

CASE STUDY

Claypit Lane

Aerated reed bed SECONDARY SEWAGE



Project

Claypit Lane, community of five domestic dwellings

Location

Claypit Lane, Lichfield,
WS14 0AQ

Project type

Design and Construction,
aerated reed bed technology
with Forced Bed Aeration
(FBA™)

Wastewater type

Secondary domestic sewage

Treatment processes

Septic tank, aerated
reed bed technology

Need

Septic tank effluent from five domestic dwellings, stables wash water and surface runoff merge into a combined effluent which discharged by gravity through a small filter bed and into a small receiving watercourse. In March 2018, ARM undertook an asset assessment of the existing filter bed, which was found to be poorly constructed, undersized, hydraulically limited and leaking through its bunding, potentially contaminating the surrounding soils and groundwater. Analysis of water samples identified that the existing filter bed was providing virtually no pollutant removal and sewage fungus was an issue at the outfall location. The site required a low-cost, treatment solution with minimal footprint and maintenance requirements to prevent pollution of the receiving watercourse and surrounding soils and groundwater.

Solution

Following the asset assessment, ARM characterised the wastewater and an appropriate reed bed treatment system was designed to treat a maximum flow rate of 56m³/d, and pollutant concentrations of 140mg/l biochemical oxygen demand (BOD), 23mg/l ammoniacal nitrogen (NH₄-N) and 102mg/l total suspended solids (TSS). The design discharge standards for the receiving watercourse was based on typical UK standards of 20mg/l, 30mg/l and 10mg/l for BOD, TSS, NH₄-N respectively.

natural wastewater treatment



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Design basis treatment requirements and discharge standards

PARAMETER	UNIT	DESIGN BASIS	DISCHARGE STANDARDS
Average daily flow	m ³ d	11	–
Peak daily flow	m ³ d	56	–
BODs	mg/l	140	20
TSS	mg/l	102	30
NH ₄ -N	mg/l	23	10

The existing filter was decommissioned and removed and a saturated vertical flow reed bed containing *Forced Bed Aeration (FBA™)* was installed by ARM in June 2018. A small blower was required to enhance the oxygen transfer to meet the oxygen demands of the BOD and NH₄-N in the influent and minimise the reed bed footprint. The blower is connected to the mains but can be operated by solar panels during the summer months.

Benefits

There are several key benefits of aerated reed bed technology with *FBA™* for domestic applications including;

- Sustainable and economical green technology that is visibly attractive
- Low power requirements and maintenance
- Partial solar powered option
- Consistent and high-quality final effluent
- Treatment of variable/ diurnal loadings
- Reduced footprints
- Meets the new ST regulations coming into force in January 2020

