DIRECTOR OF ENGINEERING REPORT

November 16, 2022

District Engineering manages projects, consultants, contractors, and equipment suppliers. Consultant reports and Project Managers reports are included in this section along with details regarding the status of the associated study, design, or construction projects.

ACTIVE PROJECTS

20-07 Digester Complex Improvements:

SCOPE: The Digester #3 floating cover and the face brick on all four digester tanks is being replaced.

Contractor: Christy-Foltz R.E. Inspector: SDD/W Gray - Donohue
Engineer: Donohue and Associates

Advertise	Pre-bid	Bid Open	Final Award	Notice to Proceed	Pre-Construction	Contract Completion
11/17/20	12/01/20	12/22/20	02/17/21	03/18/21	03/18/21	9/22/2022 Substantial 10/22/22 Final

Submittals Reviewed: 9 complete /0 open
Requests for Information (RFIs): 7 complete /0 open
Owner Requests for Proposal/Change Order (RFPCO): 11 complete / 3 open

Key Activities The wracked piece that caused alignment issues has been removed and replaced and contractor is working through installation of steel deck pieces. There are no updates on the pending change order.

Issues: Substantial completion date was Thursday 9/22/22.

Pending Changes:

1. WCD 01 and WCD 02: Additional Pump Down of Digester Contents: Contract documents required SDD to bring digester liquid elevation down to 593.0 and digesters have been turned over to contractor at various liquid elevations due to pump down issues. Contractor was put on time and material for the additional pumping required. — $ 7,584.94 -CO#4
   Digester 1 – 594.50; Digester 2 - 595.80; Digester 3 – 595.33; Digester 4 – 593.00 — $ 31,668.00
2. Unit Cost Adjustment for Replacing manway hatch on Digester #1 — $ 28,776.00 -CO#4
3. Digester #1 cold joint repairs. District issued Field Order to remove damaged concrete, prepare the leaking concrete seam, and install Xypex patch along the cold joint in the concrete walls. Work is being performed on a T&M basis. — $ 29,166.94 -CO#4
4. Delamination of coatings on Digester #3 will be addressed as contractor completes the installation of the cover. Contractor was directed to perform the work on a T&M basis. — $ T&M

20-01 Lake Shore Drive PS Replacement:

SCOPE: The lift station is being reconfigured with submersible pumps.

Contractor: Christy-Foltz R.E. Inspector: SDD/ C. Larimore- CDI
Engineer: Clark Dietz Engineers, Inc

Advertise	Pre-bid	Bid Open	Final Award	Notice to Proceed	Pre-Construction	Contract Completion Dates
12/02/20	01/05/21	02/03/21	03/24/21	04/07/21	04/07/21	4/2/22 Substantial 5/2/22 Final

Submittals Reviewed: 84 received / 83 completed / 36 Rejected
Requests for Information (RFIs): 14 submitted/14 completed
Owner Requests for Proposal/Change Order (RFPCO): 1 Issued/1 Completed
Change Orders: 2 completed

Key Activities: Contractor work is substantially complete and punch list items are being completed.

Issues: We received a request for substantial and final completion; we disagreed on the dates requested and have agreed on substantial completion. Final completion work is close to being done, but a few outstanding punch list items are keeping it from being ready (electrical details, O&M manual submittal, roofing attachment details, etc…)

Pending Changes:

1. Additional fencing added because of requested grading modifications and fence corner relocations — $ 9,028.00
2. Additional OT hours caused by West Plant discharges. — TBD $25K-Est.
3. Set-offs due to liquidated damages

21ADM50 Front Gate, Fence, and Road Repairs:

SCOPE: Replacement of the damaged front gate, plant fencing repairs, and localized cast in place concrete work in the plant are included in this project. There are two Divisions of work to be awarded separately: 1) General/Concrete; and 2) Fence and Gate

Contractor: Christy-Foltz — Original Contract Price: $632,047
Engineer: SDD
R.E. Inspector: SDD

Advertise	Pre-bid	Bid Open	Final Award	Notice to Proceed	Pre-Construction	Contract Completion Dates
08/11/22	08/30/22	10/04/22	10/26/22	11/15/22	11/15/22	Div 1 – 120 days Div 2 – 150 days

Key Activities: Bonds and Insurance are being worked through currently. Staff expects that by the planned pre-construction meeting on Tuesday 11/15/22, all paperwork will be in order and the Notice to proceed will be issued.

20ENG15 Water Tower Painting Project:

SCOPE: Power Wash, Surface preparation and overcoat of plant water tower. Included is a power wash of t wet interior for inspection, installation of the SDD logo on the tower and power wash of the gas sphere in front of the digester complex.

Contractor: Neumann Company Contractors — Original Contract Price: $197,200
Engineer: Donohue and Associates
R.E. Inspector: SDD

Advertise	Pre-bid	Bid Open	Final Award	Notice to Proceed	Pre-Construction	Contract Completion Dates
08/03/22	08/17/22	09/07/22	09/21/22	11/10/22	xx/xx/23	360 days-Substantial

Key Activities: Bonds and Insurances were approved this last period and Notice to Proceed was issued. Staff expects the contractor to begin work late spring 2023.

22ENG45 Primary Clarifier #5 Replacement Project:

SCOPE: Remove and replace Primary Clarifier #5 mechanism

Contractor: TBD — R.E. Inspector: SDD
Engineer: SDD

Advertise	Pre-bid	Bid Open	Final Award	Notice to Proceed	Pre-Construction	Contract Completion Dates
09/16/22	09/27/22	11/01/22	xx/xx/22	xx/xx/22	xx/xx/xx	330 days-Substantial

Key Activities: Bids were received this last period. *There is a contract award recommendation before the board for consideration under old business.*

20-10 De-chlorination Facilities (Bisulfite Tanks Replacement):

SCOPE: Remove and rebuild knock out wall to facilitate removal and installation of new sodium bi-sulfite tanks. Additional tuck point repairs throughout building to be performed within project. Tank removal and installation to be performed by SDD maintenance.						
Contractor: TBD					Engineer: SDD	
Advertise	Pre-bid	Bid Open	Final Award	Notice to Proceed	Pre-Construction	Contract Completion Dates
10/11/22	10/25/22	11/11/22	xx/xx/22	xx/xx/22	xx/xx/xx	60 days-Substantial

Key Activities: Bisulfite tanks have arrived on site. Staff is receiving bids on 11/11/22. We expect to have a review of the bids available after bids are opened and *to have a contract award recommendation for the board's consideration under old business*.

21ENG40 Replacement of Sludge Transfer Pump:

SCOPE: Remove and replace the existing Abel Sludge Transfer Pump (south) that has reached the end of its useful life.						
Contractor: TBD					Engineer: SDD	
Advertise	Pre-bid	Bid Open	Final Award	Notice to Proceed	Pre-Construction	Contract Completion Dates
09/21/22	10/11/22	11/03/22	xx/xx/22	xx/xx/22	xx/xx/xx	60 days-Substantial

Key Activities: Bids were opened as expected this last period. *There is a contract award recommendation for the board's consideration under old business.*

NON-CONSTRUCTION ACTIVITY

ADMINISTRATIVE OFFICE MASTER PLANNING:

Staff issued the Request for Qualifications (RFQ) for Architectural and Engineering Design Firms to submit on designing a new 'Wastewater Reclamation Office Complex' (name to be determined later) this last period. The issue RFQ responses are due back to SDD January 11, 2023.

21ENG51 Wet Weather Interceptor Capacity Study – Damon to Treatment Plant

All monitoring equipment has been removed from the collection system and Burns and McDonnell is continuing the data analysis.

21ENG04 Force Main Inspection

Finley Creek FM (16") (5300 LF of ductile iron pipe) and the 8" Wyckles force main.

Staff expects the finished condition assessment report to be delivered in December 2022.

UPCOMING PROJECTS:

21ENG30 - East Headworks Grit Flow Modeling – Clemson Engineering Hydraulics

Staff will present a video of the model in action at the trustee meeting. Final report has not been received, however the video shows what is happening in structure 201

21ENG42 – Post Anaerobic Digestion (PAD)

<<No Update>> The technical memorandum (TM) confirms the process applicability for future BNR operations and provides the design specifications necessary under the BNR treatment systems. Staff

is reviewing the TM and will offer comments back to BV prior to recommending any action on the content of the memorandum.

22ENG02&10 – Force Main Renewal (Lost Bridge and Country Club)

After reviewing similar projects submitted by various engineering firms, staff entered negotiations with Clark Dietz Engineers (CDI) out of Champaign. The FM renewals project includes replacement of cast iron segments of the Country Club interceptor and the Lost Bridge 10" interceptor that crosses underneath Lake Decatur. Staff is still working through the agreement language with CDI.

22ENG44 – Grit Classifier and Conveyor Replacement

Staff issued PO's for the 2 classifiers and 1 conveyor this last period. Draft of the plan sheets are ready for review. Bid specifications will be started in December.

Frac Tank Discussions for Nutrient Removal Pilot Study

See attached letter from Black and Veatch regarding Frac tank study.

INTERGOVERNMENTAL ACTIVITIES

None

If there are any questions, please contact me by telephone at 422-6931 ext 216, or by email at DonM@sddcleanwater.org.

Memorandum

Date: November 7, 2022
To: Donald B. Miller, P.E., Director of Engineering
From: Will Gray, P.E., Donohue & Associates

Re: **Project Status Report**
2020-07 Digester Improvements Project
Donohue Project No. 13782

Project Progress Items

- An updated project schedule was received from C-F on 10-25-2022. This schedule shows the project being substantially complete by March 1, 2023. The contractual substantial completion date is Sept. 22, 2022.
- Christy-Foltz is welding the intermediate support ring and side walls of the digester lid superstructure. SDD is using a certified weld inspector (CWI) to inspect the completed welds.
- Once superstructure side walls are welded, C-F will start to fly in ballast blocks for storage on the digester floor. They will then set the ballast blocks in their designated location within the lid. This is expected to take approx. 3 weeks to complete.

Updated: 11-7-2022	**Open**	**Closed**	**Total**
Submittals	0	10	10
RFI	0	8	8
Change Order Request	0	15	15
Change Orders	0	4	4

CHANGE ORDER LOG

- Change Order #1 has been executed, $42,549.39.
- Change Order #2 has been executed, $46,173.89.
- Change Order #3 has been executed, $442,219.00. Add 193 days to contract.
- Change Order #4 has been prepared, $65,527.88.

Sanitary District of Decatur

Frac Tank Pilot Project Summary
November 9, 2022

Sanitary District of Decatur (SDD) has embarked on long-term planning to achieve compliance with new permit requirements for total phosphorus and address aging infrastructure. Influent to the SSD Water Recourse Recovery Facility (WRRF) is unique, having very high levels of phosphorus. These influent characteristics make compliance with future phosphorus requirements very challenging.

SDD has completed an initial evaluation of alternatives to upgrade the WRRF for removing phosphorus. These evaluations focused on biological phosphorus removal processes as the best low-cost, sustainable approach to managing phosphorus discharges to the Sangamon River. A technology referred to as sidestream enhanced biological phosphorus removal (S2EBPR), is a leading candidate for achieving nutrient reduction goals. This technology has been successfully applied at other facilities and has proven to be a very consistent and reliable process.

In the conventional S2EBPR process, secondary sludge (return activated sludge – aka RAS) is discharged to a side stream biological reactor where fermentation of the RAS begins, and volatile fatty acids are produced (VFAs) supplementing influent organic loading. The unique characteristics of the influent wastewater at the Decatur WRRF is causing Black & Veatch to recommend the approach be modified. Due to the very high levels of phosphorus removal required, it is recommended that primary sludge also be discharged to the fermentation reactor to provide additional sources of biodegradable organics, necessary for driving the biological phosphorus removal process. Initial bench-scale (laboratory) testing has been performed by SDD to estimate parameters (reaction rates) to be used for design of the full-scale facilities. Further larger scale pilot testing is recommended to estimate reaction rates applicable to full scale operation. More accurate reaction rate estimates will better refine the design of full-scale facilities and result in the most efficient design at the lowest cost. Additional benefits include determination of optimal operating parameters, such as different blends of primary and secondary sludges, familiarizing operations and laboratory staff with the process, identifying operational challenges to be addressed during design, and demonstrating operation and performance of the proposed mixing system.

The pilot project considers use of a portable, 18,000-gallon Frac Tank, as the side stream reactor, and pumping different blends of primary and secondary sludges to the tank. The Frac Tank will be customized to mimic full-scale operation. Temporary piping will be laid on grade for conveying sludges to the pilot reactor. Field instrumentation will be configured with the SDD computer monitoring system. It is anticipated the pilot will be operated for up to one year to allow different operating temperatures. Construction cost for the pilot project is approximately $300,000 to $400,000, including direct procurement of equipment. A conceptual layout of the pilot project is presented in the Figure 1 below.

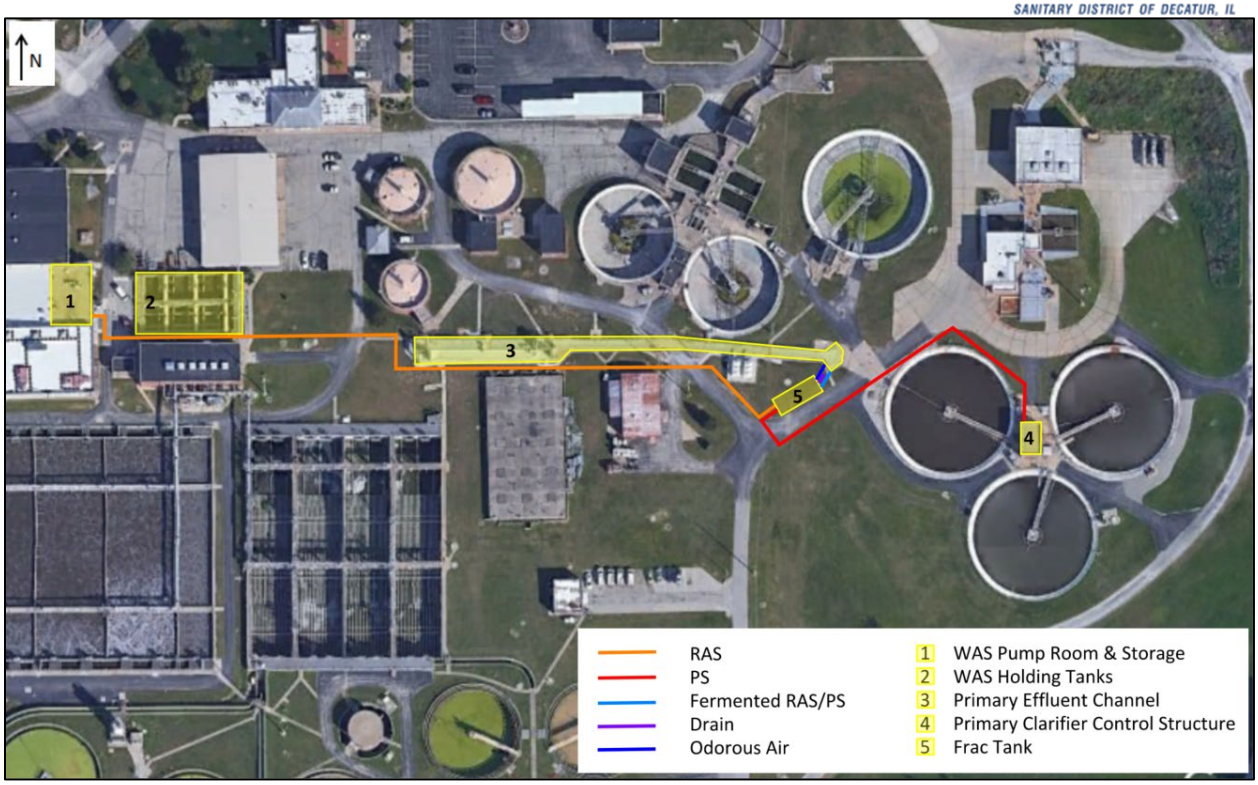

Figure 1 Preliminary Site Plan for Frac Tank Pilot Project