



# WRA Bulletin 39

September 2014

## WRA Expert Witness Work

The wide ranging hydrological expertise offered by WRA is particularly valuable for expert witness work. Since spring 2013 WRA have been working for a local residents group, called the Tanners Meadow Action Group (as mentioned in WRA Bulletin no. 38) providing crucial evidence against a planning application for more than 30 houses on a greenfield site at the village of Strood Green in Surrey. The site itself was a poorly drained area of rough grazing interspersed with a network of drainage ditches and prone to surface water flooding (Figures 1 and 2). The original engineering consultants working for the developer, were unable to provide a full and adequate description of the site hydrology, flood risk and sustainable drainage measures in their flood risk assessment. WRA submitted a comprehensive critique of this document which led to the original application being rejected by the local authority.



Figure 1 The proposed development site showing areas of standing water.

The developer however opted to pursue their application and lodged an appeal culminating in a Public Inquiry at the Mole Valley Council Offices in Dorking, held during May 2014. Despite a new consultancy company being engaged by the appellant to respond in particular to the work WRA had undertaken, the Planning Inspector decided against the application giving the issue of flood risk as one of the main reasons for their decision.



Figure 2. One of the many drainage ditches flowing alongside the development site.

The work raised the issue that many flood risk assessment submissions for large developments undertaken by general civil engineering consultants will appear to be comprehensive documents sometimes over a hundred pages. Local planning authorities and the Environment Agency will often simply “rubber stamp” these without giving due attention to the content. The original flood risk assessment for the Strood Green site was like this and the fuller examination and review by WRA found many pages of superfluous material (e.g. photos, drawings and model output) without any proper explanation. The amount of text relating to the flood risk of the site was a just few sentences referring to its location outside of the Environment Agency flood zone maps and there was no description of the hydrology.

## Groundwater Flooding and Alleviation Measures

The UK hydrological summaries published by the Centre for Ecology and Hydrology for February and March 2014 reported significant groundwater flooding following the record rainfall over the period December 2013 to February 2014. During February 2014 groundwater flooding was widespread across the Chalk of southern England, from Dorset to Kent, and

impacts on property and infrastructure were widely reported – e.g. in the Test Valley in Hampshire (Figure 3). Monthly maximum groundwater levels were also recorded in the North Downs during this period.

Groundwater flooding persisted through into March 2014 for some vulnerable locations (e.g. in the Chilterns and Berkshire Downs). This led to some properties being inundated for more than six weeks. Alleviation against such persistent groundwater flooding is a challenging task when water levels remain high for such long periods. The walls and floors of buildings can be tanked using a variety of products involving either painting or adhering compounds to form an impermeable membrane or by mixing the proofing compound with plaster. Water can also be conveyed into sumps and pumps can be set to switch on when a certain level is reached. However during this most recent episode there were cases of properties flooding when both the tanking and pumps had failed.



Figure 3 Groundwater flooding in the Test Valley, Hampshire, February 2014

WRA are able to offer specialist advice for groundwater flood alleviation and with associate companies are able to undertake drilling, borehole installation and pumping tests. A longer term solution for those properties affected by groundwater flooding is to design a system of dewatering where the groundwater is pumped once a trigger level is reached. The pumping can either be from conventional boreholes sunk vertically into the strata or also from mole drains which run horizontally. A study looking at the most effective implementation of these techniques for a listed building affected by groundwater flooding earlier this year is currently being undertaken by WRA in the village of Eynsford on the river Darrent in Kent.

## WRA Partner/Associate News

### Angola

WRA has a two-year contract to support Norconsult in assisting NVE [Norwegian Water Resources & Energy Directorate] providing technical assistance to INARH [Angolan Water Resources Institute] formed in 2010. INARH intends to expand its size from 14 to 130 persons by 2018.

The technical assistance programme focuses on four areas: river basin planning, Hydstra hydrological database system, re-establishing the hydrometric network and training. The new database will facilitate exchange of data with neighbouring SADC countries.

Paul Holmes visited in June and will be scheduling further trips with Norconsult colleagues in 2014-16.



Left to right: Johan Knudsen [Norconsult], António Eduardo [INARH, hydrometry], Narciso Ambrosio [INARH, Water Res. Planning and Development]; Maida Gomes [INARH; Water Res. Planning and Development, Stephen Hugman [Norconsult] Manuel Quintino [INARH, Director], Elisa Machado [INARH, Administration], Paul Holmes [WRA], Albertina Lemos [INARH, Administration].

## Next WRA Board Meeting

17<sup>th</sup> October, Benson

The **WRA Bulletin** is a quarterly publication, and relies on contributions submitted by Directors, 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 Harvey Rodda: [harvey@watres.com](mailto:harvey@watres.com)

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