



Water Quality Review

Bellanaboy River & Carrowmore Lake & Catchment

PMC Terminal
Shell Report

Surface water quality review- Bellanaboy Bridge Gas Terminal (BBGT)



- Surface water monitoring review of the Carrowmore Lake catchment by Aquatic Services Unit (UCC).
- Results yielded during the construction of the BBGT from 2004 to 2015.
- **Objective:**
 - Assess the trends in water chemistry and biological monitoring data.
 - Review the residual impact on the quality of the downstream receiving waters.

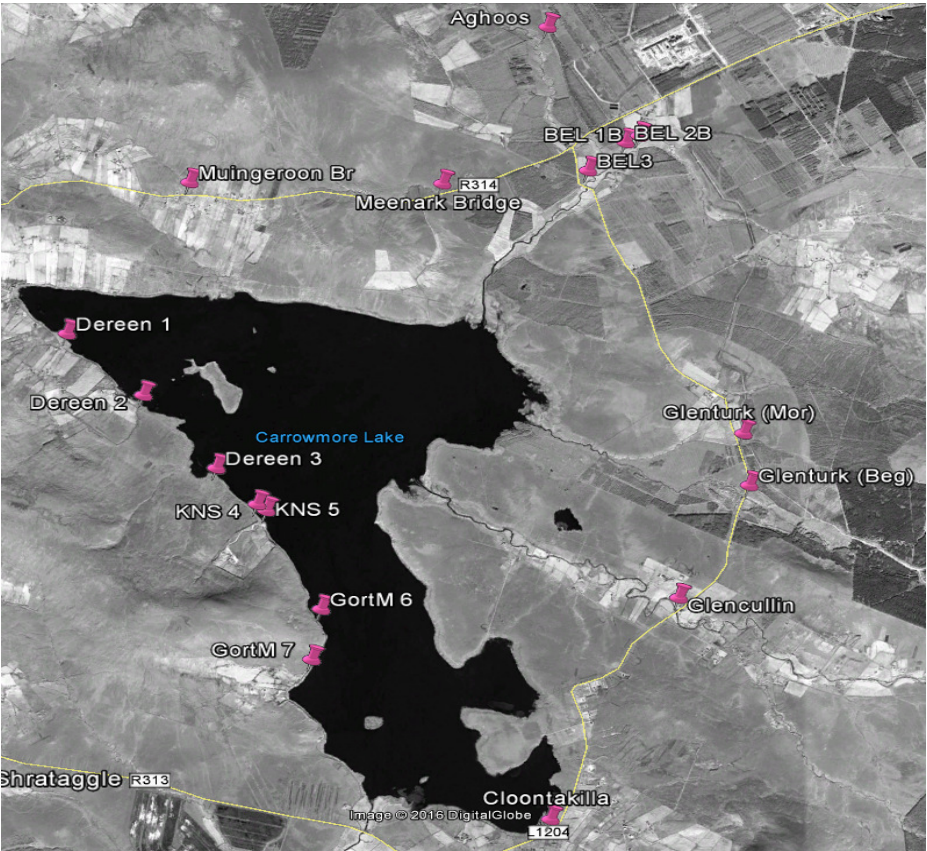
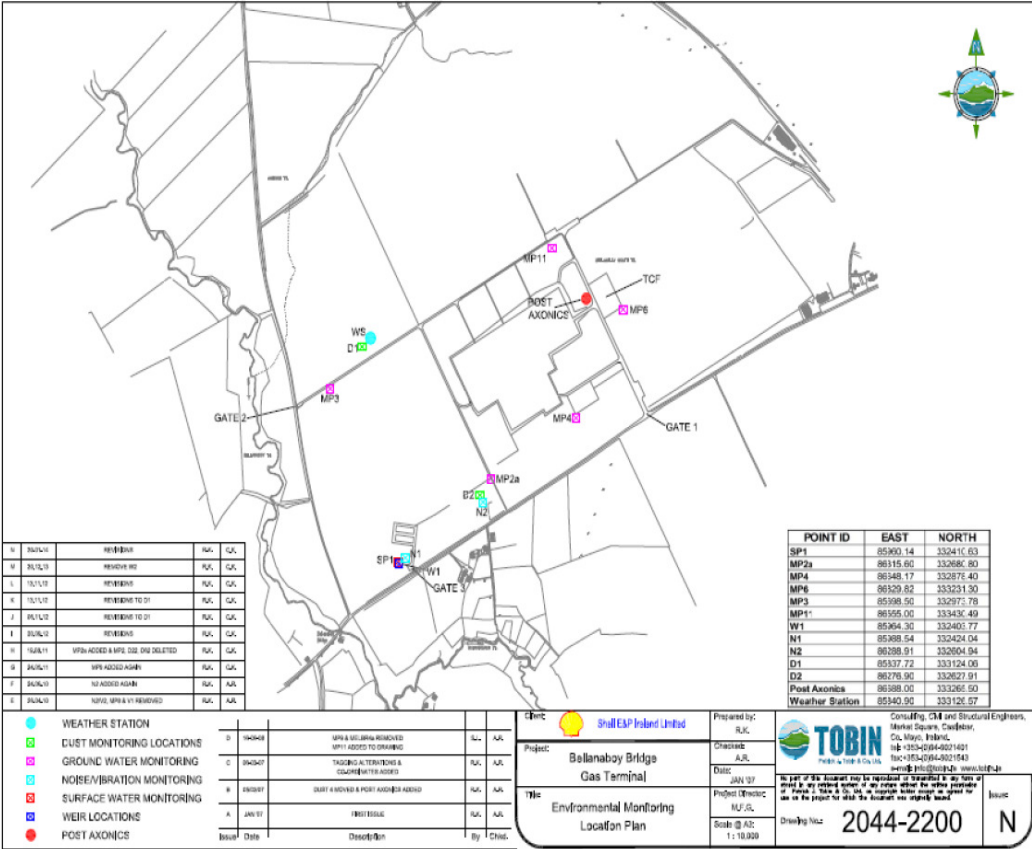
Surface water data reviewed

- The parameters included physical, nutrient and some metals.
- **Data Source:**
 - Mayo County Council surface water chemistry data for 14 tributaries of Carrowmore Lake on the Bellanaboy River.
 - Mayo County Council's biological water quality monitoring results (Small Stream Risk Scores - SSRS) for 2 sites on the Bellanaboy River.
 - EPA's summary chemical and biological monitoring results for Carrowmore Lake (2007-2015)
 - EPA Q-value monitoring results for several rivers within the Carrowmore Lake catchment including the Bellanaboy River (2005-2014).

Surface water review

- The BBGT water analysis data relate to the main surface water outlet which is located close to the boundary fence of the terminal in the south west portion of the site.
- The land area of the BBGT lies within the catchment of a small stream.
- This stream joins the Bellanaboy River approximately 350m downstream from the BBGT boundary line at a point 700m upstream of Bellanaboy Bridge and 2.5km upstream of Carrowmore Lake.
- The surface water discharge from the BBGT was named SP1

Surface water monitoring locations



Surface Water – discharge

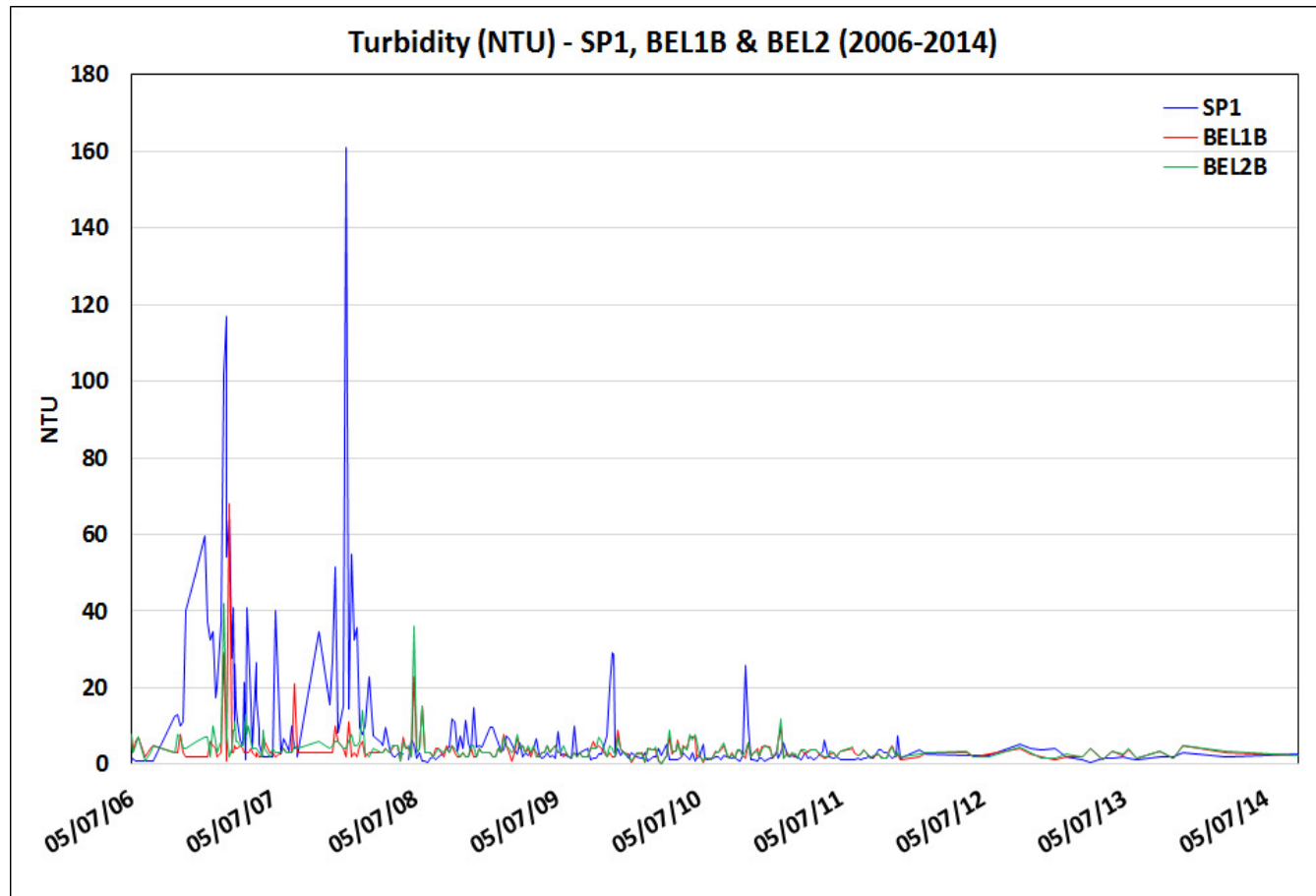
- Construction of the BBGT commenced in November 2004.
- Discharge criteria was agreed with Mayo Co Co, IFI, & Marine Institute.
- Monitoring system installed for continuous monitoring.
- Surface water discharge from the BBGT required treatment/settlement in advance of discharge:
 - Treatment via onsite plant- Axonics/siltbuster
 - Settlement through the settlement ponds



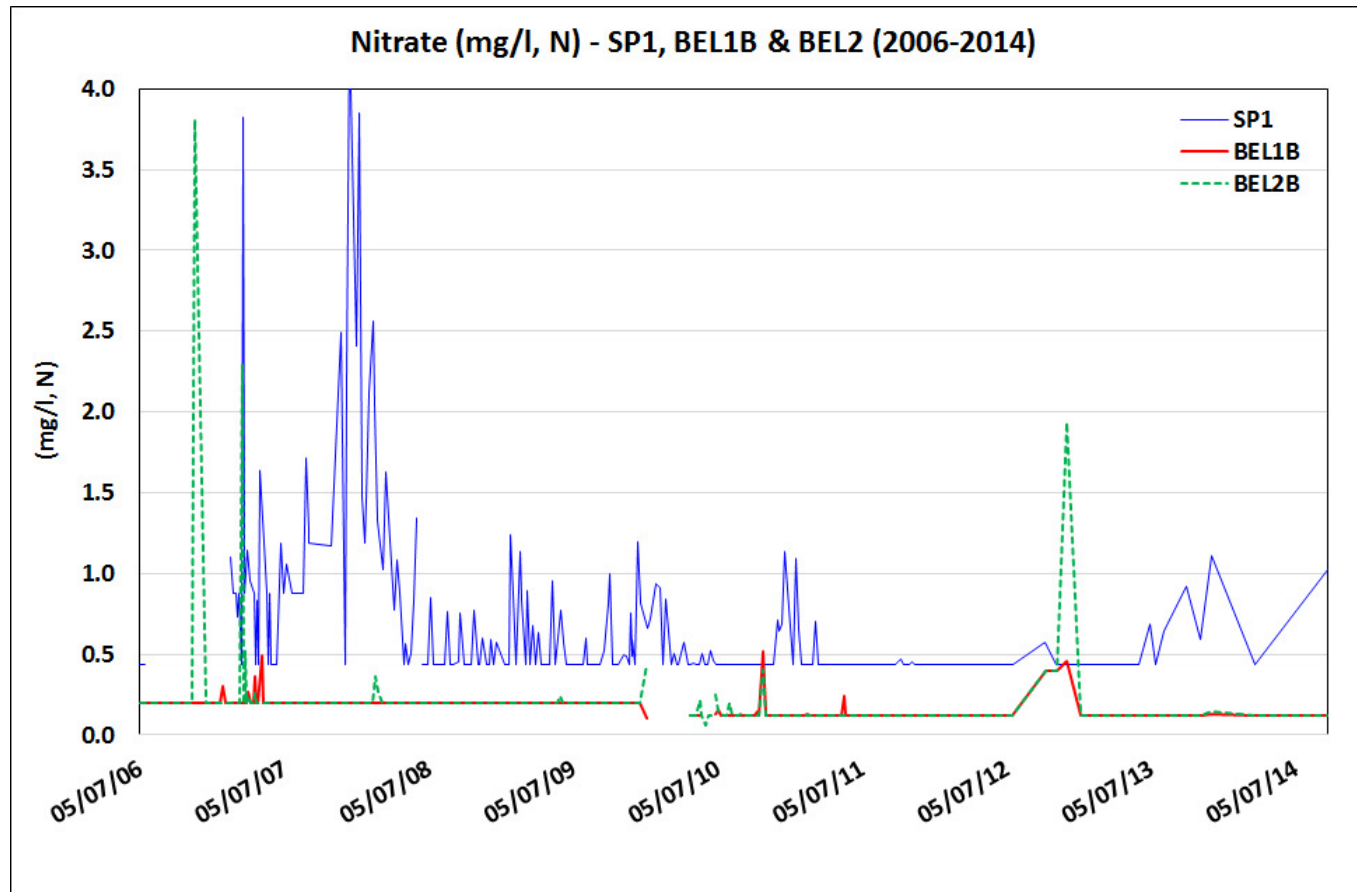
Summary of review findings

- The water chemistry data available for undertaking this review is considered very comprehensive, covering an extended timescale and a wide range of sites and parameters.
- The data for the surface water discharge displayed two distinct phases:
 - **Phase 1**- from May 2005 -August 2008 when several parameters- turbidity, suspended solids, nitrate and total aluminium and to a lesser extent ortho-P and total-P were elevated above background levels.
 - **Phase 2**- 2008- 2014 when the levels of these parameters dropped back to baseline levels.
- The discharge volumes from SP1 were small and the review indicated that the SP1 discharge was having a minimal effect on the receiving water chemistry.

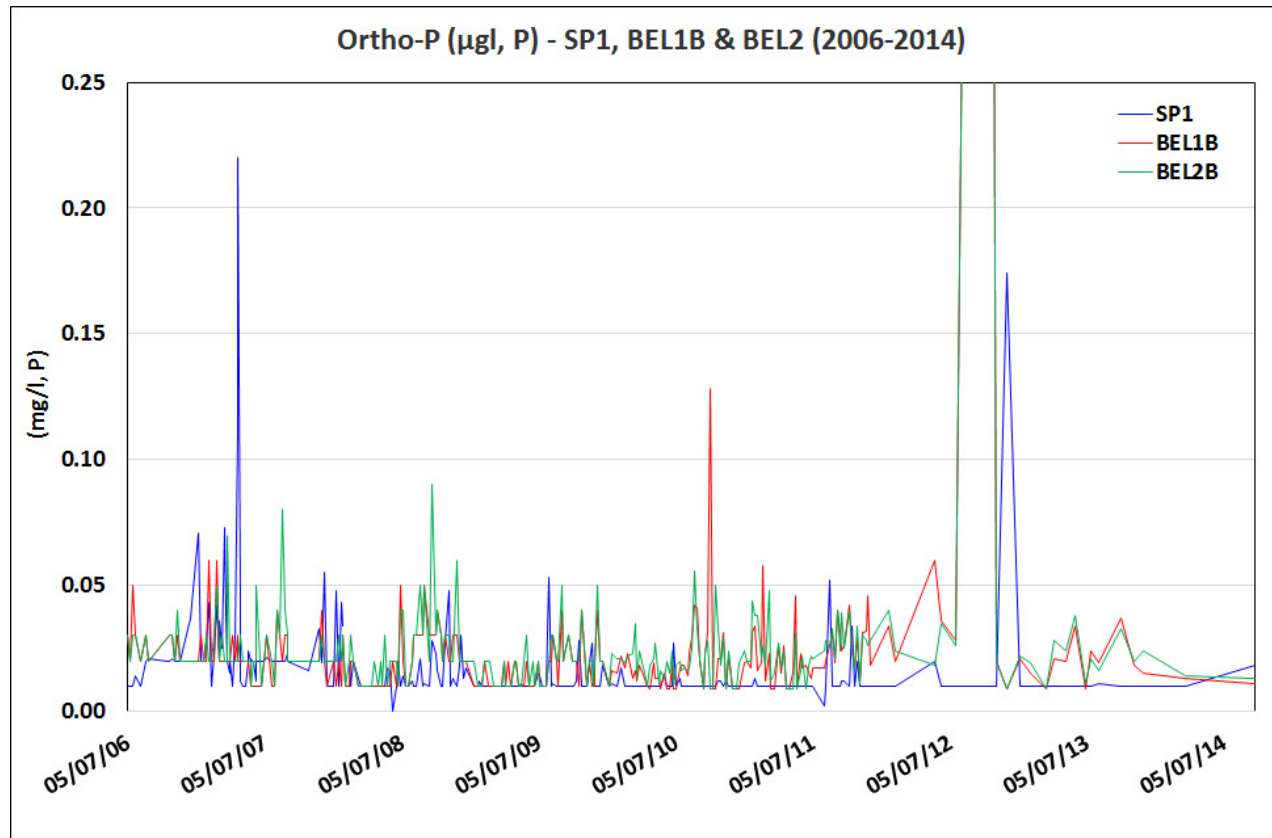
Surface water monitoring – results



Surface water monitoring – results

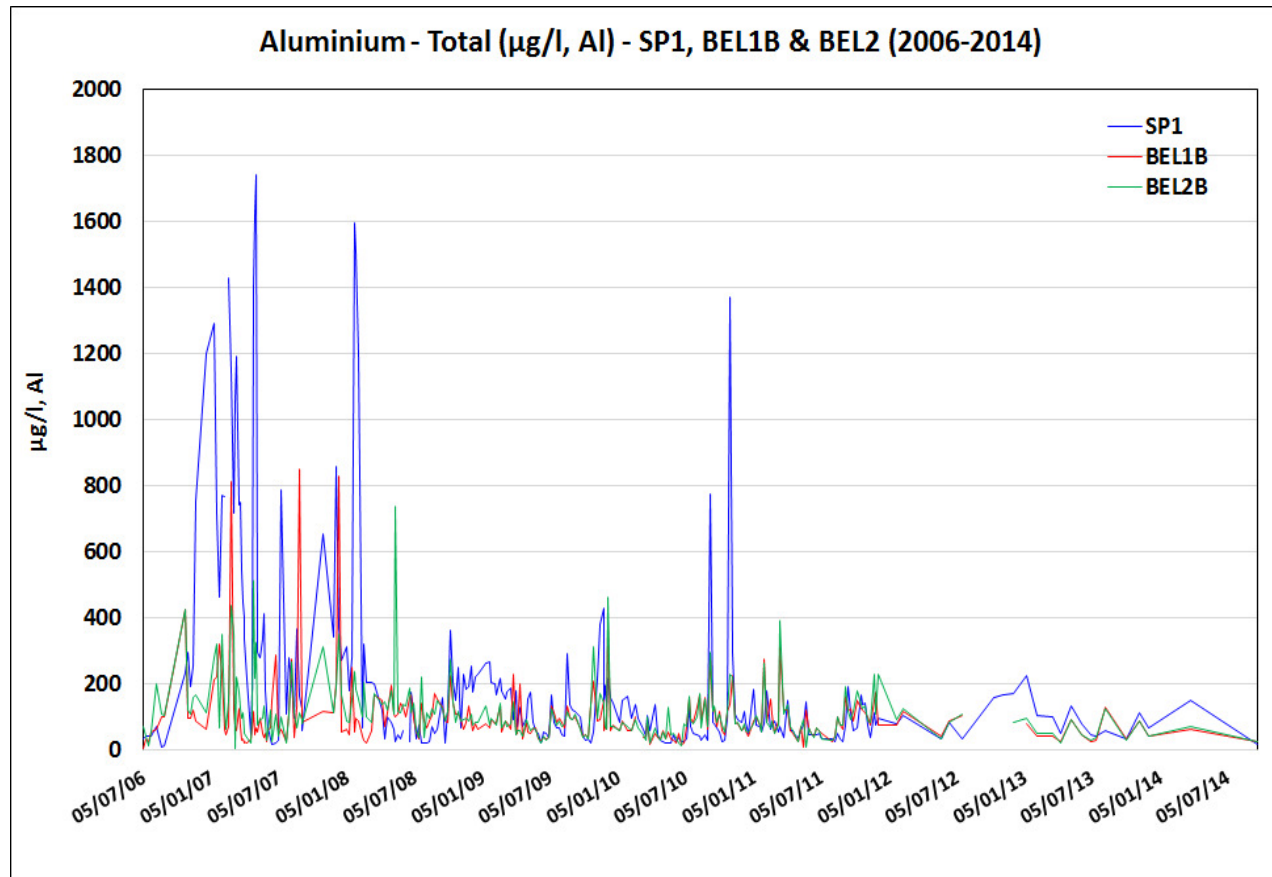


Surface water monitoring – results



r

Surface water monitoring – results



Summary of review findings

- The review of MCC database for the wider Carrowmore Lake catchment tributaries (2005-2014) indicated Water Framework Directive surface water objectives were being achieved.
- Biological data collected by the EPA in the Bellanaboy, Glenturk and Munhin Rivers from 2005 - 2014 indicate that water **Good Status** in these channels, one of which (at Bellanaboy Bridge) is downstream of SP1.
- EPA, in monitoring water quality in Lough Carrowmore from 2007- 2015 classified the lake:
 - **Moderate Ecological Status**
 - **Good Nutrient Status**
 - **Good supporting chemistry status.**

Conclusion

- The review indicates from 2005 to 2014:
 - No changes in chemical or biological quality within the Carrowmore Lake catchment.
 - Quality is within normal and natural variation, the system appears to be relatively stable in terms of its water quality, which is generally good.



