

**From:** Ziegelbauer, Heather/MKE <Heather.Ziegelbauer@jacobs.com>  
**Sent:** Tuesday, August 20, 2019 1:59 PM  
**To:** Neal, Conor  
**Cc:** Jeffrey Howard Danko; Joseph Janeczek; Carey, Angela J - DNR; Killian, James - DNR; Ryan Suennen; Finney, David/BOS  
**Subject:** RE: Quarterly Progress Report - Tyco Fire Products LP

Conor,

The week of July 8, 2019 Tyco had three Jacobs staff out at the site to review the GWCTS operations (Bruce Manning/subject matter expert, Bill Andrae/project design manager and Jack Knight/programmer). The following are the items they observed and how they are being addressed:

- Reverse Osmosis (RO)
  - Some of the RO membrane spacers were cracked and allowed for the membranes to move freely and was not effective.
  - The RO was also found to have scaling issues due to the anti-scalant pump not feeding through the system.
  - All of the membranes were pulled and replaced with new ones, along with replacing some of the spacers and endcaps.
  - The anti-scalant pump was immediately adjusted and is now feeding effectively. The anti-scalant mixture formula was also doubled to 1000 ml. per 25 gals of water from the original 450 ml. per 25 gals.
  - The adjustments have helped the RO tremendously and conductivity readings have been back to normal range and the permeate and reject percentages are looking good as well.
- VSEP – Cleaning of the VSEP units (as they had significant scaling) was started by filling them with NLR-303 (citric acid) and allowed to soak, then vibrated for several minutes and then allowed to soak again. This helped to break loose the circulation pump for the CIP system as well that wasn't working. The VSEP units have not yet ran since cleaning, as there are additional changes/adjustments that are needed first. Upcoming items for the VSEP are the following:
  - Address programming issues with the VSEP.
  - Replace dry run sensor
  - Add metering skid to allow for easier cleaning/maintenance
  - Have equipment manufacturer out to evaluate the operation of the VSEP once new equipment is installed
- Reactor Tanks – Connected the air source to the chemical reactor tanks to allow the agglomerated solids to break up so that they can be dumped out of the chemical reactors (to clear these drain ports for cleaning of the reactor tanks).
- Programming – Once the GWCTS items above were fixed and the system was restarted, the programming errors in the HMI operating system identified by the Operators did not manifest themselves while the Programmer was onsite.
- Piping – In progress are some piping modifications and include the following:
  - Piping to feed anti-scalant to the Brine Reject Tank, which feeds to the VSEP, to help try and eliminate scaling and fouling out of the membranes.
  - Piping mods in the VSEP room to allow for safe and effective cleanings in the future.
- Conveyance Lines and Extraction Wells – Near future – looking at getting a contractor out to look at and clean out the extraction well pumps and conveyance lines.

The system overall has improved since addressing or working to address the above items. Operational run times and flow rates during the last month were approximately 10 days of operation and 40,000 gallons processed; however, because the VSEP is not yet operational, the reject tank fills faster. Tyco is working to get the VSEP back in operation over the next month.

Please let us know if you have any other questions.

Thanks,

Heather Ziegelbauer, PE\* | Jacobs | Project Manager | Global Environmental Solutions | +1.262.644.6167 | + 1.312.933.1017 mobile  
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**From:** Neal, Conor <[Neal.Conor@epa.gov](mailto:Neal.Conor@epa.gov)>  
**Sent:** Thursday, August 15, 2019 3:32 PM  
**To:** Ziegelbauer, Heather/MKE <[Heather.Ziegelbauer@jacobs.com](mailto:Heather.Ziegelbauer@jacobs.com)>  
**Cc:** Jeffrey Howard Danko <[jeffrey.howard.danko@jci.com](mailto:jeffrey.howard.danko@jci.com)>; Joseph Janeczek <[joseph.janeczek@jci.com](mailto:joseph.janeczek@jci.com)>; Angela Carey <[angela.carey@wisconsin.gov](mailto:angela.carey@wisconsin.gov)>; [JAMES.KILLIAN@WISCONSIN.GOV](mailto:JAMES.KILLIAN@WISCONSIN.GOV); Ryan Suennen <[ryan.suennen@jci.com](mailto:ryan.suennen@jci.com)>; Finney, David/BOS <[David.Finney@jacobs.com](mailto:David.Finney@jacobs.com)>  
**Subject:** [EXTERNAL] RE: Quarterly Progress Report - Tyco Fire Products LP

Heather and all,

Please provide the information requested below. As mentioned in the July 15 quarterly report, did a subject matter expert troubleshoot the GWCTS in July? What was his or her diagnosis of the issue?

Conor

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**From:** Neal, Conor  
**Sent:** Tuesday, July 16, 2019 12:00 PM  
**To:** Ziegelbauer, Heather/MKE <[Heather.Ziegelbauer@jacobs.com](mailto:Heather.Ziegelbauer@jacobs.com)>  
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**Subject:** RE: Quarterly Progress Report - Tyco Fire Products LP

Heather,

Thank you for submitting the quarterly report.

Can you provide more detail on the operational and maintenance issues with the GWCTS that are limiting operational run time? I note that the GWCTS has operated for 72 days this year (27 in Q2, 45 in Q1). This rate of operation is on pace to be significantly less than the operating days in 2011 through 2017 reported in the 2018 Five Year Review.

Thank you,  
Conor

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**From:** Ziegelbauer, Heather/MKE <[Heather.Ziegelbauer@jacobs.com](mailto:Heather.Ziegelbauer@jacobs.com)>  
**Sent:** Monday, July 15, 2019 5:01 PM  
**To:** Neal, Conor <[Neal.Conor@epa.gov](mailto:Neal.Conor@epa.gov)>  
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**Subject:** Quarterly Progress Report - Tyco Fire Products LP

Conor,

On behalf of Tyco, attached is the quarterly progress report covering the period from April 2019 through June 2019. Hard copies will be forwarded via regular mail. Please let us know if you have any questions.

Regards,

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