

As stated in Section 9.1.1 of Appendix C of the EA:

*In areas where swamps would be undermined, baseline monitoring of a representative number of swamps should be conducted...In situations where surface outflows and the downstream end of the swamp are sufficiently concentrated to enable flow to be reliably measured, a low flow monitoring station (such as an instrumented V notch weir or flume) should be established.*

The monitoring of flows at the downstream end of the swamps within the Project area would be used to examine the range of hydrological behaviours in individual swamps. The baseline flow data would be used to calibrate a flow model for the swamps and examine flow behaviour prior to and following mining.

DECCW (16 December 2009) states the following:

*During consultation with DEWHA on these matters it has become evident to DECCW that a number of Woronora Plateau swamps may meet the definition of THPSS under the EPBC Act. DECCW urges ICHPL to contact DEWHA in relation to this significant issue.*

DECCW (16 December 2009) also states:

*The DECCW considers that clarification is need on whether swamps in the Bulli Seam project area are likely to meet the Commonwealth Government's definition of Temperate Highland Peat Swamps on Sandstone, an endangered ecological community.*

...

*The Commonwealth listing specifically identifies one of the two mapped upland swamp vegetation types from Tozer et al. (2006) found in the Woronora swamps (FRW p130) as part of THPSS. The other extensive vegetation type within the Woronora swamps is FRW p129. It is worth noting that the differences in floristic composition between FRW p129 and FRW p130 are subtle relative to the variation in floristics encompassed by the THPSS listing.*

The following response has been prepared by Dr Colin Bower (FloraSearch).

The swamps within the Project area do not represent the Temperate Highland Peat Swamps on Sandstone Endangered Ecological Community (EEC).

The *Approved Conservation Advice* for the Temperate Highland Peat Swamps on Sandstone EEC (DEWHA, 2008) describes the community as follows:

*The Temperate Highland Peat Swamps on Sandstone ecological community comprises temporary or permanent swamps occurring on sandstone in the temperate highlands region in NSW (DEH, 2005) from around 600–1100 m above sea level. The wetter parts of the swamps are occupied by sphagnum bogs and fens, while sedge and shrub associations occur in the drier parts (TSSC, 2005). The level of waterlogging and amount of sedimentation are influenced by the location of the swamps: hanging swamps (occurring on steep valley sides) have low levels of sedimentation, and accumulate organic material slowly; valley swamps and those along watercourses have greater levels of sedimentation, and accumulate organic material more quickly (TSSC, 2005).*

The distribution of the EEC is defined in the *Approved Conservation Advice* (DEWHA, 2008) as:

*Temperate Highland Peat Swamps on Sandstone are known from the Blue Mountains, Lithgow, Southern Highlands, and Bombala regions in NSW.*

The key features of the Temperate Highland Peat Swamps on Sandstone EEC from these definitions are:

1. An altitudinal range from 600 to 1100 m above sea level;
2. A distribution on the NSW Central and Southern Tablelands including the Blue Mountains, Lithgow, Southern Highlands and Bombala regions; and
3. The presence of sphagnum bogs.

Dr Colin Bower has provided the following advice regarding the potential for the THPSS EEC to occur in the Project Area:

- No swamps on the Woronora Plateau were included in the circumscription of the Temperate Highland Peat Swamps on Sandstone EEC by DEWHA in any of the documentation on the community including the very detailed community profile (DEWHA, 2009a), the Approved Conservation Advice (DEWHA, 2008) and the distribution map (DEWHA, 2009b). All coastal upland swamps on the Woronora Plateau occur below altitudes of 450 m, including all swamps in the Project area, and consequently fall outside the altitudinal range defined for the EEC. Nor does the Woronora Plateau as a whole occur within the geographical distribution defined for the EEC.
- Only the wetter swamps on the Woronora Plateau develop peat and these comprise the Cyperoid Heath and Tea Tree Thicket communities. However, if areas of these communities on the Woronora Plateau were to be included in the Temperate Highland Peat Swamps on Sandstone EEC, it would require a redefinition and renaming of the EEC. The altitudinal limits and distribution of the EEC would need to be redefined and in so doing the community would no longer be confined to the highlands.
- Comparison of the dominant flora species between Temperate Highland Peat Swamps on Sandstone EEC, as outlined in the DEWHA (2009) community profile, and Upland Swamps on the Woronora Plateau, as determined by numerous studies including Bangalay Botanical Surveys (2008), FloraSearch (Appendix E of the EA), Keith and Myerscough (1993), Keith *et al.* (2006), indicates there can be a high degree of floristic overlap between them, especially between the Woronora Plateau swamps and the highland swamps in the Blue Mountains. Despite this, there are also suites of species that occur only in either coastal upland swamps (e.g. Woronora Plateau) or highland swamps on the tablelands. A critical distinguishing feature of the Temperate Highland Peat Swamps on Sandstone EEC is the frequent and often dominant presence of sphagnum moss (*Sphagnum cristatum*) bogs, which are absent from coastal upland swamps. In addition, there are different suites of Tea-tree (*Leptospermum*) and Pea-flower (Fabaceae) and *Grevillea* (Proteaceae) species, among others, in the highlands and coastal uplands.

Dr Colin Bower has concluded the above points effectively exclude peat swamps on the Woronora Plateau from the Temperate Highland Peat Swamps on Sandstone EEC.

**DECCW (16 December 2009) states the following:**

***The EA presents no assessment of the cumulative impact of its operations on swamps and therefore significantly downplays the environmental impact.***

Cumulative impacts on flora and fauna, including cumulative impacts on swamps, are discussed in Section 5.7 of Appendix E and Section 4.9 of Appendix F of the EA.