs
7'	$880	120lbs
14'	$1750	280lbs

8' Mill

Stub Height	Price	Weight
3'	$208	36lbs
4'	$750	38lbs
7'	$880	120lbs
14'	$1750	280lbs

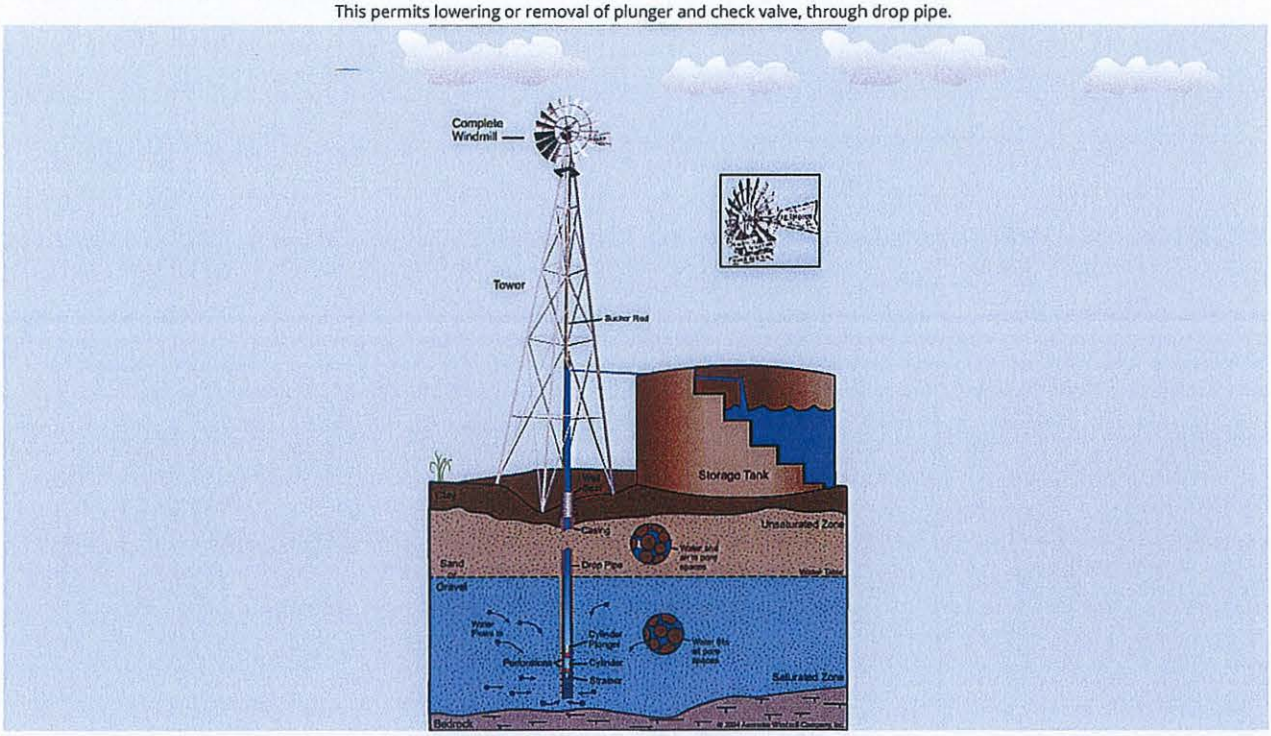
10' Mill

Stub Height	Price	Weight
3'	$240	45lbs
5'	$925	111lbs
7'	$940	140lbs

***Pumping capacities of Aermotor Windmills** shown in the table below, are approximate, based on the mill set on the long stroke, operating in a 15-20mph wind. The short stroke increases elevation by one-third and reduces pumping capacities by one-fourth.

Size of Cylinder (inches)	*Capacity Per Hour (gallons)		Elevation in Feet to Which Water Can Be Raised (size of Aermotor windmill)					
	6'	8-16'	6'	8'	10'	12'	14'	16'
1 7/8	125	180	120	175	260	390	560	920
2	130	190	95	140	215	320	460	750
2 1/4	180	360	77	112	170	250	350	590
2 1/2	225	325	65	94	140	210	300	490
2 3/4	265	385	56	80	120	180	260	425
3	320	470	47	68	100	155	220	360
3 1/2	440	640	35	50	76	115	160	265
3 3/4		730			65	98	143	230
4	570	830	27	37	58	86	125	200
5	900	1300	17	25	37	55	80	130
6		1875		17	25	38	55	85

Selection of Cylinder – Open top cylinder is recommended, where it can be used. Inside diameter of the drop pipe is slightly larger than inside diameter of cylinder. This permits lowering or removal of plunger and check valve, through drop pipe.



©2014 Aermotor Windmill Company. Website by **SanAngeloWebDesign.com**.

Appendix "D"

Official Resolution

Irrigation #15

Jack Wallace, Jr. President
W.J. "Jud" Flowers, Vice President — James Bettiga, Secretary
Prudencio Villarreal, Jr., Director — Nowell Borders, Director

SANTA CRUZ IRRIGATION DISTRICT NO. 15
P. O. Box 599 Edinburg, TX 78540- Physical address: 601 E. FM 2812 Edinburg, TX 78539 phone 956-383-3441

CERTIFICATE FOR RESOLUTION OF SANTA CRUZ IRRIGATION DISTRICT NO. 15

STATE OF TEXAS
COUNTY OF HIDALGO

We, the undersigned officers of the Board of Directors of Santa Cruz Irrigation District No. 15, herby certify as follows:

1. **The Board of Directors of said District convened a Regular Meeting on the 19th day of January, 2015 at the regular designated meeting place of said District, and the roll was a call of duly constituted officers of said Board, to wit:**

   President- Jack Wallace Jr.
   Vice President – Jud Flowers
   Secretary- James Bettiga

And all of said persons were present, constituting a quorum. Whereupon the following transacted at said Meeting. It was moved by and seconded by that the Board approve the following:

Resolution 2015-0105-012

WHEREAS, the Santa Cruz Irrigation District No. 15 of Hidalgo County, Texas ("District") is a political subdivision of the State of Texas operating pursuant to applicable State statues, including Chapter 51 and 49 of the Texas Water Code and Articles XVI, Section 59 of the State Constitution; and

WHEREAS, the Board of Directors of the District ("Board"), which is its governing body, desires to file an Application for the WaterSMART; Water Efficiency Grants for FY 2015 to include the Variable Frequency Rated Pump Motors, Wind Powered Pumping, Solar Powered Remote Sensing and Automation Capability, and Canal Lining.

WHEREAS, the Board desires to approve the Application referenced FOA_____ for submission to the U.S. Bureau of Reclamation ("Reclamation") and endorse it for approval by Resolution

NOW, THEREFORE, BE IT RESOLVED, that the president of the Board of Director's is the District's representative and is hereby authorized to enter into any and all agreement or other documents pertaining to the Application and the consummation of Project work and necessary funding related thereto; that the Board and General Manager of the District have reviewed and support the Application to appropriate officials; the District has the capability to provide the amount of funding and/or income contribution specified in the funding plan included in the Application; and the Board will work with Reclamation to meet established deadlines for entering into Cooperative Agreement and the General Manager of the District is hereby instructed to work with Reclamation to meet established deadlines for entering into Cooperative Agreement and do any and all things necessary to accomplish consummation of all requirements of the Application and Project work pursuant to the Application, Project funding, and all related matters.

And, after due discussion, said motion, carrying with it the passage of the said Resolution prevailed and carried by the following vote:

AYES: All those present

NOES: 0

That the above and foregoing paragraphs are a true, full and correct copy of the aforesaid Resolution and Order adopted at the Meeting described above, that said Resolution and Order has been duly recorded in said Board's Minutes of said Meeting, that the above and foregoing paragraphs are a true, full and correct excerpt from said Board's minutes of said Meeting pertaining to the passage of said Resolution and Order, that the persons named in the above and foregoing paragraphs are the duly chosen, qualified and acting officers and members of said Board as indicated therein; that each of the officers and members of said Board was duly and sufficiently notified, Officially and personally, in advance, of the time, place, and purpose of the aforesaid Meeting, and each of said officers and members consented, in advance to the holding of said Meeting for such purpose; and that said Meeting was open to the public and public notice of the time, place, and purpose of said meeting was given, all as required by Chapter 551, Government Code, *Vernon's Ann. Cov. Statutes.*

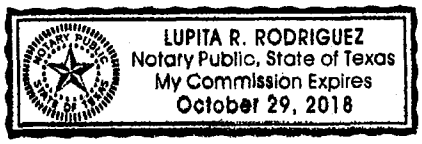
SIGNED AND SEALED the 19th day of January 2015.

Jack Wallace Jr.
Board President

James Bettiga
Board Secretary

STATE OF TEXAS §
COUNTY OF HIDALGO §

This instrument was acknowledged before me on the 20th day of January 2015, by Jack Wallace Jr, President of the Board of Directors of Santa Cruz Irrigation District, a political subdivision of the State of Texas, on behalf of said political subdivision.



Notary Public in and for the State of Texas

Appendix "E"

Contract From Texas Water Development Board For Lining N-Canal

Signed Contract
8/29/14

STATE OF TEXAS

TWDB Contract No. 1413581739

Agricultural Water Conservation Fund

COUNTY OF TRAVIS

SANTA CRUZ IRRIGATION DISTRICT NO. 15

This Contract, (hereinafter "CONTRACT"), between the Texas Water Development Board (hereinafter "TWDB") and Santa Cruz Irrigation District No. 15 (hereinafter "CONTRACTOR"), is composed of two parts: SECTION I. SPECIFIC CONDITIONS AND EXCEPTIONS TO STANDARD AGREEMENT and SECTION II. STANDARD AGREEMENT. The terms and conditions set forth in Section I will take precedence over terms and conditions in Section II.

SECTION I. SPECIFIC CONDITIONS AND EXCEPTIONS TO STANDARD AGREEMENT

ARTICLE I. DEFINITIONS

For the purposes of this CONTRACT, the following terms or phrases shall have the meaning ascribed therewith:

1. TWDB - The Texas Water Development Board, or its designated representative
2. CONTRACTOR - Santa Cruz Irrigation District No. 15
3. EXECUTIVE ADMINISTRATOR - The EXECUTIVE ADMINISTRATOR of the TWDB or a designated representative
4. PARTICIPANT – Santa Cruz Irrigation District No. 15
5. REQUIRED INTERLOCAL AGREEMENT(S) – N/A
6. AGRICULTURAL WATER CONSERVATION PROJECT – Fiber-reinforced concrete lining of an existing canal to address transmission losses within the District
7. TWDB APPROVAL DATE – May 29, 2014
8. DEADLINE FOR CONTRACT EXECUTION – August 31, 2014
9. CONTRACT INITIATION DATE – May 29, 2014

2014 AUG 21 PM 1:40 ... ADMINISTRATION

10. PROJECT COMPLETION DATE – April 15, 2019

11. CONTRACT EXPIRATION DATE – August 31, 2019

12. TOTAL PROJECT COSTS - $464,749.23

13. TWDB SHARE OF THE TOTAL PROJECT COSTS- the lesser of $200,000.00 or 43% percent of the total project costs or individual payment submission

14. LOCAL SHARE OF THE TOTAL PROJECT COSTS - $264,749.23 in cash and/or in-kind services or 57% percent of the total PROJECT costs or individual payment submission

15. PAYMENT SUBMISSION SCHEDULE – QUARTERLY
Payments are to be submitted with progress reports, within 45 days following the end of the State of Texas Fiscal Year quarters ending in: November, February, May, and/or August.

16. PROGESS REPORT SCHEDULE - QUARTERLY
Progress reports are to be submitted with any payment reimbursement requests following the completion of work performed during the State of Texas Fiscal Year quarters ending in: November, February, May, and/or August.

17. OTHER SPECIAL CONDITIONS AND EXCEPTIONS TO STANDARD AGREEMENT OF THIS CONTRACT –

a) In addition to the quarterly progress reports, the CONTRACTOR is responsible for submitting annual reports due no later than:
   i. April 15, 2015 (Project Status Report)
   ii. April 15, 2016 (Phase I Report detailing completion of the irrigation system improvements activities)
   iii. April 15, 2017 (estimate of water savings for the 2016 irrigation season)
   iv. April 15, 2018 (estimate of water savings for the 2017 irrigation season)
   v. April 15, 2019 (Draft Final Report as described in Section II, Article III, Item 3, also including the 2018 water savings estimate)

b) The annual reports should include:
   i. An annual summary of the work performed during the previous calendar year,
   ii. An annual estimate of water savings realized (for 2016, 2017, & 2018) as a result of the work performed under this CONTRACT (as described in Section II, Article III, Item 2.), and
   iii. A description of the educational outreach activities performed under this CONTRACT during the previous calendar year.

IN WITNESS WHEREOF, the parties have caused this CONTRACT to be duly executed in duplicate originals.

TEXAS WATER DEVELOPMENT BOARD

Kevin Patteson
Executive Administrator

Date: 8/20/14

SANTA CRUZ IRRIGATION DISTRICT NO. 15

Jose Hinojosa
District Manager

Date: 8/12/14

Appendix "F"

Excerpts from Santa Cruz Irrigation District No. 15 Audit

SANTA CRUZ IRRIGATION DISTRICT NUMBER FIFTEEN
STATEMENT OF NET POSITION
For the Year Ended August 31, 2013

ASSETS

Current Assets		
Accounts receivable	$	50,867
Accounts receivable - other		15,371
Flat tax receivable (net)		518,084
Bond tax receivable		19,703
Special assessments receivable		6,363
Prepaid expenses		8,644
Total Current Assets		619,032
Non Current Assets		
Investment in Certificates of Deposit, unrestricted		249,000
Capital assets (net)		1,602,496
Total Non-Current Assets		1,851,496
Total Assets	$	2,470,528

LIABILITIES AND NET POSITION

Current Liabilities		
Accounts payable	$	165,242
Accrued expense		38,842
Cash and cash equivalents		100,668
Customer deposits		187,377
Notes payable, current portion		73,078
Total Current Liabilities		565,207
Net Position		
Net investment in capital assets		1,529,417
Unrestricted net position		375,904
Total Net Position		1,905,321
Total Liabilities and Net Position	$	2,470,528

The accompanying notes are an integral part of these financial statements.

Appendix "G"

Supporting Cost Information

McCOY'S BUILDING SUPPLY
Go Build Something®

Sign In or Sign Up | Edinburg, TX | Cart Search Sub

SAVINGS | PRO SERVICES | FARM & RANCH | FIND A CONTRACTOR | ABOUT US

Building Materials Hardware Electrical Plumbing Painting Tools Farm - Ranch - Yard Interior Materials

My Cart/Project List

0 items, $0.00

My Home Store
Edinburg

Show Products:
- (•) Sold at this store
- ( ) Sold within 50 miles of 78539 as well

Recently Viewed

Concrete Mix 80#

Home » Building Materials » Concrete Products » Packaged Concrete and Sand Products » Concrete Mix 80#

Concrete Mix 80#

McCoy's Part #: 040200

$3.51 Add to Order

Product is Available at Edinburg

★★★★★ 5.0 | 1 Review

11 questions and 12 answers for this product

McCOY'S BUILDING SUPPLY
Go Build Something®

Sign In or Sign Up | Edinburg, TX | Cart Search Sub

SAVINGS | PRO SERVICES | FARM & RANCH | FIND A CONTRACTOR | ABOUT US

Building Materials Hardware Electrical Plumbing Painting Tools Farm - Ranch - Yard Interior Materials

My Cart/Project List

0 items, $0.00

My Home Store
Edinburg

Show Products:
- (•) Sold at this store
- ( ) Sold within 50 miles of 78539 as well

Recently Viewed

8" x 8" x 16" Hollow Block Standard Green

No. 15

Concrete Mix 80#

Home » Building Materials » Concrete Products » Concrete Blocks » 8" x 8" x 16" Hollow Block Standard Green

8" x 8" x 16" Hollow Block Standard Green

by Innovative Block

McCoy's Part #: 04038684

$1.44 Add to Order

Product is Available at Edinburg

★★★★★

Aermotor Windmill Component Repair

There comes a time in a windmill's life when the smart solution is a new Aermotor Basic Motor. Assembled at the factory, this is an excellent way to extend your investment.

Part	Description	X	A	B	D	E	F
875	Basic Motor	$1646	$1748	$2455	$3954	$5216	$6740
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E	14	13 1/2 & 9 3/4	$10550	1735lbs
F	16	14 7/8 & 11 3/8	$13820	2380lbs

Aermotor Windmill Components

http://aermotorwindmill.com/windmills-towers-pumps-rods-and-replacement-parts/ 1/19/2015

12' Mill – 2 1/2 X 2 1/2 X 3/16

Tower Height	Price	Weight
27'	$4320	780lbs
33'	$4500	963lbs
40'	$5280	1140lbs
47'	$6110	1440lbs

14' Mill – 3 X 3 X 3/16

Tower Height	Price	Weight
27'	$4390	900lbs
33'	$5060	1090lbs
40'	$5500	1300lbs
47'	$7590	1590lbs

16' Mill – 3 X 3 X 1/4

Tower Height	Price	Weight
33'	$6600	1420lbs
40'	$7425	1780lbs
47'	$9070	2210lbs

Aermotor Stub Towers

3' Stub Towers do not have platform
4' Stub Towers for 6' or 8' mills include regular platform
4' Stub Towers for 12' or 14' mills include oiling platform
5' Stub Towers for 10' mills include regular platform
7' Stub Towers for 6', 8', or 10' mills include regular platform
7' Stub Towers for 12', 14', or 16' mills include regular & oiling platform

6' Mill

Stub Height	Price	Weight
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4'	$750	38lbs
7'	$880	120lbs
14'	$1750	280lbs

8' Mill

Stub Height	Price	Weight
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4'	$750	38lbs
7'	$880	120lbs
14'	$1750	280lbs

10' Mill

Stub Height	Price	Weight
3'	$240	45lbs
5'	$925	111lbs
7'	$940	140lbs

http://aermotorwindmill.com/windmills-towers-pumps-rods-and-replacement-parts/ 1/19/2015

Frank Ferris

From: Eduardo Alvarez [ealvarez@ealvarezsales.com]
Sent: Tuesday, January 20, 2015 10:13 AM
To: Frank Ferris
Subject: Re: CCID #6

15" - $ 7.90 (1.40)
18" - $ 12.15 (4.32)
24" - $ 21.99 -Truckload = 704 LF = 15,480.96 (1.32)

Sent from my iPad

On Jan 19, 2015, at 3:52 PM, Frank Ferris <f.ferris@ferrisandflinn.com> wrote:

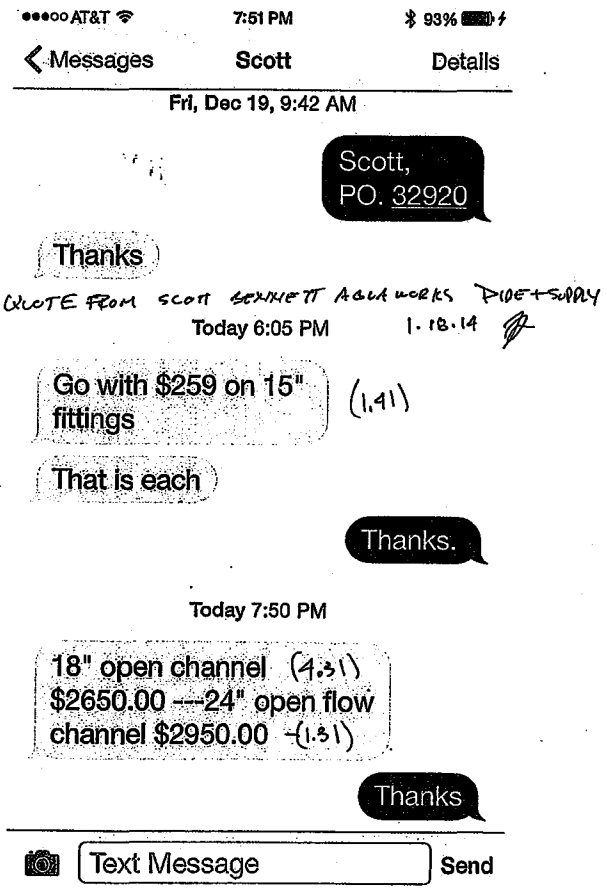
<image001.gif>
Hello Eddie

I am working on a grant project. What are your current truckload prices for

15" 80 PSI
18" 80 PSI and
24" 80 psi.

Thanks.

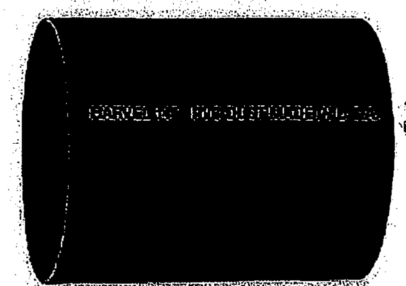
Frank A. Ferris, PE
President
FERRIS, FLINN & MEDINA, LLC
1405 N. Stuart Place Road
Palm Valley, TX 78552
956 364 2236
Fax 956 364 1023
Texas Board of Professional Engineers Firm No. F-897



Plumbing \ Pipe and Tubing \ PVC and CPVC Pipe \ Pipe,Schedule 80,6 In,10 ft. Length,PVC

Share This Product | Print

Back to Product Family



Pipe, Schedule 80,6 In, 10 ft. Length, PVC

HARVEL

Price:
$159.75 / each

/10
$15.98/LF

Deliver one time only
Save Time & Auto-Reorder Every 1 Month

1 Add to Cart
+ Add to List

Check Availability

☆☆☆☆☆ Be the first to write a review | Ask & Answer

How can we improve our Product Images?

☐ Compare

Item # 22FR52 Mfr. Model # H0800600PG1000 UNSPSC # 40142115
Catalog Page # 3919 Shipping Weight 53.0 lbs.

Country of Origin USA | *Country of Origin is subject to change.*

Technical Specs

Item	Pipe	Max. Temp.	140 Degrees F
Pipe Size	6"	Color	Gray
Length	10 ft.	Standards	ASTM D1785

CAPA
CONCRETE ASPHALT PIPE AGGREGATES

7301 W. EXPRESSWAY 83, MISSION, TX. 78572
PHONE (956) 584-5770, FAX (956) 583-2086

PRICE LIST PRECAST BOX CULVERT ASTM (C-1577) (Less than 2' Fill)								
							LAYING LENGTH	
SPAN	RISE	JOINTS PER LOAD	APPROX. WEIGHT PER BOX	PER L.F. ZONE 1	PER METER ZONE 1	METRIC SIZE	FT	METERS
3'	2'	6	7160#	$97.85	$321.03	900MM X 600MM	7.87	2.4
3'	3'	5	8200#	$106.35	$348.91	900MM X 900MM	7.87	2.4
4'	2'	5	8572#	$120.25	$394.52	1200MM X 600MM	7.87	2.4
4'	3'	4	9526#	$140.45	$460.79	1200MM X 900MM	7.87	2.4
4'	4'	4	10479#	$153.35	$503.11	1200MM X 1200MM	7.87	2.4
5'	2'	3	11978#	$160.00	$524.93	1500MM X 600MM	7.87	2.4
5'	3'	3	12586#	$172.95	$567.41	1500MM X 900MM	7.87	2.4
5'	4'	3	13730#	$190.00	$623.35	1500MM X 1200MM	7.87	2.4
5'	5'	3	14875#	$211.95	$695.37	1500MM X 1500MM	7.87	2.4
6'	2'	3	14400#	$187.25	$614.33	1800MM X 600MM	7.87	2.4
*6'	3'	3	15033#	$215.25	$706.19	1800MM X 900MM	7.87	2.4
*6'	4'	2	16370#	$224.85	$737.69	1800MM X 1200MM	7.87	2.4
*6'	5'	2	17703#	$244.05	$800.68	1800MM X 1500MM	7.87	2.4
*6'	6'	2	19039#	$269.30	$883.52	1800MM X 1800MM	7.87	2.4

Round up to $225.

7301 W. EXPRESSWAY 83, MISSION, TX. 78572
PHONE (956) 584-5770, FAX (956) 583-2086

August 13, 2012

Precast Reinforced Concrete Pipe - Rubber Gasket

Nomial Size		Delivered to: **ZONE 1**			
S.A.E.	Metric	**Class III**	**Class IV**	**Class V**	WEIGHT
12"	300 mm	$ 13.60	$ 17.50	$ 19.30	960
15"	375 mm	$ 16.00	$ 20.25	$ 22.10	1,520
18"	450 mm	$ 18.40	$ 23.00	$ 24.85	1,920
24"	600 mm	$ 24.00	$ 29.45	$ 31.30	2,840
30"	750 mm	$ 35.90	$ 39.55	$ 43.15	4,020
36"	900 mm	$ 52.05	$ 58.90	$ 61.30	5,520
42"	1050 mm	$ 67.30	$ 72.25	$ 82.90	7,100
48"	1200 mm	$ 82.30	$ 91.10	$ 104.70	8,280
54"	1350 mm	$ 98.10	$ 111.60	$ 127.50	9,800
60"	1500 mm	$ 122.95	$ 138.70	$ 164.25	12,184
72"	1950 mm	$ 169.85	$ 195.80	$ 240.25	15,900
78"	2100 mm	$ 208.30	$ 241.80	Call for Pricing	19,280

ROUND UP TO $125.→

ZONE IDENTIFICATION COUNTIES

ZONE1 CAMERON, HIDALGO, STARR, WILLACY

SPECIAL CONDITIONS

Any order shipped within **ZONE - 1** for which the sales order does not exceed **$500.00** value, there will be a delivery charge of **$500.00** added to the invoice total. Price does not included Joint Material.