



An Roinn Comhshaoil,
Aeráide agus Cumarsáide
Department of the Environment,
Climate and Communications

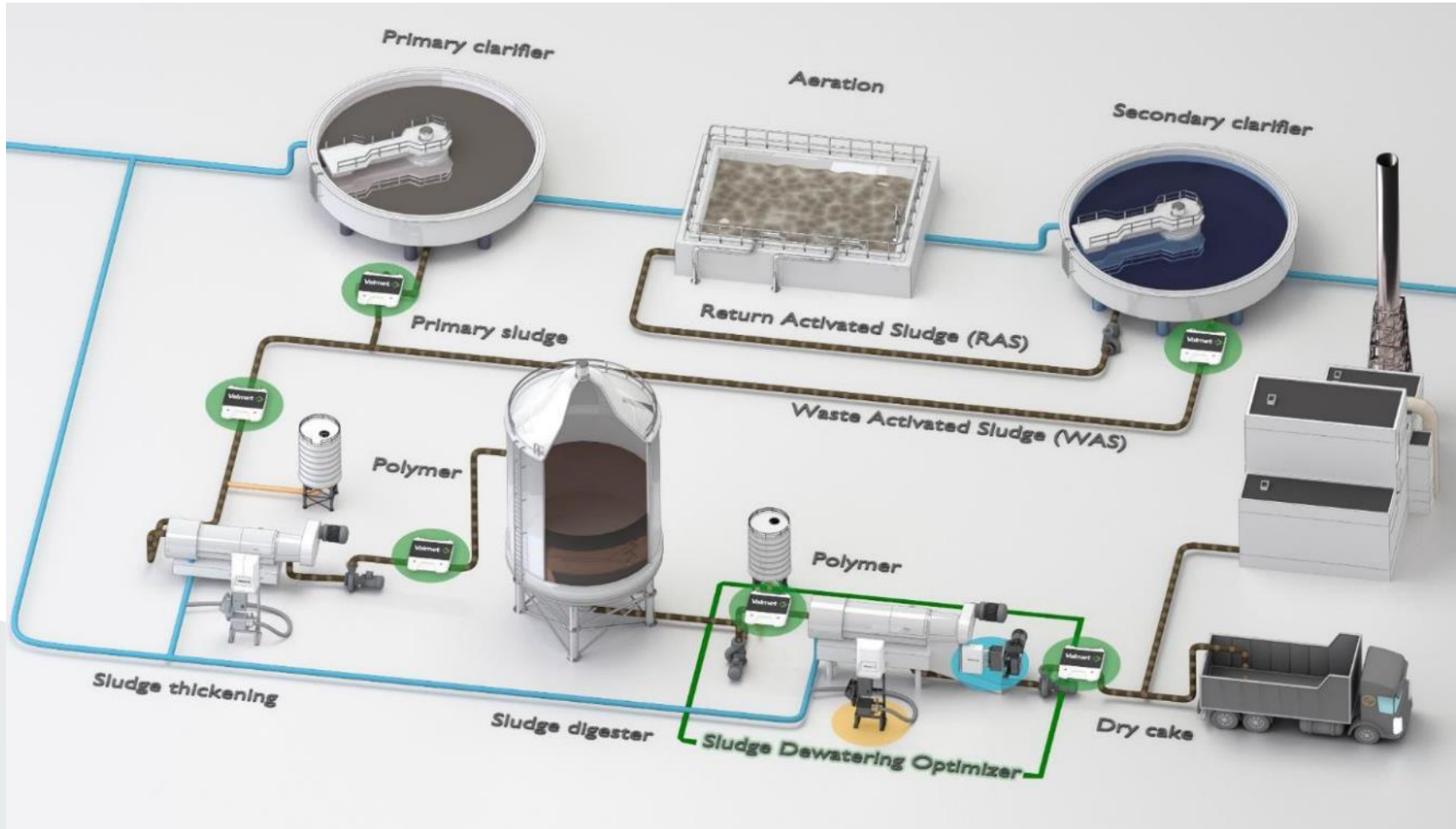
14. Polysafe RR Power Projects

- RR Power Projects (RRPP) is a local mechanical and electrical service provider and exclusive value added reseller of Valmet technology. Their aim is to bring this innovation to Ireland and transfer it into the Waste Water Treatment Plant industry to achieve:
 - Reduced polymer use in the process,
 - Generate substantial economic savings (direct and indirect)
 - Reduce the carbon footprint of the plant.
- This proposal aims to have a feasibility study into the transferable knowledge from Pulp and Paper and Waste Water.
- The feasibility study will install a sludge dewatering optimiser (SDO) and Total Solid measurements (TS) for 6 months in the Pilot Plant and provide RRPP personnel with Wastewater expertise and proficiency in automation and control business.



An Roinn Comhshaoil,
Aeráide agus Cumarsáide
Department of the Environment,
Climate and Communications

Valmet-RRPP TS application on waste water treatment plant.





An Roinn Comhshaoil,
Aeráide agus Cumarsáide
Department of the Environment,
Climate and Communications

Benefits of the new Valmet TS microwave measurement

The most reliable and accurate measurement:

- New digital sensor platform with new DSD measurement technology
- Expanded measurements range 0 – 50 %TS, with one calibration
- Higher conductivity limits
- New "Twin Blade" sensor type for large pipes
- Increases usability on different applications
- Integrated pressure measurement
- Optional Non-stick lining
- ATEX/IECEX certificated
- New User-friendly interface
- Industrial internet ready





An Roinn Comhshaoil,
Aeráide agus Cumarsáide
Department of the Environment,
Climate and Communications

Raw sludge feeding to dewatering

Athlone, Republic of Ireland

- A small wastewater treatment plant. Raw sludge is directly dewatered by centrifuge. Large and unknown total solids content variations cause a lot of challenges to the de-watering process. **Manual operations.**

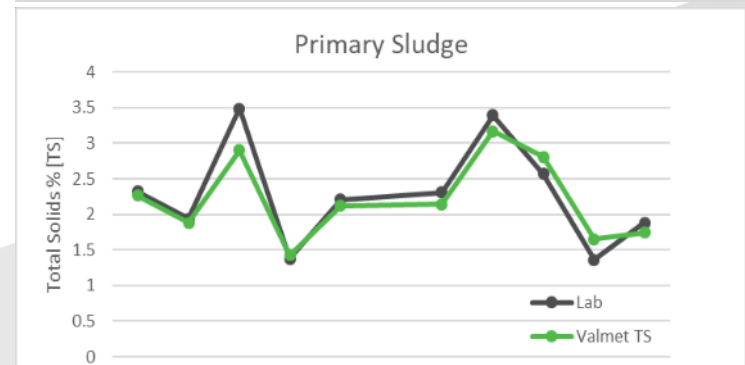
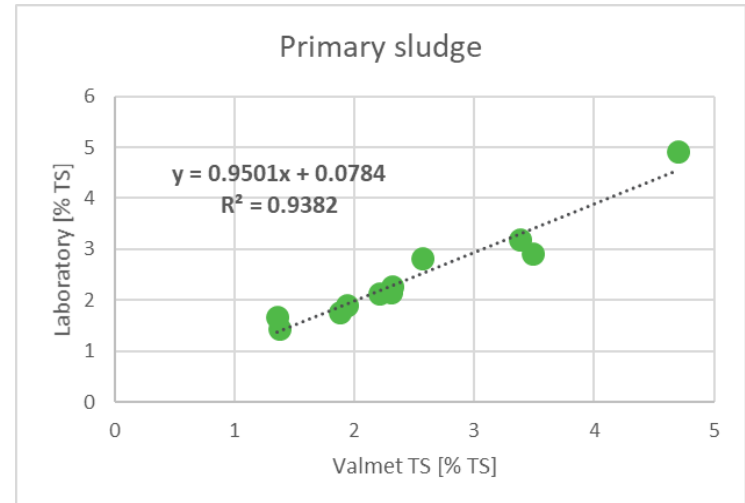
Need:

- Operators needed reliable measurements to run the de-watering process without continuous disturbances. Currently, these issues are the cause of many variations in dry cake total solids and polymer usage.

Solution:

Valmet Total Solids Measurement (Valmet TS)

- Reliable measurement to help operators run the de-watering process without additional interferences with the centrifuge operations. **Automated solution.**





An Roinn Comhshaoil,
Aeráide agus Cumarsáide
Department of the Environment,
Climate and Communications

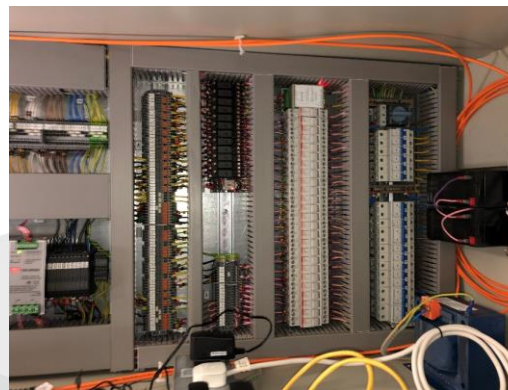
Valmet equipment delivered in August 2021.





An Roinn Comhshaoil,
Aeráide agus Cumarsáide
Department of the Environment,
Climate and Communications

Athlone WWTP – Pilot plant. Installation – September/October 2021.





An Roinn Comhshaoil,
Aeráide agus Cumarsáide
Department of the Environment,
Climate and Communications

Athlone WWTP – Pilot plant. Installation – September/October 2021.

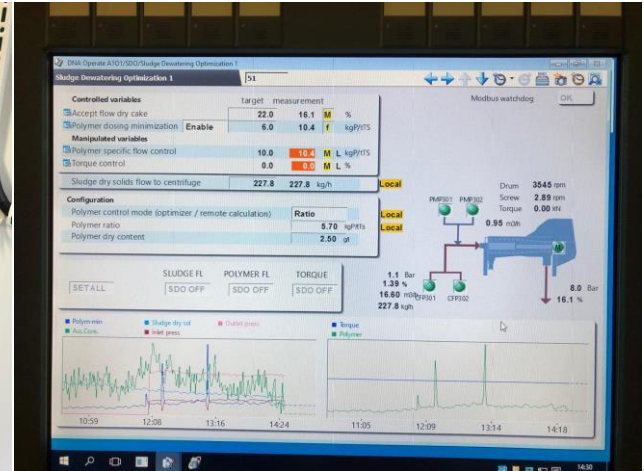


Installation of the Total Solid Measurements on the inlet and outlet of the centrifuges



An Roinn Comhshaoil,
Aeráide agus Cumarsáide
Department of the Environment,
Climate and Communications

Athlone WWTP – Pilot plant. Installation – September/October 2021



Installation of the SDO –
Sludge Dewatering Optimiser
and Bridges for Total Solid
Measurements



An Roinn Comhshaoil,
Aeráide agus Cumarsáide
Department of the Environment,
Climate and Communications

Athlone WWTP – Pilot plant. Commissioning – October/November 2021



Commissioning activities with
Valmet – supplier of the
equipment and Irish Water

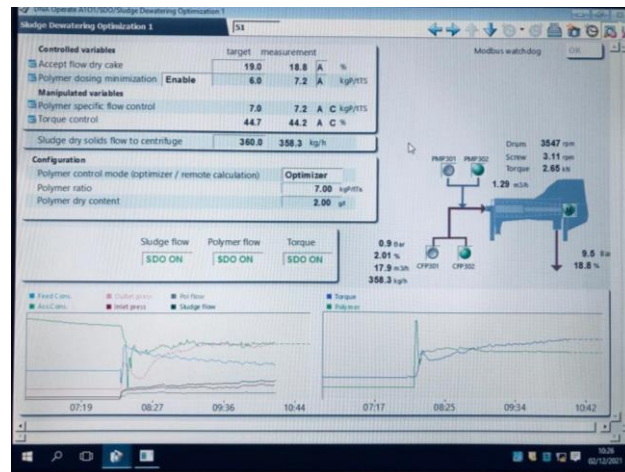
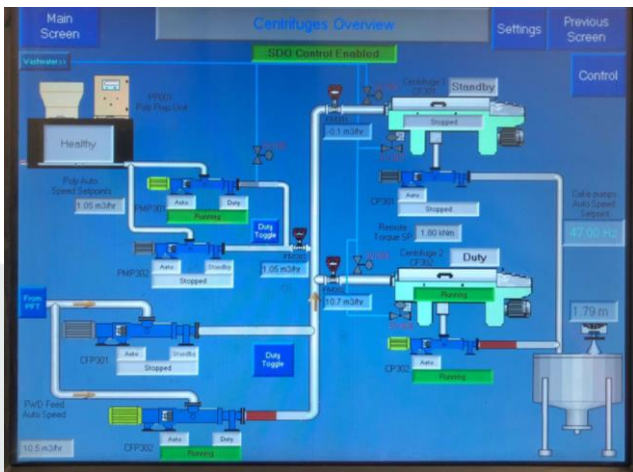


An Roinn Comhshaoil,
Aeráide agus Cumarsáide
Department of the Environment,
Climate and Communications

Athlone WWTP – Pilot plant. Commissioning – October/November 2021

TS values after TS
measurements calibration

SDO online and optimisation
achieved

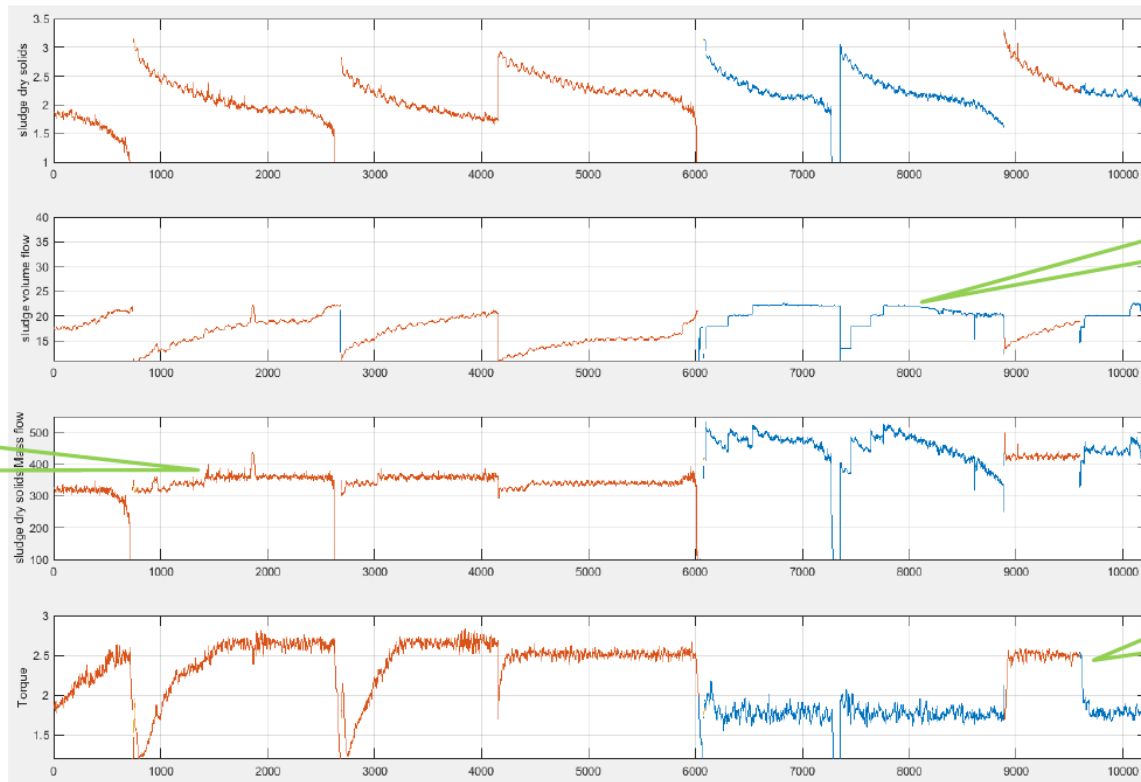




An Roinn Comhshaoil,
Aeráide agus Cumarsáide
Department of the Environment,
Climate and Communications

Athlone WWTP – Pilot plant. Trial commencement November/December 2021

7 days run on December, 4,5 SDO on, 2,5 SDO off



Steady volume flow when SDO off

Steady mass flow when SDO on

SDO runs on higher torque

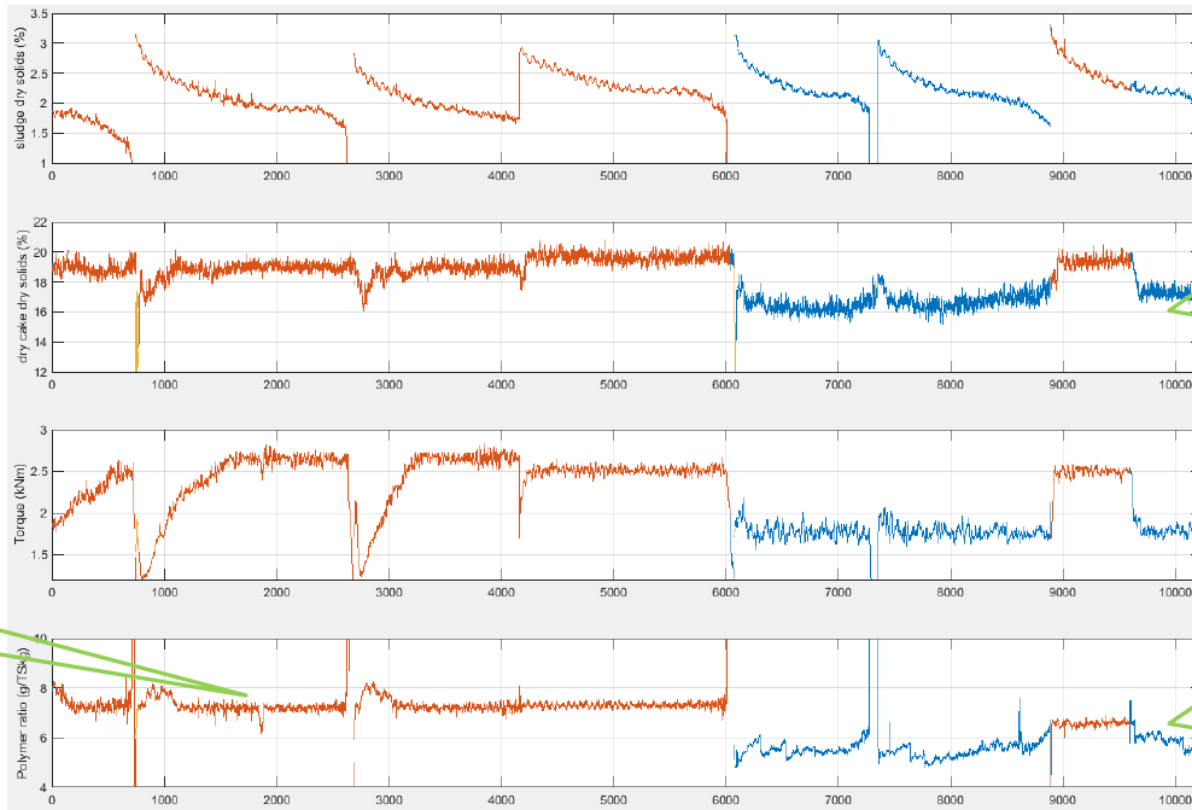
Steady mass flow on both settings



An Roinn Comhshaoil,
Aeráide agus Cumarsáide
Department of the Environment,
Climate and Communications

Athlone WWTP – Pilot plant. Trial commencement November/December 2021

7 days run on December, 4,5 SDO on, 2,5 SDO off



Dry cake dry solids were clearly on different level when SDO was on

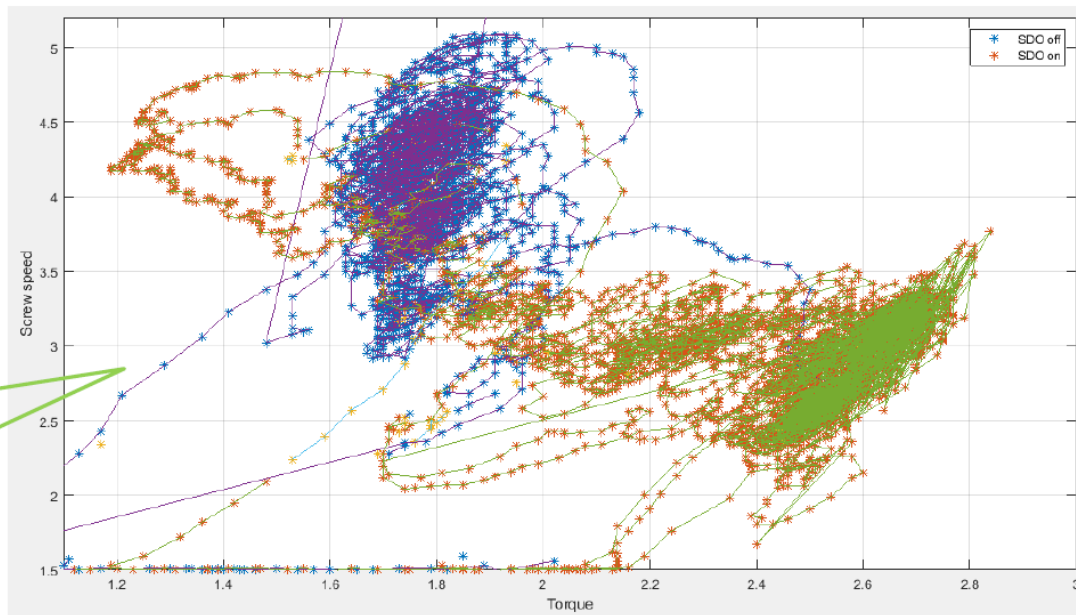
Polymer ratio was kept high to avoid dirty reject

When SDO was off polymer ratio was low, as sludge flow was too high for polymer pump

Dry Cake Total Solids increased with SDO online



Torque vs Screw speed



Centrifuge operates on lower screw speeds to increase torque on SDO

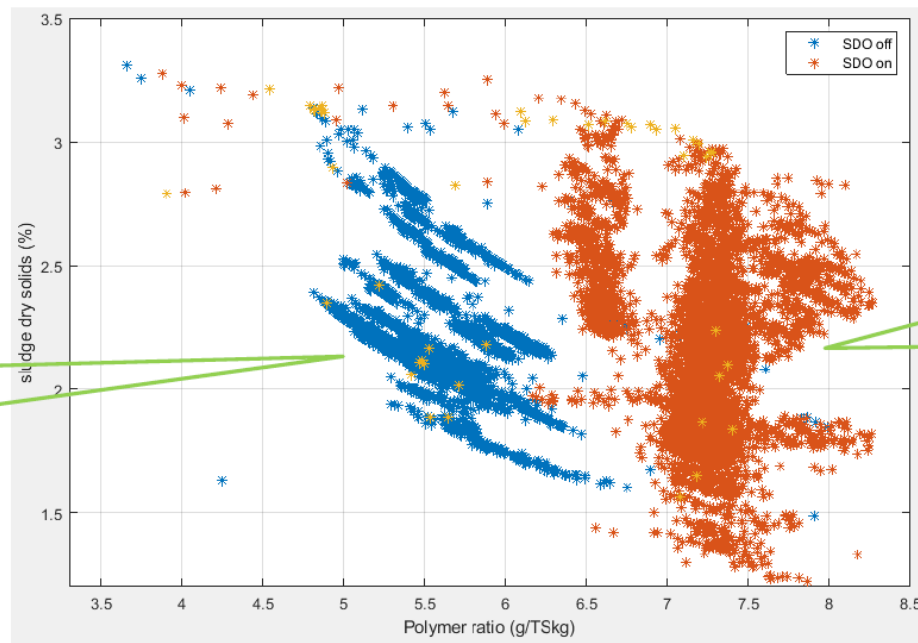
Centrifuge 1 operating on lower speeds, increasing torque output



An Roinn Comhshaoil,
Aeráide agus Cumarsáide
Department of the Environment,
Climate and Communications

Athlone WWTP – Pilot plant. Trial commencement November/December 2021

Polymer ratio vs Sludge dry solids



While SDO is off,
polymer ratio
increases as sludge
dry solids decrease

While SDO is on,
polymer ratio can be
stabilized

Polymer optimisation is working and stabilised during SDO operation



An Roinn Comhshaoil,
Aeráide agus Cumarsáide
Department of the Environment,
Climate and Communications

Athlone WWTP – Pilot plant. Trial commencement November/December 2021

Project Milestones:

- Mechanical and electrical installation of two Total Solid (TS) measurements with the required bridges was completed on 4th of the October.
- Sampling and calibration of TS`s were finalised on the 5th of October.
- Sludge dewatering optimiser cabinet (SDO) was installed on the 22nd of October with system commissioning starting 25th of October until 28th of November.
- After the 28th of November, mechanical and electrical installation of the SDO and TS`s is completed and the system is fully operating.
- The trial period for the sludge dewatering optimiser and total solid measurements started 28th of November, to be conducted for the next 6 months.



An Roinn Comhshaoil,
Aeráide agus Cumarsáide
Department of the Environment,
Climate and Communications

Athlone WWTP – Pilot plant. Trial commencement November/December 2021

Project Outcome:

- RR Power Projects after successful implementation of the SDO system for the first Centrifuge, was requested to price and install SDO with additional systems for the second Centrifuge in Athlone Waste Water Treatment Plant.
- In January 2022 RR Power Projects will provide the offer for Irish Water to implement the new system for Athlone Waste Water Treatment Plant.
- RR Power Projects was requested to follow the process for Qualified Full-Time Subcontractor for Irish Water in National Framework Agreements.
- This market-leading system can be installed in other Irish Water Plants, arrangements ongoing to implement a similar measurement system in Osberstown Waste Water Treatment Plant.