MOSTYN MANUFACTURING SITE

Groundwater Analysis Report

February 2020

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Current sampling operations review

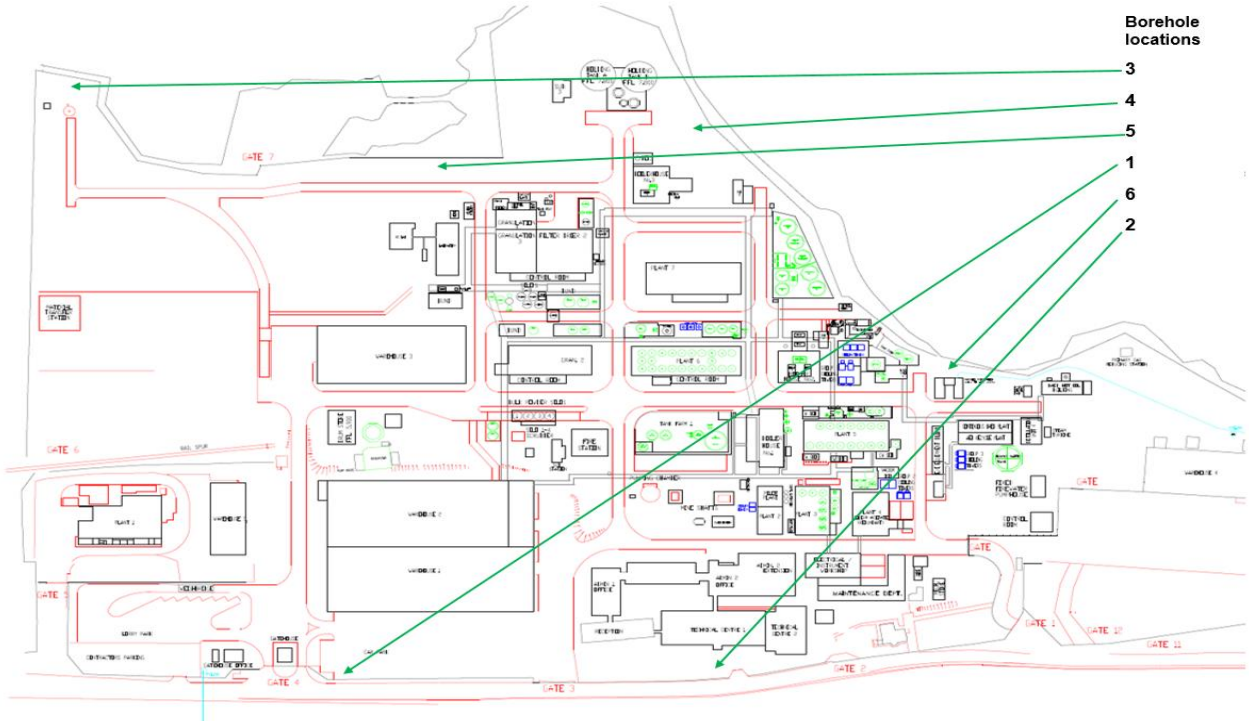
A review of the SPMP requirements for the Mostyn site had been completed with the established practice of carrying out borehole sampling twice a year determined to be appropriate. It had been agreed that if there had been any significant changes in the analysis results the monitoring frequency would be amended to suit the situation.

The analysis carried out (pH, Copper, TPH, Ammoniacle Nitrogen and conductivity) are still appropriate for the type of operations and will provide suitable indications of any changes should they occur.

The way in which the samples are taken has also been reviewed and the current method used is appropriate for the conditions (low-flow purging and sampling techniques, ASTM Standard Practice D 6771).

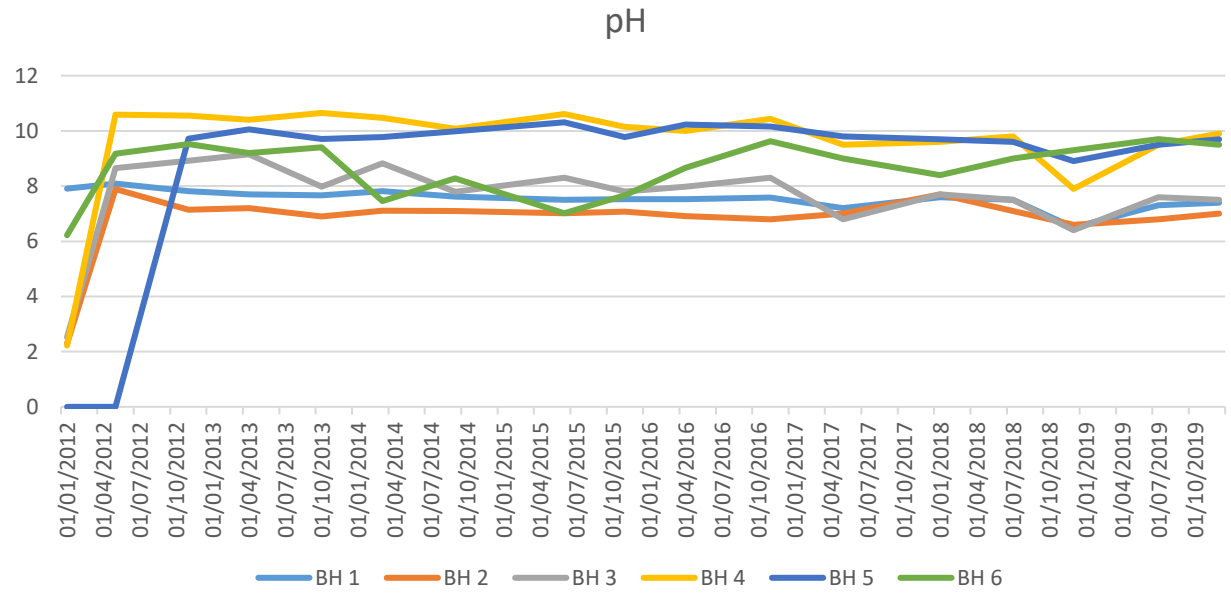
Manufacturing on the site has not significantly changed since the start of the monitoring in 2012, although the scale of operations has been reduced. The proposed changes in site operations, with the AED Recycle Plant coming on-line later this year, should not have a significant impact on the groundwater analysis – if this were the case it might indicate that the manufacturing activities in Plant 6, Plant 3 and the Luwa were not as tightly managed as we had thought. As the location of the site manufacturing process is moving towards the East end of the site some consideration has been made regarding the installation of an additional borehole to the East of Borehole 6. Based on the direction of travel of the ground water this would pick-up any loss of containment from areas like the AED or DAED Plant and Distillation Unit 4. A final decision on this has yet to be made.

In conclusion … the sampling methods and sample frequency remain appropriate. The results of the analysis are indicating that there is very little change to the chemical make-up of the ground water as it passes underneath the site. The current condition and management of the site drainage system and site bunding arrangements is appropriate.

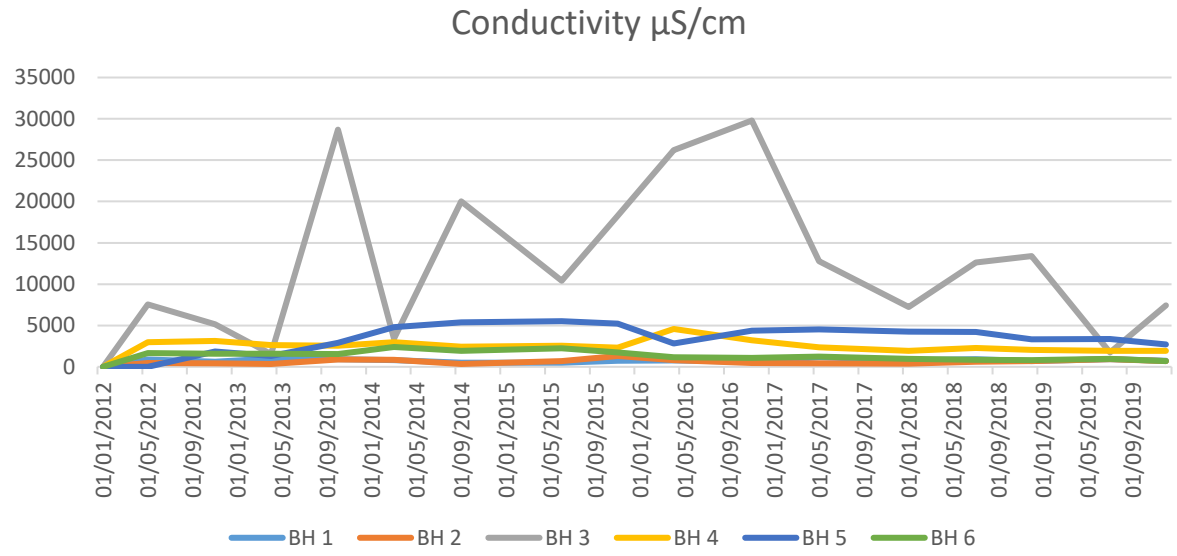


Groundwater analysis data for the past few years

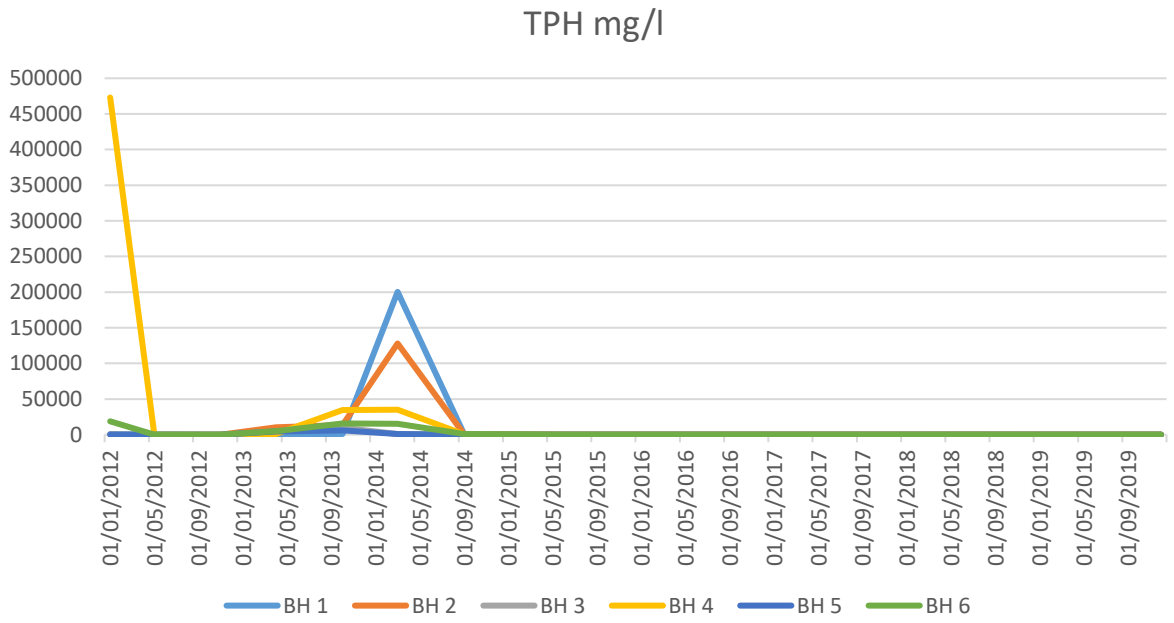
The pH of the groundwater in all six boreholes has remained fairly constant over the last seven years. Changes in the pH can mobilise metals within the surrounding areas but this does not appear to have happened to any extent. In June 2018 there has been a minor increase in the copper levels in borehole 3 (0.8mg/l to 15mg/l) when the pH fell by one unit. However, the high level of copper in borehole 3 in 2016 did not appear to have been affected by any pH change.

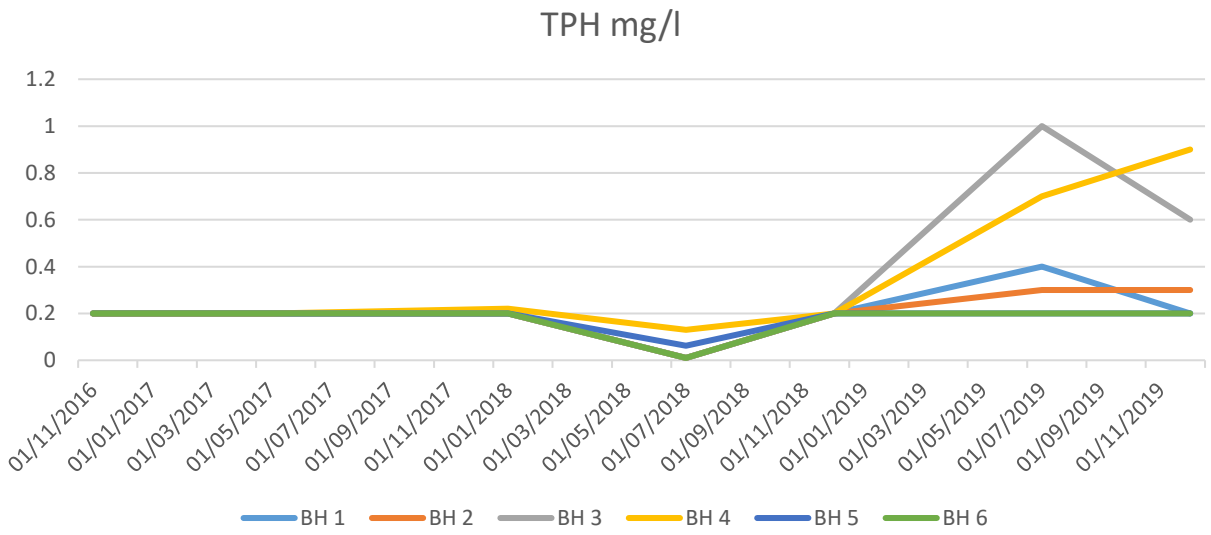


Ground water conductivity has also been quite consistent. The only anomaly has been with borehole 3. This borehole is furthest away from any manufacturing activity and, given that the groundwater flow is in the North East direction the activity has not been fully explained. This could simply be due to the levels of metals mobilised in this area. Discussions are on-going with our consultants regarding this issue.

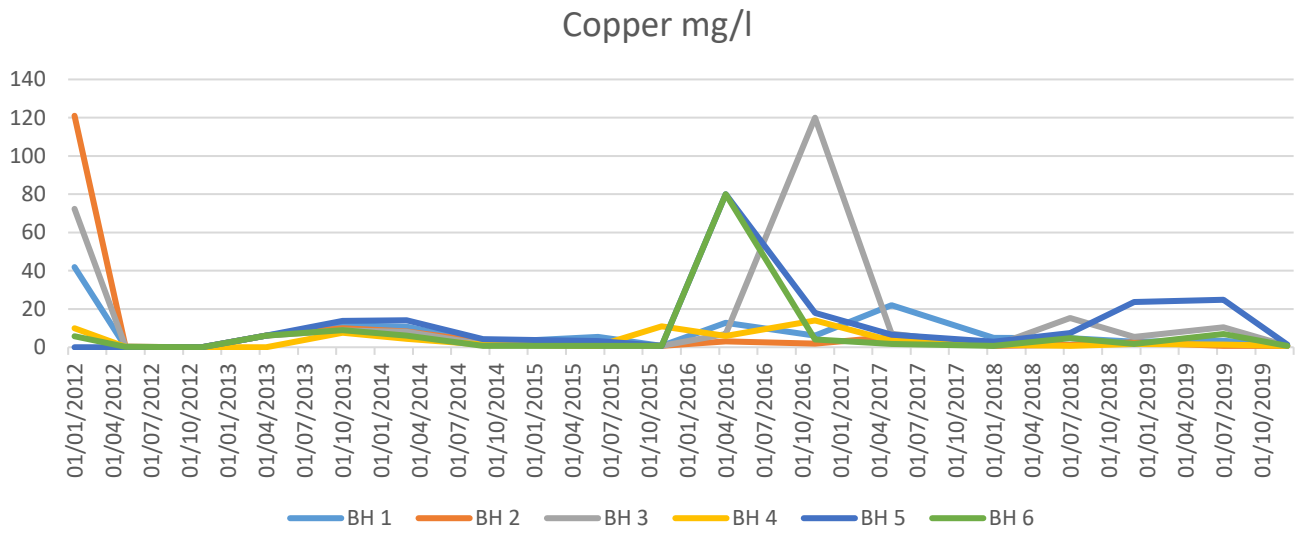


The diesel that caused some concern back in 2014 (historical spillage from 1998, hauliers fuel tank) has now effectively passed under the site, with the results consistently being between 0.1 and 0.4mg/l.
Recently there has been an increase in the THP level in Borehole 3 (0.2mg/l to 1.0mg/l). This is being reviewed as the groundwater direction under the site is in the North Easterly direction indicating that any potential spillage may have come from the neighbouring site.





Copper levels in the groundwater remain consistent, the exception being Boreholes 3 and 5, although the levels have only increased from 0.8mg/l to 15.2mg/l and then back down to 0.8mg/l in Borehole 3, in Borehole 5 the level rose to 24.8mg/l and has recovered to 1.4mg/l. there does not appear to be any definitive reason for this; possible pH reduction, as discussed before.



Levels of ammoniacal nitrogen are relatively consistent, apart from the fluctuations identified in borehole six.
Discussions are continuing with our consultants about the causes for this.