

Appendix P

Groundwater

Preliminary Notes for Response to Groundwater Impact Assessment Information Request

As discussed in the various reports submitted as part of this application parts of the northern lower area of Lot 9 on DP1039569 have been filled to raise the surface levels in this area to above the regional 100 year ARI flood level. As noted by these reports this filling work was undertaken as part of a previously approved application for the subject site.

As part of the development of this northern area of Lot 9 on DP1039569 it is proposed to construct a wetland for stormwater treatment and detention purposes. Therefore it should be clarified that the detention storage volume for the northern catchment will be provided above the standing water level of the proposed wetland and not within a dry detention basin.

Preliminary design details for the wetland indicate that the standing water level for the wetland will be at approximately RL1.0m AHD to provide sufficient fall for the surrounding subdivision internal pipe drainage network. In accordance with Section D7.9.8(d) of Tweed Shire Council's Development Design Specification D7 - Stormwater Quality the average depths for the various components of the wetland will vary from 1.5 metres for the deep water zones to 0.7 metres deep for the macrophyte zone. This will result in the deep water zones being excavated down to RL-0.5m AHD and the macrophyte zone being excavated down to RL0.3m AHD. As indicated by DNR this will result in the wetland being excavated approximately 1 metre into the groundwater table based on an average groundwater level of RL0.5m AHD. A maintenance track around the perimeter of the wetland area will be constructed at RL2.5m AHD. This will provide approximately 1.5 metres of free space above the standing water level for detention storage purposes.

It is not clear where DNR have obtained the water level of around RL2m for the flood plain area. As stated in Section 2.3 of the *Groundwater Assessment (19 January 2007)* for Fraser Drive 'the average level in the wetlands is likely to be relatively constant at MSL of RL0.10m AHD or lower except during periods of heavy rainfall'.

As indicated by DNR Section 2.6 of the *Groundwater Assessment (19 January 2007)* for Fraser Drive states that 'The high permeability of the floodplain alluvia indicate that groundwater levels within the northern areas probably varies seasonally from close to ground level in wet summer periods falling to close to the mean wetlands water level of RL0.1m AHD during the dryer winter periods'. It should be clarified that the ground level referred to in the statement above refers to the pre-development ground level of approximately RL1.0m AHD, which existed prior to the filling works undertaken on site. Not the ground level of RL2.5m indicated by DNR. Therefore based on this information the groundwater levels recorded in Table 2 in Section 2.7 and the range of groundwater levels discussed in Section 3.5.3 of the *Groundwater Assessment (19 January 2007)* appear to be consistent with the above statement.

Based on the information above, the standing water level of the wetland of approximately RL1.0m AHD will generally be higher than the average surrounding groundwater level, which varies seasonally between RL0.2m AHD and RL0.9m AHD. Therefore there is not expected to be any potential 'blowout' of the internal walls of the wetland due to water pressuring the walls of the basin.

As it will be necessary to excavate down into the groundwater table to form the proposed wetland a license will be required under Part 5 of the Water Act 1912.

As discussed above, the standing water level of the wetland will generally be higher than the surrounding groundwater level. Therefore there is potential for groundwater movement between the proposed wetland and the surrounding areas. As DNR have raised the issue of the potential contamination of the SEPP 14 wetland through the movement of contaminated groundwater it may be possible to clay line the wetland if necessary to reduce this potential for groundwater movement. However, it should be noted that the point of discharge for runoff from the northern catchment is the SEPP 14 wetland. Therefore surface runoff discharging from the wetland (treated) and the external catchment by-pass channel will be entering the wetland following rainfall events.

The discharge of runoff from the subdivision into the SEPP 14 wetland area is necessary to maintain the flow regime into the SEPP 14 wetland.

Groundwater monitoring throughout construction and for a period of operation could be undertaken to confirm if contaminated groundwater leaves the treatment pond.

As DNR have indicated that a license will be required under Part 5 of the Water Act 1912 for any dewatering undertaken on site during the construction phase, it is suggested that a dewatering management plan be prepared incorporating further details on the areas to be dewatered within the subdivision.