

BIOSOLIDS ENHANCEMENTS AT THE DOS RIOS WRC – SLUDGE BLEND TANKS AND CENTRIFUGES

Garrett Kehoe, P.E.

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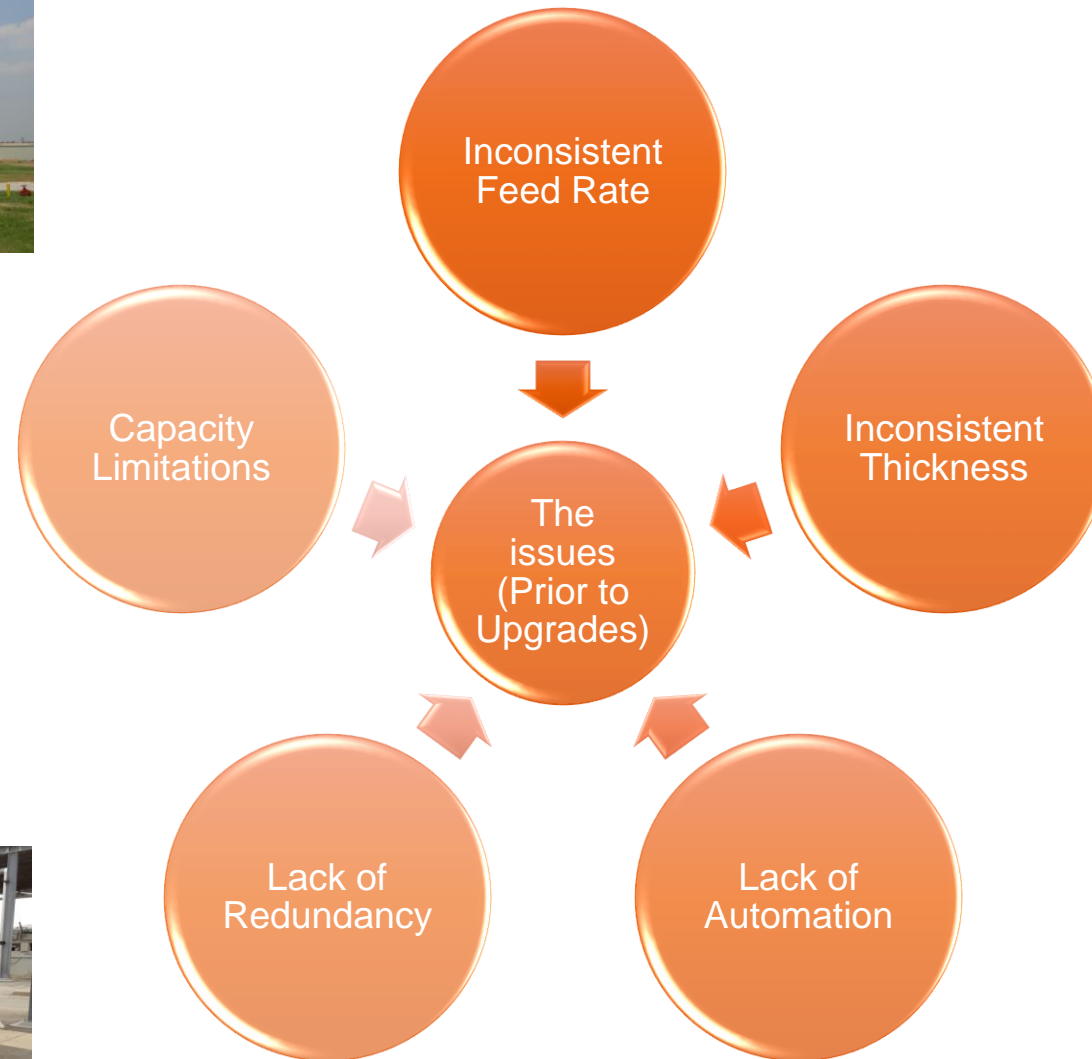
Agenda

- Background
- Issues
- Phased Solution Approach
 - Phase I – Sludge Blend Tank Improvements
 - Phase II – Thickening Centrifuges
- Lessons Learned and Implemented

Background

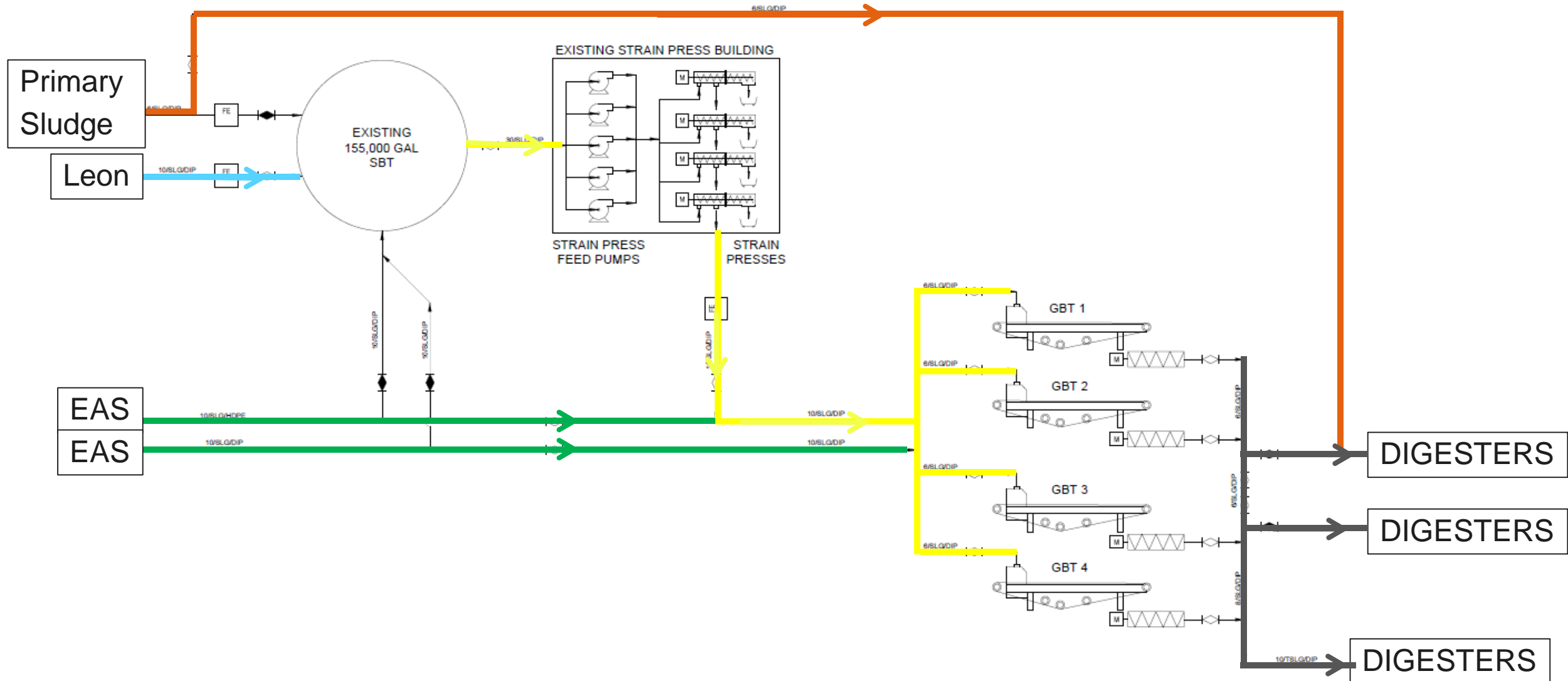
- 1984/85 – Dissolved Air Flotation Thickening
- 2006- Gravity Belt Thickeners 1 & 2
- 2009 – Gravity Belt Thickeners 3 & 4
- Dos Rios WRC Sludge consists of:
 - Excess Activated Sludge (WAS)
 - Dos Rios Primary Sludge
 - Leon Creek Sludge (Primary + WAS)





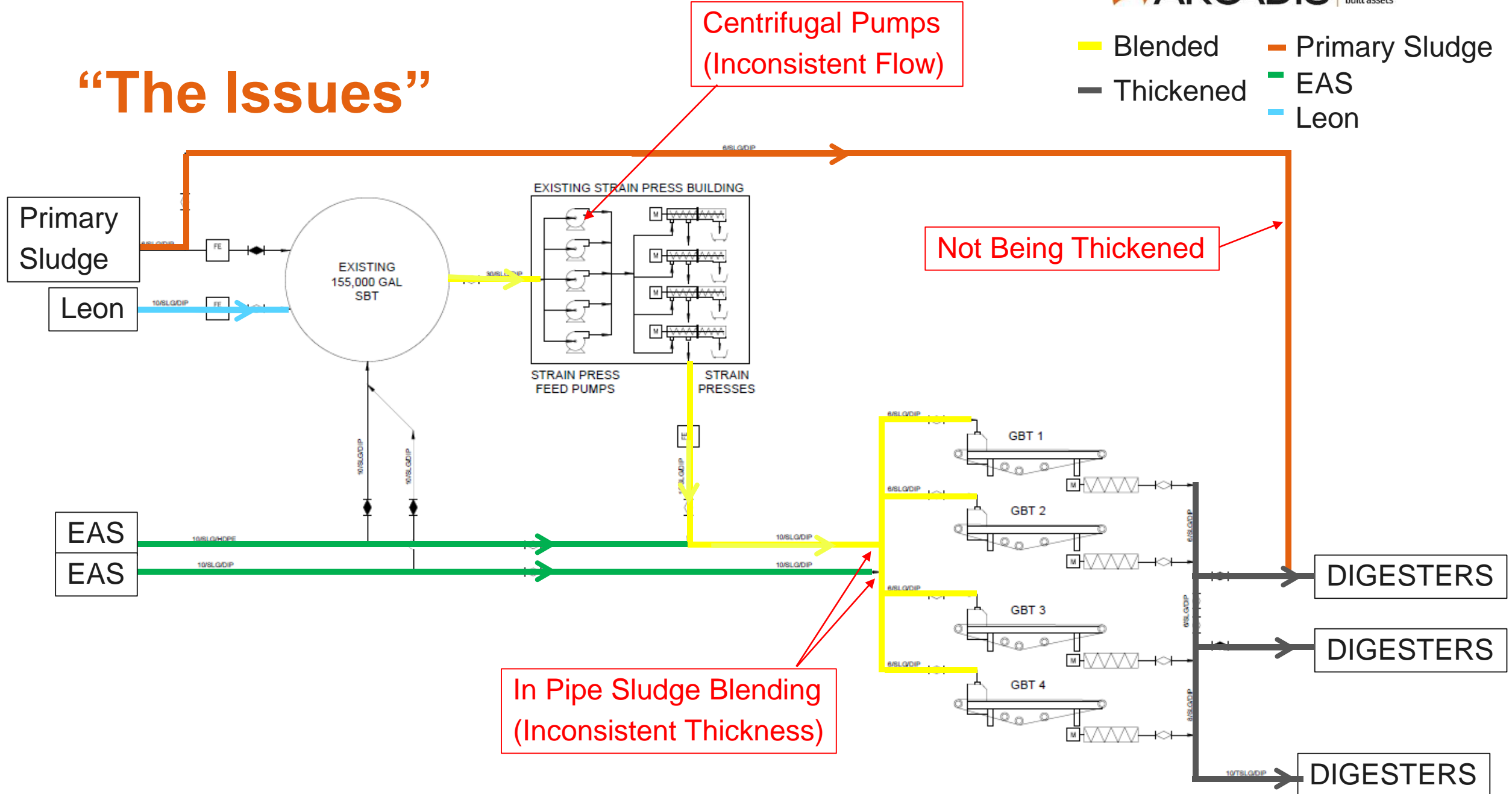
Existing System

- Blended
- Primary Sludge
- Thickened
- EAS
- Leon



“The Issues”

- Blended
- Primary Sludge
- Thickened
- EAS
- Leon



Centrifugal Pumps
(Inconsistent Flow)

Not Being Thickened

In Pipe Sludge Blending
(Inconsistent Thickness)

Phased Approach

Phase I – Sludge Blending Tank

- Fix consistency of flow and thickness
- Increase operational flexibility

Phase II – Centrifuges

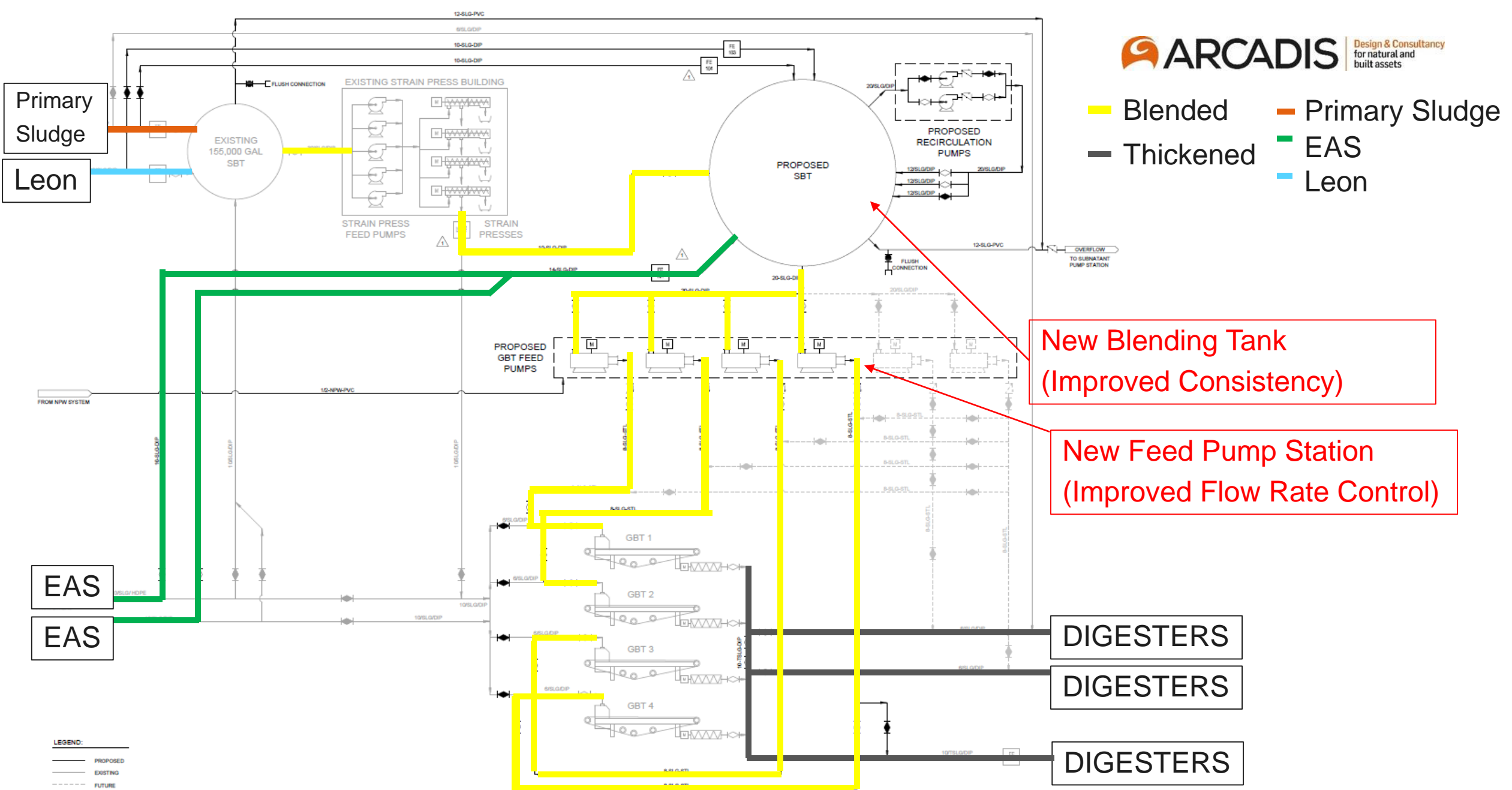
- Add redundancy
- Add capacity
- Automation
- Reduce Operational Costs



Phase I – Sludge Blend Tank

- ❖ New Gravity Belt Thickeners Feed Pump Station
- ❖ New Recirculation Pump Station
- ❖ New Blending Tank
- ❖ Overflow Protection
- ❖ Bypasses for Operational Flexibility





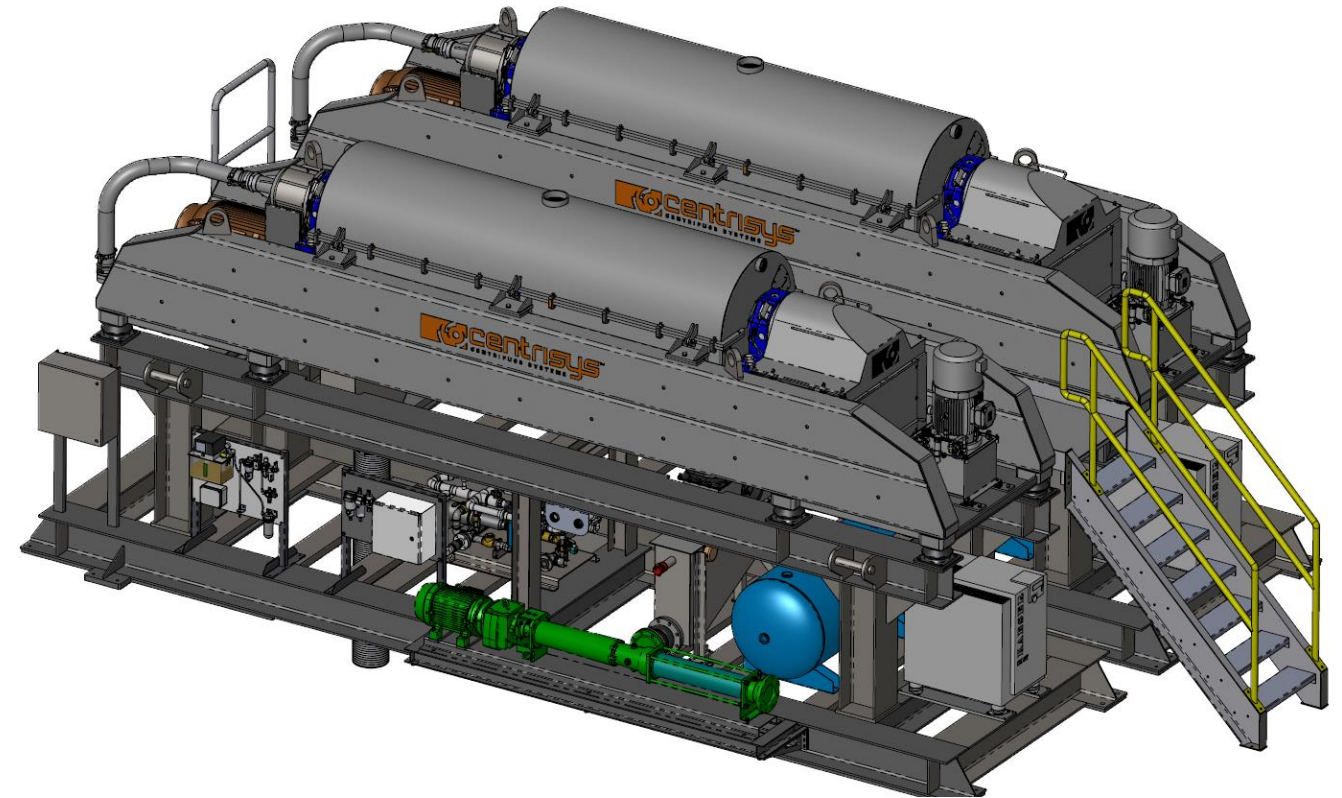
Proposed System

Completion Pictures



Phase II

- Two new Centrifuges
- New Polymer System
- New Centrate Pump Stations
- Automation
- Facilities for Future Centrifuges



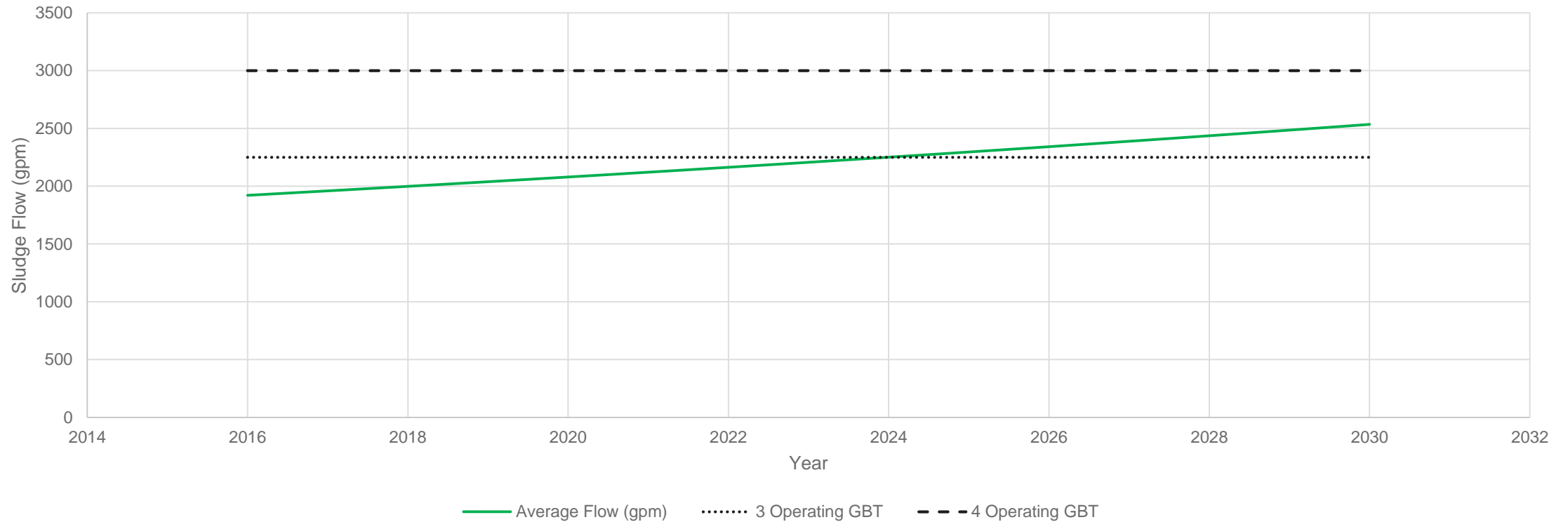
Capacity Evaluation

- Solids Loading Capacity vs Flow Capacity
- Thickening equipment needs to be evaluated for both



Phase II – Sludge Flows

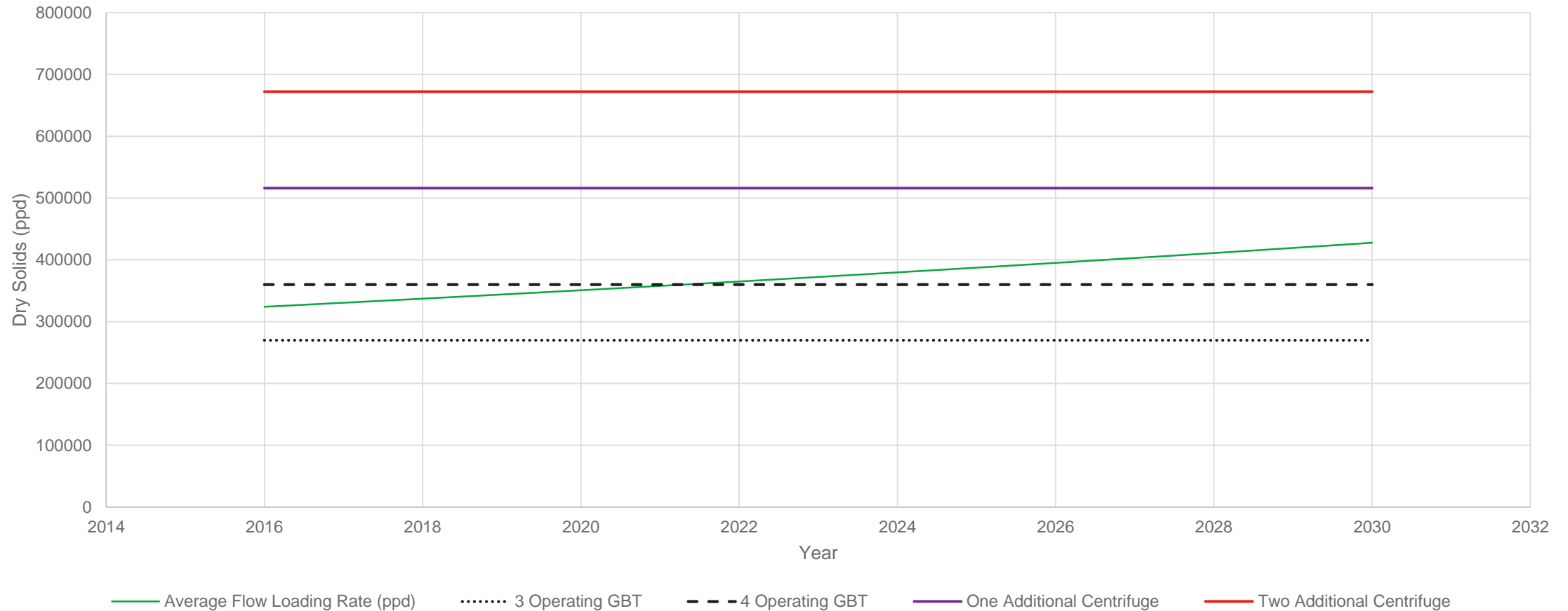
2% Growth Sludge Flow



GBT's @ 750 gpm each

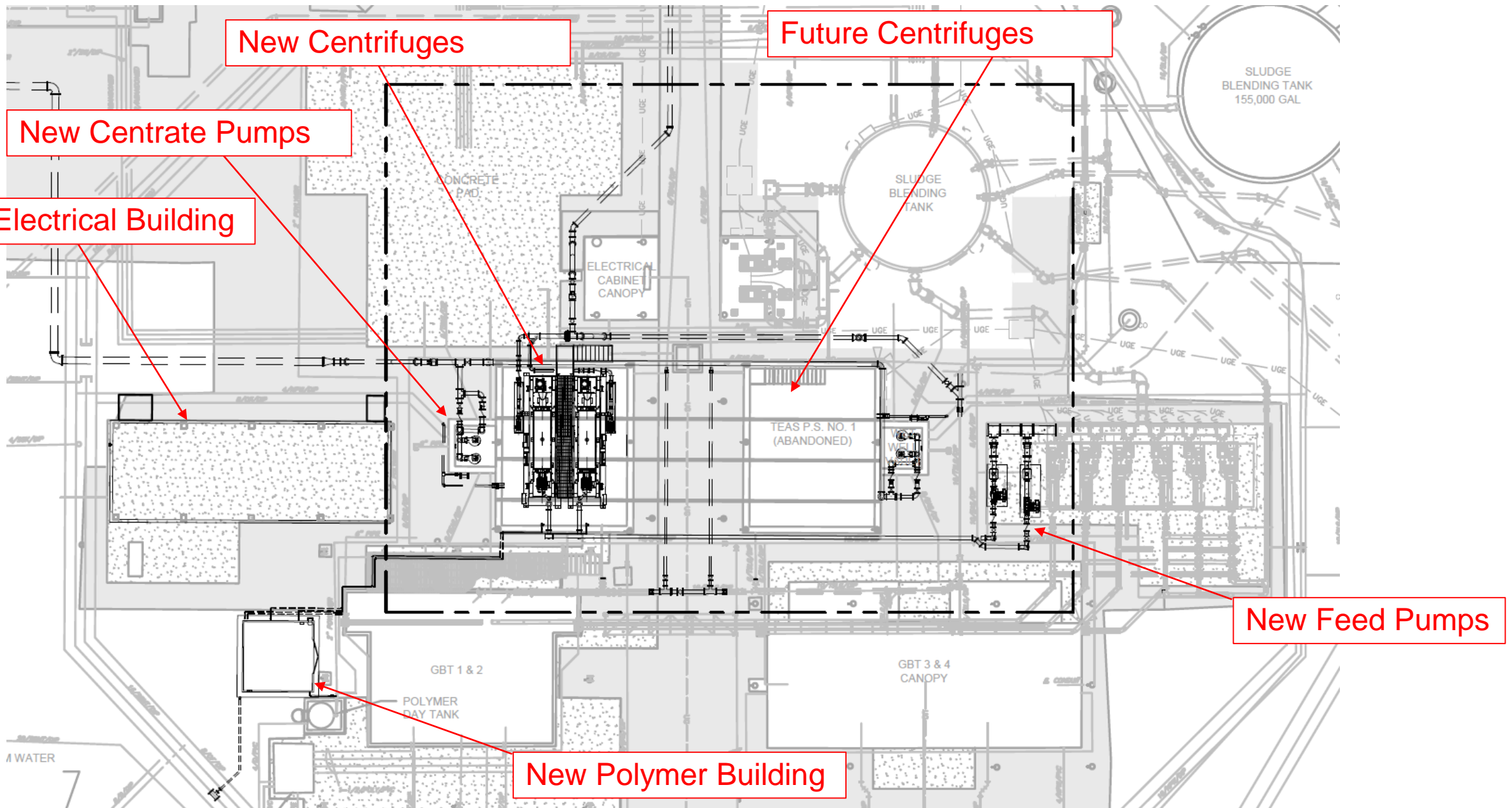
Phase II - Solids Thickening Needs

2% Growth Solids Handling Capabilities



GBT's @ 3750 lb/hr | Centrifuge @ 6500 lb/hr

Phase II



Ongoing Construction



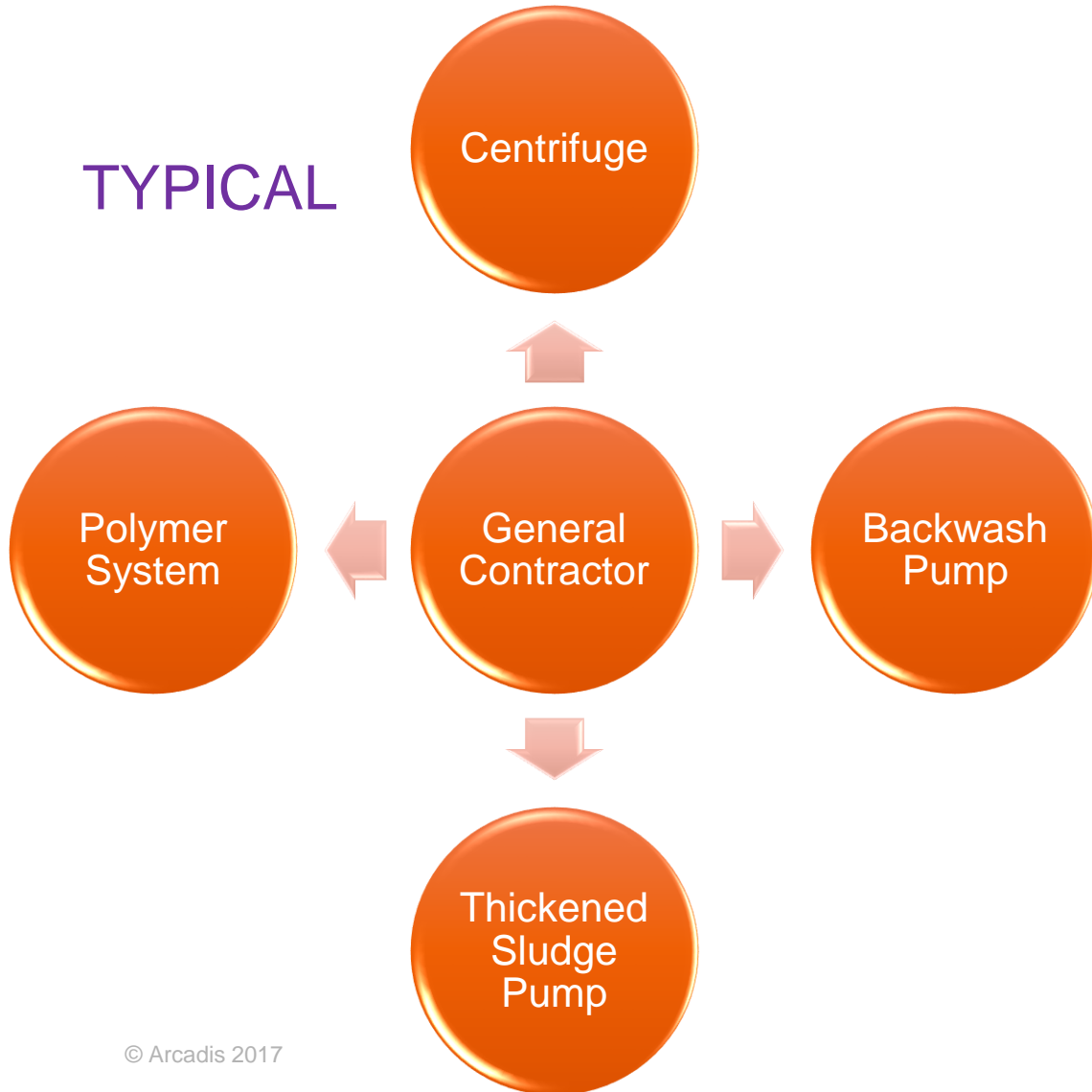
Ongoing Construction



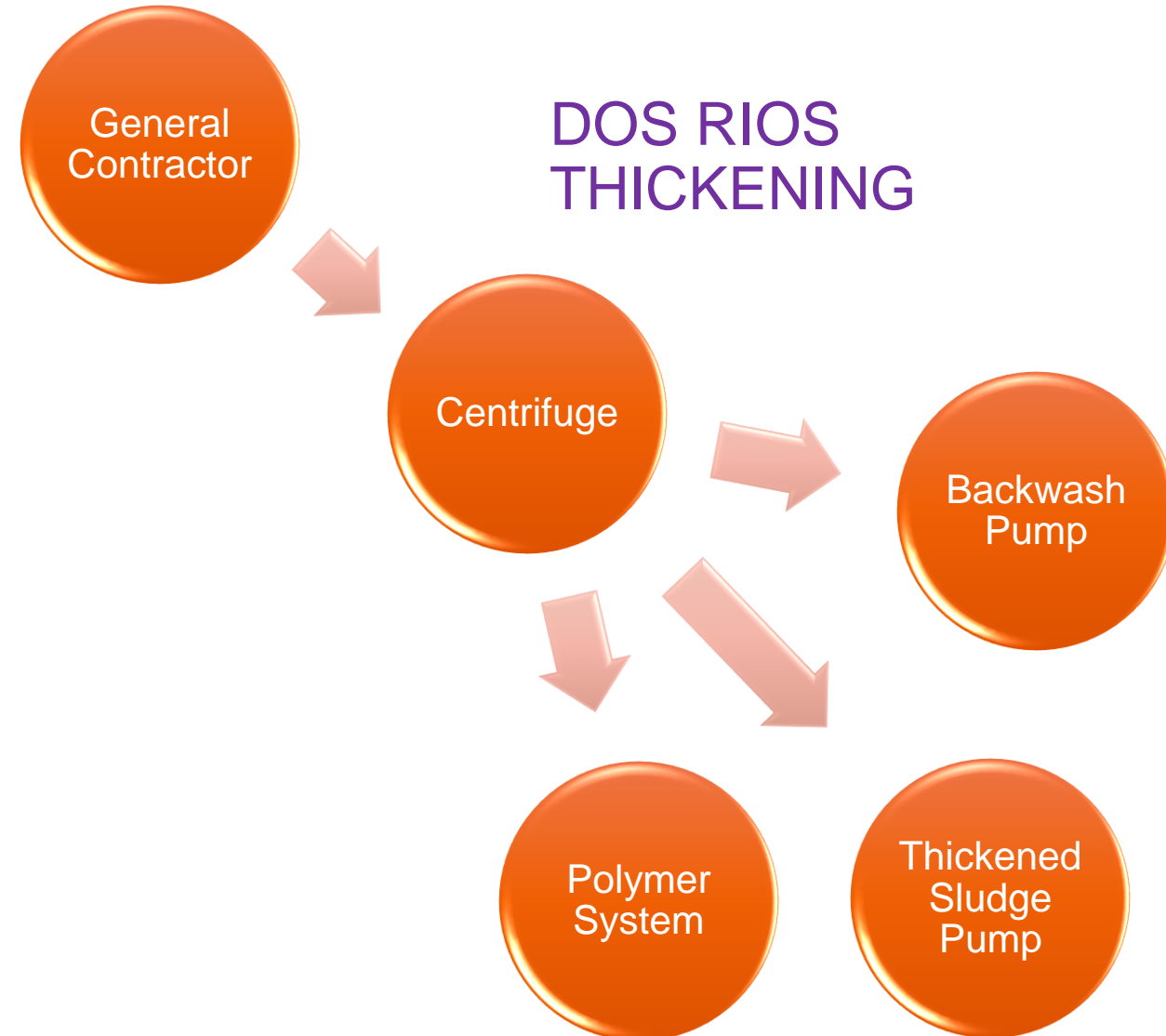
Lessons Learned

Scoping/Procurement Differences

TYPICAL

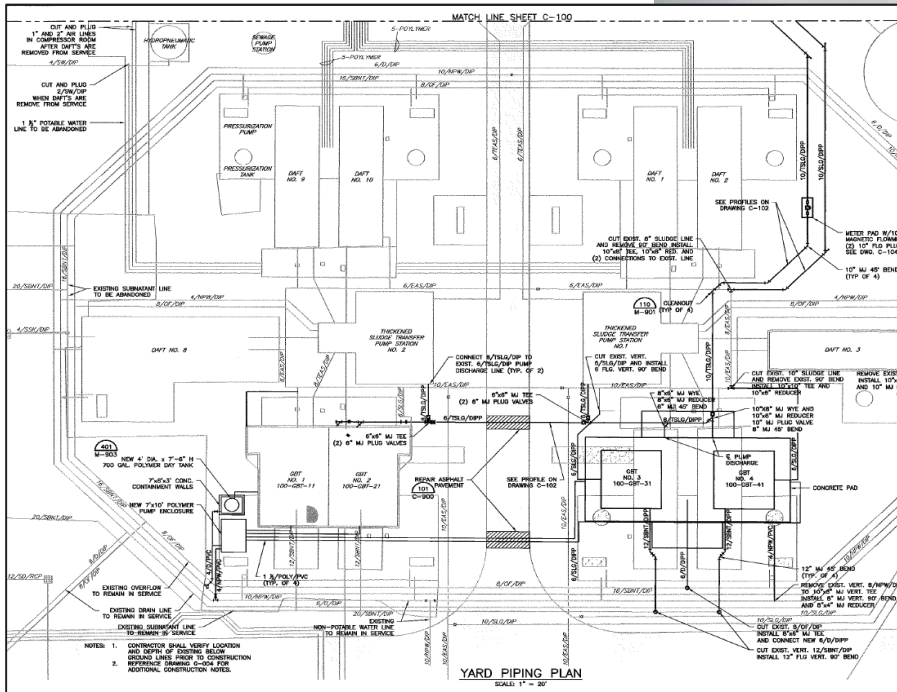


DOS RIOS THICKENING



Lessons Learned

- Available underground space extremely limited
- Exposed piping can be your friend



Lessons Learned

- I&C Workshops, I&C Workshops, I&C Workshops...
- 3 Instrumentation and controls workshops during design
- 1 Network workshop during construction
- 1 Control panel workshop during construction
- 1 Graphics workshop during construction

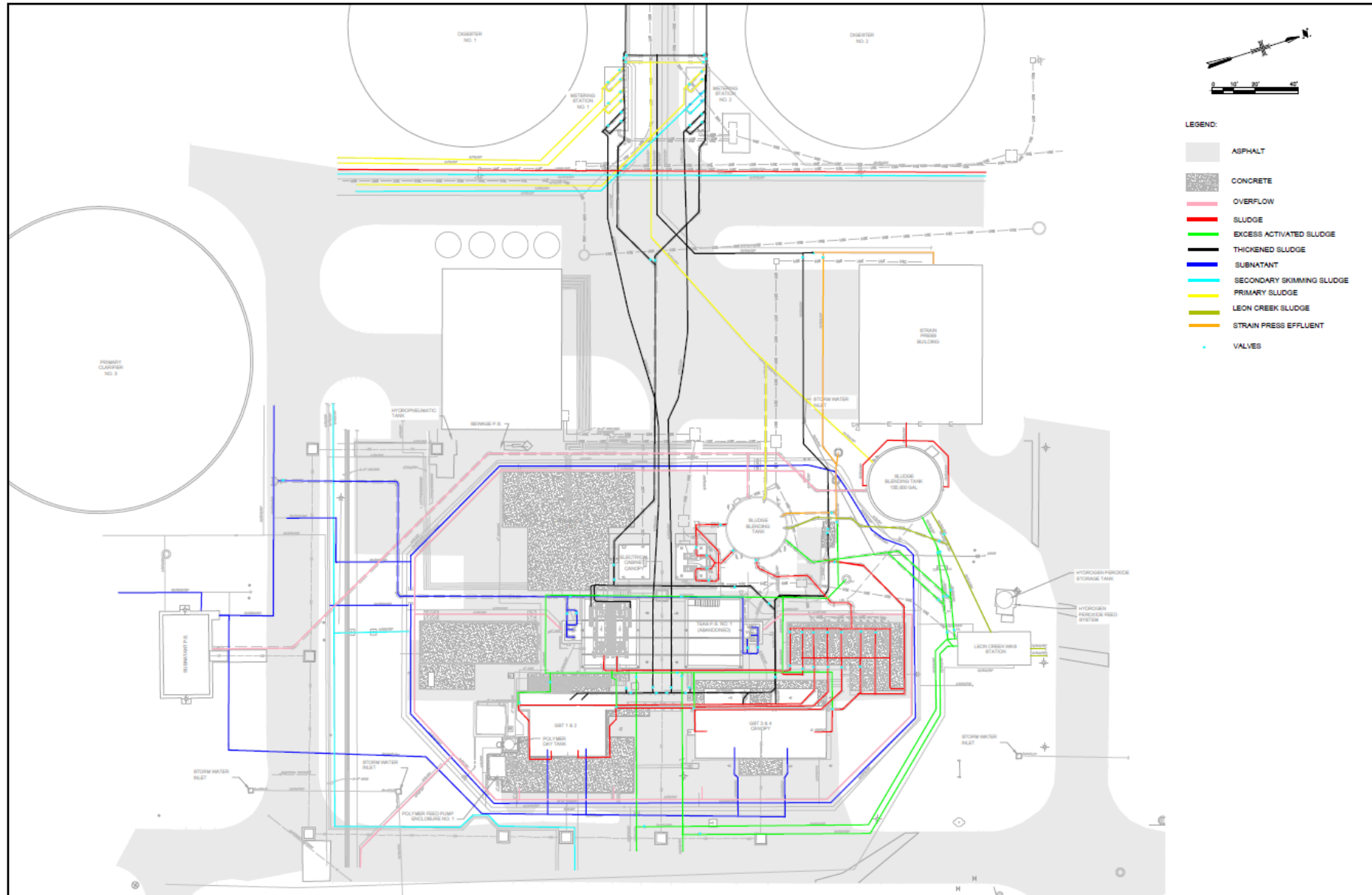
Record drawings are not always right!

Lessons Learned

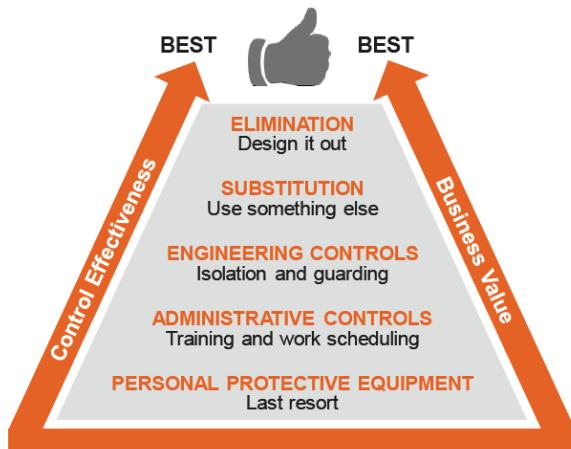
- Thickened sludge pumping is an art.
- Non Newtonian fluid.
- Highly recommend viscosity testing sludge for >5% solids.



Lessons Learned – Control Maps



Housekeeping and Safety By Design



Grating above entire centrifuge area to clear spilled sludge easily

Tapered edge to prevent storm water entry

Confined Space, no access provided

Questions?