

June 5, 2006

Mr. Bill Hartman  
GW Partners, LLC  
Mr. Matt Binsfeld  
JF Brennan Co. Inc.  
1475 North Lake Street  
Neenah, Wisconsin 54956

Dear Bill and Matt,

On June 1, 2006 and June 2, 2006, Earth Tech assessed the water treatment and related support facilities and found issues that need attention. Earth Tech Engineer Brett Bittenbender from our Grand Rapids Michigan office visited the site and reviewed a list of issues. Brett also assisted August Winter staff in the bag filter layout and siting of the booster pump and associated layout. The list covered issues that had surfaced during the initial stages of operation at and since our startup. Most recently, a drain line problem has occurred and that too is listed below.

The issues as identified in this letter have been outlined using brief explanations that will assist in our discussions and will help provide some direction on approach and resolution. Earth Tech is prepared to assist in the resolution of the issues as you find necessary. All procedures performed by Earth Tech staff will be documented by appropriate Standard Operating Procedures (SOP's) during the planning stages and maintained once the procedure is initiated.

### **Water Treatment Plant Issues**

**Effluent Meter:** The effluent meter is inaccurate when the effluent valve is open 100%. The operator manipulates the effluent valve to keep water in the effluent line so the meter maintains some accuracy. It is recommended if the Post GAC Bag Filter option is constructed, that a trap in the effluent line be incorporated so that the effluent line remains flooded and the meter remains submerged at all times. There was concern aired by a member of the GW Partners staff that a siphon could exist if a trap were installed. The installation of an APCO air vacuum release valve should resolve this concern. Other practices will continue to alleviate siphoning such as effluent valve closure when the plant is shutdown. This coupled with isolating the GAC beds when the plant is shutdown will also keep air from being introduced to the GAC beds.

**Influent Piping:** The inlet meter to the Krofta has an accuracy problem caused by air entrapment. The operator bleeds air regularly from the inlet line to resolve this issue. It is recommended that a 1 inch air valve be installed on this line at an existing tap on the top of the inlet pipe. Support may be needed for the air valve.

**ADT System:** The ADT System is presently supplied water from the same header as the Krofta filter water pumps. The smaller ADT pump competes with the larger filter water pumps for available water. At the lower flow rates the ADT system has some limited success. At higher flow rates, hydraulic and design issues will not permit ADT system operations. This was verified by the pump system supplier during an assessment on June 2, 2006. It was recommended that pump relocation be considered. Earth Tech has identified the area for relocation. While relocating this pump, it is also recommended to provide additional support to the backwash piping. Support for both the ADT and backwash piping can be incorporated together with the same overhead metal framing support. Options exist for ADT system relocation, however, cost and pump design will need to be a coordinated effort as the pump curve remains a concern dependent upon pump placement and system placement. Relocation will impact pump and system performance. Earth Tech recommends that any system relocation be reviewed for proper performance.

**Chemical Feed:** There is a present need to feed sodium hypochlorite to four (4) locations within the water treatment process. Although during the Earth Tech assessment we identified potential feed points and varying options, it was noted that four (4) feed points are needed without delay.

1. **Inlet:** With the algae growth and bloom season approaching, it is recommended that a feed point be installed on the inlet pipe to the Krofta. This point will also help the Krofta in the event of polymer overfeed. A feed rate of 1.0 to 2.0 mg/l is anticipated at this point. This feed point will be monitored and may not be fed continuously, as the condition of the Krofta and subsequent water quality will dictate feed rate and use. (A pump rated at 64.512 gpd/2.69 gph is required when feeding 12.5% sodium hypochlorite)
2. **Intermediate: (Post Krofta/Pre GAC)** Feeding a sodium hypochlorite solution to the Krofta will have a potential to resolve some of the fouling of algae and polymer on the filters. The chemical demand will have a potential to be greater than what would be recommended to feed at the inlet to the Krofta and to carry throughout the system. An intermediate feed point is recommended so that a chlorine residual can be carried through to the GAC at a dose of 0.5 to 1.0 mg/l. This will help prevent bio-fouling of the GAC. (A pump rated at 32.256 gpd/1.34 gph is required)
3. **Krofta Backwash:** Feeding a 0.5 to 1.0 mg/l solution of sodium hypochlorite to the Krofta backwash is recommended. This will help in the ongoing maintenance of the filters and should minimize the need for frequent boil-outs. (A pump rated at 13.824 gpd/0.576 gph is required)

4. **GAC Backwash:** Feeding a 0.5 to 1.0 mg/l solution of sodium hypochlorite to the GAC backwash is recommended. This will help in the ongoing maintenance of the GAC beds. The US Filter representative also recommended that super chlorinating with 20 to 25 mg/l during plant shutdown is also recommended. The US Filter Representative had other recommendations including the partial to full removal and replacement of the GAC. This looks to be the course of action that should be taken after a super chlorination is performed once equipment and chemical is received. Earth Tech staff will perform a super chlorination and backwash in an attempt to scour the GAC and possibly lengthen its life. It should be noted that backwashing is not a regular activity with GAC, and it will be performed on this site for preventative maintenance as recommended by the GAC supplier. An SOP will be developed for the super chlorination of the GAC beds. This is planned for plant shutdown on June 10, 2006. Chlorine residual will be monitored with an EPA compliant colorimetric unit, utilizing DPD. (A pump rated at 14.976 gpd/0.624gph is required for GAC backwash)

**Note:** GW Partners expressed the desire to supply pumps and related equipment for the chemical feed. Earth Tech can work with the supplier to ensure the proper feed rates and chemical compatibility with pumping and related equipment. Degassing valves, chemical compatibility, system plumbing and drum containment are some of the issues that need to be addressed. Earth Tech has had good luck with many chemical pump manufacturers including LMI pumps compatible with sodium hypochlorite and supplied with degassing valves, and 4 way valves.

**Chemical Boil-Out:** There are taps identified for chemical feed. There are also taps identified for chemical boil-out. Earth Tech recommends that while making taps for the sodium hypochlorite, taps should also be made for boil-out chemicals. A list of taps will follow.

**Sample Taps:** Earth Tech recommends that if additional taps are desired, other than those presently selected, that this would be the opportune time to make the taps as the contractor is on site. Sample taps have been relayed to the contractor for the new bag filters.

**Non Potable Water Tank:** When performing a chemical boil-out or when the Krofta is off line, the non potable tank is supplemented by city water. This is accomplished by hooking up a fire hose to the hydrant outside. A backflow preventer and meter is attached at the hydrant and a fire hose connection is made near the non potable tank. A plumbing improvement at the tank alleviating reverse flow through an offline pump is recommended. A tee with a valve and fire hose quick disconnect plumbed between valves #35 and #36 on the horizontal pipe run from the non potable tank will provide the improvement.

**Meter Calibration:** Calibration checks are needed throughout the facility. GAC #2 train flow meter needs to be rescaled. There is also some concern that the streaming current detector may be out of calibration.

**City Water Service:** The amount of backwash for the GAC should be minimal once the GAC is cleaned and maintained. City water remains an attractive option for the backwash water supply for the GAC beds.

**Backwash Piping:** Piping support is needed on the end towards the Krofta. If the ADT pump is moved, this piping support can be incorporated together.

**Backwash Valve:** The speed of backwash valve when it closes is quite fast. This valve closure speed should be slowed down.

**Krofta Drain Lines:** The drain lines from the Krofta look to be plugged. The lines flow into the sludge tank. The sludge tank as well as the drain lines may be filled with sand, anthracite and gravel. Cleanouts on the lines have not been provided. Providing a cleanout is recommended. An isolation valve placed down line from the drain line valves near the proposed cleanout will also permit flushing and isolation of each line. An above ground flush line for the routine maintenance and flushing of these lines would be a recommended addition with a cleanout. The flush line can be a simple fire hose connection with a valve. The operator can isolate each line and flush each on a routine basis. This needs to be resolved ASAP as the drain lines are plugged and attempts to unplug from topside have failed. The sludge tank may also contain excessive solids preventing proper drain line flow. I do not have schematics to review the tank layout for complete assessment.

**Tap List:**

1. Inlet Line: Convert abandoned polymer feed point to sodium hypochlorite feed point. (1 inch pvc ball valve or reduce; with 1/2 inch pvc plumbing to pump location. Pump flex tubing and manufacturer setup at pump. Pump stand desired. Replace 1 inch Nibco brass valve Number "13")
2. Inlet Line: 1 inch air valve. Existing tap, may need support. (Known as Valve Number "11")
3. Inlet Line: Additional tap on a pvc line for chemical feed post inlet meter. (1/2 to 1 inch pvc ball valve with threaded plug) Locate between inlet meter and Valve #12.
4. Krofta Backwash Line: New tap at Krofta header assembly on pvc. (1/2 to 1 inch pvc ball valve with threaded plug) This will be used as a Boil Out chemical addition site. Located near Krofta Cell #9.



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5. Intermediate Krofta Effluent: New tap on pvc line after stainless steel insert above plant water supply pumps. (1/2 to 1 inch pvc ball valve with 1/2 inch pvc plumbing down to the pump location. Pump flex tubing and manufacturer setup at pump. Pump stand desired.)
6. Backwash Line: Krofta Backwash. New tap on stainless steel line after the pump discharge. This chemical feed pump will need to be set up to start and stop on backwash pump start and stop. (1/2 to 1 inch pvc ball valve with 1/2 inch pvc plumbing down to the pump location. Pump flex tubing and manufacturer setup at the pump. Pump stand desired.) I&C setup required.
7. Backwash Line: GAC Backwash. New tap on stainless steel line after the pump discharge. This chemical feed pump will not be set up to start and stop on backwash pump start and stop. It will be manually adjusted and started when needed. (1/2 to 1 inch pvc ball valve with 1/2 inch pvc plumbing down to the pump location. Pump flex tubing and manufacturer setup at the pump. Pump stand desired.)

Note: Taps into stainless steel will require a sleeve. The detail will be provided by Earth Tech.

If you have any questions regarding this list of issues and the resolution to each, please do not hesitate to contact me or the appropriate Earth Tech contact.

Earth Tech appreciates the opportunity to work closely with you on this project and continued successes as a team.

Sincerely Submitted,

A handwritten signature in black ink that reads "Mark A. Schmidt".

Mark A. Schmidt  
Operations Manager

Cc: Terry Larson, Earth Tech  
Brett Bittenbender, Earth Tech  
Lucy Pugh, Earth Tech  
John Barthels, Earth Tech