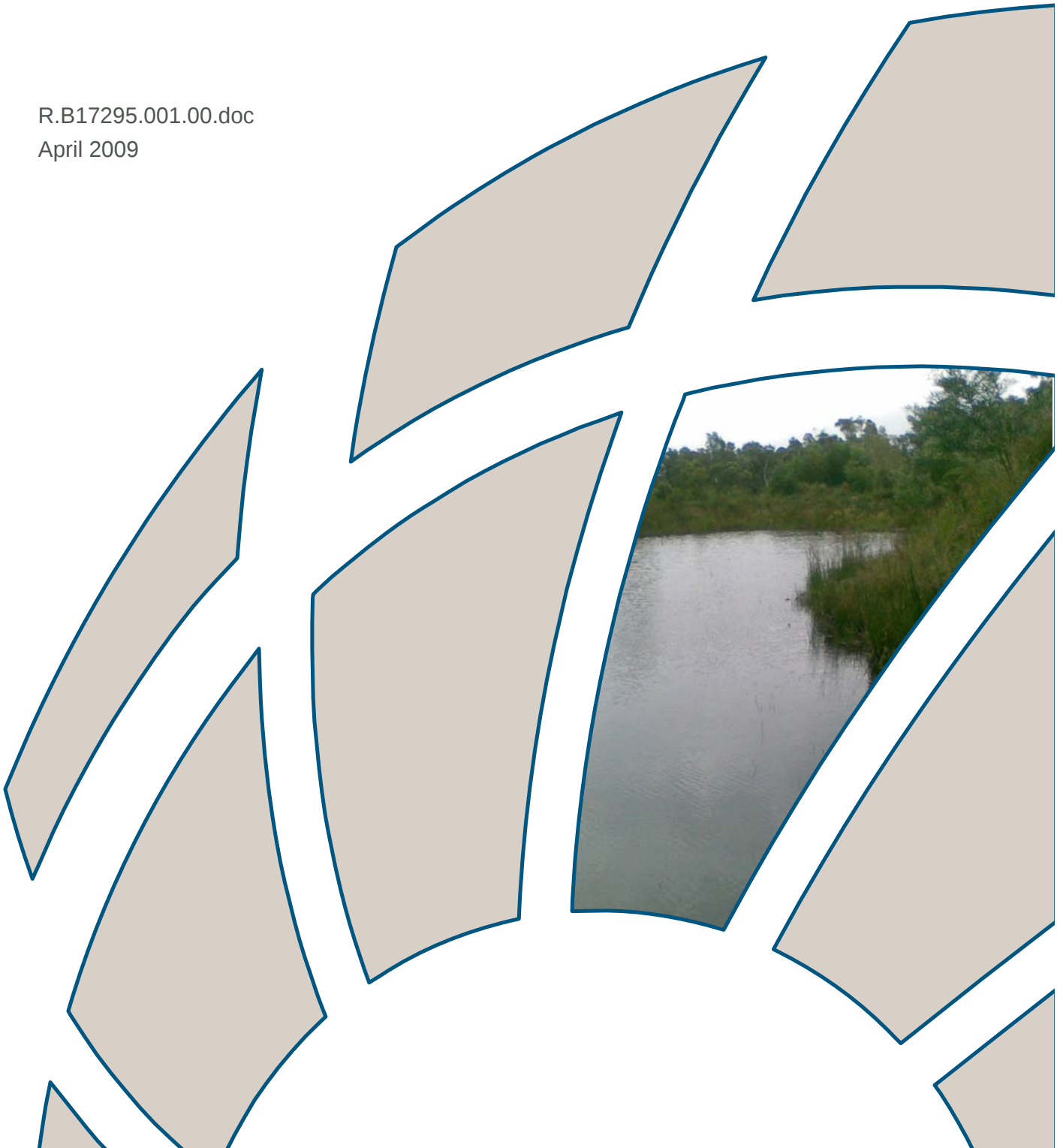




Pipers Creek Stage 1 Report

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April 2009



Pipers Creek Stage 1 Report

Prepared For: Coastplan Consulting (on behalf of Woolworths)

Prepared By: BMT WBM Pty Ltd (Member of the BMT group of companies)

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Author :	Damion Cavanagh
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1 INTRODUCTION

This preliminary report has been prepared to identify baseline conditions associated with the subject site. In this fashion, the information included in the report can be used to identify some of the key constraints and considerations for development of a concept design for the future potential development of the site.

Key site features considered in this baseline assessment include:

- Identification of stormwater catchments and drainage;
- Identification of likely flooding characteristics of the site;
- Identification of potential vegetative constraints (based upon preliminary information provided by Conics); and
- Identification of pollutant export characteristics for the undeveloped site.

The site was visited on Tuesday 4 November 2008 by Damion Cavanagh and Mark Wainwright to gain a better appreciation of the site configuration and characteristics.

2 SITE CHARACTERISTICS

2.1 Location

The site is located on The Lakes Way, South Forster as shown in Figure 2-2. The site extent includes Part Lot 20 DP 22631, Lot 148 DP 651471 and Lot 37 DP 1023220 and has a total extent of approximately 24ha.

The site is located on the western side of the Lakes Way behind the existing Barclays Marine and a Motel. The Lakeside Tavern and Bottleshop exist on Lot 37. The site adjoins a Reserve which abuts Pipers Creek.

2.2 Topography and Site Drainage

The site has a varied topography although it would be described as flat. A digital elevation model (DEM) for the site has been prepared based on recent survey information captured for the site, and is shown in Figure 2-3. In considering the site in three zones, the portion closest to the Reserve Boundary, the portion closest to the Lakes Way and the middle portion, the site can be described as follows.

The portion adjacent to the Reserve boundary and extending into the site for approximately 50m is flat with elevations varying between 0.2 to 1.0 m AHD (averaging about 0.5m AHD) apart from a small portion behind the Lakeside Tavern which exists at about 1.8 m AHD. Figure 2-1 provides a photograph taking in the front portion of the site looking south towards Forster Keys.



Figure 2-1 Front portion of site looking towards Forster Keys



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Site Extent and Locality

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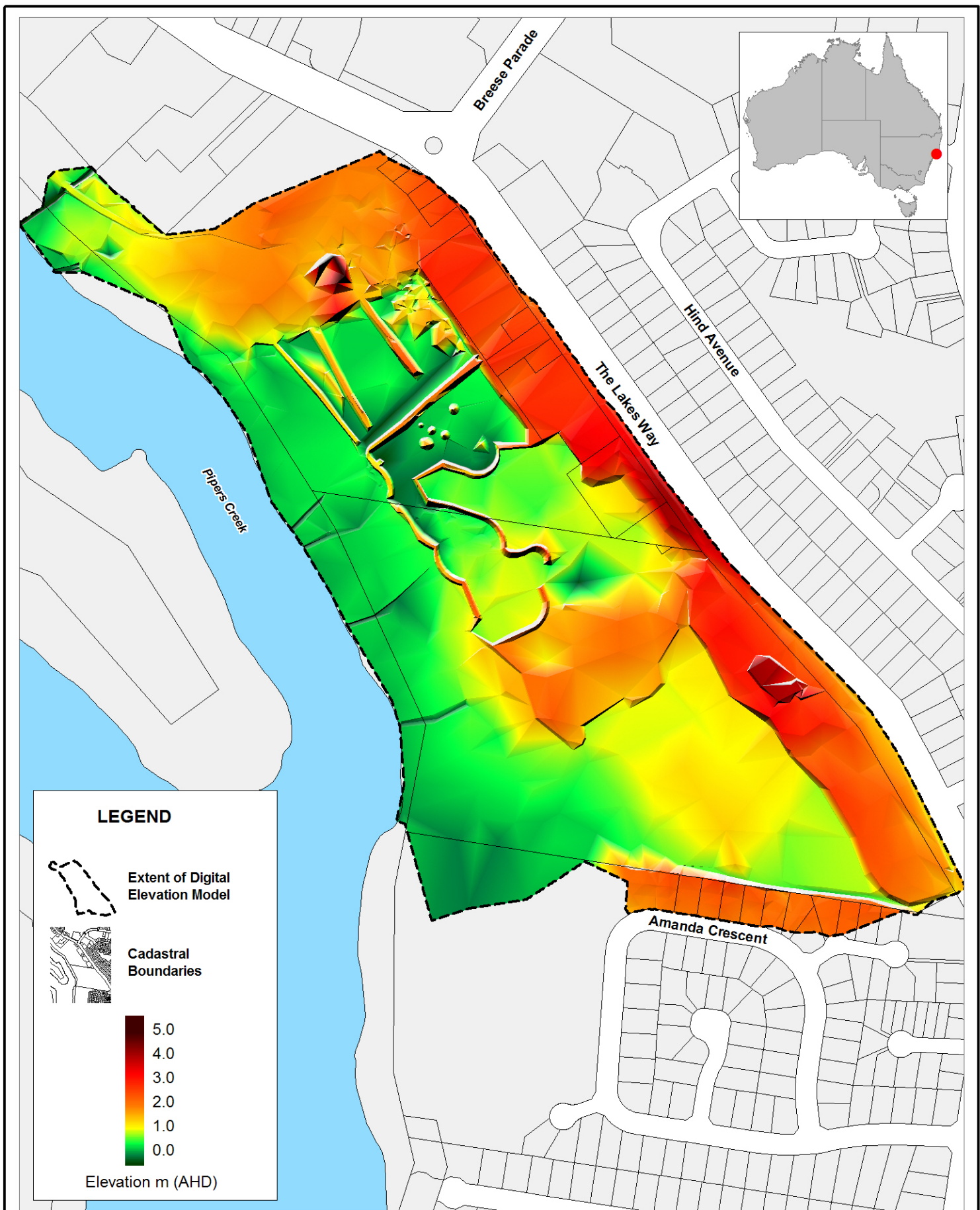
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Digital Elevation Model of Site

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The portion adjacent to the boundary on The Lakes Way extending about 50m into the site (excluding allotments owned by others, e.g. Barclays Marine) is flat with elevations varying between 2.0 to 4.3 m (averaging about 3.0m AHD). Figure 2-4 provides a photograph taken in the front portion of the site at a location to the south of Barclays Marine.



Figure 2-4 Front portion of site looking towards The Lakes Way

The middle portion of the site shows evidence of existing fill activities and as such has an unusual topography. While this portion would still be described as flat across the whole, it has a number of what appear to be filled access tracks and embankments to water bodies (most of these were empty at the time of inspection) as shown in Figure 2-5.



Figure 2-5 Embankment in middle section of site

Drainage

Site drainage is complex. It is complicated by the site being quite flat and also having been extensively modified. The majority of the site drains into a couple of large depression in immediately behind the Motel and Barclays Marine or into small tidal rivulets connected to Pipers Creek. The drainage depressions themselves appear to potentially discharge to tidal drains to Pipers Creek and also intercept a shallow groundwater table. A relatively narrow strip (~40m depth) of land facing The Lakes Way has been recently filled and these areas typically drain towards The Lakes Way.

The site while being flat overall contains a number of localised embankments and depressions. It appears (refer to Figure 2-3 which shows water ponding in this depression) that the northern “L” shaped depression may capture some overland stormwater flow and may also be deep enough to allow groundwater to surface.

The larger basin immediately to the south appears to have a tidal connection to Pipers Creek. It is also shallow enough to potentially allow for groundwater to surface. Water was noted to occur in the shallowest portion of this depression (i.e. its northern end) at the time of inspection (November 2008) as shown in Figure 2-6.



Figure 2-6 Water in basin in middle portion of site

Groundwater level surveys have yet to be completed for the site, although as noted in Section 2.2.3, it is thought that depths to groundwater across the site would be less than 1m below existing ground levels.

Stormwater Catchments

Estimated stormwater catchments for the site are shown in Figure 2-7. It is noted that The Lakes Way roughly forms a stormwater catchment boundary for the site, although there is approximately 2.3 ha of The Lakes Way and Barclays Marine / Motel that is drained through the site.

Stormwater from the far side of the Lakes Way is collected in roadside drainage lines and passed through two under-road culverts, it combines with local drainage from Barclays Marine and the Motel. This stormwater is then piped through an easement which runs between these two premises. According to GIS information provided by Council, the pipe terminates at the boundary of the subject lot and potentially drains into the abovementioned depressions, although it appears that the easement continues across the lot to the Reserve boundary.

To avoid drainage issues with the new development it is likely that stormwater from this external catchment will need to be piped under any new development to an outlet near the site boundary adjoining the Reserve. Consideration of the possible development constraints associated with this easement will need to be taken into account, i.e. provision of access to service the pipe and pipe outlet at a later stage may be required. The existence of the easement may present opportunities to co-locate drainage infrastructure in this zone. Soils

The site has potentially been extensively filled as noted by many unusual landform, cleared vegetation and disturbances noted on aerial photography. Site inspections identified a primarily sandy soil, but these would need to be confirmed as part of soil borelogs which would more accurately describe soil conditions for the site. Soil borelogs are yet to be completed for the site.

2.2.1 Existing and Proposed Landuse

The existing and proposed use of the main land parcels comprising the site are described below:

- Lot 148 DP 651471 is currently vacant, but as evidenced in aerial photography and site inspections, it has been extensively cleared and modified over the years. However, some existing stands of vegetation intact on the site and the relative values of these are being assessed as part of separate investigations.
- Lot 37 DP 1023220 is currently occupied by the Lakeside Tavern and Bottleshop. The remainder of the lot is currently vacant, but as evidenced in aerial photography and site inspections, it has been extensively cleared and modified over the years. However, some existing stands of vegetation intact on the site and the relative values of these are being assessed as part of separate investigations.

Future development of the site is likely to focus mostly on Lot 37 with lot 148 remaining largely untouched. In terms of future proposed land use, the site will be converted to use for large commercial department type stores, with commensurate open air parking provided. Access to the site would be provided from the Lakes Way either side of the Motel and Barclays Marine. The existing Lakeside Tavern and Bottleshop would remain.

2.2.2 Vegetation

Conics are completing baseline vegetation surveys. No detailed reports have as yet been provided in respect of the vegetation communities across the site and their relative values.

Based on preliminary discussions with Conics (B. Campbell, Pers. Comm., 2009) it was identified that two vegetation stands on site were of value and would probably be retained, potentially with a mixture of clearing and vegetation off-sets. These vegetation communities existed along the edge of Pipers Creek within the Reserve and for approximately 50 into the site. The second stand of vegetation exists on the boundary between lots 148 and 37, approximately 150 m south of Barclays Marine. This vegetation community is noted to be centred on (what is probably) a natural depression in the existing landscape.

The exact requirements for vegetation preservation, including need for maintenance of hydrologic regimes and as well as any allowable clearing/offsetting remain the subject of ongoing investigation and negotiation.

A SEPP 14 wetland is noted to existing approximately 100 west of the site on the opposite side of Pipers Creek.

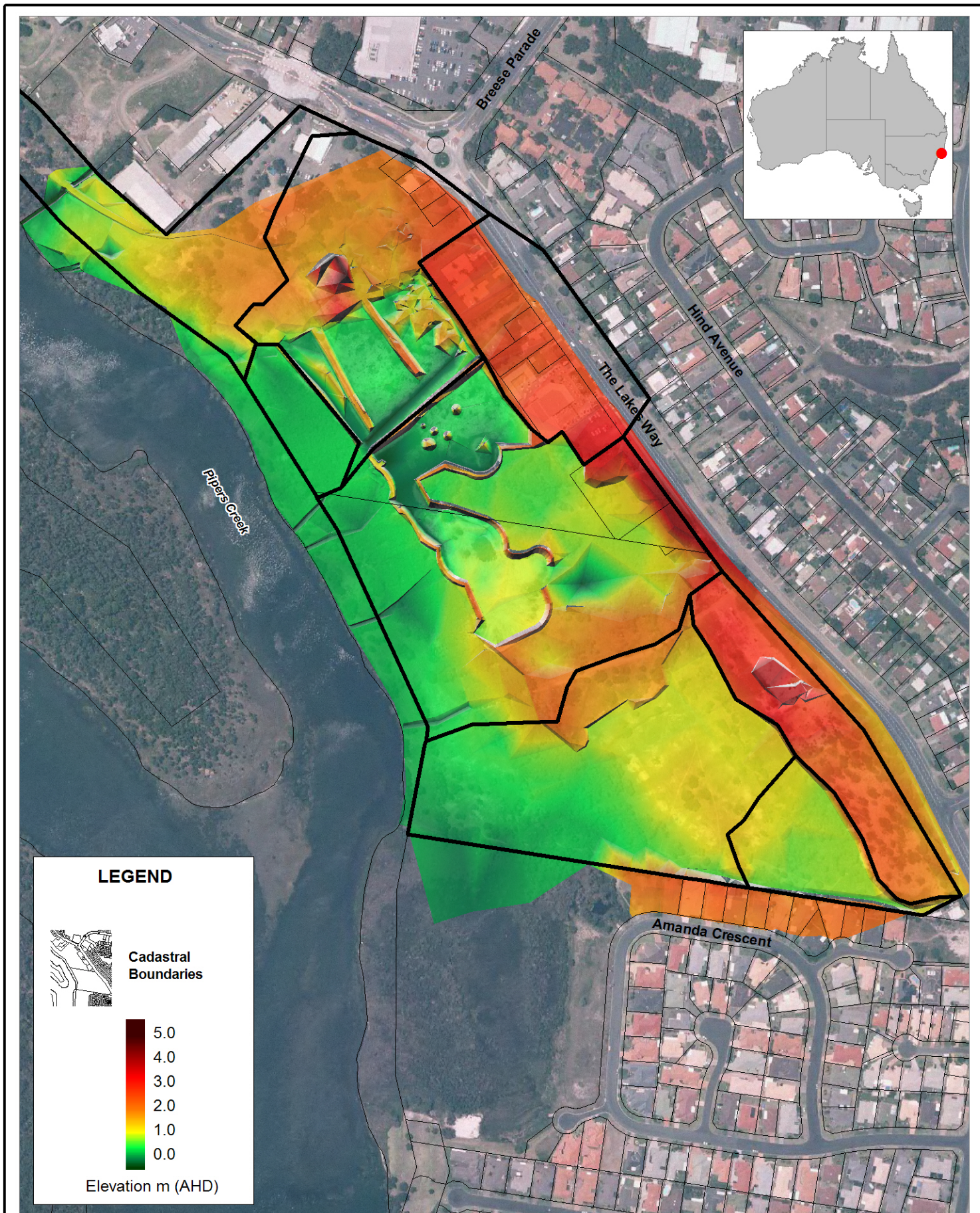
2.2.3 Groundwater

No groundwater bores have been installed across the site at this stage as part of the current investigation. However, Environ has completed a desktop study to identify key regional hydrogeological features of interest at the site. The results of the desktop study are presented in Table 2-1 below.

Table 2-1 Key Regional Hydrogeological Features (Source Environ)

Category	Details
Street Address	The Lakes Way, South Forster
Certificate of Title	Part Lot 20 DP 22631, Lot 148 DP 651471, Lot 37 DP 1023220
Site Area	24 hectares
Regional Geology	Estuarine and delta deposits
Regional Soils	Undifferentiated Surface Units, Holocene Freshwater Swamp
River Catchment Area	Port Stephens/ Wallis Lake
Anticipated Depth to Groundwater	<1m
Groundwater Database Search	Five wells within 1km radius of Site (GW080303, GW080418, GW080540, GW080483, GW080443), two installed in 1970, three installed in 2003, no data provided
SEPP 14 Wetlands	Part of Pipers Creek, immediately west of Site

The depth of groundwater across the site was also determined to be within 1m of the natural ground surface by Coffey Geotechnics Pty Ltd (Coffey, 2008) and is expected have a very low gradient but with an overall flow towards Wallis Lake to the west of the site.



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Stormwater Catchments

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