WRA Bulletin 64

April 2022

UK WORK

Fawley Farms

Berehill Farm, Whitchurch, Hampshire, is a working pig farm. A proposed development consists of two new barns and a bio-secure hut. The site is in a rural area within the North Wessex Downs and is underlain by the permeable Seaford Chalk Formation. A screening study had identified the site to be in a nitrate vulnerable zone and Groundwater Source Protection Zones 2 and 3. The risk of flooding from all sources at the site is low.

WRA LLP was commissioned by the owners of Berehill Farm to develop a Surface Water Management Plan including a sustainable drainage system (SUDS) design in order to satisfy planning conditions issued by Hampshire County Council for the proposed development.

Given the freely draining soils and permeable underlying Chalk the most appropriate form of SUDS is to infiltrate surface runoff into the groundwater system. The depth to the water table on site was observed in a borehole to be 32m below ground level. Infiltration measures would therefore be able to comply with the SUDS guidelines recommendations.

Topographic Flow Pathways around the area

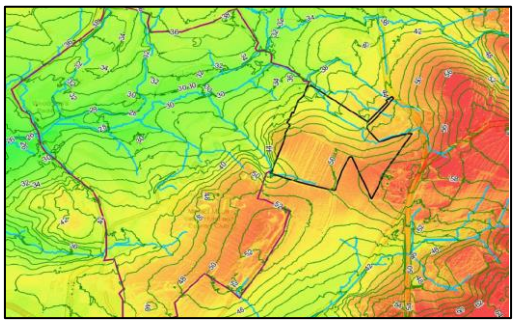
Flow pathways were generated for the site using a Digital Terrain Model (DTM), based on LiDAR data and using cell-based modelling routines within ArcGIS software. SUDS measures were proposed in the form of soakaways to ensure that surface water generated from the proposed development will not exceed the predicted greenfield surface runoff from the site. In the event of any failure of the SUDS, surface water will follow natural flow pathways onto surrounding agricultural land and will infiltrate into the freely draining topsoil.

Quarry Water Issues and Planning

Phillimore Estates Limited are the adjoining landowners to Five Oaks Farm which is the site of a proposed quarry and subsequent landfill development. Phillimore Estates' land holding includes the Meon Valley golf and country club hotel. WRA LLP was commissioned by Phillimore Estates Ltd to review the hydrological aspects of the proposed quarry and subsequent landfill development at Five Oaks Farm. Specific chapters of the Environmental Statement, downloaded from the Hampshire County Council Planning Portal, were reviewed and were the subject of a WRA report.

The review found that there are major limitations in all of the key planning applications documents. Important information is missing, such as measurements of infiltration and permeability, estimates of surface runoff using the current approved methodology, clear descriptions of the measures that will be used to manage surface water during the operations and restoration phases, an assessment of the effect of dewatering on water table draw down and stream flow, and accurate mapping of the geology. A recommendation was made that the documents should not be accepted by the Environment Agency and Lead Local Flood Authority in their current form.

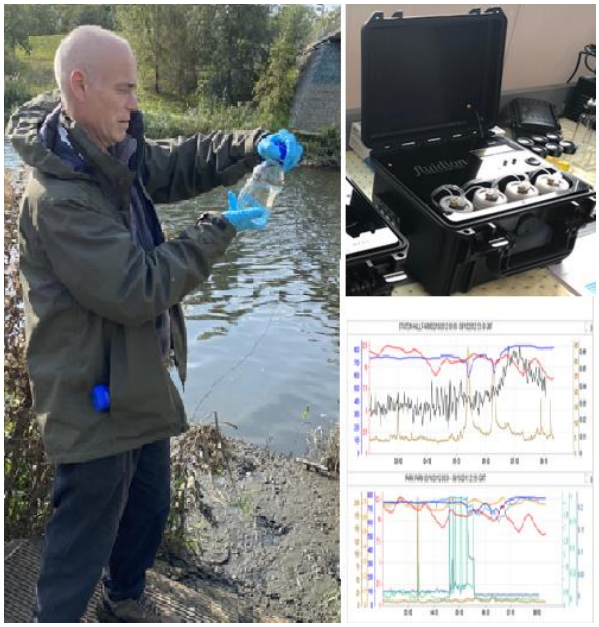
Golf course adjacent to quarry and topo map



OVERSEAS WORK

Bangladesh Project for Innovate UK—Novel Biosensors and Water Toxicity

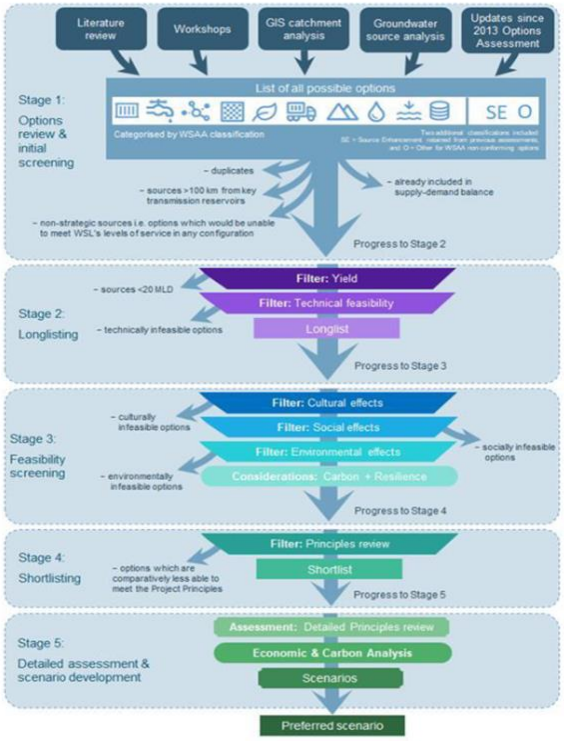
Biosensors provide a new way of measuring the environment using the idea that microbes will respond to chemical pollution by altering their metabolism. The method involves altering the DNA of microbes to enhance their metabolic activity and also adding the DNA of a light emitting gene. The biosensor equipment can then be used to rapidly detect and monitor pollution in rivers and groundwater. (See www.omb.co.uk to understand more about this technology). The Innovate funded project was designed to test a new biosensor system to measure Dissolved Oxygen and Biochemical Oxygen Demand using samples collected at EA sites on the Rivers Lee and Thames. BOD normally takes 5 days to measure whereas the Biosensor System can measure BOD in 30 minutes. WRA is testing the technology both in the UK and in Bangladesh with colleagues at Bangladesh University of Engineering and Technology (BUET), Dhaka



Sampling on River Lee, Portable Kit and continuous water quality data from the EA Monitoring station on the Lower Lee

WAIKATO RIVER WATER TAKE APPLICATION, New Zealand

Auckland's population and hence its water demand is forecast to increase significantly over the next 35 years. Drought conditions in recent years have already led to the introduction of restrictions on water use. An application to secure an increased water take from the Waikato River Watercare was referred to a Board of Inquiry (BoI). The application was underpinned by the outputs from a programme of water resource planning, engineering and other studies. WRA was appointed to undertake a technical Peer Review (see review process below) of the demand forecast, supply demand balance and alternative options assessment reports and to provide expert witness evidence to the BoI on options assessment. The BoI granted consent for the Waikato River allocation.



New Associate

Prof Sean Comber has been appointed as an Associate of Water Resource Associates LLP from March 2022.

Sean is an Environmental Scientist, with 25 years' experience working for both regulatory authorities and the private sector. He has extensive experience in assessing chemical risks, pollutant transport, heavy metals and source apportionment. He is currently Professor of Environmental Science at Plymouth University.

Next WRA Board Meeting

Thursday 5th May 2022, at 09.30 hrs at Oxford.

The WRA Bulletin is a quarterly publication, and relies on contributions submitted by Partners, Associates and Consultants. The document is circulated by email, and published on the WRA web-site, aiming to keep the WRA network up-to-date with respect to current activities. Please email contributions for future issues to Paul Whitehead: paul.whitehead@watres.com

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