

Project Alpha

Northern Ireland upgrades 50% of water treatment capacity

In 2003 Northern Ireland's Water Service committed to a strategic Public Private Partnership (PPP) project (Alpha) aimed at improving the failing drinking water facilities within the region. This is the first UK PPP of a drinking water service and represents a radical approach to capital delivery within the region. Project Alpha is aimed at five key facilities that together will provide just over 50% of the total treatment capacity of the Water Service (396 million litres per day). Project Alpha reached financial close in May 2006 and to date represents one of the fastest infrastructure PFI procurements completed.



Project Alpha: Visual impression of new facilities.

courtesy Northern Ireland Water

The business case for Alpha was clear, to meet a range of EU requirements centred around the EU Drinking Water Directive. Northern Ireland Water had been operating under authorised departures from EU water quality standards and now had to comply in the shortest possible timeframe.

Northern Ireland Water needed an affordable, value for money solution and formed a dedicated project team with NIW staff advisors Price Waterhouse Coopers, Mott MacDonald and Dundas & Wilson, headed by an international PPP specialist Sue Holmes who also led Alpha's sister waste water project (Omega).

In May 2004, the project leapt into being, setting aggressive timescales for development and procurement. These were defined contractual requirements in the form of performance based outputs and mutually beneficial allocation of risks early in the process. Together, these approaches motivated strong market competition and created the right environment for the design of innovative industry solutions in the race for selection. Twentyone bids were submitted by four pre-qualified bidders.

In August 2005, the *Dalriada Water Consortium*, including *Earth*

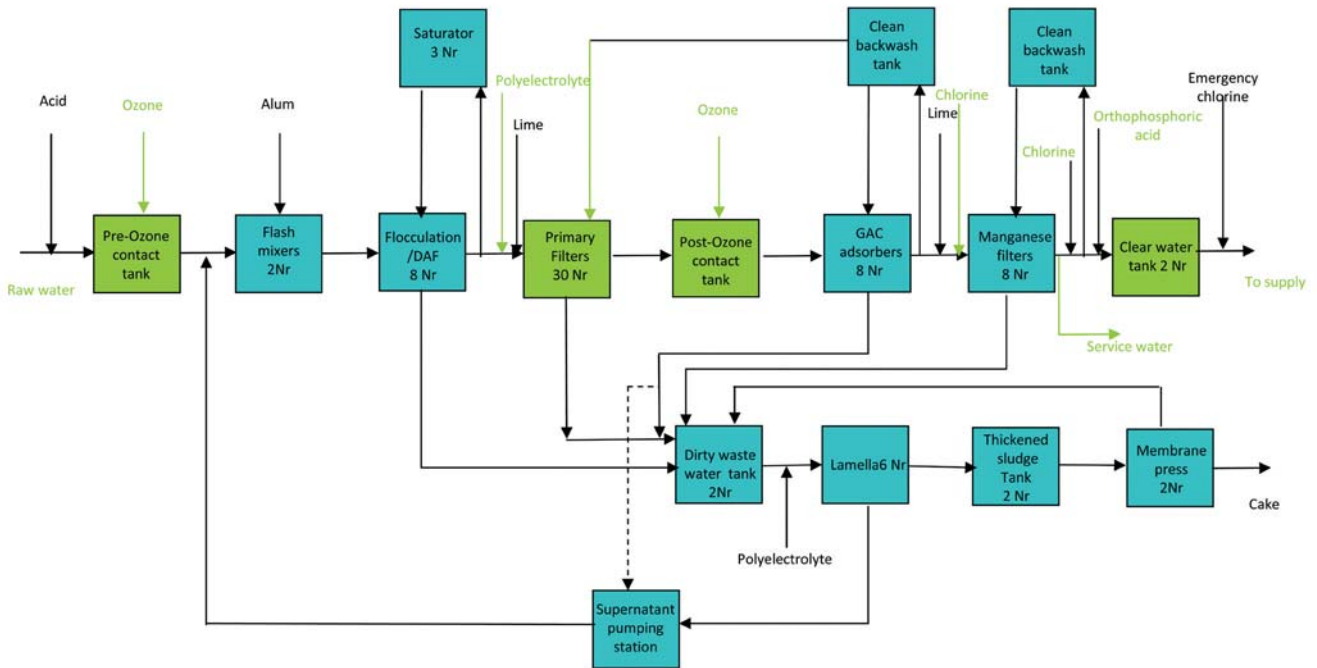
Tech Engineering UK, *Kelda Group* and *Northstone (NI)* was selected as preferred bidder. *Dalriada* were awarded the contract in May 2006, some 14 weeks ahead of schedule. This focused procurement period and the accepted construction programme at award will result in the delivery of EU drinking water compliance more than 12 months ahead of the expiry of the regulatory authorised departures.

This contract requires the contractor to **design, construct within two years and operate these new facilities for 23 years post service commencement**. This takes place around the continued operation of the existing plants by Northern Ireland Water until they can either be abandoned or incorporated as required.

The facilities are Castor Bay (Lurgan), Dunore Point (Antrim), Moyolla (Toome), Ballinrees (Coleraine) and Forked Bridge (Lisburn).

Works will deliver **four new treatment facilities and one new pumping facility representing a capital cost in the region of £110 million**. Included in the package were 22km of strategic link mains with 25Mld total capacity and a 16km bulk transfer main with 29Mld capacity.

Dunore Point



Dunore Point: Existing process flow

courtesy Northern Ireland Water

Three of the existing facilities abstract water from Lough Neagh, the largest freshwater lake in the British Isles at 383km². The last gathers the majority of its raw water from the River Bann, which is the outlet of Lough Neagh. This gives rise to process challenges as significant levels of algal blooms and seasonal changes occur in the shallow lough, resulting in high variation in raw water quality.

In general, the existing treatment is limited to sand filtration and chlorination prior to supply, though the two smaller sites have some forms of bespoke and proprietary dissolved air flocculation (DAF) treatment and most are 30 to 40 years old. It is worth noting that the original treatment plant at Forked Bridge dates back to 1890.

The required outputs from the new facilities are: Castor Bay 147M/l/d, Dunore Point (180M/l/d), Moyola (19M/l/d), Ballinrees (50M/l/d) with Forked Bridge being incorporated into Castor Bay output.

The contractor has adopted a generic treatment process approach centred around DAF technology, supplemented as required by sand filtration and other ancillary process.

Progress during the first six months of construction has not been without its own challenges and difficulties, particularly threading the new facilities around operational works. But the contractor remains on programme.

In summary, at service commencement next year Project Alpha will enable NIW to comply with EU legislation and avoid financial and legal penalties. Delivering significant benefits to Northern Ireland Water and its customers in terms of reduced costs and risks.

Project Alpha will have successfully provided capital cost savings of approximately 27% against the initial estimates and 15% against UK industry operating cost standards and it will have mobilised

financial capital in order to deliver much needed assets.■

Note: The Editor & Publishers thank Mott MacDonald Ltd for preparing the above article for publication.



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