

### **CWR summary no. 3**

Since the last update on this project, the ARCA team have been undertaking a detailed analysis of the water monitoring data obtained across the CWR site between September 2020 to September 2021. An updated report integrating the results of the work with the data from the previous project phases (see the earlier summaries and reports), has now been received by the Council.

Although the presence of fluctuating groundwater below Winchester has long been known and some assumptions have been possible relating to this, the current project is the first to assess this in detail. The project results provide key insights into the water table below the CWR site and crucially how this interacts with buried archaeological remains. These insights also have wider relevance to other areas of the city.

During the period of monitoring, groundwater levels were found to vary between 1.5 – 2.9m below ground level, within archaeological deposits. These water levels are continually linked to the underlying principal Chalk aquifer (horizontally and vertically) and a secondary superficial aquifer in the Itchen Valley, with no evidence for any perched water table identified. Groundwater below the CWR (and wider parts of Winchester) is largely influenced by regional processes within the groundwater catchment basin rather than being directly influenced by rainfall over the site itself. Seepage from the Itchen river and its tributaries (including the culverted stream immediately east of the CWR site), are likely minor contributors, affecting the very eastern part of the site only.

This water data has been combined and analysed against the previously obtained stratigraphic information and sedimentology, geochemical, biological and finds analysis, providing insights into preservation conditions below the site. The data suggests that to some degree preservation of organic material relates more to the context the material lies within and how that was formed, than in relation to groundwater (although this does have some bearing). Below the CWR site preservation of organic remains within peat deposits (which can help tell us about past environments and climate) are likely to be related to a combination of factors such as compression and previous lower groundwater levels in the Early to Middle Holocene.

The project results indicate that organic preservation within archaeological levels are better preserved below present groundwater levels, but also that preservation levels are similar within the current fluctuating groundwater zone. Thus unless there are substantial groundwater changes, such as a reduction in groundwater level from local compartmentalisation (e.g. from basement levels), preservation of biological remains within archaeological deposits would be unlikely to be adversely affected by redevelopment. The greatest risk to organic archaeological remains is considered to be damage arising from construction rather than potential changes to groundwater. The report also highlights that removal of hard surfacing as part of future development will enable rainfall recharging of groundwater rather than this being removed from the site via the drainage system as currently occurs.

The final report also contains an outline zoning of the CWR site based on the character, depth, thickness and preservation of archaeological and biological remains below the site and also notes that the assessment can be refined if dating of the deposits is obtained. This is something that the Council is currently considering.

Based on the project results the Council in discussion with Historic England and ARCA has determined that there is no requirement to undertake further water monitoring or analysis, which had been planned as a potential second project phase. This final report therefore concludes the CWR geoarchaeological and hydrogeological project.

The project results have provided a clearer understanding of the character of buried deposits below the CWR site; their archaeological and palaeoenvironmental potential and vulnerability to changes in the water environment. The findings will help to inform future redevelopment plans and guide the design of detailed archaeological evaluation trenching and research questions moving forward.

ARCA plan a scientific publication detailing the novel and ground-breaking approaches adopted by this project methodology, which Historic England comments has

*“successfully built on ‘standard’ geoarchaeological investigations, drawing on aspects of buried deposits (hydrogeology, biological preservation and geochemistry) rarely included in reports for commercial projects. There is little in the way of previous approaches to follow, which means the work done by ARCA on CWR sets the standard for future work on other sites. They’ve set a high standard!”*

END