Mature Fine Tailings (MFT) Pressure Filtration Feasibility Study

The objective of this project is to separate and recycle water from MFT, generated from oil sands mining operations, using pressure filtration technologies with associated mechanical and processing equipment.

Featured results include: separator, clarifier, emulsifier, slurry pump, inline mixer and pressure filter design; as well as PFD, P&ID and 3D Plot Plan.

According to the agreement signed on the submission of the project, the content of project (e.g. PFD, P&ID, and Equipment Sizing, etc.) is prohibited to be shared with 3rd party. However, some highlights can be concluded as below:

1. Multiple water recycling processes were designed to reduce the feed of water

2. Material Balance was carefully conducted for the entire process based on the input conditions and the output criteria.

3. A filter press was selected as the pressure filtration technology after carefully comparing with multiple possible options.

4. Pre-treatment processes were designed before MFT entering the filter press for better performance, including dilution, inline mixing with flocculants and thickening using clarifier.

5. P&ID design: HAZOP analysis and quality control analysis were conducted when designing clarifier with its storage tank system and, filter press with its feed pump system, including: low level control, high level control, bypass line control, sparing pump line, drainage line, safety valves and various transmitters.

6. A 3D plot plan was drawn using AutoCAD. Spatial Arrangement of the equipment was carefully considered to save space of the plant: A pipe rack was designed for the placement of most of the pipes, which was surrounded by all of the equipment.