



# Memo

**To:** Chris Kelsey  
**From:** James Kelly, David Randolph  
**cc:** Menglou Wang, Dick Warren  
**Date:** May 28, 2008  
**Re:** WWTP/BCF Upgrade & Expansion - RFI 05, Response #1

The following list (with desired dates for receipt of information) is requested from COA:

1. **Backup Digester Blower.** Since the digesters can run off of one blower with alternating air supply at low DO for simultaneous nitrification/denitrification (default control method), two blowers could provide sufficient redundancy. However, this would not allow redundancy for operation at higher DO residuals, since two blowers are required for that alternate control method. The savings for eliminating the third digester blower would be around \$50,000. Unless the City decides otherwise, K/J will leave the third blower in the design.

**Requested Response:** On or before Wednesday, 21 May 2008.

**Response:** For phase 1, we will go with two blowers. If needed, we will purchase the third blower before phase 2.

2. **Existing Blowers.** It appears from the drawings that there are check valves and isolation butterfly valves on each blower discharge. However, in looking at the pictures we took and the O&M manual information, it appears that those items are not installed on the existing blowers. We request that the City confirm whether or not those items are not installed on the existing blower discharge. It looks like all that is provided after the discharge silencer are a pressure relief valve, flexible connector, and temperature gauge.

**Requested Response:** On or before Wednesday, 21 May 2008.

**Response:** Blower #1, #2, and #3 have isolation butterfly valves, #4 has a sealed check valve.

3. **DO/ORP Probe Cleaning.** K/J asked Enviroquip about the cleaning interval for the DO and ORP probes in the high mixed liquor environment. Enviroquip indicated that during the winter the probes would likely need to be wiped about once every 2 weeks. In the summer, they would likely need to be wiped about twice a week. There are 3 ORP probes and 9 DO probes, for a total of 12 probes. Each of these probes has the option of being fitted with an air blast cleaning system (see below). The cost of the system is about \$800 each, plus installation. So for 12 probes the cost would be \$10k+. Unless the City requests the air blast cleaning system for each probe, we will not add them to Enviroquip's scope.

**Requested Response:** On or before Wednesday, 21 May 2008.

**Response:** An air blast cleaning system is not needed.

4. **Truck Turning and Height.** The City had asked us to evaluate space for truck turning. To do this, K/J needs information on the size (including distance between axles) of the truck. Please provide this information for us to accurately check the turning requirements. Also, provide estimated bed height for the biosolids hauling trucks to verify sufficient clearance below the distribution conveyor.

**Requested Response:** On or before Wednesday, 21 May 2008.

**Response:** Please use established height and turning requirements for a large semi-trailer.

5. **Location of Digested Sludge Withdrawal.** The floor of the digester tanks slope from south to north. The low spots are on the north end of the tank, but the most efficient withdrawal point to minimize piping and maximize pumping capacity is the south end. If we extend the pipe to the north end we add 60 feet of pipe. This adds a little bit of cost, but more importantly decreases the capacity of each pump from 90 gpm each to 75 gpm. With suction piping from the south end, a single pump could be utilized to pump the full Phase I flow (based on ~100 hour per week operation), allowing the second pump to be a backup. Both pumps can be run simultaneously to double the capacity. With both pumps running, even with the longer suction, there should still be enough capacity for Phase II. However, the purchase of a shelf-spare would be needed to ensure sufficient capacity is on hand. The disadvantage of having the suction at the south end is that then the pumps cannot drain the tanks completely, since the tanks slope to the north end. This would require using a sump pump to pump out the remaining few feet of sludge. Unless the City has objections, K/J will be proceeding with locating the digested sludge withdrawal at the south end of the digesters and providing a sump for the sump pump to allow removal of the remaining sludge.

**Requested Response:** On or before Wednesday, 21 May 2008.

**Response:** Locating the digested sludge withdrawal at the south end of the digesters and providing a sump for the sump pump to allow removal of the remaining sludge is acceptable.

6. **Old Headworks.** Please provide any information available on drawings of the old headworks structure. K/J needs to know the structural design of the structure to determine if the whole thing needs to be demolished and a new retaining wall constructed in its place, or that some portion of it can remain as a retaining wall.

**Requested Response:** On or before Wednesday, 21 May 2008.

**Response:** The City has provided you with everything we have. I will request a follow up search from Mr. Castle on Monday (06-02-08).

**City Follow-up:** Are there any additional structural drawing for headworks?

7. **Instrument Options.** K/J has requested the following options be included with certain instruments provided by Enviroquip. Cumulatively, these items could add up to \$5,000 to the Scope of Supply, but will likely be offset, at least to some extent, by equipment downsizing on the MBR permeate header. Unless the City has objections, K/J will proceed with these additions to Enviroquip's scope:

- Low pressure hot-tap connection for the air flow meters. These connections will reduce maintenance time associated with accessing the meters.
- Sunshield for DO, ORP, and TSS controllers. Needed for readability and display panel protection. Sunshield not needed for turbidity (these units will be indoors).
- Calibration kit for the TSS analyzer. Required for proper instrument operation.

- Formazin calibration kit for the turbidimeters. Required for proper instrument operation.

**Requested Response:** On or before Wednesday, 21 May 2008.

**Response:** Please proceed with the above additions to Enviroquip's scope. Also, please provide an update as to the scope changes that Enviroquip will include on CO #2.

8. **Membrane Removal Procedure.** K/J discussed with Enviroquip at some length the procedure that would be required to remove the membrane units. This information is being provided to make you aware of the procedure. There is little that can be done to improve upon this procedure without substantially impacting the cost of the project.

Enviroquip stated that lifting chains are not included with gravity piped systems because the pipe penetrations and connections are below the water surface. This means that the membranes need to be exposed to disconnect them, which then allows the connection of the lifting bar directly to the top of the membrane unit. The top membrane unit is removed first. The membrane units are not bolted together or to the frame, but are simply resting on top of the diffuser casing. The point of disconnection is right at the permeate header on the membrane unit where the flexible connection is located. The permeate connection must be unbolted, the top membrane unit attached to the lifting bar, and then removed. Then the lower membrane unit can be accessed. That permeate connection must also be unbolted, the membrane unit attached to the lifting bar, and then removed. To access the membrane units, the operator will first drain the MBR tank to expose the permeate connections. Then a ladder will be placed down into the MBR tank at the west end of the tank. The operator will climb down the ladder, crawl or walk over the tops of the membrane units until the unit to be removed is reached, and then prepare for removal of that unit. Once the top membrane unit is removed, the operator has to climb down to the top of the lower unit to prepare for removal of that unit.

**Requested Response:** None required.

9. **Aeration Basin Guardrail.** The 60% design submittal showed guardrail around the interior openings to the aeration basins. Because the basins will be covered with aluminum covers rated for foot traffic and to minimize interference with equipment installations and removal, K/J will remove the interior guardrail (leaving the existing perimeter guardrail in place), unless the City has objections.

**Requested Response:** On or before Wednesday, 21 May 2008.

**Response:** Please remove interior guardrails.

10. **Aeration Basin No. 3 and MBR Tanks No. 5 and 6 Covers.** The City has decided not to install equipment in Aeration Basin No. 3 and MBR Tanks No. 5 and 6. The design currently includes covers for Aeration Basin No. 3 and MBR Tanks No. 5 and 6. The covers will help keep debris and rainwater out of the tanks, but will make access for future installation of equipment a bit more cumbersome, since the covers will need to be removed. If the covers are not installed, the interior guardrail discussed in Item #9 above will need to remain around Aeration Basin No. 3 and be provided for MBR Tanks No. 5 and 6. Unless the City directs K/J otherwise, these covers will remain part of the Phase I design.

**Requested Response:** On or before Wednesday, 21 May 2008.

**Response:** Please have the aeration basing aluminum covers and MBR basin 5 & 6 covers included in the design as planned.