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Subject: Response to submission – Water Management
Date: 28 March 2025

Dear Jose,

Arcadis provide the following letter in response to the pre-determination submissions from DCCEEW Water (Ref OUT24/12628), dated 20 August 2024. This response is an addendum to the previous submitted Kingswood Batter Energy Storage System – Appendix M Water Impact Assessment (SSD-63207219).

Submission Comment	Response
<i>1.1 Recommendation - pre-determination</i> <i>The proponent should clarify an ability to obtain a secure water supply for the Project. This is to include confirmation of relevant agreements where required and to demonstrate sufficient water entitlements can be acquired where necessary. Where the water is to be sourced from a currently unauthorised source and/or where additional water take infrastructure is required</i> <i>e.g. , a river pump, dam, and or a bore, an impact assessment of this infrastructure</i> <i>Explanation</i> <i>Insufficient information has been provided to confirm access to a secure and appropriately authorised water supply for the Project. Options to source the water required for the Project have been proposed, however, the ability to obtain the Project's water demands from these options has not been demonstrated.</i> <i>Note: water collected under a harvestable right may only be used within the property on which it has been collected, i.e. water may not be used on properties other than that to which the harvestable right applies.</i>	The intent of the Water Impact Assessment demonstrates that there are available options for both the construction and operation phase of the project, without committing to a specific option. The highest water demand for the site will occur during construction. In Attachment 1 – Arcadis have estimated the water demand based on a number of assumptions to be 16.8 ML over the construction period. As noted in the Water Impact Assessment, there are three sources of water that can be utilised at the site pending agreement or approval: 1. Tamworth Regional Council – potable water would be brought in by tanker. Preliminary feedback from TRC identified that an agreement would be possible however the volume of water available would be subject to water restrictions during periods of drought. This supply option would attract the highest cost and is the least preferred option (refer Attachment 1) 2. Groundwater bore – there is one active licenced bore on the property. The intended use is different to the approved use and approval/agreement would be required to access this water supply (refer attachment 3)

3. Maximum Harvestable Rights – the basin capacity for the Project Site was determined to be 1.83 ML. The water quantity harvested by the dam may meet the site demands during construction 88% of the time, depending on weather conditions (refer Attachment 4).

A combination of the above water supply options would ensure adequate water entitlements as required, demonstrating the proponent's ability to secure a reliable water supply for the project. Confirmation of the approach may be subject to consent conditions.

1.2 Recommendation - pre-determination

The proponent should review and determine the applicable water regulation instrument for the project's proposed water management basin, considering the following options:

- 1. Harvestable Rights,*
- 2. Exclusion under Schedule 1, Clause 3, of the Water Management (General) Regulation 2018,*
- 3. Water Access License.*

Explanation

A water management basin is proposed for the project to retain stormwater for reuse on site. The proponent has not demonstrated how the basin fits within the water licensing regulatory framework. Dams which capture runoff and are designed to hold water need to be considered under Harvestable Rights, a relevant exclusion under Schedule 1 of the Water Management (General) Regulation 2018, or need to hold entitlement on a water access licence if the other two options are not applicable.

The WaterNSW Maximum Harvestable Rights Calculator was used to determine that up to 1.83 ML dam capacity can be provided on the Project Site (26.09 ha).

There are no existing dams on the site. The proposed water retention basin will be within the Maximum Harvestable Rights allocation.

A water balance was completed for the Project Site which demonstrated that a basin with a capacity consistent with the Maximum Harvestable Rights may meet construction period daily demands 88% of the time (depending on weather conditions). Refer to Attachment 4 for further details. This would likely need to be supplemented with another water supply to meet the daily demand during construction.

1.3 If construction occurs during a drought, what other water source options are available and proposed, noting that Council may not be able to provide the full water volume as required, and the on-site dam would be of negligible benefit at this time.

The highest water demand for the site will occur during construction for dust suppression. Construction techniques/measures and timing can be implemented as a last resort if necessary to suppress dust in lieu of water spraying such as the use of (1) coarse material such as gravel to spread over the soil to reduce dust movement, (2) using mesh or cloth barrier to reduce wind speed and capture airborne dust, (3) utilising fast growing grasses or geotextile as ground surface cover, (4) construction timing to avoid windy days and undertake site clearing during the early and late months of the year where historical rainfall data shows the highest average annual rainfall where the dam will likely have rainwater collected and stored.

Bore water source exists within the site, already proven effective under extreme stress conditions where bore water was successfully extracted and used during a 3-year drought (2018-2020) in Tamworth to supplement drinking water supply when dam levels were critically low. Tamworth has made substantial upgrades to its water infrastructure in recent years including Chaffey Dam and Dungowan Dam operating as an integrated system, allowing coordinated supply management and emergency reserves.

Kind regards,



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Enc. Attachment 1 – Water Demands
 Attachment 2 – Water Supply – Tamworth Regional Council
 Attachment 3 – Water Supply – Groundwater Bore
 Attachment 4 – Water Supply – Maximum Harvestable Right

Attachment 1

Construction Stage Water Demands

The construction stage water demands will be managed by the contractor. Expected water uses during construction include:

- Workforce consumption and amenities
- Dust suppression and washdown
- Landscape irrigation (vegetation establishment period)
- Fire suppression

A high-level estimate of the water demands in 1 year of construction has been calculated based on the following assumptions:

Water Use	Assumption	Demand (1 year)
Workforce consumption and amenities	Up to 1kL per day (based on 10L/person/day) Assume 260 working days	260 kL
Dust suppression and washdown	3 tankers/dry day Assumed to occur on days with no rain = 304 days/year on average Tanker = 13kL	11,856 kL
Landscape irrigation (vegetation establishment period)	26 weeks @ 3 tankers/week (summer) 26 weeks @ 1 tanker/week (winter) Tanker = 13kL	1014 kL 338 kL
Fire suppression (initial fill)	20kL	20 kL

Construction is estimated to take between 12 and 15 months to complete, therefore the total water demand during construction is estimated to be 16.8 ML.

Operation Stage Water Demands

The operation stage water demands will be minimal as the project would be remotely operated. Expected water uses during operation include:

- Amenities
- Fire suppression
- Landscape irrigation

Drinking water requirements for the projects will be minimal given the project would be remotely operated. Workers will be required to attend site on occasion and it has been assumed that they will bring their own drinking water. A small water demand has been included for amenities.

One 20kL fire suppression tank will be located on site. This will remain full, other than for routine testing, or in the event of an emergency. Routine testing of the fire suppression system will lead to losses (and subsequent top-up demands) which have been estimated to be approximately 1,000 litres annually.

A high-level estimate of the water demands in 1 year of operation has been calculated based on the following assumptions:

Water Use	Assumption	Demand (1 year)
Workforce consumption and amenities	Up to 20L per day (based on 2 FTE 10L/person/day) Assume 260 working days	5 kL
Landscape irrigation	Only required during extended dry weather (assume 1 tanker/ week for half the year) Tanker = 13kL	338 kL
Fire suppression (top up)	Testing losses = 1kL	1 kL

The total estimated water demand for 1 year during operation is 344 kL.

The water demands provided above are an estimate only and are considered to be conservative. The actual demands will vary based on weather, construction methodology and changes to operational requirements.

The volume of water brought in by tanker during construction could be reduced if on-site dams or bore water can be utilised.

Attachment 2

Water Supply – Tamworth Regional Council

Tamworth Regional Council is the water authority for the area. Information on water supply arrangements is provided on Council's website (<https://www.tamworth.nsw.gov.au/live/water-and-wastewater/water-services>). The town water supply does not extend to the Project Site. There are two options for water supply from Council: bulk water filling stations and metered standpipes.

Council hires out metered standpipes to approved customers under certain terms and conditions for the purpose of supplying potable water from its reticulation system for use on development sites, water cartage, road works, landscaping and wherever access to water is otherwise limited. A standpipe is a metered portable device used to obtain water directly from fire hydrants. Only approved customers can access the water network using a standpipe.

Council has 9 bulk water filling stations across the Council area which provide the community access to large volumes of water. During times of water restrictions, public access is not permitted. The nearest bulk supply point to the Project Site is the Goonoo Goonoo Road location shown in Figure 1 and located approximately 4.6km from the Project Site.

To access either water supplies, an application would need to be made to Council and by liaising with Council officers, as relevant. Trucking of water to site, would be a significant cost once supply cost, transport and fuel costs were considered. As such, use of this water source would be minimised.

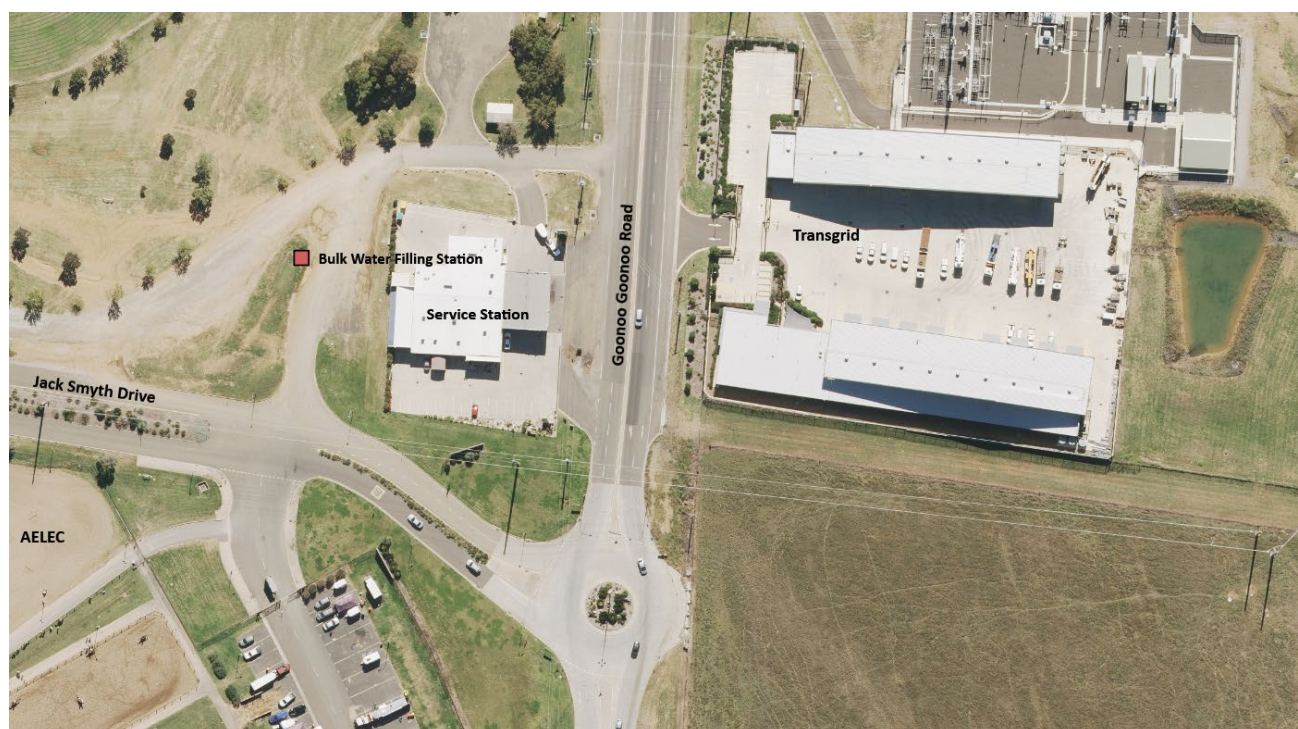


Figure 1 Goonoo Goonoo Road Bulk Water Filling Station Location (Tamworth Regional Council)

Attachment 3

Water Supply – Groundwater Bore

The following information was extracted from the WaterNSW website:

<https://realtimedata.waternsw.com.au/water.stm>

There are two licensed bores located on the Project Site (refer Figure 3):

1. GW055998 – located at the southeast boundary - Licence 90WA816555: for Stock purposes.
Yield = 1.26L/s
2. GW021947 – located mid-way along the western boundary – Licence 90BL014426: for Stock purposes.
Noted as Abandoned

Water NSW may allow water from the active bore to be licensed to provide water for the construction phase demands of the BESS. The current purpose of the licences is inconsistent with the intended use, therefore consultation with Water NSW would be required.



Figure 2 Licenced Bore Locations

Attachment 4

Water Supply – Maximum Harvestable Right

Landholders are granted harvestable rights, enabling them (whether owners or occupants of the land) to collect and retain a portion of the rainwater runoff on their property in one or more harvestable rights dams, all without the need for a water access license, water supply work approval, or water use approval.

There are no existing dams located on the Project Site. During construction a sediment and erosion control basin will be provided to meet the requirements of the Landcom 2004 Managing Urban Stormwater: Soils and Construction – Volume 1. In the operational phase, stormwater runoff will be collected in surface drains and conveyed to a surface stormwater basin for retention, detention and water quality treatment. The basin will be designed as a wet basin to retain stormwater for on-site reuse but will also have additional capacity to attenuate peak stormwater flows leaving the site. The outlet of the basin will be designed with a closure mechanism (e.g. penstock gate) on the low-level outlet which may be used to further detain flows from leaving the Project Site in the event of a spill/firewater discharge. The contributing catchment to the proposed basin is approximately 13.01ha and shown in Figure 3.

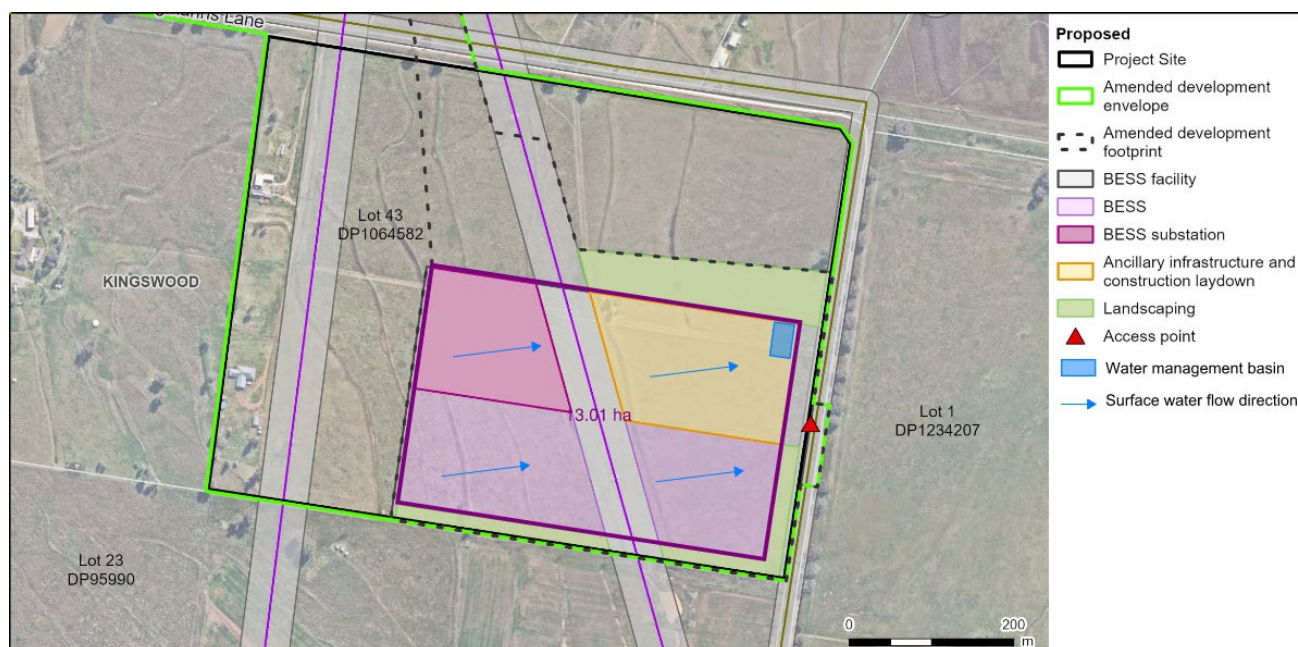


Figure 3 Proposed basin and catchment

Based on the WaterNSW Maximum Harvestable Rights Calculator (<https://www.waternsw.com.au/customer-services/water-licensing/maximum-harvestable-rights-calculator>), for the site location and area of the development (26.09 Ha), the maximum harvestable right for the lot is **1.83 ML**.

A water balance calculation has been completed as part of this assessment to determine the estimated reliability of a site retention basin with a volume of 1.83 ML.

Yield from Proposed Basin

A high-level time-series water balance was undertaken to determine the yield from the volume of dam storage. The time series relies on actual daily rainfall data. All weather data from Weather Station No. 055325 Tamworth Airport. Time Series used - January 2009 – December 2023 (inclusive) (limited by amount of evapotranspiration data available). The long term mean monthly potential areal evapotranspiration was taken for any missing evapotranspiration data.

BOM Daily Rainfall Data:

http://www.bom.gov.au/jsp/ncc/cdio/weatherData/av?p_nccObsCode=139&p_display_type=dataFile&p_startYear=&p_c=&p_stn_num=055325

Daily Evapotranspiration Data:

http://www.bom.gov.au/watl/eto/tables/nsw/tamworth_airport/tamworth_airport.shtml

The water balance model has been based on the following assumptions:

- Daily demand = 45kL/day (based on worst case summer construction on dry days)
- Initial loss = 5mm
- Basin surface area = 1000m²
- Contributing catchment area = 13.01ha
- Starting basin volume = 50% capacity

The water balance calculates the runoff volume captured based on actual rainfall depths. Where the rainfall depth is less than the initial loss of 5mm, it is assumed that no volume is captured. The water balance calculation is summarised below:

Basin volume (end of day) = Basin volume (previous day) + rainfall runoff – daily demand – evapotranspiration

The reliability of the basin to supply the required daily demand is then assessed based on the number of days where the basin has at least 90kL of water, which is the equivalent of two days of supply.

Based on the above assumptions, the basin was found to meet the estimated demands of the site during construction **88% of the time**. A sensitivity test was conducted on the starting basin volume, and it has a minor impact on the outcome ($\pm 1\%$).

This supply option would need to be supplemented with an additional water supply, either through Council supply or the groundwater bore.