PAM HAXBY-COTE
DIRECTOR

MONTANA
DEPARTMENT OF COMMERCE

STEVE BULLOCK
GOVERNOR

Mayor
CDD
2-20-18

February 14, 2018

Gary McDermott, Mayor
City of Shelby
112 First Street S
Shelby, MT 59474

RE: House Bill 6 Impacts to Treasure State Endowment Program (TSEP) Grants

Greetings,

As you are aware, TSEP held an informational meeting February 8, 2018, to discuss House Bill 6 (HB6) impacts to TSEP grants. As presented during the webinar, impacted projects that wish to submit a continuation letter, will receive a prepopulated letter to date and sign, and return to the program.

A copy of this letter is enclosed and has been emailed to project representatives to you today. Signed letters can be submitted either electronically to DOCTSEP@mt.gov or by mail to Becky Anseth, TSEP, Box 200253, Helena, MT 59620. Letters need to be by returned by June 15, 2018.

A link to the February 8, 2018 presentation is available at http://comdev.mt.gov/Programs/TSEP/Updates if you would like to review information presented.

Please feel free to call or email us if you have any further questions.

Sincerely,

Becky Anseth
Community Development Division
Montana Department of Commerce

Cc: Andy Evenson, Engineer, KLJ Engineering
Lorette Carter, Community Development Director, City of Shelby

Enc.

Becky Anseth, Program Manager
Montana Department of Commerce
301 South Park
Helena MT 59620-0523

RE: Continuation Letter

Dear Ms. Anseth,

The City of Shelby is submitting this Continuation Letter as a formal request to be included in the Governor's Budget for the 2021 biennium.

As requested, we have included an updated budget and implementation schedule for our proposed water project, which has not changed since the original application was awarded in May 2017.

Please contact the City of Shelby if you have any questions.

Regards,

Gary McDermott, Mayor
City of Shelby

cc: Andy Evenson, KLJ Engineering

7SEP 750,000 SRF Loan 881,333
RRGL 125,000
875,000

Renewable Resource Grant & Loan Program

Proposal Abstract

The City of Shelby examined the existing water system in an effort to identify/examine existing problem areas within the system and establish a recommended course of action and design basis for water improvements to meet the needs of the City, including the requirements of State and Federal regulations for a 20-year planning period and interim connection to the North Central Montana Regional Water Authority system.

Improvements are necessary to ensure safe domestic water supply that has the capacity and efficiency to provide water and fire flows to the City of Shelby and the new connection to the North Central Montana Regional Water Authority system. These additional water demands on the city's current system have place the City of Shelby in critical need of improvements and upgrades to ensure the safety and efficiency of water services to the region.

The following priorities are outlined within the PER:

1. ***Winterize wells No. 9-12 and metering:*** *The city will now have to operate additional wells year round to serve local and regional water users. Wells 9 through 12 will require the installation of heated enclosures and water mains lowered for frost protection. The metering of wells in the well field will provide critical information on well protection and hydrology within the well field to meet the needs of the city and regional water system.*
2. ***Upgrade the existing water treatment system and generator:*** *With additional water flows to regional consumers, the treatment plant will require additional virus inactivation per the UVDGM as required by DEQ 13.2.5.3d. The two Trojan 4L24 UV reactors will be upgraded to six bulbs to meet agency requirements for expanded water demand. An emergency generator will also be installed at the treatment facility in which to sustain treatment of water flow during time of critical need, be it a natural disaster, weather event, or human threat to the system.*
3. ***Shelby Heights Booster improvements and generator:*** *The system is undersized to meet the needs of additional water demands of the regional water system. A new telemetry system and additional pumps will be installed in a larger station. An emergency generator will also be installed to insure safe storage of movement of water for domestic needs and fire flow.*
4. ***Re-route the south tank water main:*** *The existing 16" AC pipe which runs beneath the south tank has been exposed to the elements at existing vaults and is quickly deteriorating. A collapse of the line would cause the loss of*

generator @ treatment facility

Shelby Heights generator

Near well Booster Station generator

3 generators @ 135,000/each = 405K

over 1 million gallons of storage capacity, severely depleting required fire flows throughout the community and region.

5. **Clear Well booster station generator:** An emergency generator is also needed at the wellfield booster station. This is critical in the event of a catastrophic event ~ weather- natural disaster-human threat to the system to continue the movement of safe, clean water to regional water users.
6. **Rehabilitate the 16" Water Main:** The single 5-mile long 16" AC pipe was constructed in 1962 and has never been fully drained and inspected. At the same time it has been exposed to the elements at existing vaults causing deterioration. The isolation valves on the 16" main are not operational and this main is runs beneath the south water tank. (Part of priority 4.)

The critical nature of the deficiencies have been documented in the examination of sources, pumping facilities, treatment facilities, storage and distribution. These long-term problems for regional water demands require updated systems, increased capacity, increased disinfection and emergency measures in place to provide life sustaining and fire protection water service. The improvements minimize health and safety treats, preserve water resources and efficiently sustain water service for the region.

Preliminary Engineering Report

Shelby Water System PER

May 2016

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1 Executive Summary

1.1 Introduction

The City of Shelby has hired KLJ to complete this preliminary engineering report (PER) for the drinking water system. This Preliminary Engineering Report (PER) documents the study, conclusions, and recommendations for the City of Shelby's water system facilities. The PER identifies the planning area, evaluates the existing condition and operation of the existing facility, identifies existing problems areas within the system, and establishes a recommended course of action and design basis for water improvements to meet the needs of the City and the requirements of State and Federal regulations for a 20 year planning period. A summary of the project background and recommended improvements are presented in the Executive Summary.

1.2 Existing Facilities

The Planning Area for this Preliminary Engineering Report includes the City of Shelby, Montana. Shelby is located at 48° 30' 26" North, 111° 51' 37" West, in Sections 21, 22, 27, 28, and 35, Township 32 North, Range 2 West. Shelby is the County Seat of Toole County. Shelby is situated at the intersection of U.S. Highway 2 and U.S. Interstate Highway 15. An aerial photographic exhibit indicating the general location and layout of the town is included in Appendix X.

An important factor that was considered when evaluating alternatives for the City of Shelby water system is the development of the North Central Montana Regional Water Authority system. This is a regional water system in its early stages of design and implementation. The system water supply is Lake Elwell formed by the Tiber Dam. Portions of the system are constructed including the intake structure and sections of pipeline. Many of the other components are in the design phase and will be constructed very soon including the treatment facility. Other main areas anticipated to receive water from the regional system include Cut Bank, Chester, Conrad, Brady, Dutton, Big Sandy, Havre, Kevin, Sunburst, Sweetgrass, Oilmont, and many others. It is too early to know for sure but if the regional system develops, water supply to Shelby could be provided within 10 years.

1.2.1 Water Supply

All of the water for the City of Shelby is supplied from 13 wells of which 11 are currently being used. The well field is located approximately 5 miles south of the city near the Marias River. The wells vary in depth from 31 to 50 feet. Well logs are included in Appendix F. The majority of the well pumps are sized to provide a total dynamic head of 450 feet with the remaining well pumps acting as feeder pumps. Well No. 11 pumps into Well No. 5; and Well No. 12 pumps into Well No. 7, these two feeder wells have smaller pumps. Well No. 6 is currently not operational and well No, 4 is anticipated to be reconnected in the summer of 2016.

1.2.2 Pump Stations

The City of Shelby water system utilizes two water pumping facilities (booster stations). They are located near the water treatment plant and at the South storage tank.

The Well Field Booster Station is adjacent to the clear well near the well field is a booster station that was constructed in 2011. This booster station moves water from the storage tank, through a treatment unit that provides UV disinfection and into a ground storage tank at the south end of the City of Shelby. The booster station is equipped with four pumps that operate in parallel. The rated capacity varies slightly depending on the number of pumps running simultaneously. The static head represents about 80 percent of the total head of the pump system; therefore, the flow rate does not vary significantly with parallel pump operation.

The Prison Tank Booster Station is adjacent to the ground storage tank at the south end of the City of Shelby. This pump station moves water from the ground storage tank to a 500,000 gallon elevated tank near the Shelby Prison. The pump station initiates operation when the water in the elevated tank drops to an elevation of 3609.6 feet. The pump station ceases operation when the water level in the elevated tank reaches an elevation of 3612.1 feet. The overflow elevation of the elevated tank is 3616.6 feet. The elevation set points that dictate pump operation can be adjusted by the system operator.

1.2.3 Treatment

The treatment plant consists of two medium pressure Trojan 4L24 UV reactors, operated in series (Shelby has operated in series since 2011) to provide 4-log virus inactivation per the UVDGM as required by DEQ 1 3.2.5.2.d.

The treatment facility is located on top of the plateau above the Marias River approximately one half mile from the well field. The treatment facility is fed from the well field by two 12" diameter pipelines that combine into one 16" diameter pipeline just outside of the treatment facility.

1.2.4 Storage

The City has four finished water storage tanks and one raw water storage tank providing a combined capacity of 3.1 million gallons of finished water and 3.2 million gallons total. The five tanks provide storage in excess of the peak day and fire flow demands for the City as long as the distribution system can deliver the water. The storage system supplements the supply system during short duration periods when demand exceeds the supply.

The five tanks provide storage in excess of the peak day and fire flow demands for the City as long as the distribution system can deliver the water. The storage system supplements the supply system during short duration periods when demand exceeds the supply. The five storage tanks that make up the storage facilities for the system include:

- South Tank
  A 1 million gallon partially buried concrete storage tank that is located on the south side of town. The tank is generally in good condition.
- Prison Tank
  A relatively new 500,000 gallon elevated tank located near the Crossroads Correctional Facility. The tank is in good condition.
- City Shop Tank
  A 1.5 million gallon above ground steel tank that is located on the northeast side of town near the City shops. In 2005 the steel water main that supplies that tank suffered

a major leak. "The foundation for this tank is an oiled sand bed, a common type of foundation at the time of the tank construction. The City needs to study this foundation to ensure the leak did not wash too much of the sand away and that the foundation will be adequate to support this tank in the long term" (from the 2006 PER). Regular maintenance of a steel tank requires periodic recoating on the outside and in.

- Airport Tank
  A 100,000 gallon elevated tank that is located on the northwest side of town near the border patrol station and the airport. Lab tests of the paint that is flaking off of the exterior of the tank show that the paint used to coat the tank was lead based. The lab results are included in Appendix E. This tank should be removed from service and properly disposed of. "This area of town should be connected to the current high pressure zone in the near future" (from the 2006 PER). A new tank could also be constructed to serve this area of town but would require a booster station. Storage requirements for this area could be provided by the prison tank.

- Well Field Clear Well
  A 100,000 gallon steel tank that is located near the water treatment plant approximately 5 miles south of the City. This tank is in good condition. Regular maintenance of a steel tank requires periodic recoating on the outside and in.

1.2.5 Distribution System

The original water distribution system was installed in the late 1930's and early 1940's. Most of the original pipe has been replaced with asbestos concrete pipe with the more recent improvements utilizing PVC. The distribution system within the City is composed primarily of 6 inch to 16 inch diameter mains. Only a few 4 inch diameter mains remain. Soils in the area are highly corrosive to cast iron and steel pipes therefore almost all of these pipes have deteriorated and have been replaced.

The distribution system is fed by a 16" asbestos cement main line extending from the treatment building (located approximately 5 miles south) to the south tank. This particular water main is very vital to the City, as it is the only main to deliver water from the well field to the City. If this main were to break, the City would be without water until the main was repaired. Due to this, a project is planned for completion in 2017 of installing a parallel 20" water main from the Well Field booster station to the existing treatment plant and then to the South storage tank. This project will provide redundancy and additional capacity to the existing 16" water main.

The distribution system is made up of the three pressure zones shown in Appendix D. The low pressure district is fed directly by the South Tank with storage provided by the South Tank, the City Shop Tank, and the Airport Tank. The high and middle pressure zones are fed directly by the new booster station located adjacent to the South Tank with storage provided by the Prison Tank. When the booster station was constructed, two PRV's were installed to reduce excessive pressures, therefore separating part of the existing system from the low pressure zone.

Generally the water distribution system in good working order. However, the existing 16" AC pipe that connects to the South Tank has been exposed to the elements at existing vaults and is beginning to deteriorate. This main is also very close to the existing foundation of the South tank. The City has shared concern of how to adequately repair this water main. The City has also shared concern regarding the two 12" water mains that deliver water from the wellfield booster station to the treatment plant. These mains are dated and were installed on a steep slope from the well field booster station to the treatment plant. However, a project has been proposed to supplement these mains with a new 20" main.

1.2.6 Water Meters

The City of Shelby is almost entirely metered with the exception of a small park. The impact of this park is relatively small with minimal usage. The City currently hires Shelby Gas to read the water meters at the same time that they read their gas meters. The meter reading process works well but the City may want to eventually consider options for more efficient meter reading. There are many options available for converting to a radio-read system, which would eliminate nearly all time to read the meters.

1.3 Need for a Project

As an interim solution, the City of Shelby has agreed to provide supplemental water to the City of Cut Bank (400,000 gpd average day and 750,000 gpd peak day) and the Devon water system (55,392 gpd average day and 83,088 gpd peak day). These additional water demands, in addition to the growth of the City of Shelby population, have exceeded the capacity of the existing water treatment plant, the output capacity of the Prison Tank Booster Station and most notably the capacity of the source water wells.

The City of Shelby connection to the NCMRWA may or may not be made during the planning period, therefore the City needs to be proactive in protecting and upgrading its existing water system.

1.4 Alternatives Considered

Various alternatives were considered to address the problems of the water system. A screening analysis eliminated alternatives that were not considered feasible. An analysis of the alternatives that were considered feasible was conducted and used to select and prioritize the preferred alternatives. The recommended preferred alternatives are:

*To be completed after well testing.

A schematic of the selected alternative is included in Appendix K, and the capital costs associated with the improvements are presented in Table 1.1.

1.5 Selection of an Alternative

*To be completed after well testing.

1.6 Proposed Project

*To be completed after well testing.

2.1 Report Objective & Organization

The City of Shelby has noted various concerns with their water system. The bulk of the concerns take place at the existing well field and the water treatment plant. With the increased demand to supply supplemental water to the City of Cut Bank and Devon, the well field and the water treatment plant capacities will need to increase. There is also increased demand from one of the City's water booster stations. The City has also shared concern with an existing 16" AC water main that runs on the West side of the South Water Storage tank. This main has been exposed to the elements through existing vaults and has begun to deteriorate. This main is also located very close to the foundation of the tank and has caused the City concerns of how to effectively rehabilitate this main.

The City of Shelby hired KLJ to conduct a preliminary engineering report (PER) for the water system to address the above described issues. As part of the PER, a thorough analysis of the existing water system was conducted. Alternatives have been considered to address the problems and recommendations made as part of this PER.

2.2 Location

The Planning Area for this Preliminary Engineering Report includes the City of Shelby, Montana. Shelby is located at 48° 30' 26" North, 111° 51' 37" West, in Sections 21, 22, 27, 28, and 35, Township 32 North, Range 2 West. Shelby is the County Seat of Toole County. Shelby is situated at the intersection of U.S. Highway 2 and U.S. Interstate Highway 15. An aerial photographic exhibit indicating the general location and layout of the town is included in Appendix X.

2.3 Physical Characteristics of the Area

2.3.1 Climate

Shelby is located in the north central region of Montana, approximately 60 miles north of Great Falls, MT near the Canadian border. According to the US Census Bureau the City encompasses a total area of 3.3 square miles. The climate in this area is a modified continental climate that is typical of northern prairies found east of the continental divide. Generally the area experiences cool dry summers and cold winters. Shelby has an average annual precipitation of approximately 11.6 inches and the total average snowfall is 22.3 inches. A National Waterfowl Production Area is located to the west.

2.3.2 Topography

Shelby is positioned within the Medicine Rock coulee; a broad coulee that drains to southeast to the Marias River located approximately 7 miles south and east of Shelby. The coulee extends for several miles northwesterly from Shelby and contains numerous natural depressions that intermittently store water. The coulee south of Shelby has a defined channel that exhibits intermittent stream flow. The coulee bottom in Shelby is approximately one half mile wide with the sides of the coulee rising sharply approximately 160 vertical feet to relatively flat benches on both the north and south sides of town. A series of finger coulees extend out from the main coulee with some significant in size having caused flooding problems in the past for the city of Shelby. Lake Shel-oole was constructed in one of these

coulee systems on the north side of town as part of a flood control project. A United States Geological Survey (USGS) quadrangle topographic map of the area is included in Appendix X.

The city of Shelby rests approximately 3,297 feet above mean sea level.

2.3.3 Surface Water

Portions of the City have been subject to flooding in the past due to local runoff from the adjacent coulees. The Lake Shel-oole flood control project has eliminated the majority of the local flooding. Shelby is not within a major floodway. Although the main coulee is quite long, the upstream natural depressions and lakes appear to control floods on the main drainage system. The City' s water supply well field is located adjacent to the Marias River and is flooded periodically. The treatment facility is well above and out of the flood plain.

A USGS quadrangle map of Shelby is located in Appendix X.

2.3.4 Groundwater

The water table is very close to the ground surface west and south of town and varies seasonally. In general, the groundwater table is close to the surface only in the coulee bottom and is well below the surface beneath the plateaus north and south of the coulee. The City of Shelby public water supply wells were constructed along the Marias River five miles south of town in order to find water of satisfactory quality and quantity to meet the City' s needs. The Marias River wells are typically shallow ranging from 35 to 50 feet deep. Gravels and sands overlie a shale formation typically found at 35 to 40 feet in this area.

2.3.5 Soil Types

Soils are predominately loams to clay loams. These soils overlie soft sedimentary rock formations from the Cretaceous era. The native soils pose very low to moderate corrosion potential to metal pipes and a severe potential for sulfate attack to concrete. Reference Appendix X for the Soils map.

2.4 Environmental Resources Present

All state and federally funded projects are subject to either the Montana Environmental Policy Act (MEPA) or the National Environmental Policy Act of 1969 (NEPA), or both. MEPA seeks to avoid or mitigate adverse impacts on the natural and human environment by mandating careful consideration of the potential impacts of any development assisted with state funds or approved by a state agency. NEPA establishes national policy, goals, and procedures for protecting, restoring, and enhancing environmental quality. In accordance with NEPA and MEPA the Uniform Environmental Checklist was completed and can be found in Appendix X. In addition to the checklist the Environmental Review Form was prepared in accordance with TSEP 2014 Construction Application Guidelines for the 2017 Biennium and is also included in Appendix X. A number of federal and state agencies were contacted in an effort to identify any potential environmental impacts that might be associated with the proposed project. All correspondence with the affected agencies is also included in Appendix X.