

Memorandum

To: Ian Miller **Date:** 14 November 2012
From: Melody Valentine **Our Ref:** 4522494
Subject: Bamarang Encroachment Assessment (Updated)

Infratil plans to apply for an extension of time for the approval to construct the Bamarang Power Station Project ("Project"). Beca has been engaged by Infratil to investigate recent development activity in the Bamarang area and assess the extent of encroachment by conflicting land-uses on the buffer zones surrounding the Project site.

Beca has undertaken an assessment to identify recent residential development activity in the area surrounding the site.

Existing development proximate to the site is located primarily to the east, towards the Nowra Township. Rural residential areas occupy the land to the east and south east of the site beginning at a distance of approximately 1.5 kilometres. Development to the east is clustered around the Princess Highway which is situated 7 kilometres east of the site. Land to the immediate north, west and south of the site is generally void of development. This is due to land being occupied by Colymea State Forest, Yalwal State Forest, The Bamarang Nature Reserve and other densely vegetated areas.

Methodology

Parameters for the encroachment assessment were informed through a review of the Heggies Noise Assessment (7 August 2008) and Heggies Addendum to Air Quality Impact Assessment (8 October 2009). These reports were prepared and submitted in support of the Concept and Stage One and Concept Environmental Assessment and Modification 2 (expansion to 450MVA), respectively. The Heggies reports assessed noise levels and air quality impacts arising from the operation of the Bamarang Power Station, when constructed, in the vicinity of the Project site. In order to do so, three properties were identified as "sensitive receptors" most likely to be impacted by noise and air-borne emissions from the power station, and modelling was used to predict whether noise and air quality at these 3 locations met accepted guidelines. The three sensitive receptors are:

- Part Lot 2 DP 1040676 Yalwal Road, approximately 750m north of the site - A commercial mud brick business is located at this location.
- Gannet Road, approximately 1.65km southeast of the site - This location is representative of the nearest of a number of semi-rural residences southeast of the site.
- 190 Bamarang Road, approximately 1.4km northwest of the site - This location is the nearest rural residence northwest of the site.

These sensitive receptors are highlighted in orange in Figure 1, below.

This study uses these same three properties as reference points for determining the extent of residential encroachment upon the buffer zones surrounding the project site, and whether this encroachment represents a significant concern in regard to a change to the impact of the Project on the surrounding areas.

A 2 kilometre radius was established around the site in which to consider recent development activity (see Figure 1). The Heggies studies concluded that air quality and noise levels at the 3 sensitive receptors were at or below the limits contained in the relevant guidelines. In assessing

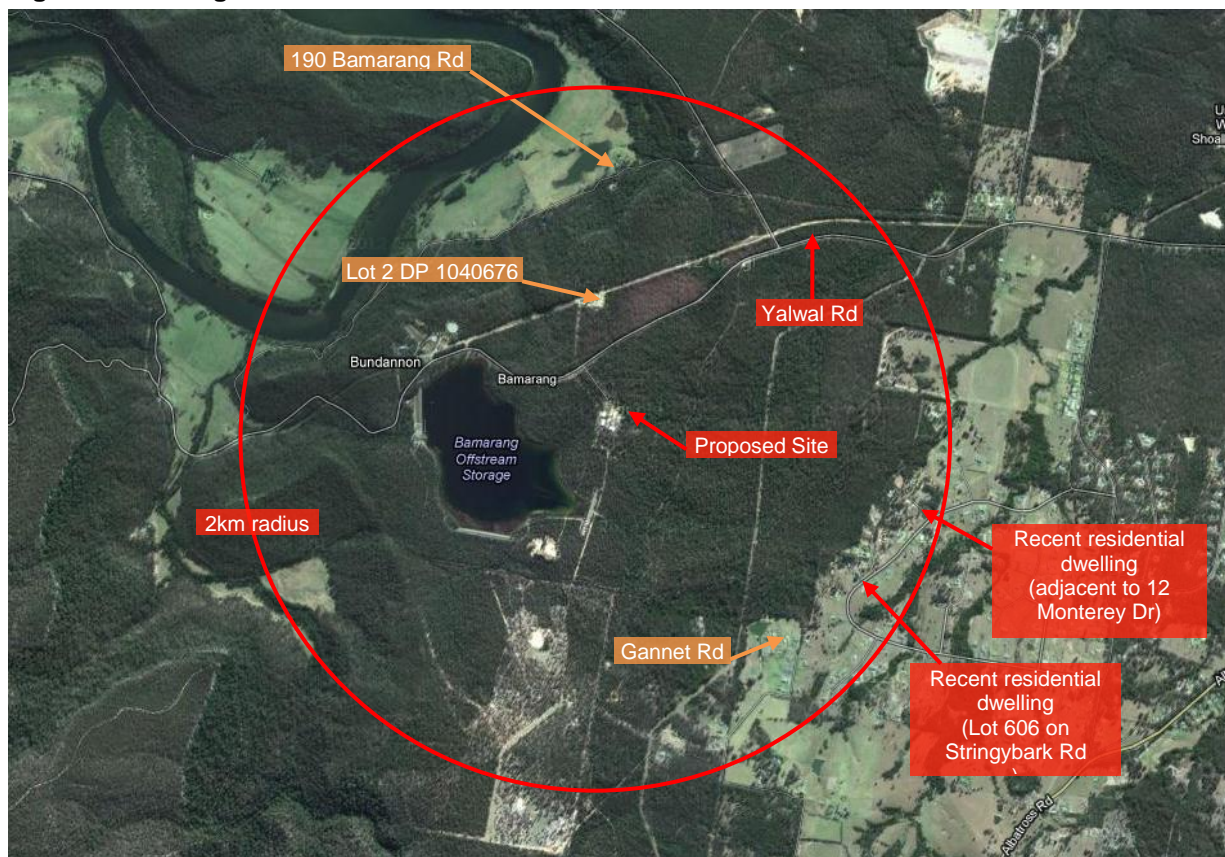
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encroachment upon the buffer zones surrounding the project site it is assumed that any development further from the proposed site than these locations will not be adversely affected.

To undertake the encroachment assessment, two methods were used to assess development activity within the area. The two methods used were:

- An analysis of aerial mapping; and
- An analysis of historical development application approvals for the immediately surrounding areas from Shoalhaven City Council Development Department.

Figure 1: Investigation Area



Shoalhaven City Council Development Department Data

An inquiry was made with the Shoalhaven City Council Development Department to obtain data specifically relating to the surrounding suburbs of the site. Historical development application data was requested, to ascertain the level of development proximate to the site. Data was provided for the suburbs of Bamarang, Mundamia (Directly East of Bamarang), Nowra Hill (Directly East of Bamarang) and Yerriyong (Directly South of Bamarang).

This data does not allow for identification of specific developments within the area of study. However, it provides an indication of the level of residential development activity within the immediate vicinity.

Table 1 summarises a search of Council's records of approved Development Applications for new dwellings since 1 July 2005.

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Table 1: Development Application Approvals for Dwellings

Year	Number of dwelling DA's approved
1 July 2005 – 30 June 2006	3
1 July 2006 – 30 June 2007	2
1 July 2007 – 30 June 2008	10
1 July 2008 – 30 June 2009	7
1 July 2009 – 30 June 2010	19
1 July 2010 – 30 June 2011	9
1 July 2011 – 30 June 2012	2

The data shows that during the past 7 years, since assessments of the Project commenced, there has been relatively little residential development activity within the vicinity of the project site.

Aerial Mapping Analysis

An analysis of aerial mapping was undertaken to visually establish recent development occurring within the investigation area. Three digital mapping services were used during this investigation; Google Maps, SIX Lite (NSW Land and Property Management Authority) and Nearmap.

Nearmap proved to be the most effective tool, enabling images of the same location from the widest range of dates to be analysed.

Nearmap images taken from 12 November 2010 to 17 July 2012 were analysed. From observation of these aerial images the following built infrastructure occurred during this period:

- A residential dwelling erected at Lot 606 on Stringybark Road
- A residential dwelling erected at adjacent to 12 Monterey Drive

The residential dwellings erected on Stringybark Road and Monterey Drive are the only developments able to be visually identified to have occurred within the investigation area between 12 November 2010 and 17 July 2012. Neither of these developments encroaches closer upon the project site than other nearby residences or the identified sensitive receptors.

Conclusion

The Shoalhaven City Council Development Department data and the aerial mapping analysis confirm that there has been no significant residential encroachment upon the buffer zones surrounding the project site.

Just two residential dwellings have been constructed over the past two years within the 2km radius surrounding the project site. Due to the densely vegetated area and State Forest surrounding the site, any future encroachment would appear more likely to occur further south and east of the investigation area where currently unoccupied cleared land exists.

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