

BENEFICIAL REUSE TO ADDRESS PH IN MINE TAILINGS

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Agenda

- Beneficial reuse of dredge material to address pH
- Project example #1
- Project example #2

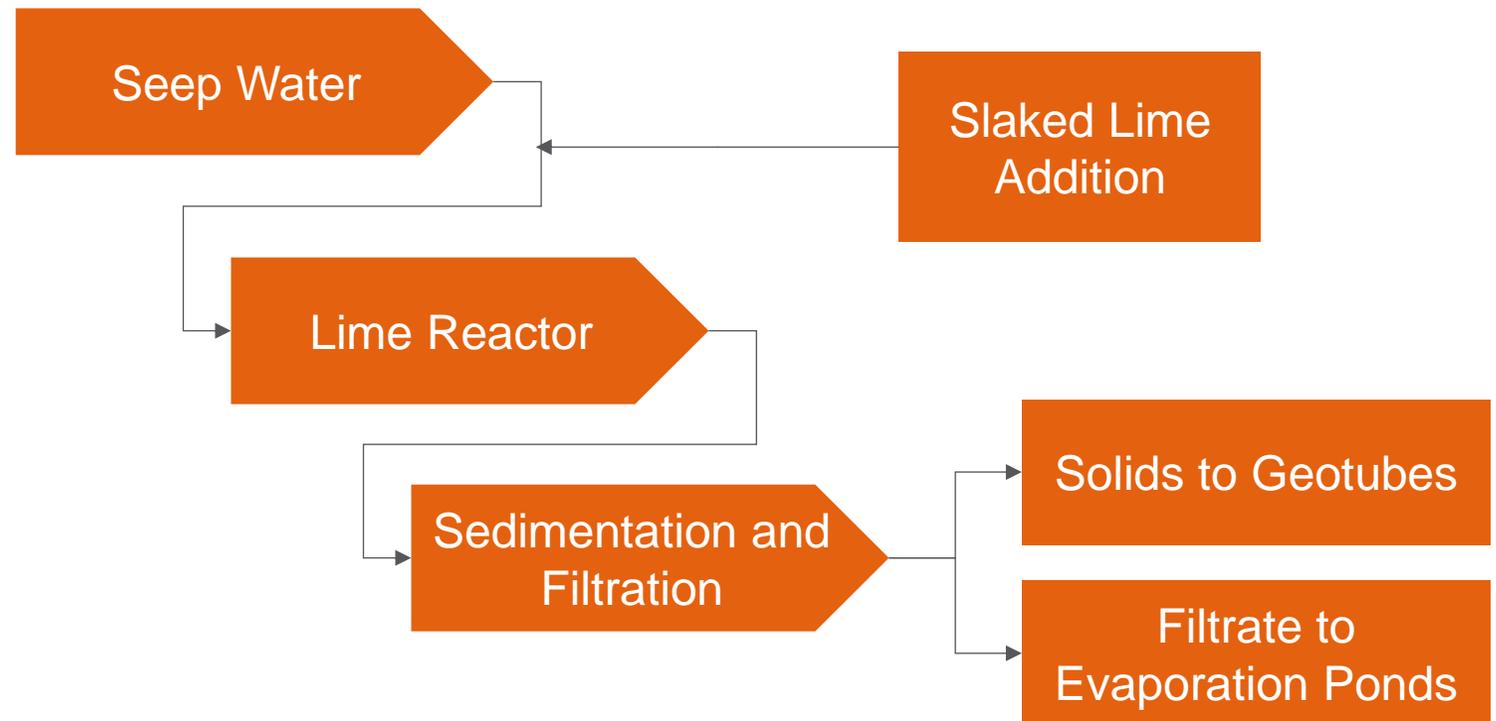
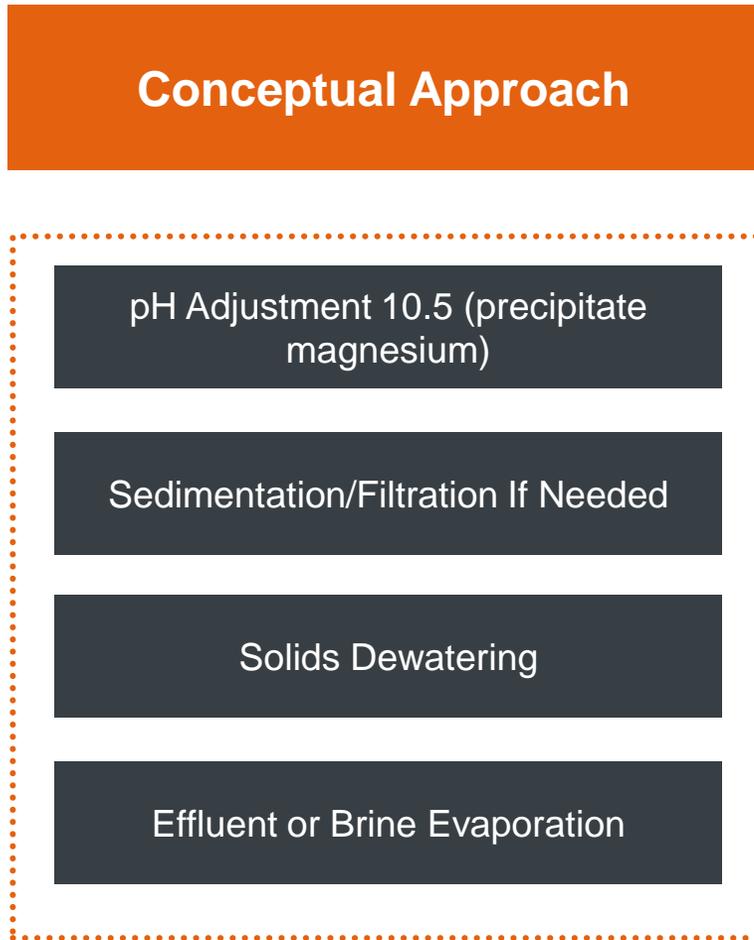
Project Example #1

Project Background

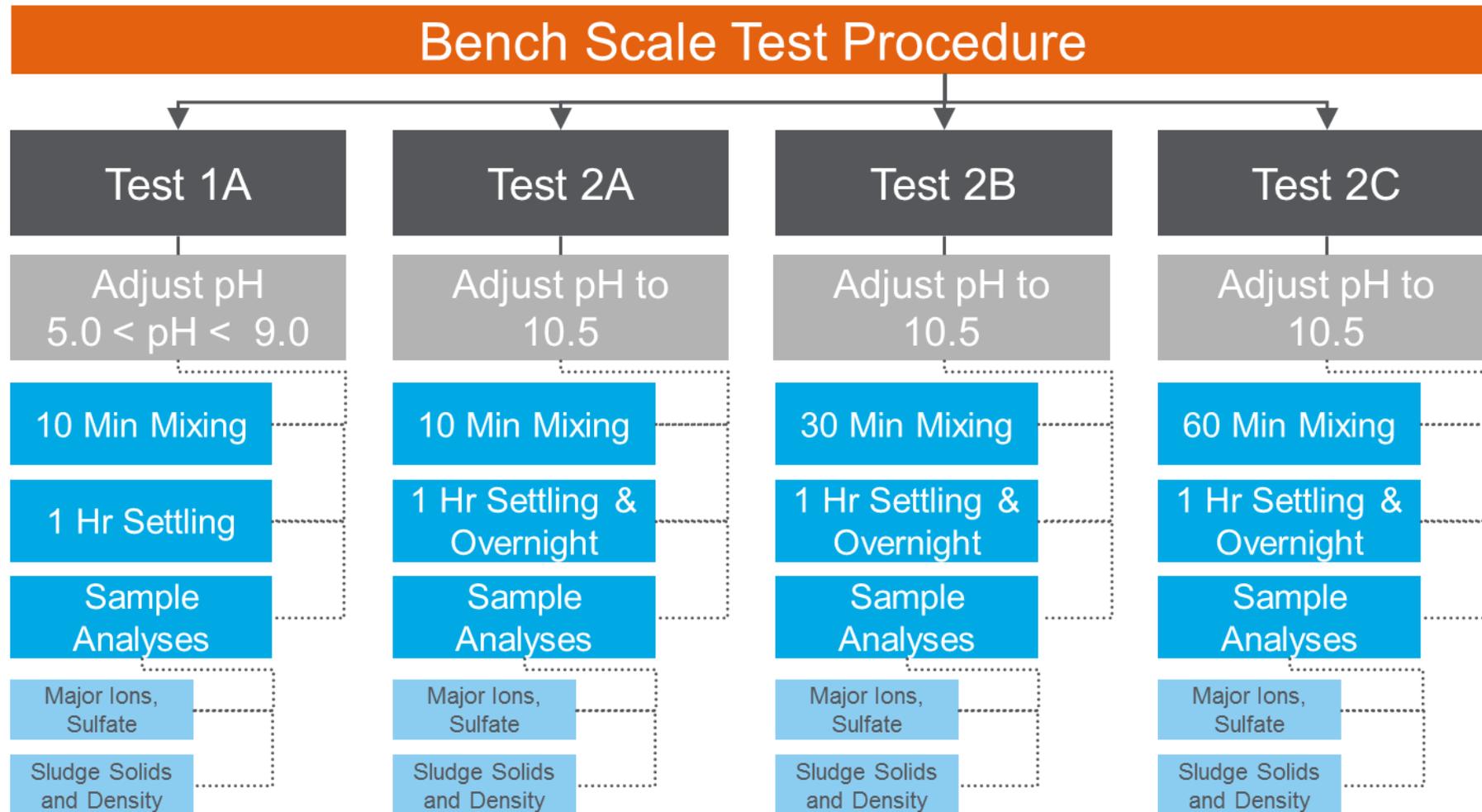
- Management of Low pH/High TDS Seep
- High TDS in receiving evaporation ponds
- Risk of uncontrolled salt precipitation



Conceptual Approach



Bench Scale Testing



Test 1A – $5.0 < \text{pH} < 9.0$

- pH adjusted to 7.6
- Immediate precipitation of small fluffy particulate
- Rapid settling
- Excellent reagent utilization (close to 100 percent based on calcium mass balance)



Tests 2A, 2B, & 2C

- Precipitation reaction was immediate for each test (rapid kinetics)
- Light fluffy precipitate
- 3 percent solids or greater
- 80 percent reagent utilization based on calcium mass balance – consistent for all three tests

10 Minutes of Mixing During pH Neutralization

30 Minutes of Mixing During pH Neutralization

60 Minutes of Mixing During pH Neutralization



Precipitate immediately at 3.0 percent solids or greater, feasible to treat with dewatering unit operations.

Tests 2A, 2B, & 2C

- TSS too voluminous to settle
- Gravity thickened overnight
- Minimal variability between the three tests visually and chemically

30 Minutes of Settling



60 Minutes of Settling



Overnight Thickening



Geotextile Separation

- Cone filter Geotube® test performed on sludge from Test 2 series
- 15 percent solids by weight was retained with no polymer addition
- >25 percent solids by weight anticipated with polymer
- Precipitate potentially viable for beneficial reuse

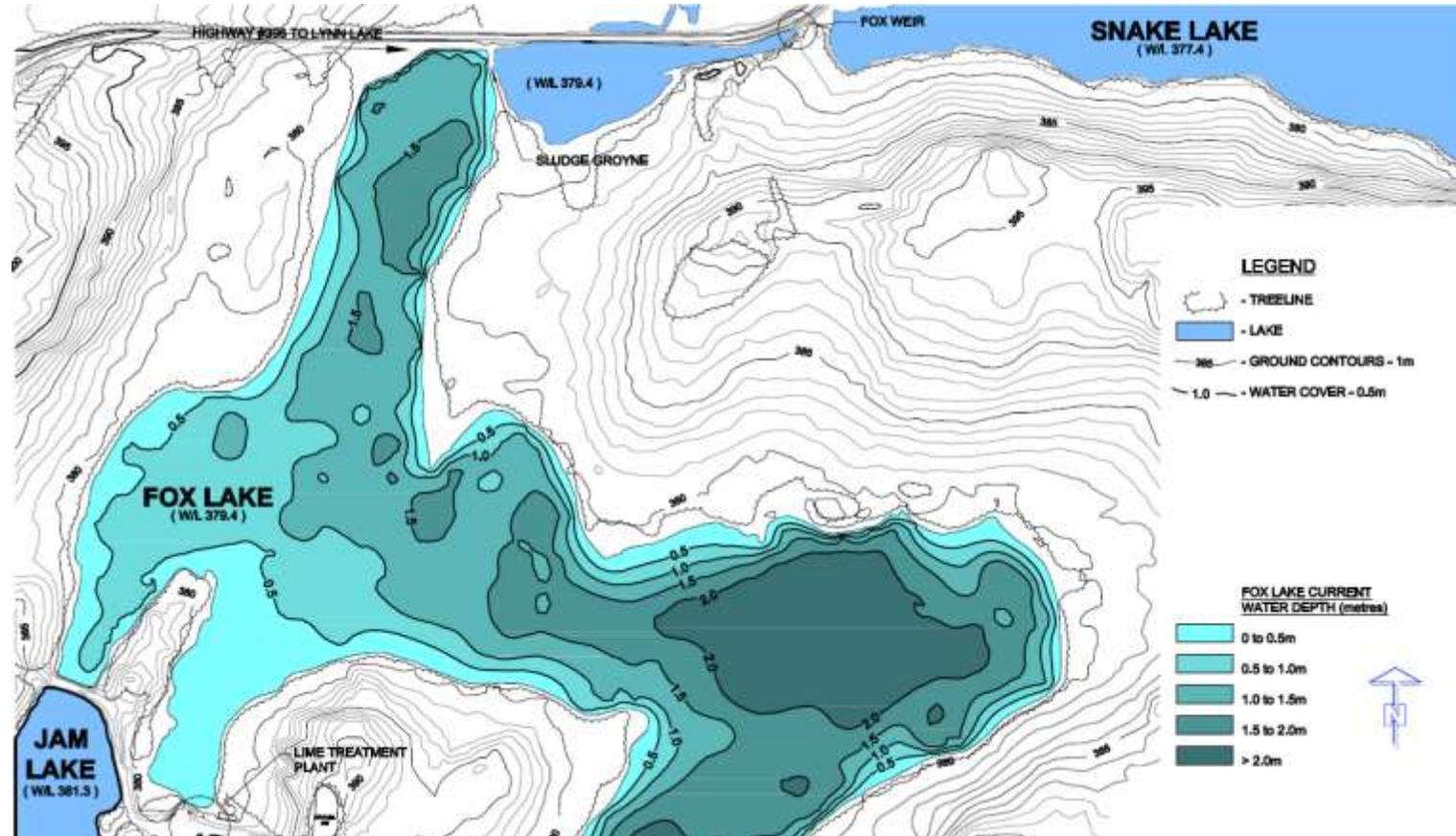


Project Example #2

Water Discharge Route



Water Depth



Beneficial Reuse Concept



Mobilization



Dredging



Pipeline



Pumping the Slurry



Project Example #2 Conclusions



Conclusion

Sludge was successfully beneficially reused at mining facilities to address pH.

