City of Arlington
Utilities Department

Memo

To: Chris Kelsey

From: James Kelly

cc: David Randolph, Menglou Wang, Dick Warren

Date: October 30, 2007

Re: WWTP/BCF Upgrade & Expansion - RFI 02, Response #1

BCF Issues:

1. **Revised BCF Drawings**. As part of the K/J responses to City 10% design review comments, BCF plan set Sheets C03 and G05 were re-issued. Please provide comments on these sheets.
   Requested Response: On or before *Friday, 26 October 2007.*

   COA Response: Responses are as follows:

   Sheet C03 – The site layout is acceptable, the configuration is as discussed and the shed sizes are per design calculations. The sheet is titled Site and Yard Piping Plan; it should only be a Site Plan (there is no piping on this drawing). On the lower portion of the sheet, would it be possible to show the mobile mixer and conveyor configuration as provided to Mark. Using screened lines, we can show required maneuvering room. Please include a note stating that the mixer and conveyor are not included in the construction package – it is provided for informational purposes only.

   Sheet G05 – No comments.

2. **Blowers**. COA operational staff, based on experience from operating the existing facility, has requested that individual 5 HP blowers be included for each new primary composting bay, as opposed to the 3 HP blower size associated with existing bays. The increased air flow will allow for better operational control and maintenance of optimal pile temperatures. A 5hp motor on a similar fan will only result in approximately 20% more additional flow for similar operating conditions. Please provide any past vacuum/ pressure gauge readings on the existing system when air is being drawn through the compost (negative aeration), during periods where primary compost that has been treated in excess of 14 days. Readings from more than one blower would be useful for sizing the new blowers. Additionally, please confirm desire for individual 5 HP blowers dedicated to the new bays.
   Requested Response: On or before *Friday, 26 October 2007.*

COA Response: This issue was discussed during the October 22, 2007 conference call. David Randolph will be providing pressure readings (vacuum) for the BCF . Please calculate the air required and then size the motor/fan assembly accordingly.

3. **Odor Control System**. As part of the K/J responses to City 10% design review comments, an evaluation of four different odor control technologies (utilizing current organic media, synthetic media, a packaged biofilter system, and a packaged carbon filter) was offered. COA direction is needed on which system to design around. If expansion of the current biofilter is chosen, it does not preclude the City from changing to a different system in the future when the site becomes more space constrained. It should also be noted that, due to the necessary footprint, K/J is not likely to recommend a biofilter system for odor control at the WWTP.
   Requested Response: On or before *Friday, 26 October 2007.*

   COA Response: The existing system will be expanded to twice its current size as discussed during the October 22, 2007 conference call.

4. **Mixer/Conveyor Configuration**. Due to the impacts on new facility locations at the BCF, an accurate understanding of the mixer/conveyor system being procured by COA, particularly from an overall footprint and mobility standpoint, is needed.
   Requested Response: On or before *Friday, 26 October 2007.*

   COA Response: PDF files showing the mobile mixer and conveyor have been forwarded to Mark Cullington for review and concurrence. Would it be possible to include a diagram of the mobile mixer and conveyor to scale on the site plan to show the required maneuvering room.

5. **Compost Marketing Flyer**. When completed, please issue the draft marketing flyer to K/J for review.
   Requested Response: Upon completion – *date to be determined.*

   COA Response: Draft flier complete, in process of presenting to City Executive department.

WWTP Issues:

1. **Dewatering Equipment Operation**. For the required expansion of dewatering facilities, K/J is evaluating different dewatering equipment technologies (belt filter press, centrifuge, screw press, fan press) in order to make a recommendation to COA. Some of the prospective equipment could be significantly downsized, with significant capital savings realized, if operational staff could become comfortable with automated control and unattended operation of the equipment on a more "around the clock" basis (we propose up to ~100 hrs per week continuous operation, Monday morning to Friday afternoon). These technologies are successfully in operation under such automated conditions around the country. Please provide COA input on receptiveness to considering these technologies and mode of operation. The City's response will dictate how we continue with our evaluation.
   Requested **Response:** On or before *Friday, 26 October 2007.*

COA Response: The City is acceptable to automated control and unattended operation of the equipment on a more "around the clock" basis. Please provide engineering calculations for sizing, hours of operation, percent solids, recommended products, costs, and installation examples for actual operational case studies.

2. **Digester Sizing.** A full comparative evaluation of options for digester sizing has now been offered to COA, with the potential impacts to other facilities at the WWTP and the BCF, as well as the WWTP's ability to produce Class B biosolids, all having been discussed. The primary alternatives were either a 10-day or a 20-day solids retention time (SRT). Please confirm that COA's preference to design the digesters around a 10-day SRT criteria has not changed, based on the information provided in K/J's responses to COA's 10% design review comments.
Requested Response: On or before *Friday, 26 October 2007.*

   COA Response: Based on design considerations discussed during the October 22, 2007 conference call, lets proceed with digester sizing based on a 10-day solids retention with no thickening.

3. **Sludge Thickening**. As part of the evaluation done for the digester sizing alternatives, continuing the usage of sludge thickening as part of the solids handling operations was discussed for the WWTP expansion. As discussed within the schematic design technical memorandum, the alternative of a 10-day SRT with no thickening appears to be the least expensive on the basis of life cycle cost. Furthermore, as discussed within K/J's responses to the COA's 10% design review comments, the increased dewatering efficiency due to sludge thickening would likely be largely offset by dewatering sludge with a shorter 10-day SRT, assuming thickened sludge would operate with a 20-day SRT. Please confirm the decision to exclude sludge thickening from the expansion design. However, if the City is not interested in allowing continuous operation of dewatering equipment, the inclusion of sludge thickening will need to be re-evaluated, since in that case it may be less expensive to include sludge thickening to reduce the number and size of dewatering units.
Requested Response: On or before *Friday, 26 October 2007.*

   COA Response: Based on design considerations discussed during the October 22, 2007 conference call, lets proceed with digester sizing based on a 10-day solids retention with no thickening.

4. **Confirmation of Setback** Requirements at the WWTP Site. As mentioned in an October 4 email from Tom Giese, we are unable to tell what the setback requirements are for the WWTP, as we are unsure of the land use designation, and it appears that both the SBRs and the dewatering building are minimal distances from the property lines with the adjacent street right-of-ways. Please confirm setbacks, and also if variances were gained for construction of either of these facilities that we might also be able to secure for locating the digesters (this would likely aid in construction sequence by allowing the post equalization basin to remain in use during construction of the digesters).
Requested Response: On or before *Friday, 26 October 2007.*

   COA Response: The Utility Plant site is zoned public/semi-public, setback is to be the as the predominantly zone – which is Old Town Business District 3 (OTB-3). For buildings and structures, this zoning carries a 0-foot setback on roads and a 5-foot setback for alleys and frontage. Historically we were allowed zero set-back with our only issue being access.

5. **Facility Visits for Fine Screen Configurations**. Please indicate if COA would like K/J to setup site visits to local treatment facilities that have incorporated fine screen equipment of similar configuration to what is being recommended for the WWTP expansion. As Tom Giese has indicated, a day trip to Eastern Washington (Colville/Cheney/Medical Lake) would offer the best local opportunity to see multiple installations.
Requested Response: On or before *Friday, 26 October 2007.*

   COA Response: It is too early to tell if fine screens are needed – we should wait until we see the preferred MBR proposal.

6. **Facility Visits for Dewatering Technologies**. Please indicate if COA would like K/J to provide references and/or setup site visits to treatment facilities for the City staff to research/view the technologies under consideration before K/J completes the evaluation and makes a recommendation, or if the City would like to review the evaluation and recommendation first and then decide which technologies warrant a site visit or possibly even an onsite demonstration.
Requested Response: On or before *Friday, 26 October 2007.*

   COA Response: The City would first like learn more about the proposed sludge thickening design (sizing, hours of operation, percent solids, recommended products, costs, etc). Then, we would like K/J to provide references so we can call some facilities to talk with operators about the equipment. If necessary, site visits can be coordinated.

7. **Preferred Configuration for Splitting of Influent Flow to the Aeration Basins**. K/J has proceeded to this point assuming flow distribution through channels with downward opening weir gates and isolation sluice gates, but COA has asked for consideration of a hard-piped distribution manifold with individual flow meters and throttling valves. Our thought was that the channel/weir configuration might offer greater equipment simplicity and benefit COA from a long-term O & M standpoint. We also feel control of flow splitting will be equally accurate with this configuration, but recognize the operational comfort level associated with individual flow meters. We feel the installed cost of the hard-piped configuration might be a little more expensive with the additional wiring requirements, but the cost differential is felt to be nominal for purposes of deciding which configuration to design around.
Requested Response: On or before *Friday, 26 October 2007.*

   COA Response: Please proceeded with the design of flow distribution through channels with downward opening weir gates and isolation sluice gates with ultra sonic flow metering (level sensors) – provide an estimated cost for this added level of control.

8. **RAS Pump Type and Location**. Based on the estimated cost differential provided to COA as part of the K/J responses to City 10% design review comments, COA to confirm if they want to use RAS pumps submersed in the membrane tank or non-submersible RAS pumps housed in an expanded MBR Support Building.
Requested Response: On or before *Friday, 2 November 2007.*

   COA Response: Please proceed with the design of submersible RAS pumps.

9. **UV Reactor Redundancy**. K/J has suggested a disinfection operational strategy that would include the necessary discharge of treated effluent to the river if one of four UV reactors was out of service (or reclaimed water discharge could continue if total effluent flow was less than 2 MGD), in lieu of adding an additional two reactors that would insure full redundancy of disinfection to the Class A reclaimed water standards potentially needed for diversion. This strategy would offer capital cost savings and equipment simplification during initial installation. Room could be reserved to add in two additional reactors at a later date, when and if a higher level of certainty is desired for the production of Class A reclaimed water. City direction on initial configuration/ number of reactors is requested.
Requested Response: On or before *Friday, 2 November 2007.*

   COA Response: As discussed during the Oct 22nd conference call and also presented in Tom Giese's Oct 10th email, lets proceed with design of two 2-unit UV systems in parallel with piping blanked off and ready for the third 2-unit UV system if needed.

10. **Interim Disinfection Needs**. Recognizing that an additional UV reactor is felt to be necessary to meet NPDES requirements until WWTP expansion is complete, purchase of an identical third Aquionics 3000 unit had been assumed. However, recent manufacturer input received by K/J, and forwarded to the City, indicates that investing in a similar model would be a sunk cost. Aquionics has indicated that the two existing units will not serve COA's intended future disinfection needs well when considering Class A disinfection requirements. Given that complete replacement of UV units will be required for the WWTP upgrade, K/J would like COA input on preferred method of UV unit procurement, both for interim and WWTP upgrade purposes. Would COA like to evaluate multiple manufacturers competitively?
Requested Response: On or before *Friday, 2 November 2007.*

    COA Response: We still want to keep this issue on the table. If additional disinfection is needed for interim treatment, we want to procure a UV system that will be compatible with the future recommended system and installed with appropriate appurtenances to support the future system. Let's revisit this issue after the 30% design.

11. **Polymer System.** The City staff has indicated the existing polymer system is undersized for design capacity and will need to be replaced for primary operation. K/J typically designs new systems around an emulsion polymer system, based on their simplicity and lower capital cost. However, dry polymer systems often have a lower life cycle cost because dry polymer is less expensive on the basis of weight of active polymer. Dry polymer is essentially 100% active, while emulsion polymer is typically 25% to 35% active. Please provide COA input on whether to keep the existing system as a backup or remove, and whether the new system should be specified and designed around a dry or emulsion type system. As mentioned above, an emulsion system is simpler and has a lower capital cost, with a slightly higher delivered chemical cost likely. Given the amount of polymer usage anticipated, K/J does not believe the life cycle cost differential would be substantial, and the new system should be the type that operators prefer.
Requested Response: On or before *Friday, 2 November 2007.*

    COA Response: We currently use a liquid polymer delivered through a system capable of delivering both dry and liquid polymer. Based on the October 22, 2007 conference call, we will proceed with design of a similar liquid/dry feed system and use the existing system as a backup. Please provide a difference in the estimated capital cost.

12. **WWTP Lab/Office Building**. Please provide the number of personnel to be accommodated within the new lab/office, along with any additional information that will aid K/J in establishing the desired square footage and layout of the building. Also, please furnish the sketch of the desired lab room and counter space layout.
Requested Response: On or before *Friday, 2 November 2007.*

COA Response: We are working on this issue.

13. **WWTP Equipment Building**. Please provide information on the desired garage and shop space, along with any additional information that will aid K/J in establishing the desired square footage and layout of the new equipment building.
Requested Response: On or before *Friday, 2 November 2007.*

COA Response: We are working on this issue.

14. **Components of the Grit Chamber Needing Replacement**. COA operational staff has indicated that components at the bottom of the vortex grit chamber are worn and need replacement. It is believed that the worn parts are the two piece steel floor plates over the grit hopper. Please provide more detailed information on the components needing replacement. If possible, photographs of worn or failing parts would be beneficial.
Requested Response: On or before *Friday, 2 November 2007.*

COA Response: We are scheduled to perform maintenance ion the grit chamber on November 5th; we will take pictures and assess the scope of the problem during this maintenance period. We will also have an ADS representative present to offer advice on how to repair the deteriorated portion of the chamber.