WaterSMART:

Water and Energy Efficiency Grants

FY 2016

Aberdeen-Springfield Canal Company

Canal Lining Water Efficiency Project

Applicant

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Funding Opportunity Announcement No. R16-FOA-DO-004

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Executive Summary

Date: 1/20/2016
Applicant Name: Aberdeen-Springfield Canal Company
City: Aberdeen
County: Bingham
State: Idaho

The Aberdeen-Springfield Canal Company (ASCC) is requesting funding under Funding Group I for the amount of $176,308.16 for a canal lining water efficiency project. ASCC proposes to line 1.4 miles of main canal which will result in a water savings of approximately 23,007 acre-feet annually (13% of total seepage loss). The proposed project will begin on October 24, 2016 and will be accomplished in approximately 1 month with November 23, 2016 as a completion date. This proposed project is not located on a Federal facility.

Background Information

In 1894 Congress enacted "the Carey Act" or the Federal Desert Land Act allowing private companies to construct irrigation delivery systems and sell water for land development in western states. Upon entering into contracts with the states, the companies built canals, mapped out lands to be segregated and sold shares of the company's water right based on segregated acres and available water. Upon completion of the projects, the developing companies then turned control over to the operating companies. The Aberdeen-Springfield Canal Company (ASCC) was the first such "Carey Act" company in Idaho and is located in the Snake River Plain just 18 miles north of American Falls, ID in the town of Aberdeen.

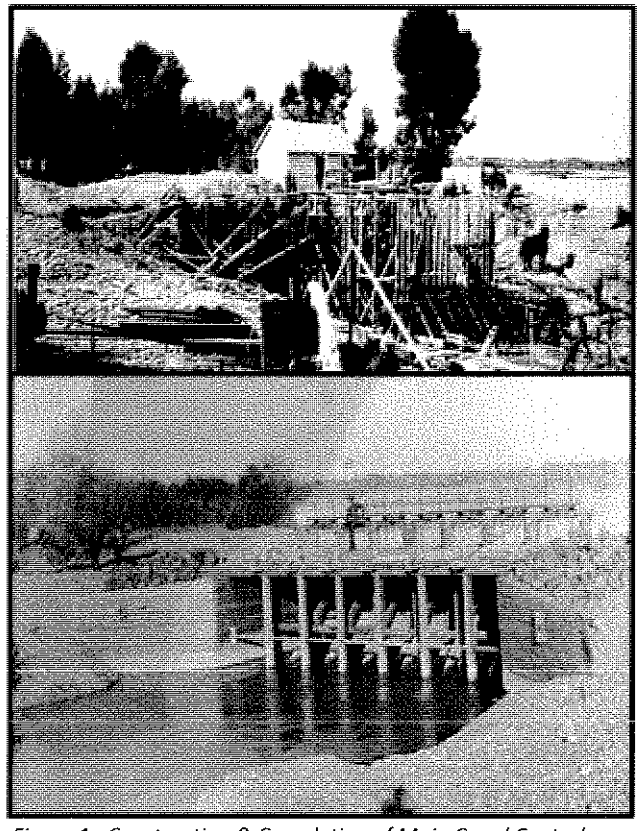

Figure 1. Construction & Completion of Main Canal Control Structure

Construction of the Aberdeen-Springfield Canal began in 1893 and by 1905 the canal was fully operational. The main canal control structure diverts water from the Snake River approximately 10 miles upstream from Blackfoot, Idaho and diversions are measured using a broad-crested weir located approximately 100 m downstream from the main canal structure. The gravity fed system boasts over 190 miles of earthen main canals and laterals delivering water to approximately 62,000 irrigated acres

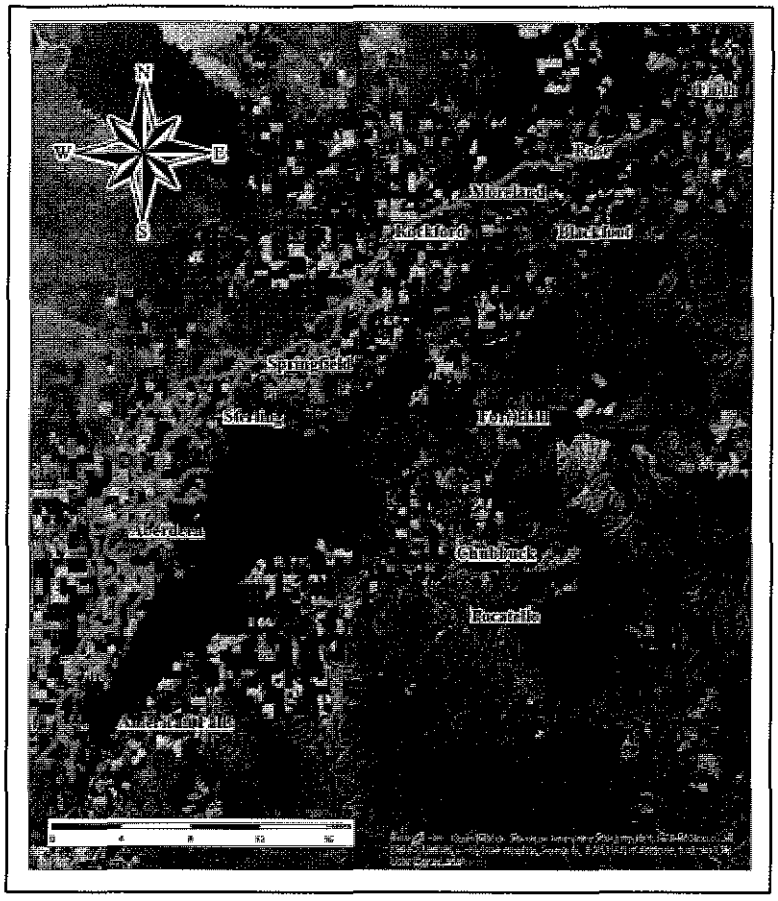

Figure 2. ASCC Canal Location

and reaches 67 miles southwest ending just west of American Falls. The main canal travels 32 miles before splitting into the "Highline" and "Lowline" canals, named for their relative elevations.

Approximately 450 shareholders utilize the canal to provide irrigation water for sugar beets, potatoes, grain, alfalfa, pasture and more. ASCC participates in several water management groups and has a long history of working with both ground and surface water users to promote good stewardship of Idaho's water resources. Recharge sites located in the system are used whenever possible for Idaho Water Resource Board and other recharge efforts.

Beginning in 2001 the company began installing modern monitoring and control devices (SCADA) and nearly all of the primary control structures are fully automated. Remote monitoring capabilities in several locations provide staff with added control over the system and have resulted in significant water savings.

Total annual diversion is approximately 350,000+ acre-feet (AF) over an average of 190 days and system transmission losses (seepage) range between be 50-60%, evaporation loss is de minimis. Deliveries are measured and recorded once daily using rectangular submerged-orifice measuring devices installed on every head gate. Water is spilled at 15 locations on the system and is accurately measured. 10-20% of the total diversion is spilled back into the American Falls Reservoir. ASCC employs a full time maintenance crew that perpetually address canal losses due to seepage however much of the canal was constructed over gravels, basalts and lava tubes which make this task extremely challenging.

Water Rights

ASCC holds natural flow, storage, and ground water irrigation rights. ASCC's primary water source is natural flow from the Snake River. In addition, ASCC has storage rights in American Falls Reservoir, Palisades Reservoir, and Jackson Reservoir and groundwater rights for two company-owned wells totaling 8.44 cfs. ASCC also delivers water to acreage within the American Falls Reservoir District,

which holds storage in American Falls Reservoir and Jackson Reservoir. Individual shareholders who also belong to American Falls Reservoir District receive delivery of their storage water through ASCC's system.

Table 1. – ASCC Irrigation Water Rights

Water Right	Priority Date	Source	Rate (CFS)	Volume (AF)	Acre Limit
1-23B	2/6/1895	Snake River	1172.1	N/A	61,772.6
1-297	4/1/1939	Snake River	230	N/A	61,772.6
35-2543	8/7/1958	Ground Water	6	2547	61,772.6
35-4246	10/15/1934	Ground Water	2.44	155	61,772.6
1-2064G	3/30/1921	Snake River (Storage)		57,133	
1-2068G	7/18/1939	Snake River (Storage)		129,940	

Current and Projected Water Demand

Agreements between ground water and surface water users in Idaho have created growing concerns for ASCC relating to water demand and canal capacity. Recently, the Idaho Ground Water Users Association (IGWA) and the Surface Water Coalition (SWC) have entered into an agreement promoting several methods to reduce ground water diversions. This agreement may adversely affect ASCC since many shareholders who currently irrigate using ground water wells that were initially installed to resolve canal capacity issues may convert back to using their surface water shares to reduce their ground water pumping. ASCC has developed several proposals to work with shareholders and local ground water users to avoid conflicts with future water delivery on the ASCC system while providing potential saved storage water for recharge whenever possible.

2015 Seepage Study

During the summer of 2015, a seepage loss study was conducted on the Aberdeen-Springfield Canal. Up until this time, total seepage losses had been estimated however specific locations where these losses were occurring had yet to be identified. Using an ADCP (Acoustic Doppler Current Profiler), an independent contractor was able to identify several canal reaches where major seepage losses were occurring which has illuminated opportunities for several targeted lining projects along the canal. The "main" canal contains several reaches where lining would yield large water savings however other factors including surface soil composition and potential for affecting nearby springs also required consideration. Upon first glance at the seepage summary graph the "M30-1A to M30-9" does appear to be the best candidate for lining however that reach consists of large rocks and basalt that would require blasting to remove introducing financial and time constraints to the project. The "Hwy 26 to Parks" reach was selected for lining since it consists of gravel constructed fill and can be easily excavated and backfilled in a timely manner. Projected reductions in transmission losses are calculated below. For a detailed summary of the study including dates of measurements and values for the Highline and Lowline canal sections see "Attachment A".

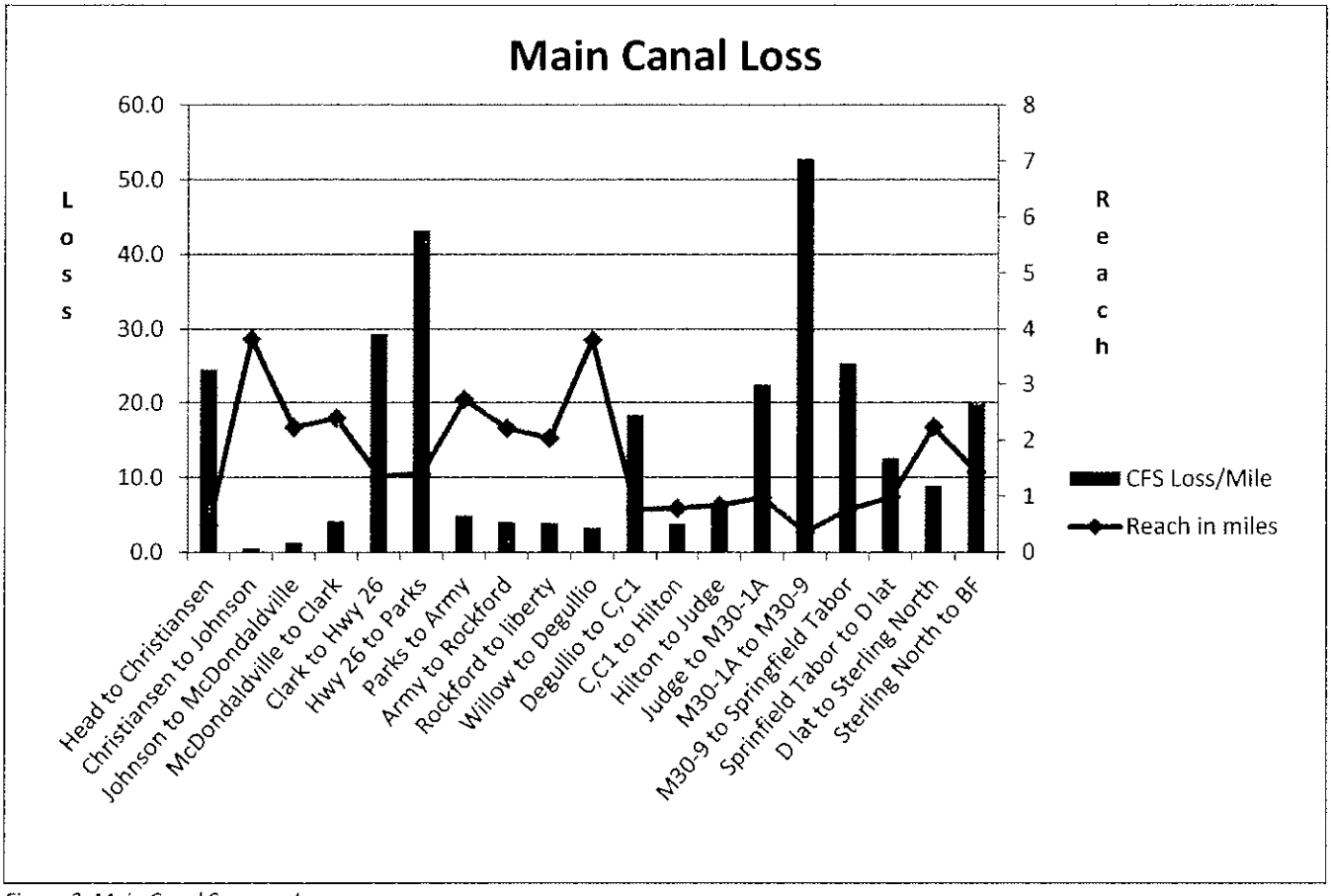

Figure 3. Main Canal Seepage Loss

Technical Project Description

Planning

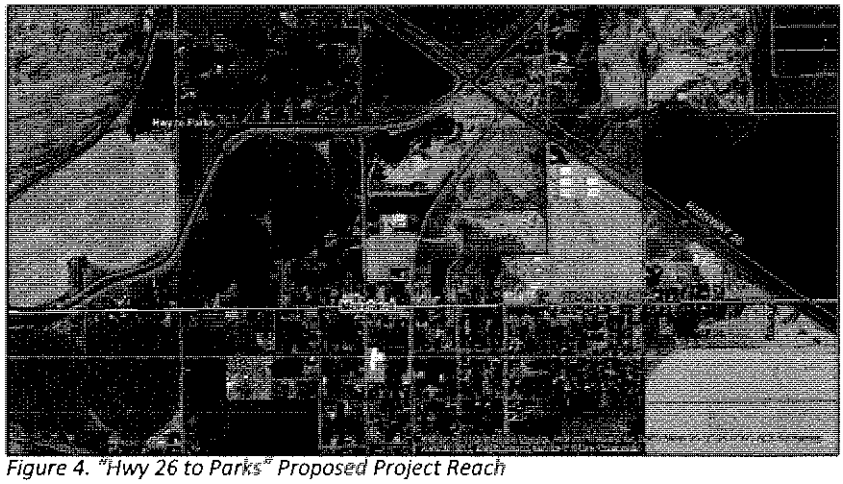

Figure 4. "Hwy 26 to Parks" Proposed Project Reach

Lining materials and bids have been gathered and evaluated by ASCC technical staff. ArcGIS was used to calculate the length of the "Hwy 26 to Parks" reach which extends 1.4 miles or 7392 feet. Canal profiles from the 2015 Seepage Study were referenced to calculate the wetted perimeter of the canal (adding 2 feet to compensate for the "buried depth" of the material). A wetted perimeter of approximately 100' was estimated and multiplied by the length of the reach in feet to calculate the total lining material necessary to complete the project.

Site Preparation

ASCC maintenance crew will excavate all substrate 2 feet down and in from the canal surfaces in the reach using large equipment already owned by the company. The staff are familiar with the project reach and are experts in working in and around the canal. The work will be completed in approximately one week.

Lining Installation

ArmorLiner™30 will be delivered in prefabricated panels that will need to be fitted, cut and seemed together. Extra staff not already employed by ASCC will be necessary to help in this process. Bob Annalora of Geosynthetic Advisors, Inc. will be contracted for 2 weeks to provide expertise and instruction in canal lining and a tool to seem the lining. Lining material will also be fitted around all headgates present in the reach. It is projected that the lining process will take approximately 2 weeks.

Backfill

All backfill that had been previously excavated will be returned and spread to a depth of 2 feet on the canal floor and side walls to cover the new lining material. This is estimated to be completed in 1 week. The project will be considered to be completed after all backfill work is finished.

Evaluation Criterion

Evaluation Criterion A: Water Conservation

The proposed project will result in quantifiable and sustained water savings and improve ASCCs ability to manage their allocated irrigation water. ASCC agrees to the terms of Section 9504(a)(3)(B) of Public Law 111-11 as there will be no increase in irrigated acres or consumptive use of water, as determined pursuant to Idaho law.

Quantifiable Water Savings

Describe the amount of water saved. For projects that conserve water, please state the estimated amount of water expected to be conserved (in acre-feet per year) as a direct result of this project. Please provide sufficient detail supporting how the estimate was determined, including all supporting calculations. Please be sure to consider the questions associated with your project type (listed below) when determining the estimated water savings, along with the necessary support needed for a full review of your proposal (please note, the following is not an exclusive list of eligible project types. If your proposed project does not align with any of the projects listed below, please be sure to provide support for the estimated project benefits, including all supporting calculations and assumptions made).

Answer: The expected amount of water savings is projected to be approximately 22,007 acre-feet per year or 13% of annual transmission losses. Supporting calculations are detailed below.

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

- *What is the applicant's average annual acre-feet of water supply?*

Answer: The average annual water supply for ASCC is 350,000 AF.

- *Where is the water that will be conserved currently going (e.g., back to the stream, spilled at the end of the ditch, seeping into the ground, etc.)?*

Answer: The water that will be conserved is currently being lost through the bottom of the canal and seeping into the ground.

- *Where will the conserved water go?*

Answer: Conserved natural flow water will remain in the Snake River where it will be available downstream for irrigation, power generation and fisheries. Conserved storage water will be available for targeted recharge efforts and other water markets.

Please include a specific quantifiable water savings estimate; do not include a range of potential water savings.

Answer: Estimated annual water savings resulting from lining the Hwy 26 to Parks reach is 121.09 AF/day or 23,007 AF/year.

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

(1) Canal Lining/Piping: Canal lining/piping projects can provide water savings when irrigation delivery systems experience significant losses due to canal seepage. Applicants proposing lining/piping projects should address the following:

(a) How has the estimated average annual water savings that will result from the project been determined? Please provide all relevant calculations, assumptions, and supporting data.

Answer: The estimated annual water savings that will result from this project have been calculated using values from the 2015 Seepage Study. Measurements taken at the beginning and end of the "Hwy 26 to Parks" reach showed a gross loss of 62 cfs. Deliveries were subtracted from the gross loss to determine a net loss over the reach.

Calculation 1: Seepage Loss

(62 cfs inflow/outflow difference) – (1 cfs water deliveries)

= 61 cfs Net Seepage Loss

The total net loss was converted to AF/day by multiplying by a conversion factor. This yield was then multiplied by the number of days the canal is operating in an average water year (190) to give an annual water loss of 23,007 AF/year. Since projected losses after lining is complete will be zero, annual water loss is also equivalent to annual water savings.

Calculation 2: Average Annual Seepage Loss

$$\frac{\text{(61 cfs Net Seepage Loss)}}{1} \times \frac{\text{(1.9835 AF/day)}}{\text{cfs}} = \text{121.09 AF/day Net Seepage Loss}$$

(121.09 AF/day Net Seepage Loss) x (190 Days in Average ASCC Water Year)

= 23,007 AF/year Average Seepage Loss

(b) *How have average annual canal seepage losses been determined? Have ponding and/or inflow/outflow tests been conducted to determine seepage rates under varying* conditions*? If so, please provide detailed descriptions of testing methods and all results. If not, please provide an explanation of the method(s) used to calculate seepage losses. All estimates should be supported with multiple sets of data/measurements from representative sections of canals.*

Answer: Inflow and outflow rates were calculated using an acoustic Doppler current profiler (ADCP) by Idaho Water Engineering. Measurements were taken over several field days where water supply and conditions were comparable. Deliveries and other outflow were considered when calculating total loss over each reach. The profile data is displayed below for the beginning (inflow) and ending (outflow) transects and a detailed summary can be seen in "Attachment A".

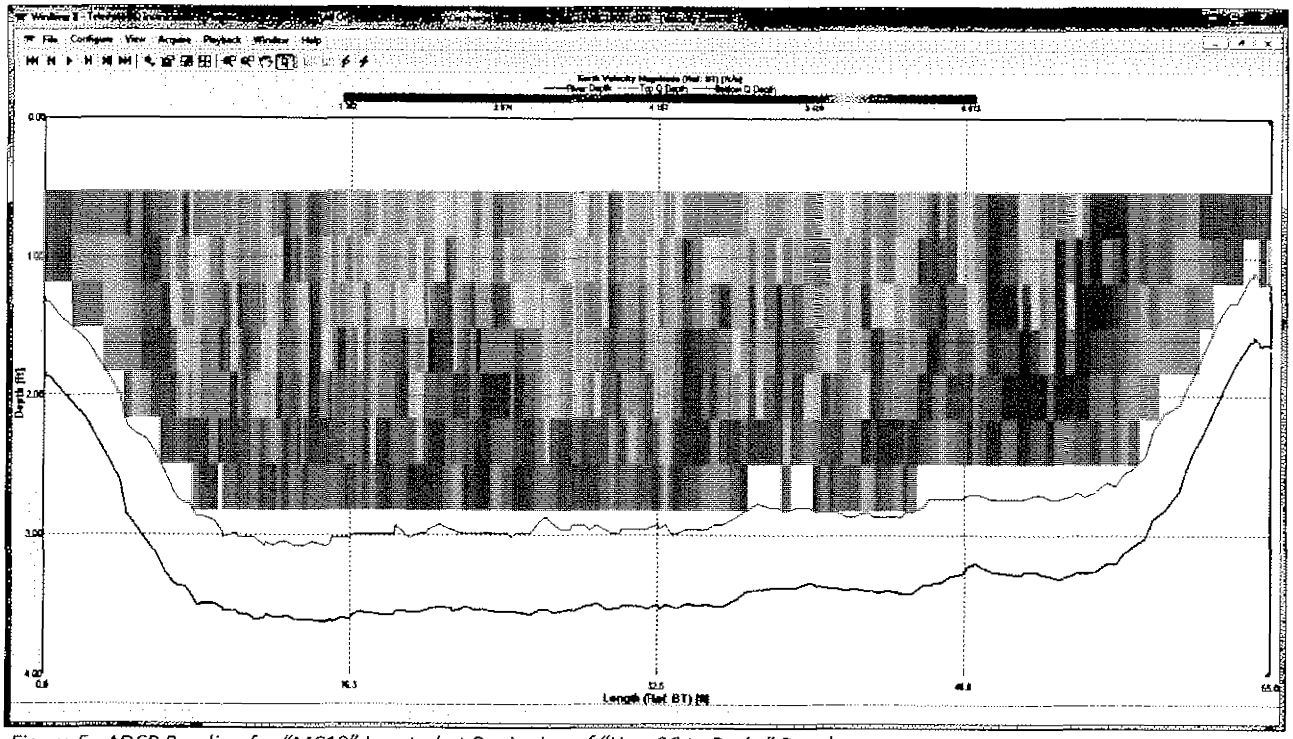

Figure 5. ADCP Reading for "MC19" Located at Beginning of "Hwy 26 to Parks" Reach

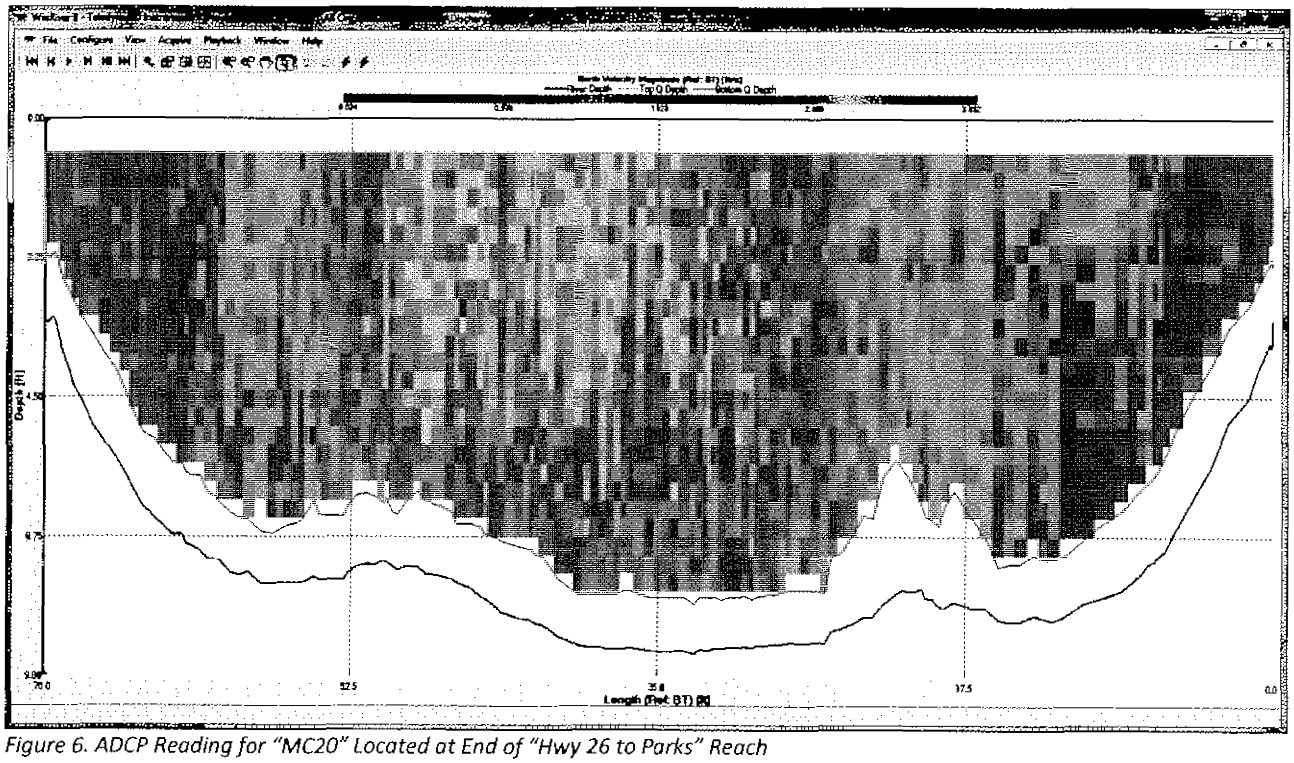

Figure 6. ADCP Reading for "MC20" Located at End of "Hwy 26 to Parks" Reach

(c) What are the expected post-project seepage/leakage losses and how were these estimates determined (e.g., can data specific to the type of material being used in the project be provided)?

Answer: The expected post-project seepage/leakage losses across the Hwy 26 to Parks reach are estimated to be zero once the lining is installed. The lining material has a hydraulic conductivity of 1.07 x 10^{-12}cm/s making it impervious.

The total estimated annual loss for the remainder of the canal is estimated to be approximately 147,146.94 AF or 86.48% of the calculated yearly loss.

(d) What are the anticipated annual transit loss reductions in terms of acre-feet per mile for the overall project and for each section of canal included in the project?

Answer: The anticipated annual transit loss reduction for the "Hwy 26 to Parks" project reach is 16,434 AF/mile. It is the only reach included in the lining project.

(e) How will actual canal loss seepage reductions be verified?

Answer: A second seepage flow study is planned for the 2017 water season to verify seepage reductions and analyze any changes in system losses that may have occurred.

(f) Include a detailed description of the materials being used.

Answer: The lining material selected is ArmorLiner™30 15.6 oz GEOMEMBRANE. Please see "Attachment B" for specific details.

Percentage of Total Supply

Provide the percentage of total water supply conserved: State the applicant's total average annual water supply in acre-feet.

$\frac{\text{23,007 AF Conserved}}{\text{350,000 AF Annual Water Supply}}$ x 100 = 6.57% of Total Average Water Supply Conserved

Evaluation Criterion B: Energy-Water Nexus

Answer: The project will help increase energy efficiency to the extent that ground water diversions will be decreased (resulting in power savings) with an increased surface water supply available through water saved. These efficiencies may not be accurately estimated at this point in the project however and will fluctuate from year to year as irrigators alter their water management regiments.

Evaluation Criterion C: Benefits to Endangered Species

Up to 12 points may be awarded for projects that will benefit federally-recognized candidate species or up to 12 points may be awarded for projects expected to accelerate the recovery of threatened or endangered species, or addressing designated critical habitat. Note: proposals for water efficiency projects that simply state that a species in the basin will benefit from water savings (i.e., without a commitment to dedicate water savings for instream flows) shall receive minimal consideration under this criterion.

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

- *What is the relationship of the species to water supply?*

Answer: Natural flow from the Snake River (ASCC's main source of water for irrigation) is also the lifeblood for the following listed and endangered salmon species:

1) **Snake River Bull Trout, threatened, 1998**
2) **Snake River Chinook Salmon, threatened, April 1992**
3) **Snake River Sockeye Salmon, endangered, Nov. 1991**
4) **Snake River Steelhead, threatened, Aug. 1997**

- *What is the extent to which the proposed project would reduce the likelihood of listing or would otherwise improve the status of the species?*

Answer: The proposed project will result in natural flow savings to the Snake River during critical salmonid spawning times. Targeted recharge efforts that may result from storage water savings will increase reach gains in along the Snake River in crucial areas as well.

Evaluation Criterion D: Water Marketing

Up to 12 points may be awarded for projects that propose developing a new water market. Note: Water marketing does not include an entity selling conserved water to an existing customer. This criterion is intended for the situation where an entity that is conserving water uses water marketing to make the conserved water available to meet other existing water supply needs or uses outside of the entity's geographic service area.

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

- *Estimated amount of water to be marketed*

- *A detailed description of the mechanism through which water will be marketed (e.g., individual sale, contribution to an existing market, the creation of a new water market, or construction of a recharge facility)*

- *Number of users, types of water use, etc. in the water market*

- *A description of any legal issues pertaining to water marketing (e.g., restrictions under Reclamation law or contracts, individual project authorities, or State water laws)*

- *Estimated duration of the water market*

Answer: Water conserved through the proposed project may be available for rental to ground water users to help meet in stream mitigation requirements or be used for recharge to satisfy newly enacted agreements. Although estimates would vary as yearly water budgets fluctuate, ASCC expects the quantity of water to be significant as it would constitute a large percentage of the amount being conserved through this project.
Any available water would be marketed through the WD 01 Rental Pool and transactions would adhere to local and state regulations. ASCC expects the duration of this water market to be infinite.

Evaluation Criterion E: Other Contributions to Water Supply Sustainability

Addressing Adaptation Strategies in a WaterSMART Basin Study

Up to 14 points may be awarded for projects that address an adaptation strategy identified in a completed WaterSMART Basin Study.

Answer: The proposed project does not address any strategies identified in WaterSMART Basin Studies.

Expediting Future On-Farm Irrigation Improvements

Answer: Future on-farm irrigation improvements are not applicable to this project.

Other Water Supply Sustainability Benefits

Up 14 points may be awarded for projects that include other benefits to water supply sustainability.

Projects may receive up to 14 points under this sub-criterion by thoroughly explaining additional project benefits, not already described above. Please provide sufficient explanation of the additional expected project benefits and their significance. Additional project benefits may include, but are not limited to, the following:

- *Will the project make water available to alleviate water supply shortages resulting from drought?*
  - *Explain in detail the existing or recent drought conditions in the project area. Describe the impacts that are occurring now or are expected to occur as a result of drought conditions.*
  - *Describe the severity and duration of drought conditions in the project area.*
  - *Describe how the water source that is the focus of this project (river, aquifer, or other source of supply) is impacted by drought.*
  - *Provide a detailed explanation of how the proposed WaterSMART Grant project will improve the reliability of water supplies during times of drought.*

Answer: Yes, currently the project area is listed as "Abnormally Dry" on the National Drought Index. In 2001 through 2004, drought resulted in severely decreasing water supply and shortened the ASCC irrigation seasons by 17 (2001), 21 (2002), 24 (2003) and 18 (2004) days. Changes in crop rotation, decreased crop yields and water shortages caused by drought all create water management obstacles that increased water savings would also help to minimize.
All natural flow and storage water savings resulting from this project may be used in years where water supply shortages result from drought. Natural flow savings beyond ASCC demand would also be available for other uses downstream in drought conditions.

For projects that will help build resiliency to drought through increased flexibility and improved water management, but do not include significant water savings, please consider Reclamation's WaterSMART Drought Response Program. Through the WaterSMART Drought Response Program, Reclamation is working with non-Federal partners to create Drought Contingency Plans and on-the-ground Drought Resiliency Projects to help provide water managers with greater flexibility during periods of drought. For more information on the Drought Response Program, please visit: <www.usbr.gov/drought/>.

- *Will the project make water available to address a specific concern? For example:*
  - *Will the project directly address a heightened competition for finite water supplies and over-allocation (e.g., population growth)?*
  - *Describe how the water source that is the focus of this project (river, aquifer, or other source of supply) is impacted by climate variation.*
  - *Will the project help to address an issue that could potentially result in an interruption to the water supply if unresolved?*

Answer: Yes, the Snake River is greatly impacted by climate change. In severe drought conditions ASCC's water supply might be limited and losing 23,007 AF to seepage would greatly impact water users.

- *Will the project make additional water available for Indian tribes?*

Answer: No.

- *Will the project make water available for rural or economically disadvantaged communities?*

Answer: Yes, the City of Aberdeen can benefit by making water available for ground water mitigation.

- *Does the project promote and encourage collaboration among parties?*

Answer: Yes, water savings from the proposed project will offer ground water users increased options for mitigation. This increases collaboration between surface water users and ground water users in Idaho and facilitates success of the State of Idaho's Rules for Conjunctive Management.

o Is there widespread support for the project?

Answer: Yes.

o What is the significance of the collaboration/support?

Answer: ASCC's collaboration with local ground water users bridges current divisions between surface water user and ground water users in Idaho to manage surface and ground water together in a unified effort.

o Will the project help to prevent a water-related crisis or conflict?

Answer: Potentially yes. Successful satisfaction of the SWC/IGWA agreement will prevent curtailment of up to 250,000 AF of ground water irrigation.

o Is there frequently tension or litigation over water in the basin?

Answer: Yes.

o Is the possibility of future water conservation improvements by other water users enhanced by completion of this project?

Answer: Yes, ASCC is a leader by example in progressive water management strategies among water users in Idaho.

• Will the project increase awareness of water and/or energy conservation and efficiency efforts?

Answer: Yes.

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

Answer: Yes, irrigation is a major component to the regional economy and to the local community.

o Will the project increase the capability of future water conservation or energy efficiency efforts for use by others?

Answer: Yes, successful completion of this project will illuminate possibilities for future water saving projects for others by example and illustrating that water savings can be accomplished to benefit all water users if they work together.

o Does the project integrate water and energy components?

Answer: Yes, project water savings lead to a decrease in ground water irrigation and electric pump demand if water is marketed to ground water users and in stream water savings are made available for power generation downstream.

Evaluation Criterion F: Implementation and Results

Project Planning

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

Does the project have a Water Conservation Plan, System Optimization Review (SOR), and/or district or geographic area drought contingency plans in place? Does the project relate/have a nexus to an adaptation strategy developed as part of a WaterSMART Basin Study)? Please self-certify, or provide copies of these plans where appropriate to verify that such a plan is in place.

Provide the following information regarding project planning:

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

(2) Describe how the project conforms to and meets the goals of any applicable planning efforts, and identify any aspect of the project that implements a feature of an existing water plan(s).

Answer: All planning efforts to utilize the water saved as a result of this project are still in the beginning phases and have yet to be installed into any written plans.

Readiness to Proceed

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

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

Answer: The following tasks will take place/have taken place within the estimated dates:

Planning/Bidding	**December 2015 - January 2016**
Excavation	**October 24 - November 2, 2016**
Lining Installation	**November 2-16, 2016**
Backfill	**November 16-23, 2016**

Please explain any permits that will be required, along with the process for obtaining such permits. Identify and describe any engineering or design work performed specifically in support of the proposed project.

Answer: No permits, engineering or design work will be necessary for the proposed project.

Performance Measures

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

Provide a brief summary describing the performance measure that will be used to quantify actual benefits upon completion of the project (e.g., water saved, marketed, or better managed, or energy saved). For more information calculating performance measure, see Section VIII.A.1. FY2016 WaterSMART Water and Energy Efficiency Grants: Performance Measures.

Answer: ASCC will provide a full report upon completion of the project containing actual costs, hours and project details. Water saved through the completion of this project will be quantified via a second seepage study and valued according to how it is then marketed and managed in future irrigation seasons. Since this project provides many opportunities for the use of water conserved, it is difficult to project what the greatest benefits will be. Should drought increase in the region the value of the conserved water would be immeasurable as it would potentially save entire crops and the livelihoods of ASCC shareholders.

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

Reasonableness of Costs

Please include information related to the total project cost, annual acre-feet conserved, energy capacity, or other project benefits and the expected life of the improvement(s).

For all projects involving physical improvements, specify the expected life of the improvement in number of years and provide support for the expectation (e.g., manufacturer's guarantee, industry accepted life-expectancy, description of corrosion mitigation for ferrous pipe and fittings, etc.). Failure to provide this information may result in a reduced score for this section.

ANSWER: Expected water savings for the 2017 irrigation year are 23,007 AF. The ArmorLiner™30 is warrantied for 20 years when buried providing a water savings of 460,140 AF over the expected life of the liner.

In 2017: $\frac{\text{Total Project Cost \$359,812.58}}{\text{23,007 Annual AF Conserved}} = \$15.64/AF$

20 Year Analysis: $\frac{\text{Total Project Cost \$359,812.58}}{\text{460,140 AF Conserved}} = \$0.78/AF$

Evaluation Criterion G: Additional Non-Federal Funding

State the percentage of non-Federal funding provided.

$$\frac{\text{\$183,504.42 Non-Federal Funding (ASCC Contribution)}}{\text{\$ 359,812.58 Total Project Cost}} \times 100 = 51\%$$

Evaluation Criterion H: Connection to Reclamation Project Activities

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

(1) How is the proposed project connected to Reclamation project activities?

Answer: ASCC has storage water in Reclamation reservoirs.

(2) Does the applicant receive Reclamation project water?

Answer: Yes, ASCC storage water.

(3) Is the project on Reclamation project lands or involving Reclamation facilities?

Answer: No.

(4) Is the project in the same basin as a Reclamation project or activity?

Answer: Yes.

(5) Will the proposed work contribute water to a basin where a Reclamation project is located?

Answer: Yes.

(6) Will the project help Reclamation meet trust responsibilities to Tribes?

Answer: Yes, via the Fort Hall Agreement of the SRBA. ASCC voluntarily contributes storage water used to mitigate for impacts to the Sho-Ban Tribes water rights caused by junior water right holders.

Performance Measures

All WaterSMART Grant applicants are required to propose a method (or "performance measure") of quantifying the actual benefits of their project once it is completed. Actual benefits are defined as water actually conserved, marketed, or better managed, as a direct result of the project. Quantifying project benefits is an important means to determine the relative effectiveness of various water management efforts, as well as the overall effectiveness of WaterSMART Grants. (See Section VIII.A. for additional details.)

Benefits from this project will be measured using several parameters. To scientifically determine how many acre-feet of water were actually conserved by the installation of canal liner a second seepage study using the same methods as the previous study will be completed in 2017. Water savings will be realized with a reduced overall yearly demand in water supply. Saved water that is either rented or recharged will be measured and valued based on current rental rates.

Environmental and Cultural Resources Compliance

To allow Reclamation to assess the probable environmental and cultural resources impacts and costs associated with each application, all applicants must respond to the following list of questions focusing on the NEPA, ESA, and NHPA requirements. Please answer the following questions to the best of your knowledge. If any question is not applicable to the project, please explain why. Additional information about environmental compliance is provided in Section IV.D.9.

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

Answer: The project will have minimal impacts to the surrounding environment. All excavation and backfill will be within canal boundaries and will have no more impact than regular canal maintenance activities.

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

Answer: No.

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

Answer: No, the project boundaries will be confined to the canal and canal banks. The project area is surrounded by farmed and/or developed lands and no wetlands or surface waters are adjacent or nearby the project area.

(4) When was the water delivery system constructed?

Answer: Construction began on the Aberdeen-Springfield Canal in 1893 and it has been fully operational since 1905.

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

Answer: No

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

Answer: No.

(7) Are there any known archeological sites in the proposed project area?

Answer: No.

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

Answer: No. The project will have a positive effect on the town of Aberdeen.

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

Answer: No.

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

Answer: No.

Required Permits or Approvals

No permits or approvals will be required to perform the work described in this application for the proposed project.

Official Resolution

Currently the ASCC Board of Director's has verbally supported applying for additional grant funding for lining of the canal however they have not had opportunity to review this grant application. An ASCC Board of Director's meeting is scheduled for February 2, 2016 and at that time an official resolution will be prepared and submitted concerning support for this application.

Attachment B

ArmorLiner™ 30

15.6 OZ GEOMEMBRANE

INTERTAPE POLYMER GROUP®

TECHNICAL DATA SHEET

DESCRIPTION

A heavyweight fabric incorporating a special weave pattern to enhance thickness, flatness, and tear properties. The coating recipe is designed to improve toughness and abrasion resistance.

FABRIC SPECIFICATIONS

Weave:	Woven black HDPE scrim
Coating:	LDPE, 5.5 mil average each side (130 g/m^2/side)
Color:	White, black or other colored coatings available
Weight:	15.6 oz/yd^2 (528g/m^2) +/- 5 %

ROLL SPECIFICATIONS

Cores:	4 inch I.D. or 5 inch I.D. available
Width:	Up to 144 in (-0, +2.5) as ordered
Length:	Minimum 250 yds/roll; up to 1000 yds/roll

These values are typical data and are not intended as limiting specifications.

PERFORMANCE PROPERTIES

The following data are typical values based on ASTM standard tests. This data should not be considered specification.

Thickness ASTM D1777	Nominal 30mil (0.75mm), ± 10%
Grab Tensile (N) ASTM D7004	MD 345 lb (1532) / TD 420 lb (1865)
Strip Tensile (N/5cm) ASTM D7003	MD 235 lb/in (2087) / TD 300 lb/in (2664)
Tongue Tear –large scale (N) ASTM D5884	MD 50 lb (222) / TD 55 lb (244)
Mullen Burst ASTM D751	700 psi 4823 kPa
MVTR ASTM E96 Proc. BW	0.17 g/m^2-24hr (0.02 perms)
Hydraulic Conductivity (Permeability) Calculated from MVTR	1.07 x 10^{-12} cm/s
Hydrostatic Resistance ASTM D751	610 psi 4196 kPa
Puncture Resistance ASTM D4833	202 lb 900 N
Carbon Black Content ASTM D4218	7.5%
Carbon Black Dispersion ASTM D5596	Category 1
Dimensional Stability ASTM D1204	MD -2.8% / TD -1.5%
Low Temperature Flex ASTM D2136	MD&TD: Pass @ -65°C (-85°F)
Seam Strength (shear), min. ASTM D7747	Seam shear should be >80% of the strip tensile of the base fabric.
Seam Strength (peel), min. ASTM D413	4 lb/in / 35 N/5cm
Accelerated UV Weathering[1] ASTM G151 ASTM G154	>90 % strength retention after 2000 hrs exposure @ 0.77 W/m^2/nm, or 1200 hrs exposure @ 1.35 W/m^2/nm

[1] Q.U.V [A-340 Lamps]; 8 hrs UV @ 60°C; 4hrs condensation @ 50°C

intertape polymer group®

100 Paramount Drive, Suite 300 | Sarasota, FL 34232 | USA

Customer Service: 800.IPG.8273 | 800.474.8273

Technical Service (Canada): 800.565.4533

Technical Service (US): 800.565.1450

www.itape.com | info@itape.com

EFFECTIVE: 2/14

Contact your IPG representative for warranty details.

AquaMaster

Attachment C

Fix [redacted] Canal

AquaMaster Estimate on behalf of :
Aberdeen Springfield Canal Company
Enquiries and Questions to Jill Carding, Fix Canal, Representative for AquaMaster products.
Tel 509 467 8487
Cell 949 394 4228
jill@fixcanal.com

AquaMaster Estimate

2 pages

Date: January 4 2016	**Estimate Expires February 28 2016**
Sales Representative: **Jill Carding**	**Project Contact: Steve Howser** **Aberdeen-Springfield Canal Company** **P.O. Box 857** **Aberdeen, Idaho 83210-0857**
Contact: Steve Howser	**Project Name: Various**
Phone: 208 397 4192	**Bid Date: N/A**
Fax:	**Ship Date: To be determined**
E Mail:steve@ascanal.org	
Freight: Included on orders over $30,000 **FOB:** **Prepaid:** **Prepay & Add:** **Van: Flatbed: X Rail: Air:**	**Ship To Address: To be determined**
Fix Canal Quote #: 01/04/16	**Purchase Order No.**
Category: Canal X Other	

Product	Quantity	Width & Length (ft)	Price/Sq Ft	Total-US$
Aquamaster NovaLiner 20 mil pre-fabricated panels Warranty 2 years exposed/10 years buried	**tbd**	**tbd**	0.2004/sq ft	
Aquamaster ArmorLiner 24 pre-fabricated panels Warranty 10 years exposed/20 years buried	**tbd**	**tbd**	0.2246/sq ft	
Aquamaster ArmorLiner 30 pre-fabricated panels Warranty 10 years exposed/20 years buried	**tbd**	**tbd**	0.2491/sq ft	

Aquamaster Armorliner 24L (Double Scrim Laminate) pre-fabricated panels Warranty 15 years exposed/25 years buried	**tbd**	**tbd**	0.2870/sq ft	

Final quotes will be subject to applicable taxes
Maximum one splice per roll
Standard roll width 144 inches wide, 120 inches for laminated products
Standard Cores 4 or 5 inch plastic
Standard roll lengths 500, 700 or 1000 linear yards except forArmorPad
Roll lengths less than 500 linear yards subject to $0.035 per square yard surcharge
Orders over $30,000 include freight within the Continental US and Canada
Net 30 day terms

Signed: Jill Carding-Winfield, Sales and Customer Service on behalf of AquaMaster products Tel 509 467 8487 Cell 949 394 4228.