

Clarifier Operational Strategy & Mine Pool Dewatering using a Portable Clarifier

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- 46 employees



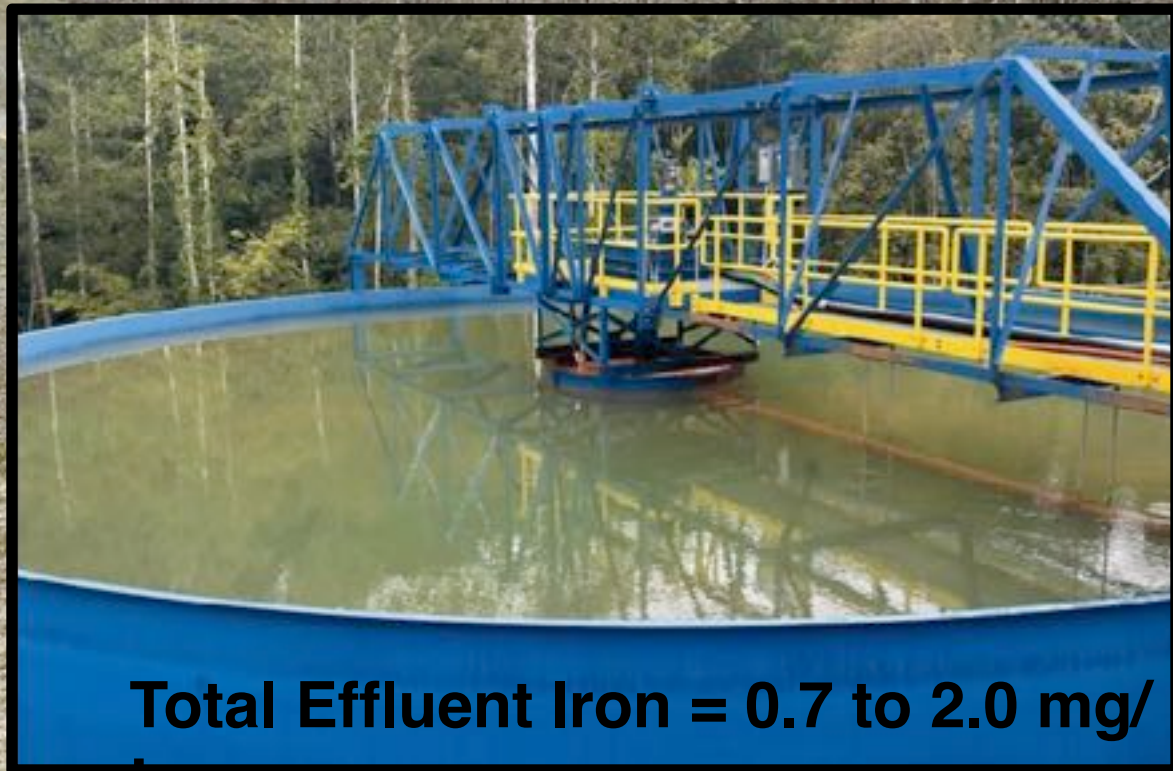
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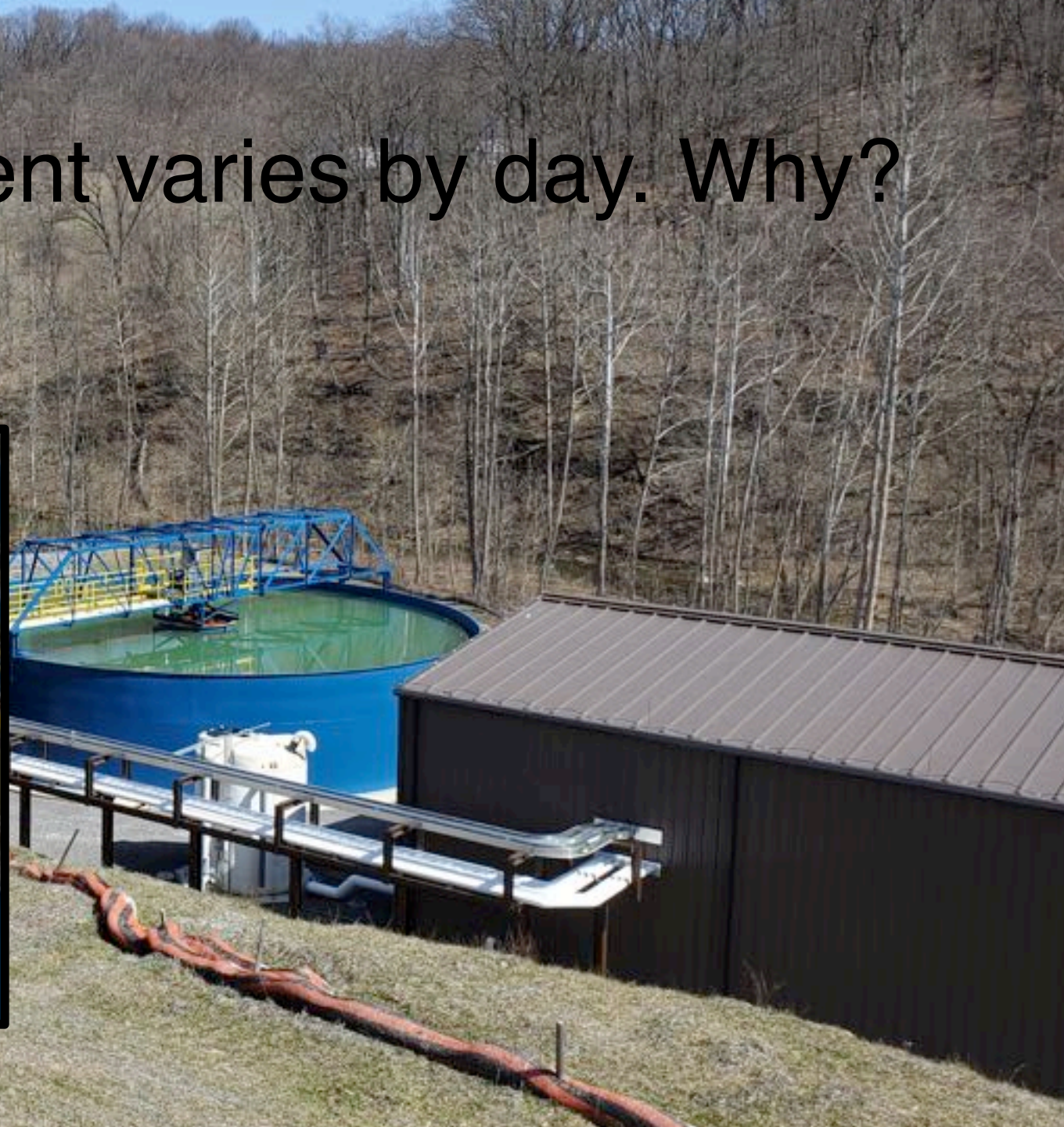


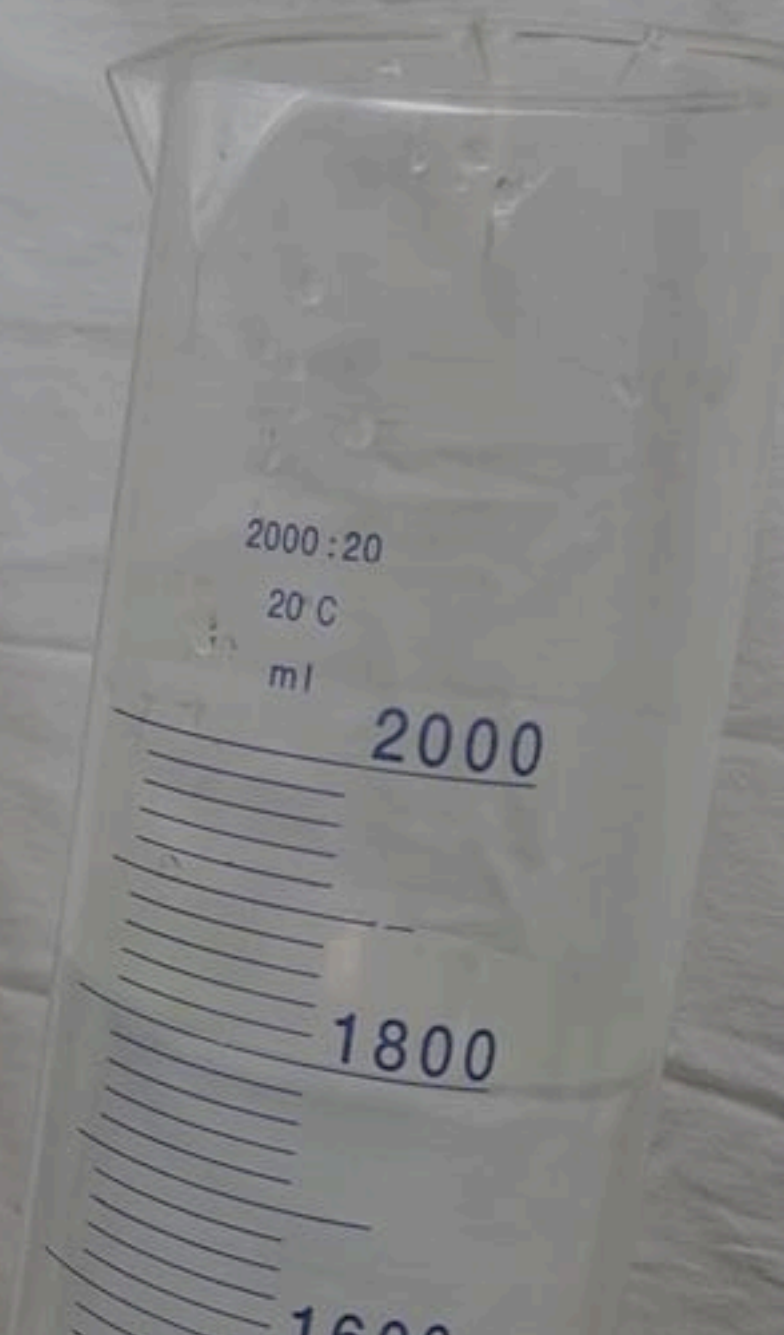
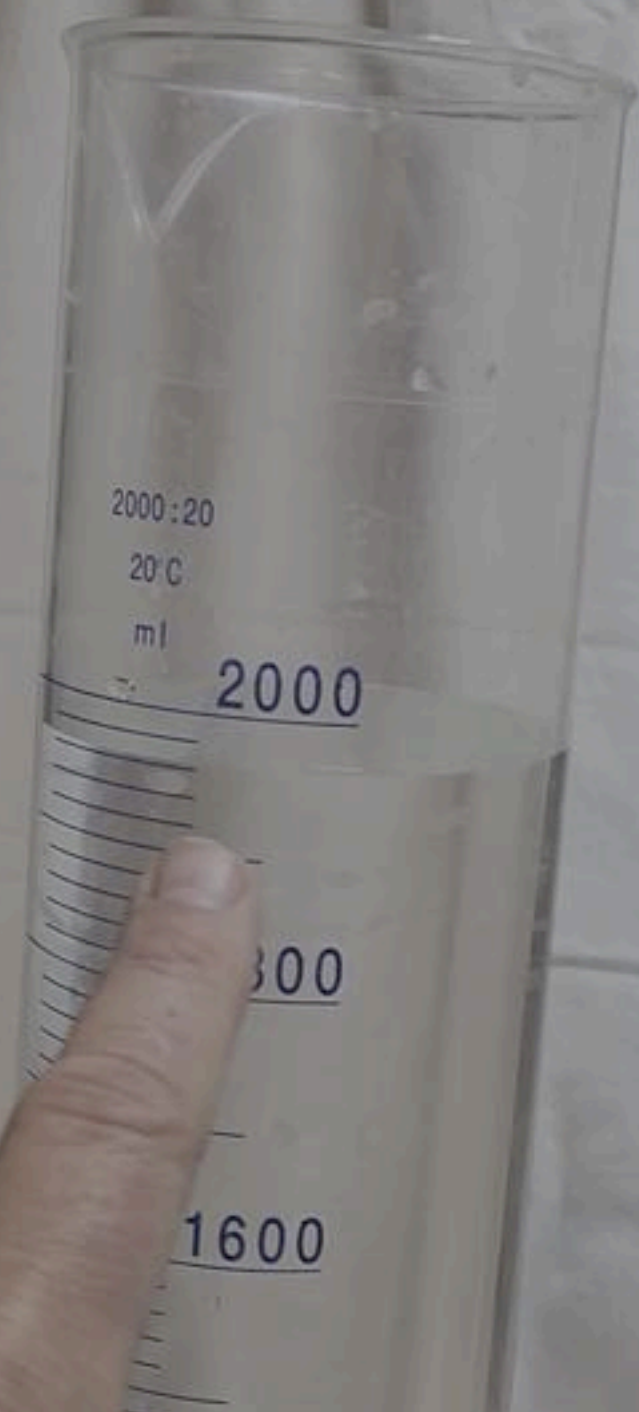
Issue: Clarifier Effluent varies by day. Why?



Total Effluent Iron = 0.7 to 2.0 mg/L

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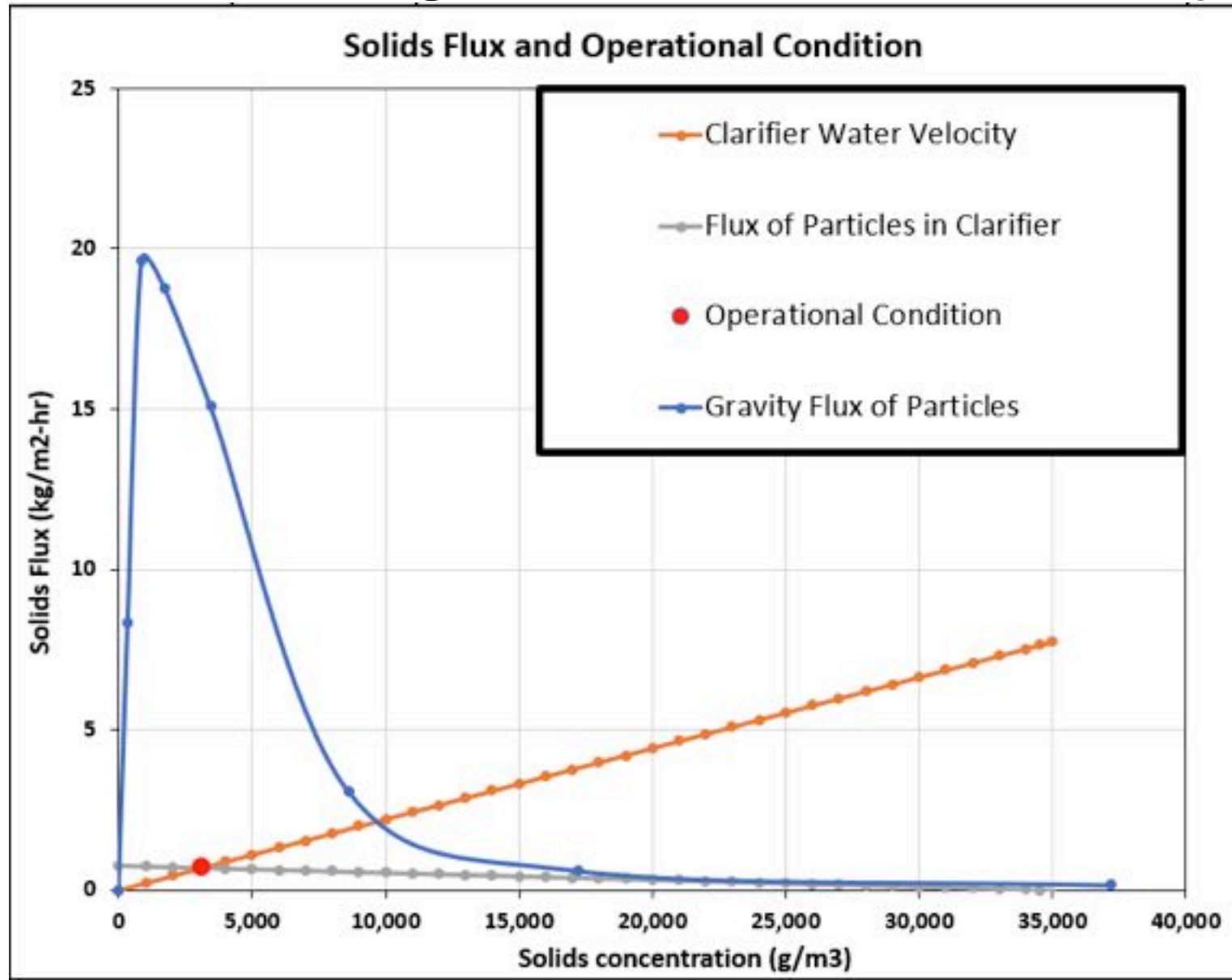


Recycled Sludge allows us to Control TSS in Center well/Pond

- Return a portion of the sludge from the clarifier back to the reaction tank
- Process: Enhanced Flocculation
- Different than High-density sludge



Mass Balance + Settling characteristics is the key to maintaining a constant TSS/clarity?

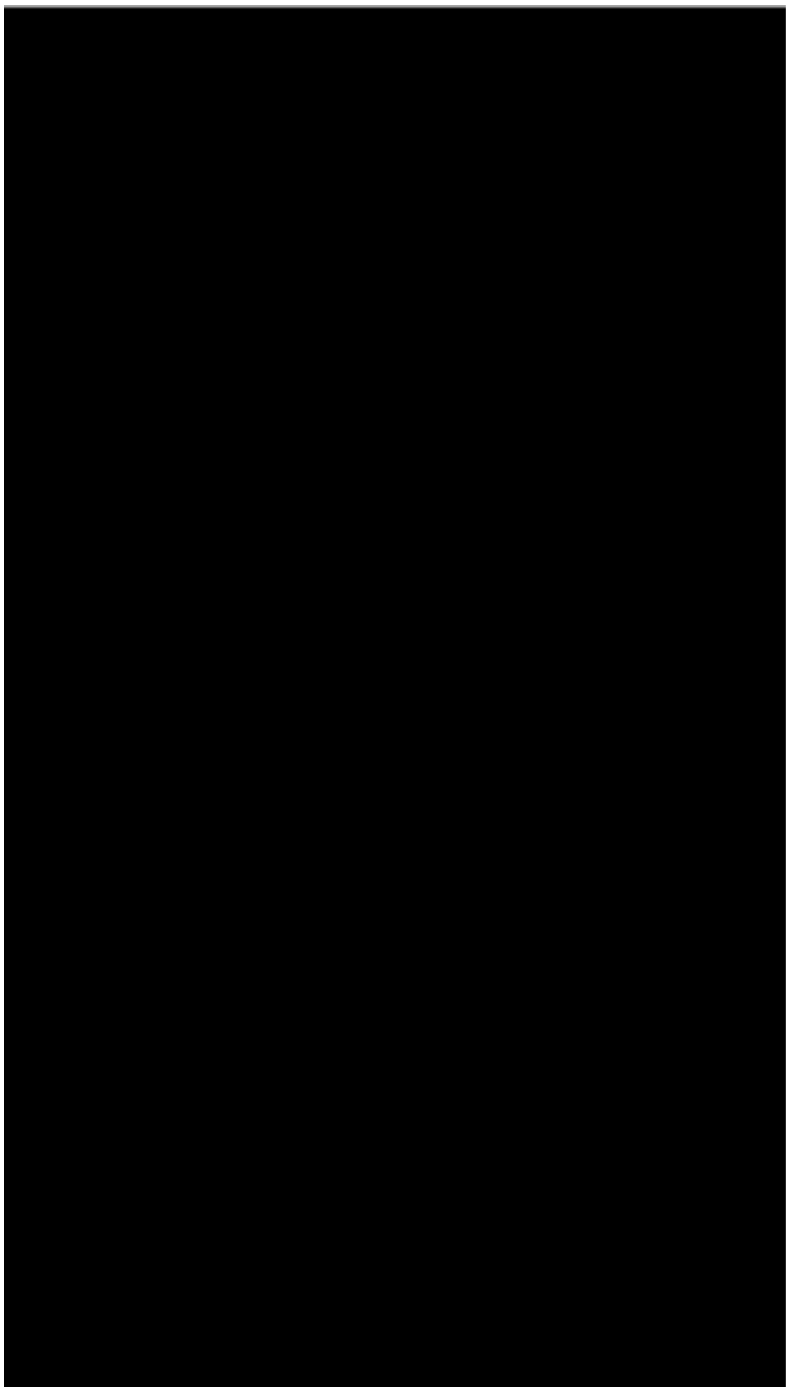



How is a constant TSS concentration



How implementable is this operational strategy?

- Performed a Stress Test
- Started at 750 gpm in a 65 ft diameter conventional shaft drive clarifier
- Immediately increased flow to 1650 gpm, waited 48 hrs
- Decreased flow to 1050 gpm, waited 48 hrs





750 gpm
Effluent Fe =
0.19



1090 gpm



1650 gpm
Effluent Fe =
0.25

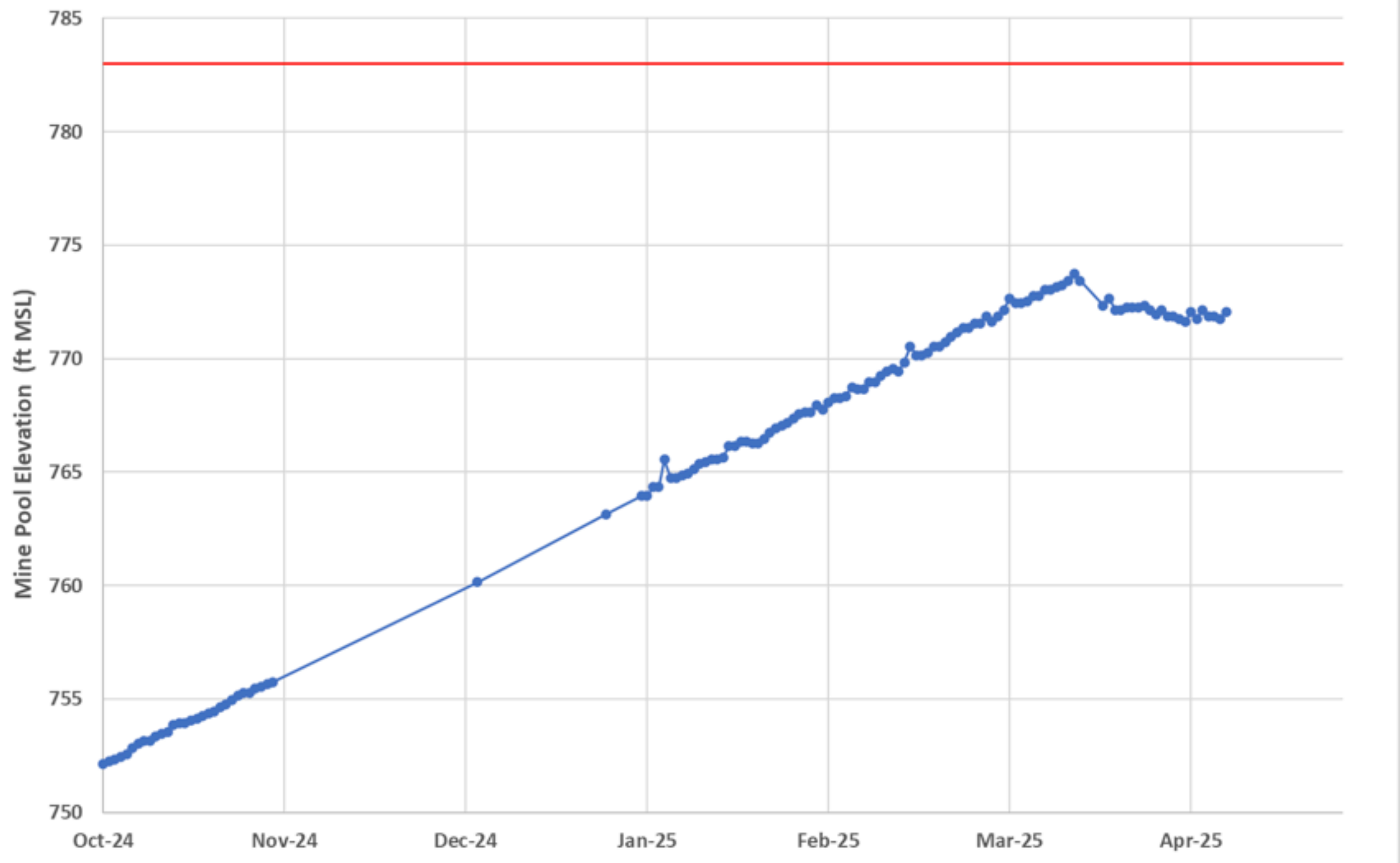
Emergency Mine Pool Dewatering using a Portable Clarifier



Contingency Plans Prevent Disasters



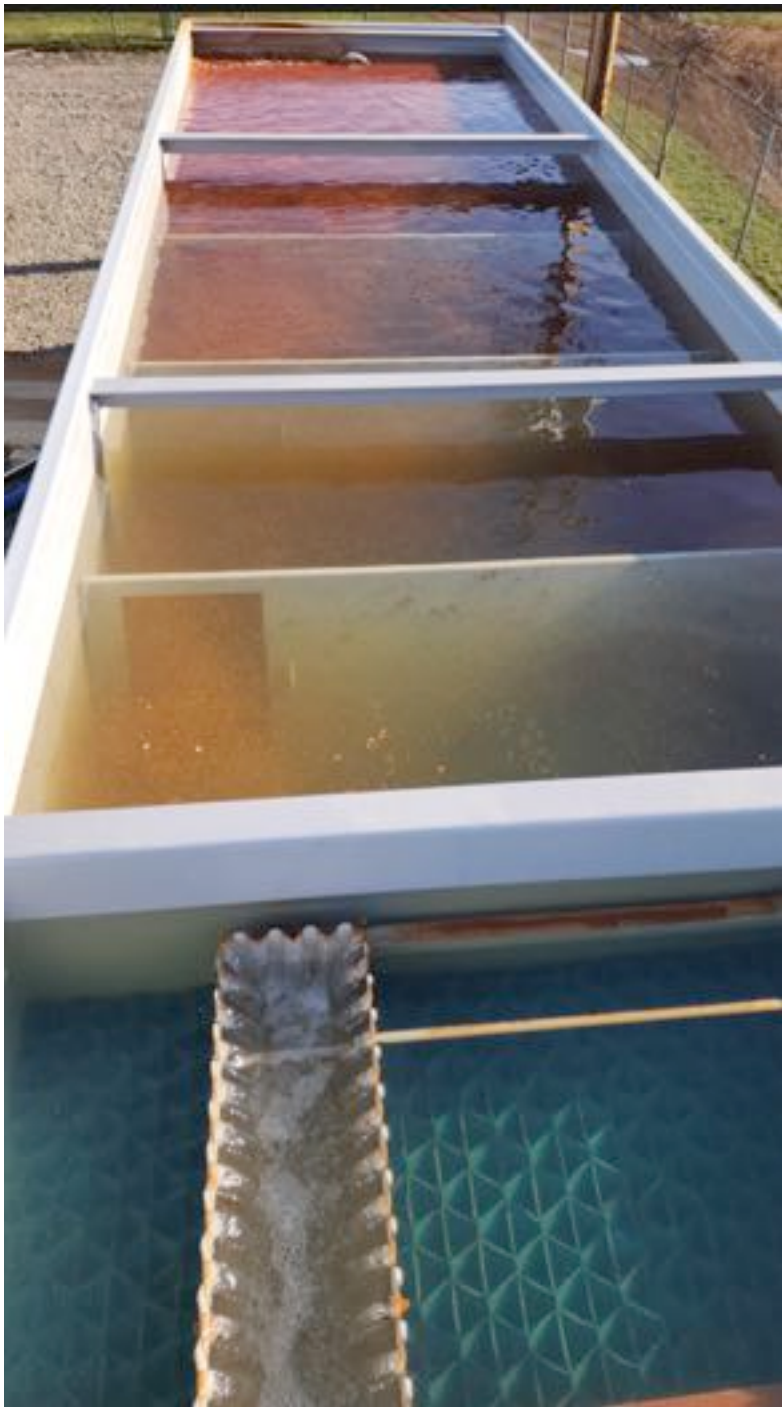












Flow = 800 gpm	Clarifier Influent	Clarifier Effluent
Total Iron	80 mg/L	0.67 mg/L

Thank You

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