PREMIER BASE

SLUDGE DEWATERING TECHNOLOGY

Premier Base has developed and patented an innovative green approach to processing and drying wastewater sludge that involves no energy consumption and no added chemicals.

The units, which have been implemented in several municipal wastewater treatment plants (WWTP) receive influent, which is typically Waste Activated Sludge from a WWTP secondary stage settlement tank with a concentration in the range of 0.8% to 1% dry solids. The units can process 15 tonnes of sludge per day and dry to in excess of 70% dry solids depending on climatic conditions and client requirements.

The process is as follows:

1. Fill units with raw sludge at less that 1.0% dry solids by gravity or pump
2. Allow retention time usually from 6 hrs to 48 hrs (depending of climatic conditions)
3. Decant by opening baffle plates
4. Close baffle plates at the end of the decanting process
5. The holding period varies by plant since the determining factor is the time taken by the WWTP to generate surplus sludge requiring removal from the aeration basin
6. Repeat Steps 1 – 5 for as many cycles as the capacity of the bed and/or the density of the sludge will allow
7. Remove dried sludge either by suction tanker equipment or scraper and conveyor depending on the dry solid content.
8. Wash down the unit to remove old sludge remnants with wash water returned to the head of the works. This is generally completed by the sludge transport contractor
9. Repeat from Step 1

Benefits

- Sludge volume reduction by up to 90%
- The units are made of concrete and therefore are durable with minimal maintenance
- The units are non mechanical therefore minimum maintenance
- The units do not require energy
- No noise
- No chemicals needed
- Odour free
- The units can be installed without interfering with the daily running of plant

Product

A single unit consists of:

- A concrete tank: unit dimensions 1.2m in depth, 3m in width and 8m in length.
- A GRP roof, scraper and conveyor can be added depending on client requirements
- An outlet in one wall, which is closed by 2 baffle plates and manually operated
- An open sump outside the outlet, to receive decanted water
- A decant water return pump in a dedicated closed manhole/sump
- Sludge inlet pipework mounted on the wall opposite the outlet

The floor of each unit or bed is constructed in a shallow V-shape to the center and is sloped towards the outlet at one side of the tank.

The units can be installed singly or in multiple units, in parallel configuration depending on site requirements and volume of Waste Activated Sludge.

Prototype of two units in parallel

Case Study

The project consisted of the construction of 3 installations of new units, with fitted louver plate doors, and breathable membrane roofs; as well as the retrofitting of existing drying beds at 3 further WWTPs (1 bed at each location) with some of the features from the technology.

The Water Systems and Services Innovation Centre (based at the Nimbus Centre, Cork Institute of Technology) was commissioned by Premier Base to design and undertake the necessary testing programme.

The process-proving phase lasted for 5 weeks. Prior to the first fill, the tanks were desludged and thoroughly cleaned to ensure no old/septic sludge remained, which could inhibit the dewatering process.

During the 5-week testing period ten fill/decant cycles were carried out, following the steps listed above.

Various items of data were gathered during the test period to monitor the performance and operating conditions of both the WWTP and the sludge beds. These included:

- Inlet Flow to the Wastewater Treatment plant
- Sludge Height in Bed before Fill cycle
- Sludge Height in Bed after Decant cycle

Reported operational financial savings over a 12 month period amounted to €206,036.43

In overall terms, it could be expected that operational savings would arise under a number of headings, namely:

- Reduced charges from the sludge transportation contractor
- Reduced processing costs
- Reduced polymer dosing
- Reduced operator hours

Premier Base Product Description