CASE STUDY

Highland Spring

Aerated vertical flow reed bed

PROCESS WASTE WATER

Project
Highland Spring, Blaen Twyni

Location
Blaen Twyni, West Glamorgan

Project type
Design and Build

Wastewater type
Industrial process wash water

Treatment
Aerated vertical Flow

Need

ARM Ltd was approached by Highland Spring to assess the existing wastewater treatment system at their Blaen Twyni site in the Brecon Beacons. The site produces flavoured drinking water supplying numerous retail outlets including supermarket chains. Borehole water is drawn from the ground on site processed and bottled prior to distribution. Flavourings and preservatives are added during production and acids, alkalis and oxidising agents used for plant cleaning processes. The waste water collected on site is a combination of product, cleaning fluids, raw water and acid/alkali for pH balancing.

The existing effluent treatment plant had been installed in 2011 and comprised 8 sequential ponds or lagoons. Variations in the shape of the ponds and level of reed planting along with partial aeration were meant to augment different mechanisms of action to effect overall treatment of the waste water. Unused borehole water was used as a means of diluting final effluent. The system had been struggling to achieve reliable performance and maintain discharges within consent. As a result effluent was being tankered away from site at significant cost.

ARM undertook a site and data survey to establish the key treatment issues. Four different effluent streams were identified and significant variation in loads were seen (between zero and 1,500mg/l COD). This variation was, in part, due to the minimal

natural wastewater treatment

CASE STUDY continued

Highland Spring

upstream flow balancing and the position in the treatment stream of the pH adjustment processes which was often stretched beyond its limits leading to plant shut downs. Consideration also had to be given to predicted potential increases in production.

PARAMETER	INFLUENT	CONSENT
Average Flow (m^3/d)	60 (350 peak)	150
Average Biological Oxygen Demand (mg/l)	400	<20
Average Total Suspended Solids (mg/l)	21	<30
Average Chemical Oxygen Demand (mg/l)	570	<70
pH	Variable (2-12)	6-9

Solution

Once the flows and loads had been determined a reed bed treatment system could be designed and installed. Maximum use was made of the existing pond assets by converting just one of the (pond 3) into an aerated vertical flow system with a total area of 180m . The two ponds upstream would provide additional balancing and the downstream ponds additional polishing treatment. Plant and operational alterations were also made up stream to provide additional balancing of the acid and alkali wash waters so that the pH adjustment system received a more consistent and manageable load.

Benefits

The aerated reed bed provides the Highland Spring, Blaen Twyni Site with a much more secure treatment system eliminating the costs associated with tankering effluent off site on a daily basis whilst making the most of their existing assets. Upstream adjustments undertaken by ARM provide additional balancing and optimisation of the pH adjustment system making the water management system far more robust.

natural wastewater treatment