

Expert Panel Water Supply Plan Review for RWSA – Scope of Work Outline

Approved by the Charlottesville City Council, November 3, 2008

Objective: To provide an expert review of the major elements of the local Community Water Supply Plan, within the context of approved permits by the Army Corps of Engineers and Virginia Department of Environmental Quality, and also within the local objectives of providing the 50-year water supply needs from within the locally-controlled watershed area with enhancement of the in-stream flow restored to the Moormans River. Further, with respect to all reviews, energy efficiency and options for renewable energy will be considered where practicable and consistent with the context of the approved permits.

1. Appoint Board of Consultants: A minimum of three senior executive level professional engineers who are nationally recognized experts in the field of water resources, having a significant number of years of experience within a wide range of projects of varying complexity.
 - a. Assist RWSA in development of scope of work and hiring criteria for individual technical studies as outlined below.
 - b. Meet with regulatory agencies to understand the context of approved permits and the feasibility and consequences of modifications.
 - c. Provide quality control review of all individual technical studies, except that the Ragged Mountain Dam Design Review team of experts may be organized independent of the Board of Consultants at the option of RWSA.
 - d. Prepare final recommendations to RWSA in a written report.
2. Individual technical studies:
 - a. Water Conservation – RWSA to retain a firm to define how water is being used by customers of City and ACSA, review conservation programs and incentives, and review rate structure, to include more aggressive conservation/efficiency measures. Firm to develop and evaluate multiple alternatives for structural measures that can firmly assure additional water conservation and achieve a significant water use reduction per capita. Alternatives will be summarized in technical memorandum for review by the Board of Consultants, and then presented to public in a community meeting with public input.
 - b. Future 50-Yr Water Demand Calculations – Board of Consultants to review demand projections for Community Water Supply Plan and make judgment on reasonableness of approach. RWSA will supply historical demand data updated to 2008. Methodology will be long-term trending and other parameters defined by regulatory agencies, and AWWA standard practices. Review will also consider decisions from a Water Conservation study. Demand needs of County and City will be determined independently and then combined.
 - c. Dredging Feasibility Study – If the South Fork Rivanna Reservoir Stewardship Task Force recommends dredging as a means of maintaining the reservoir, RWSA will retain an engineering firm with specialization

and proven experience in dredging operations to evaluate dredging of the South Fork Reservoir. The objective and scope of desired dredging will be based upon the local agencies' approval of recommendations from the task force. This may include reviewing background data, updating a bathymetric survey, updating sediment sampling and evaluation of basic characteristics, identifying wetland and other areas that would be restricted by regulatory agencies, calculating probable volume of sediment that would be removed, identifying goals of neighboring property owners, recommending acceptable dredging method(s), identifying and evaluating disposal sites (including Airport site and quarry site), interviewing local firms in construction dirt hauling and quarrying businesses to include DDR and Blue Ridge Sand. Determine feasibility of development of "in-reservoir" forebay area to more efficiently capture future sediment after initial operation. Develop estimated project cost for initial dredging operation that includes RWSA administration and quality control, and order-of-magnitude cost estimates in current dollars for future dredging to remove additional sediment that settles in the reservoir after the initial dredging operation.

- d. Ragged Mountain Dam Design Review – RWSA will retain a team of dam experts from multiple firms to review geotechnical data, preliminary design, and foundation design for proposed new dam and I-64 embankment. This review to follow draft RFP scope dated October 27, 2008. Significant focus will be on improving the value (lowest possible costs) of the project through foundation design, and will also consider revisions to dam orientation, existing Lower Dam location, and alternative core wall design. A report will be prepared listing technical decisions and providing an updated project cost estimate for a new Ragged Mountain Dam with sufficient storage to meet 50-Year demand. In addition, the team will determine the extent to which the height of this proposed dam could be lowered to reduce total storage volume by an amount equivalent to the volume restored in South Fork by an initial dredging operation, and will estimate how much of the cost of the dam is saved by the lower height (this will permit a comparison of benefits to cost when the savings are compared to the cost estimate for the initial dredging operation). The team, for comparison purposes, will also develop an updated cost estimate in current dollars to simply make required dam safety improvements to the existing Ragged Mountain Dams with no supply increase.
- e. Pipeline to Ragged Mountain – RWSA will retain a firm to review the conceptual design for a pipeline from the South Fork Reservoir to fill the Ragged Mountain Reservoir, and will develop a separate alternative to replace the Sugar Hollow Pipeline. This will include a review of Gannett Fleming's determination of pipe size and required water storage to meet the 18.7 mgd safe yield in an attempt to identify if the storage in the proposed expanded Ragged Mountain Reservoir can be reduced. This will also include field reconnaissance of both alternative pipeline routes. A project cost estimate will be prepared for each alternative, based upon an

equivalent water rate transfer capacity at each location, and include recommended pipe sizes and necessary modifications at each location to provide an intake capable of providing the transfer capacity. The study also includes a review of water plant data for each source (South Fork Rivanna and Sugar Hollow) and consideration of economical measures for addressing the sediment in the water transferred to Ragged Mountain.

Council in adopting this Scope of Work on November 3, 2008 requested that construction work on the dam will not proceed until the other studies are complete.