



Your ref: PA17/958 AN:wj  
Our ref: RF423-16  
PA017339  
Enquiries: Jane Sturgess (9550 4228)

Shire of Serpentine Jarrahdale  
6 Paterson St  
Mundijong WA 6123

*Attention: Ashwin Nair*

Dear Ashwin,

**Re: Lot 2, 266 Firns Road, Serpentine – Proposed Three Irrigation Dams**

Thank you for referring the development application for proposed irrigation dams at Lot 2 Firms Road, Serpentine received 17 November 2017. The Department of Water and Environmental Regulation (DWER) has reviewed the proposal and has following advice:

In September 2017 the Surface Water Assessment section of DWER evaluated the initial Coterra Environment hydrological analysis and it was recommended further investigation into water availability as the methodology used was not appropriate to determine daily runoff rates for a daily water balance assessment and the resulting runoff and streamflow estimation was too large.

After reviewing the amended hydrological analysis prepared by Coterra in October 2017 included within this development application, DWER offer the following comments:

- The amended hydrological assessment does not specify details of the rainfall-runoff approach applied and therefore DWER cannot comment on the appropriateness of the methodology used.
- The runoff coefficient value of 0.15 aligns with average annual runoff coefficients for the area.
- The summary of results (Table 7) is a reasonable estimate of average annual runoff for the area.
- The amended total capacity of proposed dams (~29 ML) constitutes about 43% of the total average annual runoff (~67 ML/year) into the dams.
- Designing systems to suit the average annual runoff is not recommended as it does not give an indication of the reliability of getting that volume in each year, or any shortfall in water availability in years drier than the average.

- The report does not contain a comparison of the existing (baseline) situation and the proposed future situation to assess impacts on downstream users so the downstream impacts are unknown. On-stream dams typically delay when the streams start to flow downstream as the dam is being filled.

Therefore, DWER recommends the following:

The estimated average annual runoff reflects typical average annual runoff observed and modelled in the Serpentine area, however there is no information provided for how reliable the supply is or if this may impact the water available for downstream users, especially in dry years or in the future climate “worst case” scenario.

DWER has been recommending using the Sustainable Diversion Limits (SDLs) information as a guide for assessing surface water availability. SDLs represent the maximum volume of surface water taken in winter beyond which there is an unacceptable risk that additional extractions may cause negative effect to the environment. At a minimum, we would recommend that a bypass rate be applied to the dams to mitigate any potential impacts of water extraction to downstream users and environment. The SDLs specify this as a minimum flow threshold (MFT). Note this volume has been reduced from our previous advice as the proposal as a revised catchment area. The SDL information shows:

- Lot 2 Firms Road application falls within the area where SDL specifies that approximately 5 ML/year may be taken in winter for 0.58 km<sup>2</sup> area of modified catchment of the proposed dams, with the MFT of 0.10 ML/day.
- To mitigate the possible impacts of the proposal we would recommend by-passing the MFT volume of 0.10 ML for which:
  - If the incoming flow to the dams is less than or equal to the minimum flow threshold, bypass all incoming flow.
  - If the incoming flow to the dams is greater than the MFT, bypass at a rate equal to the MFT.

This value may be subject to revision to check if it is sufficient to ensure enough water for potential downstream users. No assessment of volumes required for existing downstream users or impacts to reliability of supply has been undertaken in this review.

In addition, DWER would also recommend that the Shire places conditions on the proposal, including contingency measures, to ensure there is no impact to downstream users and the environment with regards to maintaining flows and sediment control during the construction phase.

#### **Water Resource Advice Only**

The Department of Water has recently merged with the Department of Environment Regulation and Office of the Environmental Protection Authority to create the new agency Department of Water and Environmental Regulation.

10.1.3 attachment 2  
The former agencies are in the process of amalgamating their functions. Until this fully occurs, please note that the advice in this correspondence pertains only to water resource matters previously dealt with by the Department of Water.

If you have any queries relating to the above matter, please contact the undersigned at DWER's Mandurah office on 9550 4228.

Yours faithfully



**Brett Dunn**  
**Program Manager – Land Use Planning**  
**Peel Region**

21 December 2017