

Case Study

M3 Junction 2, Surrey

SDS Aqua-Xchange™ prevents pollution of water bodies adjacent to London-bound M3 motorway



SDS Systems

SDS Aqua-Xchange™.

SDS Customer

Environ Civils; Connect Plus Services.

Client

National Highways.

Project

M3 motorway drainage improvements.

Purpose

To lessen the impact on the local environment of runoff pollution from the M3.

Brief to SDS

To provide effective and environmentally friendly treatment of surface water runoff from the eastbound carriageway of the M3.

Timing

November 2024 to March 2025.

Project Background Information

Every day around 135,000 vehicles use the M3 motorway, which runs from Sunbury, in Surrey, to Southampton. The stretch either side of Junction 2, for the M25, is one of the busiest sections of any motorway in the UK.

Adjacent to this stretch is St Ann's Lake, part of the Thorpe Park Resort. It is designated one of the waterbodies of the "South West London Waterbodies Special Protection Area" (SPA) and also adjoins land of Special Scientific Interest (SSSI). The SPA aims to maintain the integrity of the site and support the Wild Birds Directive's goals, including habitat maintenance and bird population support. This area is of national importance for its wintering gadwall and shoveler duck populations, who use the lake for feeding and roosting, and provides various semi-natural open water habitats. The lake, therefore, is not only an essential part of the local ecosystem but also supports recreational activities such as fishing, swimming and watersports, making its

protection from pollution critical for both environmental and community purposes.

Last reviewed in 2022, Thorpe Park Lakes Water Body was designated 'Poor' ecological status (Source: Defra). Surface water runoff from the eastbound carriageway has historically been a contributor to water quality issues in St Ann's Lake in particular. The potential for significant pollution is a growing concern, particularly as this stretch of the M3 has been upgraded to smart motorway status meaning the hard shoulder is also open to traffic at particularly busy times, thereby exacerbating the pollution levels due to the increased congestion.

Project Objectives

To improve the quality of surface water runoff entering St Ann's Lake from the M3's eastbound carriageway.

Project Requirements

To address the pollution risks posed by 31 outfalls that currently discharge into the lake by removing both soluble and sediment-bound pollutants carried in surface water runoff, such as toxic metals, polyaromatic hydrocarbons and microplastics, before it can penetrate the ground and reach the lake.

SDS Product Features

A drainage system extending alongside the M3 eastbound carriageway has been introduced, incorporating SDS Aqua-Xchange™ filtration media with a capacity to treat surface water runoff from an area of circa 50,000m² or approx. 2.7km of motorway, effectively removing pollutants before discharge into St Ann's Lake.

Issues Overcome

The installation overcame several site-specific constraints; these included working with a partially submerged embankment, managing the presence of NRTS cables, and dealing with the challenges of narrow lane Traffic Management.

The existing traffic management system was extended by approximately 1.9 miles to facilitate smooth execution of the project while minimising disruption to traffic. Temporary traffic management measures, such as lane closures and a 50mph speed limit, were put in place to ensure workers' and drivers' safety during construction works.

To preserve embankment stability and prevent any damage to the carriageway and existing infrastructure, a robust temporary works design was developed. All issues and concerns were effectively managed through detailed planning, ensuring that the installation proceeded smoothly without complications.

Results

The long-term impact of this project will significantly enhance the environmental integrity of the area.

By reducing pollution entering St Ann's Lake, the project supports the health of the local ecosystem and ensures compliance with water quality regulations.

The upgraded drainage system will also reduce flooding risks on the M3 carriageway, improving overall safety and contributing to the long-term resilience of the motorway infrastructure.

Iulian Oprea, Senior Project Manager, Connect Plus Services, said: "We selected the SDS Aqua-Xchange™ system for the M3 drainage improvement works after considering various alternatives. Key factors in specifying Aqua-Xchange™ included the minimal crew required for installation, ease of installation including simple bag emptying with minimal disruption to local traffic, and absence of required maintenance. Installation in fact proceeded very smoothly despite the challenging site, and we are confident the material will perform well."



Image kindly supplied by Octavius.