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WA Bluemetal  
Head Office  
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**Response to Flora Issues raised in correspondence from the Department of Agriculture, Water and the Environment**

The following summaries on specific flora species raised in the letter from the Department of Agriculture, Water and the Environment.

The flora species as designated in his correspondence are extremely unlikely to occur in the WA Bluemetal quarry area near Byford as all these species occur on the Swan Coastal Plain in sandy or wetter sites which do not occur on the lateritic sandy-gravel soils on the Darling Scarp in the proposed expansion areas of the WA Bluemetal quarry area. The summary below is based on data from the Western Australian FloraBase records (WAH 1998-) and also on the basis of over 40 years of botanical and ecological knowledge of Dr Mattiske.

Therefore, the suggestion that these 6 flora species have the potential to occur in the Byford quarry areas on upland sandy-gravel soils of the steep Darling Scarp on the eastern fringes of the Swan Coastal Plain and on the western fringes of the elevated Darling Range reflects the errors that arise when agencies rely on database searches and not detailed survey results or knowledge of specific species or local ecological knowledge of ecosystems and associated flora species.

Yours sincerely,

Dr E.M. (Libby) Mattiske (Adj. Prof. Murdoch University)

B.Sc. Hons, Ph.D.

***Diuris micrantha* (Dwarf Bee-orchid)-Vulnerable** (photographs from FloraBase, WAH 1998-)



*Diuris micrantha*, Family Orchidaceae, is a tuberous perennial herb (Western Australian Herbarium, 1998–), that has a basal tuft of narrow, linear leaves and a loose, slender inflorescence up to 60 cm high (Department of Agriculture, Water and the Environment, 2021a) . This species flowers during August to early October (Brown *et al.*, 1998). The flowers are yellow, and can number up to seven, with reddish-brown markings (Department of Agriculture, Water and the Environment, 2021a).

*Diuris micrantha* is known from seven populations, from east of Kwinana and south towards the Frankland area, Western Australia (Department of Agriculture, Water and the Environment, 2021a). It is found in small populations, on dark, grey to blackish, sandy clay-loam substrates in swamps or winter wet depressions (Western Australian Herbarium, 1998-). The bases of the flowering plants are often covered with shallow water (Brown *et al.* 1998).

There are 8 records of this species on FloraBase. It has not been previously recorded in the area and as the Byford quarry site occurs on lateritic sandy gravels on upland areas of the Darling Scarp it is extremely unlikely that this species would occur in the WA Bluemetal Quarry area.

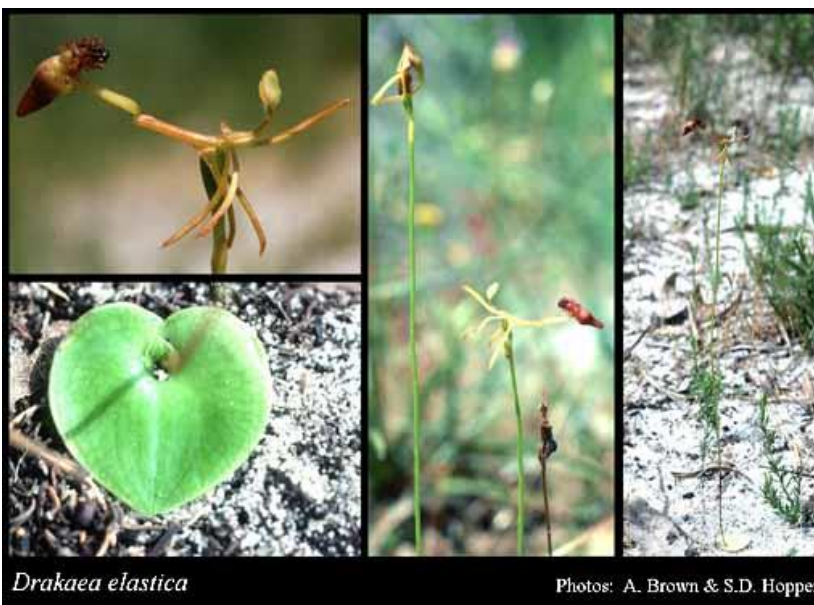
***Diuris purdiei* (Donkey-orchid)- Endangered**\_(photographs from FloraBase, WAH 1998-)



*Diuris purdiei*, Family Orchidaceae, is a tuberous, perennial, slender, terrestrial orchid growing up to 45 cm tall (Department of Agriculture, Water and the Environment, 2021b). The flowers are flattened, which are prominently marked with brown blotches on their lower surface. Flowering occurs from late September to mid-October (Western Australian Herbarium, 1998–).

This species grows on moist grey-black sand, in areas subject to inundation, and amongst native sedges and dense heath with scattered emergent overstorey species (Brown *et al.*, 1998). *Diuris purdiei* is unlikely to occur in the project area, as it occurs on flats and wet or damp sandy soils (Western Australian Herbarium, 1998–). There are 26 records of on FloraBase. It has not been previously recorded in the area and as the Byford quarry site occurs on lateritic sandy gravels on upland areas of the Darling Scarp it is extremely unlikely that this species would occur in the WA Bluemetal Quarry area.

***Drakaea elastica* (Glossy-leaved Hammer Orchid)- Endangered**\_(photographs from FloraBase, WAH 1998-)



*Drakaea elastica* is a tuberous, perennial herb. This species has a slender flower stem up to 30 cm high and a single distinctively glossy, bright-green, prostrate, heart-shaped leaf 1 cm to 2 cm in diameter. The flowers, which are red/ green and yellow in colour, appears in September to November (Western Australian Herbarium (1998–). The plant dies back to a dormant underground tuber over summer (Department of Agriculture, Water and the Environment, 2021c).

*Drakaea elastica* is known only from the Swan Coastal Plain over a range of approximately 350 km between Cataby in the north and Busselton in the south West of Western Australia (Department of Agriculture, Water and the Environment, 2021c). The species grows on bare patches of white or grey sand near adjoining low-lying winter-wet swamps (Western Australian Herbarium, 1998–). There are 19 records on FloraBase known to be found previously in Busselton, Capel, Dandaragan, Harvey, Kwinana, Murray and Rockingham. It has not been previously recorded in the area and as the Byford quarry site occurs on lateritic sandy gravels on upland areas of the Darling Scarp it is extremely unlikely that this species would occur in the WA Bluemetal Quarry area.

***Synaphea* sp. Fairbridge Farm (D. Papenfus 696)- Critically Endangered** (photographs from FloraBase, WAH 1998-)



*Synaphea* sp. Fairbridge Farm (D. Papenfus 696)

Photos: R. Butcher

*Synaphea* sp. Fairbridge Farm (D. Papenfus 696), Family Proteaceae, is a dense, clumped shrub 25–65 cm tall by 20–80 cm wide. The flowers open narrowly, are yellow, hairy, openly spaced and are angled upwards in the spike (Western Australian Herbarium (1998–). Flowering occurs in October.

This species is endemic to the Pinjarra Plain of Western Australia (Department of Agriculture, Water and the Environment, 2021c). It has been known to occur in Canning, Dardanup, Murray and the Serpentine-Jarrahdale area. It is found on grey, clayey sand with lateritic pebbles in low woodland areas near winter flats. It is often associated with weedy grasses (Department of Agriculture, Water and the Environment, 2021c).

There are 31 records known on FloraBase, these records are mainly occurring on flat black or grey sandy loam or sand in seasonally wet areas. It has not been previously recorded in the area and as the Byford quarry site occurs on lateritic sandy gravels on upland areas of the Darling Scarp it is extremely unlikely that this species would occur in the WA Bluemetal Quarry area.



***Synaphea* sp. Pinjarra Plain (A.S. George 17182)** (photographs from FloraBase, WAH 1998-)



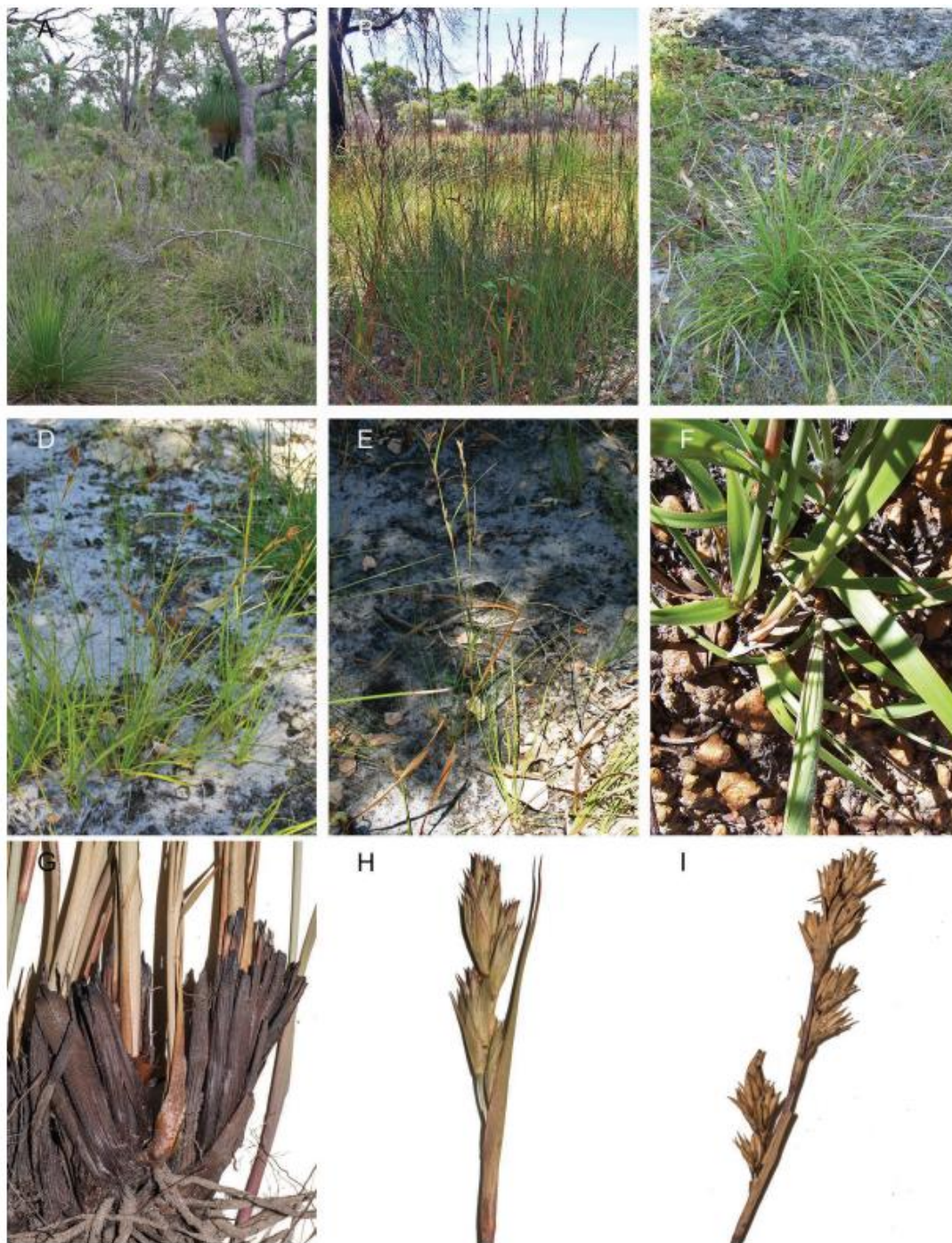
*Synaphea* sp. Pinjarra Plain (A.S. George 17182) is an erect, clumped shrub that grows to 80 cm high. It flowers in the months of September to November, and the flowers are yellow in colour.

This species is known to occur on grey sandy loam or clay, grey-brown clayey sand, brown clayey loam, and laterite. It occurs on flats, seasonally wet areas, railroad reserves, and often on wet depressions or drains (Western Australian Herbarium (1998-).

*Synaphea* sp. Pinjarra Plain (A.S. George 17182) has been previously recorded on the Swan Coastal Plain in the Capel, Murray and Serpentine-Jarrahdale areas. There are 63 known records on FloraBase. It has not been previously recorded in the area and as the Byford quarry site occurs on lateritic sandy gravels on upland areas of the Darling Scarp it is extremely unlikely that this species would occur in the WA Bluemetal Quarry area.

***Morelotia australiensis* (Formerly *Tetraria australiensis*) – Vulnerable**

(photographs from FloraBase, WAH 1998-)



**Fig. 7.** *Morelotia australiensis*. A. Habitat. B. Plants in habitat. C. Plant with old inflorescences. D, E. Flowering plants. F. Leaf and culm bases. G. Plant base with new growth after fire. H, I. Inflorescence. A–E, G–I from Watkins Reserve. F from North Dandalup. G–I from *K.L. Wilson 9310* (NSW). Photos A, B, D–F by M. Okely; C. by V. English; G–I by R.L. Barrett.

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*Morelotia australiensis*, Family Cyperaceae, is a perennial, tufted herb, with stems up to 1 metre high (Department of Agriculture, Water and the Environment, 2021d).

The distribution of *Morelotia australiensis* is severely fragmented, with the known populations occurring in isolated remnant patches of vegetation (Department of Agriculture, Water and the Environment, 2021d). It is found on grey sand over clay, and yellow sandy or clayey lateritic soils (Brown *et al.* 1998). *Morelotia australiensis* favours winter-wet swampy depressions, drainage lines or rises surrounding swamps (Brown *et al.* 1998). It is found in Marri *Corymbia calophylla* woodlands over low shrubs, herbs and sedges (Brown *et al.* 1998).

There are 36 records of *Morelotia australiensis* known to occur on FloraBase. These have been known to occur on flats and gentle slopes. This species is endemic to the greater Perth region, and is known to occur on the eastern side of the Swan Coastal Plain, from Busselton, Mundijong and Waroona, north to Serpentine. The historical populations near the Perth suburbs of Armadale and Canning are thought to be extinct (Barrett *et al.* 2021)

Two records of *Morelotia australiensis* has been previously found on the South west Highway in Whitby, which is close to the project area on the Pinjarra Plain below the Darling Scarp.

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Two records of *Morelotia australiensis* have been previously found on the South west Highway in Whitby, which is close to the project area; however as this species occurs mainly on winter-wet swampy depressions, drainage lines or rises surrounding swamps (Brown *et al.* 1998) supporting woodlands of Marri *Corymbia calophylla* woodlands over low shrubs, herbs and sedges it is unlikely to extend onto the drier upper slopes on sandy gravels on the upper slopes of the Darling Scarp supporting Jarrah-Marri-Sheoak (*Eucalyptus marginata-Corymbia calophylla-Allocasuarina fraseriana*) in the WA Bluemetal quarry area.



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