

Amlwch WwTW

£7 million investment at new Wastewater Treatment Works in North Wales

by
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Amlwch is situated on the North Eastern corner of Ynys Môn (Anglesey). A small town, with a long history of working traditions. The town grew with the development of copper mining on nearby Mynydd Parys (Parys Mountain), and was once the world's most productive Copper Mine. Amlwch today still offers a wealth of interests to the resident and visitor alike. Amlwch has a residential population of 3,438 with a total catchment population equivalent of 6,703.



Aerial photograph of Amlwch

Courtesy of Dwr Cymru Welsh Water

The challenge - the solution

The catchments of Amlwch and Llanelilian previously discharged untreated sewage directly to the sea. For Dwr Cymru Welsh Water (Welsh Water) to comply with the requirements of the Urban Waste Water Treatment Directive (UWWTD) it was proposed that wastewater treatment was provided for these catchments.

Various studies and survey work undertaken in AMP 3 resulted in a feasibility report which concluded that the preferred solution was to provide a network solution consisting of two FFT pumping stations at Llanelilian and Craig-Y-Don, and a new wastewater treatment works (WwTW) at Amlwch to treat the wastewater passed forward from the new pumping stations.

The preferred location for the new WwTW was at the abandoned Shell Oil Terminal. This land was previously owned by the Great Lakes (UK) Ltd chemical company, and is currently owned by

Canatxx Ltd. Wastewater flows from Amlwch and Llanelilian would be pumped to the new WwTW, and Welsh Water's preferred treatment would be primary sedimentation and biological filtration.

This work was originally to have been completed in AMP 3, however difficulties in obtaining land for the site of the proposed wastewater treatment works prevented this being achieved.

The project parameters

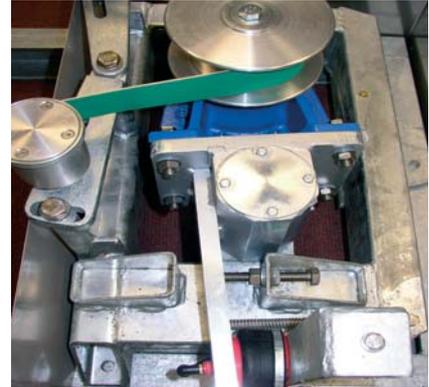
Population Equivalent	PE	6703
Per Capita Consumption Allowance	l/h/d	180
Dry Weather Flow (DWF)	m ³ /d	1954.2
Average Flow	m ³ /d	2442.7
FFT (6DWF)	l/sec	50.5

Filter Distributor Drives

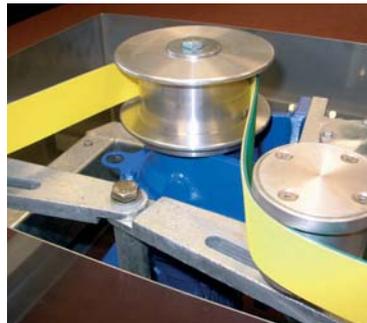
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Project consent set by the EA

BOD	40 mg/l	95%ile
TSS	60 mg/l	95%ile
DWF	4406.4m ³ /d	

Prior to the scheme starting in March 2008 there was only crude outfall in Amlwch and Llanelian. The Amlwch WwTW scheme included primary treatment, biological treatment, final settlement and sludge storage processes at the works. It also included two new pumping stations with storm storage, complete with CSO screens within each catchment to pass forward the flows to the new works.

The two new pumping stations were located within the newly constructed storm storage chambers and were provided with upstream CSO screens that would serve the areas of Llanelian and Craig-y-Don. The pumping stations then pass forward flows for treatment at Amlwch WwTW.

The pumping station, storm storage and CSO at Llanelian were built on land adjacent to the existing macerator installation owned by Welsh Water. In addition to this work, a nutriox dosing unit, flow measurement and MCC housed in a GRP kiosk were provided at the pumping station.

The pumping station and CSO at Craig-y-Don was constructed on a greenfield site. In addition to this work, flow measurement and MCC housed in a GRP kiosk were provided at the pumping station.

Technical specification of the work

The new £6.9 million Amlwch WwTW was built on a brownfield site. During construction the team had the added complication of having to work in an in-filled firewater pond. The fill had to be removed, classified and replaced to create an engineered foundation for the biofilters and humus tank.

The wastewater treatment works at Amlwch included:

- A grit removal tank
- 6mm inlet screen and screenings handling unit
- Primary settlement tank complete with desludging pump
- Two biological filters with actuated rotating distributor arms complete with recirculation pumping station
- Humus settlement tank complete with desludging pump.

In addition to this work sludge storage, odour removal, liquors pumping station, flow measurement, washwater booster set and MCC housed in a GRP kiosk were all required at the new works.



Amlwch WwTW

Courtesy of Dwr Cymru Welsh Water

The pumping station and CSO at Craig-y-Don included:

- A new CSO storm screen
- Pumps to pass forward flows to Amlwch WwTW
- Storm storage capacity
- Work flow measurement housed in a GRP kiosk
- MCC housed in a GRP kiosk
- The work also included laying a new rising main from the pumping station to Amlwch WwTW which was approximately 267m in length.

At the pumping station and CSO at Llanelian, the work included the installation of:

- A new CSO storm screen
- Storm storage capacity
- Pumps to pass forward flows to Amlwch WwTW
- Work flow measurement housed in a GRP kiosk
- MCC housed in a GRP kiosk
- Nutriox dosing unit
- The work also included laying a new rising main from the pumping station to Amlwch WwTW which was approximately 2382m in length.

At the Cadet pumping station, the work included the installation of:

- Pumps to pass forward flows to Amlwch WwTW
- Hydro brake flow control chamber

The team

The partners working on this AMP 4 scheme for Welsh Water included Costain as the civil design and construction partner, Imtech Process as the M&E and process design and construction partner and EC Harris as the cost consultants. UUOS is the operating partner at Amlwch WwTW.

Faber Maunsell was the civil design subcontractor, major civil engineering subcontractor, William Hughes was the supplier for civils, IPS for the mechanical installation and steelwork and MCS for the MCC and electrical installation.

All the partners and tier one suppliers worked closely together to ensure that the scheme was completed and delivered for Welsh Water with minimal disruption to the local area, whilst maintaining an excellent Health and Safety record. Due to the tight time constraints and large number of concurrent activities being undertaken, it was essential that all site works ie civil, mechanical and electrical, were closely co-ordinated and managed.

Works completion

Despite the late start on site due to land access issues, the conservation issues that had to be addressed and an EA enforcement date of the end of December 2008, the team achieved consent compliance by the required date.

The team working at Amlwch achieved a huge amount in eight months by building an entire WwTW, two pumping stations and rising main, and this included the installation of all the equipment and the commissioning of the scheme - turning flows on 8 December 2008. Welsh Water recognised this achievement by awarding the team, Team of the Month

Note: The Editor & Publishers Mark Fuller is Lead Design Engineer with Imtech Process and Tim Mitchell Lead Civil Design Engineer with AECOM on behalf of Costain, for providing the above article. ■