

APPENDIX A

Assessment of Likelihood of Occurrence of MNES values

Table A1. Likelihood of occurrence of terrestrial flora species of special conservation significance within the Study Area

Family	Scientific Name	Common Name	NC Act ¹	EPBC Act ¹	Habitat and Distribution	Likelihood Of Occurrence
Mimosaceae	<i>Acacia spania</i>	Western Rosewood	NT	-	Found in open woodland, typically on red earths, with a relatively restricted distribution in central Queensland (World Wide Wattle 2016).	Unlikely to occur. The nearest record is located at Iffley, >35 km south-east of the study area. That occurrence is associated with red dermosol, a soil type that is not mapped within the study area (www.asris.csiro.au).
Euphorbiaceae	<i>Bertya opposens</i>	-	C	V	Patchy in inland southern Queensland and northern New South Wales, mainly south of Emerald, but with an isolated population at White Mountains (ALA 2016). Found in a variety of woodland types, mainly on skeletal soils and/or associated with sandstone or laterite (Halford and Henderson 2002).	Unlikely to occur. There is a single record north-west of the study area (50km N. of Moranbah). It could possibly be encountered in the broader landscape in association with land zone 7; however the study area avoids areas of suitable habitat.
Euphorbiaceae	<i>Bertya pedicellata</i>	-	NT	-	This species occurs through much of central Queensland and is more restricted in south-east Queensland (ALA 2016). It occurs mainly on rocky slopes and on skeletal soils (Halford and Henderson 2002).	This species is known to occur adjacent to the study area; however it is considered unlikely to occur within the study area itself. There are two records just north of the study area at Coppabella and another record to the south of the alignment in the centre of the study area. The species was encountered near existing records adjacent to the centre of the study area where skeletal soils are present in land zone 7.
Capparaceae	<i>Capparis humistrata</i>	-	E	-	Restricted to the Marlborough–Bouldercombe and near Dingo in central Queensland. It tolerates ultramafic serpentine soils and sandy substrates in the Brigalow Belt (Hewson 1982).	Unlikely to occur. There is a single record, south-east of the study area. Grazing lands on sandy alluvium in the east of the study area are unlikely to provide suitable habitat for this species.
Apocynaceae	<i>Cerbera dumicola</i>	-	NT	-	Mainly restricted to central Queensland where it occurs in a variety of habitats, mainly in sloping terrain (ALA 2016).	Known to occur. There are three records adjacent to the western part of the study area and the species was found on the fringes of the study area during the field survey.
Cycadaceae	<i>Cycas ophiolitica</i>	Marlborough Blue	E	E	Restricted to central Queensland where it occurs in shallow soils in sloping terrain (Queensland Herbarium 2007).	Unlikely to occur. There are no records within 80 km of the study area.
Poaceae	<i>Dichanthium queenslandicum</i>	King Blue-grass	V	E	Found in inland central and southern Queensland and is mostly restricted to native grassland on cracking clay soils (Fensham 1999).	Potential to occur. There are records north of the study area, east of Goonyella Mine, and east of the study area, north of Strathfield. It could occur in grassland on land zone 4; however grasslands in the study area were found to be dominated by pasture grasses and it was not encountered during the field surveys.
Poaceae	<i>Dichanthium setosum</i>	Blue-grass	C	V	This species has a disjunct distribution with a population in central Queensland and another in the northern tablelands of New South Wales and south-east Queensland. It occurs in woodland communities on cracking clay soils (ALA 2016).	Potential to occur. There are records north of the western portion of the study area, east of Goonyella Mine, and north of the central portion of the study area, in the vicinity of Coppabella. It could occur in woodland communities on land zone 4 in the centre of the study area; however it was not encountered during the field surveys.
Poaceae	<i>Digitaria porrecta</i>	Finger Panic-grass	NT	-	Widespread on the northern tablelands of New South Wales and south-east Queensland, where it occurs on cracking clay soils and in alluvium in open woodland communities (ALA 2016).	Unlikely to occur. The nearest records are near Braeside and near Lancewood, to the east and north of the study area, respectively. No records have been obtained within 20 km of the study area and the species is sporadic in the region. The species was not encountered during the field survey, despite ample search effort in areas of suitable habitat.
Myrtaceae	<i>Eucalyptus raveretiana</i>	Black Ironbox	C	V	Found along drainage channels and in alluvial soils in central Queensland (ALA 2016).	Potential to occur. There are records immediately to the east of the alignment and the species could be present along drainage channels within the eastern portion of the study area; however the species was not encountered during the field survey.
Amaranthaceae	<i>Kelita uncinella</i>	-	E	-	Highly restricted to a population north-west of Glenden and a single occurrence east of Goonyella Mine. It occurs in low shrubby woodland on slopes of land zone 7 (Bean 2010).	Potential to occur. A record to the east of Goonyella Mine is positioned approximately 5 km to the north of the study area. This species could be found in association with land zone 7; however it was not encountered during the field survey and the study area avoids most vegetated areas on land zone 7.
Combretaceae	<i>Macropteranthes leiocaulis</i>	Southern Bonewood	NT	-	Found in subcoastal Queensland from south of Townsville to Mundubbera (ALA 2016). It occurs in vine thickets (Forster 1994).	Unlikely to occur. The nearest records are in Dipperu National Park, approximately 20 km to the east of the study area and there is only a very marginal occurrence of vine thicket habitat present within the study area.
Euphorbiaceae	<i>Omphalea celata</i>	-	V	V	Restricted to coastal and subcoastal central Queensland where it occurs in vine thicket growing as an understorey to riverine woodland in steep gullies and gorges (ALA 2016).	Unlikely to occur. Habitats within the study area are not expected to be suitable for this species and the nearest record is from Homevale National Park, approximately 37 km to the northeast of the study area.
Simaroubaceae	<i>Samadera bidwillii</i>	Quassia	V	V	Rainforest and open forest in coastal and subcoastal central and south-eastern Queensland south to the Sunshine Coast (ALA 2016).	Unlikely to occur. There are no confirmed records within 100 km of the study area.
Solanaceae	<i>Solanum adenophorum</i>	Hairy Nightshade	E	-	Found in central Queensland from near Moranbah south to near Duaringa where it occurs in association with brigalow-dominated woodland communities (ALA 2016).	Potential to occur. This species has been recorded near Goonyella and in Dipperu National Park. It could potentially occur in the study area in brigalow communities with leaf litter; however it was not encountered during the field surveys.

¹ Status abbreviations are as follows: CE = Critically Endangered, E = Endangered, V = Vulnerable, NT = Near Threatened, C = Least Concern, - = Not Listed.

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Table A2. Likelihood of occurrence of fauna species of special conservation significance within the Study Area

Family	Species Name	Common Name	Source ¹			Conservation Status ²		Likelihood of Occurrence
			ALA	WN	EPBC	EPBC Act	NC Act	
CHELIDAE	<i>Eiseya albagula</i>	Southern Snapping Turtle	-	-	X	CE	C	Known from the Burnett, Fitzroy, Raglan and Mary River Basins. The study area is positioned in the upper Fitzroy Basin (Isaac River catchment); however the nearest record is located approximately 68 km away, in the adjacent Connors River catchment (ALA 2016, WN 2016). This species prefers clear, flowing well-oxygenated waters; may occur in non-flowing waters at reduced densities, but requires permanent pools, preferably with shelter such as rock crevices, undercut banks, submerged logs or fallen trees (DOE 2014, Hamann et al. 2007). Waterways in study area are characterised by sandy channels that are mostly dry in the dry season. While some small pools were noted during field surveys, they are unlikely to be sufficient to support this species. There are no known records from the Isaac River catchment (ALA 2016, WN 2016, Limpus et al. 2011). Unlikely to occur due to a lack of suitable habitat.
CHELIDAE	<i>Rheodytes leukops</i>	Fitzroy River Turtle	-	-	X	V	V	Restricted to the Fitzroy River Basin; however the nearest record is located approximately 68 km away, in the Connors River catchment (ALA 2016). Considered to be a riffle zone specialist, but retreats to large, deep pools during dry season if necessary (DOEE 2016). Often associated with rocky substrates and ribbonweed beds (DOEE 2016). Waterways in study area are characterised by sandy channels that are mostly dry in the dry season and would be characterised by runs during the wet season (i.e. few, if any, riffles present). There are no known records from the Isaac River catchment (ALA 2016, Limpus et al. 2011). Unlikely to occur due to a lack of suitable habitat.
SCINCIDAE	<i>Egernia rugosa</i>	Yakka Skink	-	-	X	V	V	Drier forests and woodlands mainly associated with the Brigalow Belt but also known from northern and south-east Queensland. There are no records of this species within 150 km of the study area; however the species has widely scattered distribution across a wide variety of habitats, is easily overlooked and under-recorded. The study area was identified as supporting several areas of potentially suitable habitat for Yakka Skink. Notably, the field survey was conducted in late winter, which not considered to be suitable time for detecting this species. Potential to occur.
SCINCIDAE	<i>Lerista allanae</i>	Allan's Lerista	-	-	X	E	E	Restricted to the broader Clermont and Capella regions in central Queensland where it occurs in highly localised populations on friable soils (Wilson 2005). The nearest record is located approximately 70 km to the south-west of the study area. The study area falls outside of the known range of the species. Previous records have been associated with mixed <i>Eucalyptus orgadophila</i> and <i>Corymbia erythrophloia</i> or Bauhinia-dominated woodlands; however these habitats are not present in the study area. Unlikely to occur.
ELAPIDAE	<i>Acanthophis antarcticus</i>	Common Death Adder	-	X	-	-	V	Poorly known. This is a highly cryptic, under-detected species. It occurs in a wide variety of habitats from rainforest to shrublands and heathlands (Wilson and Swan 2008). Potential to occur.
ELAPIDAE	<i>Demansia maculata</i>	Ornamental Snake	X	X	X	V	V	This species occurs in the Brigalow Belt between Charters Towers and Rockhampton where it is associated with seasonally inundated areas (Wilson 2005; Wilson and Swan 2008). There are several records to the west and south of the alignment and the study area contains mapped Essential Habitat for this species. The presence of suitable habitat was confirmed during the field survey. Likely to occur.
ELAPIDAE	<i>Furina dunmali</i>	Dunmall's Snake	-	-	X	V	V	This species occurs in the Brigalow Belt in dry sclerophyll forests, cypress, and other woodlands on floodplains, or near watercourses in coastal areas (Wilson 2005; Wilson and Swan 2008). The nearest record is 120 km south-west of the study area and the alignment is positioned outside of the known distribution of the species. Unlikely to occur.
APODIDAE	<i>Hirundapus caudacutus</i>	White-throated Needletail	X	X	-	M	S	This is an aerial species, typically occurring over open, inland habitats, but occasionally over coastal areas (Higgins 1999; Pizzey and Knight 2003). Likely to occur during some seasons, although with limited interaction in the study area, apart from the consumption of airborne invertebrates.
APODIDAE	<i>Apus pacificus</i>	Fork-tailed Swift	X	-	X	M	S	This is an aerial species, typically occurring over open, inland habitats, but occasionally over coastal areas (Higgins 1999; Pizzey and Knight 2003). Likely to occur , although with limited interaction in the study area, apart from the consumption of airborne invertebrates.
ARDEIDAE	<i>Ardea modesta</i>	Eastern Great Egret	X	X	X	M	S	Shallow inland wetland habitats, including man-made dams and ponds and moist grasslands. (Marchant and Higgins 1990; Pizzey and Knight 2003). Likely to occur in wetlands within the study area.
PANDIONIDAE	<i>Pandion cristatus</i> ³	Eastern Osprey	-	-	X	M	S	A raptor species associated with the coastal belt (Pizzey and Knight 2003). Unlikely to occur in the study area.
ACCIPITRIDAE	<i>Erythrotriorchis radiatus</i>	Red Goshawk	-	X	X	V	E	Woodlands and forests, ideally with a mosaic of vegetation types and permanent water, particularly riverine forests. The species avoids both very dense and very open habitats (Marchant and Higgins 1993). Home range covers between 50 and 220 square kilometres. There are historical records from the study area. The species has declined over much of its range and there are limited resources available support a population in the vicinity of the study area. Unlikely to occur.
THRESKIONIDAE	<i>Plegadis falcinellus</i>	Glossy Ibis	-	X	-	M	S	This species occurs in shallow, vegetated wetlands and flooded grasslands across northern Australia (Marchant and Higgins 1990). There are two records in the broader landscape; however areas of suitable habitat are not present in the study area. Unlikely to occur.
ROSTRATULIDAE	<i>Rostratula australis</i> ⁴	Australian Painted Snipe	X	-	X	E,M	V	Terrestrial shallow wetlands, both ephemeral and permanent, usually freshwater but occasionally brackish. They also use inundated grasslands, saltmarsh, dams, rice crops, sewage farms and bore drains (Marchant and Higgins 1993). Potential to occur in ephemeral wetlands adjacent to the study area. Unlikely to occur in the study area itself.
SCOLOPACIDAE	<i>Callidris accuminata</i>	Sharp-tailed Sandpiper	-	X	-	M	S	Shallow wetland areas, including margins of lakes, throughout Australia (Pizzey and Knight 2003). Potential to occur in ephemeral wetlands adjacent to the study area. Unlikely to occur in the study area itself.
SCOLOPACIDAE	<i>Tringa nebularia</i>	Common Greenshank	-	X	X	M	S	Shallow wetland areas, including margins of lakes, throughout Australia (Pizzey and Knight 2003). Potential to occur in ephemeral wetlands adjacent to the study area. Unlikely to occur in the study area itself.
SCOLOPACIDAE	<i>Tringa stagnatalis</i>	Marsh Sandpiper	-	X	-	M	S	Shallow wetland areas, including margins of lakes, throughout Australia (Pizzey and Knight 2003). Potential to occur in ephemeral wetlands adjacent to the study area. Unlikely to occur in the study area itself.
SCOLOPACIDAE	<i>Gallinago hardwickii</i>	Latham's Snipe	-	-	X	M	S	Swamp and marsh margins and in wet pasture (Pringle 1987). There are no records in the broader landscape. Unlikely to occur in the study area due to lack of suitable habitat.
LARIDAE	<i>Hydroprogne caspia</i>	Caspian Tern	X	X	-	M	S	Over larger waterbodies, including lakes, rivers and coastal fringes (Higgins and Davies 1996). There are records in the broader landscape; however the study area contains limited suitable habitat. Unlikely to occur.
LARIDAE	<i>Gelochelidon nilotica</i>	Gull-billed Tern	X	X	-	M	S	Over larger waterbodies, including lakes, rivers and coastal fringes (Higgins and Davies 1996). There are records in the broader landscape; however the study area contains limited suitable habitat. Unlikely to occur.

Family	Species Name	Common Name	Source ¹			Conservation Status ²		Likelihood of Occurrence
			ALA	WN	EPBC	EPBC Act	NC Act	
COLUMBIDAE	<i>Geophaps scripta scripta</i>	Squatter Pigeon (southern subsp.)	X	X	X	V	V	Open dry sclerophyll woodland with grassy understorey, nearly always near permanent water. Birds may occasionally feed in sown grasslands and pastures (Crome and Shields 1992; Higgins and Davies 1996). There are numerous records in the vicinity of the study area and several records were obtained during the field survey. Known to occur.
CACATUIDAE	<i>Calyptorhynchus lathamii</i>	Glossy Black-Cockatoo	X	X	-	-	V	Feeds in localised occurrences of fruiting <i>Allocasuarina</i> (Pizzey and Knight 2003). The species is known to occur in Dipperu National Park south-east of the study area and there are food trees present in the eastern half of the study area. However, no signs of feeding activity were detected during the field survey and the study area itself contains limited resources for this species. Unlikely to occur.
CUCULIDAE	<i>Cuculus optatus</i>	Oriental Cuckoo	X	-	-	M	S	Migrant species that can occur in a variety of habitats including rainforest, open eucalypt forest, leafy trees in paddocks and mangroves (Higgins 1999). There are two records in the broader landscape. Potential to occur in the study area as a sporadic visitor.
MONARCHIDAE	<i>Myiagra cyanoleuca</i>	Satin Flycatcher	-	-	X	M	S	This species inhabits heavily vegetated gullies in eucalypt-dominated forests and taller woodlands. It could move through the region as a passage migrant, but is unlikely to stay in the local landscape and there are no records in the area. Unlikely to occur.
MONARCHIDAE	<i>Monarcha melanopsis</i>	Black-faced Monarch	X	X	X	M	S	This species inhabits vegetated gullies in eucalypt-dominated forests and taller woodlands (Higgins et al. 2006). There are three records in the landscape; however the study area is considered unlikely to contain suitable habitat. Unlikely to occur.
MONARCHIDAE	<i>Symposiachrus trivirgatus</i>	Spectacled Monarch	X	X	-	M	S	This species inhabits vegetated gullies, rainforest and riparian forest (Higgins et al. 2006). There is a single record in the landscape; however the study area is considered unlikely to contain suitable habitat. Unlikely to occur.
RHIPIDURIDAE	<i>Rhipidura ruficauda</i>	Rufous Fantail	X	X	-	M	S	This species inhabits vegetated gullies, rainforest and riparian forest (Higgins et al. 2006). There are three records in the landscape; however the study area is considered unlikely to contain suitable habitat. Unlikely to occur.
MOTACILLIDAE	<i>Motacilla flava</i>	Yellow Wagtail	-	-	X	M	S	Yellow Wagtail is a regular migrant to Australia in low numbers, occurring in open landscapes, swamp margins and paddocks (Higgins et al. 2006). There are no records in the vicinity of the study area. Unlikely to occur , except as a potential vagrant.
ACROCEPHALIDAE	<i>Acrocephalus australis</i>	Australian Reed-warbler	X	X	-	M	S	Australian Reed-Warbler is found throughout Australia where there is suitable habitat. The species prefers dense vegetation alongside water, especially thick reed beds, as well as tall crops, bamboo thickets and lantana. There are records in the broader landscape; however it is unlikely to occur in the study area due to a lack of suitable habitat.
ESTRILDIDAE	<i>Neochmia ruficauda ruficauda</i>	Star Finch (eastern subspecies)	-	-	-	E	E	Unlikely to occur. This species occurs in grassy areas in the vicinity of water. Over the last 100 years, the species has disappeared from its former range, and is most likely extinct in southern and central Queensland. In addition, there are no records in the broader landscape surrounding the study area.
TACHYGLOSSIDAE	<i>Tachyglossus aculeatus</i>	Short-beaked Echidna	X	X	-	-	S	This is a widespread and fairly common (although secretive) species with several records in the broader landscape (ALA 2016). Likely to occur.
DASYURIDAE	<i>Dasyurus hallucatus</i>	Northern Quoll	-	X	X	E	C	Northern Quoll lives in a range of habitats but prefer rocky areas and eucalypt forests. The species was once found from north of Brisbane right across to the northern parts of the Western Australian coast. It is now reduced to populations in the Northern Territory, Western Australia and several areas of Queensland. There nearest database records are from Homevale National Park, approximately 37 km northeast of the study area. Unlikely to occur in the study area, due to the absence of suitable habitat.
PSEUDOCHEIDAE	<i>Petauroides volans</i>	Greater Glider	-	X	X	V	C	This species is associated with mature eucalypt forest and woodland with hollow trees available for shelter (Menkhorst and Knight 2004). There is a record approximately 10 km south of the study area; however it is considered unlikely that the study area itself would contain suitable habitat for the species. Unlikely to occur.
PHASCOLARCTIDAE	<i>Phascolarctos cinereus</i>	Koala	-	X	-	V	V	Sclerophyll forest and woodland on foothills and plains on both sides of the Great Dividing Range (Menkhorst and Knight 2004). Scattered database records exist in the broader landscape, including a recent record 1 km to the east of the study area along South Walker Creek Road. No evidence of Koala activity was detected during the field survey. It is, nevertheless, likely to occur at a low density in the vicinity of the study area.
MEGADERMATIDAE	<i>Macroderma gigas</i>	Ghost Bat	-	X	X	V	V	This species occurs in a range of habitats through much of the tropics, roosting in caves or abandoned mine shafts during the day (Churchill 2008). There is a single historical record from 28 km to the north-east of the study area; however habitats within the study area are no longer expected to support this species. Unlikely to occur.
VESPERTILIONIDAE	<i>Nyctophilus corbeni</i>	South-eastern Long-eared Bat	-	-	X	V	V	This species occurs in open woodland and has also been recorded in dry rainforest at some localities (Parnaby 2009). It roosts under the shelter of bark. The nearest record is from Expedition Range National Park, >250 km south of the study area. Unlikely to occur.

¹ Source abbreviations are as follows: ALA = Atlas of Living Australia Portal, WN = WildNet database records, EPBC = EPBC online search results. 0

² Status abbreviations are as follows: Ex = Extinct, CE = Critically Endangered, E = Endangered, V = Vulnerable, NT = Near Threatened, M = Migratory, S = Special Least Concern, C = Least Concern Wildlife.

³ Listed as Migratory under the EPBC Act as Osprey *Pandion haliaetus*

⁴ Listed as Migratory under the EPBC Act as Painted Snipe *Rostratula benghalensis s. lat.*

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APPENDIX B



Vegetation Assessment Results for Communities Assessed as Brigalow TEC



Site	RE and Status	Dominant flora species (*= exotic species)	Representative photographs
B3 -21.83371422 148.48421498 -21.83393315 148.48424717 -21.83435292 148.48435295 -21.83454780 148.48437491	Mapped RE: 11.4.9/11.5.3 Ground-truthed RE: 11.4.9 VM Act Status: Endangered Biodiversity Status: Endangered EPBC Act Status: Endangered	Brief description: Brigalow open forest. Canopy (T1): 69.9% cover. Height range 10-16m; median height 14m. Dominant species: <i>Acacia harpophylla</i> . Sub-canopy (T2): 1.1% cover. Height range 6-10m; median height 8m. Dominant species: <i>Acacia harpophylla</i> . Shrub (S1): 5.7% cover. Height range 2-6m; median height 4m. Dominant species: <i>Terminalia oblongata</i> , <i>Lysiphyllum cunninghamii</i> . Shrub (S2): 2.9% cover. Height range 0-2m; median height 1m. Dominant species: <i>Carissa ovata</i> , <i>Acacia harpophylla</i> . Groundcover: 16.8% cover. Dominant species: <i>Brunoniella acaulis</i> , <i>Cyperus</i> sp. Associated species: <i>Cheilanthes</i> sp. Notes: Ground-truthed as Endangered RE. Ground-truthed as Brigalow TEC. This brigalow patch is also on the other side of the track, but is narrower on the western side of the track.	
B7 -21.91612484 148.41905968 -21.91621444 148.41884460 -21.91638703 148.41839173 -21.91647478 148.41817615	Mapped RE: 11.9.4/11.9.5 Ground-truthed RE: 11.9.5 VM Act Status: Endangered Biodiversity Status: Endangered EPBC Act Status: Endangered	Brief description: Brigalow open forest. Canopy (T1): 23.3% cover. Height range 9-15m; median height 10m. Dominant species: <i>Acacia harpophylla</i> , <i>Eucalyptus populnea</i> . Sub-canopy (T2): Height range 5-8m; median height 6m. Dominant species: <i>Acacia harpophylla</i> , <i>Eucalyptus populnea</i> . Shrub (S1): 2.9% cover. Height range 1.5-5m; median height 3m. Dominant species: <i>Acacia harpophylla</i> , <i>Ehretia membranifolia</i> . Associated species: <i>Lysiphyllum cunninghamii</i> Shrub (S2): 2.6% cover. Height range 0-1.5m; median height 1m. Dominant species: <i>Carissa ovata</i> , <i>Alectryon diversifolius</i> . Groundcover: n/a Notes: Ground-truthed as Endangered RE. Ground-truthed as Brigalow TEC.	



Site	RE and Status	Dominant flora species (*= exotic species)	Representative photographs
B8 -21.90574125 148.43614468 -21.90595759 148.43606095 -21.90639186 148.43592541 -21.90660199 148.43584729	Mapped RE: 11.9.3/11.9.7 Ground-truthed RE: 11.9.1 VM Act Status: Endangered Biodiversity Status: Endangered EPBC Act Status: Endangered	Brief description: Brigalow-Eucalypt open forest. Canopy (T1): 3.2% cover. Height range 20-28m; median height 24m. Dominant species: <i>Eucalyptus cambageana</i> . Sub-canopy (T2): 46.9% cover. Height range 9-16m; median height 12m. Dominant species: <i>Acacia harpophylla</i> , <i>Eucalyptus cambageana</i> . Shrub (S1): 1.1% cover. Height range 1.5-5m; median height 3m. Dominant species: <i>Terminalia oblongata</i> , <i>Casuarina cristata</i> . Shrub (S2): 52.2% cover. Height range 0-1.5m; median height 1m. Dominant species: <i>Carissa ovata</i> , <i>Alectryon diversifolius</i> . Associated species: <i>Casuarina cristata</i> Groundcover: n/a Notes: RE mapping discrepancies (ground-truthed as Endangered RE). Ground-truthed as Brigalow TEC.	
B14 -21.88841050 148.25783654 -21.88834311 148.25760252 -21.88831947 148.25718191 -21.88826574 148.25690540	Mapped RE: Non-Remnant; adjacent to 11.3.37 Ground-truthed RE: 11.9.5 VM Act Status: Endangered Biodiversity Status: Endangered EPBC Act Status: Endangered	Brief description: Brigalow forest. Canopy (T1): 54.5% cover. Height range 12-18m; median height 15m. Dominant species: <i>Acacia harpophylla</i> , <i>Eucalyptus populnea</i> . Sub-canopy (T2): n/a. Shrub (S1): n/a Shrub (S2): n/a. Groundcover: n/a Notes: RE mapping discrepancies (ground-truthed as remnant, Endangered RE). Ground-truthed as Brigalow TEC.	

Site	RE and Status	Dominant flora species (*= exotic species)	Representative photographs
<p>Q6</p> <p>-21.82063392 148.46873989</p>	<p>Mapped RE: Non-Remnant; adjacent 11.5.3/11.4.9</p> <p>Ground-truthed RE: Non-Remnant; adjacent is 11.5.3/11.4.9</p> <p>VM Act Status: Least Concern</p> <p>Biodiversity Status: No Concern at Present</p> <p>EPBC Act Status: Endangered</p>	<p>Brief description: Eucalypt woodland.</p> <p>Canopy (T1): 30% cover. Height range 15-20m; median height 17m. Dominant species: <i>Eucalyptus populnea</i>, <i>Casuarina cristata</i>.</p> <p>Sub-canopy (T2): Height range 6-12m; median height 9m. Dominant species: <i>Terminalia oblongata</i>.</p> <p>Shrub: Height range 1.5-6m; median height 4m. Dominant species: <i>Erythroxylum australe</i>.</p> <p>Groundcover: n/a.</p> <p>Notes: The 11.4.9 component of this vegetation is the western edge of a large patch of vegetation containing 11.4.9, with brigalow dominant or sub-dominant in some areas. Examination of aerial imagery following the field survey indicates that this area corresponds to the Brigalow TEC.</p>	
<p>Q19</p> <p>-21.82560355 148.46990372</p>	<p>Mapped RE: Non-Remnant; adjacent 11.4.9/11.5.3</p> <p>Ground-truthed RE: 11.4.9</p> <p>VM Act Status: Endangered</p> <p>Biodiversity Status: Endangered</p> <p>EPBC Act Status: Endangered</p>	<p>Brief description: Belah woodland.</p> <p>Canopy (T1): 30% cover. Height range 12-18m; median height 16m. Dominant species: <i>Casuarina cristata</i>, <i>Terminalia oblongata</i>.</p> <p>Sub-canopy (T2): n/a.</p> <p>Shrub: n/a.</p> <p>Groundcover: n/a.</p> <p>Notes: RE mapping discrepancies (ground-truthed as remnant). Brigalow confirmed to be dominant elsewhere within patch. Ground-truthed as Endangered RE. Ground-truthed as Brigalow TEC.</p>	

Site	RE and Status	Dominant flora species (*= exotic species)	Representative photographs
<p>Q22</p> <p>-21.83742698 148.48392388</p>	<p>Mapped RE: 11.5.3/11.4.9</p> <p>Ground-truthed RE: 11.4.9</p> <p>VM Act Status: Endangered</p> <p>Biodiversity Status: Endangered</p> <p>EPBC Act Status: Endangered</p>	<p>Brief description: Brigalow open forest.</p> <p>Canopy (T1): 60% cover. Height range 10-15m; median height 13m.</p> <p>Dominant species: <i>Acacia harpophylla</i>.</p> <p>Sub-canopy (T2): n/a.</p> <p>Shrub: n/a.</p> <p>Groundcover: n/a.</p> <p>Notes: South-western edge of Brigalow patch (see site B3). Endangered RE confirmed. Brigalow TEC confirmed.</p>	
<p>Q23</p> <p>-21.83819326 148.48488528</p>	<p>Mapped RE: 11.5.3/11.4.9</p> <p>Ground-truthed RE: 11.4.9</p> <p>VM Act Status: Endangered</p> <p>Biodiversity Status: Endangered</p> <p>EPBC Act Status: Endangered</p>	<p>Brief description: Brigalow open forest.</p> <p>Canopy (T1): 60% cover. Height range 10-14m; median height 12m.</p> <p>Dominant species: <i>Acacia harpophylla</i>.</p> <p>Sub-canopy (T2): n/a.</p> <p>Shrub: n/a.</p> <p>Groundcover: n/a.</p> <p>Notes: South-western edge of Brigalow patch (see site B3). Endangered RE confirmed. Brigalow TEC confirmed.</p>	



Site	RE and Status	Dominant flora species (*= exotic species)	Representative photographs
<p>Q29</p> <p>-21.91643069 148.41888609</p>	<p>Mapped RE: 11.9.4/11.9.5</p> <p>Ground-truthed RE: 11.9.5</p> <p>VM Act Status: Endangered</p> <p>Biodiversity Status: Endangered</p> <p>EPBC Act Status: Endangered</p>	<p>Brief description: Brigalow open forest.</p> <p>Canopy (T1): 69.9% cover. Height range 10-12m; median height 11m.</p> <p>Dominant species: <i>Acacia harpophylla</i>.</p> <p>Sub-canopy (T2): n/a.</p> <p>Shrub: n/a.</p> <p>Groundcover: n/a.</p> <p>Notes: Endangered RE confirmed. Brigalow TEC confirmed. Also refer site B7 for a more detailed assessment of this patch.</p>	
<p>Q33</p> <p>-21.91326569 148.42681705</p>	<p>Mapped RE: 11.9.4/11.9.5</p> <p>Ground-truthed RE: 11.9.1</p> <p>VM Act Status: Endangered</p> <p>Biodiversity Status: Endangered</p> <p>EPBC Act Status: Engangered</p>	<p>Brief description: Brigalow-Eucalypt open forest.</p> <p>Canopy (T1): 20% cover. Height range 18-25m; median height 22m.</p> <p>Dominant species: <i>Eucalyptus cambageana</i>.</p> <p>Sub-canopy (T2): n/a.</p> <p>Shrub: n/a.</p> <p>Groundcover: n/a.</p> <p>Notes: RE mapping discrepancies (ground-truthed as Endangered RE). Ground-truthed as Brigalow TEC. This is a vegetation boundary - here to north-west is 11.9.1; to south-west is 11.9.7.</p>	


Site	RE and Status	Dominant flora species (*= exotic species)	Representative photographs
<p>Q34</p> <p>-21.90395113 148.43659521</p>	<p>Mapped RE: 11.9.3/11.9.7</p> <p>Ground-truthed RE: 11.9.1</p> <p>VM Act Status: Endangered</p> <p>Biodiversity Status: Endangered</p> <p>EPBC Act Status: Endangered</p>	<p>Brief description: Brigalow-Eucalypt open forest.</p> <p>Canopy (T1): 15% cover. Height range 10-18m; median height 14m.</p> <p>Dominant species: <i>Eucalyptus cambageana</i>, <i>Casuarina cristata</i>.</p> <p>Sub-canopy (T2): n/a.</p> <p>Shrub: n/a.</p> <p>Groundcover: n/a.</p> <p>Notes: RE mapping discrepancies (ground-truthed as Endangered RE). Ground-truthed as Brigalow TEC.</p>	
<p>Q35</p> <p>-21.90942896 148.43268882</p>	<p>Mapped RE: 11.9.3/11.9.7</p> <p>Ground-truthed RE: 11.9.1</p> <p>VM Act Status: Endangered</p> <p>Biodiversity Status: Endangered</p> <p>EPBC Act Status: Endangered</p>	<p>Brief description: Brigalow-Eucalypt open forest.</p> <p>Canopy (T1): 10% cover. Height range 20-28m; median height 24m.</p> <p>Dominant species: <i>Eucalyptus cambageana</i>.</p> <p>Sub-canopy (T2): n/a.</p> <p>Shrub: n/a.</p> <p>Groundcover: n/a.</p> <p>Notes: RE mapping discrepancies (ground-truthed as Endangered RE). Ground-truthed as Brigalow TEC (also refer to site B8 for a more detailed assessment within this patch).</p>	

Site	RE and Status	Dominant flora species (*= exotic species)	Representative photographs
<p>Q47</p> <p>-21.94481090 148.35693972</p>	<p>Mapped RE: 11.5.3/11.7.2</p> <p>Ground-truthed RE: 11.4.9</p> <p>VM Act Status: Endangered</p> <p>Biodiversity Status: Endangered</p> <p>EPBC Act Status: Endangered</p>	<p>Brief description: Brigalow-Belah forest.</p> <p>Canopy (T1): 70% cover. Height range 15-24m; median height 19m.</p> <p>Dominant species: <i>Casuarina cristata</i>.</p> <p>Sub-canopy (T2): n/a.</p> <p>Shrub: n/a.</p> <p>Groundcover: n/a.</p> <p>Notes: RE mapping discrepancies (ground-truthed as Endangered RE). Ground-truthed as Brigalow TEC. Gully.</p>	
<p>Q59</p> <p>-21.8879 148.25621</p>	<p>Mapped RE: 11.9.5/11.9.3</p> <p>Ground-truthed RE: 11.9.5 with 11.9.7/11.5.3 adjacent</p> <p>VM Act Status: Endangered</p> <p>Biodiversity Status: Endangered</p> <p>EPBC Act Status: Endangered</p>	<p>Brief description: Brigalow forest.</p> <p>Canopy (T1): Height range 9-12m; median height 12m.</p> <p>Dominant species: <i>Acacia harpophylla</i>.</p> <p>Sub-canopy (T2): Height range 4-6m; median height 5m.</p> <p>Dominant species: <i>Eremophila mitchellii</i>, <i>Petalostigma pubescens</i>, <i>Erythroxylum australe</i>.</p> <p>Shrub: Height range 0.4-1m; median height 0.6m.</p> <p>Dominant species: <i>Carissa ovata</i>.</p> <p>Groundcover: Dominant species: <i>Aristida sp.</i>, <i>Chloris virgata</i>, <i>Einadia nutans</i>, <i>Harrisia martinii</i>.</p> <p>Notes: Confirmed as Endangered RE. Confirmed as Brigalow TEC.</p>	


APPENDIX C



Vegetation Assessment Results for Communities Assessed as Not TECs



Site	RE and Status	Dominant flora species (*= exotic species)	Representative photographs
B1 -21.80332412 148.46553097 -21.80356435 148.46557916 -21.80420305 148.46571721 -21.80401848 148.46575887	Mapped RE: 11.5.3/11.4.9 Ground-truthed RE: 11.4.9 VM Act Status: Endangered Biodiversity Status: Endangered EPBC Act Status: Not listed	Brief description: Belah woodland. Canopy (T1): 28% cover. Height range 14-18m; median height 16m. Dominant species: <i>Casuarina cristata</i> , <i>Eucalyptus populnea</i> . Sub-canopy (T2): n/a. Shrub (S1): 7.8% cover. Height range 2-6m; median height 4m. Dominant species: <i>Psydrax odorata</i> , <i>Terminalia oblongata</i> . Associated species: <i>Flindersia dissosperma</i> Shrub (S2): 18.1% cover. Height range 0-2m; median height 1m. Dominant species: <i>Carissa ovata</i> , <i>Diospyros humilis</i> . Groundcover: 13.2% cover. Dominant species: <i>Cenchrus ciliaris</i> , <i>Bothriochloa pertusa</i> . Associated species: <i>Brunoniella acaulis</i> Notes: Ground-truthed as Endangered RE. Brigalow not present in this patch	
B2 -21.82690619 148.47499799 -21.82691230 148.47524056 -21.82686872 148.47566754 -21.82685656 148.47596702	Mapped RE: 11.4.9/11.5.3 Ground-truthed RE: 11.5.3 VM Act Status: Least Concern Biodiversity Status: No Concern at Present EPBC Act Status: Not listed	Brief description: Eucalypt woodland. Canopy (T1): 33.8% cover. Height range 12-18m; median height 15m. Dominant species: <i>Eucalyptus populnea</i> , <i>Casuarina cristata</i> . Sub-canopy (T2): Height range 6-10m; median height 8m. Dominant species: <i>Eucalyptus populnea</i> . Shrub (S1): 30.7% cover. Height range 2-6m; median height 4m. Dominant species: <i>Erythroxylum australe</i> , <i>Flindersia dissosperma</i> . Associated species: <i>Eremophila mitchellii</i> . Shrub (S2): 9.8% cover. Height range 0-2m; median height 1m. Dominant species: <i>Flindersia dissosperma</i> , <i>Petalostigma pubescens</i> . Groundcover: 5.2% cover. Dominant species: <i>Digitaria sp.</i> , <i>Bothriochloa pertusa</i> . Associated species: <i>Brunoniella acaulis</i> . Notes: Ground-truthed as Least Concern RE. Ground-truthed as not TEC.	



Site	RE and Status	Dominant flora species (*= exotic species)	Representative photographs
B11 -21.93116248 148.39172881 -21.93067934 148.39246080 -21.93105410 148.39190491 -21.93078596 148.39227330	Mapped RE: 11.5.15 Ground-truthed RE: 11.5.3 VM Act Status: Least Concern Biodiversity Status: No Concern at Present EPBC Act Status: Not listed	Brief description: Eucalypt woodland. Canopy (T1): 20.6% cover. Height range 15-25m; median height 22m. Dominant species: <i>Eucalyptus populnea</i> , <i>Acacia rhodoxylon</i> . Sub-canopy (T2): 3.5% cover. Median height 11m. Dominant species: <i>Acacia rhodoxylon</i> , <i>Eucalyptus populnea</i> . Associated species: <i>Notelaea linearis</i> Shrub (S1): 19.9% cover. Median height 6m. Dominant species: <i>Acacia rhodoxylon</i> , <i>Croton insularis</i> . Associated species: <i>Diospyros geminata</i> Shrub (S2): 41.1% cover. Median height 1m. Dominant species: <i>Acalypha eremorum</i> , <i>Carissa ovata</i> . Groundcover: n/a Notes: RE mapping discrepancies (ground-truthed as not SEVT). Ground-truthed as not SEVT TEC.	
Q1 -21.82737356 148.48357762	Mapped RE: Non-Remnant; adjacent 11.5.3/11.4.9 Ground-truthed RE: Non-Remnant; adjacent is 11.5.3 VM Act Status: Least Concern Biodiversity Status: No Concern at Present EPBC Act Status: Not listed	Brief description: Eucalypt woodland. Canopy (T1): 30% cover. Height range 15-20m; median height 17m. Dominant species: <i>Eucalyptus populnea</i> . Sub-canopy (T2): n/a. Shrub: 30% cover. Height range 1.5-4m; median height 3m. Dominant species: <i>Terminalia oblongata</i> . Groundcover: Dominant species: <i>Bothriochloa pertusa</i> Notes: Adjacent vegetation ground-truthed as not Brigalow TEC.	None available



Site	RE and Status	Dominant flora species (*= exotic species)	Representative photographs
Q2 -21.82739980 148.47792202	Mapped RE: Non-Remnant; adjacent 11.5.3/11.4.9 Ground-truthed RE: Non-Remnant; adjacent is 11.5.3 VM Act Status: Least Concern Biodiversity Status: No Concern at Present EPBC Act Status: Not listed	Brief description: Eucalypt woodland. Canopy (T1): 30% cover. Height range 15-20m; median height 17m. Dominant species: <i>Eucalyptus populnea</i> . Sub-canopy (T2): n/a. Shrub: n/a Groundcover: n/a. Notes: Adjacent vegetation ground-truthed as not Brigalow TEC. Brigalow 100m to north.	None available
Q3 -21.82738513 148.47247529	Mapped RE: Non-Remnant; adjacent 11.5.3/11.4.9 Ground-truthed RE: Non-Remnant; adjacent is 11.5.3 VM Act Status: Least Concern Biodiversity Status: No Concern at Present EPBC Act Status: Not listed	Brief description: Eucalypt woodland. Canopy (T1): 30% cover. Height range 15-20m; median height 17m. Dominant species: <i>Eucalyptus populnea</i> . Sub-canopy (T2): n/a. Shrub: Height range 2-6m; median height 4m. Dominant species: <i>Terminalia oblongata</i> . Groundcover: n/a. Notes: Vegetation ground-truthed as not Brigalow TEC. However, brigalow TEC is present adjacent to this site.	None available



Site	RE and Status	Dominant flora species (*= exotic species)	Representative photographs
<p>Q4</p> <p>-21.82357941 148.46900392</p>	<p>Mapped RE: Non-Remnant; adjacent 11.5.3/11.4.9</p> <p>Ground-truthed RE: Non-Remnant; adjacent is 11.5.3</p> <p>VM Act Status: Least Concern</p> <p>Biodiversity Status: No Concern at Present</p> <p>EPBC Act Status: Not listed</p>	<p>Brief description: Eucalypt woodland. Canopy (T1): 25% cover. Height range 15-20m; median height 17m. Dominant species: <i>Eucalyptus populnea</i>, <i>Casuarina cristata</i>. Sub-canopy (T2): n/a. Shrub: n/a Groundcover: n/a.</p> <p>Notes: Vegetation ground-truthed as not Brigalow TEC. However, brigalow occurs in a mosaic as part of the community to the east; therefore, brigalow TEC is present adjacent to this site.</p>	
<p>Q5</p> <p>-21.82148712 148.46857158</p>	<p>Mapped RE: Non-Remnant; adjacent 11.5.3/11.4.9</p> <p>Ground-truthed RE: Non-Remnant; adjacent is 11.5.3</p> <p>VM Act Status: Least Concern</p> <p>Biodiversity Status: No Concern at Present</p> <p>EPBC Act Status: Not listed</p>	<p>Brief description: Eucalypt woodland. Canopy (T1): 30% cover. Height range 12-20m; median height 15m. Dominant species: <i>Eucalyptus populnea</i>, <i>Casuarina cristata</i>. Sub-canopy (T2): n/a. Shrub: Height range 2-6m; median height 4m. Dominant species: <i>Alphitonia excelsa</i>. Groundcover: n/a.</p> <p>Notes: Washed out gully. Adjacent vegetation ground-truthed as not Brigalow TEC.</p>	<p>None available</p>



Site	RE and Status	Dominant flora species (*= exotic species)	Representative photographs
<p>Q7</p> <p>-21.81944076 148.46874626</p>	<p>Mapped RE: 11.5.3/11.4.9</p> <p>Ground-truthed RE: 11.5.3</p> <p>VM Act Status: Least Concern</p> <p>Biodiversity Status: No Concern at Present</p> <p>EPBC Act Status: Not listed</p>	<p>Brief description: Eucalypt woodland.</p> <p>Canopy (T1): 25% cover. Height range 14-20m; median height 16m. Dominant species: <i>Eucalyptus populnea</i>, <i>Eucalyptus platyphylla</i>. Associated species: <i>Corymbia clarksoniana</i></p> <p>Sub-canopy (T2): 5% cover. Height range 6-10m; median height 8m. Dominant species: <i>Alphitonia excelsa</i>.</p> <p>Shrub: 2% cover. Height range 2-5m; median height 3m. Dominant species: <i>Petalostigma pubescens</i>.</p> <p>Groundcover: n/a.</p> <p>Notes: Ground-truthed as not Brigalow TEC.</p>	
<p>Q8</p> <p>-21.81813327 148.46863420</p>	<p>Mapped RE: 11.5.3/11.4.9</p> <p>Ground-truthed RE: 11.5.3</p> <p>VM Act Status: Least Concern</p> <p>Biodiversity Status: No Concern at Present</p> <p>EPBC Act Status: Not listed</p>	<p>Brief description: Eucalypt woodland.</p> <p>Canopy (T1): 25% cover. Height range 14-20m; median height 16m. Dominant species: <i>Eucalyptus populnea</i>.</p> <p>Sub-canopy (T2): n/a.</p> <p>Shrub: 5% cover. Height range 2-5m; median height 3m. Dominant species: <i>Alphitonia excelsa</i>.</p> <p>Groundcover: n/a.</p> <p>Notes: Ground-truthed as not Brigalow TEC.</p>	
<p>Q14</p> <p>-21.80265793 148.46537674</p>	<p>Mapped RE: 11.5.3/11.4.9</p> <p>Ground-truthed RE: 11.5.3</p> <p>VM Act Status: Least Concern</p> <p>Biodiversity Status: No Concern at Present</p> <p>EPBC Act Status: Not listed</p>	<p>Brief description: Eucalypt woodland.</p> <p>Canopy (T1): 25% cover. Height range 15-20m; median height 17m. Dominant species: <i>Eucalyptus populnea</i>.</p> <p>Sub-canopy (T2): n/a.</p> <p>Shrub: n/a.</p> <p>Groundcover: n/a.</p> <p>Notes: Ground-truthed as not Brigalow TEC.</p>	<p>None available</p>



Site	RE and Status	Dominant flora species (*= exotic species)	Representative photographs
<p>Q15 -21.80762127 148.46610957</p>	<p>Mapped RE: Non-Remnant; adjacent 11.5.3/11.3.4 Ground-truthed RE: 11.4.9 - but < 0.5 ha (only 75m X 10m) VM Act Status: n/a Biodiversity Status: n/a EPBC Act Status: Not listed</p>	<p>Brief description: Brigalow open forest. Canopy (T1): 40% cover. Height range 14-18m; median height 16m. Dominant species: <i>Acacia harpophylla</i>. Sub-canopy (T2): n/a. Shrub: 2% cover. Height range 2-6m; median height 4m. Dominant species: <i>Terminalia oblongata</i>. Groundcover: Dominant species: <i>Ancistrachne uncinulata</i> Notes: Ground-truthed as Endangered RE, although patch not large enough to be mapped. Ground-truthed as not Brigalow TEC (<0.5 ha).</p>	
<p>Q16 -21.80827531 148.46633596</p>	<p>Mapped RE: Non-Remnant; adjacent 11.5.3/11.3.4 Ground-truthed RE: 11.4.9 - but < 0.5 ha (only 75m X 10m) VM Act Status: n/a Biodiversity Status: n/a EPBC Act Status: Not listed</p>	<p>Brief description: Brigalow open forest. Canopy (T1): 40% cover. Height range 14-18m; median height 16m. Dominant species: <i>Acacia harpophylla</i>. Sub-canopy (T2): n/a. Shrub: n/a. Groundcover: n/a. Notes: Ground-truthed as Endangered RE, although patch not large enough to be mapped. Ground-truthed as not Brigalow TEC (<0.5 ha).</p>	



Site	RE and Status	Dominant flora species (*= exotic species)	Representative photographs
<p>Q20 -21.82880050 148.48362532</p>	<p>Mapped RE: Non-Remnant; adjacent 11.5.3/11.4.9 Ground-truthed RE: Non-Remnant; adjacent is 11.5.3 VM Act Status: Least Concern Biodiversity Status: No Concern at Present EPBC Act Status: Not listed</p>	<p>Brief description: Eucalypt woodland. Canopy (T1): 35% cover. Height range 15-21m; median height 18m. Dominant species: <i>Eucalyptus populnea</i>. Sub-canopy (T2): n/a. Shrub: Height range 0-1.5m; median height 1m. Dominant species: <i>Carissa ovata</i>. Groundcover: n/a. Notes: Ground-truthed as not Brigalow TEC.</p>	
<p>Q21 -21.83203440 148.48413569</p>	<p>Mapped RE: Non-Remnant; adjacent 11.4.9/11.5.3 Ground-truthed RE: 11.4.9 but < 0.5 ha (40m X 50m) VM Act Status: n/a Biodiversity Status: n/a EPBC Act Status: Not listed</p>	<p>Brief description: Brigalow open forest. Canopy (T1): 60% cover. Height range 18-15m; median height 12m. Dominant species: <i>Acacia harpophylla</i>. Sub-canopy (T2): n/a. Shrub: 2% cover. Height range 0-2m; median height 1m. Dominant species: <i>Carissa ovata</i>. Groundcover: n/a. Notes: Ground-truthed as Endangered RE, although patch not large enough to be mapped. Ground-truthed as not Brigalow TEC (<0.5 ha).</p>	


Site	RE and Status	Dominant flora species (*= exotic species)	Representative photographs
Q26 -21.84038722 148.48520505	Mapped RE: 11.5.3/11.3.4 Ground-truthed RE: 11.3.4 VM Act Status: Of Concern Biodiversity Status: Of Concern EPBC Act Status: Not listed	Brief description: Eucalypt woodland. Canopy (T1): 25% cover. Height range 12-15m; median height 14m. Dominant species: <i>Eucalyptus tereticornis</i> , <i>Corymbia clarksoniana</i> . Associated species: <i>Corymbia dallachiana</i> . Sub-canopy (T2): n/a. Shrub: n/a. Groundcover: n/a. Notes: Of Concern RE confirmed. There is no Brigalow as mapped immediately to the south-east of this patch - it is a mixture of <i>Eucalyptus populnea</i> and cleared.	
Q30 -21.91413338 148.42604902	Mapped RE: 11.9.4/11.9.5 Ground-truthed RE: 11.9.7 VM Act Status: Of Concern Biodiversity Status: Of Concern EPBC Act Status: Not listed	Brief description: Eucalypt woodland. Canopy (T1): 40% cover. Height range 12-18m; median height 15m. Dominant species: <i>Eucalyptus populnea</i> . Sub-canopy (T2): n/a Shrub: n/a Groundcover: n/a Notes: RE mapping discrepancies (ground-truthed as not SEVT or Brigalow). Ground-truthed as not SEVT or Brigalow TEC.	None available
Q31 -21.91630363 148.41923193	Mapped RE: 11.9.4/11.9.5 Ground-truthed RE: 11.9.7 VM Act Status: Of Concern Biodiversity Status: Of Concern EPBC Act Status: Not listed	Brief description: Eucalypt woodland. Canopy (T1): 30% cover. Height range 10-15m; median height 12m. Dominant species: <i>Eucalyptus populnea</i> . Sub-canopy (T2): 15% cover. Height range 6-10m; median height 8m. Dominant species: <i>Acacia harpophylla</i> . Shrub: n/a Groundcover: n/a Notes: RE mapping discrepancies (ground-truthed as not SEVT or Brigalow). Ground-truthed as not SEVT or Brigalow TEC.	

Site	RE and Status	Dominant flora species (*= exotic species)	Representative photographs
Q32 -21.91487937 148.42366939	Mapped RE: 11.9.4/11.9.5 Ground-truthed RE: 11.9.7 VM Act Status: Of Concern Biodiversity Status: Of Concern EPBC Act Status: Not listed	Brief description: Eucalypt woodland. Canopy (T1): 30% cover. Height range 12-17m; median height 15m. Dominant species: <i>Eucalyptus populnea</i> , <i>Eucalyptus cambageana</i> . Sub-canopy (T2): n/a Shrub: n/a Groundcover: n/a Notes: RE mapping discrepancies (ground-truthed as not SEVT or Brigalow). Ground-truthed as not SEVT or Brigalow TEC.	None available
Observation Site (not TEC) – Waypoint 72 -21.8994213 148.44045684	Mapped RE: 11.9.3/11.9.7 Ground-truthed RE: Non-remnant VM Act Status: n/a Biodiversity Status: n/a EPBC Act Status: Not listed	Brief description: regrowth woodland. Canopy (T1): 1% cover. Height range 12-25m; median height 18m. Dominant species: <i>Eucalyptus cambageana</i> . Sub-canopy (T2): n/a. Shrub: n/a. Groundcover: Dominated by <i>Cenchrus ciliaris</i> . Notes: RE mapping discrepancies (ground-truthed as non-remnant). Ground-truthed as not Native Grassland TEC.	
Q36 -21.94420204 148.31678160	Mapped RE: 11.3.2/11.3.1 Ground-truthed RE: 11.3.4 VM Act Status: Of Concern Biodiversity Status: Of Concern EPBC Act Status: Not listed	Brief description: Eucalypt woodland. Canopy (T1): 10% cover. Height range 15-25m; median height 20m. Dominant species: <i>Corymbia tessellaris</i> , <i>Eucalyptus crebra</i> . Sub-canopy (T2): n/a. Shrub: n/a. Groundcover: n/a. Notes: Ground-truthed as not Brigalow TEC.	

Site	RE and Status	Dominant flora species (*= exotic species)	Representative photographs
<p>Q37</p> <p>-21.94457000 148.31782364</p>	<p>Mapped RE: 11.3.2/11.3.1 Ground-truthed RE: 11.5.3</p> <p>VM Act Status: Least Concern Biodiversity Status: No Concern at Present EPBC Act Status: Not listed</p>	<p>Brief description: Eucalypt woodland. Canopy (T1): 25% cover. Height range 12-22m; median height 17m. Dominant species: <i>Eucalyptus populnea</i>, <i>Acacia harpophylla</i>. Sub-canopy (T2): n/a. Shrub: n/a. Groundcover: n/a.</p> <p>Notes: RE mapping discrepancies (ground-truthed as not Endangered or Of Concern RE). Ground-truthed as not Brigalow TEC.</p>	
<p>Q38</p> <p>-21.93900006 148.30675383</p>	<p>Mapped RE: 11.5.3 Ground-truthed RE: 11.4.9 but < 0.5 ha</p> <p>VM Act Status: n/a Biodiversity Status: n/a EPBC Act Status: Not listed</p>	<p>Brief description: Brigalow forest. Canopy (T1): 50% cover. Height range 9-12m; median height 10m. Dominant species: <i>Acacia harpophylla</i>. Sub-canopy (T2): n/a. Shrub: n/a. Groundcover: n/a.</p> <p>Notes: Ground-truthed as Endangered RE, although patch not large enough to be mapped. Ground-truthed as not Brigalow TEC (<0.5 ha).</p>	

Site	RE and Status	Dominant flora species (*= exotic species)	Representative photographs
<p>Q42</p> <p>-21.94764230 148.32437787</p>	<p>Mapped RE: Non-Remnant; adjacent to 11.3.2/11.3.1</p> <p>Ground-truthed RE: 11.3.4</p> <p>VM Act Status: Of Concern</p> <p>Biodiversity Status: Of Concern</p> <p>EPBC Act Status: Not listed</p>	<p>Brief description: Eucalypt woodland.</p> <p>Canopy (T1): 30% cover. Height range 15-25m; median height 20m. Dominant species: <i>Corymbia tessellaris</i>, <i>Eucalyptus crebra</i>.</p> <p>Sub-canopy (T2): n/a.</p> <p>Shrub: n/a.</p> <p>Groundcover: n/a.</p> <p>Notes: RE mapping discrepancies (ground-truthed as remnant). Ground-truthed as not Brigalow TEC.</p>	
<p>Q43</p> <p>-21.94008912 148.37610511</p>	<p>Mapped RE: 11.5.3/11.7.2</p> <p>Ground-truthed RE: 11.4.9 but < 0.5 ha</p> <p>VM Act Status: n/a</p> <p>Biodiversity Status: n/a</p> <p>EPBC Act Status: Not listed</p>	<p>Brief description: Brigalow forest.</p> <p>Canopy (T1): 50% cover. Height range 9-12m; median height 10m. Dominant species: <i>Acacia harpophylla</i>.</p> <p>Sub-canopy (T2): n/a.</p> <p>Shrub: n/a.</p> <p>Groundcover: n/a.</p> <p>Notes: Ground-truthed as Endangered RE, although patch not large enough to be mapped. Ground-truthed as not Brigalow TEC (<0.5 ha).</p>	

Site	RE and Status	Dominant flora species (*= exotic species)	Representative photographs
<p>Q47</p> <p>-21.94481090 148.35693972</p>	<p>Mapped RE: 11.5.3/11.7.2</p> <p>Ground-truthed RE: 11.4.9</p> <p>VM Act Status: Endangered</p> <p>Biodiversity Status: Endangered</p> <p>EPBC Act Status: Not listed</p>	<p>Brief description: Brigalow-Belah forest.</p> <p>Canopy (T1): 70% cover. Height range 15-24m; median height 19m.</p> <p>Dominant species: <i>Casuarina cristata</i>.</p> <p>Sub-canopy (T2): n/a.</p> <p>Shrub: n/a.</p> <p>Groundcover: n/a.</p> <p>Notes: RE mapping discrepancies (ground-truthed as Endangered RE). Ground-truthed as not Brigalow TEC (Brigalow not dominant or co-dominant in this patch). Gully.</p>	
<p>Q57</p> <p>-21.92793 148.39719</p>	<p>Mapped RE: 11.9.5/11.9.1</p> <p>Ground-truthed RE: 11.9.5/11.9.1</p> <p>VM Act Status: Endangered</p> <p>Biodiversity Status: Endangered</p> <p>EPBC Act Status: Not listed</p>	<p>Brief description: Belah-Eucalypt open forest.</p> <p>Canopy (T1): Height range 18-21m; median height 20m.</p> <p>Dominant species: <i>Eucalyptus cambageana</i>, <i>Casuarina cristata</i>.</p> <p>Sub-canopy (T2): Height range 8-10m; median height 9m.</p> <p>Dominant species: <i>Pouteria sp.</i>, <i>Denhamia oleaster</i>, <i>Notelaea sp.</i>, <i>Casuarina cristata</i>.</p> <p>Shrub: Height range 1-2m; median height 1.5m.</p> <p>Dominant species: <i>Acalypha eremorum</i>, <i>Casuarina cristata</i>.</p> <p>Groundcover: n/a.</p> <p>Notes: Confirmed as Endangered RE. Ground-truthed as not Brigalow TEC (Brigalow not dominant or co-dominant in this patch).</p>	

Site	RE and Status	Dominant flora species (*= exotic species)	Representative photographs
<p>Q58</p> <p>-21.88193 148.24558</p>	<p>Mapped RE: Non-remnant</p> <p>Ground-truthed RE: Regrowth</p> <p>VM Act Status: n/a</p> <p>Biodiversity Status: n/a</p> <p>EPBC Act Status: Not listed</p>	<p>Brief description: Regrowth Brigalow.</p> <p>Canopy (T1): Height range 1.5-7m; median height 4m. Dominant species: <i>Acacia harpophylla</i>. Associated species: <i>Eremophila mitchellii</i>, <i>Acalypha eremorum</i>. Emergent species: <i>Eucalyptus populnea</i>.</p> <p>Sub-canopy (T2): n/a.</p> <p>Shrub: Height range 0.1-0.6m; median height 0.5m. Dominant species: <i>Carissa ovata</i>.</p> <p>Groundcover: Dominant species: <i>Cenchrus ciliaris</i>, <i>Bothriochloa pertusa</i>, <i>Chloris virgata</i>.</p> <p>Notes: Ground-truthed as not Brigalow TEC (ground layer >50% exotic grasses).</p>	

APPENDIX D

Modelled and ground-truthed threatened fauna habitat maps

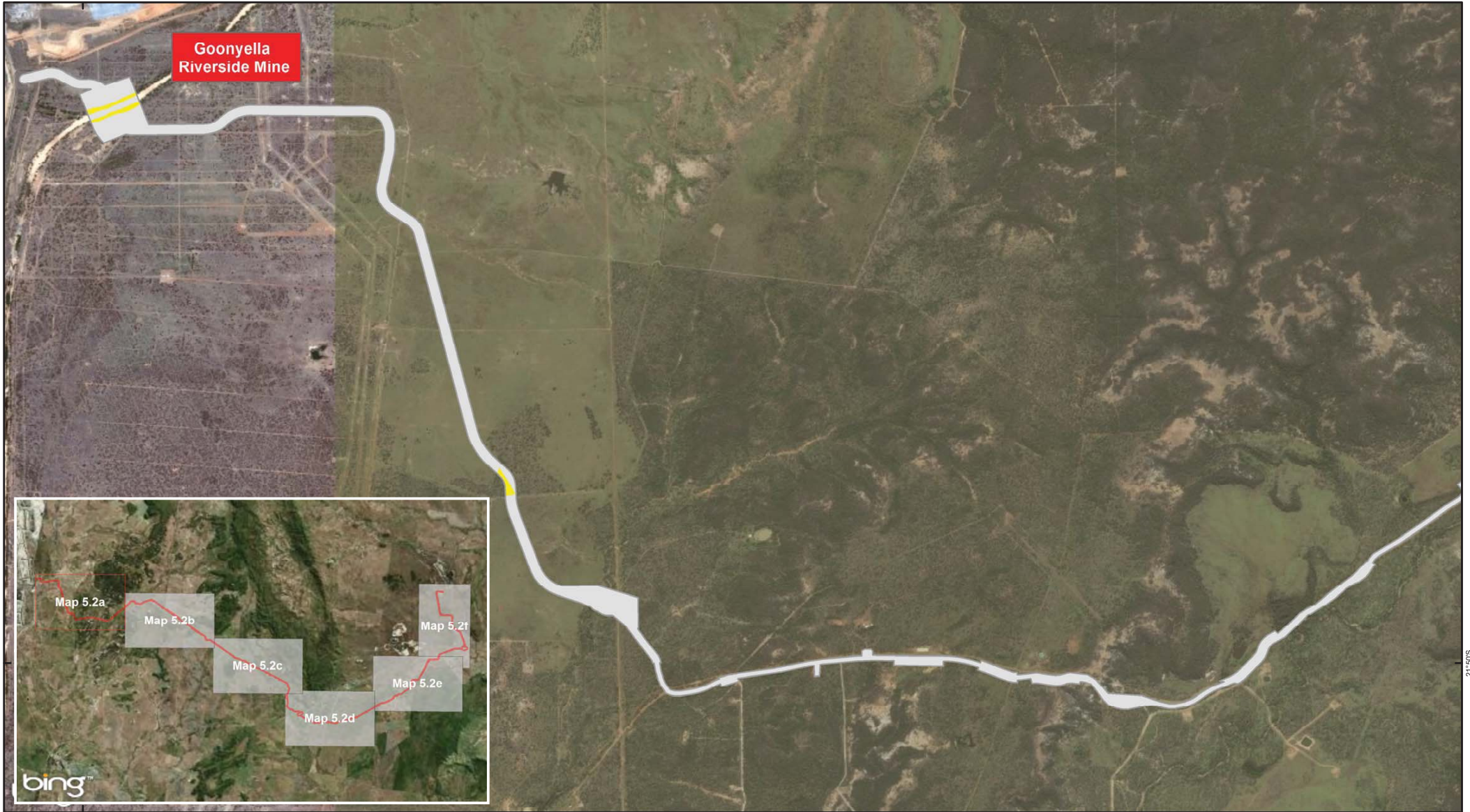
Figures 5.2a-f Modelled and Ground-truthed Ornamental Snake Habitat within the Dragline Transportation Route

Figures 5.3a-f Modelled and Ground-truthed Squatter Pigeon (Southern Subspecies) Habitat within the Dragline Transportation Route

Figures 5.4a-f Modelled and Ground-truthed Koala Habitat within the Dragline Transportation Route

Figures 5.5a-f Modelled and Ground-truthed Yakka Skink Habitat within the Dragline Transportation Route

148°0'E



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 Data Source: Image from ArcGIS Online Bing Maps data (c) 2010 Microsoft Corporation and its data suppliers. Regional Ecosystems V7 and RE Waterways sourced from QLD Government 2012.

Coordinate System: GCS GDA 1994
 Datum: GDA 1994
 Units: Degree



1:30,000 at A4
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 Meters

LEGEND

Ornamental Snake Habitat

- Essential Habitat
- Unlikely Habitat

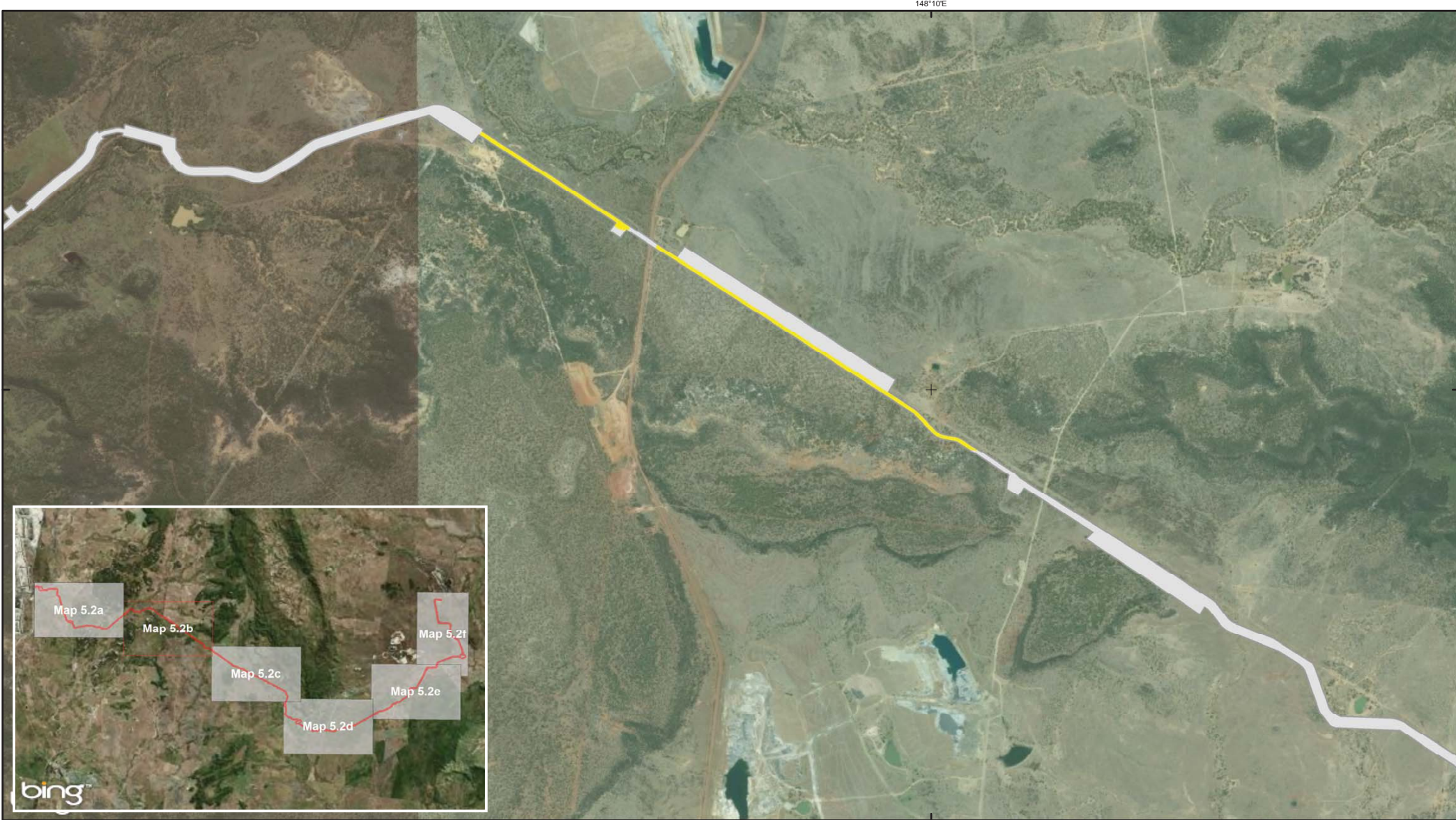
- Dragline Corridor Revision C
- Temporary Shutdown Areas

Figure: 5.2a
 Title: Modelled and ground-truthed Ornamental Snake habitat within the Dragline Route

Project: BMC Dragline Move Project
 Terrestrial Ecology MNES Assessment

Client: Advisian





Notes:
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Coordinate System: GCS GDA 1994
 Datum: GDA 1994
 Units: Degree



LEGEND

- Ornamental Snake Habitat
- Essential Habitat
- Unlikely Habitat
- Dragline Corridor Revision C
- Temporary Shutdown Areas

Figure: 5.2b
 Title: Modelled and ground-truthed Ornamental Snake habitat within the Dragline Route
 Project: BMC Dragline Move Project Terrestrial Ecology MNES Assessment
 Client: Advisian





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Coordinate System: GCS GDA 1994
 Datum: GDA 1994
 Units: Degree



1:30,000 at A4
 0 165 330 660 990 1,320
 Meters

LEGEND

Ornamental Snake Habitat

- General Habitat
- Unlikely Habitat

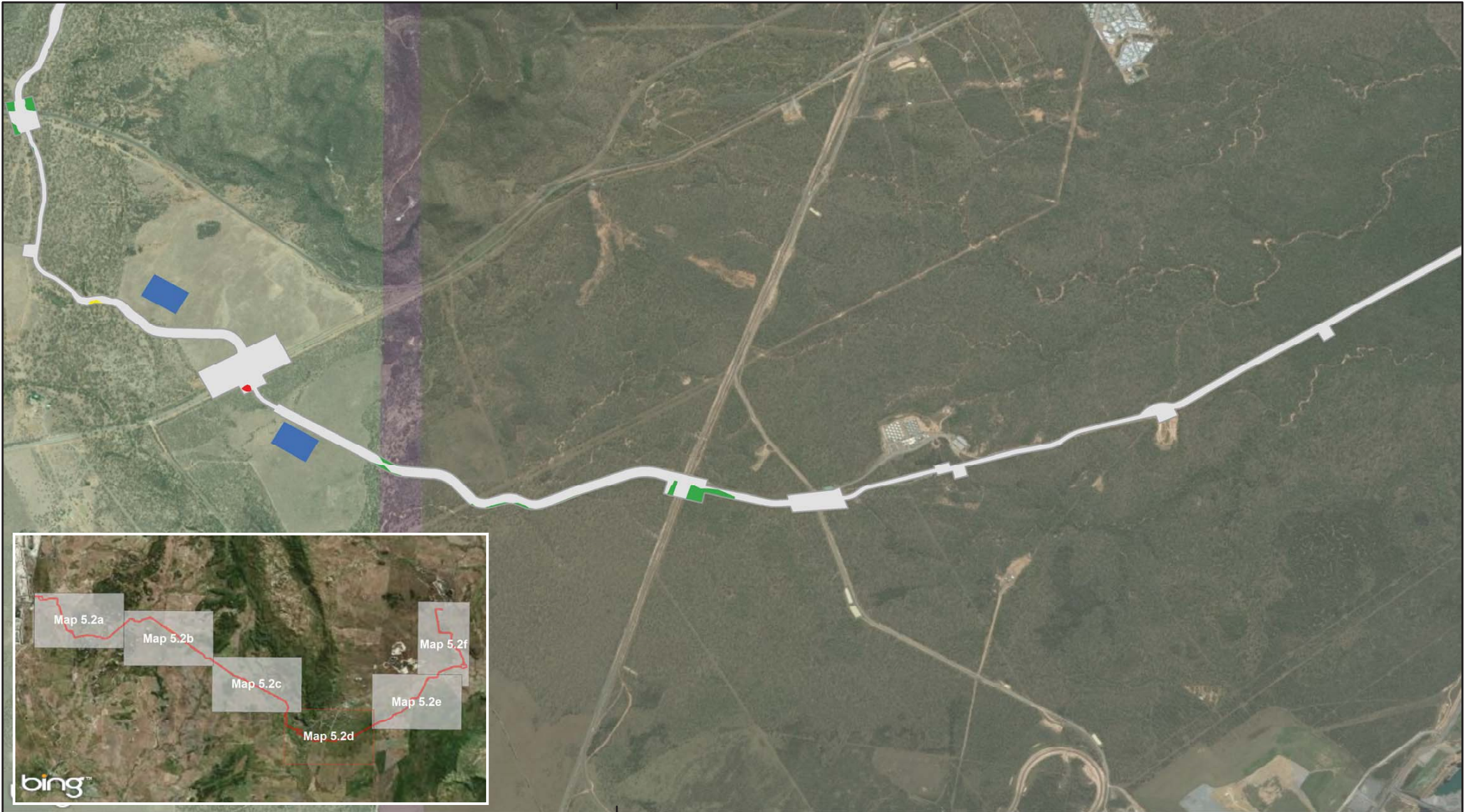
- Dragline Corridor Revision C
- Temporary Shutdown Areas

Figure: 5.2c
 Title: Modelled and ground-truthed Ornamental Snake habitat within the Dragline Route

Project: BMC Dragline Move Project
 Terrestrial Ecology MNES Assessment

Client: Advisian





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Coordinate System: GCS GDA 1994
 Datum: GDA 1994
 Units: Degree



1:30,000 at A4
 0 165 330 660 990 1320
 Meters

LEGEND

Ornamental Snake Habitat

- Core Habitat
- Essential Habitat
- General Habitat
- Unlikely Habitat

- Dragline Corridor Revision C
- Temporary Shutdown Areas

Drawn By: MG Reviewed by: AC Date: 20 Sep 16

Figure: 5.2d
 Title: Modelled and ground-truthed Ornamental Snake habitat within the Dragline Route
 Project: BMC Dragline Move Project Terrestrial Ecology MNES Assessment
 Client: Advisian





Notes:
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 Data Source: Image from ArcGIS Online Bing Maps data (c) 2010 Microsoft Corporation and its data suppliers. Regional Ecosystems V7 and RE Waterways sourced from QLD Government 2012.

Coordinate System: GCS GDA 1994
 Datum: GDA 1994
 Units: Degree



1:30,000 at A4
 0 165 330 660 990 1,320
 Meters

LEGEND

Ornamental Snake Habitat

Essential Habitat

General Habitat

Unlikely Habitat

Dragline Corridor Revision C

Temporary Shutdown Areas

Drawn By: MG Reviewed by: AC Date: 20 Sep 16

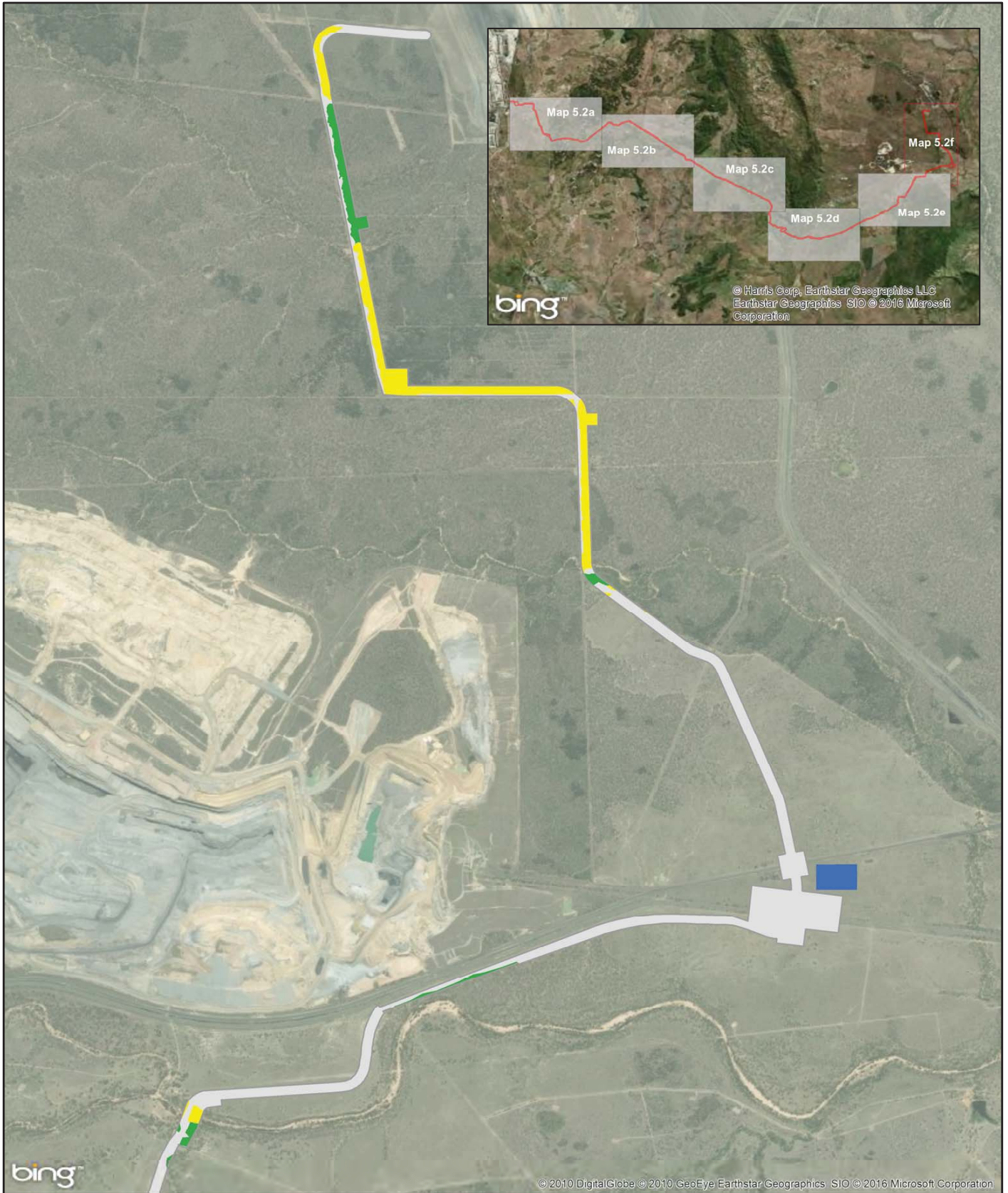
Document Location: C:\Users\Owner\Documents\Clients\BAAM\Dragline\BAAM_A3_Landscape_series_Dragline.mxd Date: 20-Sep-16 11:16:24 PM

Figure: 5.2e
 Title: Modelled and ground-truthed Ornamental Snake habitat within the Dragline Route

Project: BMC Dragline Move Project
 Terrestrial Ecology MNES Assessment

Client: Advisian

BAAM
 ECOLOGICAL CONSULTANTS



Notes: Coordinate System: GCS GDA 1994 Datum: GDA 1994 Units: Degree  1:30,000 at A4 0 0.15 0.3 0.6 0.9 1.2 Kilometers

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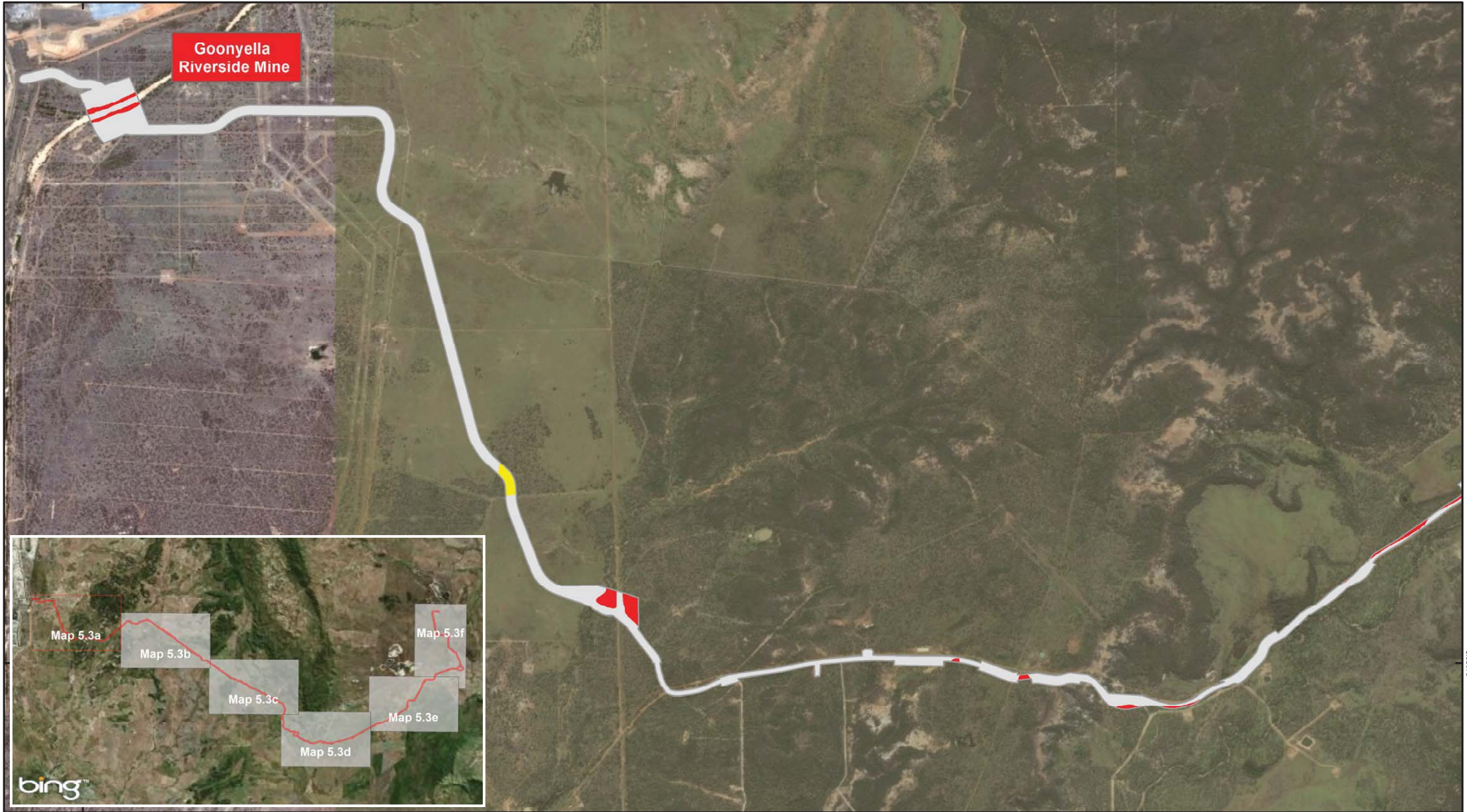
Legend

- Dragline Corridor Revision C
- Essential Habitat
- General Habitat
- Unlikely Habitat
- Temporary Shutdown Areas

Figure: **5-2f**
 Title: Modelled and ground-truthed Ornamental Snake habitat within the Dragline Route
 Project: **BMC Dragline Move Project Terrestrial Ecology MNES Assessment**
 Client: **Client LOGO or name**



148°0'E



21°50'S

21°50'S

Notes:
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 Data Source: Image from ArcGIS Online Bing Maps data (c) 2010 Microsoft Corporation and its data suppliers. Regional Ecosystems V7 and RE Waterways sourced from QLD Government 2012.

Coordinate System: GCS GDA 1994
 Datum: GDA 1994
 Units: Degree



1:30,000 at A4
 0 165 330 660 990 1320
 Meters

LEGEND

Squatter Pigeon (Southern Subspecies)

- Core Habitat
- Essential Habitat
- Unlikely Habitat

- Dragline Corridor Revision C
- Temporary Shutdown Areas

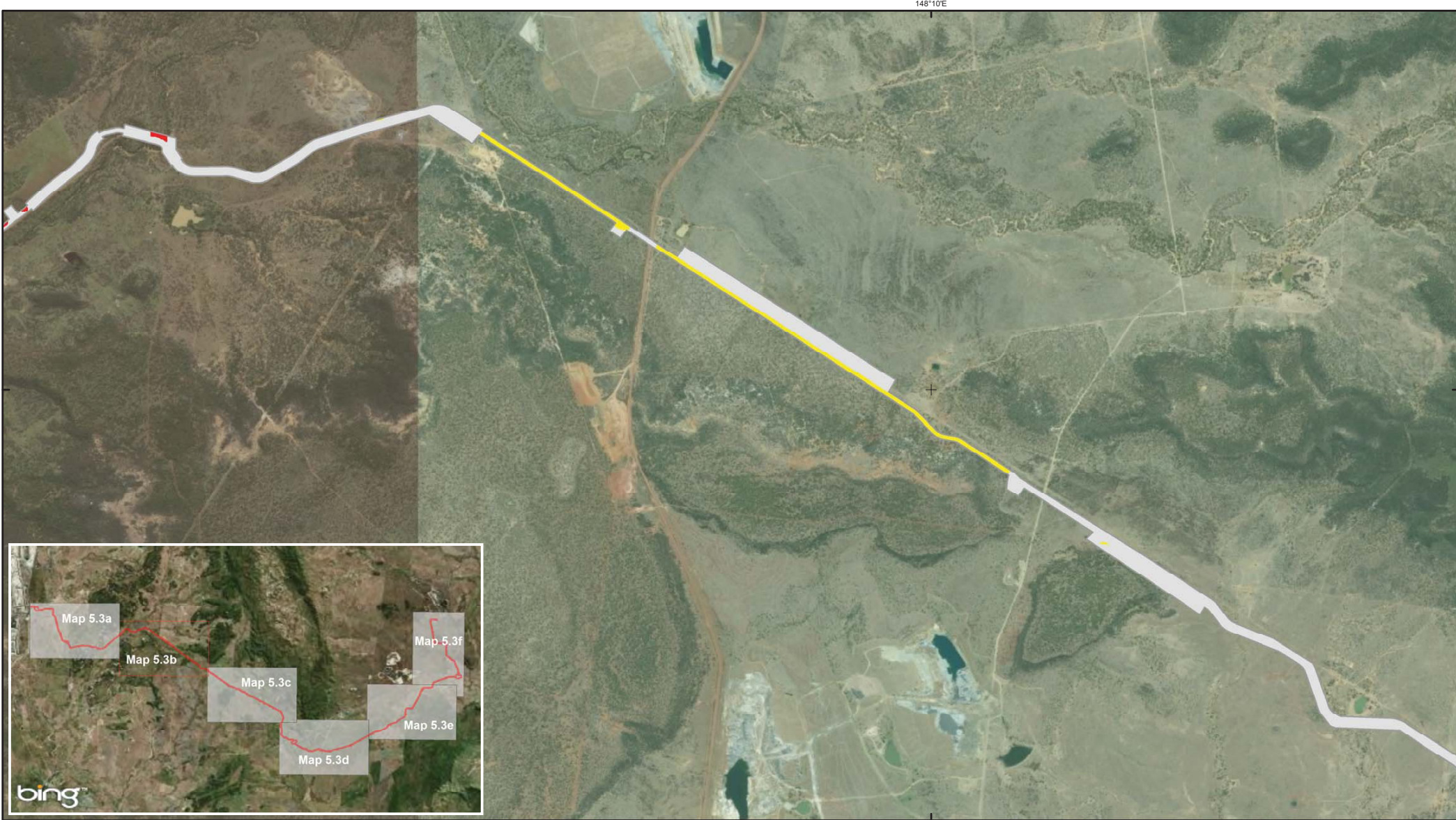
Drawn By: MG Reviewed by: AC Date: 21 Sep 16

Figure: 5.3a
 Title: Modelled and ground-truthed Squatter Pigeon (Southern Subspecies)

Project: BMC Dragline Move Project
 Terrestrial Ecology MNES Assessment

Client: Advisian





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Coordinate System: GCS GDA 1994
 Datum: GDA 1994
 Units: Degree



LEGEND

- Core Habitat
- Essential Habitat
- Unlikely Habitat
- Dragline Corridor Revision C
- Temporary Shutdown Areas

Drawn By: MG Reviewed by: AC Date: 21-Sep-16

Figure: 5.3b
 Title: Modelled and ground-truthed Squatter Pigeon (Southern Subspecies)
 Project: BMC Dragline Move Project Terrestrial Ecology MNES Assessment
 Client: Advisian





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 Data Source: Image from ArcGIS Online Bing Maps data (c) 2010 Microsoft Corporation and its data suppliers. Regional Ecosystems V7 and RE Waterways sourced from QLD Government 2012.

Coordinate System: GCS GDA 1994
 Datum: GDA 1994
 Units: Degree



1:30,000 at A4
 0 165 330 660 990 1,320
 Meters

LEGEND

Squatter Pigeon (Southern Subspecies)

- Core Habitat
- Essential Habitat
- General Habitat
- Unlikely Habitat

Dragline Corridor Revision C

Drawn By: MG Reviewed by: AC Date: 21-Sep-16

Document Location: C:\Users\Owner\Documents\Clients\BAAM\Dragline\BAAM_A3_Landscape_series_Dragline.mxd Date: 21-Sep-16 12:10:23 AM

Figure: 5.3c
 Title: Modelled and ground-truthed Squatter Pigeon (Southern Subspecies)

Project: BMC Dragline Move Project
 Terrestrial Ecology MNES Assessment

Client: Advisian





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Coordinate System: GCS GDA 1994
 Datum: GDA 1994
 Units: Degree



1:30,000 at A4
 0 165 330 660 990 1,320
 Meters

LEGEND

Squatter Pigeon (Southern Subspecies)

- Core Habitat
- Essential Habitat
- General Habitat
- Unlikely Habitat
- Dragline Corridor Revision C
- Temporary Shutdown Areas

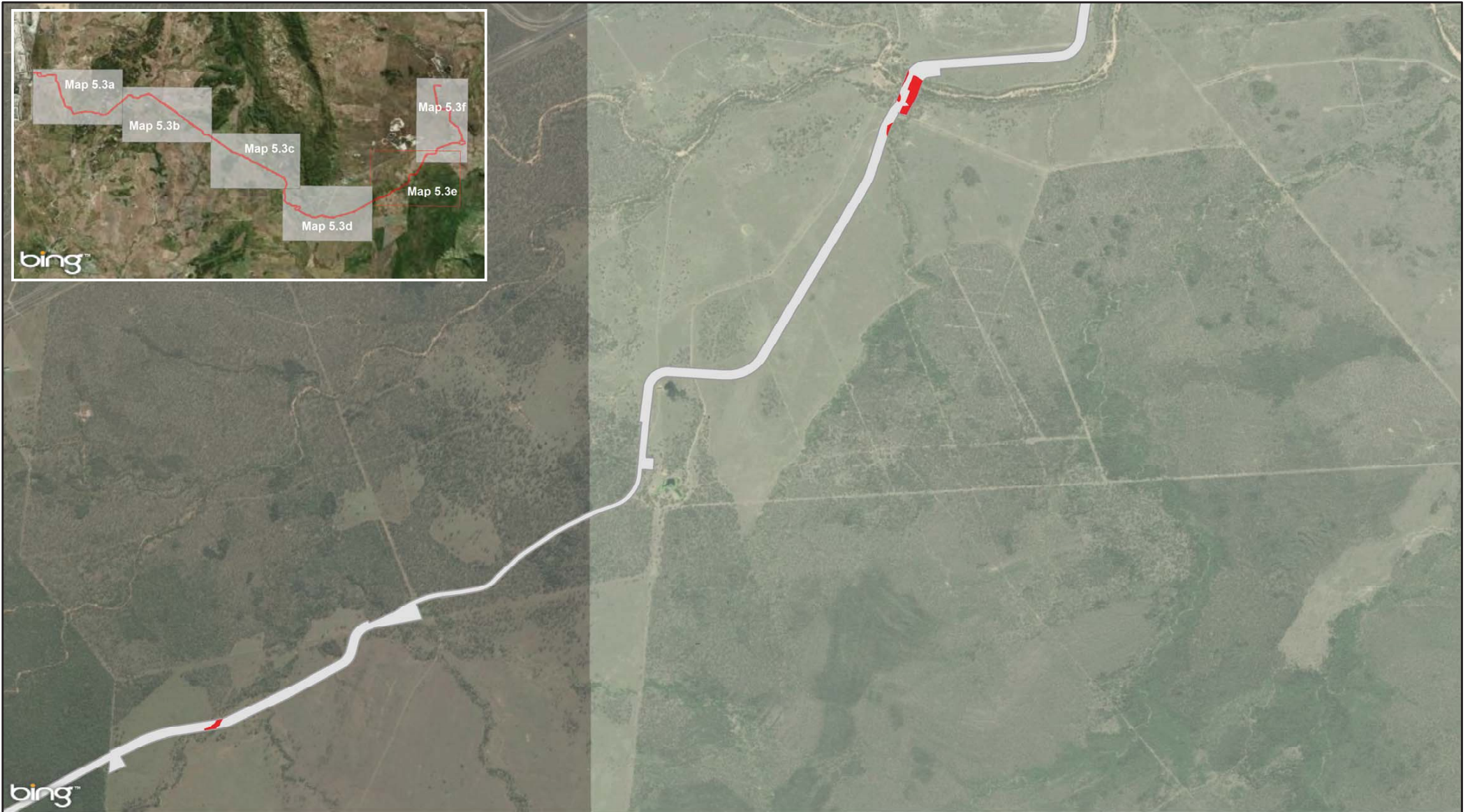
Drawn By: MG Reviewed by: AC Date: 21-Sep-16

Figure: 5.3d
 Title: Modelled and ground-truthed Squatter Pigeon (Southern Subspecies)

Project: BMC Dragline Move Project
 Terrestrial Ecology MNES Assessment

Client: Advisian





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Coordinate System: GCS GDA 1994
 Datum: GDA 1994
 Units: Degree



1:30,000 at A4
 0 165 330 660 990 1,320
 Meters

LEGEND

Squatter Pigeon (Southern Subspecies)

- Core Habitat
- Essential Habitat
- General Habitat
- Unlikely Habitat

Dragline Corridor Revision C

Drawn By: MG Reviewed by: AC Date: 21 Sep 16

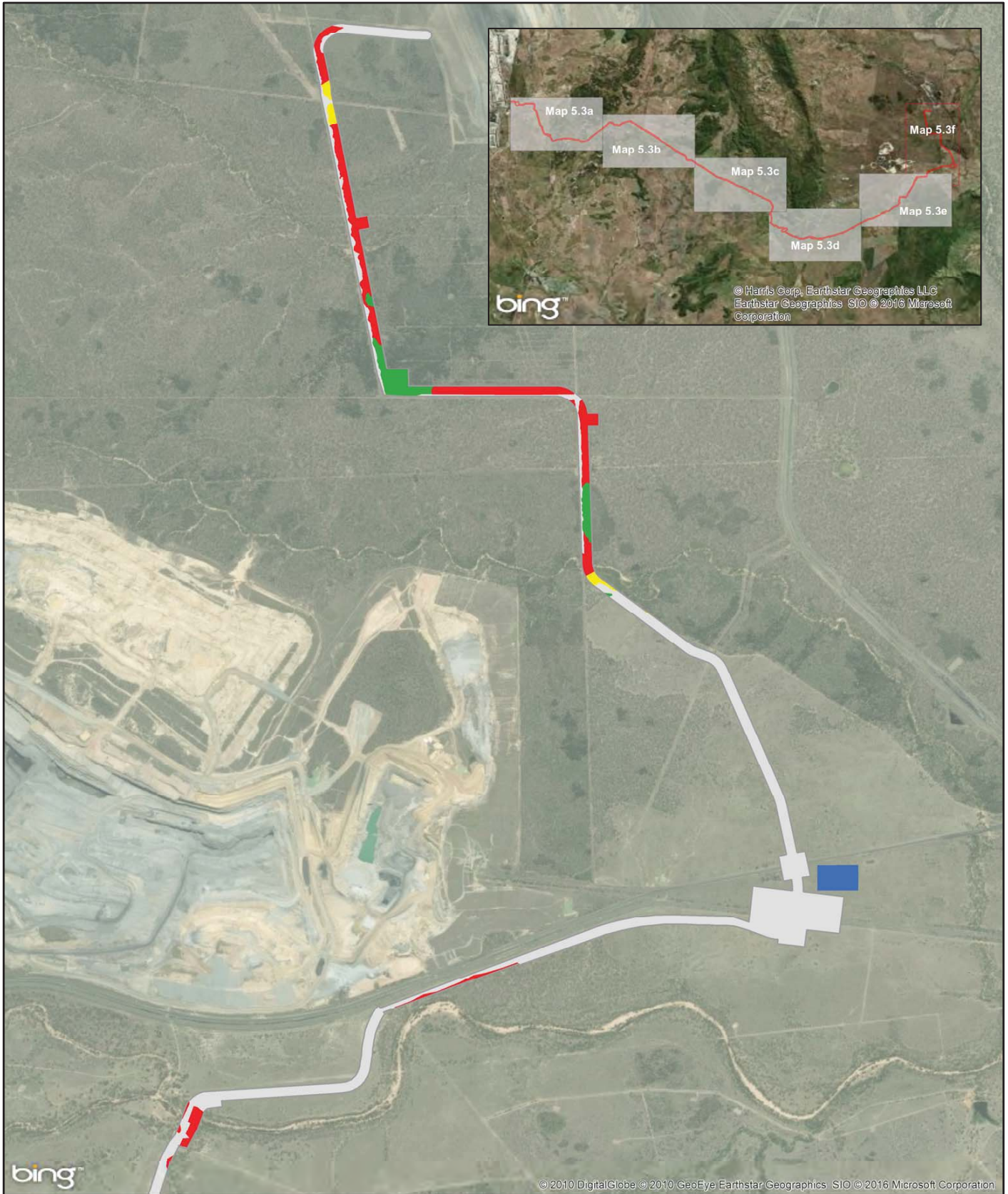
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Figure: 5.3e
 Title: Modelled and ground-truthed Squatter Pigeon (Southern Subspecies)

Project: BMC Dragline Move Project
 Terrestrial Ecology MNES Assessment

Client: Advisian

BAAM
 ECOLOGICAL CONSULTANTS



Notes:

Coordinate System: GCS GDA 1994
Datum: GDA 1994
Units: Degree



1:30,000 at A4
0 0.15 0.3 0.6 0.9 1.2
Kilometers

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Legend

Squatter Pigeon (Southern Subspecies)	General Habitat	Dragline Corridor Revision C
Core Habitat	Unlikely Habitat	Temporary Shutdown Areas
Essential Habitat		

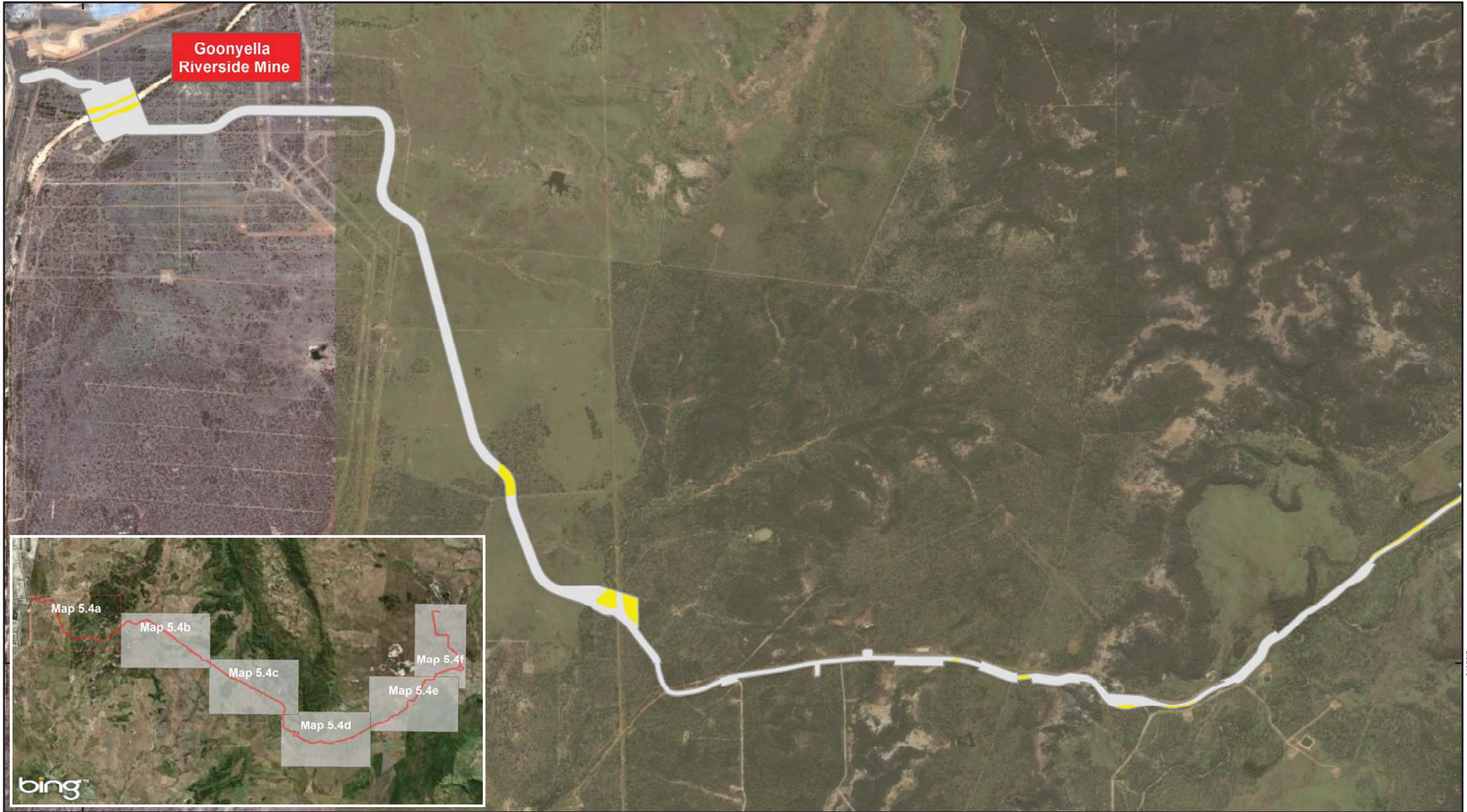
Drawn By: MG Reviewed by: AC Date: 21-Sep-16

Document Location: C:\Users\Owner\Documents\Clients\BAM\Dragline\BAA\A3_Portrait_dragline.mxd; Date: 21-Sep-16 1:00:30 AM

Figure: **5-3f**
Title: Modelled and ground-truthed Squatter Pigeon (Southern Subspecies)
Project: **BMC Dragline Move Project Terrestrial Ecology MNES Assessment**
Client: **Client LOGO or name**



148°0'E



Goonyella
Riverside Mine

Map 5.4a

Map 5.4b

Map 5.4c

Map 5.4d

Map 5.4e

Map 5.4f

bing™

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Coordinate System: GCS GDA 1994
 Datum: GDA 1994
 Units: Degree



1:30,000 at A4
 0 165 330 660 990 1,320
 Meters

LEGEND

- Koala**
- Essential Habitat
 - Unlikely Habitat
 - Dragline Corridor Revision C
 - Temporary Shutdown Areas

Drawn By: MG Reviewed by: AC Date: 21 Sep-16

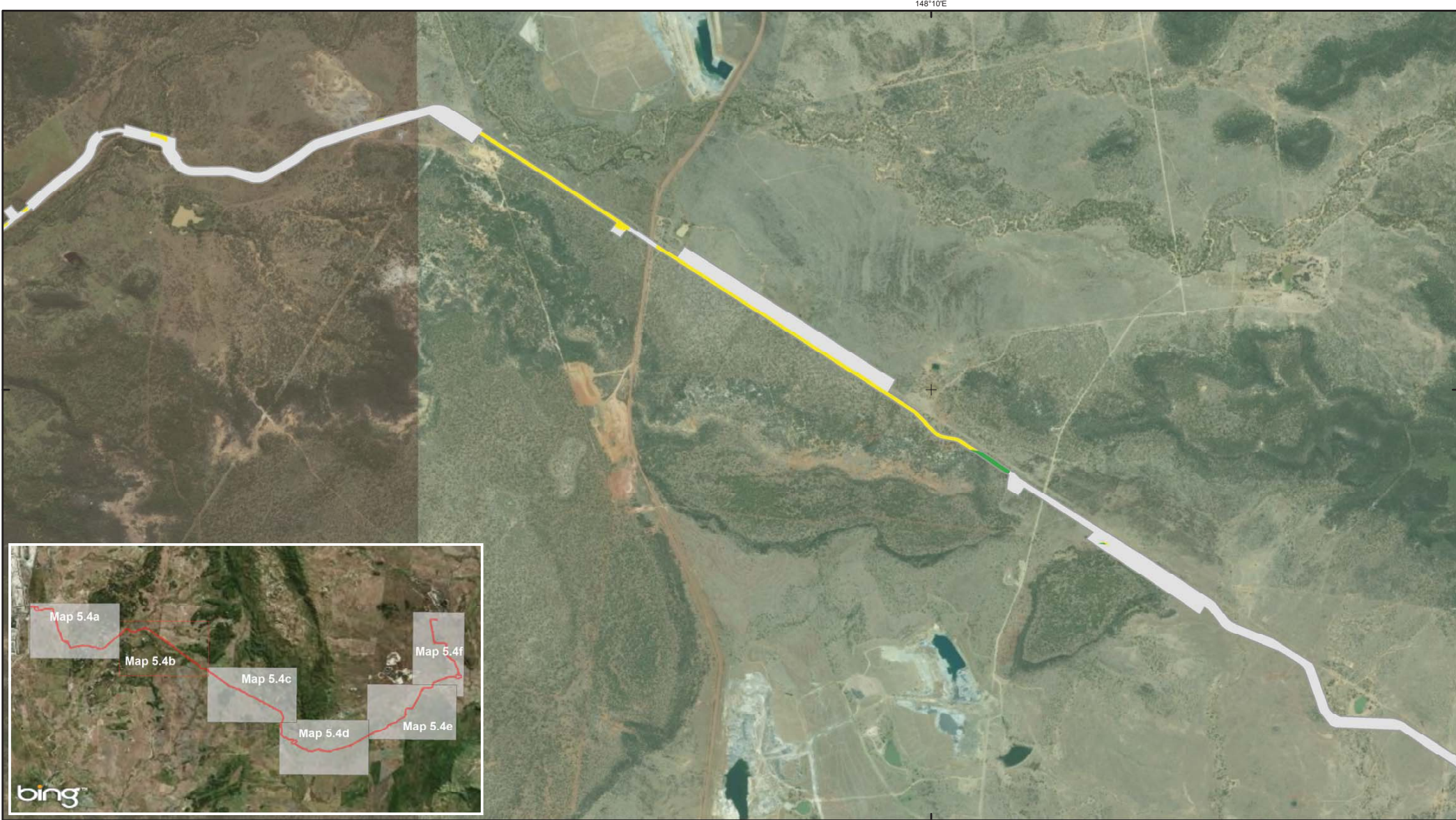
Document Location: C:\Users\Owner\Documents\Clients\BAAM\Dragline\BAAM_A3_Landscape_series_Dragline.mxd Date: 20-Sep-16 11:18:24 PM

Figure: 5.4a
 Title: Modelled and ground-truthed Koala habitat within the Dragline Route

Project: BMC Dragline Move Project
 Terrestrial Ecology MNES Assessment

Client: Advisian





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Coordinate System: GCS GDA 1994
 Datum: GDA 1994
 Units: Degree
 1:30,000 at A4
 0 165 330 660 990 1,320
 Meters

LEGEND

- Koala**
- Essential Habitat
 - General Habitat
 - Unlikely Habitat
 - Dragline Corridor Revision C
 - Temporary Shutdown Areas

Figure: 5.4b
 Title: Modelled and ground-truthed Koala habitat within the Dragline Route
 Project: BMC Dragline Move Project Terrestrial Ecology MNES Assessment
 Client: Advisian





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Coordinate System: GCS GDA 1994
 Datum: GDA 1994
 Units: Degree



1:30,000 at A4
 0 165 330 660 990 1,320
 Meters

LEGEND

- Koala**
- Dragline Corridor Revision C
 - Essential Habitat
 - Unlikely Habitat

Drawn By: MG Reviewed by: AC Date: 21 Sep 16

Document Location: C:\Users\Owner\Documents\Clients\BAAM\Dragline\BAAM_A3_Landscape_series_Dragline.mxd Date: 21-Sep-16 12:10:23 AM

Figure: 5.4c
 Title: Modelled and ground-truthed Koala habitat within the Dragline Route

Project: BMC Dragline Move Project
 Terrestrial Ecology MNES Assessment

Client: Advisian





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Coordinate System: GCS GDA 1994
 Datum: GDA 1994
 Units: Degree



1:30,000 at A4
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 Meters

LEGEND

- Koala**
- Essential Habitat
 - Temporary Shutdown Areas
 - Unlikely Habitat
 - Dragline Corridor Revision C

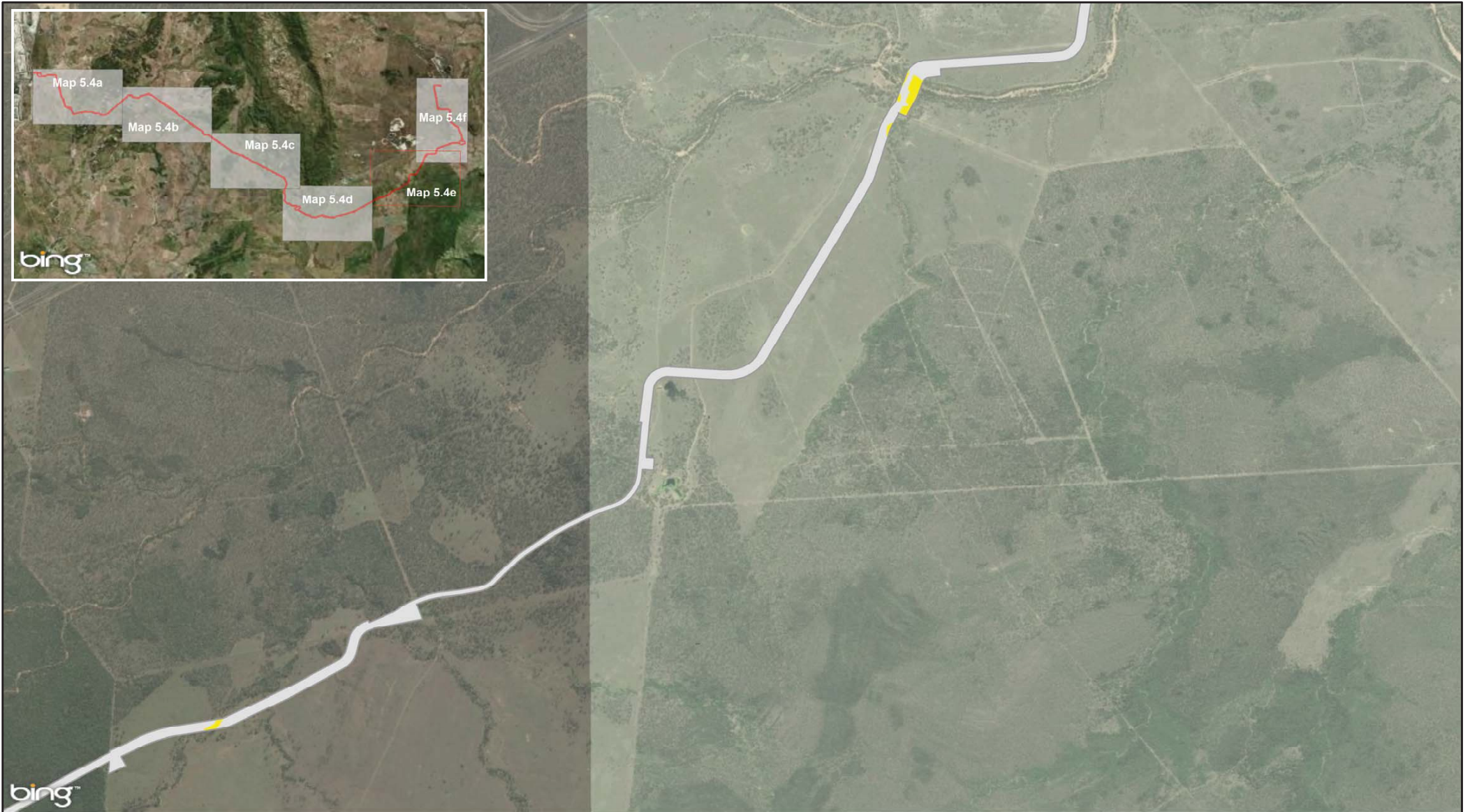
Drawn By: MG Reviewed by: AC Date: 21-Sep-16

Figure: 5.4d
 Title: Modelled and ground-truthed Koala habitat within the Dragline Route

Project: BMC Dragline Move Project
 Terrestrial Ecology MNES Assessment

Client: Advisian





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Coordinate System: GCS GDA 1994
 Datum: GDA 1994
 Units: Degree



1:30,000 at A4
 0 165 330 660 990 1320
 Meters

LEGEND

- Dragline Corridor Revision C
- Essential Habitat
- Unlikely Habitat

Drawn By: MG Reviewed by: AC Date: 21 Sep 16

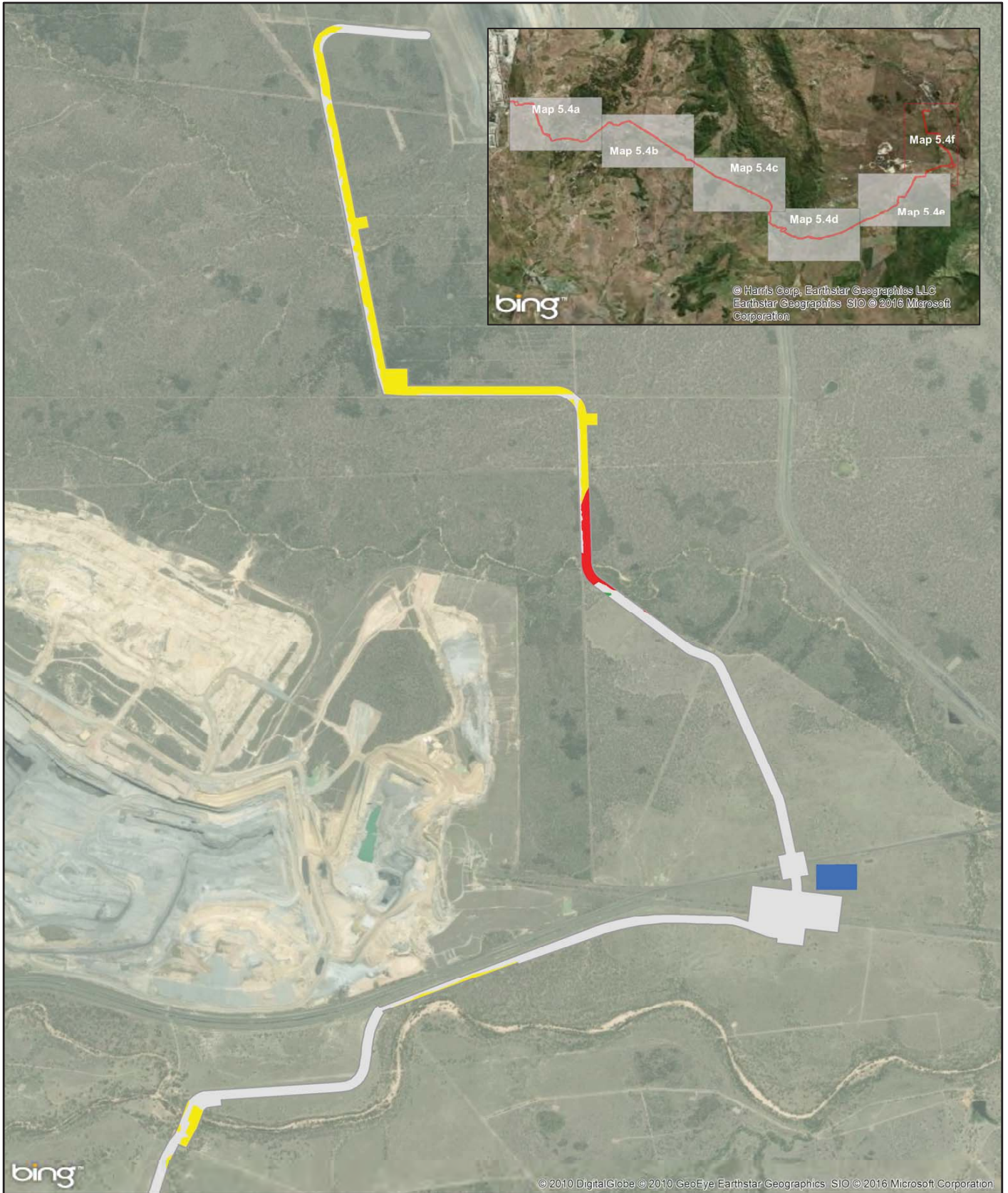
Document Location: C:\Users\Owner\Documents\Clients\BAAM\Dragline\BAAM_A3_Landscape_series_Dragline.mxd Date: 21-Sep-16 12:10:23 AM

Figure: 5.4e
 Title: Modelled and ground-truthed Koala habitat within the Dragline Route

Project: BMC Dragline Move Project
 Terrestrial Ecology MNES Assessment

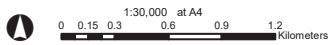
Client: Advisian





Notes:

Coordinate System: GCS GDA 1994
 Datum: GDA 1994
 Units: Degree



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Legend

- Dragline Corridor Revision C
- Core Habitat
- Temporary Shutdown Areas
- Essential Habitat
- General Habitat
- Unlikely Habitat

Drawn By: MG Reviewed by: AC Date: 21-Sep-16

Document Location: C:\Users\Owner\Documents\Clients\BAAM\Dragline\BAAM_A3_Portrait_dragline.mxd; Date: 21-Sep-16 1:00:30 AM

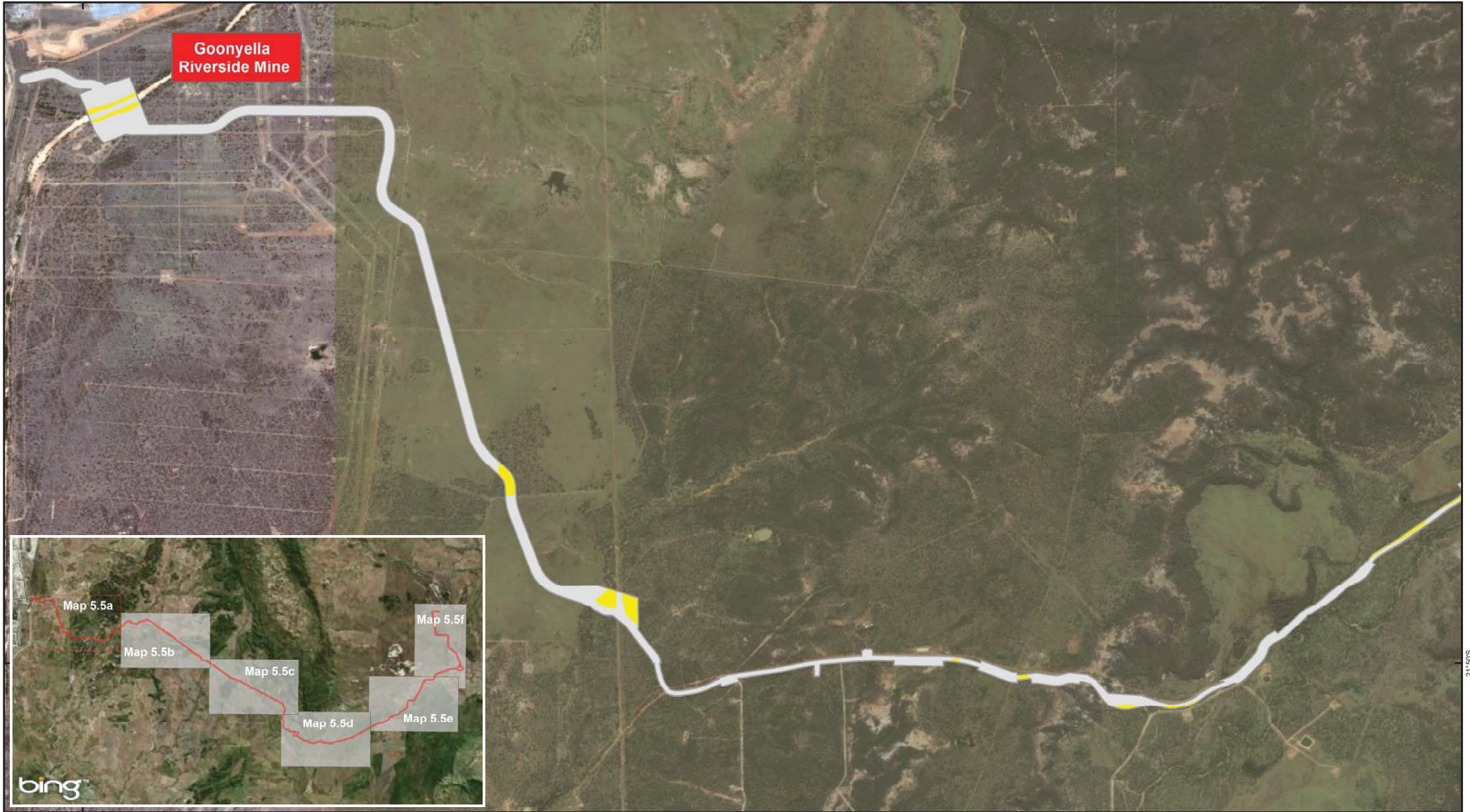
Figure: **5-4f**
 Title: Modelled and ground-truthed Koala habitat within the Dragline Route

Project: **BMC Dragline Move Project Terrestrial Ecology MNES Assessment**

Client: **Client LOGO or name**



148°0'E



Goonyella
Riverside Mine

Map 5.5a

Map 5.5b

Map 5.5c

Map 5.5d

Map 5.5e

Map 5.5f

bing™

Notes:
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Coordinate System: GCS GDA 1994
 Datum: GDA 1994
 Units: Degree



1:30,000 at A4
 0 165 330 660 990 1,320
 Meters

LEGEND

- Yakka Skink**
- Dragline Corridor Revision C
 - Essential Habitat
 - Temporary Shutdown Areas
 - Unlikely Habitat

Drawn By: MG Reviewed by: AC Date: 21-Sep-16

Figure: 5.5a
 Title: Modelled and ground-truthed Yakka Skink habitat within the Dragline Route

Project: BMC Dragline Move Project
 Terrestrial Ecology MNES Assessment

Client: Advisian





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Coordinate System: GCS GDA 1994
 Datum: GDA 1994
 Units: Degree



LEGEND

- Yakka Skink**
- Essential Habitat
- Unlikely Habitat
- Dragline Corridor Revision C
- Temporary Shutdown Areas

Figure: 5.5b
 Title: Modelled and ground-truthed Yakka Skink habitat within the Dragline Route
 Project: BMC Dragline Move Project Terrestrial Ecology MNES Assessment
 Client: Advisian



Drawn By: MG Reviewed by: AC Date: 21-Sep-16



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Coordinate System: GCS GDA 1994
 Datum: GDA 1994
 Units: Degree



1:30,000 at A4
 0 165 330 660 990 1,320
 Meters

LEGEND

Yakka Skink

- Essential Habitat
- Unlikely Habitat

Dragline Corridor Revision C

Drawn By: MG Reviewed by: AC Date: 21 Sep 16

Document Location: C:\Users\Owner\Documents\Clients\BAAM\Dragline\BAAM_A3_Landscape_series_Dragline.mxd Date: 21-Sep-16 12:10:23 AM

Figure: 5.5c
 Title: Modelled and ground-truthed Yakka Skink habitat within the Dragline Route

Project: BMC Dragline Move Project
 Terrestrial Ecology MNES Assessment

Client: Advisian





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Coordinate System: GCS GDA 1994
 Datum: GDA 1994
 Units: Degree



1:30,000 at A4
 0 165 330 660 990 1,320
 Meters

LEGEND

- Yakka Skink**
- Essential Habitat
- General Habitat
- Unlikely Habitat
- Dragline Corridor Revision C
- Temporary Shutdown Areas

Drawn By: MG Reviewed by: AC Date: 21-Sep-16

Figure: 5.5d
 Title: Modelled and ground-truthed Yakka Skink habitat within the Dragline Route

Project: BMC Dragline Move Project
 Terrestrial Ecology MNES Assessment

Client: Advisian





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Coordinate System: GCS GDA 1994
 Datum: GDA 1994
 Units: Degree



1:30,000 at A4
 0 165 330 660 990 1320
 Meters

LEGEND

Yakka Skink

- Essential Habitat
- Unlikely Habitat

Dragline Corridor Revision C

Drawn By: MG Reviewed by: AC Date: 21-Sep-16

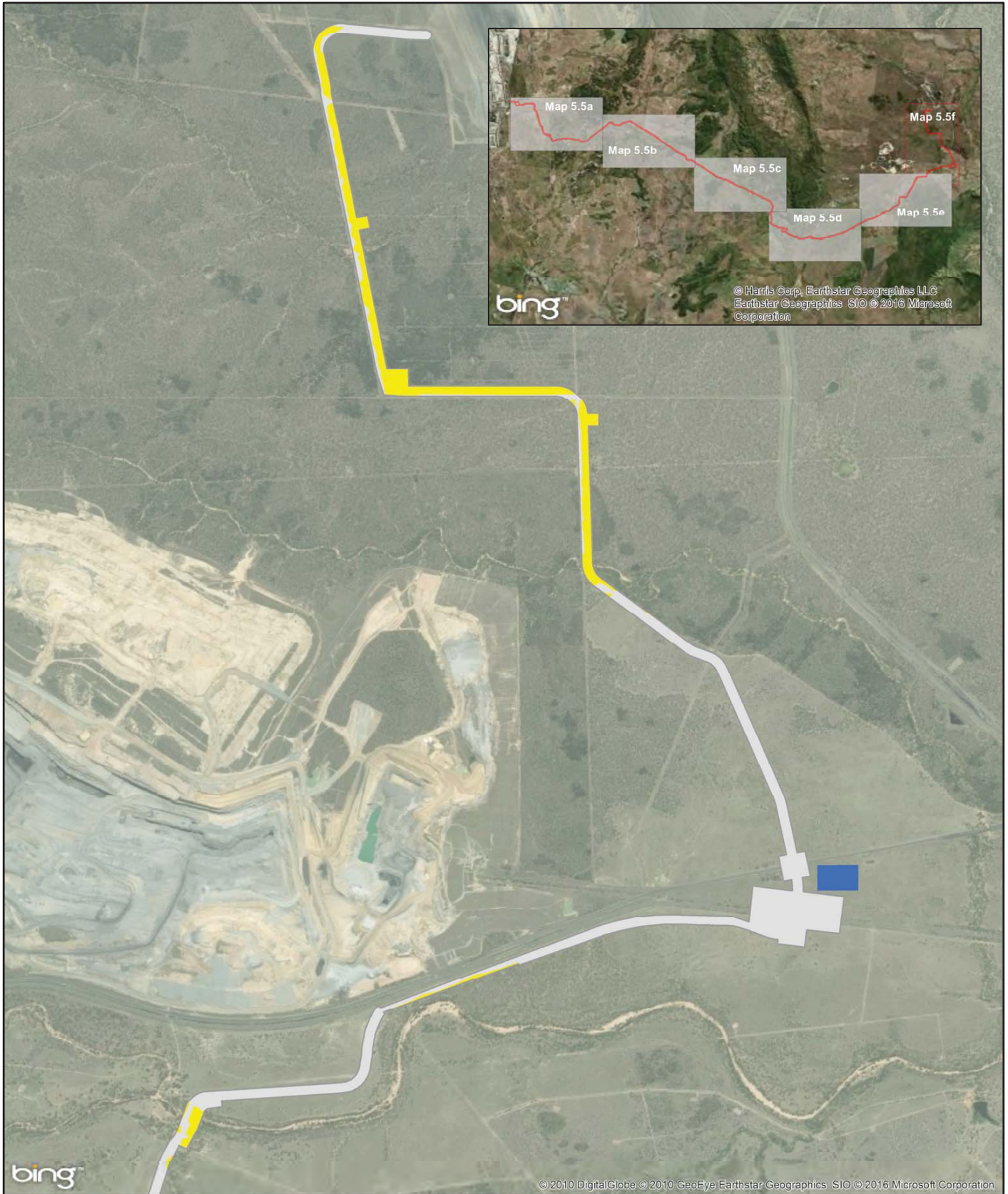
Document Location: C:\Users\Owner\Documents\Clients\BAAM\Dragline\BAAM_A3_Landscape_series_Dragline.mxd Date: 21-Sep-16 12:10:23 AM

Figure: 5.5e
 Title: Modelled and ground-truthed Yakka Skink habitat within the Dragline Route

Project: BMC Dragline Move Project
 Terrestrial Ecology MNES Assessment

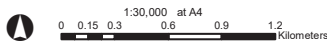
Client: Advisian





Notes:

Coordinate System: GCS GDA 1994
Datum: GDA 1994
Units: Degree



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Legend

- Dragline Corridor Revision C
- Essential Habitat
- Temporary Shutdown Areas
- Unlikely Habitat

Figure: **5-5f**
 Title: Modelled and ground-truthed Yakka Skink habitat within the Dragline Route
 Project: **BMC Dragline Move Project Terrestrial Ecology MNES Assessment**
 Client: **Client LOGO or name**



Drawn By: MG Reviewed by: AC Date: 21-Sep-16

Document Location: C:\Users\Owner\Documents\Clients\BAAM\Dragline\BAAM_A3_Portrait_dragline.mxd; Date: 21-Sep-16 1:49:00 AM

APPENDIX E

EPBC Act Assessment of Significant Impacts – Listed Threatened Ecological Communities and Threatened and Migratory Species

Table E.1 Brigalow (*Acacia harpophylla* dominant and co-dominant communities) assessment against Significant Impact Guidelines 1.1

Table E.2 Ornamental Snake *Denisonia maculata* assessment against significant Impact Guidelines 1.1

Table E.3 Squatter Pigeon (Southern Subspecies) *Geophaps scripta scripta* assessment against Significant Impact Guidelines 1.1

Table E.4 Koala *Phascolarctos cinereus* assessment against Significant Impact Guidelines 1.1 & EPBC Act referral guidelines for the vulnerable koala

Table E.5 Yakka Skink *Egernia rugosa* assessment against Significant Impact Guidelines 1.1

Table E.6 EPBC Act Assessment of Impact Significance on Listed Migratory Species in the Project Area

Table E.1 Brigalow (Acacia harpophylla dominant and co-dominant) assessment against Significant Impact Guidelines 1.1

Criteria	Assessment of Impact Significance
<p>An action is likely to have a significant impact on an endangered ecological community if there is a real chance or possibility that it will:</p>	<p>Brigalow (Acacia harpophylla dominant and co-dominant) communities</p> <p>Description</p> <p>Brigalow is the commonly accepted name for the species <i>Acacia harpophylla</i> and the vegetation in which this species is dominant or co-dominant. Brigalow is either dominant in the tree layer or co-dominant with other species such as <i>Belah Casuarina cristata</i>, other species of <i>Acacia</i>, or <i>Eucalyptus</i> species (Butler, 2007).</p> <p>The structure of the community ranges from open forest to open woodland with a tree layer between about 9 m in low rainfall areas to 25 m in higher rainfall areas (Butler, 2007). A prominent shrub layer is usually present often comprising vine thicket species such as <i>Geijera parviflora</i>, <i>Pittosporum angustifolium</i>, <i>Melaleuca bracteata</i>, <i>Alectryon oleoifolius</i> subsp. <i>elongatus</i>, <i>Alectryon diversifolius</i>, <i>Elaeodendron australe</i> var. <i>integrifolium</i>, <i>Ehretia membranifolium</i> as well as the weed <i>Optunia stricta</i>. Ground cover percentage is variable with typical species being <i>Paspalidium caespitosum</i>, <i>Ancistrachne uncinulata</i>, <i>Aristida</i> spp., <i>Erychleana tomentosa</i>, <i>Rhagodia spinescens</i>, <i>Einadia hastata</i>, and <i>Solanum parvifolium</i>, although <i>Harrisia martini</i>* and <i>Bryophyllum delagoense</i>* may be typically abundant.</p> <p>The Brigalow ecological community occurs roughly within the 500-750 mm annual rainfall belt with a predominance of summer rainfall (Butler, 2007).</p> <p>Community condition is impacted by edge effects created by massive fragmentation with invasion of declared weed species such as <i>Opuntia stricta</i> and <i>O. tomentosa</i>* and <i>Harrisia martini</i>* together with canopy gaps, caused by canopy dieback and senescence in the absence of recruitment (TSSC 2001a).</p> <p>Distribution</p> <p>The ecological community extends from south of Charters Towers in Queensland, in a broad swathe east of Blackall, Charleville and Cunnamulla, south to northern New South Wales near Narrabri and Bourke. In Queensland, it occurs predominantly within the Brigalow Belt North, Brigalow Belt South, Darling Riverine Plains and Southeast Queensland bioregions, with smaller amounts in the Mitchell Grass Downs, Mulga Lands and Einasleigh Uplands bioregions (Butler, 2007).</p> <p>In Queensland, a number of regional ecosystems (REs) are considered to form the Brigalow ecological community.</p> <p>Community Assessment Approach</p> <p>A desktop study summarised current terrestrial ecological values within the Project area to inform subsequent ground surveys and impact assessment. Data relevant to the distribution and ecology of Brigalow ecosystems was sourced through a number of relevant and publicly available data sources and relevant literature and online sources. This was utilised in conjunction with a review of available aerial imagery and a field survey within the study area, with a subsequent amendments to the Queensland Herbarium vegetation mapping to increase the resolution of available vegetation mapping and add confidence to the assessment of likely impacts to the Brigalow Ecological Community. In accordance with the listing advice, only patches >15 years of age matching a Queensland Regional Ecosystem that is known to correspond to the EPBC-listed community, and in which <i>Acacia harpophylla</i> was included as a dominant or co-dominant part of the vegetation were considered to represent the community. Patches that did not meet the condition criteria (i.e. those with ≥50% cover of exotic plants in canopy, shrub or ground layers) were also excluded.</p>

Criteria	Assessment of Impact Significance
	<p>Community Assessment Results</p> <p>Within the Project area this community is restricted to areas ground-truthed as Regional Ecosystems (REs) 11.4.9, 11.9.1 and 11.9.5 dominated by native vegetation in all layers. The mapped occurrence of this community covers an area of approximately 190 ha within the broad area of investigation (a 500 m buffer of the centreline of the study area) (Figure 5.1). Eight separate patches were identified in total (one was divided into two subpatches, separated by a narrow track). These patches were found to be either consistent with remnant or mature regrowth and were generally in good condition, with patchy occurrences of <i>Harrisia Cactus</i>, <i>Parthenium</i> and <i>Buffel Grass</i> in association with some patches.</p> <p>The broad investigation area is approximately 8740 ha. Approximately 645 ha of this area are estimated to be impacted by the Project footprint (which equates to 7.4% of the area). Through the application of an unbiased, uniformly distributed clearing model, it would be reasonable to expect that 7.4% of the 190 ha (which equates to approximately 14 ha) of the community within the broad investigation area would be impacted. However, the impact area has been positioned to prioritise the avoidance of the endangered community, as well as other MNES. As a result, the overall impact has been reduced to 9.7 ha (or 5.1%), which is estimated to represent <0.05% of the equivalent REs that correspond to the TEC in the Northern Bowen Basin subregion.</p>
Reduce the extent of an ecological community.	<p>The clearing of vegetation corresponding to the <i>Brigalow</i> (<i>Acacia harpophylla</i>) dominant and co-dominant) community within the study area is estimated to cover a total area of 9.7 ha. Given its Endangered status under Commonwealth legislation, any reduction in the extent of this ecological community is a significant impact that cannot be reduced to acceptable levels through the mitigation of impacts on retained patches. Therefore, the proposed must be considered to have a significant impact in this category.</p>
Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines.	<p>The Project footprint has been sited to avoid fragmentation of any patches of the community, with one exception. A patch identified as being consistent with RE 11.4.9 in South Walker Creek will be fragmented into two patches. The patch is approximately 13 ha in size and currently consists two subpatches, separated by a 26 m wide track. The project footprint will widen this track to form a total gap of up to 80 m, with a disturbance area of approximately 3 ha. This will result in two separated patches, of approximately 8 ha and 2 ha respectively. For the other seven patches expected to be impacted, disturbance to the community will only remove a portion of the edges of any patch. Nevertheless, the chance of a significant impact due to fragmentation is considered likely.</p>
Adversely affect habitat critical to the survival of an ecological community.	<p>The Project footprint requires only the partial clearing of seven discrete patches of the TEC and will not reduce the size of any patch to <0.5 ha. Therefore, all existing patches of this community will be retained in the landscape, and there will not be an overall reduction in habitat critical to the survival of the community. The chance of significant impact in this category is considered to be unlikely.</p>
Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of	<p>The transport of the dragline will be a one-off impact, requiring a minimal area of groundwater to ensure safe passage. It is not expected to result in changes to hydrology to the extent that the community will be impacted in any way by changes in water or nutrients. In addition, it is not considered to be the type of impact that would result in changes to groundwater levels. Therefore, the likelihood of significant impact in this category is considered to be unlikely.</p>

Criteria	Assessment of Impact Significance
surface water drainage patterns.	
Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting.	The Project footprint requires only the partial clearing of seven discrete patches of the TEC and will not reduce the size of any patch to <0.5 ha. Therefore, all existing patches of this community will be retained in the landscape, and there will not be an overall reduction in the extent of the community. The chance of significant impact in this category is considered to be unlikely .
Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: <ul style="list-style-type: none"> - Assisting invasive species, that are harmful to the listed ecological community, to become established; or - Causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community. 	The transport of the dragline will be a one-off impact, requiring a defined area clearing and sometimes subsequent groundwork to ensure safe passage. This has the potential to promote the spread of invasive weeds; however weed control measures will be implemented as part of the Environmental Management Plan. The Project is not expected to result in significant changes to the vegetation and it is not expected to compromise the integrity of the community. Therefore, the likelihood of significant impact to the quality of the relevant patches of the community as a result of this Project is considered to be unlikely .
Interfere with the recovery of an ecological community.	The Project footprint requires only the partial clearing of seven discrete patches of the TEC and will not reduce the size of any patch to <0.5 ha. Therefore, all existing patches of this community will be retained in the landscape, and there will not be an overall reduction in the extent of the community. The chance of significant impact or interference with the recovery of this community is considered to be unlikely .

Table E.2 Ornamental Snake *Denisonia maculata* assessment against Significant Impact Guidelines 1.1

Criteria	Assessment of significance
<p>An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:</p>	<p>This species occurs in the Brigalow Belt between Charters Towers and Rockhampton where it is associated with seasonally inundated areas, such as gilgais and channel beds in low-lying areas (Wilson 2005; Wilson and Swan 2008). The species is threatened by habitat loss, fragmentation and degradation, as well as changes to hydrology and water quality, cane toad, predation by feral species and weed invasion (Department of the Environment 2016a).</p> <p>Species Assessment</p> <p>Data relevant to the habitat, distribution and ecology of the species was sourced through relevant literature and online sources, as well as a number of relevant and publicly available data sources including the Atlas of Living Australia, EPBC online search tool and the Queensland Government Wildnet database. This information, together with a review of aerial photography and existing vegetation mapping by the Queensland Herbarium assisted in the prioritisation of sites for field habitat assessments throughout the Project area during August–September 2016.</p> <p>Determination of the potential occurrence of Ornamental Snake involved a general assessment of habitat features that could potentially support this species. There are several database records in the vicinity of the study area, although the presence of the species could not be confirmed during the field surveys due to the lineal nature and significant size of the study area and the known patchiness of the occurrence of the species. It was considered that a more conservative approach was to model potential habitat and ground-truth the presence of known habitat factors. In ground-truthing modelling results the presence of suitable habitat was confirmed in a number of locations.</p> <p>Modelling and ground-truthing potential habitat in the landscape surrounding the study area (500 m buffer relative to the centre line of the study area corridor) has identified approximately 1235 ha as preferred habitat for Ornamental Snake (comprising 4 ha of core habitat and 1231 ha of essential habitat). The broad investigation area is approximately 8740 ha. Approximately 645 ha of this area are estimated to be impacted by the Project footprint (which equates to 7.4% of the area). Through the application of an unbiased, uniformly distributed clearing model, it would be reasonable to expect that 7.4% of the 1235 ha (which equates to approximately 91 ha) of preferred habitat within the broad investigation area would be impacted. However, the impact area has been positioned to prioritise the avoidance of preferred habitat for MNES. As a result, the overall impact has been reduced to 52.3 ha (or 4.2%), which is estimated to represent approximately 0.1% of the equivalent remnant REs that correspond to preferred habitat for this species in the Northern Bowen Basin subregion.</p> <p>There are several database records from the vicinity of the study area. Given that the species is patchy in the surrounding landscape, it must be considered that there is potential for the population in the study area to be an important population. Therefore, there is potential for a significant impact leading to a long-term decrease in the size of an important population of this species.</p>
<p>Lead to a long-term decrease in the size of an important population of a species.</p>	<p>The width of the disturbance is expected to be confined to approximately 40 m in most areas and the dragline move will be a one-off impact. Therefore there is a potential that the proposed activity would result in reducing the overall area of occupancy of an important population.</p>
<p>Reduce the area of occupancy of an important population.</p>	<p>The width of the disturbance is expected to be confined to approximately 40 m in most areas and the dragline move will be a one-off impact. Therefore the activity is expected to be unlikely to result in fragmentation of an existing important population into two or more populations.</p>
<p>Fragment an existing important population into two or more populations.</p>	<p>Adversely affect habitat critical to the survival of a species.</p>

Criteria	Assessment of significance
<p>Disrupt the breeding cycle of an important population.</p>	<p>There are several database records from the vicinity of the study area. Given that the species is patchy in the surrounding landscape, it must be considered that there is potential for the population in the study area to be an important population and that the breeding cycle of such a population could potentially be impacted. Therefore, there is potential for a disruption to the breeding cycle of an important population.</p>
<p>Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.</p>	<p>The width of the disturbance is expected to be confined to approximately 40 m in most areas and the dragline move will be a one-off impact. In addition, suitable habitat is patchy, but widespread across the broader study area (Figure 5.2). Therefore the activity is expected to be unlikely to result in significant modification, destruction, isolation or limits to availability of habitat to the extent that the species is likely to decline.</p>
<p>Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.</p>	<p>Wherever possible, the route of the proposed dragline move follows that of a previous dragline move which was undertaken approximately 16 years prior to this assessment. It is not anticipated that the currently proposed move will result in an increase in invasive predators or weeds in addition to those that are already widespread and established in the potential habitat for this species and the chances of a significant impact in this category are considered to be unlikely.</p>
<p>Introduce disease that may cause the species to decline.</p>	<p>The width of the disturbance is expected to be confined to approximately 40 m in most areas and the dragline move will be a one-off impact. Therefore the activity is expected to be unlikely to result in introducing a disease that may cause the species to decline.</p>
<p>Interfere substantially with the recovery of the species.</p>	<p>The corridor of the proposed dragline move follows that of a previous dragline move, which was undertaken approximately 16 years prior to this assessment, with minimal deviation from the previous route. The width of the disturbance is expected to be confined to approximately 40 m in most areas and the dragline move will be a one-off impact. Therefore, whilst the study area may support an important population of the species, it is considered unlikely that the proposed impact would interfere substantially with the recovery of the species.</p>

Table E.3 Squatter Pigeon (Southern Subspecies) *Geophaps scripta* assessment against Significant Impact Guidelines 1.1

Criteria	Assessment of significance
<p>An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:</p>	<p>Squatter Pigeon southern occurs singly, in pairs or in small groups in grassy woodland habitats throughout its range (Pizzey and Knight 2004). Its distribution has suffered a significant contraction since European settlement and it is threatened by habitat loss, fragmentation and degradation, as well as predation and weed invasion (Department of the Environment 2016b).</p> <p>Species Assessment</p> <p>Data relevant to the habitat, distribution and ecology of the species was sourced through relevant literature and online sources and a number of relevant and publicly available data sources including the Atlas of Living Australia, EPBC online search tool and the Queensland Government Wildnet database. This information, together with a review of aerial photography and existing vegetation mapping by the Queensland Herbarium assisted in the prioritisation of sites for field habitat assessments throughout the Project area during August–September 2016.</p> <p>Determination of the potential occurrence of Squatter Pigeon involved timed bird surveys throughout the study area, as well as opportunistic observations on foot and from a vehicle. Numerous database records have been obtained for the study area and several sightings were made during the field survey. This indicates that the species is relatively prevalent in the study area, just as it is across much of central and north Queensland (a different subspecies occurs even further north).</p> <p>Modelling and ground-truthing vegetation mapping in the landscape surrounding the study area (500 m buffer relative to the centre line of the study area corridor) has identified approximately 3354 ha as preferred habitat for Squatter Pigeon (comprising 2167 ha of core habitat and 1187 ha of essential habitat). The broad investigation area is approximately 8740 ha. Approximately 645 ha of this area are estimated to be impacted by the Project footprint (which equates to 7.4% of the area). Through the application of an unbiased, uniformly distributed clearing model, it would be reasonable to expect that 7.4% of the 3354 ha (which equates to approximately 263 ha) of preferred habitat within the broad investigation area would be impacted. However, the impact area has been positioned to prioritise the avoidance of preferred habitat for MNES. As a result, the overall impact has been reduced to 89.2 ha (or 2.6%), which is estimated to represent approximately <0.05% of the equivalent remnant REs that correspond to preferred habitat for this species in the Northern Bowen Basin subregion.</p>
<p>Lead to a long-term decrease in the size of an important population of a species.</p>	<p>The width of the disturbance is expected to be confined to approximately 40 m in most areas and the dragline move will be a one-off impact. There is ample habitat for Squatter Pigeon in the broader landscape and it is considered unlikely that a total clearing area of up to 89 ha with a narrow width of this nature would lead to a long-term decrease in the size of an important population of this species.</p>
<p>Reduce the area of occupancy of an important population.</p>	<p>The width of the disturbance is expected to be confined to approximately 40 m in most areas and the dragline move will be a one-off impact. There will only be a minor loss of habitat in a landscape that otherwise contains abundant resources for Squatter Pigeon. Therefore the activity is expected to be unlikely to result in reducing the overall area of occupancy of an important population.</p>
<p>Fragment an existing important population into two or more populations.</p>	<p>Squatter Pigeon (southern) across the remainder of its range, at least in central and north Queensland is expected to represent a single population. It is considered that the study area occupies a very minor portion of the habitat occupied by this population. The width of the disturbance is expected to be confined to approximately 40 m in most areas and the dragline move will be a one-off impact. There will only be a minor loss of habitat in the landscape and it is not expected to create a barrier for the species given the tendency for individuals to disperse readily into and across areas of non-remnant vegetation. Therefore the activity is expected to be unlikely to result in fragmentation of an existing important population into two or more populations.</p>

Criteria	Assessment of significance
Adversely affect habitat critical to the survival of a species	The width of the disturbance is expected to be confined to approximately 40 m in most areas and the dragline move will be a one-off impact. Squatter Pigeon habitat is widespread in the overall landscape and it is considered unlikely that a total clearing area of up to 98 ha with a narrow width of this nature surrounded by a mixture of pastoral land and remnant vegetation would adversely affect habitat critical to the survival of a species.
Disrupt the breeding cycle of an important population.	The width of the disturbance is expected to be confined to approximately 40 m in most areas and the dragline move will be a one-off impact. Therefore the activity is expected to be unlikely to result in a disruption to the breeding cycle of an important population.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The width of the disturbance is expected to be confined to approximately 80 m in most areas and the dragline move will be a one-off impact. In addition, suitable habitat is widespread throughout the broader study area (Figure 5.3). The Project is not expected to result in any additional barriers to dispersal or significant isolation and exposure to individual koalas in a landscape that is already a mixture of pastoral land and predominantly sparse remnant vegetation. Therefore the activity is expected to be unlikely to result in significant modification, destruction, isolation or limits to availability of habitat to the extent that the species is likely to decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	Wherever possible, the route of the proposed dragline move follows that of a previous dragline move which was undertaken approximately 16 years prior to this assessment. It is a not anticipated that the currently proposed move will result in an increase in invasive predators or weeds in addition to those that are already widespread and established in the potential habitat for this species and the chances of a significant impact in this category are considered to be unlikely .
Introduce disease that may cause the species to decline.	The width of the disturbance is expected to be confined to approximately 40 m in most areas and the dragline move will be a one-off impact. Therefore the activity is expected to be unlikely to result in introducing a disease that may cause the species to decline.
Interfere substantially with the recovery of the species.	Squatter Pigeon (Southern Subspecies) across the remainder of its range, at least in central and north Queensland is expected to represent a single population. It is considered that the study area occupies a very minor portion of the habitat occupied by this population. The width of the disturbance is expected to be confined to approximately 40 m in most areas and the dragline move will be a one-off impact. There will only be a minor overall loss of habitat in a landscape with abundant resources for Squatter Pigeon. Therefore the activity is expected to be unlikely to interfere substantially with the recovery of the species.

Table E.4 Koala *Phascolarctos cinereus* assessment against Significant Impact Guidelines 1.1 & EPBC Act referral guidelines for the vulnerable koala (Department of the Environment 2014)

Criteria	Assessment of significance
<p>Assessing adverse effects on habitat critical to the survival of the Koala.</p>	<p>A habitat score of 9 was determined for Koala habitat within the impact area (see Table 5.1 of main report), the area proposed to be cleared contains known Koala food trees and an area ≥20 ha is proposed to be cleared within areas of known Koala food trees with a habitat score ≥8, therefore referral of the project is recommended and in addition to assessment against the Significant Impact Guidelines 1.1, Section 8 of the referral guidelines must be addressed (see below).</p>
<p>An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:</p>	<p>Lead to a long-term decrease in the size of an important population of a species.</p>
<p>Reduce the area of occupancy of an important population.</p>	<p>The width of the disturbance is expected to be confined to approximately 40 m in most areas and the dragline move will be a one-off impact. Koala food trees are prevalent in the overall landscape and it is considered unlikely that a total clearing area of up to 98 ha within a narrow corridor of this nature surrounded by a mixture of pastoral land and remnant vegetation would lead to a long-term decrease in the size of an important population of this species.</p>
<p>Fragment an existing important population into two or more populations.</p>	<p>The width of the disturbance is expected to be confined to approximately 40 m in most areas and the dragline move will be a one-off impact. The Koala population in the vicinity of the study area is expected to be small and at a low density. There will only be a minor loss of habitat in a landscape that otherwise contains abundant resources for Koala. Therefore the activity is expected to be unlikely to result in reducing the overall area of occupancy of an important population.</p>
<p>Adversely affect habitat critical to the survival of a species</p>	<p>The Koala population in the vicinity of the study area is expected to be small and at a low density. A higher density population of Koala is present to the east in the vicinity of the Eton Range near Nebo. It is considered that the study area is located broadly on the margins of a larger Koala population to the east. Therefore the activity is expected to be unlikely to result in fragmentation of an existing important population into two or more populations.</p>
<p>Disrupt the breeding cycle of an important population.</p>	<p>The width of the disturbance is expected to be confined to approximately 40 m in most areas and the dragline move will be a one-off impact. Koala food trees are prevalent in the overall landscape and it is considered unlikely that a total clearing area of up to 98 ha with a narrow width of this nature surrounded by a mixture of pastoral land and remnant vegetation would adversely affect habitat critical to the survival of the species.</p>
<p>Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.</p>	<p>The width of the disturbance is expected to be confined to approximately 40 m in most areas and the dragline move will be a one-off impact. Therefore the activity is expected to be unlikely to result in a disruption to the breeding cycle of an important population.</p>
<p>Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable</p>	<p>The width of the disturbance is expected to be confined to approximately 40 m in most areas and the dragline move will be a one-off impact. In addition, suitable habitat is widespread throughout the broader study area (Figure 5.4). The Project is not expected to result in any additional barriers to dispersal or significant isolation and exposure to individual koalas in a landscape that is already a mixture of pastoral land and predominantly sparse remnant vegetation. Therefore the activity is expected to be unlikely to result in significant modification, destruction, isolation or limits to availability of habitat to the extent that the species is likely to decline.</p>
<p>Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable</p>	<p>Wherever possible, the route of the proposed dragline move follows that of a previous dragline move which was undertaken approximately 16 years prior to this assessment. It is a not anticipated that the currently proposed move will result in an increase in invasive predators or weeds in addition to those that are already widespread and established in the potential habitat for this species and the chances of a significant impact in this category are considered to be unlikely.</p>

Assessment of significance	
Criteria	
species' habitat.	
Introduce disease that may cause the species to decline.	The width of the disturbance is expected to be confined to approximately 40 m in most areas and the dragline move will be a one-off impact. Therefore the activity is expected to be unlikely to result in introducing a disease that may cause the species to decline.
Interfere substantially with the recovery of the species.	The Koala population in the vicinity of the study area is expected to be small and at a low density. A higher density (important) population of Koala is present to the east in the vicinity of the Eton Range near Nebo. It is considered that the study area is located broadly on the margins of a larger Koala population to the east. The Project is not expected to result in any additional barriers to dispersal or significant isolation and exposure to individual koalas in a landscape that is already a mixture of pastoral land and predominantly sparse remnant vegetation. In addition, ample food sources for Koala are present in the landscape. Therefore the activity is expected to be unlikely to interfere substantially with the recovery of the species.
Could the action interfere substantially with the recovery of the koala?	
Increasing koala fatalities in habitat critical to the survival of the koala due to dog attacks to a level that is likely to result in multiple, ongoing mortalities.	The project will not introduce any new human populations and associated dogs to the study area, therefore no increase in koala fatalities from dog attacks as a result of the project is predicted.
Increasing Koala fatalities in habitat critical to the survival of the Koala due to vehicle-strikes to a level that is likely to result in multiple, on-going mortalities.	There will be construction traffic during preparation of the dragline transport route for a once-off dragline move. Once the dragline has been moved, there will be no ongoing road traffic associated with the project. The Environmental Management Plan will include measures for reducing the potential impacts of construction traffic on fauna. No increase in Koala fatalities from vehicle strikes as a result of the project is predicted.
Facilitating the introduction or spread of disease or pathogens for example Chlamydia or <i>Phytophthora cinnamomi</i> , to habitat critical to the survival of the Koala, that are likely to significantly reduce the reproductive output of Koalas or reduce the carrying capacity of the habitat.	Habitat within and surrounding the project area is highly fragmented and intersected by many roads and tracks, therefore there is no opportunity for the project actions to result in exposure of habitats to pathogens that are not already present in the wider environment. The Environment Management Plan will include measures for ensuring that all vehicles and equipment are washed down prior to working within the dragline transportation route, limiting the possibility for the introduction or spread of disease or pathogens.
Creating a barrier to movement to, between or within habitat critical to the	The project does not include any excavations or the construction of any structures that would create a barrier to Koala movement.

Assessment of significance	
<p>Criteria</p> <p>survival of the Koala that is likely to result in a long-term reduction in genetic fitness or access to habitat critical to the survival of the Koala.</p> <p>Changing hydrology which degrades habitat critical to the survival of the Koala to the extent that the carrying capacity of the habitat is reduced in the long term.</p>	<p>Where the dragline transport route crosses waterways, there is a commitment to stabilise creel banks and reinstate the riparian vegetation, including trees suitable for Koala feed and shelter. There will be no impacts of the project on hydrological conditions that would lead to degradation of Koala habitat.</p>

Table E.5 Yakka Skink *Egernia rugosa* assessment against Significant Impact Guidelines 1.1

Criteria	Assessment of significance
<p>An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:</p>	<p>Yakka Skink <i>Egernia rugosa</i></p> <p>Yakka Skink lives in colonies, occupying communal burrows, often under dead timber or deep rock crevices. These skinks are found in dry open forests and woodlands, usually on coarse gritty soils that are well drained, although colonies have been recorded in a wider variety of habitats (Ehmann 1992; Cogger 2000; Drury 2001; Wilson 2005). They sometimes occupy old rabbit burrows. The species is threatened by loss of habitat, loss of shelter sites through agricultural practices, too-frequent fire, trampling of burrows by livestock and predation by foxes and cats (Drury 2001).</p> <p>Species Assessment</p> <p>Data relevant to the habitat, distribution and ecology of the species was sourced through relevant literature and online sources and a number of relevant publicly available data sources including the Atlas of Living Australia, EPBC online search tool and the Queensland Government Wildnet database. This information, together with a review of aerial photography and existing vegetation mapping by the Queensland Herbarium assisted in the prioritisation of sites for field habitat assessments throughout the Project area during August–September 2016.</p> <p>Determination of the potential occurrence of Yakka Skink involved a general assessment of habitat features that could potentially support this species. There are no database records from the Project area and the presence of the species could not be confirmed during the field surveys due to the linear nature and significant size of the study area and the known patchiness of the occurrence of the species. It was considered that a more conservative approach was to model potential habitat and ground-truth the presence of known habitat factors. In ground-truthing modelling results, the presence of suitable habitat was confirmed in a number of locations. Nevertheless, this is a secretive species that occurs in a variety of habitats and it is considered to have the potential to occur on the basis of its known distribution and habitat preferences.</p> <p>Despite the lack of records, modelling of habitat based on existing vegetation mapping in the landscape surrounding the study area (500 m buffer relative to the centre line of the study area corridor) has identified approximately 3618 ha as preferred habitat for Yakka Skink. The broad investigation area is approximately 8740 ha. Approximately 645 ha of this area are estimated to be impacted by the Project footprint (which equates to 7.4% of the area). Through the application of an unbiased, uniformly distributed clearing model, it would be reasonable to expect that 7.4% of the 3618 ha (which equates to approximately 268 ha) of preferred habitat within the broad investigation area would be impacted. However, the impact area has been positioned to prioritise the avoidance of preferred habitat for MNES. As a result, the overall impact has been reduced to 99.35 ha (or 2.7%), which is estimated to represent approximately 0.0% of the equivalent remnant REs that correspond to preferred habitat for this species in the Northern Bowen Basin subregion.</p>
<p>Lead to a long-term decrease in the size of an important population of a species.</p>	<p>There are no database records from the Project area. However, the species is difficult to detect, the study area is positioned within the centre of the distribution of this species and the species is considered to have potential to occur in the study area. Given that the species is scarce in the surrounding landscape and there is potential for a local population to be present in the study area (i.e. many individuals occupying one or more communal burrows), it is reasonable to consider that there is potential for an important population to occur in the study area, especially in the context of the genetic diversity of the species. Therefore, there is potential for a significant impact leading to a long-term decrease in the size of an important population of this species.</p> <p>A pre-clearance survey is recommended (during the summer or autumn) in areas identified as preferred habitat for this species. If the species is located, opportunities for avoidance should be considered in the first instance and relocation of individuals to suitable habitat undertaken if avoidance is not possible.</p>

Criteria	Assessment of significance
Reduce the area of occupancy of an important population.	The width of the disturbance is expected to be confined to approximately 40 m in most areas and the dragline move will be a one-off impact. Therefore the activity is expected to be unlikely to result in reducing the overall area of occupancy of an important population.
Fragment an existing important population into two or more populations.	The width of the disturbance is expected to be confined to approximately 40 m in most areas and the dragline move will be a one-off impact. Therefore the activity is expected to be unlikely to result in fragmentation of an existing important population into two or more populations.
Adversely affect habitat critical to the survival of a species	The width of the disturbance is expected to be confined to approximately 40 m in most areas and the dragline move will be a one-off impact. Therefore the activity is expected to be unlikely to adversely affect habitat critical to the survival of a species.
Disrupt the breeding cycle of an important population.	<p>There are no database records from the Project area. However, the species is difficult to detect, the study area is positioned within the centre of the distribution of this species and the species is considered to have potential to occur in the study area. Given that the species is scarce in the surrounding landscape and there is potential for a local population to be present in the study area (i.e. many individuals occupying one or more communal burrows), it is reasonable to consider that there is potential for the study area to support an important population and that the breeding cycle could potentially be impacted. Therefore, there is potential for a disruption to the breeding cycle of an important population.</p> <p>A pre-clearance survey is recommended in areas identified as preferred habitat for this species to identify potential burrow locations. If burrows are located and confirmed, opportunities for avoidance should be considered in the first instance and relocation of individuals to suitable habitat undertaken if avoidance is not possible.</p>
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The width of the disturbance is expected to be confined to approximately 40 m in most areas and the dragline move will be a one-off impact. In addition, suitable habitat is widespread throughout the broader study area (Figure 5.6). Therefore the activity is expected to be unlikely to result in significant modification, destruction, isolation or limits to availability of habitat to the extent that the species is likely to decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	Wherever possible, the route of the proposed dragline move follows that of a previous dragline move which was undertaken approximately 16 years prior to this assessment. It is a not anticipated that the currently proposed move will result in an increase in invasive predators or weeds in addition to those that are already widespread and established in the potential habitat for this species and the chances of a significant impact in this category are considered to be unlikely .
Introduce disease that may cause the species to decline.	The width of the disturbance is expected to be confined to approximately 40 m in most areas and the dragline move will be a one-off impact. Therefore the activity is expected to be unlikely to result in introducing a disease that may cause the species to decline.
Interfere substantially with the recovery of the species.	Yakka Skink is a widespread, yet scarce species. The study area is located a little to the north of the centre of the species' geographical distribution. It has yet to be confirmed whether the species is present in the vicinity of the study area and the impact area has been sited to avoid areas of remnant vegetation that hold the highest potential habitat value for the species. There remains a possibility that an as yet undetected population of Yakka Skink may be impacted by the Project; however it is considered unlikely that an impact in the study area would interfere substantially with the recovery of the species.

Table E.6 EPBC Act Assessment of Impact Significance on Listed Migratory Species in the Project Area

Criteria	Assessment of Significance
<p>An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will:</p>	<p>Based on the assessment of existing terrestrial ecological values documented in the main report and the assessment of likelihood provided in Appendix A, the following terrestrial species listed as Migratory under the EPBC Act are currently recognised as known or having potential to occur within the study area:</p> <ul style="list-style-type: none"> • White-throated Needletail <i>Hirundapus caudacutus</i>; • Fork-tailed Swift <i>Apus pacificus</i>; • Oriental Cuckoo <i>Cuculus optatus</i>. <p>White-throated Needletail and Fork-tailed Swift are predicted to occur in the study area, possibly on an annual basis. Both are aerial species for which the Project area does not represent 'important habitat' and no impacts are expected due to the proposed action as these species forage over a wide variety of land use, including human infrastructure and large waterbodies.</p>
<p>Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of <i>important habitat</i> for a migratory species.</p>	<p>The impact area has been positioned to avoid all permanent wetlands areas and crosses ephemeral watercourses only where absolutely necessary. None of the impact area is considered to represent important habitat for any migratory fauna.</p> <ul style="list-style-type: none"> • Oriental Cuckoo This species may be an occasional, transient visitor to the study area. It would generally occur in open, wooded habitats. The proposed action is expected to have minimal effects on the migrating population of this species and no important habitat will be modified, destroyed or isolated. Therefore the impact is unlikely to be significant.
<p>Result in invasive species that are harmful to the migratory species becoming established in an area of <i>important habitat</i> for the migratory species.</p>	<p>As noted above, none of the impact area is considered to represent important habitat for any migratory fauna. Therefore, the impact of the proposed action is unlikely to be significant.</p>
<p>Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an <i>ecologically significant proportion of the population</i> of a migratory species.</p>	<ul style="list-style-type: none"> • Oriental Cuckoo This species may be an occasional, transient visitor to the study area. It does not breed in Australia. Therefore the impact is unlikely to be significant.

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