

Chorley

Combined sewer overflow



Project

Chorley

Location

Chorley, Lancashire UK

Project type

Design and construction
supervision

Wastewater type

Combined Sewer Overflow

Completion date

2024

Treatment process

ARMStorm™ Saturated
Vertical Flow (SVF)
treatment wetland with
Forced Bed Aeration (FBA™)

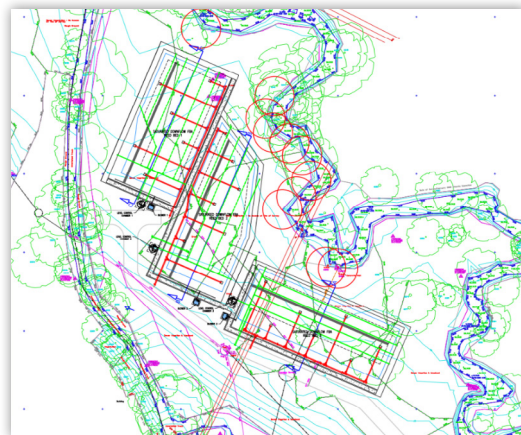
Need

Chorley 12 is a Combined Sewer Overflow (CSO) located in the village of Heskin, Chorley, off Park Hall Road, PR7 5NL. The CSO discharged directly into Syd Brook (a tributary of the river Yarrow) for approximately 150 days annually during storm events. The spills are characterised by moderate 95th%ile concentrations of 162mg/l Biochemical Oxygen Demand (BOD5), 15mg/l Ammoniacal Nitrogen (NH4-N) and 180mg/l Total Suspended Solids (TSS).

The spills impacted the receiving watercourse quality, and a low-maintenance, low-carbon sustainable solution was required to meet Environmental Quality Standard (EQS) within Syd Brook.

Solution

To attenuate and treat the CSO discharges up to a 1:30year design storm event, three 600m² ARMStorm™ Saturated Vertical Flow (SVF) wetland cells with Forced Bed Aeration (FBA™) were designed and constructed in parallel. The ARMStorm™ solution is an innovative development of Saturated Vertical Flow



Plan of the **ARMStorm™** CSO wetland treatment system.



Photograph of the **ARMStorm™** CSO wetland treatment system.



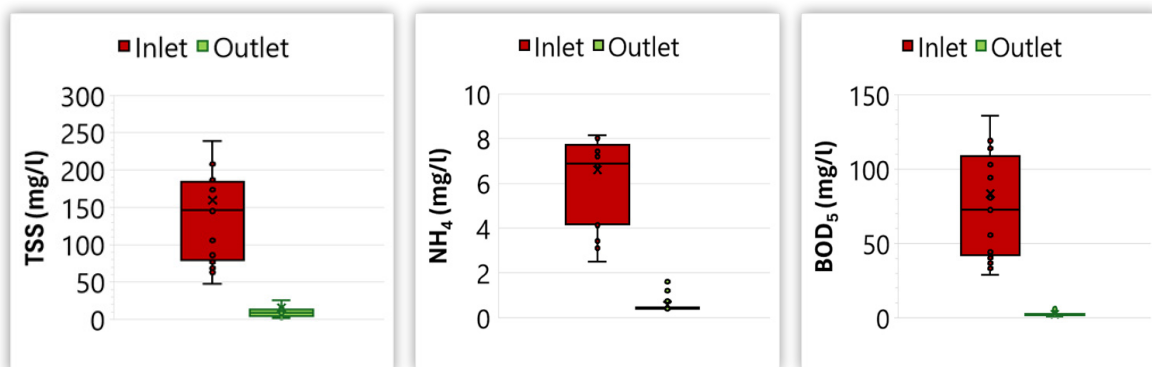
(SVF) aerated wetland technology, incorporating the use of surface freeboard attenuation and optimisation of the aeration operation to allow effective management of shock loads and large stormwater volumes.

The Nature-Based Solution (NBS) designed for Chorley 12 treats 20l/s instantaneously with an appropriate built-in attenuation and balancing capability in the surface freeboard. This removes the requirement for upstream concrete storage tanks, minimising the project CAPEX and embedded carbon.

Performance

A 12-week post-commissioning study revealed excellent performance and compliance with the final effluent discharge quality. The system reduced average concentrations of:

- BOD₅ by 97% from 84mg/l to <3mg/l,
- NH₄ by 92% from 6.61mg/l to <0.50mg/l and
- TSS by 90% from 160mg/l to <20mg/l.



Box plots summarising performance during a 12-week post commissioning water quality survey.

Benefits

ARMStorm™ achieves the most stringent regulatory permits and environmental quality standards (EQS) while delivering multiple co-benefits including:

- Environmental protection
- Low lifetime costs (TOTEX)
- Few mechanical/moving parts
- Low carbon footprint
- Built-in attenuation
- Habitat and biodiversity creation
- Sludge and shock load management
- Aesthetic value

