

Agency: Commerce, Community and Economic Development**Grants to Municipalities (AS 37.05.315)****Grant Recipient: Kodiak****Federal Tax ID: 92-6000083****Project Title:****Project Type: Remodel, Reconstruction and Upgrades**

Kodiak - Monashka Pumphouse Upgrades

State Funding Requested: \$5,700,000**House District: 35 / R**

Future Funding May Be Requested

Brief Project Description:

As one of the City of Kodiak's most critical pieces of infrastructure, the Monashka pumphouse provides almost the entire water supply for the City of Kodiak's public water system. The pumphouse, built in the early 1970s has deteriorated and the pumps used to pump the water are of 1940s vintage. It is critical that Kodiak upgrade the building and pumps as soon as possible.

Funding Plan:

Total Project Cost:	\$6,800,000
Funding Already Secured:	(\$1,100,000)
FY2014 State Funding Request:	<u>(\$5,700,000)</u>
Project Deficit:	\$0

*Funding Details:**FY 2011-2012: City budgeted \$595,000 of local funds to project**FY 2013: Received \$420,000 through MMGP transfer from other Kodiak project (UV water treatment plant project)**FY 2013: \$84,000 in local Cityfunds to meet the required 30% match for MMG***Detailed Project Description and Justification:**

The Monashka pumphouse provides almost the entire water supply for the City of Kodiak's public water system, averaging 4.73 million gallons per day but produces up to 10 million gallons per day during peak fish processing seasons. The pumphouse was constructed in the early 1970s, and only limited changes have been made to the building and pumping system since it was built. The two story concrete building houses an electrical room and four single speed pumps of 1940s vintage for which parts are no longer made. The building is experiencing significant separation of wall panel connections and floor and roof systems. Some repairs to the old pumps require specialty machining which is costly since parts are no longer made. The electrical system and pump motor starts are inadequate and out-of-date. Bats continue to infest the upper floor of the building causing damage as they burrow into walls and electrical components despite ongoing efforts to remove them. The City has been working to identify the scope of the upgrades needed to this critical facility since 2009. The total project upgrades to date are estimated to be \$6.8 million. So far the City has secured \$1.1 million in local funds, one reassigned state grant, and is working to authorize a reappropriation of additional unused grant money from the UV water treatment plant project. The City continues to make applications to the MMGP and recently completed a questionnaire for a Clean Water Loan for this project. Recent information provided by structural engineers working on the feasibility study indicates possible compromise to the structural and seismic stability of the building which may require even more work than initially expected. The critical need for this facility and the unknown nature of the repairs and upgrades make this an absolutely critical project for the City of Kodiak. Therefore, the City of Kodiak is requesting state funding assistance for completed design and replacement/upgrades of this facility in the amount \$5,700,000.

Project Timeline:

April 2013: Complete final feasibility study & fieldwork, focusing on building seismic stability & pump replacements
June 2013: Complete pre-design
February 2014: Complete design
April 2014: Bid Ready
Spring/summer 2014: Construction

Entity Responsible for the Ongoing Operation and Maintenance of this Project:

City of Kodiak

Grant Recipient Contact Information:

Name: Aimee Kniaziowski
Title: City Manager
Address: 710 Mill Bay Road
Kodiak, Alaska 99615
Phone Number: (907)486-8640
Email: akniaziowski@city.kodiak.ak.us

Has this project been through a public review process at the local level and is it a community priority? Yes No



Vent with bat behind the screen



Bat feces



Bat urine running down the wall



Switch Panel



Crack in downstairs ceiling



Electrical room



View of upper floor



Backup diesel pump



Inside pumphouse

Monashka Pumphouse Information

Monashka Pumphouse provides almost the entire water supply for the City of Kodiak's public water system. The plans for the pumphouse indicate that construction began sometime in 1972. Since the start up of operations only minor changes have occurred such as adding additional pumps and the replacement of the original motor start systems. The additional pumps were added by the Public Works crew and the electrical work was completed by local electricians. With the old age of all the electrical within the building and very old pumping technology upgrading of this critical facility has been needed for a long time.

The City's daily average water usage the last three years is 4.73 million gallons per day (MGD). Depending on the time of year, water flows can be as low as 2 MGD (December) and as high as 10 MGD at the peak of the Pollock and Cod season (March). This creates a very unusual demand on the City's water and pumping needs. This highly fluctuating flow requires a water system that is much larger than one generally needed for a community the size of Kodiak.

The pumphouse is a two floor concrete building fabricated from pre-cast panels with a flat roof. The top floor contains the electrical room with motor starts and storage that was originally intended for onsite chlorination facility that was not used. The basement floor houses the pumps and piping. The pumps consist of three large single speed electric pumps and one emergency diesel powered pump. There are two 300 HP electric pumps capable of 3,000 gallons per minute (gpm) each or roughly 4.2 million gallons per day, (MGD). There is one 400 HP electric pump capable of 4,100 gpm or roughly 5.9 MGD. The diesel powered pump is driven by an old Cat engine and can pump 3,870 gpm or 5.6 MGD. When all three electric pumps are running, the City can pump 10.8 MGD.

As multiple pumps are used, they lose efficiency and no longer get the maximum capability out of each pump as more are run. Energy consumption increases, but capacity decreases with the older pumps. The City hopes to find improved capacity with newer variable speed pumps and reduced energy consumption.

The pumps are 1940 technology and no longer manufactured. They have proven to be very reliable and dependable over the years; however parts must be manufactured on an as needed basis and are extremely costly. The City prefers to have a machine shop build parts which is less costly than having the manufacturer that owns the pumps rights build parts.

Pumping water from Monashka to the City's Upper Reservoir follows a very complex pump route. Water is pumped a great distance along a very challenging route in regards to elevation. The pipe distance from Monashka to Pillar Creek is 2.34 miles using a single 24 inch ductile iron line installed around 1972. There are two transmission lines each 1.2 miles long and made of ductile iron pipe that route water from Pillar Creek to Upper Reservoir; one is a newer 24 inch line installed in 1996, and the original 20 inch line installed earlier as part of the system from Pillar Creek. This is a total of 4.74 miles of transmission line. The Monashka reservoir elevation is 147 feet. At one point on the route, the high point between Monashka and Pillar Creek is 300 feet of elevation which then drops to a low of 43 feet at Pillar Creek. The elevation at Upper Reservoir is 353.7 feet.

All of the original electric motor starts have been replaced with soft start systems. However, the last ones were replaced in 1992 and are not being supported with on-the-shelf parts either. As pieces fail, the City has to special order replacement parts at very high cost and time. The starts are Allen Bradley start systems which are one of the major manufacturers of industrial components like this.

Electrical energy use at the Monashka pumphouse is a significant factor in establishing local water rates. For example, in FY 2010 1,924,528 KW of power was used at a cost of \$296,452.13. In FY 2012, the pumphouse used 2,220,480 KW of power at a cost of \$393,904.80. The Cost of Power Adjustment (COPA) fluctuated during this time period, but the City hopes it will stabilize at a lower rate with Kodiak Electric Association's addition of wind power and expanded hydro capacity at Terror Lake.

The pumphouse shows its age more and more. There is separation on some of the wall panel connections and between the two floors of the pumphouse. The City contracted with CH2MHill to do a feasibility study to evaluate the overall condition of the building. Preliminary indications were that the building was in fair condition. However, they are currently undertaking additional investigation of the building's structural & seismic stability. Once this work is completed, the City will have a clearer picture of whether it building can be upgraded or may need complete replacement.

If the building is seismically stable, design work would progress toward upgrading the pumps and capability of the pumps, electrical systems including modern start systems and most likely variable frequency drive pump systems. Building improvements could be planned, particularly the effort to control bat infestation problems. Plans will include improving long distance monitoring and control of the pumps systems to improve response to water system demands. This is particularly of concern during extreme weather events in the winter time. The City has experienced events where power was lost at Monashka and it took crews over 12 hours to get to the pumphouse by road.

If the building is found to be unsuitable for upgrades or retrofits, the costs will go up and the project will be much more critical due to the community's almost complete dependency on the water pumped through this facility.