CITY OF RAPID CITY

RAPID CITY, SOUTH DAKOTA 57701-2724

PUBLIC WORKS DEPARTMENT

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MEMORANDUM

TO: Public Works Committee

CC: Mayor Hanks

FROM: Dirk Jablonski, Public Works Director

DATE: August 8, 2007

RE: Source Water Protection Initiative

Recently the City of Rapid City received word from our Congressional delegation that funding for the Source Water Protection Initiative was included in the proposed FY 2008 budget. Senators Tim Johnson and John Thune sponsored a bill which included $600,000 for the project. Likewise, Congresswoman Herseth-Sandlin successfully sponsored $500,000 for the same project. Although the final funding is far from approved, this initial appropriation is an important first step.

In November, 2006, the City entered into contract with Stanley Consultants of Minneapolis Minnesota, to develop a Funding Brochure to present to the delegation as part of the request. Stanley Consultants arranged to meet and accompanied staff in making the presentation requesting funding for the project. Their experience and assistance was instrumental in acquiring the funding.

During discussions with the congressional staff members it was noted that the chances of success for funding would be enhanced if the City made an investment in the project. Appropriations are more likely to be provided for actual construction than studies. In the case of the Source Water Protection Initiative it was noted that it would be in the City's interest to fund a plan to address source water protection. The Source Water Protection Initiative Master Plan would collect and analyze existing data, define and rank problem areas, develop alternatives for each project area, and determine cost estimates. This plan would be used by the City to address the issue of source water protection. A draft Proposal for engineering services which outlines what would be included in the Master Plan is attached for your use. There have been no contract negotiations.

Stanley Consultants was the firm that also assisted the City of Rapid City in acquiring an appropriation for the Canyon Lake Dam and Park Restoration Project. Although all funding appropriations were deleted after the last election, the appropriation has been reinstated for the FY 2008 budget.

In the past two years Rapid City has received an appropriation of $800,000 for the Utility Master Plan, pending allocations of $100,000 and $200,000 for Canyon Lake, and pending allocations of $500,000 and $600,000 for the Source Water Protection Initiative. Stanley Consultants assisted in each of these efforts.

SUMMARY: A Source Water Protection Initiative Master Plan is needed to provide direction on the City will address this important issue. It is also needed to demonstrate the good faith effort by the City to address the problem so that the availability of Federal or State appropriations is enhanced. Stanley Consultants has successfully assisted the City in acquiring appropriations on other work and on this project. They have been involved with this project and are familiar with it. It is requested that Council authorize staff to enter into contract negotiations with Stanley Consultants for the master plan effort. If authorization is granted, a proposed contract will be brought to Council for consideration.

CITY OF RAPID CITY, SOUTH DAKOTA

SOURCE WATER PROTECTION INITIATIVE MASTER PLAN

Proposal for Professional Engineering Services

Stanley Consultants, Inc.

March 2007

Project Understanding

There are over 2400 on-site wastewater disposal systems, primarily septic tanks, in the Rapid City metropolitan area. These tanks are located in older sections within the city limits of Rapid City as well as new additions on the outskirts of the city in the hills. In the case of new homes, a septic system can be more cost effective than connecting to existing sanitary sewers, particularly when it is further than 400 feet away. In nearly all subdivision developments within the city limits, the developers of the projects are responsible for building and obtaining permits for sanitary sewer extensions.

Some of the residences with septic tanks are located directly over an area known as the outcropping of the Madison Aquifer. Wells drilled into this aquifer provide drinking water for the City of Rapid City and surrounding communities. The outcrop (or exposed) area of the Madison Aquifer is also in the recharge zone of the aquifer. Due to the limestone geology of the area, the aquifer is replenished by rainwater and snowmelt, which infiltrate into the rock. Water in the aquifer flows through fractures, pores and caves in the limestone making the Madison Aquifer more vulnerable to surface pollution. In aquifers unlike the Madison in geology, the rain and snowmelt are filtered by soils and sediments on its way to replenishing the aquifer.

With the coincidence of residential development, karst (limestone) geology and on-site wastewater disposal systems, preventative measures must be taken to safeguard the primary source of drinking water from contaminants and chemicals. Data from the United States Geological Survey (USGS) appears to indicate elevated levels of nitrate in monitoring and even some private wells drawn from the Madison Aquifer. These wells are located west of the City of Rapid City.
One short term approach to protection of the drinking water source for the City is to inspect, monitor and control the estimated 2400 septic tanks in the area. Orders for maintenance and/or reconstruction (in the case of failure) must be enforced. The City of Rapid City has a full time employee to handle this task. The long term solution is the elimination of septic tanks by connecting homes to the City's sanitary collection system.

Project Approach

Stanley Consultants offers a phased approach for the City of Rapid City Source Water Protection Master Plan. The Plan generally consists of the following tasks: Data Collection and Analysis, Refinement of the Problem, Development of Alternatives, Evaluation of Alternatives and Development of an Implementation Plan. Results of the study will be summarized in a Master Planning Report.

The project team will initiate the project by meeting with city staff to gain a full understanding of the direction of the study. Following the meeting Stanley staff will work with City staff to collect data. Data analysis will help define the challenges facing the City with respect to potential for contamination of the drinking water source. Alternatives will be developed to proactively mitigate potential contamination of the aquifer. The recommended alternative will be laid out in a phased plan to guide the City in implementing their plan for source water protection.

The task outline below is followed by the detailed descriptions of the individual tasks.

Task 1 Project Initiation Meeting
Task 2 Data Collection and Analysis
Task 3 Problem Refinement
Task 4 Alternatives Development
Task 4 Evaluation and Recommendation
Task 5 Implementation Plan
Task 6 Master Plan Report
Task 7 Project Management

Task 1: Project Initiation Meeting

Objective: Meet with the client and stakeholders to gain a full understanding of the objective of the project. Define the study boundary. Define communication protocols for the project.

Activities:

1. Attend a Project Initiation Meeting in Rapid City with city staff and members of the engineering consultant team.
2. Compile contact information of project participants. Determine points of contact for the City of Rapid City and Stanley Consultants for various tasks of the project.

Client Responsibilities:

- Attend meeting
- Provide contact information

Deliverable: Meeting Agenda, Meeting Notes with Communication Protocols

Task 2: Data Collection and Analysis

Objective: Collect information needed to document the areas of concern within the study boundary.

Activities:

1. Make a data request to the City for GIS data for
    a. Aerial mapping, utilities, septic tanks, geological, transportation, existing collection system, natural resources, and environmental data.
2. Collect any existing geotechnical information, growth projections, collection system record drawings (if not in GIS).
3. Make a field visit to document project features.
4. Determine current and future number of on-site treatment systems (septic tanks) that overlap sensitive aquifer areas.
5. Review City policies and ordinances regarding source water protection.

Client Responsibilities:

- Provide data as requested.

Deliverable: GIS Map depicting study areas and pertinent attributes.

Task 3: Problem Definition

Objective: Refine the problem statement.

Activities:

1. Refine the problem statement.
2. Define and rank project areas based on contamination type, potential impact to the aquifer, geology of the area and age of the system of the on-site system.
3. Discuss with client in two separate workshops.

Client Responsibilities:

- Participate in two workshops

Deliverables: Deliver these draft portions of the Master Plan, which describe the problem statement, project areas and ranking and project constraints.

Task 4: Alternatives Development

Objectives: Develop alternatives for each project area, which may include conceptual pipeline routes.

Activities:

1. Estimate costs for the alternatives.
2. Identify project constraints.

Client Responsibilities:

- Review draft document

Deliverables: Deliver those portions of the Master Plan, which describe the alternatives for each project area.

Task 5: Evaluation and Recommendations

Objective: Evaluate alternatives against a set of criteria developed for this task. Recommend an alternative for each project area.

Client Responsibilities:

- Assist with evaluation criteria development.
- Review draft chapters.

Activities:

1. Develop a set of criteria on which to evaluate alternatives. Criteria may include capital cost, life cycle costs, sustainability, public health, environmental and/or property considerations. Criteria may be monetary and nonmonetary. Criteria will be developed in conjunction with City of Rapid City through staff discussions.
2. Recommend an alternative for each project area. The alternatives will have sufficient detail to allow for the next stage of planning. The alternative descriptions may include:
    a. A conceptual pipeline route and pipe size
    b. Need for lift stations
    c. Other on-site treatment if sewers are unworkable
    d. Constructability issues (rock, soil cover, city disruption, etc.)
    e. Master planning level cost estimate
3. Meet with Client to discuss.

Deliverables: Deliver the draft chapter of the Master Plan, which discusses the evaluation criteria, alternatives evaluation and recommendation.

Task 5: Implementation Plan

Objective: Provide an Implementation Plan that outlines the various identified projects, associated priority based on perceived impact on the aquifer, cost considerations, sequencing with adjoining areas, prevailing development patterns, and other factors, and estimated costs.

Client Responsibilities:

- Review draft plan.
- Provide input on priority factors.

Activities:

1. Develop Implementation section of Master Plan that outlines the projects, assigns implementation priority, and develops logic for continuity between projects that are adjoining or dependent on common elements such as sewer interceptor.
2. Presents project budgets and projected implementation duration.

Deliverables: Provide draft Implementation Section.

Task 6: Master Plan Report

Objective: Provide a Master Plan Report that documents the planning activities and results for Client's use for future activities.

Client Responsibilities:

- Review draft report.

Activities:

1. Develop draft Master Plan report that summarizes the results of the planning activities including pertinent data, alternatives development, alternatives evaluation and prioritization, budgetary costs, project durations, scheduling, and implementation plan.
2. Meet with Client to discuss.
3. Prepare final Master Plan Report.

Deliverables: Provide draft and final Master Plan Reports.

Task 7: Project Management

Objective: Provide ongoing management, administration and coordination of the project, keeping the client fully informed for the length of the project.

Client Responsibilities:

- Interface with project team as appropriate.
- Process payment requests

Activities:

1. Project initiation tasks
2. Monitor and control budget and schedule for compliance with contract
3. Comply with internal standards for Quality Control.
   a. Internal review of concepts and draft submittals by senior project managers and/or senior design group heads.
4. Maintain project records.
5. Submit monthly payment request in client's desired format with monthly status report.

Deliverable: Copies of project status meeting notes, initial project schedule, and periodic updates, monthly progress reports and monthly submittals for progress payments.