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Memorandum

To	Mr Andrew Stannard	From	Aurecon C/o Jane Stark
Copy		Reference	225678
Date	6 August 2012	Pages (including this page)	9
Subject	Roma Ecological Assessment – Addendum to Lot 5 WV434		

Mr Stannard,

This memorandum relates to the ground-truthing of the proposed development area shown in Figure 1.1 and documents the results of ecological investigations of this corridor.

These ecological investigations were undertaken on 11 July 2012 by two (2) Aurecon ecologists (Jenny Grundy and Sandra Walters).

A report specific to additional proposed development areas within Lot 5 on WV434 has been previously prepared and submitted to Santos (Ecological Assessment Report – Lot 5 WV434; Santos Document Reference 0020-GLNG-4-1.3-0069).

This memorandum should be considered as an addendum to the report listed above. This memorandum is specific to the ecology of the proposed development area shown in Figure 1.1. For ecological information related to proposed development that is in addition to that covered by this report, please refer to the appropriate Lot-specific report.

Ecological Assessment

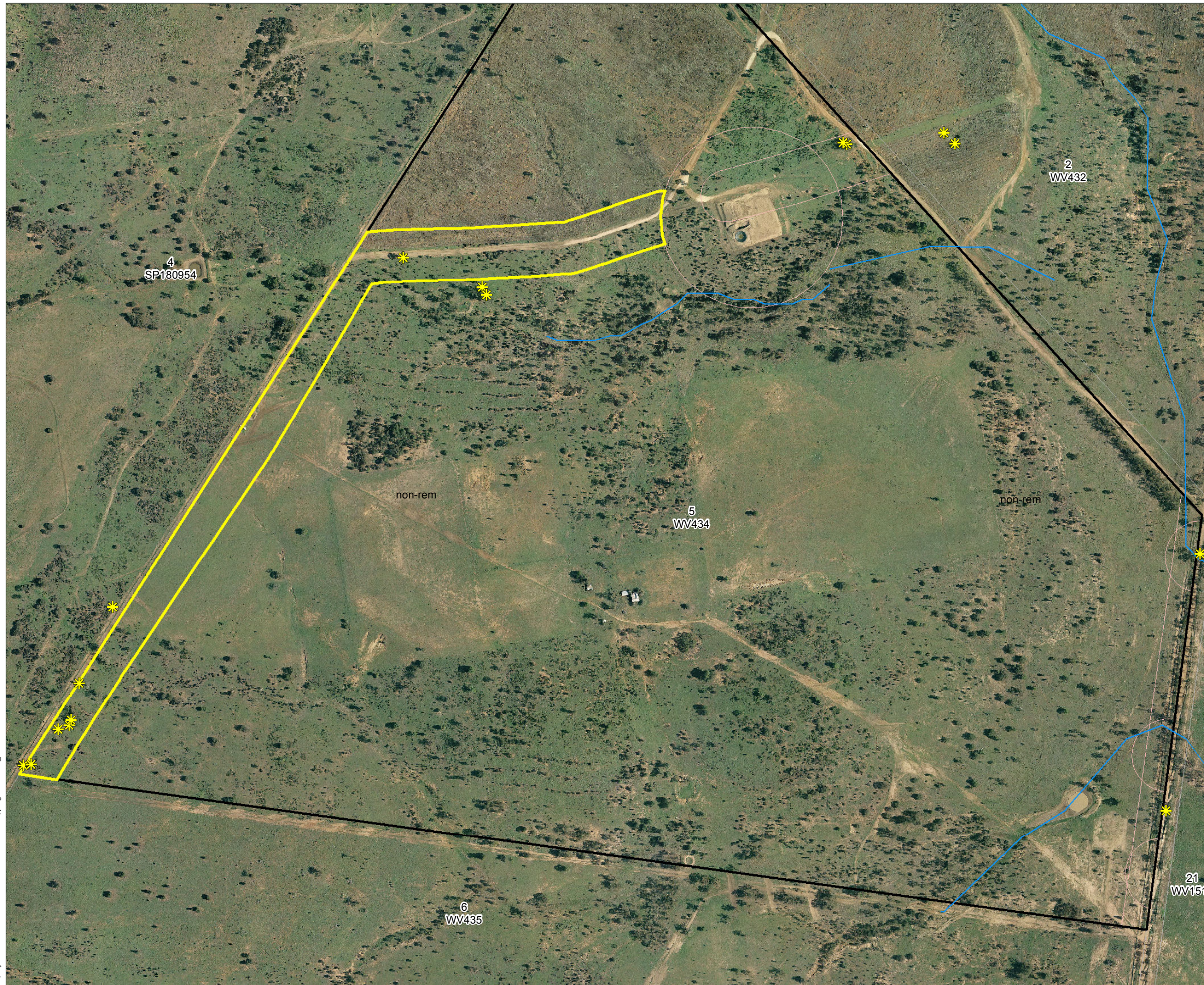
General

The proposed development area, as shown in Figure 1.1, is situated within areas previously cleared for stock grazing and gas field infrastructure. The majority of the area is dominated by groundcover, although areas of thick woody regrowth are present along the eastern end of the proposed corridor.

No Regional Ecosystems (REs) are mapped within the development area. No Environmentally Sensitive Areas (ESAs) are mapped in or within 1 km of the proposed development area.

No watercourses are located within the development area, although a 'stream order 1' watercourse runs adjacent to the eastern end of the corridor, approximately 115 m from the development area (Queensland Government 2012).

The proposed development corridor does cross two (2) unmapped minor drainage lines, which drain into the 'stream order 1' watercourse. The first drainage line is located at GPS Easting 699220, Northing 7081023 (GDA 94, Zone 55J). It has a sandy bed of varying width up to 2 m wide with defined steep banks which are 1 – 1.5 m in height. The second drainage line is located at GPS Easting 698696 Northing 7080987. This drainage line has been modified by an existing track and consists of narrow sandy beds (less than 1.5 m wide) and low banks less than 0.5 m in height.



Legend

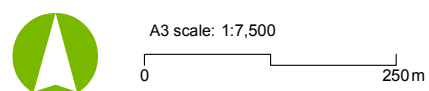
- Type A Species
- EVNT Species Regions
- 5WV434 Ground Truthed Areas
- Drainage (100K)
- Upstream ground truth areas
- Regional Ecosystem (Biodiversity Status)**
- Endangered - Dominant
- Endangered - Sub-dominant
- Of Concern - Dominant
- Of Concern - Sub-dominant
- Not of Concern

Notes: Upstream Ground Truth Areas layer clipped to Lot 5WV434

Date: 23/07/2012

Version: 1

Map by: Moore NK P:\Aurecon\215648 Santos\Mapping\24WV432_Overview.mxd 23/07/2012 15:56



Job No: 225678
Coordinate system: GDA 1994 MGA Zone 55

Floristics

The development area has been extensively cleared for agriculture, tracks and previous pipeline construction. As such, it is dominated by *Pennisetum ciliare* (Buffel Grass) and *Sporobolus creber* (Western Rats Tail Grass) with areas of thick regrowth dominated by *Acacia harpophylla* (Brigalow). Photos 1.1, 1.2 and 1.3 show a representation of different areas within the proposed development.

The ground cover is relatively dense throughout the entire development area with approximately 80% cover of the total area assessed. It is dominated by *Pennisetum ciliare* and *Sporobolus creber*. Other species recorded to a lesser degree include *Enteropogon ramosus* (Twirly Windmill Grass), *Themeda triandra* (Kangaroo Grass), *Verbena tenuisecta* (Mayne's Curse) and *Sclerolaena birchii* (Galvanised Burr).

At the eastern end of the proposed development area, on the southern side of the road, regrowth vegetation dominated by *Acacia harpophylla*, is moderately dense (up to 60% canopy coverage in some areas) and ranges in height from 3 – 6 m. This area also contains the occasional mature *Brachychiton populneus* (Kurrajong), *Brachychiton rupestris* (Narrow Leaved Bottle Tree) and *Eucalyptus populnea* (Poplar Box) up to 20 m in height. Other woody species occurring in this area to a lesser extent include *Eremophila mitchellii* (False Sandalwood), *Acacia excelsa* (Iron Wood), *Callitris glaucophylla* (White Cypress Pine) and *Acacia salicina* (Sally Wattle).

The northern side of the road, at the eastern end of the proposed corridor, has been extensively cleared and is dominated by ground cover. In this area there is one mature *Eucalyptus orgadophila* (Mountain Coolabah) and very sparse woody shrubs up to approximately 1 m in height.

The southern end of the proposed development area has previously been cleared for a pipeline and road, and contains limited woody vegetation. This area contains the occasional mature tree up to 20 m, predominantly *Brachychiton* spp. and *Eucalyptus populnea*, with a very sparse regrowth layer up to 2 m.

A list of species recorded along the proposed development area is outlined in Table 1.4 at the end of this document.



Photo 1.1 Eastern end of the proposed corridor, on the southern side of the track



Photo 1.2 Eastern end of the proposed corridor, on the northern side of the track



Photo 1.3 Southern end of the proposed corridor

Five (5) *Brachychiton populneus* trees and two (2) *Brachychiton rupestris* trees were recorded within the proposed development. One (1) *Brachychiton populneus* tree and multiple *Cymbidium canaliculatum* (Black Orchids) were recorded adjacent to the proposed development area. *Brachychiton* spp. and *Cymbidium canaliculatum* are Type A restricted plants under the *Nature Conservation Act 1992* (NC Act). The locations of these Type A species are identified in Table 1.1 and Figure 1.1 (represented by the yellow asterisk).

No flora species protected under the provisions of the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) were observed within the proposed development area.

Table 1.1 Location of Type A Restricted Plants (NC Act)

Species	Easting (GDA 94, Zone 55J)	Northing (GDA 94, Zone 55J)
Species recorded within the proposed development area		
<i>Brachychiton rupestris</i>	698828	7081023
<i>Brachychiton populneus</i>	698097	7080046
<i>Brachychiton populneus</i>	698112	7080049
<i>Brachychiton rupestris</i>	698164	7080116
<i>Brachychiton populneus</i>	698185	7080124
<i>Brachychiton populneus</i>	698189	7080134
<i>Brachychiton populneus</i>	698204	7080205
Species recorded adjacent to the proposed development area		
<i>Brachychiton populneus</i>	698269	7080351
<i>Cymbidium canaliculatum</i> x 7	698979	7080966
<i>Cymbidium canaliculatum</i>	698987	7080951

Habitat values

Twenty-one (21) incidental fauna species were recorded within the proposed development area as listed in Table 1.2. Evidence of macropod species (ie scats) were also observed within the proposed development area.

No conservation significant fauna species listed under the provisions of the EPBC Act and/or the NC Act were recorded during field investigations.

Table 1.2 Incidental fauna observed at the proposed corridor on Lot 5 WV434

Scientific name	Common name
Birds	
<i>Acanthiza nana</i>	Yellow Thornbill
<i>Aquila audax</i>	Wedge- tailed Eagle
<i>Cacatua roseicapilla</i>	Galah
<i>Callipepla spp.</i>	Quail
<i>Corvus orru</i>	Torresian Crow
<i>Cracticus nigrogularis</i>	Pied Butcherbird
<i>Cracticus torquatus</i>	Grey Butcherbird
<i>Falco longipennis</i>	Australian Hobby
<i>Malurus melanocephalus</i>	Red-backed Fairy-wren
<i>Manorina melanocephala</i>	Noisy Miner
<i>Melithreptus albobularis</i>	White-throated Honeyeater
<i>Ocyphaps lophotes</i>	Crested Pigeon
<i>Oriolus sagittatus</i>	Olive-backed Oriole
<i>Pardalotus striatus</i>	Striated Pardalote
<i>Platycercus adscitus</i>	Pale-headed Rosella
<i>Pomatostomus spp.</i>	Babbler
<i>Rhipidura fuliginosa</i>	Grey Fantail
<i>Smicromnis brevirostris</i>	Weebill
Frogs	
<i>Limnodynastes peronii</i>	Striped Mash Frog
Macropods	
<i>Macropus giganteus</i>	Eastern Grey Kangaroo
<i>Macropus rufogriseus</i>	Red-necked Wallaby

The proposed development area crosses two (2) minor drainage lines, which drain into the 'stream-order 1' watercourse situated to the south of the eastern part of the corridor. The 'stream-order 1' watercourse is located approximately 115 m from the proposed development area and contains mature riparian vegetation, significant habitat trees and Type A species under the NC Act. At the time of ecological survey, the minor drainage lines within the proposed development area contained still pools of water. These pools had been fouled by cattle and had no visible signs of life, although the Striped Marsh Frog was heard in the vicinity of one pool.

A *Eucalyptus orgadophila* (Mountain Coolabah) tree with significant habitat values was recorded within the proposed development area and a *Eucalyptus orgadophila* significant habitat tree was also recorded approximately 10 m outside the proposed development. The location of both these trees is shown in Table 1.3.

Table 1.3 Significant habitat trees recorded within and adjacent to the development area

Significant Habitat Trees	Easting (GDA 94, Zone 55J)	Northing (GDA 94, Zone 55J)
<i>Eucalyptus orgadophila</i> (within development area)	699259	7081118
<i>Eucalyptus orgadophila</i> (approximately 10 m outside the development area)	698972	7080959

Habitat features present within the eastern end of the development area, on the southern side of the road, include canopy cover suitable for shelter, foraging and perching, moderate woody debris (ie fallen/felled timber), moderate leaf litter and dense groundcover (ie grassy tussocks). This area would contain additional habitat and buffer vegetation for species utilising the adjacent riparian region. The habitat values for this area are considered moderate, however, given the fragmented nature of this vegetation, its value to ground-dwelling and arboreal mammals would be marginal.

The remaining areas of the proposed development contain limited woody vegetation and have been extensively disturbed as a result of previous vegetation clearing for agricultural purposes and the surrounding development. Habitat features present within the remaining areas are limited to dense groundcover vegetation, limited amount of woody debris, and limited shrubby canopy cover suitable for shelter, foraging and perching. As a result, the habitat values of all other areas are considered low.

References

Queensland Government (2012b), *Vegetation Management Act Regional Ecosystem and Remnant Map - Version 6.1*, Centered on Lot on Plan 5 WV434, Online RE Maps, The Department of Environment and Heritage Protection, Brisbane, viewed 16 July 2012, <http://www.ehp.qld.gov.au/REMAP>.

Botanical Species List

Table 1.4: Botanical species recorded on Lot 5 WV434

Scientific Name	Common Name	Notes
<i>Acacia excelsa</i>	Iron Wood	
<i>Acacia harpophylla</i>	Brigalow	
<i>Acacia salicina</i>	Sally Wattle	
<i>Alectryon diversifolia</i>	Scrub Boonaree	
<i>Alphitonia excelsa</i>	Red Ash	
<i>Alstonia constricta</i>	Bitter Bark	
<i>Ancistrachne uncinulata</i>	Giant Spear Grass	
<i>Aristida calycina</i>	Dark Wiregrass	
<i>Aristida caput-medusae</i>	Curly Head Wire Grass	
<i>Aristida latifolia</i>	Hairy Aristida	
<i>Atalaya hemiglauca</i>	Whitewood	
<i>Austrostipa verticillata</i>	Slender Bamboo Grass	
<i>Backhousia angustifolia</i>	Grey Myrtle	
<i>Brachychiton populneus</i>	Kurrajong	Type A Restricted Plant under NC Act
<i>Brachychiton rupestris</i>	Narrow Leaved Bottle Tree	Type A Restricted Plant under NC Act
<i>Callitris glaucophylla</i>	White Cypress Pine	
<i>Calotis cuneifolia</i>	Purple Burr Daisy	
<i>Capparis lasiantha</i>	Nipan	
<i>Capparis loranthifolia</i>	Native Orange	
<i>Capparis spinosa</i>	Capparis	
<i>Carissa ovata</i>	Currant Bush	
<i>Cheilanthes sieberi</i>	Mulga Fern	
<i>Chloris inflata</i>	Purple Top Rhodes	
<i>Chloris ventricosa</i>	Tall Chloris	
<i>Cirsium vulgare</i>	Spear Thistle	Non-native species
<i>Conyza bonariensis</i>	Fleabane	Non-native species
<i>Cynodon dactylon</i>	Green Couch	
<i>Cyperus gracilis</i>	Slender Sedge	
<i>Enteropogon ramosus</i>	Twirly Windmill Grass	
<i>Eragrostis cilianensis</i>	Stink Grass	
<i>Eragrostis lacunaria</i>	Purple Love Grass	
<i>Eragrostis spp</i>	Love Grass	
<i>Eremophila deserti</i>	Turkey Bush	
<i>Eremophila mitchellii</i>	False Sandalwood	
<i>Eucalyptus melanophloia</i>	Silver Leaved Ironbark	
<i>Eucalyptus orgadophila</i>	Mountain Coolabah	
<i>Eucalyptus populnea</i>	Poplar Box	
<i>Geijera parviflora</i>	Wilga	
<i>Glycine tabacina</i>	Glycine Pea	
<i>Gomphocarpus physocarpus</i>	Balloon Cotton Bush	Non-native species
<i>Goodenia glabra</i>	Smooth Goodenia	
<i>Hovea lorata</i>	Hovea	
<i>Iseilema vaginiflorum</i>	Red Flinders Grass	
<i>Juncus usitatus</i>	Juncus	
<i>Lomandra hystrix</i>	Creek Mat Rush	
<i>Lomandra leucocephala</i>	Lomandra	
<i>Lomandra longifolia</i>	Lomandra	
<i>Lomandra multiflora</i>	Lomandra	
<i>Lysicarpus angustifolius</i>	Budgeroo	
<i>Maireana microphylla</i>	Small-leaf Bluebush	
<i>Malva parviflora</i>	Marshmallow	Non-native species
<i>Malvastrum americanum</i>	Malvastrum	Non-native species

Scientific Name	Common Name	Notes
<i>Medicago laciniata</i>	Cutleaf Medic	Non-native species
<i>Medicago polymorpha</i>	Burr Medic	Non-native species
<i>Melinis repens</i>	Red Natal	Non-native species
<i>Notelaea microcarpa</i>	Small-fruited Mock-olive, Native Olive	
<i>Opuntia stricta</i>	Prickly Pear	Non-native LP Act Class 2 Weed
<i>Opuntia tomentosa</i>	Velvety Tree Pear	Non-native LP Act Class 2 Weed
<i>Owenia acidula</i>	Emu Apple	
<i>Oxalis stricta</i>	Yellow Wood Sorel	
<i>Panicum effusum</i>	Inquisitive Grass	
<i>Parsonsia lanceolata</i>	Monkey Rope	
<i>Pennisetum ciliare</i>	Buffel Grass	Non-native species
<i>Ranunculus lappaceus.</i>	Australian Buttercup	
<i>Sclerolaena birchii</i>	Galvanised Burr	
<i>Sida cordifolia</i>	Flannel Weed	
<i>Sida rohlenae</i>	Scrub Sida	
<i>Sida subspicata</i>	Queensland Hemp	
<i>Sporobolus creber</i>	Western Rats Tail Grass	
<i>Stylosanthes scabra</i>	Stylo	Non-native species
<i>Themeda triandra</i>	Kangaroo Grass	
<i>Urochloa mosambicensis</i>	Mozambique Grass	Non-native species
<i>Verbena officinalis</i>	Common Verbena	Non-native species
<i>Verbena tenuisecta</i>	Mayne's Curse	Non-native species
<i>Xanthium occidentale</i>	Noogoora Burr	Non-native species
<i>Xerochrysum bracteatum</i>	Everlasting Daisy	