

INTERNATIONAL WORK

Smart City, Kalkara, Malta

WRA provided expert advice for a legal issue at Smart City, Kalkara, Malta. The construction of a retail centre had been delayed due to seepage of water into the foundations, which then required extensive dewatering. The construction company needed to demonstrate the source of the water and that it was not due to any natural climatic conditions.



Lagoon and fountains at Kalkara Smart City

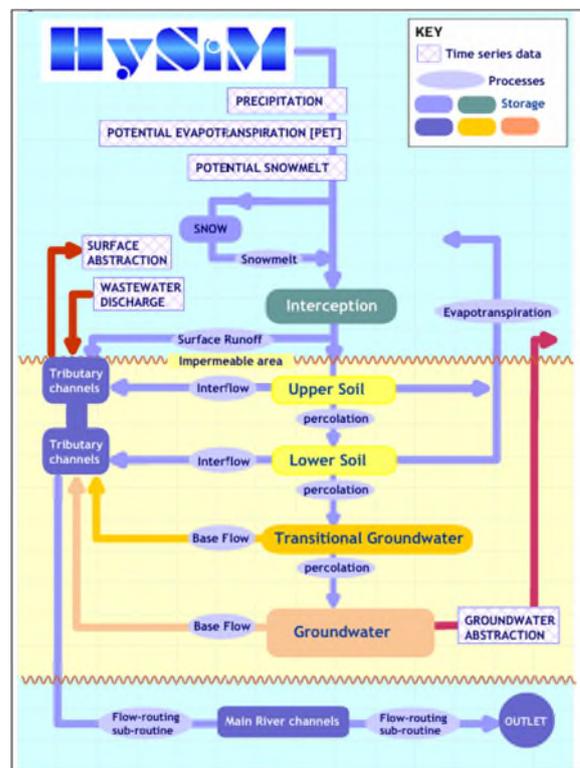
WRA undertook a review of the local climate, hydrology and ground conditions using GIS and satellite imagery and climatic records available on line. In addition, reports were provided from the site design including an assessment of the geology and the results of exploratory boreholes. The flooding of the site due to natural conditions was dismissed. Mediterranean climate of Malta with a summer drought meant that zero rainfall was recorded during the time of dewatering. Likewise, available groundwater data recorded the water table in the permeable limestone aquifer to be some depth below the base of the foundations. Instead the presence of an artificial lagoon built around the site with fountains was identified as the cause of the seepage as its completion and filling matched the start of the dewatering from construction records. A later visit to the site with the completed retail centre confirmed the lagoon as an entirely artificial feature.



HYSIM Training, Tanzania

Working with RSK East Africa, GIZ & EACOP, Jamie Ledingham gave a HYSIM modelling course at the Regal Naivera complex in the northern city of Tanga. Participants included people from TANGA UWASA, PBWB and the Resilience Academy.

Training covered software familiarization, data import /export, model configuration and calibration using local gauging stations. Hands-on experience of long-term flow simulation was then provided using the Sigi River Basin and Mabayani Dam which are the main source of water for the city. The work included interface with systems modelling using Aquator, Ribasim and WEAP.



Tanzania is investing in the Resilience Academy, and becoming a highly capable centre of excellence for the country. Their aim is to develop hydrology and provide rainfall-runoff modelling skills to basin water boards.

GIZ is keen to assist the PBWB further in using Hysim through their SASA programme, while Tanga UWASA has greater interest in systems modelling.

- GIZ German Agency for International Cooperation
- EACOP East African Crude Oil Pipeline
- SASA Green and Smart Cities programme
- PBWB Pangani Basin Water Board
- UWASA Urban Water Supply & Sanitation Authority

UK WORK

Widmore Pond, South Oxfordshire

Working for Sonning Common Parish Council, Paul Holmes carried out a hydrological survey of Widmore Pond, supported by Andy Dixon with hydraulic-assisted augering. The job aimed to identify measures that can be taken to manage pond water level and understand the reason for low water levels experienced in 2024-25.



Widmore Pond

Widmore Pond is likely an old 17th Century sand pit, filled from superficial groundwater with 0.3 m of water and over 0.8 m of soft mud on a hard bottom. Maximum volumes of water and sediment in the pond are 490 m³ and 785 m³. Pond area of 1162 m²

The pond occupies an outcrop “window” of Lambeth Group [LG] clay and sand between Head deposits to the north and Winter Hill Gravel [WHG] south, overlying Chalk. The pond is fed from springs and a deep hollow south of the pond, capturing WHG/LG groundwater. Construction of a retirement village began in 2024, and pond water level declined and never recovered, such that the Parish Council had to pump mains water to prevent drying up.

The retirement village reduces groundwater by diverting all runoff into Chalk borehole soakaways, and by sheet-piling around Widmore Spring.

Groundwater inflow could be increased by construction of a gravity-feed aquifer drain and caisson to capture LG groundwater, or by construction of a Chalk production borehole.



Cavity marking line of groundwater resurgence at south-east end of pond

Flooding at Little Tew in the Cotswolds

WRA undertook a detailed study of Little Tew Brook for a property flooded by Storm Bert in Nov- 2024.



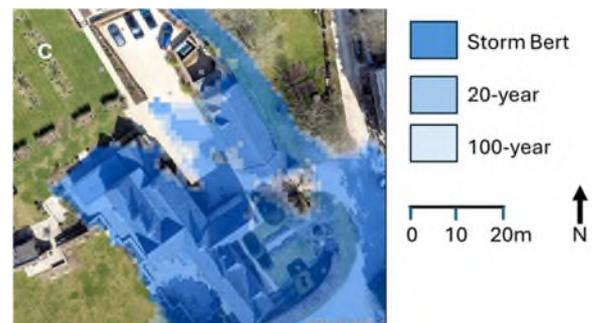
Little Tew Brook under normal conditions

The stream rose and water seeped through the walls of the cottages, which were flooded to a depth of 0.1m.



Little Tew Brook during Storm Bert flooding

ReFH2 software was used to estimate peak flow of 0.5-0.6 m³/s associated with Storm Bert, applying 15-minute rainfall data from the Chipping Norton gauge. Flood water was restricted by a 0.6 m culvert near the property entrance with a capacity of 0.41 m³/s. Alleviation measures proposed an overflow culvert, the diversion of water into a neighbouring paddock and use of a borehole soakaway into underlying permeable Marlstone Rock Formation. Other SuDS measures were proposed to reduce surface water input to the stream.



Predicted flood extents for three flood scenarios

Next WRA Board Meeting

7th November 2025. Marlow.

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

Water Resource Associates LLP, PO Box 1674, Oxford, OX4 9QT. Tel: +44[0] 1491 838 190, www.watres.com