

## MEMORANDUM

**TO: RIVANNA WATER & SEWER AUTHORITY  
BOARD OF DIRECTORS**

**FROM: RWSA ENGINEERING STAFF**

**REVIEWED BY: THOMAS L. FREDERICK, EXECUTIVE DIRECTOR**

**SUBJECT: REPORT ON ON-GOING PROJECTS FOR FEBRUARY 2010**

**DATE: MARCH 23, 2009**

The following projects are underway; current project status is in **bold** type. This report includes a section on Capital Projects, large maintenance projects, and the Environmental Management System.

### **Ragged Mountain Dam**

The Ragged Mountain Dam project is to construct a new roller compacted concrete (RCC) dam just downstream of the existing Lower Ragged Mountain Dam. The new structure will provide a normal pool elevation which is 45 feet higher than the current pool elevation, resulting in a useable water storage volume of approximately 2.2 billion gallons. This project serves two primary functions: First, it is a major component of the Community Water Supply Plan, and assures adequate stored water to meet projected demands for the next 50 years as well as significant improvements in water releases to streams in our watershed. In addition, the new structure will allow the decommissioning of the two existing dams which due to safety concerns (inadequate spillway capacity and stability concerns) are currently operating under a “conditional” operating certificate from the Dam Safety Division of the Virginia Department of Conservation and Recreation (DCR), a state agency which operates under the oversight of the Soil and Water Conservation Board (SWCB).

In 2003 a process began which resulted, on January 19, 2007, in approval by SWCB of a 22-month extension of the Class I Conditional Operating Certificates for both the Upper and Lower Ragged Mountain Dams. These certificates were conditional upon submitting study and design documents for the new dam facility no later than November 2008. In an effort to meet the November 2008 DCR deadline and in anticipation of the Community Water Supply Joint Permit issuance, RWSA staff solicited for proposals, performed interviews, and selected a consulting engineering firm to perform design and bid services. At its August 2007 meeting the Board authorized the Executive Director to negotiate and execute a contract with Gannett Fleming Inc. Staff finalized the contract in September 2007.

Design activities completed as part of that contract include: detailed survey of the dam site and surrounding property, bathymetric survey of the existing reservoirs, initial geotechnical investigations (soil and rock borings) and geophysical studies, hydrology and hydraulic analysis and

design of the dam, raw water pipeline relocation, and preliminary design of improvements to I-64. Additionally, conversations have taken place with VDOT on I-64 design requirements and on the use of Reservoir Road for construction access.

Following preliminary analysis of the subsurface findings, and initial discussions with VDOT, significant questions arose concerning depth of foundation, extent of core walls into the abutments, and requirements for drainage under Interstate 64. To resolve these questions, the Board authorized staff in September 2008 to draft a request for proposal (RFP) to establish an Independent Technical Review Team (ITRT) to evaluate these features as well as the overall design of this project. The ITRT would be composed of nationally recognized experts with specialties in one or more of the following fields: RCC dam design, subsurface engineering/grouting, geology, geotechnical engineering, and dam construction. The City Council, the ACSA Board, the Albemarle County Board of Supervisors, and the RWSA Board met on November 25, 2008 to discuss additional review suggested by City Council. At the November 25 meeting, staff was authorized to issue the RFP for the ITRT. An RFP and letter of invitation was sent to prospective members of the ITRT on December 11, 2008. At the February 23 Board of Directors meeting, staff was authorized to execute contracts with Paul Rizzo, Dan Johnson, and Donald Bruce to form the ITRT. The ITRT met for a workshop March 10, 11, and 12. The ITRT completed its report on the initial workshop, which includes a number of cost saving approaches to consider for construction of the dam.

There was further agreement at the November 25 Four Boards meeting regarding water conservation, dredging feasibility, and pipeline studies. A water conservation study was developed by the City and ACSA. RWSA staff has received proposals from several firms to review the conceptual design of the South Fork Rivanna Reservoir to Ragged Mountain Reservoir pipeline and executed a contract with Wiley/Wilson of Lynchburg, VA dated August 27, 2009 to perform the review. A Dredging Feasibility Study consultant selection is discussed elsewhere in this report in the section on South Fork Rivanna Reservoir Maintenance Plan.

DCR Dam Safety and Floodplain Management has indicated that the Soil & Water Conservation Board has issued a 12-month conditional operating permit extension for both the Upper and Lower Ragged Mountain Dams. The conditional operating permit expiration date is November 30, 2009. DCR requested that RWSA notify them of schedule and progress as milestones are reached. In March 2009, RWSA staff notified DCR of the ITRT's suggestion that a more realistic completion date for the new dam could be as late as early 2013. At the time RWSA received no formal response from DCR but a DCR official was quoted in *The Daily Progress* as indicating there could be a process for a further time extension as long as sufficient progress were being made. DCR requested an October 20<sup>th</sup> meeting with staff to discuss the conditional permit and project progress. At that meeting, DCR staff indicated that they were concerned about the schedule to resolve dam operating permit deficiencies. As part of the conditional operating permit extension application DCR requested a letter outlining progress to date and the proposed schedule moving forward. DCR staff also requested that RWSA be present at the November 19, 2009 Soil and Water Conservation Board (SWCB) meeting to answer questions pertaining to the permit and schedule. RWSA made a presentation and responded to questions at the SWCB meeting after which a six-month operating certificate was granted with conditions. Among the conditions was RWSA Board adoption of the latest schedule, which was achieved at the November Board meeting.

At the June 2009 Board meeting, staff presented and the Board adopted a recommendation to continue design of the Ragged Mountain Dam with a new consulting engineering firm. A Request for Proposals was advertised and proposals were received on August 4, 2009. Two proposals were received, from Hazen and Sawyer Engineers, and Schnabel Engineering. A selection panel

consisting of City, ACSA, and RWSA staff interviewed representatives of each of these firms on August 20, 2009, and selected Schnabel Engineers as the most qualified firm to complete the design. At the September, 2009 Board of Directors meeting the Executive Director was authorized to enter into a contract with Schnabel Engineers for preliminary design of the new dam. A design kick-off meeting was held on October 15th to determine initial efforts and responsibilities to re-activate this project.

Initial geophysics field work is complete at the dam site and at a potential aggregate source area. Following consultation among Schnabel, RWSA staff, and the ITRT, a decision was made to retain the alignment for the new dam that had been previously recommended by Gannett Fleming. **Geotechnical and geophysical investigations in potential borrow material areas have revealed that there is not enough sound rock at shallow depths to support economical on-site generation of aggregate for the concrete dam. There is, however, a larger quantity of earth materials than initially expected. This has led to increased interest in whether an earth-fill dam could be constructed of readily available on-site materials, at less cost than the originally envisioned RCC dam. Recent and on-going geotechnical and geophysical explorations are focusing on this question, and a large portion of recent discussions among RWSA staff, Schnabel, and the ITRT involved examination of the major issues related to construction of an earth-fill dam and evaluation of the pros and cons of each approach.**

#### **Interstate 64 Drainage Design for Ragged Mountain Reservoir**

At the November Board of Directors meeting staff was authorized to enter into a contract with Volkert, Inc. to develop concepts and design improvements to the area of Interstate 64 embankment which will be inundated by the new Ragged Mountain reservoir. This portion of design was separated from the scope of work of the new dam design in order to engage a consultant with more focused capabilities in dealing with VDOT and FHWA issues related to the Interstate highway system. Several of the Volkert principals are former senior VDOT personnel, and they enjoy very effective working relationships with current VDOT staff. Volkert has chosen to employ Schnabel Engineering Associates as sub-consultant for geotechnical issues.

On January 27, 2010 RWSA staff, Volkert, and Schnabel met with VDOT representatives from the Central, District, and local offices, as well as several FHWA staff members. An in-depth discussion of the issues to be resolved took place, and a framework for proceeding through the design process was laid out. Volkert has been working to address several of the design questions, and a second meeting with the VDOT review personnel will take place **by April**.

**Analyses of hydraulic and structural issues are near completion, and the next discussion with VDOT and FHWA will cover details of design concept proposals for assuring that all functional, hydraulic, and structural concerns have been adequately addressed in a cost-effective manner.**

Volkert is on track to resolve all conceptual issues with VDOT and FHWA in time to be able to provide a cost estimate of necessary improvements by late Spring.

#### **Comprehensive Sanitary Sewer Interceptor Study**

Proposed development, I&I concerns, and infrastructure age in the Urban Service Area has prompted the need for a comprehensive RWSA sanitary sewer interceptor evaluation. This study is examining current and future wet and dry weather flows and flow capacity in most of the interceptor

system. Additionally, the study will assist RWSA and its wholesale customers in establishing I&I reduction goals and future capital project needs. In January 2006, RWSA entered into a contract with Greeley & Hansen to perform the study. Flow metering at twenty-one (21) locations throughout the interceptor system through May 2006 was completed. The information collected showed very consistent and repeatable dry weather flow data. Unfortunately, the lack of significant rain events during this period impacted the consultant's ability to analyze wet weather flow. Additional flow monitoring was conducted from July through November of 2006, yielding several significant rainfall events.

The consultants compiled the flow metering data throughout the system and have developed and calibrated the existing conditions for the sanitary sewer flow model including the dry weather, 1-year, 2-year, 5-year, and 10-year design storm for wet weather events. Significant effort has been spent on understanding the response of the system to two large, but fundamentally different storm events. In addition, the consultants evaluated the impacts of existing dry and wet weather flow regimes on existing infrastructure, and have compiled data sources to evaluate the projected sewer capacity needs into the future. The consultants have finalized the sewer modeling efforts and have completed the future dry and wet weather flow projections.

Following the completion of a calibrated model of the sewer interceptors by the consultant, RWSA staff has coordinated several meetings with ACSA and City staff with the consultant present to discuss the extent to which the future sewer master plan would rely on goals for inflow and infiltration reduction of the combined regional sewer system with multiple owners, with the balance of wet weather flows to be carried by interceptor pipes, pumping stations, holding basins, and treatment facilities operated by RWSA. The intent of these discussions is an open dialogue toward developing a mutual agreement. Meetings among staff were held on November 19, 2008, December 12, 2008, and March 27, 2009. To facilitate the discussions at these meetings, the consultant advanced a "straw man" recommendation that long-term future wet weather flow projections reflect a 27% decrease compared to model-calibrated wet-weather flow under 2006 conditions. The consultant's recommendation took into account the limited information then available to the consultant on the specific condition of the City and ACSA sewer systems, combined with literature and data from other U. S. communities that have pursued inflow and infiltration planning and/or implementation, to form the consultant's best professional judgment on goals they believed consistent with current regulatory practice and overall cost-effectiveness to the entire combined regional system (City/ACSA/RWSA).

At the March 27, 2009 meeting, the City and ACSA staff requested based on their on-going sanitary sewer evaluations that RWSA evaluate more extensive near-term interceptor capacity projects that do not rely on near-term I/I reduction. This alternate would dictate larger interceptor conveyance and treatment capacity during the initial phases of CIP implementation. The City, ACSA and RWSA staff members met again on June 8 to discuss project status and future direction. At the June 8 meeting the City and ACSA agreed to develop each's own wet weather reduction goals and timelines reflecting the observations and on-going evaluations of the conditions of their respective systems. In late September, the City and ACSA presented information to RWSA on their wet weather reduction goals. Following several stakeholders meetings, it was determined that the best approach was to request that Greeley and Hansen perform additional work on the calibrated model. The Board approved additional funding for the modeling at the November Board Meeting. A work authorization was executed in mid-December with Greeley and Hansen. **RWSA, ACSA and City staff met on February 17, 2010 to discuss the initial model run results and further course of action. Greeley was directed to run another set of model runs and they were distributed to the stakeholders on February 24<sup>th</sup> and the team met again on March 9<sup>th</sup> to discuss the second**

set of model runs. At the March 9 meeting a consensus was reached with the City and ACSA staff on several major elements of a completed sewer master plan: (1) the Moores Creek Pump Station will be upgraded to a wet weather peak capacity of between 28 to 30 million gallons per day (mgd); (2) the existing 21-inch Schenks Branch Interceptor will be in the next CIP to be replaced its entire length with a larger 30-inch pipe to carry additional wet weather flow from the City's system; and (3) the highest priority areas for initiating significant inflow and infiltration reduction would include the Lower Rivanna and Crozet "sewersheds". The decision on the increase in pumping capacity between the Rivanna Interceptor and WWTP was tabled pending additional information from Greeley and Hansen and will be the subject of another meeting in the near future.

### **Rt. 29 Temporary Pump Station Installation**

At the April 2006 meeting, the Board approved a design service contract with Michael Baker, Inc. for the evaluation and preparation of a Preliminary Engineering Report (PER) on improvements to enhance system reliability and provide for future increases in demand for the system served by the North Rivanna Water Treatment Plant (WTP). The initial PER proposed a large diameter pipeline to allow efficient conveyance of water from the primary Urban water system into the North Rivanna system, with a pump station to boost pressures. Following the PER, a corridor study was performed to identify a preferred specific location for the pipeline. During the corridor study several factors were recognized that led to a decision to delay corridor selection: (1) there is a lack of a publicly dedicated corridor within the jurisdictional area between the Wal-Mart area and the Airport except U S Highway 29; (2) VDOT will not permit a new pipe within the U S Highway 29 right-of-way; (3) privately-owned land in the immediate area could be subject to extensive re-grading depending on future zoning and development decisions; and (4) Albemarle County was considering options to extend the right-of-way of Berkmar Drive, which could become an excellent pipeline alternative. To serve as a back-up until the corridor is selected, providing system redundancy for reliable water service in the North Rivanna system, and to honor a contractual commitment to VDOT to remove the existing 12" waterline beneath north-bound lanes of Route 29, a modification to Baker's scope was authorized at the November Board of Director's meeting. This modification to the design scope calls for design of the pipeline abandonment to meet VDOT requirements, and design of fixtures for quickly connecting a trailer-mounted pump to supply water from the Urban pressure band into the North Rivanna system.

**The preliminary design has been reviewed by RWSA staff. Staff will meet with VDOT to discuss the pipeline abandonment plans, and following receipt of VDOT comments Baker will prepare design documents to incorporate all review comments. The "90% design" is expected to be complete within 15 days following Baker's receipt of VDOT comments.**

### **Canterbury/Stillhouse Pump Station Replacement**

This project is to replace the existing ACSA Canterbury pump station which is located adjacent to Barracks Road and serves the Stillhouse Mountain Tank service area. Areas served include Hessian Hills, Montvue, West Leigh, Meriwether Hills, Colthurst, Albemarle High School, Flordon, and portions of Rio Road, Hydraulic Road, and Woodburn Road. The existing pump station has pumps, electrical components, and control systems which need to be replaced. The site is severely constrained such that rehabilitation or replacement in the existing location is not feasible. Preliminary engineering has reviewed several alternative locations for the proposed pump station and identified an initial preferred site. Discussions with the owner indicated an

objection to the pump station to be built in the desired site. While not dismissing this site, RWSA and ACSA staffs agreed to explore alternative locations which may merit further investigation. One alternative site along Woodburn Road was identified for review and Michael Baker engineers have performed the feasibility study for that site. That study has been reviewed, and the Virginia Department of Health has provided written confirmation that they will accept this modification of the water delivery system. At the October 2009 meeting the Board authorized the Executive Director to enter into a contract with Michael Baker Engineers to begin design of the project. **The Basis of Design Memorandum has been reviewed by RWSA and ACSA staffs and comments have been discussed with Baker. Baker is proceeding to prepare the Preliminary Design.**

### **Moore's Creek WWTP ENR Upgrade**

RWSA is required by the Virginia Department of Environmental Quality (DEQ) to upgrade the Moore's Creek WWTP to meet new stringent nutrient removal regulations. This project's Preliminary Engineering Report (PER) was finalized and submitted to DEQ in February 2007. Water Quality Improvement Fund (WQIF) grant contract negotiations were finalized with DEQ's Chesapeake Bay office staff and the RWSA's Executive Director received approval from the RWSA Board at the May Board meeting to enter into a formal WQIF Grant Agreement with DEQ. After a public comment period, DEQ signed the Grant Agreement on June 27, 2007. The RWSA WQIF grant is currently approved for \$15,612,413 (of the \$33,486,968 originally estimated cost). DEQ's Office of Wastewater Engineering approved our May 24, 2007 PER re-submittal on September 25, 2007.

In May of 2007 the Board authorized the hiring of Hazen & Sawyer Engineers to begin work on the first group of services including: Regulatory Assistance, Odor Control Evaluation, and Preliminary Design. At the November 2007 Board meeting, the project team presented information on two key alternatives to provide disinfection at the MCWWTP post ENR implementation. As recommended, the Board authorized staff to move forward in the design process to include the use of UV disinfection as opposed to the repurposing of existing tertiary settling basins. The Board also approved two additional task authorizations to the Hazen and Sawyer contract Engineering Final Design and Bid Phase services.

In January 2008 RWSA reviewed Hazen & Sawyer's thirty-percent design review. An update to the Board related to expected impacts on the project budget was completed at the February meeting by Hazen and Sawyer. The 75% design documents were presented to RWSA at a June 2008 design review meeting. Based on confirmation of the suspected 20% increase in design nitrogen loads, Hazen and Sawyer developed Technical Memorandum No. 11 to address RWSA's technical options and project budget impacts.

At the June 23, 2008 RWSA Board meeting, the Executive Director presented the recommended options to address the increased nitrogen load. The Board approved adding two additional tertiary filters to the ENR project bid documents along with bid procedures that allow a deduct price if RWSA and DEQ choose after bidding not to construct the additional two filters. This deduct for the filters is tied to the DEQ amending RWSA's WQIF grant agreement to an annual total nitrogen performance equivalent of 6.0 mg/l in the event DEQ chooses after the bid openings not to provide additional grant funding at 60% of the total cost for the two additional filters.

On November 20<sup>th</sup> RWSA hosted a successful “Contractor’s Breakfast” as a means to introduce the project to potential construction contractors. Staff held a community meeting on February 3<sup>rd</sup> to provide the project’s status and potential challenges to our surrounding neighbors. This meeting was well received and the community provided many accolades to the RWSA staff for their efforts on this project. On March 13, 2009, RWSA received written authorization to construct the project from DEQ’s Office of Wastewater Engineering. This project was advertised for bid on February 19, 2009, and a Pre-Bid Conference was held on March 10<sup>th</sup> at RWSA with 13 General Contractors and many subcontractors in attendance. Bids were opened on March 31, 2009 and the apparent low bidder at \$40,319,000 was Adams Robinson Enterprises, Inc. of Dayton, Ohio. The Engineer’s estimate of probable cost on this project was \$49,466,000. The Engineer requested a WQIF grant modification from DEQ to adjust the grant amount from \$15,612,848 to \$21,788,621 based upon bid prices. The Virginia Department of Environmental Quality approved a grant adjustment to \$21.5 million and a groundbreaking was held on May 27 with Governor Timothy Kaine as the guest speaker. Notice to Proceed with construction was issued to Adams Robinson Enterprises effective June 1, 2009. Substantial completion is anticipated on November 11, 2012 with Final Completion on January 11, 2013.

**Present work includes the near complete exterior wall concrete form work and concrete placement of aeration basin number five and the ongoing work of the aeration tanks’ effluent channel. The contractor has made significant efforts on the basin’s interior walls and appurtenances. The work to build these tanks has included significant pipe gallery and air piping modifications in the basement of the blower building. Significant electrical switch gear work has started at the blower building. Work is also proceeding in the chemical storage and feed facilities with two of the six tanks in place and base slabs for these facilities in place. Masonary construction on this facility has started. The new septage receiving facility is generally in place with work continuing to meet the required start-up milestone of May 2010. At this time, start-up activities are slated to begin in late March, with full operation anticipated in April 2010. The contractor is slightly ahead of schedule on this milestone. As the septage and odor control facility becomes operational, the maintenance and operations staff will receive on-site training.**

**On the north side of the plant, extensive concrete and pipe work continues at the new tertiary filters. “Wye walls” are under construction and backfilling of the exterior walls is underway. The new solids handling centrifuge and chemical feed tanks have been placed in the solids building with full installation anticipated in the coming months. As of February 28, 2010, the project construction is approximately 35.5% complete with 21.3% of the substantial completion time expired. As such, the contractor is ahead of schedule.**

### **Meadowcreek Sanitary Sewer Interceptor Upgrade**

The Meadowcreek Interceptor was placed into service in the mid-1950s and currently serves the northern and eastern portions of City of Charlottesville, bordering County neighborhoods, and the University of Virginia Sports and Arts Precincts. Over the last several years there have been numerous repairs to this line caused by structural degradation and/or stream encroachment. RWSA’s first five-year capital improvement plan presented in January 2005 included the proposed engineering analysis of this Interceptor and its downstream impacts; a study that was expanded a few months later to represent a system wide Comprehensive Sanitary Sewer Interceptor Study (“Study”). The Study included flow measurement at selected points of the Meadowcreek Interceptor and other RWSA sewer interceptors leading to an analysis comparing actual flow with pipeline capacities. Flow monitoring was undertaken from January through

November of 2006. Results have indicated that there is little, if any, extra capacity available during peak service conditions within some sections of this Interceptor. At the January 2007 meeting, the Board adopted the staff recommendation to advance the work on a project to upgrade the sanitary sewer capacity in this drainage area, through a contract amendment with Greeley & Hansen consulting engineers.

In June 2007 the findings of the Meadowcreek Interceptor Routing Study and Evaluation were presented to the Board. At that meeting the Board endorsed moving forward with a contract to conduct design and permitting of a new, larger pipeline to be built along/within the alignment of the existing pipe. Discussions with City Parks and Recreation staff, City Public Works staff, The Nature Conservancy (regarding a stream restoration project for Meadow Creek approved in November 2007) and numerous property owners along the proposed alignment have yielded substantial guidance on alignment, construction access, and construction methodology and coordination issues. Property owners along the entire existing alignment have been notified that surveyors, wetland specialists, cultural resources specialist as well as other project staff will be working within and near the existing easement as we continue to proceed with this project. In late September 2007 staff reviewed preliminary technical memoranda from the consultants on alignment, recommended pipe material and several other key issues. As of October 2007, the preliminary alignment was established with the exception of a few very difficult locations where meetings with property owners, local and state officials were held.

Wetland delineation was completed in December 2007 and the Joint Permit Application was submitted to the Army Corps of Engineers in early January 2008. Soil borings for the design of the project were completed in December 2007. A 30% design submittal was delivered to RWSA in mid-January 2008. Schnabel Engineering completed the soil borings survey and submitted a Geotechnical Engineering Study to RWSA on February 1<sup>st</sup>. A workshop was held on March 31, 2009 with the City and ACSA and the pipe sizing for the Meadow Creek Interceptor was finalized. The final PER was submitted to DEQ on May 19, 2008. A meeting was held with DEQ on June 10<sup>th</sup> to discuss the PER. In June, RWSA received approval from the Army Corps of Engineers for Nationwide permits for construction and the VMRC permit. RWSA staff and the City held an Open House on September 24<sup>th</sup> to provide information on the RWSA Meadow Creek Interceptor Upgrade project and the City Meadow Creek Stream Restoration project.

Numerous follow-up meetings were conducted throughout the fall with neighborhood and stakeholder groups. In December 2008 and January 2009, RWSA developed and published landscaping plans that were prepared by landscape architects at Williamsburg Environmental Group. RWSA has received very positive feedback on the landscaping plans to provide a re-vegetation plan for the different land use areas in the sewer interceptor easement corridor, in coordination with the City's stream restoration project and including park property. City Parks staff were instrumental in assisting with the landscaping plan development.

The Interceptor project advertised for bid on September 8. A pre-bid meeting was held on October 6 with a great turnout. The bid opening date was originally set for October 20 but was ultimately rescheduled via several addenda. The bid opening occurred on November 10<sup>th</sup>. There were 9 bids received for Contract A ranging from \$5,650,900 to \$10,058,050 (including the Schenks Branch Interceptor work and not including any alternate bid items). Furthermore, there were 9 bids received for Contract B ranging from \$5,187,000 to \$10,950,000 (not including any alternate bid items). Considering that the Engineer's estimates for Contract A and Contract B were \$10,607,875 and \$10,427,850 respectively, RWSA is very pleased that the bid prices are reflective of the current competitive bidding market. At the December 2009 Board Meeting, the

Board approved award of the Meadow Creek Interceptor Contracts A and B to Metra Industries of Little Falls, NJ. In addition, the Board authorized a construction administration and inspection services agreement with Greeley and Hansen in conjunction with the construction work.

The easements and plats for the five City properties were reviewed and approved at the December 7 City Council meeting. **All easement negotiations have concluded. RWSA received signed easements for the City properties on March 11. RWSA executed the certificate of take for the 1 remaining easement for which we could not achieve a voluntary conveyance as discussed at the December 2009 Board Meeting.**

**RWSA is currently executing the contract documents with the Contractor, Metra Industries. It is anticipated that the Notice to Proceed with construction and the pre-construction conference will occur by the end of March.**

Williamsburg Environmental Group has incorporated comments from property owners, HOAs, and the City Parks Department into the final landscape plans which are now in final review. **Staff is coordinating with Williamsburg Environmental Group regarding the finalization of the remaining bidding documents. The landscaping contract, which will restore landscaping to easement areas as the sewer pipe is replaced, will be advertised for bid in April.**

### **Sanitary Sewer Interceptor Rehabilitation**

Results from the sewer flow monitoring and modeling under the Comprehensive Sanitary Sewer Study provided awareness to specific I&I concerns in the collection system and resulted in strengthened commitments from the City, ACSA and RWSA to continue I&I abatement programs collaboratively. Since November 2007, RWSA has been working with Tri-State Utilities, a utility rehabilitation contractor, to assess the condition of and rehabilitate several sanitary sewer interceptors. In December 2007, Tri-State inspected a portion of the Powell Creek Interceptor and subsequently a majority of the line that had been inspected was rehabilitated with a cured in place liner. In February 2008, Tri-State cleaned and inspected the entire Schenk's Branch Interceptor using CCTV. In April 2008, Tri-State rehabilitated five manholes along the Powell Creek Interceptor using a cementitious liner. An emergency sewer repair was completed in June 2008 for a portion of the Moores Creek Relief Interceptor in the Quarry Park area. Approximately 300' of 30" diameter sewer was repaired using a cured in place liner to prevent the possible failure of the pipe walls. Smoke testing of selected sections of the Albemarle-Berkley Interceptor and the Rivanna Interceptor was completed in August 2008 and smoke testing of sections of the Crozet Interceptor was completed in October 2008.

In October 2008 proposals were received for professional engineering services to aid in the rehabilitation and repair of the sewer collection system. Two short listed firms were interviewed and staff selected Frazier Engineering, P.A. based on the proposals, interviews, and qualifications. Work Authorization No. 1 with Frazier included locating points of inflow in the Rivanna Interceptor, the assessment of the Schenks Branch Interceptor and aiding in the development of a cleaning, CCTV and lining contract with Tri-State Utilities. Work Authorization No. 2 included inspection of manholes along the Rivanna Interceptor and the Albemarle-Berkley Interceptor and the development of a sewer point repair contract. At the April 2009 Board meeting, staff presented a six-month work plan for the Sewer Interceptor Rehabilitation program for the Schenk's Branch, Albemarle-Berkley, and Crozet Interceptors.

In November 2009, staff identified a portion of the Meadow Creek Interceptor that was located within a severely eroded stream channel and had several deflected joints. An emergency repair was completed, in which 45' of clay pipe was replaced with ductile iron pipe and then approximately 450' of 21" cured-in-place liner was installed to seal all of the joints and add structural integrity to the sewerline. The eroded stream bank was repaired and armored with rip rap to protect against future erosion over the pipe. The cost of this emergency repair was estimated at \$116,000.

**Reports for the lower Rivanna Interceptor flow metering, the lower Rivanna Interceptor manhole inspections, the Schenk's Branch Interceptor condition assessment, the Albemarle-Berkley Interceptor manhole inspections and the Crozet Interceptor Manhole inspections have been finalized. Staff is evaluating different procurement options for a term contract for sewer point repairs and sewer CCTV and CIPP lining in order to begin repairing the defects that have been identified in the reports.**

**Staff continues to work with ACSA and City staff to eliminate two sources of inflow that were identified along the lower Rivanna Interceptor. Temporary flow meters have been installed along the Rivanna Interceptor and Crozet Interceptor to identify which sections of the interceptors are most susceptible to I&I and have been installed on the Meadow Creek, Moores Creek and Schenk's Branch Interceptors to provide preconstruction flow information.**

### **Moores Creek and Rivanna Sanitary Sewer Pump Station Improvements**

The Urban Sewer Service Area (including Charlottesville and a portion of Albemarle County) is split into two regions. The region located to the west includes: Crozet, Boars Head, Fontaine Research Park, 5<sup>th</sup> Street, Biscuit Run, Jefferson Park Avenue, Scott Stadium, Cherry Avenue and Valley Road, portions of the UVa Hospital, the Belmont Neighborhood and portions of the Downtown area, which drain to the 30" Moores Creek Interceptor and 36" Moores Creek Relief Interceptor, and eventually to the Moores Creek Pump Station. The region located to the north and east includes: Route 29 North from Ivy Road to near the North Fork of the Rivanna River, the sports and arts precincts of the University of Virginia, areas surrounding Preston Avenue, the areas along and between Rio and McIntire Roads, North Downtown, Pantops, and Woolen Mills, which drains to the 54" and 60" Rivanna Interceptor, and eventually the Rivanna Pump Station.

In 2006 and 2007, a system wide flow monitoring program was completed for RWSA as part of the on-going Comprehensive Sanitary Sewer Study. The flow monitoring indicated that several interceptors experienced significant amounts of inflow and infiltration during wet weather events. While the Comprehensive Sanitary Sewer Interceptor Study is not complete, much of the flow predictions and system modeling efforts are well understood. The Authority is presently working with both the City and Albemarle County Service Authority (ACSA) on development of an inflow and infiltration reduction program. To the extent that wet weather flow will not be eliminated by this reduction program, RWSA will need to include such flow in the upgrade of the Rivanna and Moores Creek Pump Stations. The completion of the pump station upgrades will be coordinated with the completion of the Moores Creek Advanced Wastewater Treatment (AWT) Plant ENR upgrades and the improved treatment process incorporated into the nutrient upgrade design that will permit the facility to treat greater volumes of wet weather flow.

Within this report are references to pump station capacities. It needs to be addressed upfront that pump stations are and must be designed to carry peak flows during wet weather events. It is very

common within the industry that pump stations are designed to carry 3 or more times the average treatment capacity of a wastewater system during short, peak periods.

The Moores Creek Pump Station is physically located within the front gate of the Moores Creek AWT Plant (geographically in Albemarle County). The pump station was built in 1981 as part of the Phase I construction of the Moores Creek AWT Plant. The firm wet weather pumping capacity (defined as the capacity with the largest pump out of service) of the station is currently approximately 14.9 mgd. The pump station discharges into a 900-foot long, 24-inch force main, which carries the flow to the headworks of the plant on the opposite side of Moores Creek. As part of the AWT's Enhanced Nutrient Removal (ENR) upgrade, currently under construction, the open portions of the pump station influent structure will be covered, with a vacuum line transporting foul air to an odor control facility on the south side of the plant. The pump station is supplied back-up power through a 640 kilowatt (kw) diesel generator in the adjacent building.

The Rivanna Pump Station is located at the corner of Chesapeake Street and Riverside Avenue within the City of Charlottesville, adjacent to the entrance of Riverside Park. The pump station was built between 1979 and 1981. The pump station discharges into a 2,600-foot long, 36-inch force main, which crosses the railroad and carries the flow to the headworks of the Moores Creek plant. The pump station is supplied back-up power through a 350 kw diesel generator at a separate site, on Marchant Street, located between the pump station and the Moores Creek WWTP. Currently the electrical service to the station only allows three pumps to operate at any one time. The firm pumping capacity of the Rivanna Pump Station is 24.5 mgd.

The future firm wet weather pumping capacity of the two influent pump stations are being established in consultation with the City and ACSA, coordinated with the agreed inflow and infiltration reduction program being developed. **On March 9, 2010 it was agreed to design the Moores Creek Pump Station Upgrade for between 28 and 30 million gallons per day wet weather flow.** As the design points are set the consultant will prepare preliminary engineering evaluations to meet the decided future capacity needs. Once an alternative is selected, a consultant will then design the desired upgrades to include provisions for appropriate sized pumps, electrical gear, influent screening, back-up power generation, SCADA control and integration, force main capacity expansion, site and permitting work, as well as architectural, structural and mechanical systems. The work will include permitting and permitting assistance as well as public outreach assistance. The work may also include preparation of bid documents, bidding assistance, construction administration, and inspection services.

Due to differing objectives, the pumping capacity upgrades for the Moores Creek and Rivanna projects will proceed as separately designed, permitted, bid and constructed facilities. As agreement is reached with the City and ACSA on the inflow and infiltration reduction targets under the Comprehensive Sanitary Sewer Study, the Moores Creek Pump Station upgrade on the RWSA site will proceed as quickly as possible in order to carry capacity currently being designed by the City in its new Stadium Road Collector pipeline. The schedule for the upgrade in pumping capacity between the Rivanna Interceptor and WWTP will allow for adequate consideration of neighborhood concerns. The President of the Woolen Mills Neighborhood Association was contacted in February for suggestions regarding the approach for upcoming public outreach, to allow effective communication to continue throughout the design.

Proposals for the Moores Creek & Rivanna Sanitary Sewer Pump Station Improvements Project (RFP 09-06) were advertised on November 6, 2009 and were due on November 24, 2009 and 6 proposals were received. Representatives from RWSA, ACSA and the City reviewed the

proposals and met on December 7<sup>th</sup> to “shortlist” the Consultants for interviews. At that time, a consensus was reached that Hazen and Sawyer’s proposal was the most qualified and responsive to the RFP, that interviews were not warranted at that time, and that RWSA would proceed to begin negotiating a scope and fee with Hazen and Sawyer. As such, and in consideration of the time sensitive nature of the pump station upgrade projects, RWSA recommended that the Board authorize Hazen and Sawyer to begin on the preliminary investigation and public outreach work which will lay the foundation for the final design of these projects at the January 2010 Board meeting and it was approved. **RWSA executed the task authorizations with Hazen and a kick-off meeting was held on February 17.**

**As stated on page 5 of this report, a consensus was reached with ACSA and City staffs on March 9, 2010 to design the Moores Creek Pump Station Upgrade for between 28 to 30 million gallons per day for wet weather, and that criterion has now been established for the design in progress. It is anticipated that a similar decision will soon be reached on the Rivanna side of the sewer system, and in the meantime the consultant is developing conceptual approaches for different alternatives for increasing the capacity of pumping between the Rivanna Interceptor and the WWTP.**

**Once the design flow criteria are determined and the preliminary alternatives are examined, additional work authorizations will be brought to the Board for consideration of the final design of the projects.**

### **Community Water Supply Mitigation Plan**

RWSA solicited a Request for Proposal for the design of the Community Water Supply Plan stream and wetland mitigation efforts in June of 2007, with RFP’s being received in July. At its October 2007 meeting, the Board authorized the Executive Director to execute a contract with VHB. VHB was given Notice to Proceed on both the stream and wetlands efforts in April and May of 2008. Additionally, staff has been working extensively with lease holders on the RWSA owned Buck Mountain Creek property to identify final mitigation concepts and configuration for each impacted parcel. Fencing of a portion of buffer areas along two lease areas and the installation of alternative watering systems have recently been completed under a Virginia Soil and Water Conservation District grant program. 75% cost share payments from Thomas Jefferson Soil and Water Conservation District have been paid to the two leaseholders, and RWSA has processed payment of the remaining 25% to the two leaseholders. VHB surveyors staked these areas in advance of installing the fence. Additional coordination with lease holders is ongoing to identify and address how the mitigation plan will affect land use and future leases. VHB submitted design plans to DEQ and the Corps for the Buck Mountain Stream Restoration and Buffer Enhancement projects on March 3, 2009. Work towards completion of the final mitigation plan is continuing based on DEQ comments received in March 2009. For the Franklin Street/Moores Creek wetland mitigation site, test pits will be pursued to ensure that the all utility conflicts have been identified for a proposed storm sewer pipeline, slight revisions in proposed site grading will be accommodated to preserve a number of existing trees in the planned wetland creation area, and deed restriction language is being reviewed by legal counsel. For the Buck Mountain stream restoration and buffer restoration/enhancement site, draft deed restriction language has been submitted to regulatory agencies for review, compensation credit for final proposed stream restoration and stream buffer planting is being calculated, and the details of the monitoring plan components are being finalized. **Completion of design is anticipated in 2010. Staff is presently working toward a goal of initiating construction of the mitigation sites in 2011.**

## **South Fork Rivanna Reservoir Dredging Feasibility Study**

On June 30, 2008 the chairman of the four political boards (ACSA, City Council, Board of Supervisors and RWSA) met on the issue of South Fork Rivanna Reservoir long-term maintenance. At that meeting an eleven (11) member task force was created and RWSA was asked to postpone the issuance of an RFQ until the task force provided further information to the four boards. Before the Task force convened it was expanded to thirteen (13) members. The first meeting of this Task Force was on August 12<sup>th</sup>, with the following topics presented: Objective of the Task Force, summary of reservoir status for fishing and other recreational interest, water quality, historical bathymetric surveys, and County land use strategies to reduce sedimentation. A question roundtable for the Task Force members was also conducted.

On September 8th, the second meeting was held with open discussion between the Task Force members on the reservoir field trip that had been conducted and their impressions. Additional discussion took place on the kinds of desired public input that the Task Force members would like to see. The Chairwomen opened the discussion on public input to the public sitting in the audience who provided numerous recommendations for the Task Force members to consider. Ms. Lee Catlin, the County Public Information Officer discussed FOIA related information with the Task Force members and answered any FOIA related questions from the members. Finally, ideas for the Task Force web page with public access for questions was discussed.

The Task Force held meetings on September 29<sup>th</sup> and October 13<sup>th</sup> to hear presentations on potential physical changes to the South Fork Rivanna Reservoir in the absence of maintenance dredging, and to design a public input process for the month of October. On October 9<sup>th</sup> the Task Force released an online and paper questionnaire to gather public information on the community's expectations for the reservoir. The Task Force has received approximately 300 responses to this questionnaire. In addition, 18 citizens offered comments at a public forum held by the Task Force on October 27, 2008. Members of the Task Force participated in a tour hosted by RWSA of the South Rivanna Water Treatment Plant on November 19<sup>th</sup> to better understand the complexities of the water treatment process. The Task Force held meetings on November 13<sup>th</sup>, and November 19<sup>th</sup> to hear informational presentations on dredging and maintenance needs of the Reservoir. Task Force meetings on December 8<sup>th</sup> and December 18<sup>th</sup> were focused on discussing and drafting the final report to the four Boards. The Task Force continued to work through December and into January to produce a report that captures the perspectives of all Task Force members. The final meeting of the Task Force was held on January 26, 2009 and the Task Force approved the final report by a majority vote. RWSA and Albemarle County staff compiled and produced 90 copies of the final report, and the report was released February 11, 2009.

A meeting of the four political boards was held on March 3, 2009 to review and discuss the final report. A bulletized summary of the Task Force recommendations was presented, and all four boards approved the first five of those recommendations, with the first bullet item being amended to add that RWSA seek additional legal advice with respect to the potential legal implications of modifications to the existing permitted water supply plan. In addition, the City Council asked to review a draft RFP written by RWSA for a dredging feasibility study of the entire reservoir, and RWSA's RFP was edited in response to City Council comments.

After some discussion regarding funding between the City Council and ACSA, an RFP for procurement of an engineering firm to carry out the dredging feasibility study was approved by the RWSA Board on May 18 and the RFP was advertised on May 22, 2009 with a proposal deadline of June 17, 2009. Eight proposals were received. A 9-member selection committee, comprised of

representatives from the City of Charlottesville, the Albemarle County Service Authority, the Rivanna Water and Sewer Authority, Albemarle County, and two private citizens, met to discuss the proposals and select a short list of candidate firms to interview. The short list includes two firms; HDR Engineering, Inc., and F.X. Browne, Inc., Following interviews with the selection committee on August 3, 2009 the selection committee chose HDR Engineering to be the top-ranked proposer. RWSA has reviewed HDR's initial scope and fee proposal and negotiations have resulted in options for various levels of study and fee.

At the October Board meeting approval was granted for RWSA to enter into a contract with HDR in the amount of \$343,777. The scope of work includes three phases of work as follow: PHASE I Reservoir Characterization - 1) Wetlands Assessment; 2) Bathymetric Survey & Volume Analysis; 3) Pre-Dredge Survey; 4) Sediment Characterization; and 5) Reservoir Characterization Public Meeting. PHASE II Dredging Alternatives Analysis – 6) Dredging Alternatives Evaluation; 7) Dewatering/Processing Alternatives Evaluation; and 8) Dredging Analysis Public Meeting. PHASE III Dredging Feasibility Summary Report – 9) Summary Report. HDR will be conducting field operations on the reservoir during the months of November and December, with a final report due within 210 days.

Field work for the wetlands assessment, bathymetric survey, pre-dredge survey, and sediment sampling were conducted in December. HDR's reports summarizing their findings on these tasks **have been** placed on the Dredging Feasibility Study web page, **and a public presentation of results of Phase I of the study and discussion of Phase II was held on March 9, 2010.**

An authorization to add a Beneficial Use of Sediment Analysis to the Feasibility Study **was approved to be added to HDR scope of work at the February Board of Directors meeting**, as funding of this study was approved by City Council in January. **Work is proceeding of Phase II of this study, including the added study of possible beneficial uses of sediments.**

### **Environmental Management System**

Sustainability continues as top priority for the Water and Sewer Authority in maintaining our environmental programs.

**No change in status.**