City of Visalia

Visalia Water Reclamation Facility

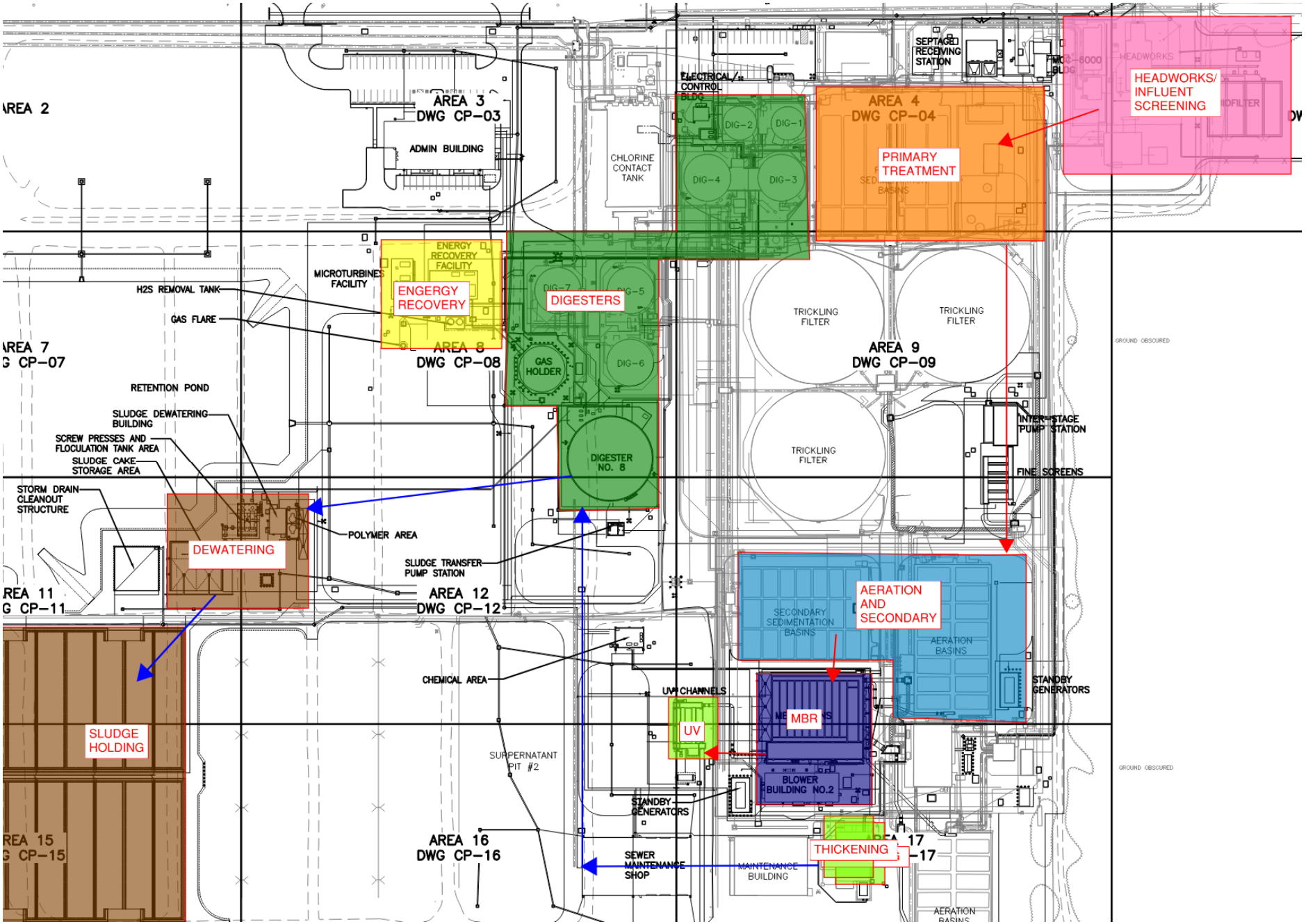
Facility Plan Update
Council Presentation

2/20/2024

carollo 90 YEARS

01 Background and Purpose

WRF Overview



Treatment Photos

Project Background and Severity

- The WRF was upgraded in 2017 due to increased regulations
- Improvements were made for a rated capacity of 22 mgd, however to save costs some improvements were not implemented leaving the total design capacity at 18 mgd.
- In recent years, increased industrial loads along with water conservation efforts have increased influent wastewater concentrations and as a result put increased strains on the facility.
- This study is an effort to update current treatment process capacities using a biological process model.

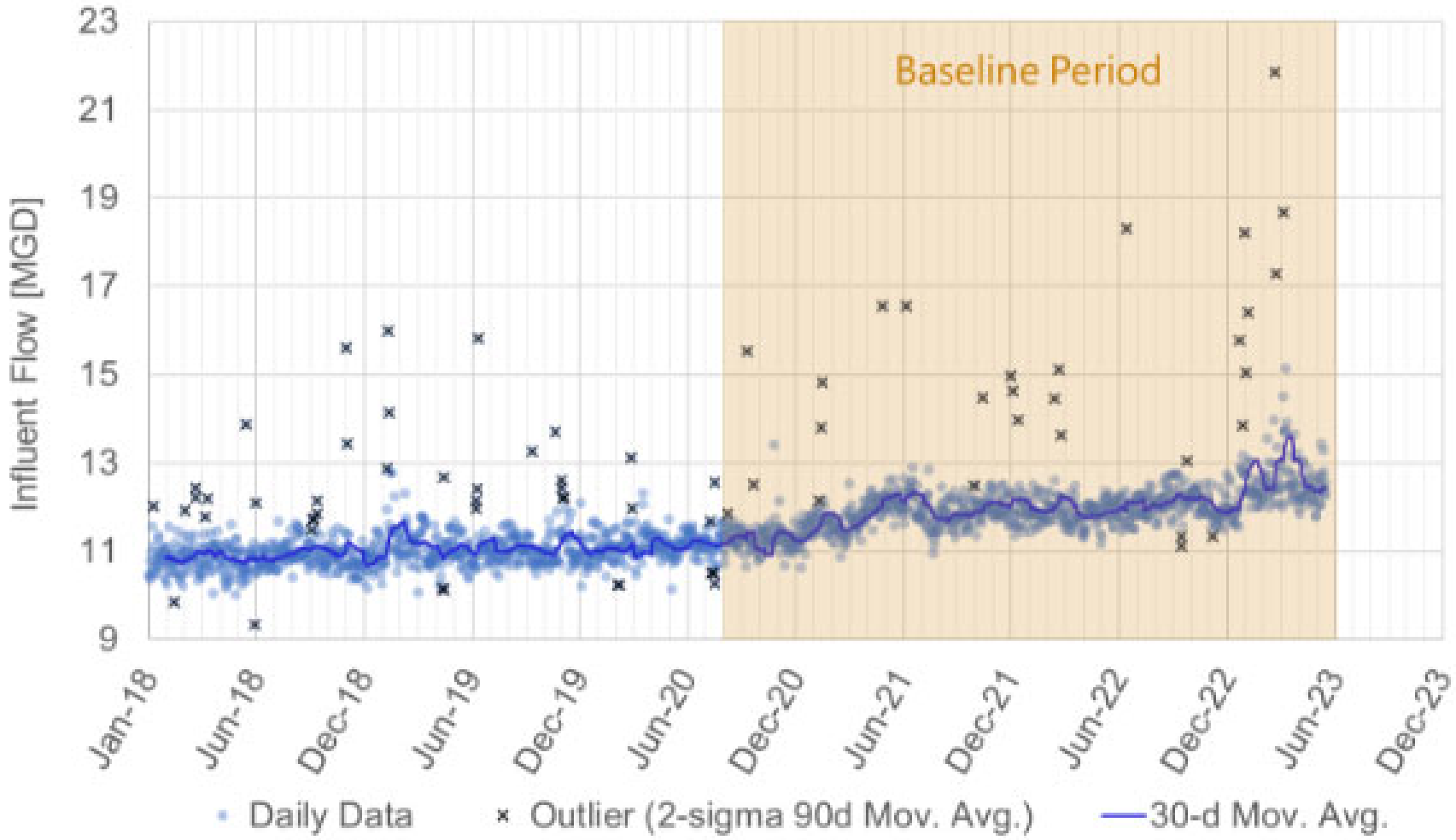
02

Treatment Process Performance

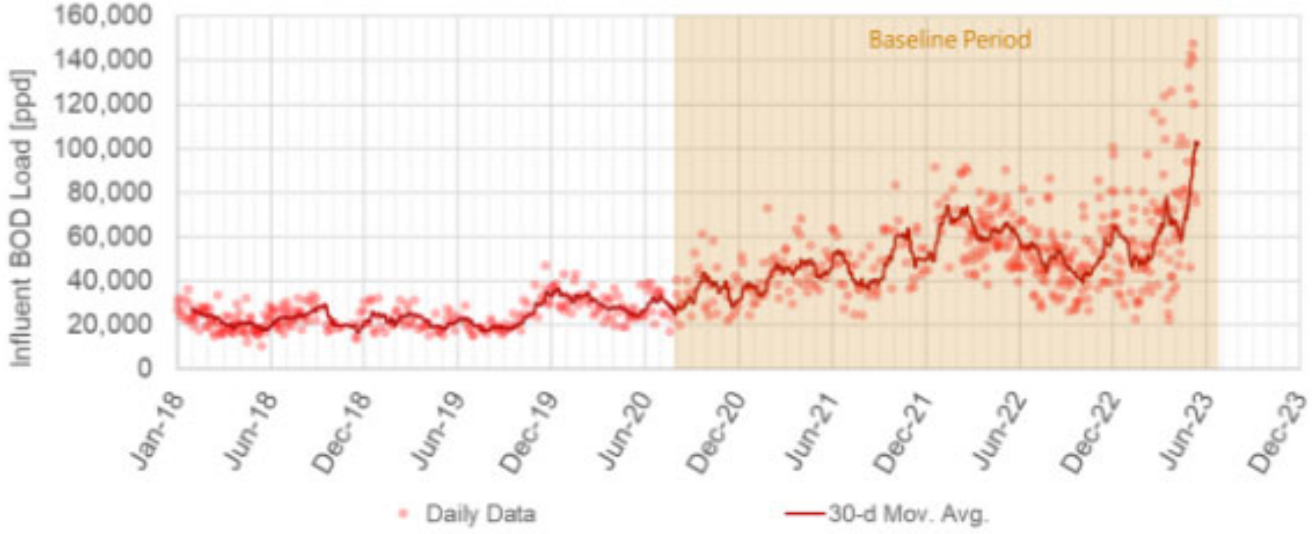
Solids Handling Facilities are Struggling

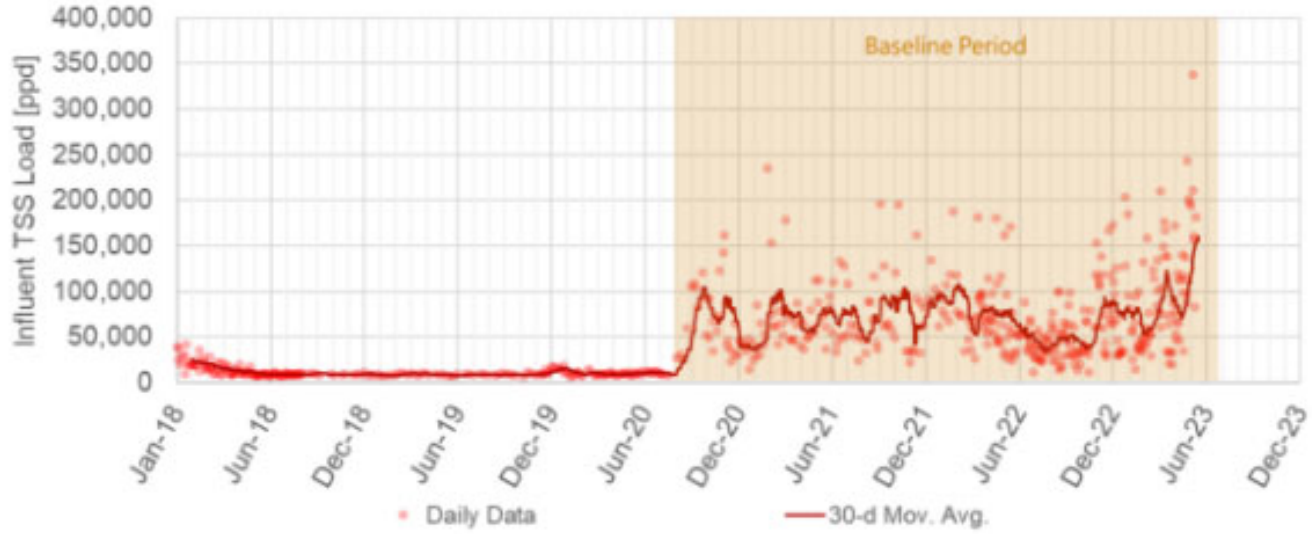
- Digesters are operating at very low HRTs and are currently being overloaded during peak loading periods
- PS and TWAS pumping is limited to 2-3%, which exacerbates HRT limitation
- Digesters are overloaded with Grit causing reduced volume (est 20% by volume filled)
- City does not have sufficient redundancy with dewatering equipment due to no standby dewatering screw press

Historical Influent Data

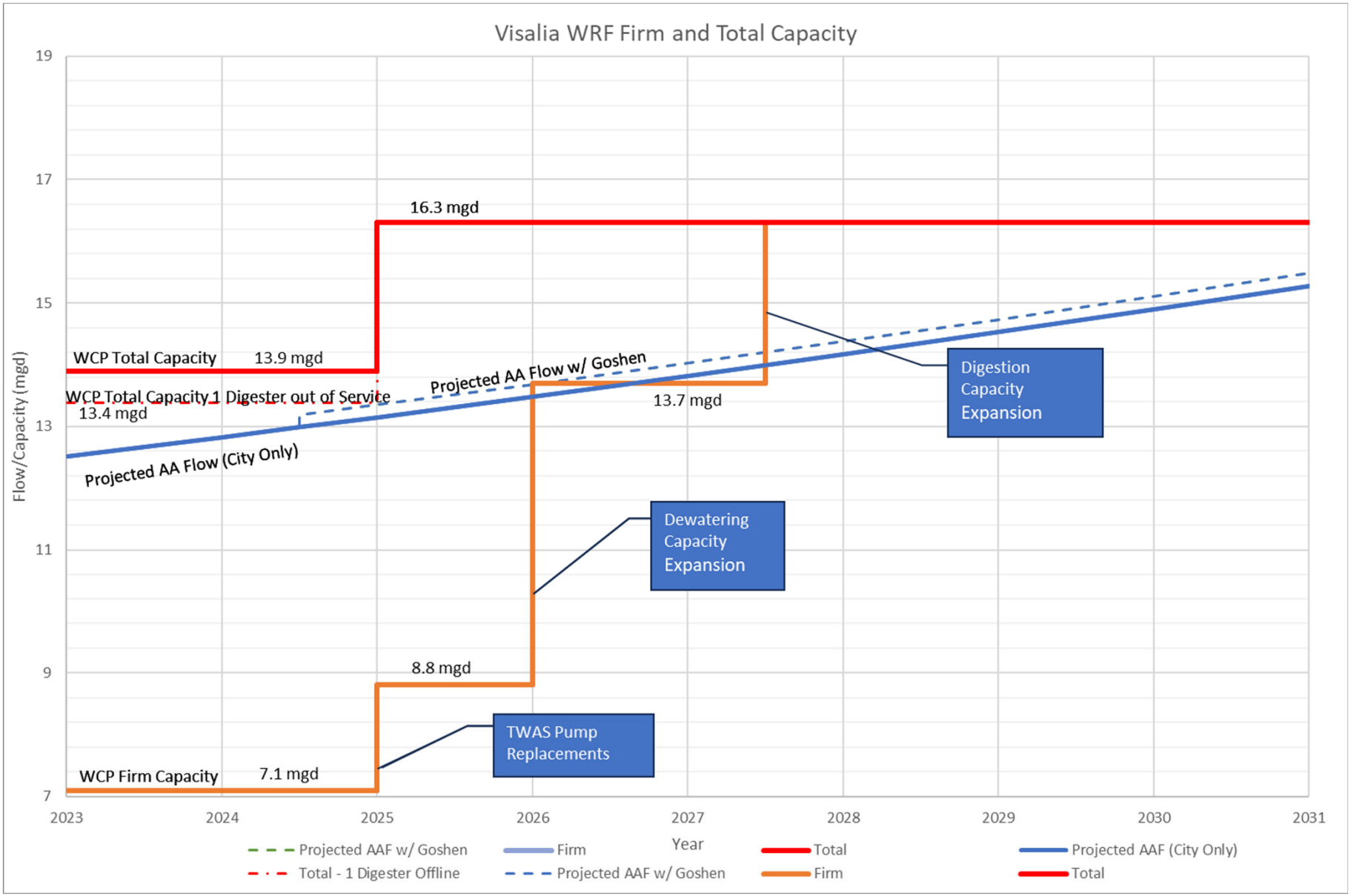


Biological Oxygen Demand and Total Suspended Solids Loadings

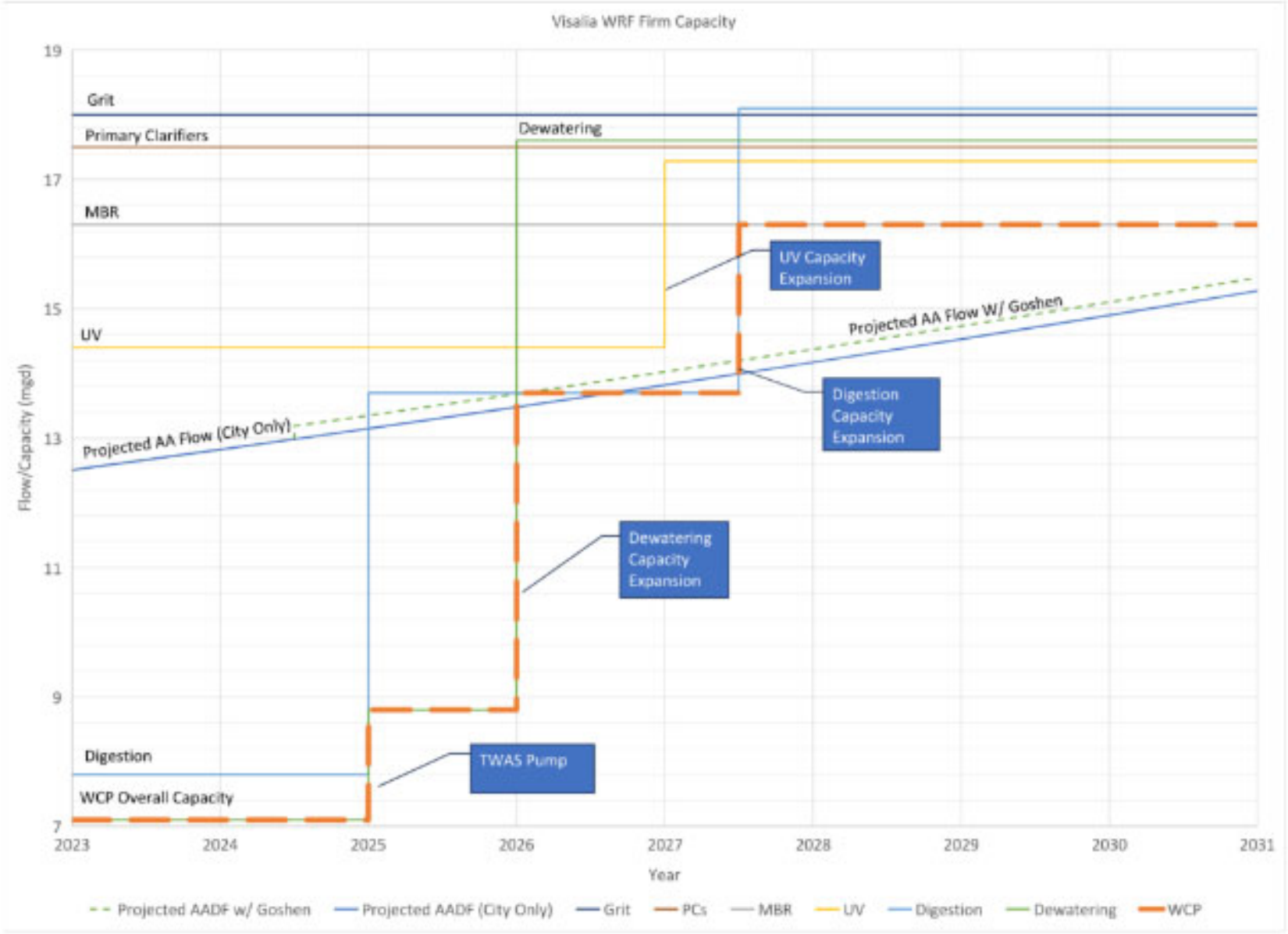




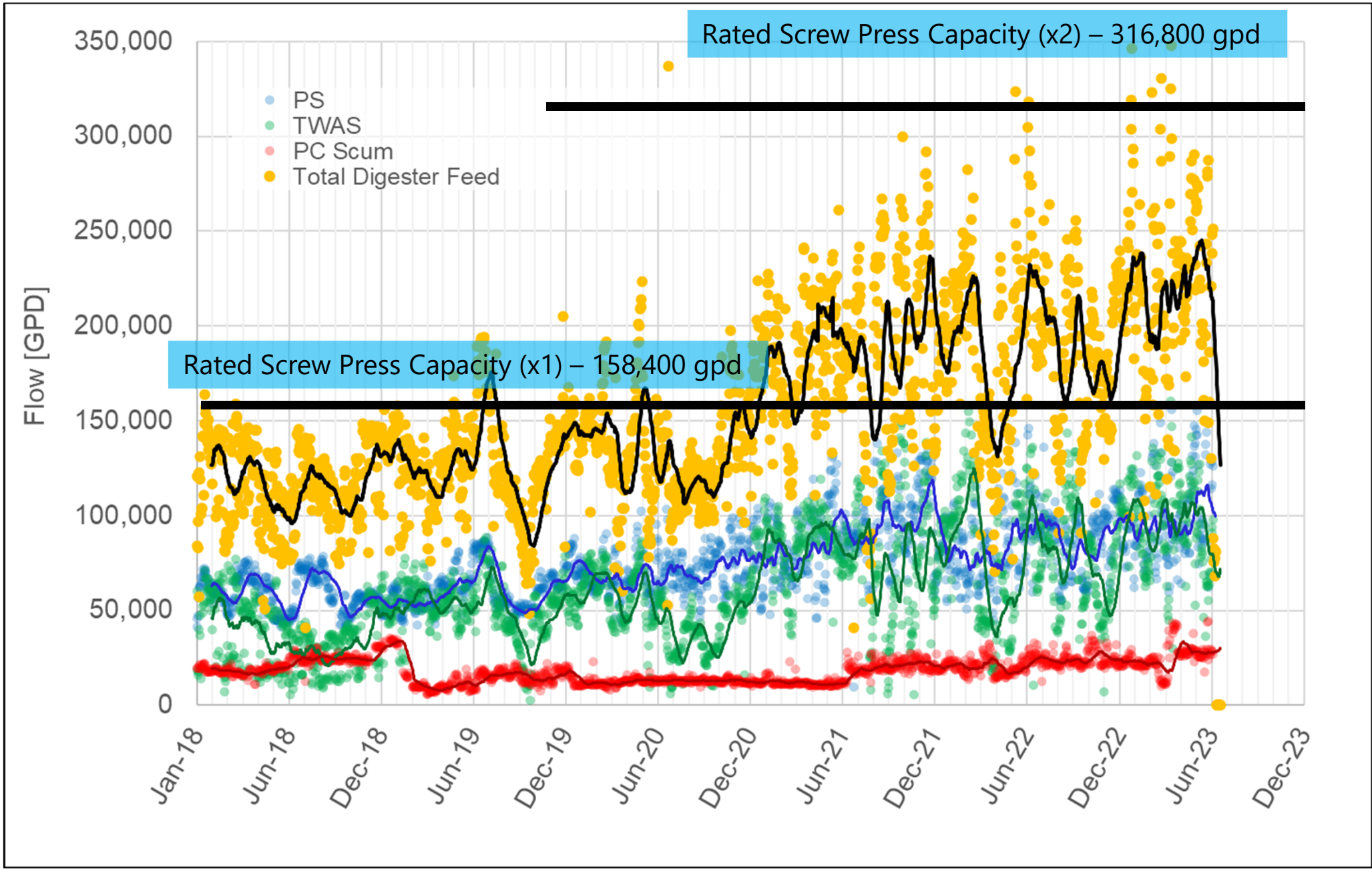
Capacity/Firm Capacity Analysis



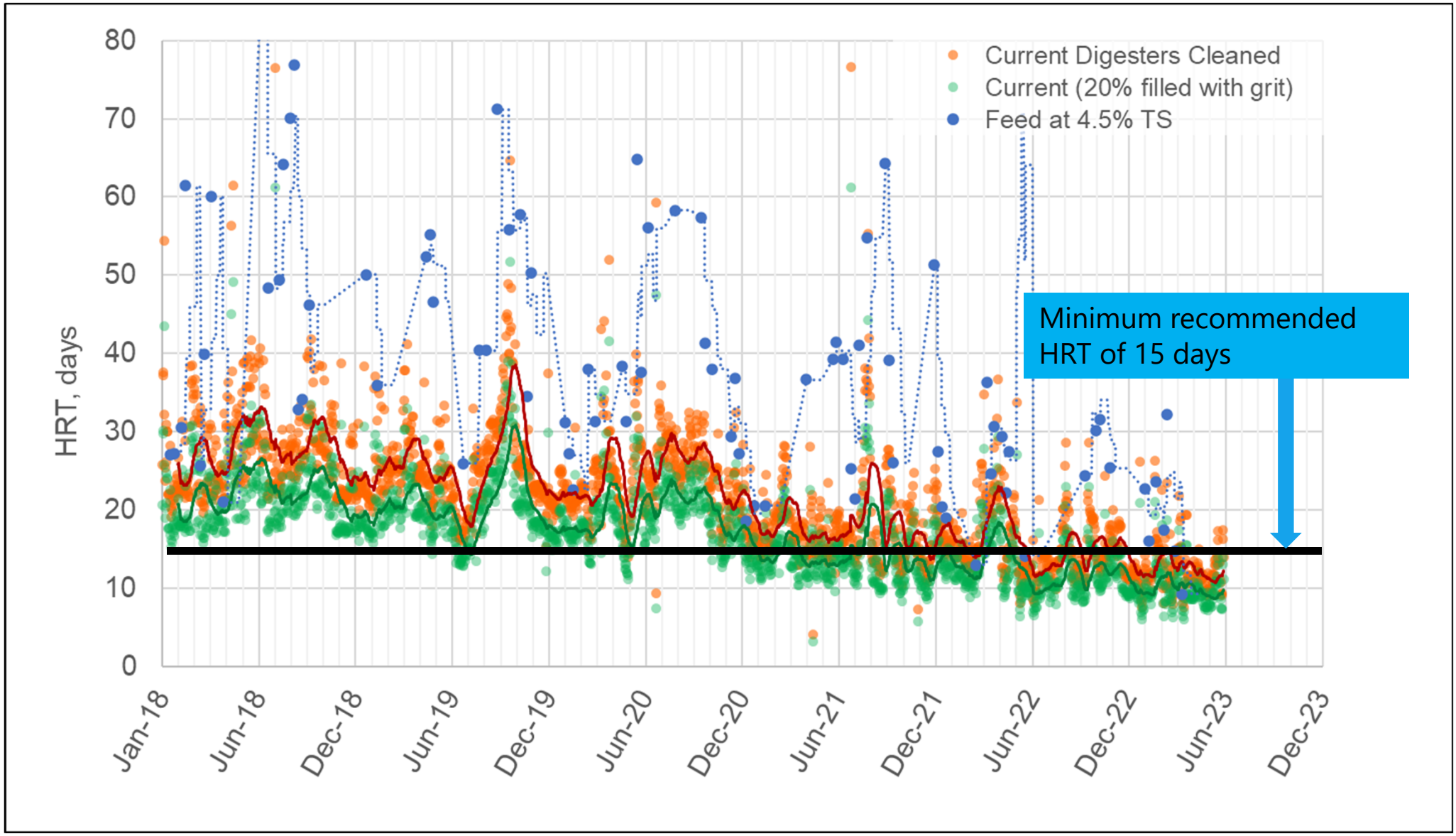
Process Area Capacity



Sludge Flows & Dewatering Capacity



Impact of higher feed concentration (4.5%) on Digester SRT



03

Condition Assessment

Condition Assessment Findings

- In general the equipment at the WRF is in good condition
- There were significant upgrades in the last improvement project and all of this equipment is in good condition
- The following areas need some attention:
  - Headworks
  - Digesters
  - Sludge Drying beds
  - Misc. piping/pumps/valves

Site Photos

04

Environmental Opportunities

Environmental Opportunities

- Engine Generators
- Microturbines
- Gas Turbines
- Fuel Cells
- RNG to Pipeline Injection
- R-CNG to Vehicle Fuel

05

Near-Term Improvements

Near-term capacity related projects

- Now:
  - Replace PS and TWAS pumps to allow thickening of the sludge more
    - Goal: 3% PS and 6% TWAS
  - Add one screw press for firm capacity/redundancy
  - Add one digester with same capacity as Digester No. 8
  - Add additional UV Bank to provide firm capacity/redundancy

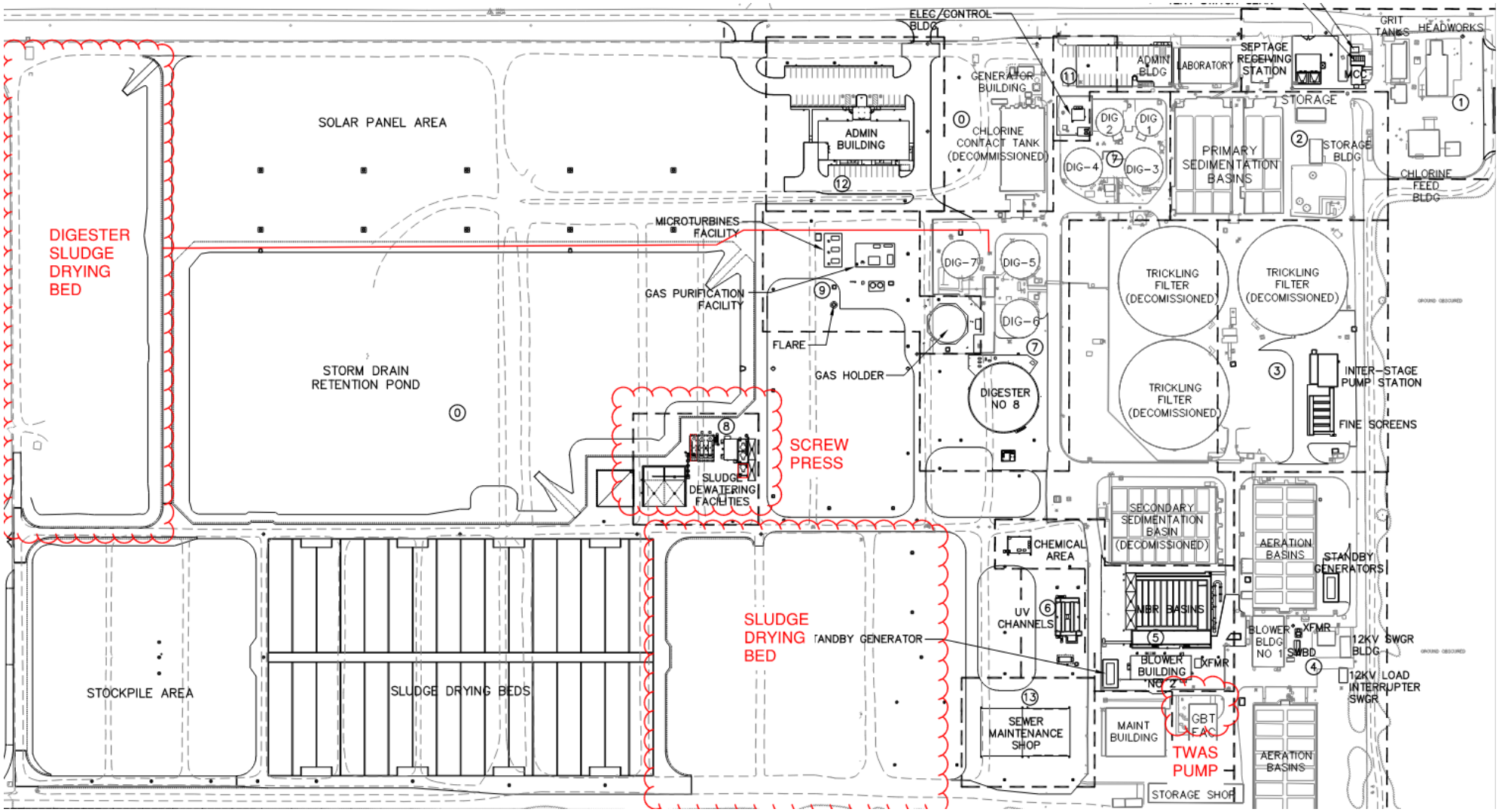
06

Summary and Recommendations

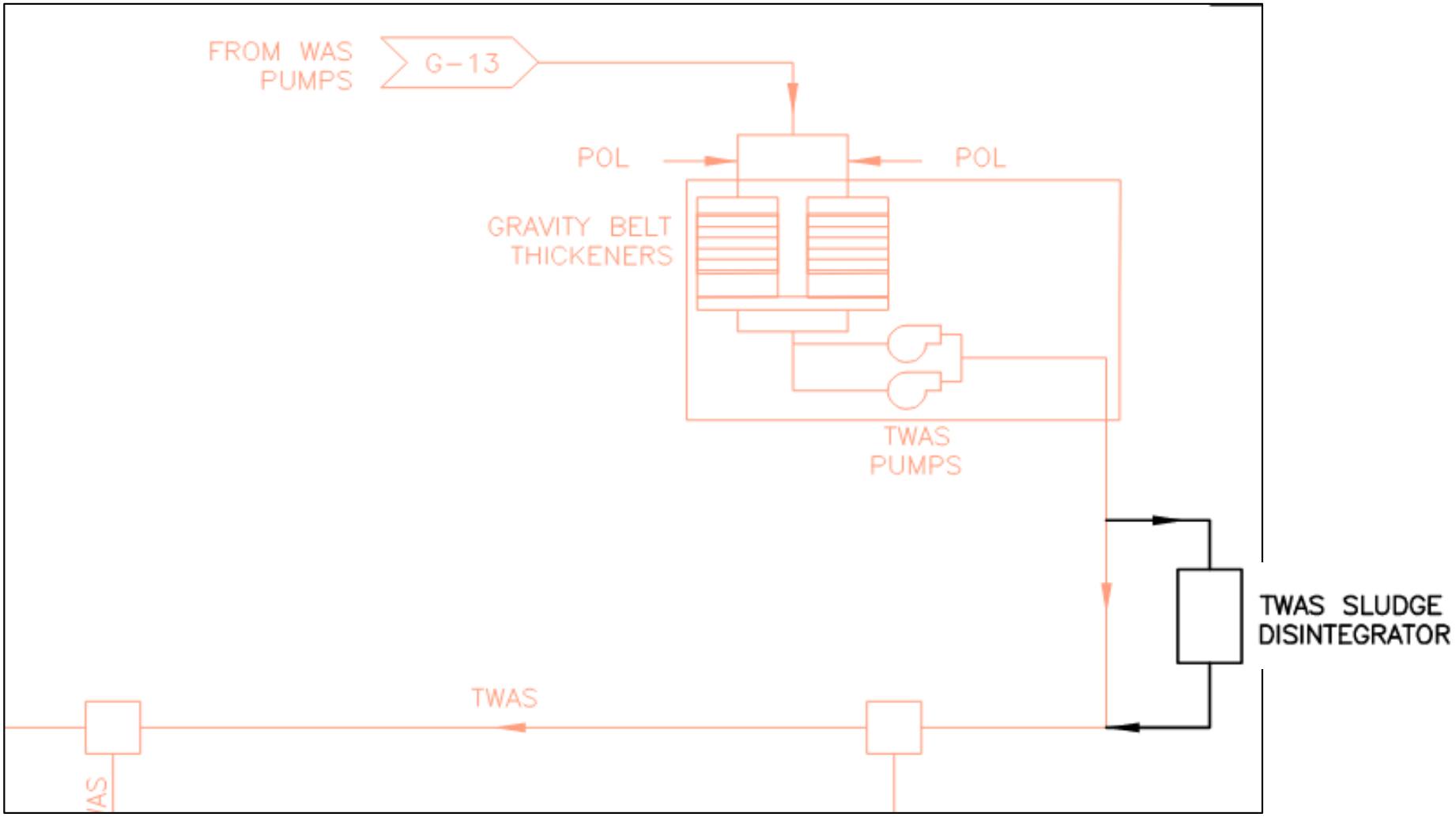
Immediate Recommendations for Digesters

- Place Dig No. 4 back in service (waiting on piping)
- Continue tracking digester health parameters and develop response plan for early signs of failure
- Clean/de-grit digesters that have not been cleaned recently (i.e. last 2-4 years)
- PS and TWAS pumping modifications and/or replace discharge piping
- Re-purpose Dig #8 as a primary digester (Currently used as 70% storage)
- Additional digester volume likely needed to accommodate future growth to buildout

Solids Handling Improvements

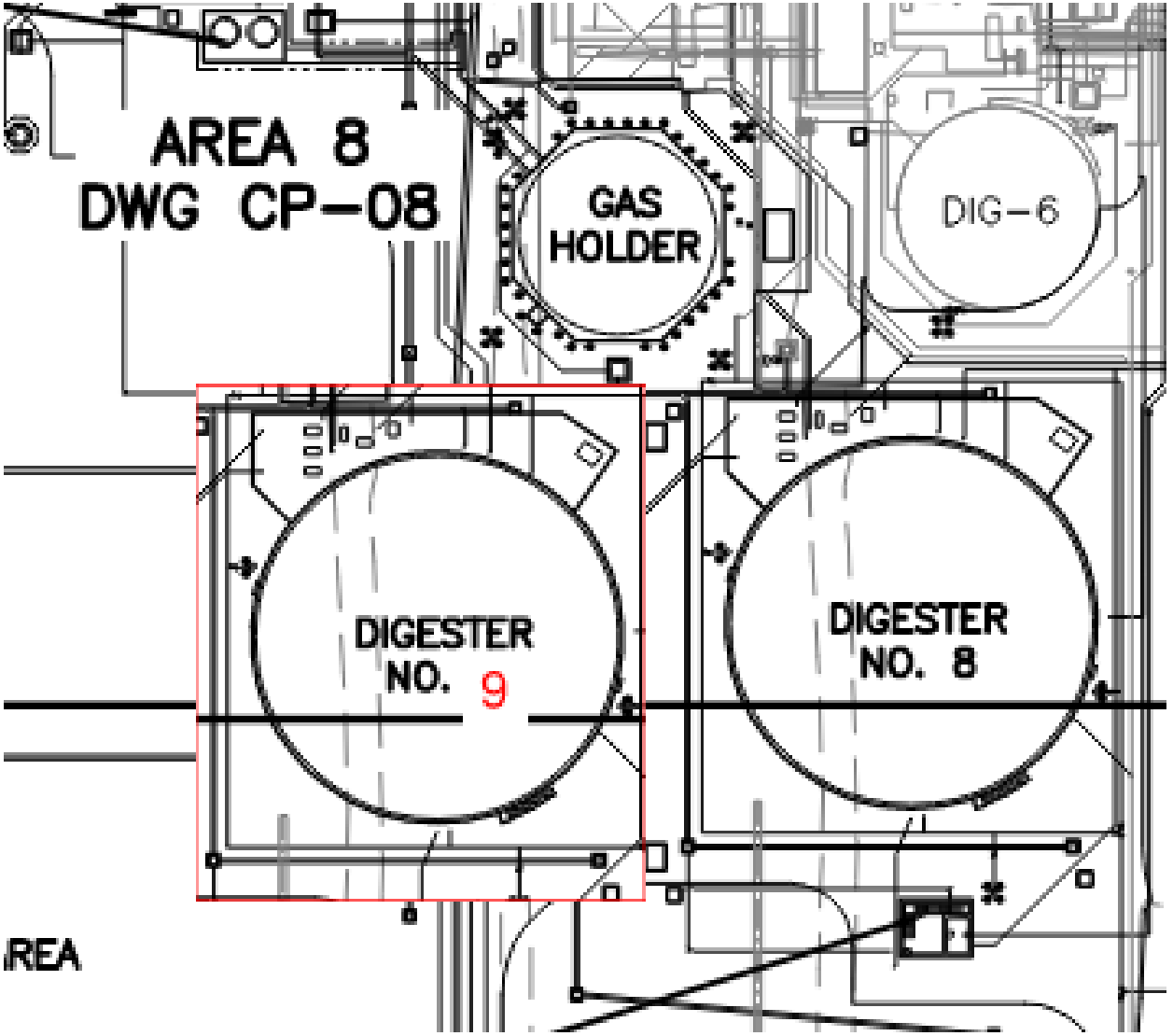


TWAS Pumps



TWAS Pump Station Upgrades

Digester Upgrades



Digester Upgrades

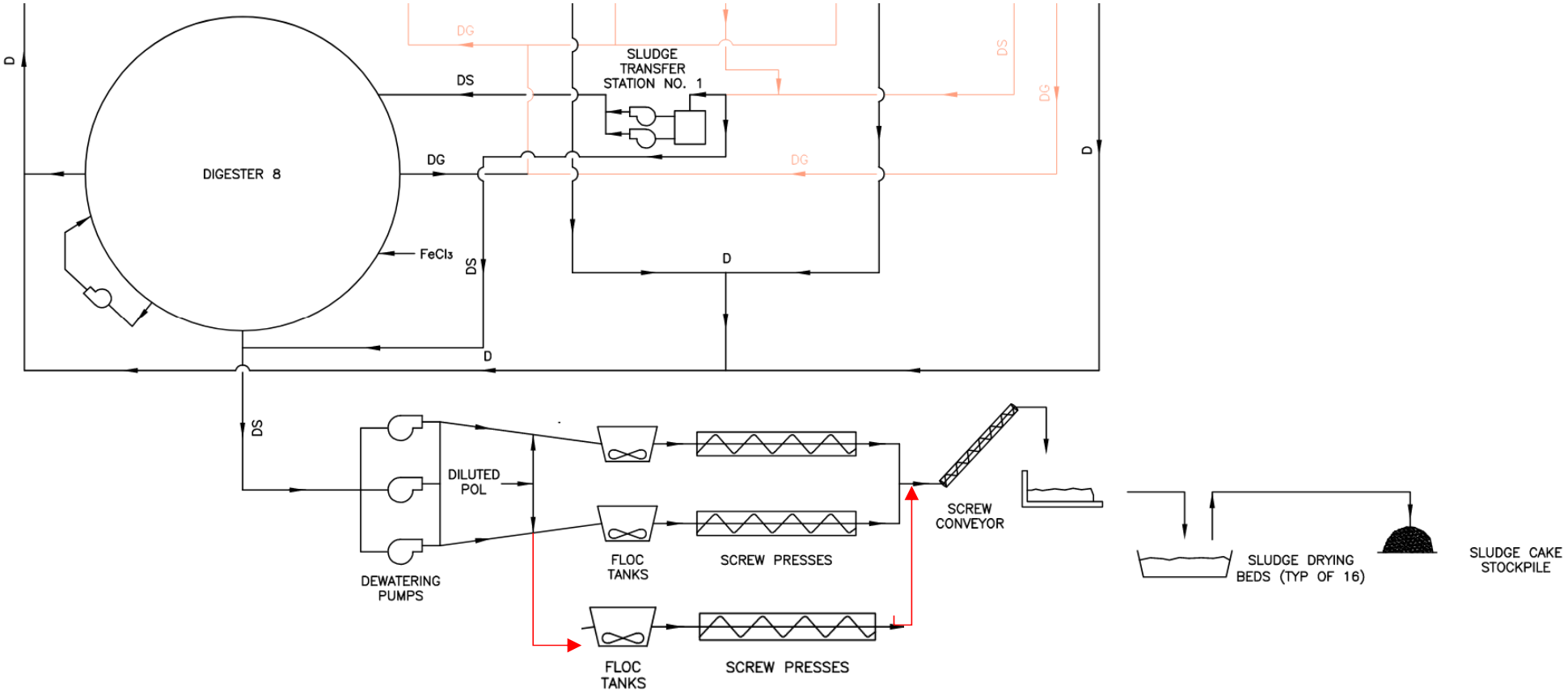
Near Term Dewatering Recommendations

- Additional dewatering unit needed to provide redundancy/standby
- Provide additional drying beds and sludge storage if dewatering maintenance or down time is experienced

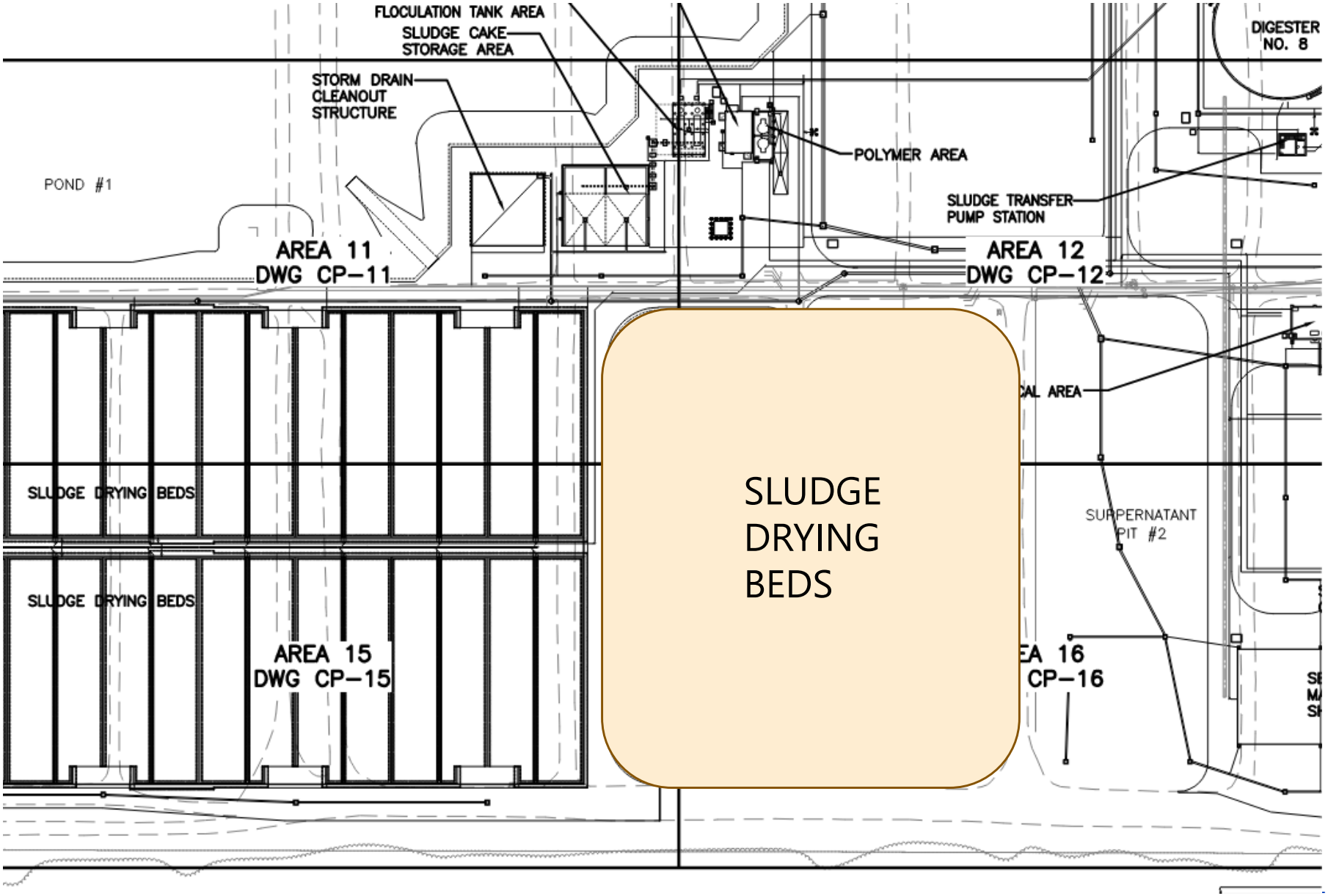
Dewatering Unit

- Add photo

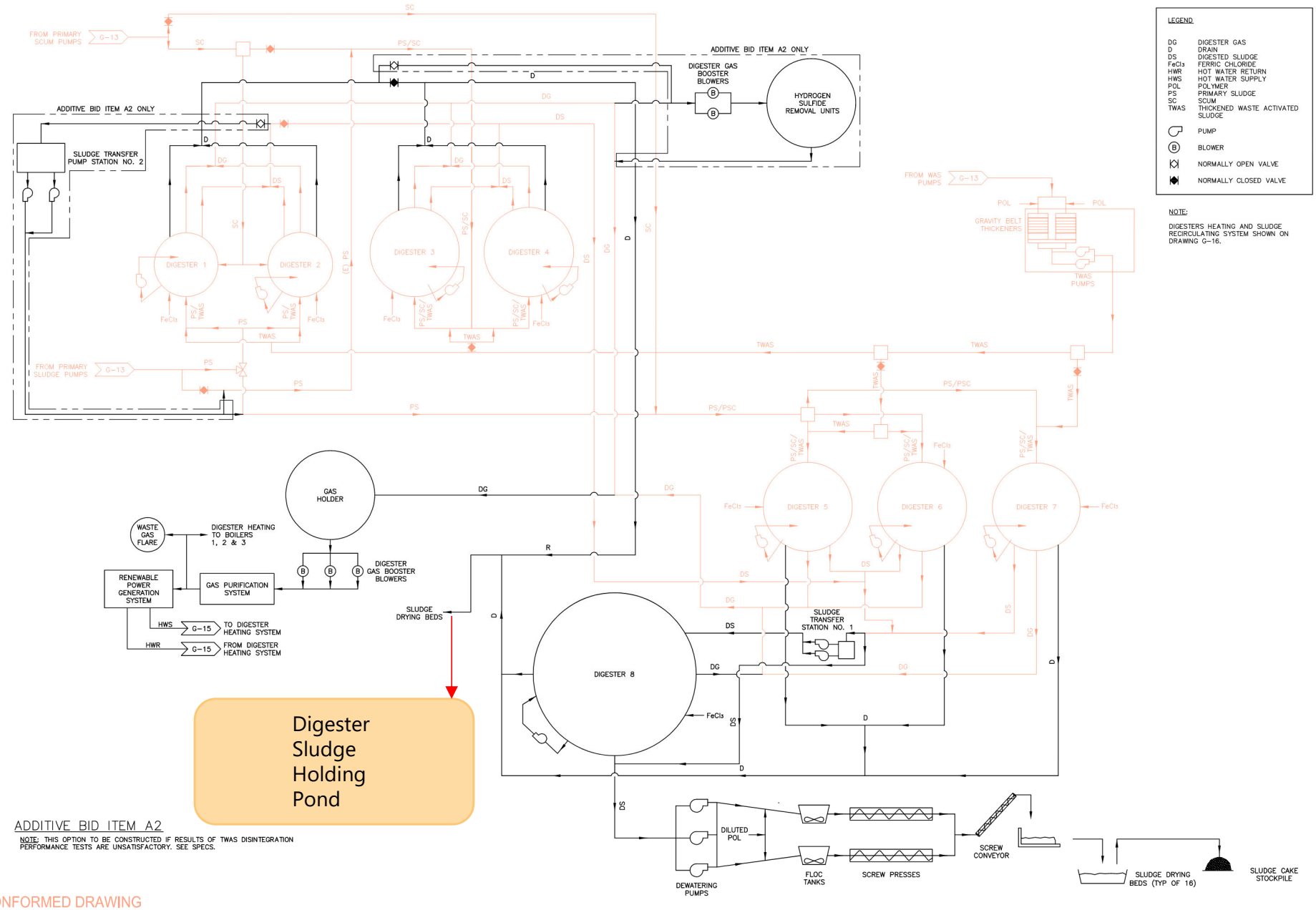
Screw Press


DG
SLUDGE
TRANSFER
STATION NO. 1
DS
DG
DS
DG
D
DIGESTER 8
DG
DG
FeCl3
DS
D
D
DS
DILUTED
POL
SCREW
CONVEYOR
FLOC
TANKS
SCREW PRESSES
DEWATERING
PUMPS
SLUDGE DRYING
BEDS (TYP OF 16)
SLUDGE CAKE
STOCKPILE
FLOC
TANKS
SCREW PRESSES

Sludge Drying Beds

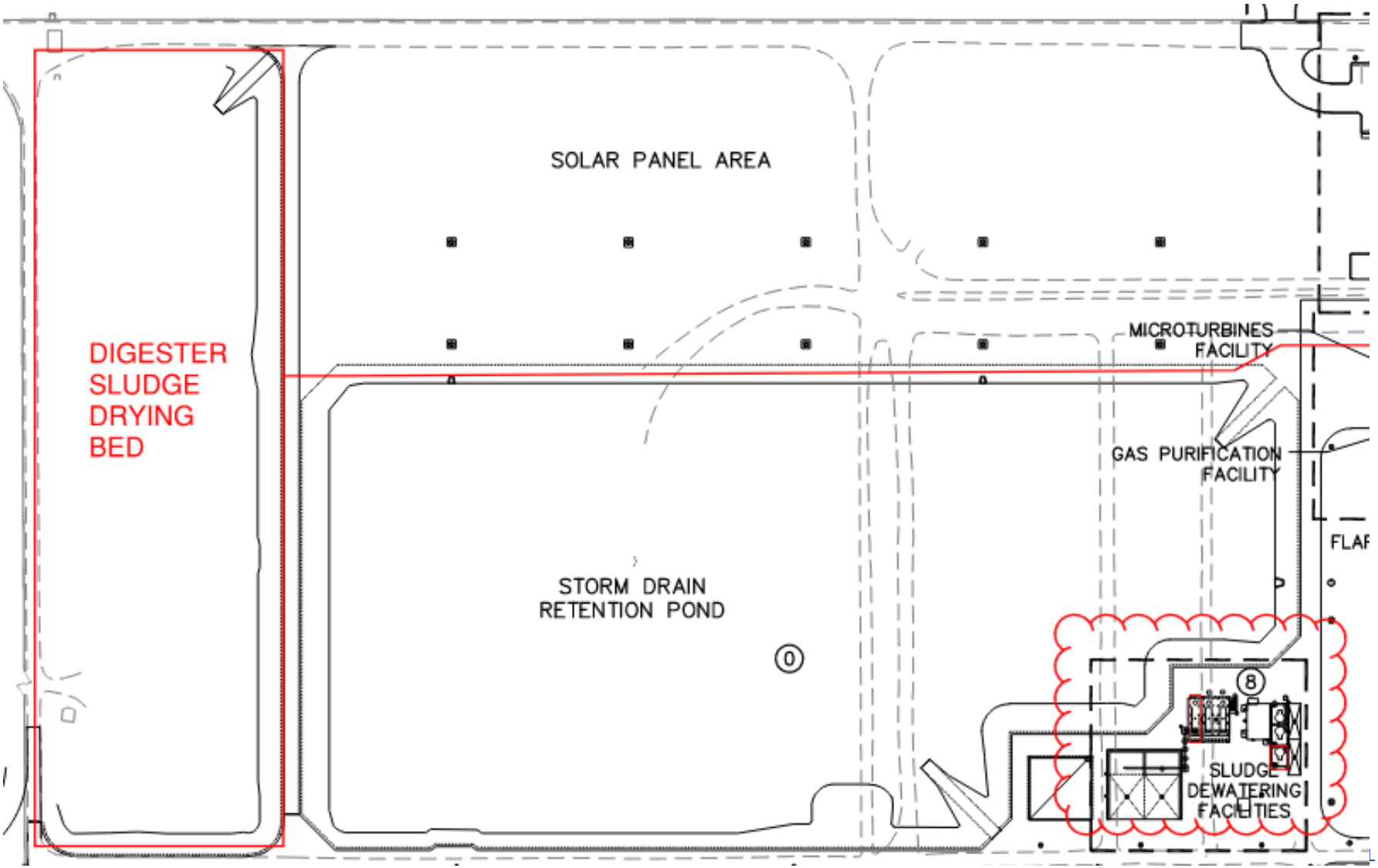


Digester Sludge Holding Pond



CONFORMED DRAWING

Digester Sludge Holding Pond



Near Term UV Recommendations

- Additional UV bank unit needed to provide redundancy/standby