Clearing Permit Decision Report

1. Application details and outcome

1.1. Permit application details

Permit number:	CPS 2814/3
Permit type:	Purpose permit
Applicant name:	BHP Iron Ore Pty. Ltd.
Application received:	20 December 2021
Application area:	75 hectares of native vegetation
Purpose of clearing:	Construction and maintenance of water and power infrastructure and associated activities
Method of clearing:	Mechanical clearing.
Properties:	Lot 19 on Deposited Plan 48921, Newman Lot 42 on Deposited Plan 217099 (Road), Newman Lot 139 on Deposited Plan 218627(Crown Reserve 44387), Newman Lot 200 on Deposited Plan 218369 (Road), Newman Lot 205 on Deposited Plan 216723 (Road), Newman Lot 300 on Deposited Plan 44340 (Road), Newman Lot 351 on Deposited Plan 74327, Newman Lot 556 on Deposited Plan 400578, Newman Lot 571 on Deposited Plan 71045, Newman Lot 1643 on Deposited Plan 215886, Newman Lot 2347 on Deposited Plan 218627, Newman Lot 2356 on Deposited Plan 216724 (Road), Newman Lot 2357 on Deposited Plan 216724 (Road), Newman Yates Road reserve (PIN 11502252), Newman
LGA area:	Shire of East Pilbara
Localities:	Newman

1.2. Description of clearing activities

The amendment is to extend the permit duration to 7 April 2030, and to update the permit holder to BHP Iron Ore Pty Ltd. following the removal of Billiton from the company name. CPS 2814/2 allowed for clearing of up to 75 hectares for the purpose of construction and maintenance of water and power infrastructure and associated activities within various properties and the Yates Road reserve, Newman, in the Shire of East Pilbara. The clearing footprint sought under the CPS 2814/3 amendment remains unchanged.

1.3. Decision on application and key considerations

Decision:	Granted
Decision date:	04 March 2022
Decision area:	75 hectares of native vegetation within an application area of approximately 595 hectares as depicted in Section 1.5 (Figure 1).

1.4. Reasons for decision

This clearing permit amendment application was submitted, accepted, assessed and determined in accordance with sections 51E and 51O of the *Environmental Protection Act 1986* (EP Act). The Department of Water and Environmental Regulation (DWER) advertised the application for 14 days and no submissions were received.

In making this decision, the Delegated Officer had regard to the site characteristics (Appendix A), relevant datasets (Appendix E.2), the findings of a flora and vegetation survey and desktop fauna assessment, the clearing principles set out in Schedule 5 of the EP Act (Appendix B), the applicant's minimisation and mitigation measures, relevant planning instruments, and any other matters considered relevant to the assessment (Section 3).

The Delegated Officer also took into consideration that the proposed amendments relate only to an extension to the CPS 2814/2 permit duration to 7 April 2030, and an update to the permit holder name. It was noted that of the 75 hectares of clearing approved under CPS 2814/2, approximately 45.3 hectares of clearing had been undertaken by the permit holder up to 30 June 2021, and that no modifications to the clearing footprint or approved clearing area have been proposed.

In considering the above, the Delegated Officer concluded that the outcomes of the assessment has not changed since the assessment for CPS 2814/2. After a review of the assessment and permit, the Delegated Officer considered that the proposed clearing may result in the potential introduction and spread of weeds into adjacent vegetation which could impact on the quality of the adjacent vegetation and its habitat values, and the proposed clearing may result in the potential loss of riparian vegetation and alteration to surface water flow.

The Delegated Officer determined that the proposed extension of time and name change is not likely to lead to an unacceptable risk to the environment. The Delegated Officer decided to grant the clearing permit amendment subject to additional conditions, including those for weed control, riparian vegetation, and surface water flow as well as standard recording and reporting conditions in line with current DWER standards:

- change the permit holder's name from BHP Billiton Iron Ore Pty Ltd to BHP Iron Ore Pty. Ltd;
- extend the duration of the permit to 7 April 2030;
- avoid, minimise and reduce impacts and the extent of clearing;
- take hygiene steps to minimise the risk of the introduction and spread of weeds;
- where practicable avoid the clearing riparian vegetation;
- where a watercourse is to be impacted by clearing maintain the existing surface water flow;
- maintain records relating to the species composition, structure, and density of the cleared area, the dates and locations where the clearing occurred, the size of the area cleared, actions taken to avoid, minimise, and reduce the impacts and extent of clearing, and actions taken to minimise the risk of the introduction and spread of weeds, and actions to manage and mitigate impacts to riparian vegetation and surface water flow;
- and provide the records required when requested.

1.5. Site maps

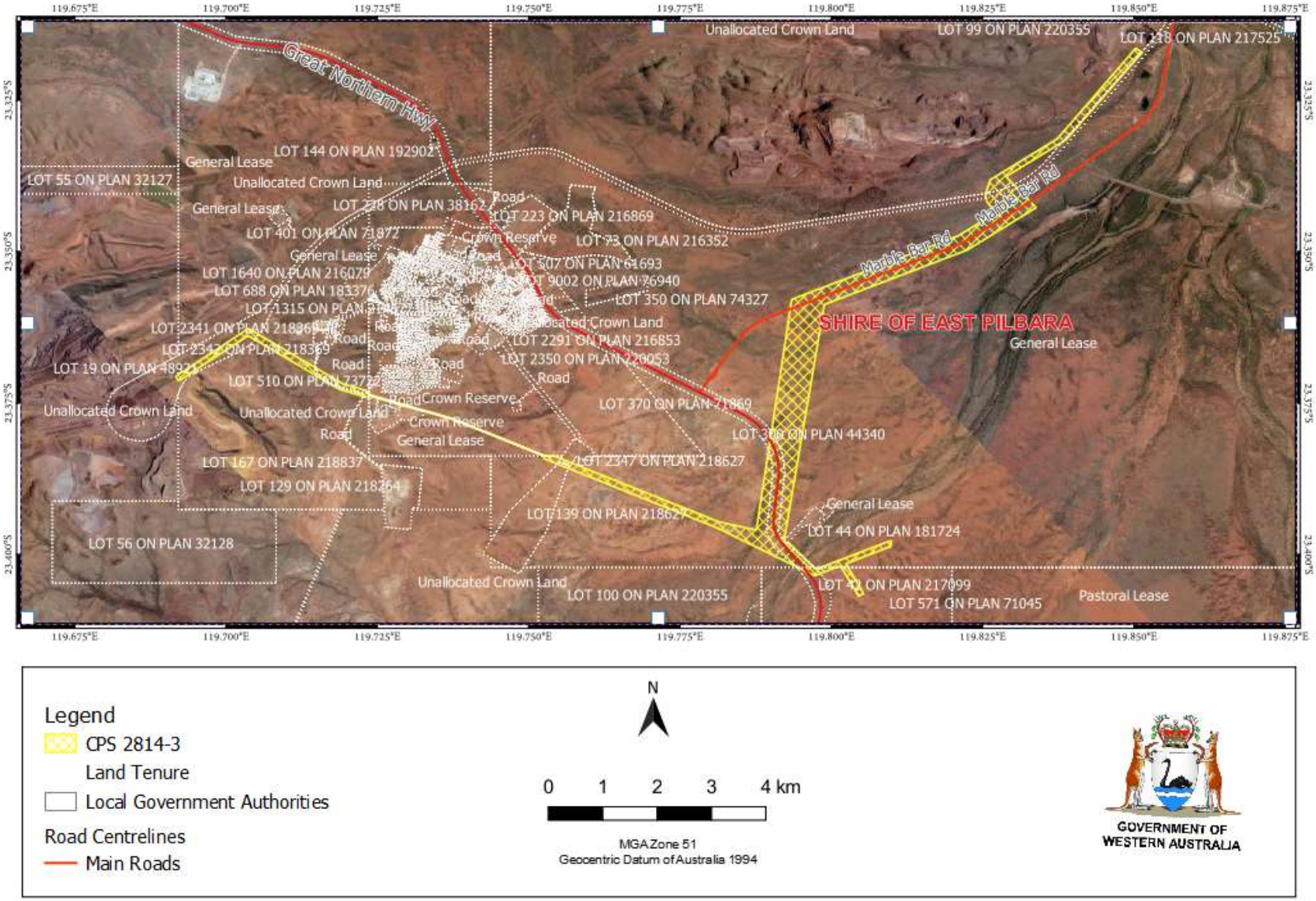

Figure 1. Map of the application area . The area in yellow indicate the areas authorised to be cleared under the granted clearing permit.

2. Legislative context

The clearing of native vegetation in Western Australia is regulated under the EP Act and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* (Clearing Regulations).

In addition to the matters considered in accordance with section 51O of the EP Act (Section 1.3), the Delegated Officer has also had regard to the objects and principles under section 4A of the EP Act, particularly:

- the precautionary principle
- the principle of intergenerational equity
- the principle of the conservation of biological diversity and ecological integrity

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Biosecurity and Agriculture Management Act 2007* (BAM Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Iron Ore (Mount Newman) Agreement Act 1964* (WA)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (December 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2019)
- Technical guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA 2016)

3. Detailed assessment of application

3.1. Avoidance and mitigation measures

Clearing Permit 2814/3 authorises the clearing up to 75 hectares of native vegetation within a total application area of approximately 595 hectares, to upgrade the existing Newman water supply system to provide an increased water supply to the Newman Hub project at the Mt Whaleback minesite. The clearing required is for the purposes of construction and maintenance of a new water supply pipeline, replacement of some sections of an existing pipeline, and the installation or upgrade of tanks, pump stations and other associated infrastructure (BHP Billiton 2008).

Existing tracks and other previously disturbed areas will be utilised wherever possible (BHP Billiton 2008). All topsoil and vegetation will be stockpiled for later use in rehabilitation. All cleared areas not required for ongoing operations will be rehabilitated at the completion of the construction works (BHP Billiton 2008). To avoid impacts to riparian vegetation and watercourses the clearing corridor at each creekline crossing will be limited to approximately 3.5 metres wide.

A vegetation and flora survey over the majority of the application area was originally conducted by *ecologia* environmental consultants between 18 and 23 April 2008 (BHP Billiton 2008). The initial survey was conducted using sixty nine 50 metre by 50 metre quadrats, and 12 transects, representing all the vegetation types of the survey area *(ecologia* 2008b). The plans for the pipeline project were revised after the flora survey was conducted with smaller additional areas added. These additional areas were surveyed separately at later dates by *ecologia a*nd BHP Billiton (BHP Billiton 2008).

BHP reports on each native vegetation clearing permit in accordance with the permit reporting conditions. BHP's Annual Environmental Report for Financial Year 2021 reported a total of 45.25 hectares of clearing up to 30 June 2021 (BHP 2021). To date 0.42 hectares of disturbance has been rehabilitated (BHP 2021). No further clearing has occurred beyond that reported in the Financial Year 2021 Annual Environmental Report (BHP 2021).

3.2. Assessment of impacts on environmental values

The assessment against the clearing principles (Appendix D) identified that the impacts of the proposed clearing may present a potential risk to flora and fauna of conservation significance, riparian vegetation, and land and water resources. The consideration of impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

3.2.1. Environmental value: Biological values (flora) – Clearing Principle (a)

Assessment: The vegetation over the application area has been broadly mapped by Shepherd *et al* (2001) as;

- Association 18: a low woodland of mulga *(Acacia aneura)*
- Association 29: a sparse low woodland of mulga, discontinuous in scattered groups
- Association 82 of hummock grasslands, low tree steppe, and snappy gum over *Triodia wiseana.*

A flora and vegetation survey over the majority of the application area conducted by *ecologia* in April 2008 recorded 375 flora taxa from 47 families and 137 genera (*ecologia* 2008b) and results were considered to represent a moderate level of diversity. Vegetation condition ranged from degraded to pristine as determined by *ecologia* (2008b) (Appendix A1). Ninety per cent of the application area was in a condition of good or worse with *ecologia* (2008b) describing the vegetation along the corridor itself as generally degraded and disturbed, due to previous disturbance related to the existing infrastructure, cattle grazing and substantial weed invasion.

Current database records indicate that one Threatened flora taxa, and 37 Priority flora taxa have been recorded within 50 kilometres of the application area consisting of six Priority 1, seven Priority 2, eighteen Priority 3 and six Priority 4 taxa (Appendix A2.2). No records are located within the application area (Appendix D: Figure B).

No species of Threatened flora were recorded during the flora survey of *ecologia* (2008b). Since the original assessments of *ecologia* (2008b) *Lepidium catapycnon* has been delisted as a Threatened species (15/02/2018) (DAWE nd), and is now considered a Priority 4 species by the DBCA. Database records indicate that the Threatened flora taxa, *Seringia exastia,* has been recorded approximately 17.3 kilometres from the application area (Appendix A2.2). This species was listed as Threatened (CR) when it was only known from a few locations in the vicinity of Broome. Taxonomically the widespread species *Seringia elliptica* has recently been incorporated into *Seringia exastia* (Binks *et al.* 2020). Given the much broader distribution of the resulting taxon, it is no longer considered to be of significance (Binks *et al*. 2020). In consideration of past survey results and distance to known records it is unlikely that *Seringia elliptica* occurs over the application area.

One Priority 3 flora species, *Themeda* sp. Hamersley Station (M.E. Trudgen 11431), was recorded during the survey of *ecologia* (2008b). The populations consisted of one plant and approximately 200 plants, respectively. *Themeda* sp. Hamersley Station is a perennial tussock grass that occurs on grassy plains and creeklines on red cracking clays, clay loam, and alluvium. The Western Australian Herbarium has a further 55 records of this species, occurring throughout the Pilbara. Most records are from on and near Hamersley Station, however the taxa occurs over a range of approximately 450 kilometres from Karratha to Newman (WAH 1998-). Habitat for this species is widespread in the local area and there are likely to be more populations outside the application area (*ecologia* 2008b).

Three Priority taxa; *Ipomoea racemigera* (P2), *Goodenia* sp. East Pilbara (A.A. Mitchell PRP 727) (P3) and *Swainsona thompsoniana* (P3) have been recorded within 600 metres of the application area. Three of the four records of *Ipomoea racemigera* (P2) have been recorded after the survey of *ecologia* (2008b). These three records are over 16 kilometres distant from the application area. The remaining historical record from 1984 within the vicinity of the application area was considered in the original assessment. One of the fourteen *Goodenia sp*. East Pilbara records was recorded after the survey of *ecologia* (2008b). This record is located approximately 540 metres to the south of the application area.

The one record of *Swainsona thompsoniana* approximately 580 metres to the south of the application area was made in 2017, after the assessment of *ecologia* (2008b) in a rehabilitated landfill site. *Swainsona thompsoniana* is a newly described species endemic to the Pilbara bioregion. However the newly described species is the same as that informally named in 1996 as *Swainsona* sp. Hamersley Station (A.A. Mitchell 196) (P3) and was considered as such in previous reporting. *Swainsona thompsoniana* occurs over an area of approximately 200 square kilometres including within two National Parks (Millstream-Chichester and Karijini), from east of Pannawonica to Mount Florence Station, and south-east towards Tom Price and Wittenoom.

Two conservation significant ecosystems have been mapped within 50 kilometres of the application area (Appendix A2), one of which is a vegetation community. The vegetation of the application area does not align with the Priority 3 ecological community (PEC); *Vegetation of sand dunes of the Hamersley Range/Fortescue Valley.* No vegetation of conservation significance was recorded by *ecologia* (2008b). The vegetation types within the application area were considered well represented in the surrounding region (*ecologia* 2008b).

Fourteen weed species were recorded during the flora survey of *ecologia* (2008b): *Aerva javanica* (Kapok Bush), *Bidens bipinnata* (Bipinnate Beggartick), *Cenchrus ciliaris* (Buffel Grass), *Centaurium erythraea* (Common Centaury), *Chloris virgata* (Feathertop Rhodes Grass), *Citrullus colocynthis* (Colocynth), *Citrullus lanatus* (Afghan Melon), *Conyza bonariensis* (Flaxleaf Fleabane), *Cynodon dactylon* (Couch Grass), *Datura leichhardtii* (Datura), *Echinochloa colona* (Awnless Barnyard Grass), *Malvastrum americanum* (Spiked Malvastrum), *Portulaca oleracea* (Purslane) and *Vachellia farnesiana* (Mimosa Bush). The spread of existing weeds species, or the introduction of new weed species to the application area, may compromise the condition of adjacent native vegetation.

Conclusion: For the reasons set out above, and the avoidance and mitigation measures provided by the applicant (Section 3.1), it is considered that potential impacts of the proposed clearing on flora taxa of conservation significance can be managed by taking hygiene steps to minimise the risk of the introduction and spread of weeds.

Conditions: To address potential impacts to adjacent flora and native vegetation from the proposed construction and maintenance of water and power infrastructure the following management measure will be required as a condition on the clearing permit:

- Take hygiene steps to minimise the risk of the introduction and spread of weeds.

3.2.2. Environmental value: Biological values (fauna) – Clearing Principle (b)

Assessment: Data base searches indicate that twenty-seven fauna species of conservation significance have been recorded within 50 kilometres of the application area, consisting of 16 birds, eight mammals and three reptiles (Appendix A2.3). No records are located within the application area (Appendix D: Figure C).

Four main fauna habitat types were identified within the application area by *ecologia* (2008b): Floodplain; Hillslopes, Drainage lines and Flat plains. *ecologia* (2008a) undertook a desktop study including a review of fauna surveys previously conducted within and around the application area. Based on previous records a total of 244 fauna species, including 28 native and six introduced mammal species, 126 bird species, 77 reptile species and seven amphibians, could potentially occur over the application area.

Data base searches indicate that three fauna species of conservation significance have been recorded within 800 metres of the application area (Appendix D: Figure C). That is, the Greater Bilby *(Macrotis lagotis)* (VU) Western Pebble-mound Mouse (*Pseudomys chapmani*) (P4), and Glossy Ibis *(Plegadis falcinellus)* (Mi). One bilby record within 150 metres of the application area is a historical record from 1979 (labelled as Capricorn Roadhouse, Newman), with the remaining seven records for this species all greater than 40 kilometres distant from the application area. In consideration of the primary habitats present, and the age of the one proximal record, it is unlikely that the Greater Bilby occurs. In consideration of the habitats present, age and proximity of records the Western Pebble-mound Mouse is likely to occur over hillslope habitat and the Glossy Ibis is likely to occur, at least intermittently, within drainage line habitat and associated floodplains.

ecologia (2008a) considered that five fauna species of conservation significance likely to occur within the application area, based on known ranges, habitat preferences, and previous sightings in surrounding areas *(ecologia* 2008a). The Australian Bustard (*Ardeotis australis*) (previously P4) has subsequently been de-listed (DBCA 2019). The remaining four species are:

- Pilbara Olive Python (*Liasis olivaceus barroni)* (VU)
- a Blind Snake (*Ramphotyphlops ganei*) (P1)
- Western Pebble-mound Mouse (P4)
- Rainbow Bee-eater (*Merops ornatus)* (Mi)

The Rainbow Bee-eater has subsequently been removed as a listed migratory species under the EPBC Act, and is similarly not listed in Western Australia as a migratory bird protected under an international agreement under schedule 5 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018. The Rainbow Bee-eater maintains its listing as a marine species declared under s248 of the EPBC Act. The species is listed as 'Least Concern' under the International Union for Conservation of Nature (IUCN) Red List of Threatened species, and 'Least Concern' under the Action Plan for Australian Birds (Garnett and Baker 2021).

Since the assessment of *ecologia* (2008b) five additional fauna species have been recorded within 50 kilometres of the application area: the Pilbara leaf-nosed Bat *(Rhinonicteris aurantia)* (VU), Brush-tailed Mulgara *(Dasycercus blythi)* (P4), Princess Parrot *(Polytelis alexandrae)* (P4), Redshank *(Tringa tetanus)* (Mi), and Spotted ctenotus *(Ctenotus uber johnstonei)* (P2)

In consideration of the habitats present and the distance to known records (15.1 kilometres) it is unlikely that caves providing permanent or semi-permanent day roosts or maternity roosts for the Pilbara leaf-nosed Bat (or the Ghost Bat - *Macroderma gigas*) are likely to be located in the application area. Similarly records of the Brush-tailed Mulgara are 15.8 kilometres distant, the Princess Parrot 15.8 kilometres distant, and the Spotted ctenotus 17.2 kilometres distant, and in consideration of the primary habitats present are unlikely to occur over the application area. The migratory Redshank is a wading bird feeding in shallow waters around lakes, marshes, mudflats and coastal wetlands and the larger drainage lines and associated floodplains offer habitat.

In consideration of the likelihood of fauna species of conservation significance occurring, and the scale and nature of the proposed clearing, the four main fauna habitat types identified within the application are considered to be of relatively low conservation value for conservation significant fauna species and are all well represented throughout the surrounding region *(ecologia* 2008a). Of the habitats occurring, the riparian vegetation associated with drainage line habitats in arid zones generally record greater species richness and abundances than other habitats, and are important entities due to their mesic qualities. Frequent fire has increased the importance of these habitats. Their linear configuration and more mesic characteristics facilitate dual roles as both fire refuge, and routes for immigration, emigration and dispersal in a landscape subject to frequent fire.

Fourteen weed species were recorded during the flora survey of *ecologia* (2008b). The spread of existing weeds species, or the introduction of new weed species to the application area, may compromise the condition of adjacent fauna habitat.

Conclusion: For the reasons set out above, and the avoidance and mitigation measures provided by the applicant (Section 3.1) it is considered that the narrow, linear nature of the proposed clearing is expected to result in minimal impacts to fauna habitat. Any displacement of fauna will be localised, and suitable habitat is available immediately adjacent to the proposed clearing. The clearing corridor at each creek crossing will be limited to approximately 3.5 metres wide, and proposed clearing will therefore only impact small areas of riparian vegetation. Any potential impacts of the proposed clearing on fauna of conservation significance can be managed by taking hygiene steps to minimise the risk of the introduction and spread of weeds and minimising the clearing of riparian vegetation associated with the upper reaches of the Fortescue River, Whaleback Creek, and Homestead Creek.

Conditions: To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- Where practicable avoid the clearing riparian vegetation.
- Take hygiene steps to minimise the risk of the introduction and spread of weeds.

3.2.3. Environmental value: Biological values (threatened ecological community) – Clearing Principle (d)

Assessment: One faunal Threatened Ecological Community (TEC) listed under the BC Act has been mapped over a portion of the application area (Appendix D: Figure B). That is the Endangered Ethel Gorge aquifer stygobiont community comprising a diverse assemblage of invertebrate stygofauna (that is, invertebrate species that live in groundwater systems or aquifers).

The stygofauna community includes the sub-class Oligochaeta (worms), along with the crustacean families Bathynellacea, Candonidae, Limnocytheridae, Tainisopodidae and Paramelitidae (that includes one new genus of Crangonyctoid amphipoda with at least 14 species).

The stygofauna community is known from the Ethel Gorge (Ophthalmia Basin) alluvium calcrete aquifer on the Fortescue River in the vicinity of Newman including over a portion of the application area. No additional TECs were identified during the flora survey of *ecologia* (2008b).

Groundwater drawdown and salinisation are recognised as threatening process for the Ethel Gorge stygofauna (DBCA, nd). Standard and staged construction and maintenance methodologies relating to water and power infrastructure along an existing pipeline corridor are not expected to have any significant effect on groundwater levels or groundwater salinity.

Conclusion: The native vegetation proposed to be cleared is unlikely to comprise the whole or a part of, or be necessary for, the maintenance of a TEC. For the reasons set out above, and the avoidance and mitigation measures provided by the applicant (Section 3.1), it is considered that the narrow, linear nature of the proposed clearing in tandem with standard and staged construction and maintenance methodologies is unlikely to impact the Endangered Ethel Gorge aquifer stygobiont community.

Conditions: No management conditions relating to Threatened Ecological Communities required.

3.2.4. Environmental value: Biological values (riparian vegetation) – Clearing Principle (f)

Assessment: Proposed clearing required for the construction and maintenance of water and power infrastructure crosses the upper reaches of the Fortescue River, Homestead Creek and Whaleback Creek, and the western end of the application area runs adjacent to Whaleback Creek (Appendix A1; Appendix D: Figure D). Riparian vegetation is associated with these watercourses and proposed clearing is likely to include native vegetation growing in, or in association with, an environment associated with a watercourse.

Riparian vegetation occurs along these watercourses, consisting of moderately dense *Eucalyptus camaldulensis* and *Eucalyptus victrix* trees over mixed Acacia species, sedges and grasses (*ecologia* 2008b). Eucalypts typically line the banks of these drainage lines and are often found growing within the river bed itself. *Eucalyptus camaldulensis* and *Eucalyptus victrix* are groundwater dependant vegetation, and survive through the dry winter by obtaining water from groundwater sources (Cook and Eamus 2018). Native vegetation clearing for the proposed purpose is unlikely to have any impacts on groundwater.

As there are watercourses with associated native vegetation within the application area, the proposal is at variance to this principle. However, the watercourses will only be directly impacted where the pipeline corridor crosses the watercourse. The clearing corridor at each creek crossing will be limited to approximately 3.5 metres wide, and hence the proposed clearing will only impact small areas of riparian vegetation which is well represented and widespread in the Pilbara (*ecologia* 2008b).

Fourteen weed species were recorded during the flora survey of *ecologia* (2008b). The spread of existing weeds species, or the introduction of new weed species to the application area, may compromise the condition of adjacent riparian vegetation.

Conclusion: For the reasons set out above, and the avoidance and mitigation measures provided by the applicant (Section 3.1), it is considered that the impacts of the proposed clearing on native vegetation growing in, or in association with, an environment associated with a watercourse are likely to be minimal. Impacts of the proposed clearing can be managed by maintaining current hydrological flows, taking hygiene steps to minimise the risk of the introduction and spread of weeds, and minimising the clearing of riparian vegetation associated with the upper reaches of the Fortescue River, Whaleback Creek, and Homestead Creek.

Conditions: To address impacts to native vegetation growing in, or in association with, an environment associated with a watercourse, the following management measure will be required as a condition on the clearing permit:

- Where practicable avoid the clearing of riparian vegetation.
- Where a watercourse is to be impacted by clearing, maintain the existing surface water flow.
- Take hygiene steps to minimise the risk of the introduction and spread of weeds.

3.2.5. Environmental value: Land and water resources (land) – Clearing Principle (g)

Assessment: The application area falls predominantly within the Elimunna Land System, with small areas falling within the Newman, Rocklea, River, Spearhole, McKay and Washplain Land Systems (Appendix D: Figure E).

Land Systems have been mapped and described in technical bulletins produced by the former Department of Agriculture (now the Department of Primary Industries and Regional Development) (van Vreeswyk *et al.* 2004).

The Elimunna Land System consists of hills and low rises with stony soils on shallow red loams; groves land unit on red loamy earth soils; and drainage floors with self mulching cracking clay soils. The Elimunna Land System is reasonably resistant to soil erosion, however soil disturbance or altered water flows may cause localised soil erosion (Van Vreeswyk *et al.* 2004).

The Newman Land System consists of jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands. This land system is not prone to erosion (Van Vreeswyk *et al.* 2004).

The Rocklea Land System consists of basalt hills, plateaux, lower slopes and minor stony plains. This land system has a very low erosion risk under pastoral use, however, vegetation clearing may create an accelerated risk of erosion in drainage lines (Van Vreeswyk *et al.* 2004).

The River Land System consists of flood plains and major rivers supporting eucalypt woodlands, tussock grasslands and soft spinifex grasslands. This land system is susceptible to erosion if vegetation is removed (Van Vreeswyk *et al.* 2004).

The Spearhole Land System consists of gently undulating hardpan plains supporting groved mulga shrublands and hard spinifex. This land system is not prone to erosion (Van Vreeswyk *et al.* 2004).

The McKay Land System consists of hills, ridges, plateaux remnants and breakaways of meta sedimentary rocks supporting hard spinifex grasslands. This land system is not prone to degradation or soil erosion (Van Vreeswyk *et al.* 2004).

The Washplain Land System consists of hardpan plains supporting groved mulga shrublands. Some parts of this land system are moderately susceptible to erosion (Van Vreeswyk *et al.* 2004).

The application area traverses some land systems which may be susceptible to erosion, particularly in drainage line areas. Proposed clearing is linear in nature and predominantly adjacent to existing roads and tracks. Standard construction methodologies measures will be implemented that will address erosion and other land degradation processes including strategies for drainage controls and wind and water erosion. With these standard construction methodologies in place, the proposed clearing is not expected to result in an increased risk of changes to pH, waterlogging or eutrophication (Phosphorus export), particularly in consideration of the final land use.

Given the scale and location of the application area, the proposed clearing is unlikely to contribute to rising salinity. It is not anticipated that the removal of vegetation will contribute to long term increased amounts of wind or water erosion in adjacent areas. Localised erosion can occur from construction works in any of the Land Systems, but particularly over drainage lines. The clearing corridor at each creek crossing has been limited by the applicant to approximately 3.5 metres wide. The linear nature of the proposed clearing over a pipeline corridor and the minimal impact to drainage lines by confining a clearing width of approximately 3.5 metres at each creek crossing is unlikely to result in significant land degradation.

Conclusion: For the reasons set out above, and the avoidance and mitigation measures provided by the applicant (Section 3.1), it is considered that any impacts to surrounding landscapes, soils and drainage can be managed through appropriate design and standard construction methodologies. Noting the extent of the proposed clearing, the condition of the vegetation, and standard construction methods employed proposed clearing is not likely to cause appreciable land degradation.

Conditions: No management conditions relating to land degradation required.

3.2.6. Environmental value: Land and water resources (water) – Clearing Principle (i)

Assessment: Proposed clearing required for the construction and maintenance of water and power infrastructure crosses the upper reaches of the Fortescue River, Homestead Creek and Whaleback Creek, and the western end of the application area runs adjacent to Whaleback Creek (Appendix A1; Appendix D: Figure D).

The application area is located within a Public Drinking Water Source Area (PDWSA). All activities conducted within the PDWSA, should be in accordance with the DWER's Land Use Compatibility Tables (DWER 2022) and the proponent is advised to follow the Water Quality Protection Guidelines, produced by DWER to minimise any risk that the proposed clearing and associated activities may pose to the PDWSA (DWER 2022) (see Section 3.3).

Drainage lines and gullies intersecting the application area feed into Whaleback Creek, Homestead Creek and the upper reaches of the Fortescue River. The watercourses are dry for most of the year, only flowing briefly following significant rainfall (BHP Billiton 2008). Appropriate surface water management practices will be implemented to minimise erosion and minimise potential impacts on the quality of surface water (BHP Billiton 2008). To avoid impacts to watercourses, the clearing corridor at each creekline crossing will be limited to approximately 3.5 metres wide and the long narrow area of clearing proposed for construction and maintenance along a pipeline corridor is unlikely to have any significant impact on surface water quality.

Groundwater quality monitoring is conducted as part of the existing mine operations at the nearby Mount Whaleback and Orebody 29 minesites (BHP Billiton 2008).

DWER's Water Source Protection and Planning team has advised that it does not oppose the CPS 2814/3 application, however, to avoid and minimise water quality impacts the clearing should be minimised and best management practice guidance followed (DWER 2022a) (see Section 3.3).

The proposed clearing may cause some short-term surface water sedimentation during construction and maintenance works, however, proposed clearing is not likely to cause deterioration in the quality of surface or underground water. Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Conclusion: For the reasons set out above, and the avoidance and mitigation measures provided by the applicant (Section 3.1), it is considered that potential impacts of the proposed clearing can be managed by maintaining current hydrological flows and adhering to best management practice guidance.

Conditions: To address potential impacts to water resources from proposed clearing the following management measure will be required as a condition on the clearing permit.

- Where a watercourse is to be impacted by clearing, maintain the existing surface water flow.

3.3. Relevant planning instruments and other matters

The application to amend CPS 2814/2 was received by DWER on 20 December 2021. The application was advertised for 14 days and no submissions were received.

The applicant requested a permit extension to 30 November 2032. Relevant leases for Lot 351 on Plan 74327 and Lot 19 on Plan 48921 expire in April 2030**.** The current permit cannot be extended past April 2030 and any extension to CPS 2814/2 can only be granted up to April 2030. The applicant has been advised of, and agreed to, the revised date (BHP 2022a).

Access to Lot 1643 on Deposited Plan 215886 is via Special Lease I150289 (special lease) registered on 02/03/2001 granted under the *Iron Ore (Mount Newman) Agreement Act 1964* (WA) (State Agreement). The lessees are the participants in the Mount Newman Joint Venture, managed by BHP. The purpose of the lease is for the installation use, operation and maintenance of a Dust Suppression Pipeline to the Mine site. The term of the special lease expires in March 2022, and the terms of the special lease require an application for renewal to be made at least one year prior to the expiration of the current term. The lessees have a right to successive extensions, each for a further term of 21 years. On the 22 December 2020, on behalf of the lessees, BHP applied to the Department of Planning, Lands and Heritage (DPLH) for the renewal of the special lease for a further period of 21 years (BHP 2022a). The renewal of Special Lease I150289 is outstanding. The DPLH have advised DWER that they are currently progressing the renewal of lease, as granted, in favour of BHP (DPLH 2022). The lease is due to expire on 05 March 2022 and will likely enter a period of holding-over prior to the finalisation, execution, and registration of the new lease. The new lease is intended to be granted for the same purpose, over the same area, for a period of 21 years and will be back-dated to the expiration of Special Lease I150289 to ensure tenure continuity and to minimise any disruption to mining operations (DPLH 2022). There does not appear to be any outstanding issues that would ultimately prevent the grant of the new lease over the identified area, and the DPLH is working to expedite the finalisation of the renewal (DPLH

2022). Noting the advice from DPLH, DWER considers it appropriate to grant the amended permit ahead of the finalisation of the lease agreement.

Lot 42 on Deposited Plan 217099 and Lot 300 on Deposited Plan 44340 are components of lands proclaimed as a highway under Main Roads Western Australia (Main Roads) control. Main Roads has informed the applicant that it has no objection to the renewal of the CPS 2814/2 clearing permit for the purpose of construction and maintenance of water, power infrastructure and associated activities over the highway (BHP 2022).

The application area is located within the Newman Water Reserve PDWSA protected under the *CAWS Act 1947* in both Priority 1 and Priority 3 areas. The eastern component of the application area is very close to several drinking water bore protection zones known as Wellhead Protection Zones (WHPZs) with the closest within 150 metres (Appendix D: Figure E). Advice on water quality impacts in relation to current policy and guidelines for the granting of licences to clear native vegetation in these areas under relevant legislation was obtained from DWER's Water Source Protection and Planning team (DWER 2022a). Best management practice is required to avoid and minimise any adverse impacts to water quality within the Newman PDWSA caused by clearing. (This is of particular importance within the immediately adjacent WHPZs.) The extent of clearing should be minimised as much as possible and all activities conducted within the PDWSA should be in accordance with DWER Water Quality Protection Notes (WQPN) and the Land Use Compatibility Tables available at WQPN 25 Land use compatibility tables for PDWSAs (August 2021). Relevant Water Quality Protection Notes available from the DWER website include WQPN 83 Infrastructure corridors near sensitive water resources and:

- WQPN 83: Infrastructure corridors near sensitive water resources;
- WQPN 44: Roads near sensitive water resources;
- WQPN 56: Tanks for fuel and chemical storage near sensitive water resources;
- WQPN 10: Contaminant spills: Emergency response plans;
- WQPN 30: Groundwater monitoring bores; and
- Brochure: Construction depots near sensitive water resources

According to the Land Use Compatibility Tables, powerlines and drinking water infrastructure (drinking water pipelines, bores, drinking water treatment plant) are considered compatible with conditions in Priority 1 (P1) areas, and compatible with conditions, or acceptable, in Priority 3 (P3) areas and infrastructure corridors (DWER 2022a). DWER's Water Source Protection and Planning team does not oppose the CPS 2814/3 application, however, to avoid and minimise water quality impacts, the clearing should be minimised and best management practice guidance followed, including WQPN 25 (Land use compatibility tables for PDWSAs) and WQPN 83 (Infrastructure corridors near sensitive water resources) (DWER 2022a).

The application area is located within the Pilbara Surface Water Area (UFI 54) and the Pilbara Groundwater Area (UFI 44) proclaimed under the *Rights in Water and Irrigation Act (1914)* (RIWI Act). Advice regarding obligations under the RIWI Act was obtained from DWER's North West Region (NWR) team (DWER 2022b). A previous permit (PMB 167 682) issued to BHP to obstruct or interfere with bed and banks, under section 17 of the RIWI Act, has now expired. If proposed works are likely to interfere with, or modify, the bed or banks of a watercourse a new permit will be required (DWER 2022b). DWER's water licensing team in the Pilbara office can be contacted to discuss licensing requirements. If works over watercourses has been done in the past, and no new disturbance is required, a permit may not be necessary.

In accordance with section 51E(4A) of the EP Act, the DWER considered that the Shire of East Pilbara may have a direct interest in the subject matter of application CPS 2814/3, and was invited to comment. No comments were received from the Shire of East Pilbara by DWER. The applicant has provided evidence that the Shire of East Pilbara has no objections to an extension to the CPS 2814/2 native vegetation clearing permit and it's conditions (BHP 2021).

The application area is located within the boundaries of a Native Title Determination area. That is, Nyiyaparli People (WAD6280/1998): Revised Native Title Determination on 19/01/2021 (WAD90/2020) Karlka Nyiyaparli (Aboriginal Corporation) registered native title bodies corporate (RNTBC) and State of Western Australia and Ors (WR2020/001).

The application area is located within the boundaries of an associated registered Indigenous Land Use Agreement (ILUA) area. That is, the Nyiyaparli People and BHP Billiton Comprehensive Agreement - Initial ILUA (WI2012/005)

Spatial data indicates that numerous Aboriginal Heritage Places (Registered Sites and Other Heritage Places) are located within 50 kilometres of the application area, three of which intersect the application area itself: Mt Whaleback (Place ID 6702), Jinjirana (Place ID 18480), and Borrow Pit MRD Newman (Place ID 9079). Several Aboriginal Heritage Places are located within 300 metres of the application area including: Ore Body 29.18 (Place ID 7036), Ore Body 29.12. (Place ID 11971), Diggina Billabong West (Place ID 7549), Shovelanna Hill 19 (Place ID 9193), Newman MRD Outcrop A (Place ID 10636), and Minderoo Well (Place ID 38827). It is the permit holder's responsibility to comply with the *Aboriginal Heritage Act 1972* (WA), and to ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

Appendix A – Site characteristics

The information provided below describes the key characteristics of the area proposed to be cleared and is based on the best information available to DWER at the time of this assessment. This information was used to inform the assessment of the clearing against the Clearing Principles, contained in Appendix B. The 'local area' is considered a 50 kilometre radius of the application areas.

A.1 Site characteristics

<table>
<tr><th>Site characteristic</th><th>Details</th></tr>
<tr><td>Local context</td><td>The application area is located on the junction of the Pilbara (PIL) and Gascoyne (GAS) IBRA Bioregions as defined by Thackway and Cresswell (1995). The application area is located immediately south of the town of Newman (Appendix A: Figure A).</td></tr>
<tr><td>Vegetation description</td><td>Shepherd et al, 2001 produced regional vegetation mapping of vegetation associations or Western Australia. Three of these associations have been mapped over the application area.
<table>
<tr><th>Vegetation association</th><th>Description</th><th>Structure</th><th>System</th></tr>
<tr><td>18</td><td>Mulga Acacia aneura and associated species.</td><td>Low woodland, open low woodland or sparse woodland</td><td>Hammersley_ 18</td></tr>
<tr><td>29</td><td>Sparse low woodland; mulga, discontinuous in scattered groups</td><td>Low woodland, open low woodland or sparse woodland</td><td>Kumarina Hills_29</td></tr>
<tr><td>82</td><td>Hummock grassland with scattered bloodwoods & snappy gum Triodia spp., Corymbia dichromophloia, Eucalyptus leucophloia</td><td>Low tree-steppe</td><td>Hammersley_ 82</td></tr>
</table></td></tr>
<tr><td>Vegetation condition</td><td>Vegetation condition ranged from degraded to pristine as determined by ecologia (2008b).

Ninety per cent of the application area was in a condition of good or worse condition. ecologia (2008b) describe the vegetation along the corridor as generally degraded and disturbed, especially on the northern extent of the corridor adjacent to the rail line. In this area the vegetation was heavily grazed by cattle, weed species were abundant with exotics that proliferate in disturbed areas.
<table>
<tr><th>Vegetation condition (ecologia 2008b)</th><th>Description</th><th>Per cent of area surveyed</th></tr>
<tr><td>Pristine</td><td>No disturbance</td><td>5.8</td></tr>
<tr><td>Excellent</td><td>Minimal disturbance</td><td>4.3</td></tr>
<tr><td>Good</td><td>Moderate disturbance</td><td>56.5</td></tr>
<tr><td>Poor</td><td>Significant disturbance</td><td>27.6</td></tr>
<tr><td>Degraded</td><td>Very high disturbance</td><td>5.8</td></tr>
</table></td></tr>
<tr><td>Land Systems</td><td>
<table>
<tr><th>Land System</th><th>Code</th><th>Description</th></tr>
<tr><td>Elimunna System</td><td>285Ei</td><td>Stony plains on basalt supporting sparse acacia and cassia shrublands and patchy tussock grasslands.</td></tr>
<tr><td>McKay System</td><td>285Mk</td><td>Hills, ridges, plateaux remnants and breakaways of meta sedimentary and sedimentary rocks supporting hard spinifex grasslands with acacias and occasional eucalypts.</td></tr>
<tr><td>Mine</td><td>285Ne</td><td>Disturbed area, mines, mullock dumps etc</td></tr>
</table></td></tr>
</table>

Site characteristic	Details		
	Newman System	285Ne	Rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands.
	River System	290Ri	Narrow, seasonally active flood plains and major river channels supporting moderately close, tall shrublands or woodlands of acacias and fringing communities of eucalypts sometimes with tussock grasses or spinifex.
	Rocklea System	285Rk	Basalt hills, plateaux, lower slopes and minor stony plains supporting hard spinifex and occasionally soft spinifex grasslands with scattered shrubs.
	Spearhole System	290Sp	Gently undulating gravelly hardpan plains and dissected slopes supporting groved mulga shrublands and hard spinifex.
	Washplain System	290Ws	Hardpan plains supporting groved mulga shrublands.

Waterbodies

Type of inland water	Description	Proximity (m)
Rivers	Mainstream: Fortescue River	0
Rivers	Major River: Whaleback Creek	0
Rivers	Major River: Homestead Creek	0
Geodata, Lakes	Watercours_a	0
Hydrography, linear	Watercourse Bank - non-perennial	0
Hydrography, linear	Watercourse - minor, non-perennial	0
Hydrography, linear	Earth Dam	0
Rivers	Opthalmia Reservoir : Mainstream	50
Geodata, Lakes	Reservoir	264
Rivers	Opthalmia Dam Wall : Mainstream	756
Rivers	Mainstream	973
Geodata, Lakes	w_body_void	981
Rivers	Significant Stream	1,808
Rivers	Warrawanda Creek : Major River	4,319
Rivers	Shovelanna Creek : Significant Stream	7,490
Geodata, Lakes	Lake	7,691
Rivers	Minor River	12,445
Rivers	Major Trib	12,722
Rivers	Sylvania Creek: Major River	17,773
Rivers	Warrawanda Creek : Minor River	18,254
Rivers	Coondiner Creek : Significant Stream	30,512
Rivers	Jimblebar Creek : Significant Stream	33,254
Rivers	Caramulla Creek : Major River	41,710

<table>
<tr><th>Site characteristic</th><th>Details</th></tr>
<tr><td>Hydrogeography</td><td>
<table>
<tr><th>Factor</th><th></th></tr>
<tr><td>Hydrographic Catchment-Division</td><td>Indian Ocean</td></tr>
<tr><td>Hydrographic Catchment-Catchment</td><td>Fortescue River_Upper</td></tr>
<tr><td>Hydrographic Catchment-Basin</td><td>Fortescue River</td></tr>
<tr><td>RIWI Act Surface Water Area and Irrigation District</td><td>Pilbara Surface Water Area (UFI 54)</td></tr>
<tr><td>RIWI Act Rivers</td><td>None</td></tr>
<tr><td>RIWI Act Groundwater Areas</td><td>Pilbara Groundwater Area (UFI 44)</td></tr>
<tr><td>CAWS Act Clearing Control Catchment</td><td>None</td></tr>
<tr><td>Public Drinking Water Source Areas</td><td>Newman Water Reserve (P1)
Newman Water Reserve (P3)</td></tr>
<tr><td>Wellhead Protection Zone</td><td>None</td></tr>
<tr><td>Reservoir Protection Zone</td><td>None</td></tr>
<tr><td>Groundwater salinity</td><td>500-1,000 TDS/Mg/L</td></tr>
</table>
</td></tr>
<tr><td>Conservation areas</td><td>No DBCA managed lands are located within 50 kilometres of the application area.</td></tr>
<tr><td>Climate and Landform</td><td>The climate of the Pilbara is semi-desert tropical with the region experiencing two distinct seasons; a hot summer from October to April, and a mild winter from May to September with the majority of rainfall received during the hot summer months (Sudemeyer 2016). The annual rainfall for the closest town of Newman is approximately 324 millimetres (BOM 2020).</td></tr>
</table>

A.2 Ecosystem, flora and fauna analysis

A.2.1 Significant ecosystems

ID	Common name	Status (WA)	Status (Comm)	Location
Ethel Gorge	Ethel Gorge aquifer stygobiont community	EN	-	Intersects the application area
Fortescue Valley Sand Dunes	Vegetation of sand dunes of the Hamersley Range/Fortescue Valley	P3	-	35 kms to the north

A.2.2 Significant flora

Threatened taxa	Status	No. of Records	Closest Record (km)
Seringia exastia	CR	4	17.3

Priority taxa	Status	No. of Records	Closest Record (km)
Vittadinia sp. Coondewanna Flats (S. van Leeuwen 4684)	P1	1	22.6
Acacia corusca	P1	12	23.8
Eremophila capricornica	P1	1	25.5
Paranotis sp. Pilbara (H. Ajduk HAOP04a)	P1	7	30.9
*Eremophila s*p. West Angelas (S. van Leeuwen 4068)	P1	1	36.7
Eremophila rhegos	P1	1	37.1

Priority taxa	Status	No. of Records	Closest Record (km)
Ipomoea racemigera	P2	5	0.04
Isotropis parviflora	P2	10	12.5
Goodenia hartiana	P2	11	19.4
Euphorbia inappendiculata var. *inappendiculata*	P2	1	23.1
Aristida lazaridis	P2	1	29.9
Hibiscus sp. Gurinbiddy Range (M.E. Trudgen MET 15708)	P2	1	42.2
Oxalis sp. Pilbara (M.E. Trudgen 12725)	P2	1	43.4
Goodenia sp. East Pilbara (A.A. Mitchell PRP 727)	P3	14	0.5
Swainsona thompsoniana	P3	1	0.58
Gymnanthera cunninghamii	P3	3	1.4
Aristida jerichoensis var. *subspinulifera*	P3	9	3.1
Eremophila sp. Hamersley Range (K. Walker KW 136)	P3	3	4.9
Streptoglossa sp. Cracking clays (S. van Leeuwen et al. PBS 7353)	P3	2	8.6
Indigofera gilesii	P3	9	11.5
Rhagodia sp. Hamersley (M. Trudgen 17794)	P3	19	14.3
Triodia sp. Mt Ella (M.E. Trudgen 12739)	P3	7	14.9
Eremophila rigida	P3	1	16.0
Crotalaria smithiana	P3	2	17.3
Themeda sp. Hamersley Station (M.E. Trudgen 11431)	P3	2	20.3
Eremophila magnifica subsp. *velutina*	P3	2	28.8
Acacia subtiliformis	P3	4	29.7
Amaranthus centralis	P3	1	36.0
Maireana prosthecochaeta	P3	2	41.0
Xerochrysum boreale	P3	1	41.6
Sida sp. Barlee Range (S. van Leeuwen 1642)	P3	2	42.3
Goodenia nuda	P4	8	2.2
Eremophila magnifica subsp. *magnifica*	P4	2	2.6
Lepidium catapycnon	P4	20	5.1
Eremophila youngii subsp. *lepidota*	P4	2	8.4
Goodenia berringbinensis	P4	1	17.1
Acacia bromilowiana	P4	3	36.7

A.2.3 Significant fauna

Common name	Scientific name	Status	No. Records	Closest Record (km)
Mammals				
Black-flanked Rock-wallaby	*Petrogale lateralis lateralis*	EN	5	9.2
Greater Bilby	*Macrotis lagotis*	VU	8	0.15
Pilbara Leaf-Nosed Bat	*Rhinonicteris aurantia* (Pilbara)	VU	154	15.1
Ghost Bat	*Macroderma gigas*	VU	13	2.2
Brush-Tailed Mulgara	*Dasycercus blythi*	P4	2	15.8
Long-Tailed Dunnart	*Sminthopsis longicaudata*	P4	4	4.6
Spectacled Hare-Wallaby (Mainland)	*Lagorchestes conspicillatus leichardti*	P4	2	39.5
Western Pebble-Mound Mouse	*Pseudomys chapmani*	P4	72	0.76
Birds				
Peregrine Falcon	*Falco peregrinus*	OS	8	1.61
Princess Parrot	*Polytelis alexandrae*	P4	2	40.0

Common name	Scientific name	Status	No. Records	Closest Record (km)
Gull-Billed Tern	*Gelochelidon nilotica*	MI	8	3.2
Caspian Tern	*Hydroprogne caspia*	MI	3	3.6
Glossy Ibis	*Plegadis falcinellus*	MI	11	0.13
Curlew Sandpiper	*Calidris ferruginea*	CR	1	3.9
Common Sandpiper	*Actitis hypoleucos*	MI	18	1.0
Sharp-Tailed Sandpiper	*Calidris acuminata*	MI	10	1.0
Pectoral Sandpiper	*Calidris melanotos*	MI	2	1.0
Red-Necked Stint	*Calidris ruficollis*	MI	2	3.7
Long-Toed Stint	*Calidris subminuta*	MI	4	1.0
Oriental Plover	*Charadrius veredus*	MI	1	3.2
Wood Sandpiper	*Tringa glareola*	MI	4	3.7
Common Greenshank	*Tringa nebularia*	MI	5	2.9
Marsh Sandpiper	*Tringa stagnatilis*	MI	1	3.7
Redshank	*Tringa totanus*	MI	1	2.9
Reptiles				
Pilbara olive python	*Liasis olivaceus barroni*	VU	9	2.1
Gane's blind snake (Pilbara)	*Anilios ganei*	P1	10	1.5
Spotted ctenotus (northeast)	*Ctenotus uber johnstonei*	P2	1	17.0

A.3 Vegetation extent

Factor	Pre-European extent (ha)	Current extent (ha)	Remaining (%)	Current extent in all DBCA managed land (ha)	Current extent in all DBCA managed land (%)
IBRA bioregion:					
Pilbara (PIL)	17,808,657	17,731,765	99.6	1,801,715	10.2
Gascoyne (GAS)	18,075,219	18,067,441	100.0	1,855,508	10.3
Vegetation associations					
18 (Hammersley_18)	19,890,667	19,842,830	99.8	1,317,179	6.6
29 (Kumarina Hills_29)	7,903,991	7,898,973	99.9	496,368	6.3
82 (Hammersley_82)	2,565,901	2,553,206	99.5	295,378	11.6
Remnant vegetation (50km radius)					
Remnant vegetation	995,739.4	988,760	99.3		

Appendix B – Assessment against the Clearing Principles

Assessment against the Clearing Principles	Variance level	Is further consideration required?
Environmental value: biological values		
Principle (a): *"Native vegetation should not be cleared if it comprises a high level of biodiversity."* Assessment: A flora and vegetation survey over the majority of the application area recorded 375 flora taxa from 47 families and 137 genera (*ecologia* 2008b). Relevant database records indicate that one Threatened flora taxa, and 37 Priority flora taxa have been recorded within 50 kilometres of the application area consisting of six Priority 1, seven Priority 2, eighteen Priority 3 and six Priority 4 flora taxa (Appendix A2.2). Twenty-seven fauna species of conservation significance have also been recorded within 50 kilometres of the application area and one Threatened Ecological Community has been mapped over the application area. The narrow corridor of proposed clearing in an area that has already been subject to a considerable degree of disturbance is unlikely to significantly impact on the biological diversity of the region.	Not likely to be at variance	Yes Section 3.2.1
Principle (b): *"Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna."* Assessment: Twenty-seven fauna species of conservation significance have been recorded within 50 kilometres of the application area consisting of 16 birds, eight mammals and three reptiles (Appendix A2.3).	Not likely to be at variance	Yes Section 3.2.2
Principle (c): *"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."* Assessment: No species of Threatened flora were recorded during the flora survey of *ecologia* (2008b). Since the original assessments of *ecologia (*2008b) *Lepidium catapycnon* has been delisted as a Threatened species (15/02/2018) (DAWE nd), and is considered a Priority 4 species by the DBCA. Database records indicate that the Threatened flora taxa, *Seringia exastia,* has been recorded approximately 17.3 kilometres from the application area (Appendix A2.2). This species was listed as Threatened (CR) when it was only known from a few locations in the vicinity of Broome. Taxonomically the widespread species *Seringia elliptica* has recently been incorporated into *Seringia exastia* (Binks *et al.* 2020). Given the much broader distribution of the resulting taxon, it is no longer considered to be of significance (Binks *et al*. 2020). In consideration of past survey results and distance to known records it is unlikely that *Seringia elliptica* occurs over the application area. Native vegetation proposed to be cleared is unlikely to include, or be necessary for, the continued existence of, Threatened flora.	Not likely to be at variance	No
Principle (d): *"Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community."* Assessment: One Threatened Ecological Community (TEC) has been mapped over a portion of the application area (Appendix D: Figure B). That is the Endangered Ethel Gorge aquifer stygobiont community comprising a diverse assemblage of invertebrate stygofauna. Construction and maintenance of water and power infrastructure along a pipeline corridor is not expected to have any effect on groundwater levels or groundwater salinity.	Not likely to be at variance	Yes Section 3.2.3

Assessment against the Clearing Principles	Variance level	Is further consideration required?
No TEC's were identified during the flora survey of the application area by *ecologia* (2008b) and native vegetation proposed to be cleared is unlikely to comprise the whole or a part of, or be necessary for, the maintenance of a TEC.		
Environmental values: significant remnant vegetation and conservation areas		
Principle (e): *"Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared."* Assessment: The national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with an extent below 30 per cent of that present prior to 1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia 2001). The application area is located within both the Pilbara Bioregion and the Gascoyne Bioregion. Both these bioregions retain over 99.5 per cent of their original extent (Government of Western Australia 2019) (Appendix A3). Three regional vegetation associations described and mapped by Shepherd *et al.* (2001) have been mapped over the application area (Appendix A1). All three relevant vegetation associations retain over 99.5 per cent of their original extent (Government of Western Australia 2019) (Appendix A3). Remnant native vegetation has been mapped within the local area of a 50 kilometre radius of the application area. Over 99.3 per cent of the original vegetation occurring in the local area has been retained (Appendix A3). Although several large scale mining operations are located within the immediate vicinity of the application area on a broader scale the surrounding area has not been extensively cleared. The native vegetation proposed to be cleared is not considered significant as a remnant of native vegetation in an area that has been extensively cleared.	Not at variance	No
Principle (h): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area."* Assessment: There are no conservation areas managed by the DBCA within the vicinity, or within the local area of a 50 kilometre radius of the application area. The closest such lands are the Collier Range National Park located approximately 117 kilometres south of the application area, and Karijini National Park approximately 125 kilometres north-west of the application area. Due to the separation distances to lands managed for conservation purposes the proposed clearing of native vegetation is unlikely to have an impact on the environmental values of any adjacent or nearby conservation area.	Not likely to be at variance	No
Environmental values: land and water resources		
Principle (f): *"Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland."* Assessment: The proposed pipeline corridor crosses the upper reaches of the Fortescue River, Homestead Creek and Whaleback Creek, and the western end of the application area runs adjacent to Whaleback Creek (Appendix A1; Appendix D: Figure D). Riparian vegetation is associated with these watercourses *(ecologia* 2008b) and proposed clearing is likely to include native vegetation growing in, or in association with, an environment associated with a watercourse.	At variance	Yes Section 3.2.4
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."*	May be at variance	Yes

Assessment against the Clearing Principles	Variance level	Is further consideration required?
Assessment: Eight broad Land Systems have been mapped over the application area (Appendix A1) with a range of soil types potentially susceptible to wind and water erosion. The linear nature of the proposed clearing for a pipeline corridor and the minimal impact to susceptible soil types is unlikely to result in significant land degradation.		Section 3.2.5
Principle (i): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water."* Assessment: The application area is located within the Pilbara Surface Water Area (UFI 54) and the Pilbara Groundwater Area (UFI 44) proclaimed under the RIWI Act, and major watercourses including the upper reaches of the Fortescue River, Whaleback Creek, and Homestead Creek intersect the application area (Appendix D: Figure D). Portions of the application area are also within a Public Drinking Water Source Area. Existing surface water flows will not be altered and standard construction methodologies for drainage control and water erosion will be implemented. The linear nature of the proposed clearing and the minimal impact to watercourses is unlikely to result in significant land degradation. Groundwater will not be intersected and proposed clearing is not likely to cause deterioration in the quality of surface or underground water.	Not likely to be at variance	Yes Section 3.2.6
Principle (j): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding."* Assessment: The application area is located within the Fortescue River (Upper) catchment of the Fortescue River Basin. The application area is not located within any annual exceedance probability (AEP) floodplains, and none are mapped within 50 kilometres of the application area. The application area intersects the Fortescue River, Homestead Creek and Whaleback Creek, and the western end of the application area runs adjacent to Whaleback Creek (Appendix D: Figure D). These watercourses are dry most of the year, only flowing briefly following significant rainfall. The application area drains into the Fortescue River (Upper) catchment. Natural flooding occurs occasionally within this catchment during the wet season (November to March) following significant rainfall (BHP Billiton 2008). Standard and staged construction methodologies including strategies for drainage controls and water erosion will be employed. The comparatively small area to be cleared (75 hectares) in relation to the size of the catchment area (2,975,192 hectares) is unlikely to cause or exacerbate the incidence or intensity of flooding.	Not likely to be at variance	No

Appendix C – Vegetation condition rating scale

Vegetation condition is a rating given to a defined area of vegetation to categorise and rank disturbance related to human activities. The rating refers to the degree of change in the vegetation structure, density and species present in relation to undisturbed vegetation of the same type. The degree of disturbance impacts upon the vegetation's ability to regenerate. Disturbance at a site can be a cumulative effect from a number of interacting disturbance types.

The *ecologia* (2008) survey utilised the Keighery (1994) condition rating scale.

Vegetation condition scale of Keighery (1994)

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, with disturbance affecting individual species; weeds are non-aggressive species.
Very good	Vegetation structure altered, with obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and/or grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and/or grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and/or grazing.
Completely degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

Appendix D – Figures (A to E)

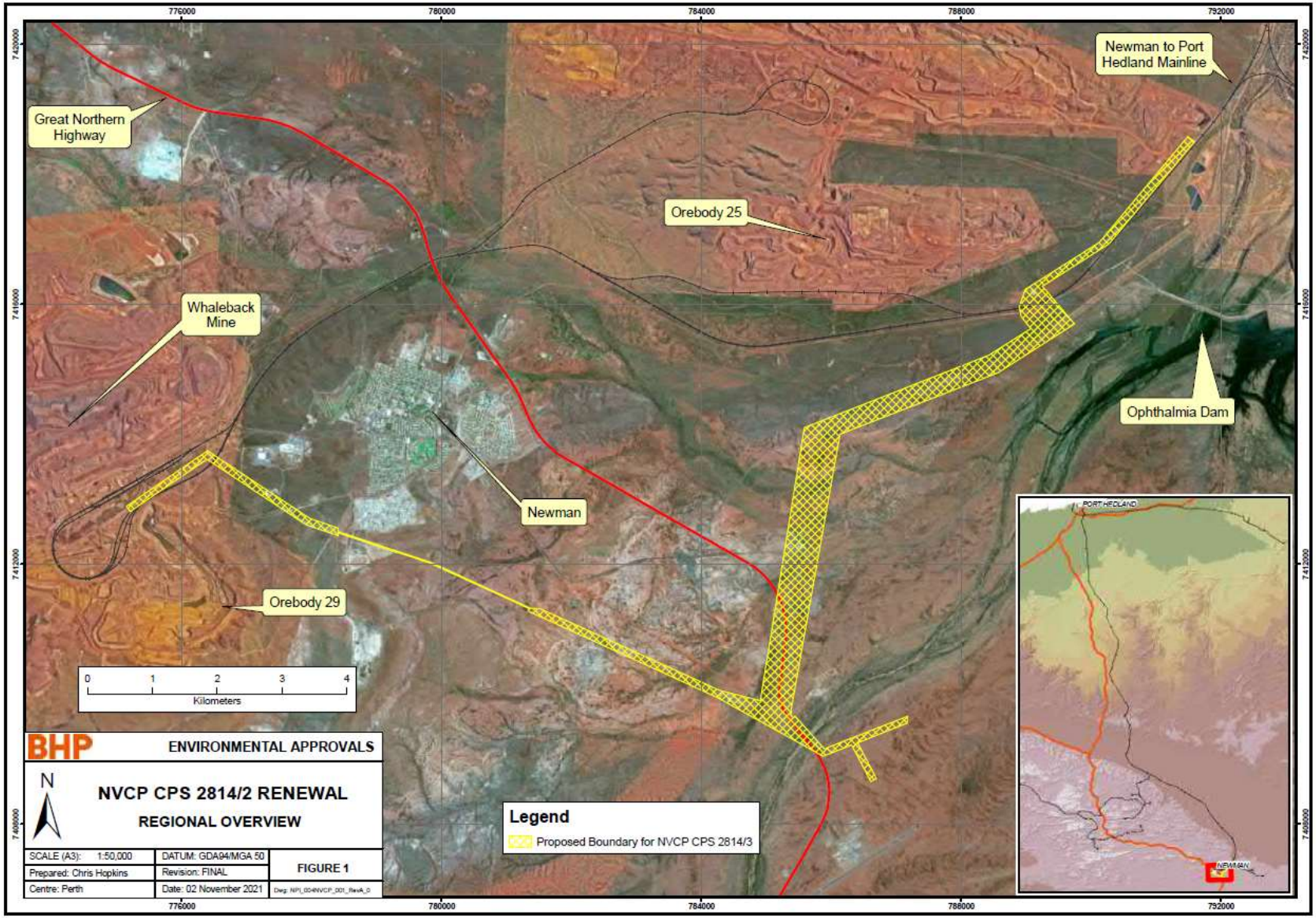

Figure A: Application area

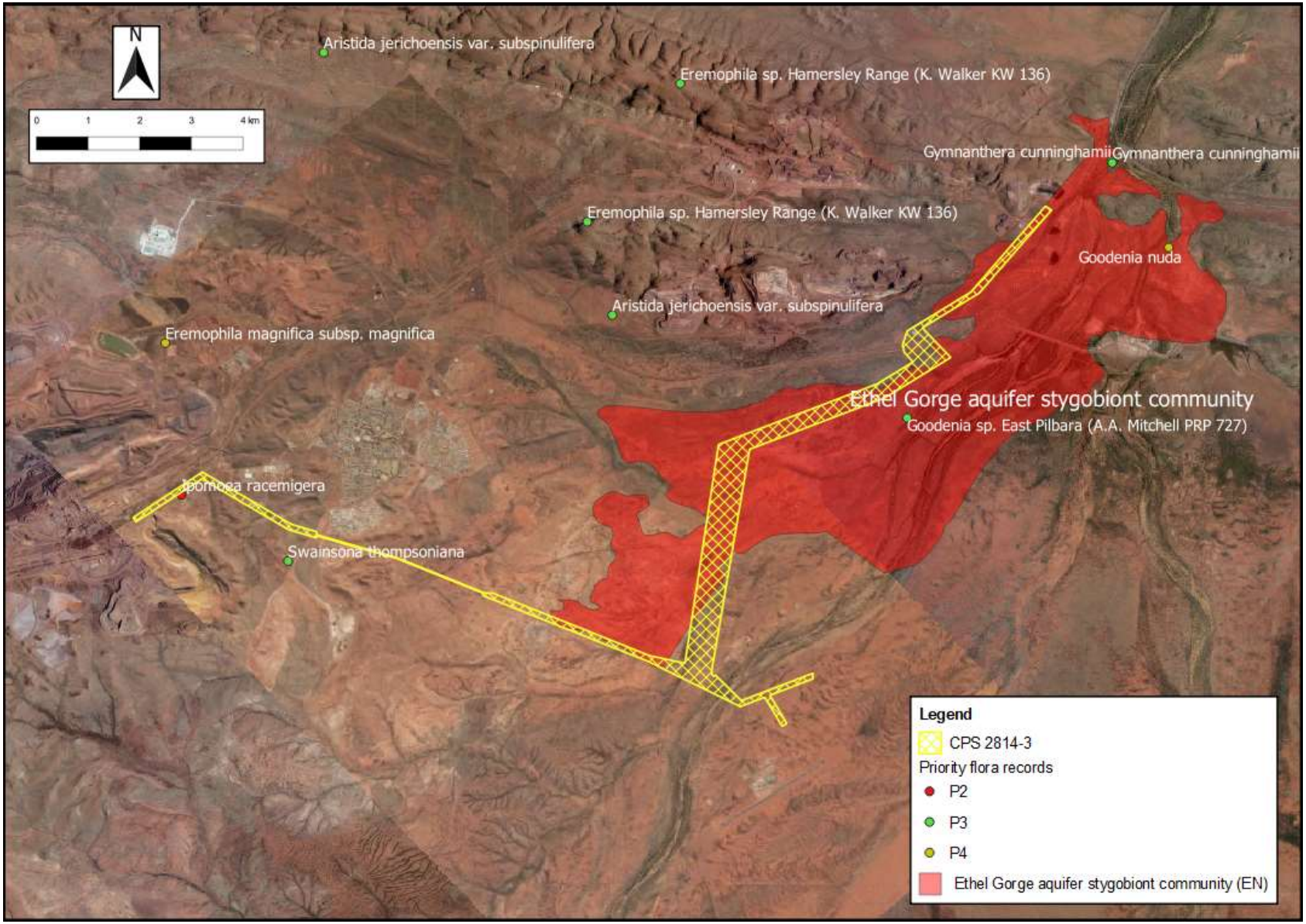

Figure B: Threatened ecological communities and conservation significant flora locations

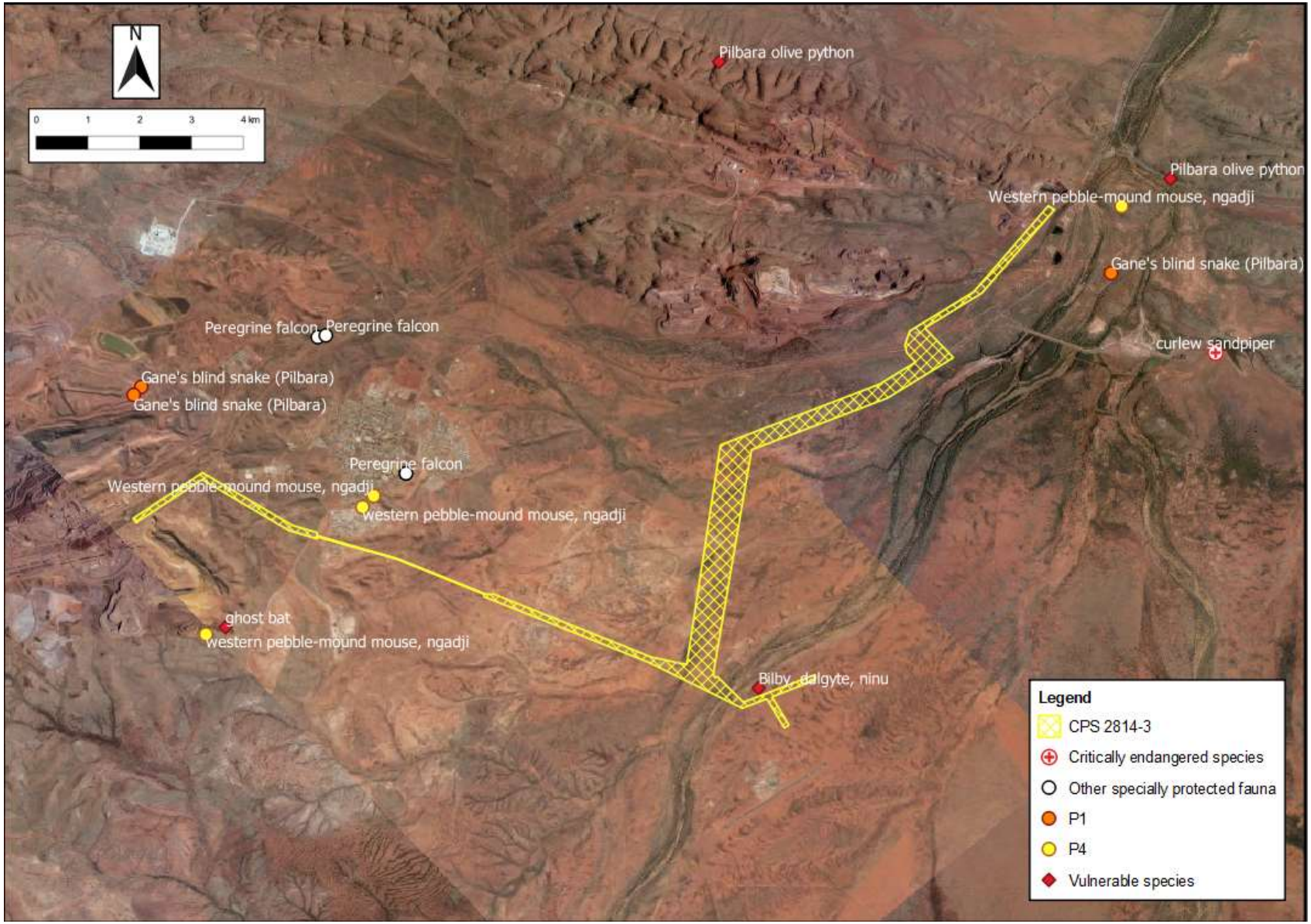

Figure C: Conservation significant fauna locations

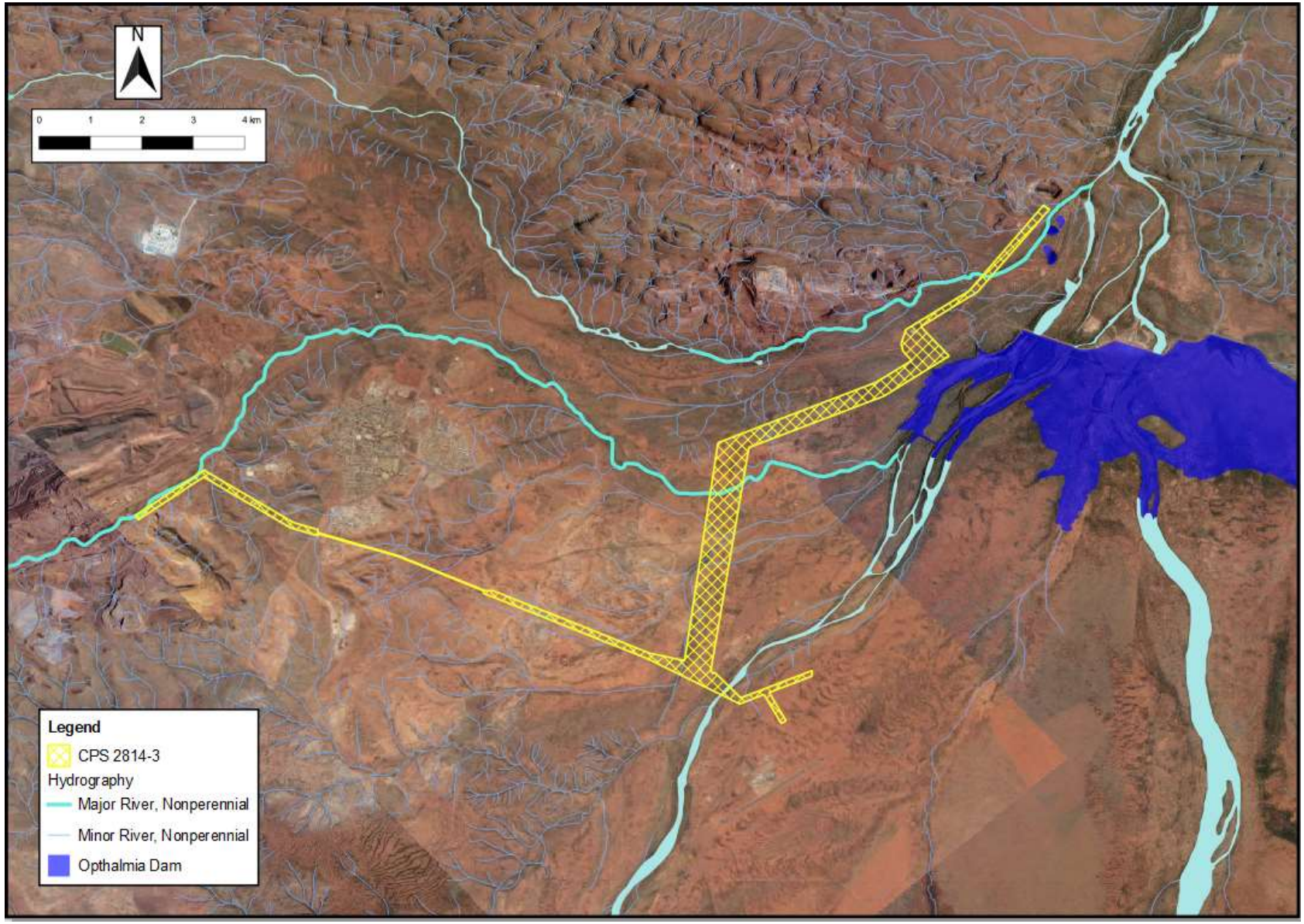

Figure D: Watercourses and wetlands

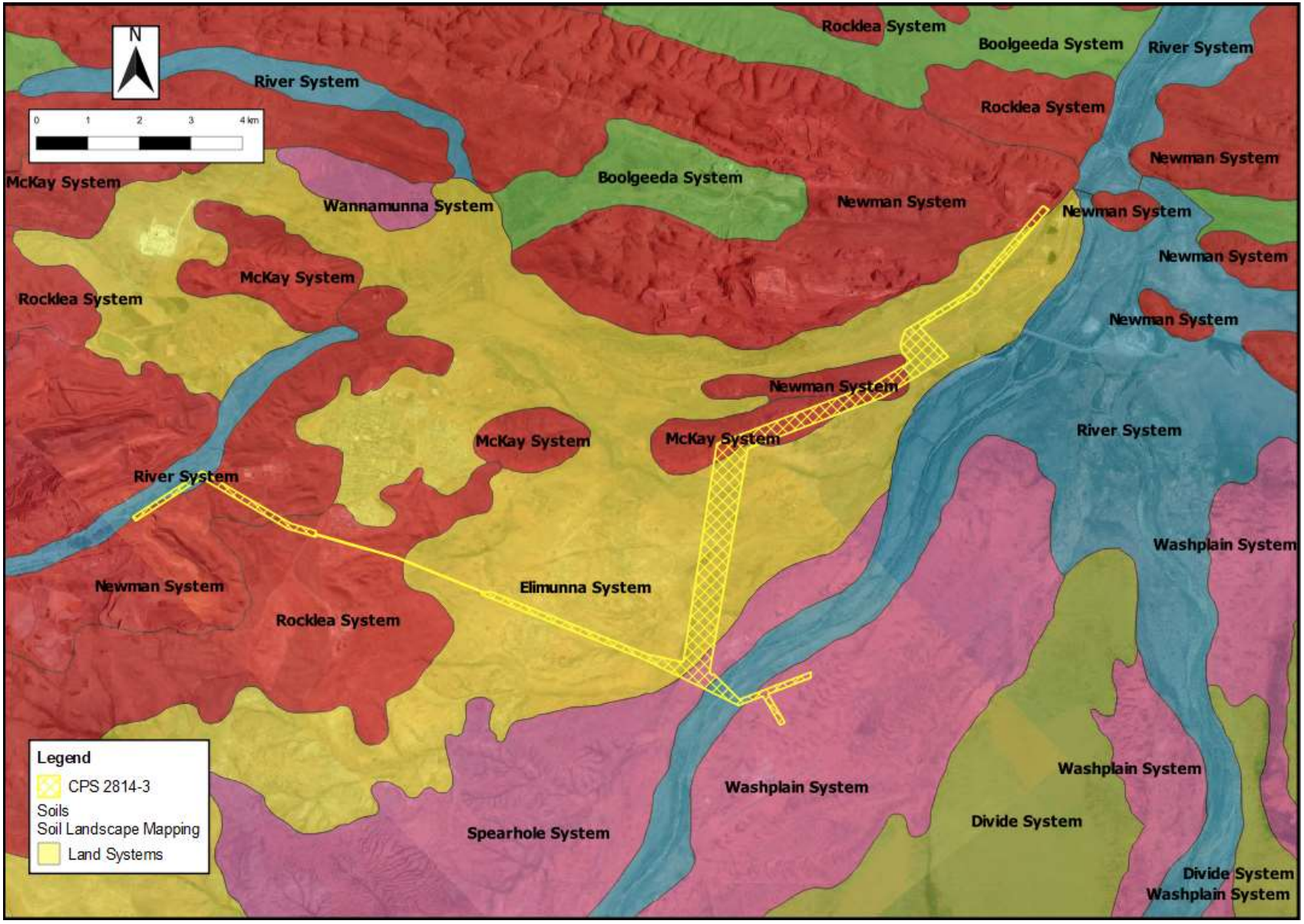

Figure E: Land Systems

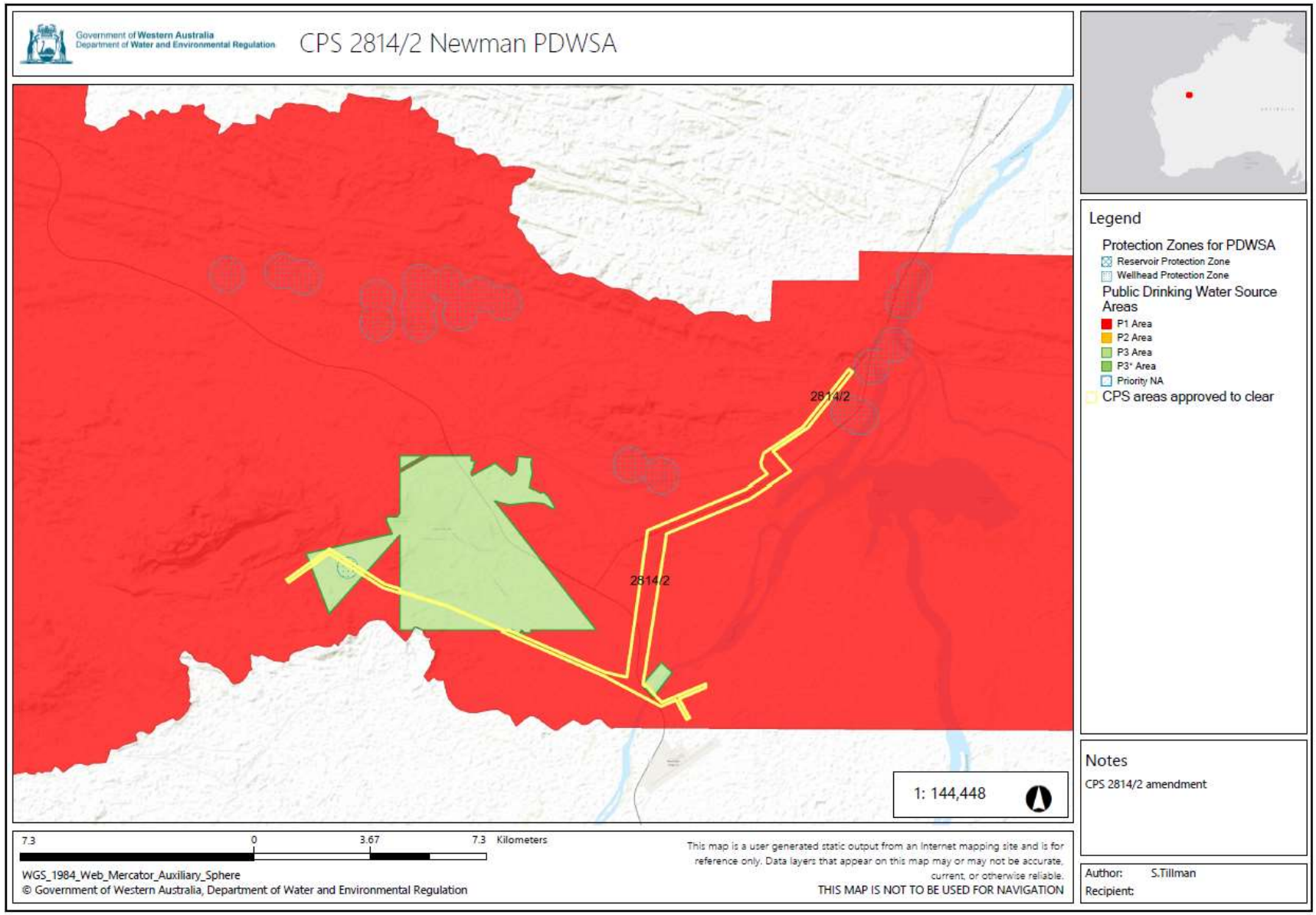

Figure E: Protection zones for Public Drinking Water Source Areas

Appendix E – References and databases

E.1 References

BHP Iron Ore Pty. Ltd. (BHP) (2021) Newman Water System Upgrade Project. Application for an amendment to clearing permit CPS 2814/2: Permit duration and name change. BHP Pty Ltd, Western Australia.

BHP Iron Ore Pty. Ltd. (BHP) (2022a) Supporting information from BHP Iron Ore Pty. Ltd for CPS 2814/3. Application for renewal of Special Lease I150289 (DWERDT548682; DWERDT548683).

BHP Iron Ore Pty. Ltd. (BHP) (2022b) Supporting information from BHP Iron Ore Pty. Ltd for CPS 2814/3. Main Roads Western Australia authorisation for access to Great Northern Highway (Lot 42 on Deposited Plan 217099 and Lot 300 on Deposited Plan 44340) (DWERDT560998).

BHP Billiton Iron Ore Pty. Ltd. (BHP Billiton) (2008) Newman Water System Upgrade Project. Application to Clear Native Vegetation (Purpose Permit CPS 2814/1) under the *Environmental Protection Act 1986.* BHP Billiton Iron Ore Pty Ltd, Western Australia.

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Department of Biodiversity, Conservation and Attractions (DBCA) (nd) Fact Sheet: Threatened Ecological community: Ethel Gorge aquifer stygobiont community.

Department of Biodiversity, Conservation and Attractions (DBCA) (2019) Threatened and Priority Fauna List. https://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-animals

Department of Planning, Lands and Heritage (DPLH) (2022) Response to an enquiry made by the Department of Water and Environmental Regulation (DWER) as to the status of Special Lease I150289 granted under the Iron Ore (Mount Newman) Agreement Act 1964 (WA) (DWER Ref A2085798).

Department of Water and Environmental Regulation (DWER) (2022a) Advice received from the Water Source Protection and Planning team of the Department of Water and Environmental Regulation in regard to CPS 2814/3 and Public Drinking Water Supply Areas (PDWSA) received on 18 February 2022 (DWERDT566531)

Department of Water and Environmental Regulation (DWER) (2022b) Advice received from the North West Region (NWR) team of the Department of Water and Environmental Regulation in regard to CPS 2814/3 and obligations under the *Rights in Water and Irrigation Act (1914)* (RIWI Act) received on 3 March 2022 (DWERDT571803)

ecologia (2008a) Newman Water Pipeline Enhancement Project: Desktop Fauna Survey. *ecologia* Environment, Western Australia.

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E.2 GIS databases

Publicly available GIS Databases used (sourced from www.data.wa.gov.au):

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- Aboriginal Heritage Places (DPLH-001)
- Cadastre (LGATE-218)
- Cadastre Address (LGATE-002)
- Contours (DPIRD-073)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- Flood Risk (DPIRD-007)
- Groundwater Salinity Statewide (DWER-026)
- Hydrography – Inland Waters – Waterlines
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics
- Imagery
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Native Title (ILUA) (LGATE-067)
- Pre-European Vegetation Statistics
- Remnant Vegetation, All Areas
- Native Vegetation Extent (DPIRD-005)
- Public Drinking Water Source Areas (DWER-033)
- Ramsar Sites (DBCA-010)
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available
- Soil Landscape Mapping – Systems
- Wheatbelt Wetlands Stage 1 (DBCA-021)

Restricted GIS Databases used:

- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)