

Thurso WwTW & sludge treatment centre

£12.56m project completed within 14 months - under budget

Until December 2005, raw sewage from Thurso and the adjoining village of Scrabster was discharged, after maceration, into Thurso Bay through a long sea outfall. To have a conurbation of approximately 15,000PEA discharging sewage into the sea without wastewater treatment is unacceptable in today's society. Therefore, in order to comply with the Urban Waste Water Treatment Directive (UWWTD) appropriate secondary (biological) treatment had to be provided by December 31, 2005. Following consultations with the interested parties and Statutory Consultees, the scope of the project was finalised, design completed with Scottish Water Solutions (SWS) getting construction underway in November 2004 and completing the £12.56 million project within 14 months, £300,000 under budget and before the regulatory deadline of 31st December 2005.



Thurso WwTW

courtesy Scottish Water Solutions

In order to promote a solution that would have community and stakeholder buy in, consultations were ongoing for several months prior to submitting a planning application. In addition to Statutory Consultees including, The Highland Council, Scottish Environment Protection Agency, Scottish Natural Heritage, consultations were ongoing with landowners/tenants, Thurso Community Council and the general public.

The main questions asked were:

- * **Will I see it? WWTP & Sludge Treatment Centre** - the site can be seen from the foreshore at Thurso, some

2 kilometres away, photo montages were used as evidence. It is below the local horizon and would look very similar to a farm building nearby. It cannot be seen from the public roadways from Castletown or the south.

Thurso Headworks, storm tanks & transfer pipeline - the pumping station and storm tank were in the existing car park area adjacent to Thurso Headworks with the storm tank in a nearby lorry park. Once constructed, all that can be seen are a re-aligned traffic island with access covers and a control cabinet sited behind the existing public toilet.

Consultant to the Built, Natural and Social Environment

White
Young
Green

White Young Green is pleased to be providing Engineering and Project Management Services on the Integrated Wastewater Framework Eastern Region for DRD Water Service.



For further details contact:
Jane Chambers, Regional Director
White Young Green,
1 Locksley Business Park,
Montgomery Road, Belfast, BT6 9UP
Tel: 028 9070 6000
Email: belfast@wyg.com

thinking beyond construction

www.wyg.com

847

Thurso Sir Archibald Road – a small pumping station was buried underground adjacent to the car sales compound.

* **Will I hear it?-**

WwTP & Sludge Treatment Centre - The site is 500m from East Thurso and should have no noise impact.

Thurso headworks, storm tanks & Transfer pipeline- the pumps would be within an underground chamber & therefore would not cause noise nuisance.

Thurso Sir Archibald Road - measures to combat noise were similar to Thurso Headworks.

- * **Will I smell it** - a well operated WwTP creates what could be described as an 'earthy' odour that is not normally considered obnoxious. Odour control equipment was installed in the Sludge Treatment Centre and other areas where sludge is handled. Scottish Water Solutions have learned from past experience on other WwTP sites and would be installing the most appropriate odour control system. The odour risk was minimised by siting the works over 500m from the nearest dwelling at East Thurso.

- * **Thurso Headworks, storm tanks & tr'sfer pipeline**
- odour risk was minimised by installing the most appropriate odour control system at the pumping station and air valves on the buried pipeline.

- * **Thurso Sir Archibald Road** - measures to combat odour were similar to Thurso headworks.

The solution

The requirements to overcome the visual, noise and odour questions, along with the Consent Requirements of SEPA, more or less shaped the project solution which comprises:-

Thurso headworks, storm tank & transfer pipeline

An underground sewage transfer pumping station adjacent to Thurso Headworks that pumps 3 DWF (80 l/s) of raw sewage to the new WwTP underground storm tank 500m³ to provide 2 hours storage between 3 DWF and Formula A flows. A transfer pumping main from Thurso Headworks to convey sewage to the new WwTP.

Wastewater Treatment Plant

Secondary Wastewater treatment plant (WwTP) at new site at East Thurso, approximately 1.5kms from the existing headworks at Thurso harbour to include:

- * inlet screening & grit removal;
- * two primary settlement tanks;
- * three activated sludge aeration reactor basins;
- * two final settlement tanks;
- * two sludge storage tanks;
- * a sea outfall extending some 460m north of WwTP into Thurso Bay.

Sludge Treatment Centre

A sludge treatment centre on the WwTP site to pasteurise Caithness sludges to allow disposal onto agricultural land to include:

- * imported sludge reception screen;
- * sludge cake press;
- * lime pasteurisation;
- * imported sludge cake hopper;
- * covered storage area.

Standards & costings

Design population: 15,200 PE.

Consent Standard: 25mg/l BOD, 125mg/l COD

Approved scope out-turn cost £12.56 million.

End of project out-turn cost £11.82m

Design

In order to meet the Regulatory deadline, design was fast tracked by Scottish Water Solutions' Engineering section, completing all detail design in half the time such a complex job would usually take. To achieve this time efficiency the Engineering design team made use of standard details that were developed as 'Signature Solutions' by Scottish Water Solutions.

Construction

Construction was undertaken by *Galliford Morgan Joint Venture* (GMJV) who is one of Scottish Water Solutions' in-house delivery partners. Work commenced during November 2004 and by late May 2005, most of the major civil structures were nearing completion.

For safety reasons, due to predominantly rough sea conditions regularly experienced along the north coast of Scotland, and also for environmental reasons, the sea outfall was bored through the Caithness slab rock by directional drilling.

Thereafter, mechanical/electrical plant was installed, which allowed commissioning/testing of the transfer pumping station and pipeline by July 2005. Once this part of the project was operational the sequential commissioning of the wastewater treatment plant was underway in October 2005. This allowed just enough time for the biological process to mature, which enabled Thurso WwTP to be operating within consent before 31st October 2005.

Scottish Water Solutions received Planning Permission and early land entry mid October 2004 and delivered a WwTP that was operating within Consent before the Regulatory deadline of 31st December 2005.

The project delivered a saving of £740k, which equates to 5.9% efficiency on approval scope cost of £12.56 million.

The new waste water treatment plant has improved the wastewater going into the Pentland Firth ten fold, which would also boost Thurso's reputation as a top surfing destination. ■
