02 April 2024

Francis Pulvermacher
Property Director
Christ's Hospital
The Counting House
Christ's Hospital
Horsham
West Sussex
RH13 0YP

Dear Francis,

CHRISTS HOSPITAL SCHOOL - ADDENDUM TO WATER NEUTRALITY STATEMENT

Ref: DC/24/0063 Christs Hospital School - Variation of Condition 1 of ref: DC/21/1524 relating to Water Neutrality

Christ's Hospital School has submitted a planning application for approval by Horsham District Council for the extension of the existing Bluecoat Sports Centre, located at Christ's Hospital School, Horsham, West Sussex. The extension will include a new swimming pool (in addition to the existing swimming pool) and new changing rooms. Christ's Hospital School is located within Southern Water's Sussex North Water Resources Zone ('WRZ'). In September 2021, Natural England released a Position Statement to address concerns over the impacts of groundwater abstraction by Southern Water to supply water to their Sussex North WRZ. Natural England's view is that, unless it can be demonstrated without reasonable scientific doubt that there is no negative impact, the groundwater abstraction by Southern Water cannot increase. Therefore, all new developments that are to be supplied by mains water must demonstrate water neutrality, meaning that the new development must not use more water than the previous use of the site.

In December 2023 Envireau Water (a specialist water resources consultancy) produced a Water Neutrality Statement (Ref. 3490757 Christ's Hosp Water Neutrality \ RPT WN Christ's Hospital) [the Statement] which concluded that *"Based upon this analysis, Christ's Hospital School can prove water neutrality and betterment of the water usage of the Bluecoat Sports Centre, and therefore that it is beyond reasonable scientific doubt that the development can be achieved with no impact on the River Arun SAC / SPA / Ramsar site."*

Following submission of the report to Horsham District Council, the following points of clarification were received from Stephanie Bryant (Senior Planning Officer) on 22nd March 2024:

1. *It appears from the statement and appendices that the product specification has been used to calculate the figures in Table 1. Please can you confirm if this is the case? If so, please update Table 1 to include the actual measured figures of the existing fittings.*

2. *Below Table 3 within the statement, reference has been made to fittings having been recently replaced in the existing changings rooms. Please can you confirm how recently (i.e. when) this was and whether these are of the same specifications as included in Appendix E and data in Table 1 or those in Appendix F.*

3. *Please can you confirm how the metre readings data provided in the appendices has been used in the baseline annual volume figure calculations?*

4. *Depending on the answers to the above points, recalculation may be required. If this is the case, please do this and resubmit an amended Water Neutrality statement by email.*

This letter serves as an addendum to the Water Neutrality Statement (Ref. 3490757 Christ's Hosp Water Neutrality \ RPT WN Christ's Hospital) [the Statement] and presents responses to the four points raised by Horsham District Council.

1. *It appears from the statement and appendices that the product specification has been used to calculate the figures in Table 1. Please can you confirm if this is the case? If so, please update Table 1 to include the actual measured figures of the existing fittings.*

Table 1 of the Statement presents water usage based on the product specifications provided in Appendix E of the Statement. The product specifications have been provided by Delta Green Environmental Design, the mechanical and electrical design consultants for the project. The product specification sheets in Appendix E clearly state the regulated flow rates and/or the volume of a toilet flush. As these are inherently part of the product design and cannot be changed the values have been taken as read. These values are the actual figures of the existing fittings.

On 5th January 2024, Cenergist, a specialist consultancy and energy efficiency turnkey solutions provider, undertook flow rate testing of the existing fittings as part of a flow and energy auditing exercise. The survey was undertaken during a school holiday, during normal opening times. As such, it represents a low demand situation. The results provided to Envireau Water are given below:

- Men's changing room basins = 5 litres / minute
- Student boys changing room wash basins = Cold 15 litres / minute : Hot 10 litres / minute
- Disabled/baby change basin = 20 litres / minute
- Ladies toilet wash basin = Cold 10 litres / minute : Hot 8 litres / minute
- Cleaners sink = 20 litres / minute
- Men's & student changing room showers = 12-14 litres / minute

Table 1 from the Statement has been updated to present these values and is provided below.

Table 1 Water usage based on existing fittings

Fitting type	Product	Measured Flow rate (litres per minute)	Specification Flow rate (litres per minute)	No. of minutes used	Volume per use (litres)	Litres per person per day (l/p/d)
WC dual flush	Contour 21 (WC pan) Conceala 2 (Cistern)	-	-	-	3	3
Washbasin taps	Avon 21	5 - 20	3.7	0.2	0.6	0.6
Shower (*30 seconds pre-swim*)	Concept Easybox Slim	12 - 14	8.0	0.5	4	4
Shower (*3 minutes post-swim / activity)*	Concept Easybox Slim	12 - 14	8.0	3	24	24
Baseline water usage for swimmers						**31.6**
Baseline water usage for other Sports Centre users						**27.6**

It is important to note that the comparison of manufacturers specification data to actual measurements will rarely align, because the manufacturer specification is based on a system pressure of 3 Bar. Unless the site system water pressure is at exactly 3 Bar (at the outlet) then the flow rate will vary, with flow rate increasing with higher pressures.

Water use calculations are undertaken using a standard pressure of 3 Bar, so that the flow values used are comparable between different fittings and systems.

The flow rates measured on site are higher than the manufacturers flow rates from the data sheets, suggesting that the system pressure was slightly higher than 3 Bar when it was measured. In practice, water pressure changes throughout the day depending on the usage across the system, so if the system was only being lightly used at the time of measurement, then the pressure would be higher and the flow rate elevated. As stated above, the measurements were taken during a low demand period, and are consistent with a concomitant higher system pressure. Because of the inherent inaccuracy of site measurements, a conservative approach to the water neutrality assessment has been taken by using the manufacturers specification flow rates, which are lower than the measured values, because the baseline water usage figure is an underestimate compared to the measured flow rates.

2. *Below Table 3 within the statement, reference has been made to fittings having been recently replaced in the existing changings rooms. Please can you confirm how recently (i.e. when) this was and whether these are of the same specifications as included in Appendix E and data in Table 1 or those in Appendix F.*

The fittings in the existing changing rooms were installed in 2017 (Ref. Francis Pulvermacher, Property Director Christs Hospital School). These fittings are those described in Table 1 of the Statement and Appendix E.

3. *Please can you confirm how the metre readings data provided in the appendices has been used in the baseline annual volume figure calculations?*

As stated in Section 2.2 (pages 8 & 9) of the Statement:

> "The calculated baseline water usage for the swimmers and other Sports Centre users was compared to the mains sub-meter readings provided by Christ's Hospital School and showed that the calculated baseline water usage is within 5% of the meter readings, which is within an acceptable range and is therefore appropriate for use in this assessment.".

The meter readings are presented in Appendix B and Appendix C. Appendix B provides data that is split between the sub-metered zones. Prior to 2020, there was no submetering, and therefore the data refers to the total supply to the school. Metering problems, as described in the Statement, means that high confidence was attributed to meter readings between 7th April 2023 and 9th October 2023. These data provided a total water use (scaled to 365 days) of 9,834m^3. This compares to the calculated volume (including swimmers & visitors 7391m^3 & pool backwash 2815m^3) of 10,206m^3. The exact difference is 3.8% (which is less than 5%).

4. *Depending on the answers to the above points, recalculation may be required. If this is the case, please do this and resubmit an amended Water Neutrality statement by email.*

The Statement shows that water neutrality and betterment is achieved without the need to upgrade all the facilities to the new fittings. The Statement accounts for the blended use by assuming a 10% reduction in the number of people using the existing facilities and them using the new facilities instead, together with the extra 30% of people (the increase in admissions). The 10% move from the existing to the new facilities is a reasonable assumption made by Delta Green (the mechanical and electrical designers) and Christs Hospital.

As discussed in the response to Point 1, the use of the manufacturers specification flow rates provides a robust and conservative baseline, and therefore water neutrality assessment. The new water supply will be controlled to an operating pressure of 3 Bar, giving reliability on the post development water use element. The actual baseline is an underestimate based on measured flow rates, which means that the conservative approach will result in a likely betterment in excess of that calculated.

Envireau Water is of the opinion that the data submitted in the Water Neutrality Statement is appropriate, accurate and robust and that recalculation is not required. We consider that it has been demonstrated beyond reasonable scientific doubt that there will be no impact on the River Arun SAC / SPA / Ramsar site, from a water balance (water neutrality) point of view.

Yours sincerely,

[redacted]

James Dodds
Director, Water Management Specialist

[redacted]

Lee Clarke
Principal Hydrologist