



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 6834/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: BHP Billiton Iron Ore Pty Ltd

1.3. Property details

Property: Miscellaneous Licence 52/163
Local Government Area: Shire of East Pilbara
Colloquial name: Orebody 31 Pipeline Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
20		Mechanical Removal	Pipeline construction and maintenance and all associated activities.

1.5. Decision on application

Decision on Permit Application: Granted
Decision Date: 31 March 2016

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description The application area has been mapped as the following Beard vegetation association:

29: Sparse low woodland; mulga, discontinuous in scattered groups

A Level 1 Flora and Vegetation Survey of the application area was undertaken by Onshore Environmental Consultants Pty Ltd (Onshore Environmental) during the period 13 – 14 July 2015 (Onshore Environmental, 2015). The flora survey identified the following ten vegetation associations in the application area

1. *Eucalyptus* Woodland - Woodland of *Eucalyptus victrix* over Low Open Woodland of *Acacia citrinoviridis* and *Acacia aptaneura* over High Open Shrubland of *Melaleuca glomerata* and *Acacia pyrifolia* on medium drainage line.
2. *Acacia* Low Open Forest - Low Open Forest of *Acacia citrinoviridis*, *Acacia coriacea* subsp. *pendens* and *Eucalyptus victrix* over Open Tussock Grassland of **Cenchrus ciliaris*, *Eulalia aurea* and *Aristida holathera* var. *holathera* with Very Open Hummock Grassland of *Triodia pungens* on medium drainage lines.
3. *Acacia* Low Woodland - Low Woodland of *Acacia aptaneura*, *Acacia paraneura* and *Corymbia aspera* over Open Tussock Grassland of *Aristida inaequiglumis*, *Aristida contorta* and *Eneapogon polyphyllum* with Low Open Shrubland of *Ptilotus obovatus*, *Solanum lasiophyllum* and *Eremophila lanceolata* on sandy loam plains.
4. *Sclerolaena* Low Shrubland - Low Shrubland of *Sclerolaena cuneata*, *Sclerolaena costata* and *Streptoglossa odora* over Open Tussock Grassland of *Aristida inaequiglumis*, *Aristida contorta* and *Enteropogon ramosus* with Low Open Woodland of *Acacia aptaneura*, *Acacia paraneura* and *Hakea lorea* subsp. *lorea* on plains.
5. *Triodia* Hummock Grassland - Hummock Grassland of *Triodia basedowii* with High Open Shrubland of *Acacia aptaneura* and *Acacia pruinocarpa* and Low Open Shrubland of *Scaevola parvifolia*, *Sida cardiophylla* and *Ptilotus astrolasicus* on sand plains.
6. *Triodia* Open Hummock Grassland - Open Hummock Grassland of *Triodia basedowii* over Open Tussock Grassland of *Aristida inaequiglumis* and *Aristida contorta* with Low Open Woodland of *Acacia aptaneura* and *Acacia pruinocarpa* on sandy stony plains.
7. *Chrysopogon* Closed Tussock Grassland - Closed Tussock Grassland of *Chrysopogon fallax*, *Aristida inaequiglumis* and *Digitaria ammophila* with Low Open Forest of *Acacia aptaneura* and *Corymbia aspera* and Open Shrubland of *Eremophila forrestii* subsp. *forrestii* and *Eremophila fraseri* in broad drainage line.
8. *Elytrophorus* Tussock Grassland – Tussock Grassland of *Elytrophorus spicatus* over Sedges of *choenoplectus dissachanthus* (3 merous variant) and *Schoenoplectus laevis* with Low Open Woodland of *Eucalyptus camaldulensis* on wet fringe of lake bed.
9. *Aristida* Open Tussock Grassland - Open Tussock Grassland of *Aristida inaequiglumis*, *Aristida contorta* and *Eulalia aurea* with Low Open Woodland of *Acacia aptaneura* and *Eucalyptus camaldulensis* and Very Open Hummock Grassland of *Triodia basedowii* on plains.
10. *Gnephosis* Herbs - Herbs of *Myriocephalus rudallii*, *Alternanthera nodiflora* and *Goodenia lamprosperma* with Low Woodland of *Eucalyptus camaldulensis* and Open Tussock Grassland of *Eragrostis kennedyae* and *Eragrostis tenellula* on drainage zone.

Clearing Description	Orebody 31 Pipeline Project. BHP Billiton Iron Ore Pty Ltd (BHP Billiton) proposes to clear 20 hectares within an application area of approximately 36.38 hectares for the purposes of construction and maintenance of pipelines and all associated activities. The project is located 15 kilometres east of Newman within the Shire of East Pilbara.
Vegetation Condition	Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994) to Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994).
Comment	Where it is necessary for new roads or pipelines to be installed within the Major Drainage Line habitat, clearing will be kept to a bare minimum and will maintain the natural surface flow (BHP Billiton, 2015).

3. Assessment of application against clearing principles

(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

Comments	<p>Proposal is not likely to be at variance to this Principle</p> <p>The application area is located within the Gascoyne Interim Biogeographic Regionalisation of Australia (IBRA) bioregion in which approximately 99.95% of the pre-European extent of vegetation remains in Western Australia (Government of Western Australia, 2014; GIS Database). This region is described as rugged, low Proterozoic sedimentary and granite ranges divided by broad flat valleys (CALM, 2002). The area also contains Mulga woodland with <i>Triodia</i> occurs on shallow stony loams on rises, while the plains are covered by Mulga parkland (CALM, 2002). The vegetation of the Gascoyne bioregion is well represented in Western Australia and is considered to be of least concern with regards to conservation status (Department of Natural Resources and Environment, 2002).</p> <p>A flora survey of the broader Orebody 31 project (located adjacent to the application area) was undertaken by Onshore Environmental in 2013. The Orebody 31 Level 2 Flora and Vegetation survey identified a total of 280 taxa, representing 35 families and 110 genera in the Orebody 31 project area (Onshore Environmental, 2014). However, within the Orebody 31 Pipeline application area, a reduced number of taxa would be present. The flora survey identified a total of 10 vegetation associations within the application area (Onshore Environmental, 2015). No species of Threatened species were recorded during the flora survey. One Priority Flora species, <i>Goodenia nuda</i> (P4) was recorded during the flora survey (Onshore Environmental, 2015). <i>G. nuda</i> was recorded from two locations in the northern parts of the application area on the banks and channels of medium drainage lines. Two individuals of <i>G. nuda</i> were recorded at one location and the other location recorded 30 individuals (Onshore Environmental, 2015). <i>G. nuda</i> are widespread throughout the Pilbara, with records of the species from the northern Carnarvon and eastern Gascoyne regions (Onshore Environmental, 2015). This species has been recorded from more than 80 locations throughout the Pilbara region and it is unlikely that the clearing associated with the proposal will have a detrimental impact on <i>G. nuda</i>. BHP Billiton (2015) confirm <i>G. nuda</i> individuals will be avoided where practicable, however it may be necessary to disturb this species to allow for the construction and maintenance of the pipeline and associated infrastructure.</p> <p>One plant taxon was identified as a range extension, <i>Eragrostis kennedyae</i>. This species is a low, perennial grass which was recorded at one location at the eastern fringes of Ophthalmia Dam (Onshore Environmental, 2015). The presence of <i>E. kennedyae</i> in the application area represents a 250 kilometre extension to the nearest documented population and the first record of the species in the Pilbara region (Onshore Environmental, 2015). <i>E. kennedyae</i> is distributed throughout the Murchison region, Carnarvon, Gascoyne, Great Victoria Desert, Little Sandy Desert and Yalgoo region (DPaW, 2016). It is unlikely that the proposal will have a detrimental impact on the species as the species is widely distributed throughout several bioregions in Western Australia. BHP Billiton (2015) report <i>E. kennedyae</i> will be avoided where practicable, however it may be necessary to disturb this species to allow for the construction and maintenance of the pipeline and associated infrastructure.</p> <p>Six introduced flora species (weeds) were recorded within the application area, including <i>Acetosa vesicaria</i>, <i>Bidens bipinnata</i> (Bipinnate Beggartick), <i>Cenchrus ciliaris</i> (Buffel Grass), <i>Cynodon dactylon</i> (Couch), <i>Malvastrum americanum</i> (Spiked Malvastrum) and <i>Setaria verticillata</i> (Whorled Pigeongrass) (BHP Billiton, 2015; Onshore Environmental, 2015). BHP Billiton (2015) report that control of established weed populations will be completed according to the BHP Billiton Iron Ore Weed Control and Management Procedure. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.</p> <p>No Threatened Ecological Communities (TEC's) occur within the application area (BHP Billiton, 2015; GIS Database). However, the buffer area of the 'Ethel Gorge Aquifer Stygobiont Community' TEC is located over the application area. This TEC buffer covers a large area (30,496.61 hectares) and is associated with subterranean biota occurring in the groundwater aquifer. The proposed clearing is unlikely to impact on groundwater ecosystems or subterranean biota (BHP Billiton, 2015). No Priority Ecological Communities (PEC's) were identified in the flora survey undertaken of the application area (BHP Billiton, 2015; GIS Database).</p>
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A desktop survey of fauna species potentially occurring in the region was undertaken prior to the fauna survey (BHP Billiton, 2015). The desktop survey identified six mammal species, 66 bird species and 28 reptile species potentially occurring within a mapped buffer of the application area (Onshore Environmental, 2015). Several conservation significant, migratory avifauna (16 species) were identified as potentially occurring within the application area. Avifauna utilise the major drainage line and artificial habitat (Ophthalmia Dam) in the application area. However, none of the avifauna species are dependent on the application area and large areas of preferred habitat are located in surrounding areas (BHP Billiton, 2015).

The fauna survey recorded one Threatened species, the Rainbow Bee-eater (*Merops ornatus*), within the application area (Onshore Environmental, 2015). Suitable breeding habitat (major drainage line habitat) for the species was reported in the application area by Onshore Environmental (2015). Although, semi-permanent areas of standing water are located in the application area, suitable foraging habitat (shrublands and woodland) is not located within the application area (DotE, 2016b). No evidence of breeding was recorded in the application area during the fauna survey (BHP Billiton, 2015). It is unlikely Rainbow Bee-eater individuals would be adversely impacted by the proposal due to the small amount of habitat proposed to be disturbed and large areas of suitable breeding and foraging habitat located in surrounding areas (BHP Billiton, 2015; Onshore Environmental, 2015). The application area is not considered to be significant habitat for the species (BHP Billiton, 2015).

Clearing for the proposal is relatively small, the application area is considered to be low in biodiversity and the vegetation in the surrounding area is well represented (Government of Western Australia, 2014). For these reasons, it is unlikely the proposal will result in the clearing of native vegetation that has higher biodiversity values than the surrounding, undisturbed vegetation.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology BHP Billiton (2015)
CALM (2002)
Department of Natural Resources and Environment (2002)
DPaW (2016)
DotE (2016b)
Government of Western Australia (2014)
Onshore Environmental (2015)

GIS Database:
- Threatened Fauna
- Threatened and Priority Flora
- TEC/PEC – Buffer
- TEC/PEC – Boundaries

(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 indigenous to Western Australia.

Comments Proposal is not likely to be at variance to this Principle

A Level 1 fauna survey was conducted over the application area. Based on the results of this survey the following five broad habitat types have been identified in the application area (BHP Billiton, 2015; Onshore Environmental, 2015):

1. Mulga;
2. Stony Plain;
3. Sand Plain;
4. Major Drainage Line; and
5. Artificial Habitat - Dam.

The most widespread fauna habitat type of the application area was mulga habitat (Onshore Environmental, 2015).

A search of available biological databases was undertaken and no Threatened fauna were recorded in the application area (GIS Database). A desktop survey of fauna species potentially occurring in the region was undertaken prior to the fauna survey (BHP Billiton, 2015). The desktop survey identified 6 mammal species, 66 bird species and 28 reptile species potentially occurring within a 4 kilometre buffer of the application area (Onshore Environmental, 2015). Based on previous surveys and database searches, 25 fauna species of conservation significance were identified as potentially occurring within the application area. The majority of these conservation fauna species were migratory bird species (BHP Billiton, 2015; Onshore Environmental, 2015). While suitable habitat is located in the application area for these migratory species, none of the species are dependent on the area and large areas of preferred habitat are located in surrounding areas. For these reasons the potential impact on each species was considered to be low or negligible (BHP Billiton, 2015).

The fauna survey recorded the Rainbow Bee-eater (*Merops ornatus* - Threatened), within the application area (Onshore Environmental, 2015). Onshore Environmental (2015) also reported suitable breeding habitat (major drainage line habitat) for the species in the application area. However, the potential impact on Rainbow Bee-eater individuals is considered to be low as no evidence of breeding was recorded in the application area and

large areas of suitable breeding and foraging habitat are recorded in surrounding areas (BHP Billiton, 2015). Although, semi-permanent areas of standing water are located in the application area, suitable foraging habitat (shrublands and woodland) is not located within the application area (DotE, 2016b). Rainbow Bee-Eaters are also highly mobile, common in the Pilbara region and widely distributed around Australia. It is unlikely Rainbow Bee-eater individuals would solely rely on the application area, therefore the application area is not considered to be significant habitat for the species (BHP Billiton, 2015; Onshore Environmental, 2015).

Two reptile species, the Pilbara Olive Python (*Liasis olivaceus barroni* – Threatened) and the Pilbara Flat-headed Blind Snake (*Anilius ganei* – Priority 1) could potentially occur in the application area (BHP Billiton, 2015; Onshore Environmental, 2015). The Pilbara Olive Python is known from a number of sites in the Pilbara and prefers escarpments, gorges and water holes in the ranges of the Pilbara region (DotE, 2016a; Onshore Environmental, 2015). The species is usually recorded in close proximity to water, including man-made water sources and rock outcrops or under spinifex (DotE, 2016a). As the species is associated with drainage systems and semi-permanent watercourses there is the potential for individuals to occur in the application area, particularly the major drainage line habitat and artificial habitat (Ophthalmia Dam). However, no individuals were recorded during the fauna survey and it is unlikely this species would depend on the application area due to the species' large home range (DotE, 2016a).

The Pilbara Flat-headed Blind Snake is endemic to the Pilbara region. This species is cryptic and little is known about the species' habitat preferences. Individuals prefer moist gorges and gully habitats. However, the Pilbara Flat-headed Blind Snake may occur in a wide range of stony habitats (Onshore Environmental, 2015). There is the potential for the species to occur in the mulga, stony plain and sand plain habitats of the application area. However, no Pilbara Flat-headed Blind Snake individuals were recorded as part of the fauna survey (Onshore Environmental, 2015). Given the small amount of native vegetation clearing required (20 hectares) and the large amount of preferred gorge/gully habitat for this species located in the region and surrounding area, the potential impact on the species is considered to be low (BHP Billiton, 2015).

The area proposed to be cleared does not contain significant habitat for fauna species indigenous to Western Australia.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology BHP Billiton (2015)
DotE (2016a)
DotE (2016b)
Onshore Environmental (2015)

GIS Database:
- Threatened Fauna

(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.

Comments Proposal is not likely to be at variance to this Principle

A search of available databases was undertaken and no Threatened flora have been recorded in the application area (GIS Database). A flora survey was also undertaken by Onshore Environmental in 2015 which did not record species of Threatened flora in the application area (BHP Billiton, 2015; Onshore Environmental, 2015). The native vegetation proposed to be cleared is not likely to contain or is not necessary for the continued existence of rare flora.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology BHP Billiton (2015)
Onshore Environmental (2015)

GIS Database:
- Threatened and Priority Flora

(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.

Comments Proposal is not likely to be at variance to this Principle

According to available databases no Threatened Ecological Communities (TEC's) occur within the application area (GIS Database). However, the buffer area of the 'Ethel Gorge Aquifer Stygobiont Community' TEC is located over the application area. The TEC is associated with subterranean biota occurring in the groundwater aquifer. This TEC buffer covers a large area (30,496.61 hectares) and it is unlikely that the small scale clearing of 20 hectares required as part of the proposal will impact on groundwater ecosystems or subterranean biota (BHP Billiton, 2015). The proposal will not impact on the maintenance of the TEC.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology BHP Billiton (2015)

GIS Database:

- TEC/PEC - Buffers
- TEC/PEC - Boundaries

(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.

Comments Proposal is not at variance to this Principle

The application area falls within the Gascoyne Interim Biogeographic Regionalisation of Australia (IBRA) bioregion in which approximately 99.96% of the pre-European extent of vegetation remains in Western Australia (refer table below) (Government of Western Australia, 2014; GIS Database). As large areas of the pre-European extent of native vegetation remain within the Gascoyne IBRA region, the vegetation is considered to be of least concern with regards to conservation status (Department of Natural Resources and Environment, 2002).

The native vegetation located in the application area has been mapped as Beard vegetation association 29: sparse low woodland; mulga, discontinuous in scattered groups (GIS Database). This vegetation association has not been extensively cleared as over 99% of the vegetation association remains at the State level and bioregional levels (refer table below) (Government of Western Australia, 2014).

The clearing of vegetation as part of the proposal is not part of a significant ecological linkage. The area proposed to be cleared is also not considered to be significant as a remnant in an area that has been extensively cleared (BHP Billiton, 2015; GIS Database). The vegetation of the application area is considered to be degraded to excellent in condition and for these reasons the clearing of native vegetation is not at variance to this Principle (Onshore Environmental, 2015).

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in All DPaW Managed Land
IBRA Bioregion – Gascoyne	18,075,219.48	18,067,441.43	99.96	Least Concern	10.30
Beard veg assoc. – State					
29	7,903,991.47	7,900,200.44	99.95	Least Concern	5.22
Beard veg assoc. – Bioregion					
29	3,802,459.63	3,799,635.88	99.93	Least Concern	7.81

* Government of Western Australia (2014).

** Department of Natural Resources and Environment (2002).

Based on the above, the proposed clearing is not at variance to this Principle.

Methodology BHP Billiton (2015)
 Department of Natural Resources and Environment (2002)
 Government of Western Australia (2014)
 Onshore Environmental (2015)

GIS Database:

- IBRA WA (Regions - Sub Regions)
- Pre-European Vegetation

(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

Comments Proposal is at variance to this Principle

The majority of the application area is located east of Ophthalmia Dam, an artificial, water body constructed for the purpose of town water and mining water supply (BHP Billiton, 2015; MWH, 2015). A small, western portion of the application area is located at Ophthalmia Dam (BHP Billiton, 2015). The Fortescue River (major, non-perennial watercourse) and several creeks including Warrawanda and Shovelanna Creeks flow into the dam following seasonal rainfall (BHP Billiton, 2015; GIS Database). The eastern portion of the application area intersects Shovelanna Creek, a non-perennial, minor watercourse (BHP Billiton, 2015).

The proposal requires the clearing of riparian vegetation within the Ophthalmia Dam and major drainage line habitats for the purpose of pipeline construction and maintenance activities (BHP Billiton, 2015). The application area supports riparian vegetation that is growing in, or in association with a watercourse including the flora species; *Corymbia aspera*, *Eremophila fraseri*, *Elytrophorus spicatus*, *Schoenoplectus dissachanthus*, *Schoenoplectus laevis*, *Eucalyptus camaldulensis*, *Eulalia aurea*, *Myriocephalus rudallii*, *Goodenia*

lamprosperma, *Eragrostis kennedyae* and *Eragrostis tenellula* (BHP Billiton, 2015; DPaW, 2016). These species occur along creeks, river beds, river banks, riverine flats, lakes, swamps, watercourses, billabongs, lagoons, drainage lines or floodplains (DPaW, 2016). The potential impacts to riparian vegetation may be minimised through the implementation of a vegetation management condition.

BHP Billiton (2015) report that clearing within the major drainage line habitat will be kept to a bare minimum and surface water flows of watercourses will be maintained. However, clearing of riparian vegetation will be required to allow for the construction and ongoing maintenance of the water pipeline and associated activities

The clearing is not likely to significantly impact the ecological or hydrological functions of Ophthalmia Dam, Shovelanna Creeks or major creek line habitats. The proposed clearing will not have a detrimental impact on vegetation associations located in the area.

Based on the above, the proposed clearing is at variance to this Principle.

Methodology BHP Billiton (2015)
DPaW (2016)
MWH (2015)
Onshore Environmental (2015)

GIS Database:
- Hydrography, linear

(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

Comments **Proposal may be at variance to this Principle**

The majority of the application area is mapped as the Washplain land system, followed by the McKay land system while small portions of the application area are located in the Divide and River land systems (BHP Billiton, 2015; Van Vreeswyk et al., 2004; GIS Database).

The Washplain land system consists of shrubs and grasses, alluvial plains, groves and drainage tracts. Level alluvial hardpan plains are subject to overland sheet flow and drainage tracts receive more concentrated surface water flow. The Washplain land system is not prone to soil erosion (Van Vreeswyk et al., 2004). The McKay land system consists of hills, ridges, plateaux remnants and breakaways of meta sedimentary and sedimentary rocks supporting hard spinifex grasslands. The River land system consists of active flood plains and major rivers supporting grassy Eucalypt woodlands, tussock grasslands and soft spinifex grasslands (Van Vreeswyk et al., 2004). Flood plains and river terraces located in this area are subject to regular overbank flooding from major channels, watercourses, sandy banks and poorly defined levees. The River system is mostly stabilised by buffel grass and spinifex and erosion is uncommon. However, when vegetation is removed the susceptibility to erosion is high to very high (Van Vreeswyk et al., 2004). The Washplain, River, Divide and McKay land systems are resilient and not prone to degradation or soil erosion (Van Vreeswyk et al., 2004). The relatively small amount of native vegetation clearing required for the proposal is not likely to cause soil or wind erosion. However, the proposal requires clearing within the River land system and there is a potential for erosion to occur in this land system. Potential land degradation impacts may be minimised by the implementation of a staged clearing condition.

Northcote, et al, (1960-68) describe the landforms and soils in the application area as extensive flat and gently sloping plains, which sometimes have a surface cover of gravels and on which red brown hardpan frequently outcrops. The dominant soils are shallow, earthy loams which are not susceptible to erosion (Northcote, et al, 1960-68).

The small amount of native vegetation clearing (20 hectares) required for the proposal is not likely to change salinity levels, impact nutrient export or soil acidification (BHP Billiton, 2015). Some of the native vegetation in the application area has also been previously cleared, is disturbed or devoid of native vegetation (Onshore Environmental, 2015). Therefore, it is unlikely that the proposal will cause waterlogging, flooding or degradation of the land in the area.

Based on the above, the proposed clearing may be at variance to this Principle.

Methodology BHP Billiton (2015)
Northcote, et al. (1960-68)
Onshore Environmental (2015)
Van Vreeswyk et al. (2004)

GIS Database:
- Hydrography, linear
- Rangeland Land System Mapping

(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.

Comments Proposal is not at variance to this Principle

The application area does not lie within any conservation areas or Department of Parks and Wildlife managed lands (BHP Billiton, 2015; GIS Database). The nearest conservation area is Karijini National Park which is located approximately 140 kilometres north-west of the application area (GIS Database). As this conservation area is located a considerable distance from the application area, the proposed clearing is not likely to have any impacts on the environmental values of adjacent or nearby conservation areas.

Based on the above, the proposed clearing is not at variance to this Principle.

Methodology BHP Billiton (2015)

GIS Database:
- DPaW Tenure

(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.

Comments Proposal is not likely to be at variance to this Principle

No Public Drinking Water Source Areas (PDWSA) are located in the application area. The nearest PDWSA is the Newman Water Reserve which is located approximately 5.5 kilometres west of the application area. The Newman Water Reserve will not be impacted by the proposal (BHP Billiton, 2015; GIS Database).

The groundwater within the application area is between 500 – 1,000 milligrams per litre of Total Dissolved Solids (TDS) which is considered to be potable water (GIS Database). It would not be expected that the proposed clearing of 20 hectares within a permit boundary of 36.38 hectares would cause salinity levels within the application or surrounding area to alter. No changes to the pH of groundwater are expected as a result of the clearing.

The proposed clearing is unlikely to cause deterioration in the quality of surface water including erosion or eutrophication of water bodies on-site or off-site. Clearing within major drainage lines, Ophthalmia Dam and Shovelanna Creek may lead to a short term increase in sedimentation or turbidity. However, these impacts are considered to be temporary and are not expected to result in the deterioration of surface water quality. BHP Billiton (2015) report any disturbance to major drainage lines, will be kept to a minimum and natural surface water flows will be maintained.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology BHP Billiton (2015)

GIS Database:
- Groundwater Salinity, Statewide
- Hydrography, linear
- Public Drinking Water Source Areas

(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

Comments Proposal is not likely to be at variance to this Principle

Annual total rainfall for the nearest weather station located at Newman Aero recorded 448.8 millimetres in 2015 and total average annual evaporation for the area is 3,200 millimetres (BoM, 2016). As the application area receives low rainfall and annual evaporation is high, there is likely to be little surface flow during normal seasonal rains (BoM, 2016). The Fortescue River and several creeks including Warrawanda and Shovelanna Creeks flow into Ophthalmia Dam following seasonal rainfall. The western part of the application area is located within Ophthalmia Dam and is therefore subject to seasonal flooding (BHP Billiton, 2015; GIS Database). However, it is unlikely that the proposed clearing will cause or exacerbate the incidence or intensity of localised or regional flooding.

BHP Billiton (2015) report clearing activities will be minimised and natural surface water flows will be maintained.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

**Methodology BHP Billiton (2015)
BoM (2016)**

GIS Database:
- Hydrography, linear

Planning instrument, Native Title, Previous EPA decision or other matter.

Comments There is one native title claim (WC2005/006) over the application area (DAA, 2016). This claim has been registered with the National Native Title Tribunal on behalf of the claimant groups (DAA, 2016). However, the tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the Act (i.e. the proposed clearing activity) has been provided for in that process, therefore, the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

According to available databases, there are numerous registered Aboriginal sites of significance within the application area (DAA, 2016). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal sites of significance are damaged through the clearing process.

It is the proponent's responsibility to liaise with the Department of Environment Regulation, Department of Parks and Wildlife and the Department of Water to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licences or approvals are required for the proposed works.

The clearing permit application was advertised on 23 November 2015 by the Department of Mines and Petroleum inviting submissions from the public. There were no submissions received.

Methodology DAA (2016)

4. References

- BoM (2016) Bureau of Meteorology Website - Climate Data Online, Newman Aero. Bureau of Meteorology. <http://www.bom.gov.au/climate/data/index.shtml>. (Accessed 2 February 2016).
- BHP Billiton (2015) Application for a Native Vegetation Clearing Permit Application, Orebody 31 Pipeline Supporting Document. BHP Billiton Iron Ore Pty Ltd, Perth, Western Australia, November 2015.
- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions. Gascoyne (Augustus subregion) Department of Conservation and Land Management, Perth, Western Australia.
- DAA (2016) Aboriginal Heritage Inquiry System. Department of Aboriginal Affairs. <http://maps.dia.wa.gov.au/AHIS2> (Accessed 17 February 2016).
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5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
DAA	Department of Aboriginal Affairs, Western Australia
DAFWA	Department of Agriculture and Food, Western Australia
DEC	Department of Environment and Conservation, Western Australia (now DPaW and DER)
DER	Department of Environment Regulation, Western Australia
DMP	Department of Mines and Petroleum, Western Australia
DRF	Declared Rare Flora
DotE	Department of the Environment, Australian Government
DoW	Department of Water, Western Australia
DPaW	Department of Parks and Wildlife, Western Australia

DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities (now DotE)
EPA	Environmental Protection Authority, Western Australia
EP Act	<i>Environmental Protection Act 1986</i> , Western Australia
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
IBRA	Interim Biogeographic Regionalisation for Australia
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
PEC	Priority Ecological Community, Western Australia
RIWI Act	<i>Rights in Water and Irrigation Act 1914</i> , Western Australia
TEC	Threatened Ecological Community

Definitions:

{DPaW (2015) Conservation Codes for Western Australian Flora and Fauna. Department of Parks and Wildlife, Western Australia):-

T	<p>Threatened species: Published as Specially Protected under the <i>Wildlife Conservation Act 1950</i>, listed under Schedules 1 to 4 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora (which may also be referred to as Declared Rare Flora).</p> <p>Threatened fauna is that subset of ‘Specially Protected Fauna’ declared to be ‘likely to become extinct’ pursuant to section 14(4) of the <i>Wildlife Conservation Act</i>.</p> <p>Threatened flora is flora that has been declared to be ‘likely to become extinct or is rare, or otherwise in need of special protection’, pursuant to section 23F(2) of the <i>Wildlife Conservation Act</i>.</p> <p>The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.</p>
CR	<p>Critically endangered species Threatened species considered to be facing an extremely high risk of extinction in the wild. Published as Specially Protected under the <i>Wildlife Conservation Act 1950</i>, in Schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.</p>
EN	<p>Endangered species Threatened species considered to be facing a very high risk of extinction in the wild. Published as Specially Protected under the <i>Wildlife Conservation Act 1950</i>, in Schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.</p>
VU	<p>Vulnerable species Threatened species considered to be facing a high risk of extinction in the wild. Published as Specially Protected under the <i>Wildlife Conservation Act 1950</i>, in Schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.</p>
EX	<p>Presumed extinct species Species which have been adequately searched for and there is no reasonable doubt that the last individual has died. Published as Specially Protected under the <i>Wildlife Conservation Act 1950</i>, in Schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice for Presumed Extinct Fauna and Wildlife Conservation (Rare Flora) Notice for Presumed Extinct Flora.</p>
IA	<p>Migratory birds protected under an international agreement Birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and the Bonn Convention, relating to the protection of migratory birds. Published as Specially Protected under the <i>Wildlife Conservation Act 1950</i>, in Schedule 5 of the Wildlife Conservation (Specially Protected Fauna) Notice.</p>
CD	<p>Conservation dependent fauna Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened. Published as Specially Protected under the <i>Wildlife Conservation Act 1950</i>, in Schedule 6 of the Wildlife Conservation (Specially Protected Fauna) Notice.</p>
OS	<p>Other specially protected fauna Fauna otherwise in need of special protection to ensure their conservation. Published as Specially Protected under the <i>Wildlife Conservation Act 1950</i>, in Schedule 7 of the Wildlife Conservation (Specially Protected Fauna) Notice.</p>
P	<p>Priority species Species which are poorly known; or</p>

Species that are adequately known, are rare but not threatened, and require regular monitoring. Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

P1 Priority One - Poorly-known species:

Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.

P2 Priority Two - Poorly-known species:

Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.

P3 Priority Three - Poorly-known species:

Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

P4 Priority Four - Rare, Near Threatened and other species in need of monitoring:

(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands.

(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for Vulnerable, but are not listed as Conservation Dependent.

(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.