

August 17, 2005

MEMORANDUM

TO: Laurence S. Zimmermann

COPIES TO: William W. Allis

FROM: Lori L. Kappen

SUBJECT: Rivanna: Opinion of Probable Cost for 20 MGD Actiflo Pretreatment Plant

An opinion of probable cost was developed for the pretreatment plant based on the water quality and chemical feed data received. The data indicate that the primary treatment goal is turbidity removal. Nutrient data for the South Fork Rivanna and Ragged Mountain Reservoirs indicate that nutrient levels at both reservoirs are low, although there are occasional small peaks at the South Fork Rivanna Reservoir. It is not anticipated that the nutrient levels are high enough at the South Fork Rivanna Reservoir to require removal; however, any phosphates would likely be removed during treatment for turbidity removal.

The treatment process used for developing the opinion of probable cost, Actiflo, is a robust clarification process that can produce high quality effluent under a variety of water quality conditions. Other treatment processes may also be appropriate, and could have lower capital and/or operating costs.

Disinfection is not included as part of the treatment process. This may result in buildup of biomass in the transmission pipeline, so provisions for routine cleaning of the pipeline should be included in any transmission system design.

The opinion of probable cost for the plant is \$11,100,000. The detailed estimate is located at N:/411/43387 Rivanna/ 20 MGD Pretreatment Plant Cost.xls. The estimate includes the following components:

- Two 10 MGD Actiflo pretreatment trains. The manufacturer indicated that one train could treat up to 15 MGD adequately for short periods, should one unit be out of service.
- Chemical storage and feed facilities for sodium permanganate, aluminum sulfate, polymer, and caustic soda.
- A 250,000 gallon tank for equalization of the raw water and high service pumping rates.
- A 62 foot diameter sludge thickener and sludge pumping station.
- A small office/lab.
- Mechanical and electrical rooms.
- A small storage area, a janitorial closet, and a unisex lavatory.
- Limited site work, including a chemical unloading area and chemical containment, fencing around the WTP area, pavement within the fenced area, excavation, and grading. A flat site was assumed.

Jennifer Whitaker

From: Keno, Aaron D. [akeno@GFNET.com]
Sent: Tuesday, January 31, 2006 2:45 PM
To: Jennifer Avery Whitaker
Cc: Pursel, Thomas B.
Subject: Pipeline Easement

Jennifer:

Have you and Tom F. decided on permanent and temporary easement widths? We really need that decision now so that we can walk the route in the field and develop plans. Can you get us an answer this week?

You may want to consider these issues:

1. Trench width will be ~ 5 feet.
2. Considering 4 feet of bury, total trench depth will typically be ~ 7 feet.
3. With 1:1 slopes down to the top of pipe and vertical trench at the pipe, the top of bank to top of bank width would be 13 feet. This could be more depending on how the contractor approaches the installation.
4. With 10 feet of width for stockpiling excavated material and string pipe, a total of at least 23 feet is needed.
5. An additional 10' for truck access would temporarily be required.

Therefore, to be comfortable, you probably need at least 25 feet permanent easement with the pipeline set at 10' off of a property line and an additional 10-15 feet temporary construction easement. Maybe more in areas where additional bury is necessary.

Please provide a typical section description so that we can complete the drawing and schedule the field work.

Aaron D. Keno, P.E.
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Jennifer Whitaker

From: Keno, Aaron D. [akeno@GFNET.com]
Sent: Thursday, January 19, 2006 9:26 AM
To: jwhitaker@rivanna.org; Reynolds, Neville
Cc: Barker, Nancy; tfrederick@rivanna.org
Subject: RE: Environmental Surveys for Pipeline Route

Will do Jennifer.

-----Original Message-----

From: Jennifer Whitaker [mailto:jwhitaker@rivanna.org]
Sent: Wednesday, January 18, 2006 1:49 PM
To: 'Reynolds, Neville'; Keno, Aaron D.
Cc: 'Barker, Nancy'; tfrederick@rivanna.org
Subject: RE: Environmental Surveys for Pipeline Route

Neville and Aaron,
Please coordinate with me when you plan to do the field work. There may be portions of this alignment that I will like to join you on.
Thank you
Jennifer

From: Reynolds, Neville [mailto:RREYNOLDS@VHB.com]
Sent: Wednesday, January 18, 2006 12:19 PM
To: tfrederick@rivanna.org; Jennifer Whitaker
Cc: Aaron Keno; Barker, Nancy
Subject: RE: Environmental Surveys for Pipeline Route

We will coordinate with GF and schedule the work ASAP.

From: Tom Frederick [mailto:tfrederick@rivanna.org]
Sent: Wednesday, January 18, 2006 10:59 AM
To: Jennifer Whitaker
Cc: Aaron Keno; Barker, Nancy; Reynolds, Neville
Subject: Environmental Surveys for Pipeline Route

Everything is a "go" for GF/VHB to schedule and conduct a route survey for the SFRR to RMR pipeline. The selected route includes what GF presented to the public on October 27 as "3A" with the exception of the UVa Foundation Property. For the UVa Foundation property, the crossing of Old Garth Rd, the Rentals property, the route along US 250, Birdwood Golf Course, and the Heyward property, they need to follow route modifications that have were documented in our correspondence with the UVa Foundation and Jimmy Heyward. With respect to the Heyward property for the new 36-inch pipe, they need to stay in the gap below the elevation of the proposed spillway elevation of the Ragged Mtn dam, but the Heyward's have asked for input on a route inside that gap that minimizes tree and environmental destruction.

GF/VHB need to give advanced notice to the Heyward's, UVa Foundation, and VDOT following commitments RWSA made in correspondence to those agencies (GF should have a copy). Also, I committed to Jimmy Heyward that we would met with him on our suggestions through the gap after the survey, and am looking to GF/VHB for those suggestions.

With respect to the final report, we will be showing the pipe along the edge of the VDOT R/W for the "By-Pass" as refined (to take as many of the turns out as possible while staying outside the cut/fill of the proposed road and any environmentally sensitive areas), but the narratives in the report should stay flexible to the possibility that VDOT approval may not be assured, especially if the road is not committed to be built and VDOT proposes to "sell back". By flexible, I mean don't use language that ties our hands – but also

don't describe the "sell back" issue or offer any specific reasons in the report why VDOT might not provide the encroachment.

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