



CITY OF RAPID CITY

Engineering Services

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City of Rapid City Water Reclamation Facility Proposed Facility Improvements

To ensure that adequate wastewater treatment is maintained for the community the City of Rapid City (City) has identified the need for repair, replacement and improvement projects at its Water Reclamation Facility (WRF). These projects consist of repair, replacement or improvements of critical components of the existing facility and will not result in expansion of the facility or disturbance of new areas.

The City proposes to fund these projects with a State Revolving Fund (SRF) Loan. In 2008 the City implemented a water reclamation rate increase that included the necessary debt service to cover the payments for the proposed loan.

A brief description of the proposed WRF projects to be funded by the SRF Loan and their estimated cost and schedule is as follows. Please note, the location of each of these proposed projects is provided on the accompanying facility map (Exhibit A).

1. Motor Control Center Replacement

Project Description

This project will consist of replacement and relocation of an existing Motor Control Center (MCC) located in the lower level of the facility Operations Building. This MCC provides power and control for the pretreatment, primary clarification, and primary treatment portions of the facility. This MCC has shown serious signs of corrosion and deterioration to the copper bus and wire connections that have prompted the need for its replacement.

The project will consist of replacement and relocation of this MCC into a less corrosive environment. The main project components are:

- Replace existing MCC with new smart MCC
- Replace all existing electrical equipment in the first floor electrical room and move to the new equipment room
- Build a sealed equipment room in the first floor Operations Building old lab space for the new MCC and associated electrical/control equipment
- Install new air purification units in the new sealed equipment room

- Replace all electrical feeders to equipment inside the Operations Building
- Replace all electrical feeders to equipment outside the building and provide an above grade cable tray for the feeders
- Monitoring and alarming of the sealed equipment room for hydrogen sulfide levels
- Smart Controls integral with the new MCC to handle motor protection and metering with a remote I/O PLC cabinet similar to the existing for connection to the main plant HMI

Project Schedule

The City of Rapid City contracted with West Plains Engineering, Inc. to conduct a Preliminary Design Study for this project. This preliminary design study is complete and resulted in the recommendations noted above. West Plains Engineering, Inc. is currently contracted to complete a final design for the project. The City proposes to bid for construction of this project in September 2009 or when the SRF Loan is approved.

Estimated Project Costs

Estimated costs for this project are:

Engineering Costs	\$100,000
Construction Costs	<u>\$725,000</u>
Total Estimated Project Costs	\$825,000

2. Digester Control Building Improvements

Project Description

The Digester Control Building Improvement project will consist of replacement of the combination boiler/heat exchangers, gas piping modifications, waste gas flare, control improvements, HVAC modifications, electrical upgrades and other improvements in the WRF Digester Control Building. The boiler/heat exchangers and other equipment in the Digester Control Building are showing serious signs of corrosion and are in need of replacement or relocation. Replacement of the boiler/heat exchangers will facilitate the need to bring the building into compliance with current NFPA and electrical codes.

Project Schedule

The City of Rapid City contracted with Burns & McDonnell Engineering Company, Inc. to conduct an evaluation of the current biosolids management system at the City of Rapid City WRF. This study was completed in March 2007. The City has completed replacement of the Secondary Digester Cover and Gas Handling Equipment which was the first project identified in this study. The Digester Control Building Improvements is the second project to be conducted as a result of this evaluation.

Burns & McDonnell Engineering Company, Inc. is currently contracted to complete the final design for this project. The City proposes to bid for construction of this project in September 2009 or when the SRF Loan is approved.

Estimated Project Costs

Estimated costs for this project are:

Engineering Costs	\$ 165,000
Construction Costs	<u>\$1,083,000</u>
Total Estimated Project Costs	\$1,248,000

3. Non-Potable Water System Improvements

Project Description

The WRF uses a non-potable water system to supply process water for various operational activities and equipment maintenance including production of polymer solutions for sludge handling and processing, pump seal lubrication, heat pump supply, wash down and cleaning of surfaces and equipment, and landscape irrigation. The existing system was installed as part of the original facility construction in 1967 and is located in the lower level of the Operations Building. The existing non-potable water system has experienced corrosion and failures, primarily due to the age and condition of the system, and is difficult to access for maintenance and repair. There is not a source of potable water for the Water Reclamation Facility other than that hauled by truck, therefore the non-potable water supply system is essential for the function of this facility. This project will provide for the evaluation, planning, design, bidding and construction of a Non-Potable Water System for the WRF including piping, disinfection, pumps, and pressure tank(s).

Project Schedule

The City has contracted with HDR Engineering for system evaluation and design. The City anticipates bidding for construction for this project in November 2009.

Estimated Project Costs

Estimated costs for this project are:

Engineering Costs	\$100,000
Construction Costs	<u>\$400,000</u>
Total Estimated Project Costs	\$500,000

4. Primary Digesters Cover Replacement

Project Description

The Primary Digesters Cover Replacement project will consist of replacement of the existing floating primary digester covers and gas mixing equipment with fixed digester covers and the related gas mixing equipment. The two primary digester covers were installed in 1967 as part of the original facility and have exceeded the typical design and operational life of this type of equipment. As with other equipment at the digester complex both primary covers exhibit significant external corrosion and it is very likely that the interior steel surfaces are corroded. The gas collection piping and cover accessories are also corroded. The City proposes to replace the covers in series under one construction contract.

Project Schedule

This project was identified in the biosolids management evaluation conducted by Burns & McDonnell Engineering Company, Inc. and is the final major project to be completed at the WRF digester complex. The City anticipates contracting for engineering design services in January 2010 and bidding for construction of this project in September 2010.

Estimated Project Costs

Estimated costs for this project are:

Engineering Costs	\$ 200,000
Construction Costs	<u>\$1,760,000</u>
Total Estimated Project Costs	\$1,960,000

5. Ultraviolet Disinfection Building HVAC

Project Description

As part of the 2002 WRF expansion the City installed an Ultraviolet (UV) Disinfection System to replace the previous chlorine disinfection system. The cooling system installed in conjunction with this UV System has proven to be inadequate to keep the system sufficiently cooled. This project will consist of the design and installation of a system that will keep the UV System adequately cooled.

Project Schedule

The City anticipates contracting for engineering design services in October 2009 and bidding for construction of this project in January 2010.

Estimated Project Costs

Estimated costs for this project are:

Engineering Costs	\$10,000
Construction Costs	<u>\$70,000</u>
Total Estimated Project Costs	\$80,000

6. Grit Removal and Handling EquipmentProject Description

Portions of the Grit Removal and Handling System have reached the end of their useful life and need to be replaced. This project consists of replacement of the grit cyclone and classifier, and associated piping and appurtenances.

Project Schedule

The City anticipates contracting for engineering design services in October 2010 and bidding for construction of this project in February 2011.

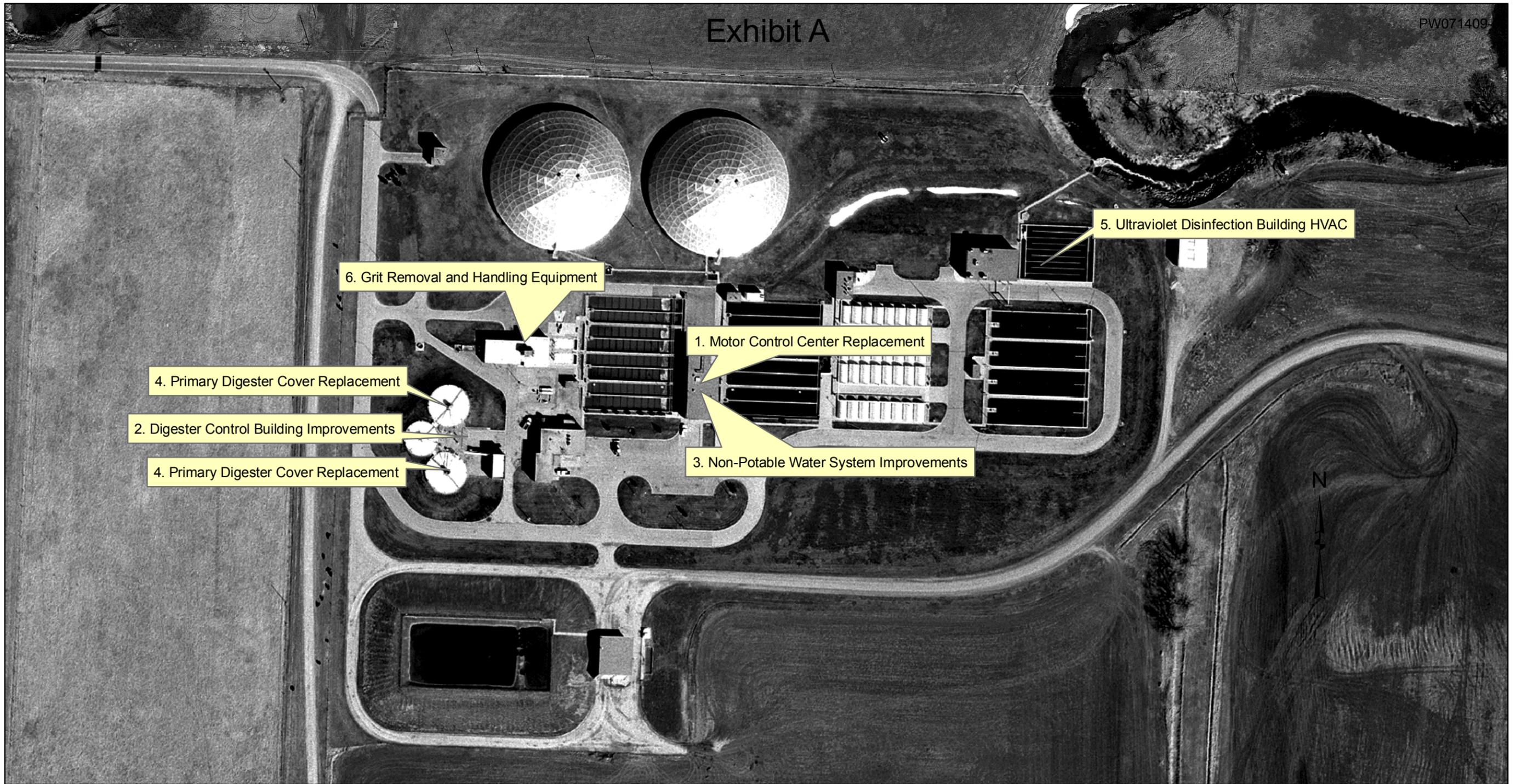
Estimated Project Costs

Estimated costs for this project are:

Engineering Costs	\$ 20,000
Construction Costs	<u>\$180,000</u>
Total Estimated Project Costs	\$200,000

Cost Summary

Total Estimated Construction Cost	\$4,218,000
Total Estimated Engineering Cost	<u>\$ 595,000</u>
Total Estimated Cost	\$4,813,000



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May 2009**