Dear Joshua,

On behalf of Amazon Data Services Ireland Limited (ADSIL) I wish to provide the following update related to IED license condition 3.17 Evaporative Cooling Water Diversion Feasibility Study.

The purpose of this update is to summarise the key characteristics of the evaporative cooling systems at ADSIL data centres, the relative volumes of evaporative discharge observed since grant of licenses and the challenges AWS have encountered in obtaining representative sampling data to be incorporated into any subsequent feasibility study.

Evaporative Cooling System Characteristics

As described in the Operational Report submitted with the IED licence application (Attachment-4-8-1), the Air Handling Units (AHUs) on the data centre roofs provide conditioned air to maintain temperature, relative humidity and pressurisation in data halls. AHUs operate under two modes; free cooling (normal temperatures) and evaporative cooling (when temperatures are elevated).

Evaporative cooling is used when atmospheric temperatures are above a setpoint, to cool data halls. Evaporative cooling utilises mains water (at ambient temperature) as the cooling media. The majority of the water is evaporated in during the cooling process. Prior to the cooling process, water is sanitised using ultraviolet disinfection. There is no chemical treatment of this water as part of the operation of the evaporative cooling processes. When used for cooling, water is recirculated in a closed loop system. When a conductivity of 1,500 µS/cm is reached, water is automatically discharged to the onsite stormwater network at ambient temperature.

As the water is supplied from the public utility mains, there is no risk of Principle Pollution Substances, Priority Substances or Priority Hazardous Substances (main polluting substances as defined in the Schedule of EPA (Licensing)(Amendment) Regulations 2004, S.I. No. 394 of 2004 being discharged from the installation above the limits outlined in the Surface Waters Regulations (S.I. No. 272 of 2009). See Figure 1 below which details the water flow and cooling water discharge process.

It should be noted that there is no direct discharge from any ADSIL licensed facility to a receiving waterbody, rather there is an indirect discharge via the public stormwater drainage network which subsequently discharges to their respective surface waterbody. A flow control system at the outlet of the site stormwater attenuation system is used to achieve the controlled discharge rate to this public stormwater sewer.

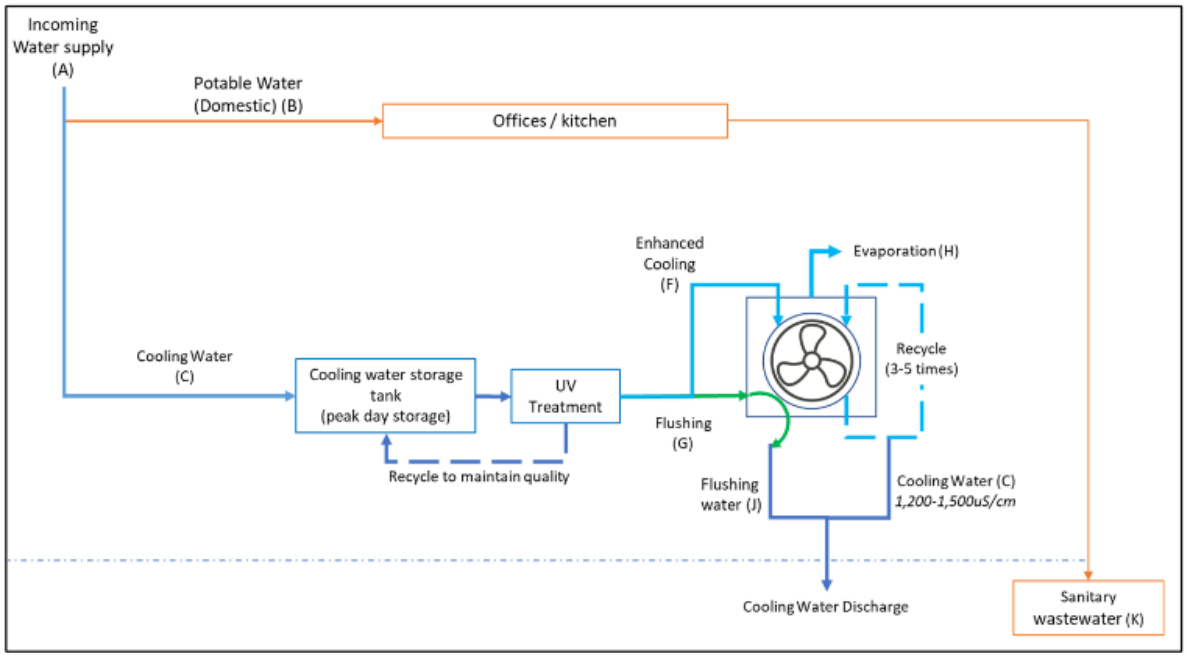

Figure 1 Evaporative cooling water process diagram

The key characteristics of the evaporative cooling systems are as follows:

- Systems are designed to operate intermittently, with cooling cycles directly correlated to ambient air temperatures. During periods of lower outdoor temperatures, the systems may not engage at all. This accounts for the majority of operation;
- Cooling setpoints for the systems are typically higher than the outside ambient air temperatures. This results in the systems only running when necessary to maintain internal comfort levels. Setpoints typically are higher than high ambient air temperatures observed in Ireland even in summer months; and
- Volumes of water discharged from the evaporative cooling process are minimal due to the elevated temperature setpoints not being achieved.

Challenges in Obtaining Representative Sampling Data

As mentioned in previous correspondence on this matter, ADSIL initiated a sampling program to capture monitoring data in order to carry out an evaporative cooling water quality assessment of discharge prior to any mixing with surface water generated from rainfall precipitation within the confined of the licensed site. This dataset was to be used to carry out an assessment in the feasibility to reroute evaporative cooling water from surface water discharge to the foul water network and to demonstrate the perceived environmental benefit of such an approach.

Some of the key challenges encountered include:

- Unpredictable timing of evaporative cooling cycles based on ambient temperatures – due to the setpoint temperature threshold and ambient temperatures encountered this has not been occurred during the sampling period in 2024.
- Negligible discharge volumes making it impractical to isolate and capture representative samples.

Conclusion

ADSIL has made a concerted effort to obtain representative sampling data for the evaporative cooling water discharge at our data centres as required under IED license condition 3.17. However, ADSIL has encountered significant challenges in achieving this due to the inherent nature of their evaporative cooling system design and operation:

- The evaporative cooling systems are designed to operate intermittently, with cooling cycles directly correlated to ambient air temperatures. During periods of lower outdoor temperatures, the systems may not engage at all, which accounts for the vast majority of operation;
- The cooling setpoints for the systems are typically higher than the outside ambient air temperatures encountered even in the Irish summer months. This results in the evaporative cooling systems only running when absolutely necessary to maintain optimal internal data centre operational conditions; and
- The volumes of water discharged from the evaporative cooling process are consequently minimal due to the elevated temperature setpoints not being frequently achieved.

These factors have made it impractical for ADSIL to capture representative sampling data, despite having a methodology in place to sample the discharge directly from the AHUs.

This situation demonstrates that the actual discharge volumes from the evaporative cooling processes at ADSIL's data centres is non-coincidental. ADSIL continues to complete daily visual inspections of our surface water monitoring points and weekly grab sampling as per IED license requirements.

Given the challenges encountered, ADSIL propose not to reroute the evaporative cooling discharge to the foul water network. AWS will continue to review this position on an ongoing basis throughout the duration of operation.

Please let me know if you have any questions.

Best Regards,

Fran

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