



TO: Mayor Larry Morrissey
 Members of City Council
 FROM: William Bittner, Director of Public Works
 SUBJECT: Water System Rehabilitation Plan
 DATE: July 31, 2006

This is to provide a status report on the progress of our water system upgrade. It is a very general summary. The project is on schedule. If you have questions or would like more information, please let me know.

In recent months the City Council has approved several engineering agreements and contracts for services related to this project. Activities will increase in the upcoming months. As the program includes a variety of improvements at a number of locations, there will be a significant number of contracts for Council consideration.



The City Council gave final approval to the rehabilitation plan on January 9, 2006, when it authorized a \$15,000,000 bond issue (first stage of an estimated \$75,000,000 project), and approved a water rate increase to fund the project. The first phase of the rate increase, a 15% increase went into affect April 1, 2006. The first \$15,000,000 in bonds were sold at a net rate of slightly over 4.5%.

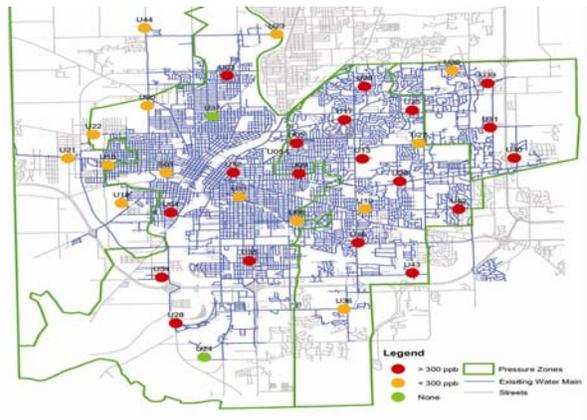


An engineering team was established in 2005 when the project was initiated. The team consists of MWH Americas, Inc., Strand Associates, Inc., and McMahon Associates, Inc. Working with City staff, the team developed the rehabilitation plan at an extended planning session. The team provides considerable

capability for our implementation efforts. The City has a master engineering service agreement with each firm. As the project evolves, new tasks are identified and assigned to a particular firm. A task order is negotiated defining scope of work and estimated costs. The task order is submitted to Council as an amendment to the master agreement.

The full engineering team meets monthly in full day session to coordinate project activities. In addition, City staff members will work with individual members of the team on a daily basis to address specific project issues.

The Water Rehabilitation Plan was developed to



address customer dissatisfaction with water quality, radium standards, inconsistent water service pressure and an aging physical plant. Changes will be made in how the system operates. Eighteen well sites will serve as the primary source of water. Equipment at these sites will be modernized and water treatment plants constructed as needed. Thirteen sites will be placed on standby status. Standby wells will be available for use during periods of high consumption or backup during system maintenance. The system will operate with a higher degree of automation.



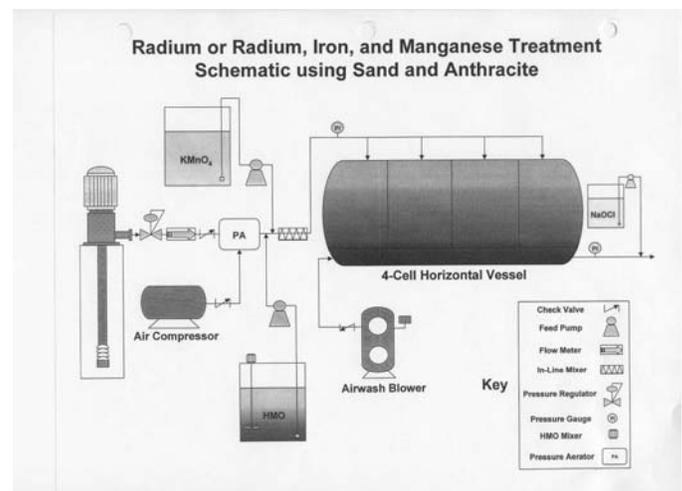
MWH Americas, Inc., developed a system hydraulic model for the City in 2002. This was a very basic model which helps to size extensions and identify hydraulic deficiencies.

One of the initial tasks assigned in the rehabilitation project was to refine the model to be used in design of pumping facilities and the automated control of the system. System characteristics have now been defined adequately to help size pumps and motors. This is critical in providing uniform system pressure and in keeping electric costs to a minimum.

Additional software work will be completed to provide the basic system information to develop the automated control system. The control system must be capable of responding to numerous operating scenarios. The model helps define an operational situation and determine a system response.

In addition, we will be developing software to model flow over a period of time. This will identify where there is "old" water in the system. Water retained in the system for a long period has the potential to develop chlorine by-products. These are now regulated. Large water systems are required to model their system to identify potential problems. Until recently, we understood the requirement would be waived for Rockford because of our distributed well system. We have been informed otherwise. Because of the work already completed for the rehabilitation project, we can meet the October 2006 regulation deadline.

Design work on the 10 water treatment plants is well underway. The units will remove a combination of iron, manganese and radium through aeration, precipitation and filtration.



Building foot prints, site layout and architectural concepts are being prepared for each site. The buildings housing the treatment units will be considerably larger than most of the existing facilities. Therefore, site design is a major consideration.

The IEPA requires that pilot studies be completed prior to design of water treatment facilities. A pilot plant is a small model treatment plant that is tested at the proposed facility to help determine treatment effectiveness and design parameters. In June, the IEPA approved the City's pilot study protocol concept. It proposes pilot studies at only three well sites as indicative of all 10 locations. Pilot testing will begin in August.

Treatment plant equipment will be purchased as pre-packaged units. Having all plants similar will simplify operation and long term maintenance. In response to an RFP, eight companies submitted qualifications to supply the pre-packaged units. The City is currently negotiating a contract with the three top ranked suppliers to complete the pilot study for their equipment and be eligible to bid their units. It is anticipated these contracts will be brought to Council in the next 30 days. Once the pilot studies are complete, design parameters will be established for each vendor. Competitive bids will then be taken to supply the treatment equipment to the construction contractor. As the pre-packaged units are proprietary, they are not the same. A rating system will be needed to determine the best value.



In April of 2005, the IEPA issued a compliance order to the City because of radium in the drinking water. The order was the result of several years of testing that identified 5 wells that exceeded the radium standards. Radium compliance was a catalyst in the development of the system rehabilitation plan. In January of 2006 the City submitted the Radionuclide Compliance Report prepared by Strand Associates. The compliance strategy calls for implementation of treatment by 2009. The City is required to submit quarterly progress reports and to notify all customers of the radium issues every quarter until resolved. Although radium compliance is only part of the water system rehabilitation plan, it adds urgency to the scheduling.



Replacement of the Stanley Street Pumping Station has been an identified need for some time. The facility was constructed in 1929 and is dilapidated. It is critical because it includes a 5 million gallon storage tank and is connected to an existing piping system that distributes water to the central City. Currently, four aging wells, suspect because of V.O.C. contamination, supply water to the site. It is planned to construct a new deep well and abandon the existing ones. Strand Associates is completing the design of the well. In February, the IEPA approved the addition of the new well. McMahon is designing the new pumping facility. It is anticipated construction can begin in 2007



In July, the City Council awarded the bid for Phase I of the well rehabilitation project. Wells are a consumable commodity and degenerate over time. From time to time, rehabilitations are completed to rejuvenate the pumping capability. The process generally includes a base line capacity test, inspection of the hole using televising equipment and then using a variety of methods to address any deficiencies found. Problems can include plugging of the strata, filling of the hole with sand and wear of mechanical equipment. The response to the treatment provides some indication of the future useful life of the well. Well rehabs are generally done as maintenance when the capacity begins to decline. With significant investment planned at a number wells, we want to be comfortable that the expected performance of the well is worth the investment. Additional well rehabilitation work will be bid this fall.

The rehabilitation plan identified over 11 miles of



large trunk line main needed to adequately distribute water. These improvements, located at various locations throughout the City, are critical to provide a more uniform water pressure and implement the plan to utilize fewer wells.

City staff scrambled to have a portion of this work included in the Harrison Street project let by IDOT in July. CMT, Inc., the consultant company that does much of the design for the Airport, has completed the design for a transmission loop around the south side of the Airport. The loop connects two wells and strengthens the distribution system. The construction contract should be bid in the next 60 days.

It is anticipated a task order will be established this fall to complete the design for remaining pipelines. Construction would be completed in 2007.



To address elevation differences in the community, the water system is operated using several pressure zones. These zones were created by closing valves along a defined boundary. This resulted in numerous dead-ends and opportunity for "old" water. The lack of water flow contributes to sedimentation.

To address the problem, the engineering team identified a number of locations where dead-end water pipe can be looped at reasonable costs. At other locations, a plan was devised to install small by-pass lines (bleeder-lines) around closed valves. This allows a small amount of water to run from the high pressure system to the low, keeping fresher water in the pipes.

It was anticipated the work would be done near the end of the project. With the lack of a street program in 2006, the project was moved up and the design and contract management assigned to in-house engineering staff. Modifications of the system are being completed at over 200 locations. The project is being completed in phases. The Council has approved 2 contracts to date and several more are upcoming.



The rehabilitation plan anticipated the removal of 3 dilapidated concrete storage tanks located at Alpine & Newburg, Pierpont & Chestnut and Levings Lake Park. We get regular inquiries about their status. We would like to remove these eye-sores as soon as practical. Since we will be shutting down numerous facilities for construction work, staging is critical. To assure adequate service during construction, all existing facilities need to be available. The most probable schedule is removal of the tanks in the summer of 2008.