



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 4363/1
Permit Holder:	Hamersley Iron Pty Ltd
Duration of Permit:	8 August 2011 – 8 August 2019

The Permit Holder is authorised to clear native vegetation subject to the following conditions of this Permit.

PART I – CLEARING AUTHORISED

1. Purpose for which clearing may be done

Clearing for the purpose of soil and infiltration testing, inclusive of sample pits, auger holes and access tracks.

2. Land on which clearing is to be done

Lot 99 on Deposited Plan 238653 (Pastoral Lease CL742/1993, Mount Sheila 6751)

3. Area of Clearing

The Permit Holder must not clear more than 24.5 hectares of native vegetation within the areas shaded yellow on attached Plan 4363/1.

4. Application

This Permit allows the Permit Holder to authorise persons, including employees, contractors and agents of the Permit Holder, to clear native vegetation for the purposes of this Permit subject to compliance with the conditions of this Permit and approval from the Permit Holder.

5. Compliance with Assessment Sequence and Management Procedures

Prior to clearing any native vegetation under conditions 1, 2 and 3 of this Permit, the Permit Holder must comply with the Assessment Sequence and the Management Procedures set out in Part II of this Permit.

PART II – ASSESSMENT SEQUENCE AND MANAGEMENT PROCEDURES

6. Avoid, minimise etc clearing

In determining the amount of native vegetation to be cleared authorised under this Permit, the Permit Holder must have regard to the following principles, set out in order of preference:

- (a) avoid the clearing of native vegetation;
- (b) minimise the amount of native vegetation to be cleared; and
- (c) reduce the impact of clearing on any environmental value.

7. Weed control

- (a) When undertaking any clearing or other activity authorised under this Permit, the Permit Holder must take the following steps to minimise the risk of the introduction and spread of *weeds*:
- (i) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;
 - (ii) ensure that no *weed*-affected soil, *mulch*, *fill* or other material is brought into the area to be cleared; and
 - (iii) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

8. Vegetation management

The Permit Holder shall not clear native vegetation within 50 metres of the *riparian vegetation* growing in association with Duck Creek.

9. Retain vegetative material and topsoil, revegetation and rehabilitation

The Permit Holder shall:

- (a) retain the vegetative material and topsoil removed by clearing authorised under this Permit and stockpile the vegetative material and topsoil in an area that has already been cleared.
- (b) within 12 months following completion of works approved under this permit, *revegetate* and *rehabilitate* the area(s) that are no longer required for the purpose for which they were cleared under this Permit by:
 - (i) re-shaping the surface of the land so that it is consistent with the surrounding 5 metres of uncleared land; and
 - (ii) laying the vegetative material and topsoil retained under condition 9(a) on the cleared area(s).
- (c) within 24 months of laying the vegetative material and topsoil on the cleared area in accordance with condition 9(b) of this Permit:
 - (i) engage an *environmental specialist* to determine the species composition, structure and density of the area *revegetated* and *rehabilitated*; and
 - (ii) where, in the opinion of an *environmental specialist*, the composition structure and density determined under condition 9(c)(i) of this Permit will not result in a similar species composition, structure and density to that of pre-clearing vegetation types in that area, *revegetate* the area by deliberately *planting* and/or *direct seeding* native vegetation that will result in a similar species composition, structure and density of native vegetation to pre-clearing vegetation types in that area and ensuring only *local provenance* seeds and propagating material are used.
- (d) where additional *planting* or *direct seeding* of native vegetation is undertaken in accordance with condition 9(c)(ii) of this permit, the Permit Holder shall repeat condition 9(c)(i) and 9(c)(ii) within 24 months of undertaking the additional *planting* or *direct seeding* of native vegetation.
- (e) where a determination by an *environmental specialist* that the composition, structure and density within areas *revegetated* and *rehabilitated* will result in a similar species composition, structure and density to that of pre-clearing vegetation types in that area, as determined in condition 9(c)(i) and (ii) of this permit, that determination shall be submitted for the CEO's consideration. If the CEO does not agree with the determination made under condition 9(c)(ii), the CEO may require the Permit Holder to undertake additional *planting* and *direct seeding* in accordance with the requirements under condition 9(c)(ii).

PART III - RECORD KEEPING AND REPORTING

10. Records must be kept

- (a) In relation to the clearing of native vegetation authorised under this Permit:
- (i) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
 - (ii) the date that the area was cleared; and
 - (iii) the size of the area cleared (in hectares).

- (b) In relation to the *revegetation* and *rehabilitation* of areas pursuant to condition 9 of this Permit:
- (i) the location of any areas *revegetated* and *rehabilitated*, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
 - (ii) a description of the *revegetation* and *rehabilitation* activities undertaken;
 - (iii) the size of the area *revegetated* and *rehabilitated* (in hectares);
 - (iv) the species composition, structure and density of *revegetation* and *rehabilitation*.

11. Reporting

- (a) The Permit Holder must provide to the CEO on or before 31 July of each year, a written report:
- (i) of records required under condition 10 of this Permit; and
 - (ii) concerning activities done by the Permit Holder under this Permit between 1 July and 30 June of the preceding year.
- (b) Prior to 8 May 2019, the Permit Holder must provide to the CEO a written report of records required under condition 10 of this Permit where these records have not already been provided under condition 11(a) of this Permit.

DEFINITIONS

The following meanings are given to terms used in this Permit:

direct seeding means a method of re-establishing vegetation through the establishment of a seed bed and the introduction of seeds of the desired plant species;

environmental specialist means a person who is engaged by the Permit Holder for the purpose of providing environmental advice, who holds a tertiary qualification in environmental science or equivalent, and has experience relevant to the type of environmental advice that an environmental specialist is required to provide under this Permit;

fill means material used to increase the ground level, or fill a hollow;

local provenance means native vegetation seeds and propagating material from natural sources within 50 kilometres of the area cleared.

mulch means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation;

planting means the re-establishment of vegetation by creating favourable soil conditions and planting seedlings of the desired species;

regenerate/ed/ion means re-establishment of vegetation from in situ seed banks and propagating material (such as lignotubers, bulbs, rhizomes) contained either within the topsoil or seed-bearing *mulch*;

rehabilitate/ed/ion means actively managing an area containing native vegetation in order to improve the ecological function of that area;

revegetate/ed/ion means the re-establishment of a cover of *local provenance* native vegetation in an area using methods such as natural *regeneration*, *direct seeding* and/or *planting*, so that the species composition, structure and density is similar to pre-clearing vegetation types in that area.

riparian vegetation has the meaning given to it in Regulation 3 of the Environmental Protection (Clearing of Native Vegetation) Regulations 2004;

watercourse has the meaning given to it in section 3 of the *Rights in Water and Irrigation Act 1914*;

weed/s means a species listed in Appendix 3 of the "Environmental Weed Strategy" published by the Department of Conservation and Land Management (1999), and plants declared under section 37 of the *Agriculture and Related Resources Protection Act 1976*.

wetland/s means an area of seasonally, intermittently or permanently waterlogged or inundated land, whether natural or otherwise, and includes a lake, swamp, marsh, spring, dampland, tidal flat or estuary.

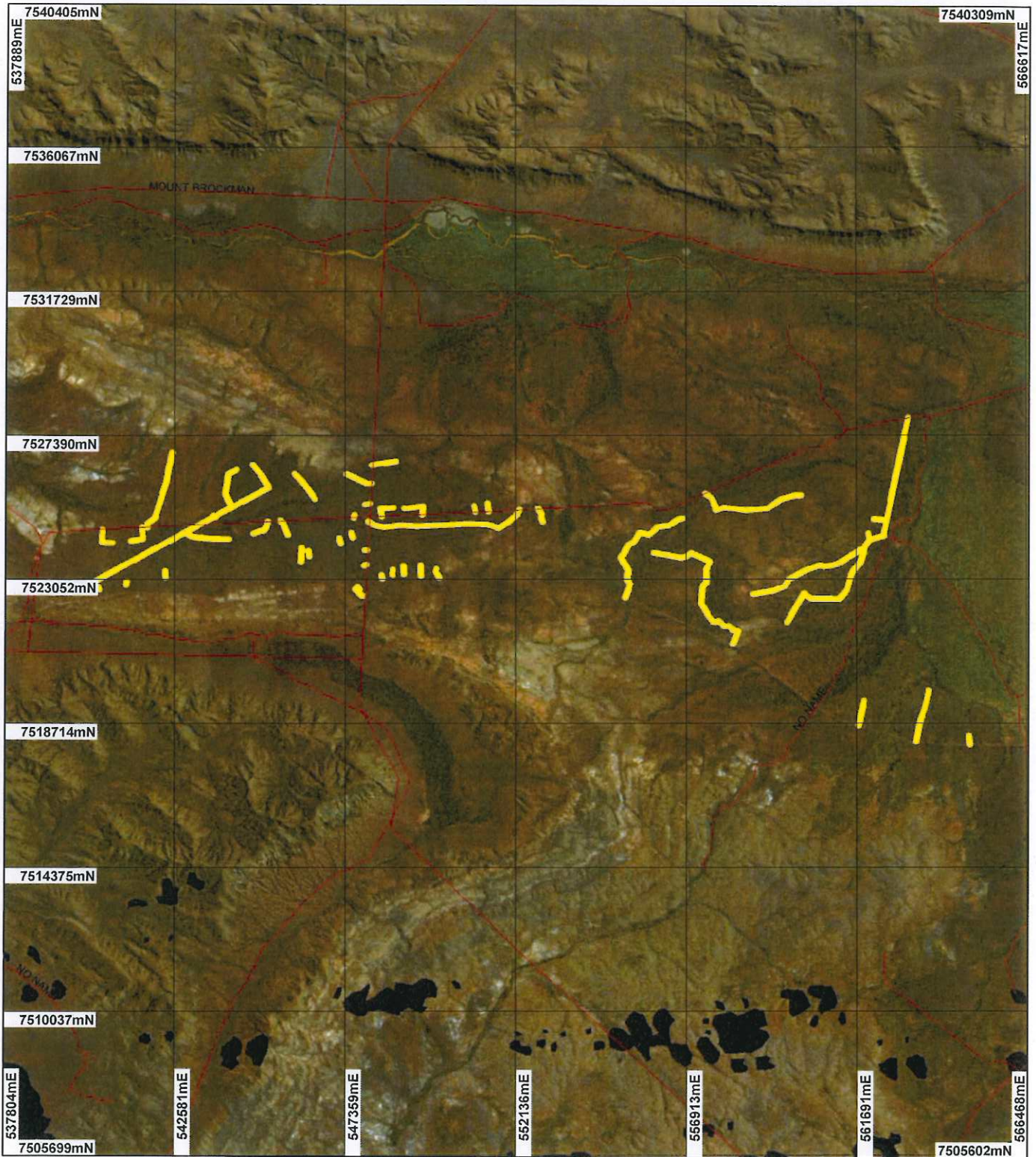


Kelly Faulkner
MANAGER
NATIVE VEGETATION CONSERVATION BRANCH

*Officer delegated under Section 20
of the Environmental Protection Act 1986*

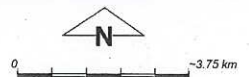
14 July 2011

Plan 4363/1



LEGEND

- Clearing Instruments**
- Areas Approved to Clear
 - Road Centrelines
 - Cadastre
- Western Australia Landsat Mosaic 25m - AGO 2006



Geocentric Datum Australia 1994

Note: the data in this map have not been projected. This may result in geometric distortion or measurement inaccuracies.

k. Faulkner

Officer with delegated authority under Section 20 of the Environmental Protection Act 1986

Information derived from this map should be confirmed with the data custodian acknowledged by the agency acronym in the legend.



Department of Environment and Conservation

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1. Application details

1.1. Permit application details

Permit application No.: 4363/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Hamersley Iron Pty Ltd

1.3. Property details

Property: PART LOT 99 ON PLAN 238653 (MOUNT SHEILA 6751)
Local Government Area: Shire of Ashburton
Colloquial name:

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
24.5		Mechanical Removal	Geotechnical investigations

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 14 July 2011

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
The vegetation under application has been mapped as Beard Vegetation Associations 29, 82 and 175. Shepherd (2009) describes that vegetation associations as:	The proposal is to clear 24.5 hectares of native vegetation within Hamersley Pastoral Station.	Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery 1994).	The condition of the vegetation under application was determined via a Flora and Vegetation Survey provided by Mattiske Consulting Pty Ltd (2011).
29: Sparse low woodland; mulga, discontinuous in scattered groups.	The condition of the vegetation ranges from very good to pristine (Keighery, 1994) depending on level of weed invasion and disturbance through grazing.	Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery 1994).	
82: Hummock grasslands, low tree steppe; snappy gum over Triodia wiseana.	A total of 189 vascular plant taxa from 99 plant genera and plant families were recorded within the Greater Nammuldi Irrigated Agricultural Survey Area (Mattiske Consulting Pty Ltd, 2011).	Pristine: No obvious signs of disturbance (Keighery 1994).	
175: Short bunch grassland - savanna/grass plain (Pilbara).			

3. Assessment of application against clearing principles

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

Comments

Proposal is not likely to be at variance to this Principle

The proposal is to clear up to 24.5 hectares of native vegetation (within a larger footprint area of 1 176 hectares) for the purpose of soil sampling and characterisation associated with the proposed Nammuldi Agricultural Diversification Project.

The condition of the vegetation within the application area ranges from very good to pristine (Keighery, 1994). The rating of the vegetation was dependant on the abundance of introduced species, grazing impact from cattle and time since last burnt (Mattiske Consulting Pty Ltd, 2011).

A total of thirteen vegetation communities have been defined and mapped along the Greater Nammuldi Irrigated Agricultural Survey Area (Mattiske Consulting Pty Ltd, 2011). These communities are broadly classified as representing four major groups: Low Acacia Woodlands, Triodia Hummock grasslands, Tussock grasslands, and drainage line vegetation (Mattiske Consulting Pty Ltd, 2011).

Mattiske Consulting Pty Ltd (2011) conducted a Flora and Vegetation Survey over the Greater Nammuldi

Irrigated Agriculture Area and recorded a total of 189 vascular plant taxa from 99 plant genera and plant families.

Within the Greater Nammuldi Irrigated Agricultural Survey Area two priority flora species have been identified; *Goodenia nuda* (Priority 4) and *Vigna* sp. Central (M. E Trudgen 1626) (Priority 2) (Mattiske Consulting Pty Ltd, 2011). Both of these priority species were recorded at three locations within the survey area. The vegetation types present within the application are well represented within the local and regional area. Therefore the relatively small area under application is not likely to be necessary for the continued existence of priority flora.

Numerous fauna species have been recorded within a 40 km radius of the application area, including *Malurus leucopterus* subsp. *leucopterus* (White-winged Fairywren), *Falco peregrinus* (Peregrine Falcon) and *Burhinus grallarius* (Bush Stone -curlew) (DEC, 2007). The majority of the fauna habitats within the area proposed to be cleared are well represented elsewhere within the local and regional area, and no significant loss of habitat for fauna indigenous to Western Australia is expected.

Duck Creek is the largest drainage channel that runs through the application area and the vegetation along it is of local significance as it represents a refuge for fauna during times of drought (HGM, 1999). A 50 m vegetated buffer will ensure that the fauna habitat along Duck Creek is not impacted.

The application area is unlikely to represent an area of higher biodiversity value when compared to representative vegetation in a local and regional context.

Considering the above the proposed clearing is not likely to be at variance to this Principle.

Methodology

References:

DEC (2007)

HGM (1999)

Mattiske Consulting Pty Ltd (2011)

GIS Database:

- SAC Biodatasets - Accessed June 2011

- Pre European Vegetation

(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 may be at variance to this Principle

Numerous fauna species have been recorded within a 40 km radius of the application area, including *Malurus leucopterus* subsp. *leucopterus* (White-winged Fairywren), *Falco peregrinus* (Peregrine Falcon) and *Burhinus grallarius* (Bush Stone - curlew) (DEC, 2007).

Duck Creek is the largest drainage channel that runs through the application area and the vegetation along it is of local significance as it represents a refuge for fauna during times of drought (HGM, 1999). A 50 m vegetated buffer will ensure that the fauna habitat along Duck Creek is not impacted.

The majority of the fauna habitats within the area proposed to be cleared are well represented elsewhere within the local and regional area, and no significant loss of habitat for fauna indigenous to Western Australia is expected. The proposed clearing will not sever any wildlife corridors and therefore the clearing will not remove an ecological linkage that is necessary for the maintenance of fauna.

In addition, the fauna species identified within the local area (40km radius) area highly mobile and/ or widespread and therefore the proposed clearing is not likely to impact them.

Considering the vegetation along Duck Creek is of local importance for fauna the proposed clearing may be at variance to this Principle.

Methodology

References:

HGM (1999)

NatureMap (2007)

GIS Database:

- Hydrography linear

- Hydrography linear (hierarchy)

- Pre European Vegetation

- SAC Biodatasets - Accessed June 2011

(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

No Declared Rare Flora (DRF) has been recorded within a 40km radius of the proposed cleared area.

Mattiske Consulting Pty Ltd (2011) conducted a Flora and Vegetation Survey over the Greater Nammuldi Irrigated Agriculture Area and did not identify any plant taxa gazetted as DRF.

Therefore, it is not likely that the proposed clearing will be at variance to this principle.

Methodology References:
Mattiske Consulting Pty Ltd (2011)

GIS Databases:
- Pre European Vegetation
- SAC Biodatasets - Accessed June 2011

(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

The local area (40km radius) surrounding the application area contains 7 records of the Threatened Ecological Community (TEC) 'Themeda grasslands on cracking clays'.

The closest TEC is approximately 3km east of the application area and another occurrence is 5km to the north.

Mattiske Consulting Pty Ltd (2011) conducted a Flora and Vegetation Survey over the Greater Nammuldi Irrigated Agriculture Area and found that the Tussock Grasslands observed on site were not an occurrence of this TEC as they were not dominated by the perennial Themeda (Kangaroo grass).

Considering the above it is not likely that the area under application comprises the whole or part of, or is necessary for the maintenance of a TEC. Therefore, the clearing as proposed is not likely to be at variance to this principle.

Methodology References:
Mattiske Consulting Pty Ltd (2011)

GIS Databases:
- Pre European Vegetation
- SAC Biodatasets - Accessed June 2011

(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 area under application is located within the Pilbara Interim Biogeographic Regionalisation of Australia (IBRA) bioregion. This IBRA bioregion has approximately 100 per cent of its Pre European vegetation extent remaining (Shepherd, 2009).

The vegetation under application is mapped as Beard Vegetation Associations 29, 82 and 175, all of which have approximately 100 percent of their Pre European extent remaining in the Pilbara bioregion (Shepherd, 2009).

Digital imagery (Western Australia Landsat Mosaic 25m - AGO 2006) indicates that the local area (40km radius) surrounding the area under application retains approximately 100 per cent vegetation cover.

Given the vegetation representation within the local area it is unlikely that the vegetation under application is significant as a remnant in an extensively cleared landscape.

Therefore, the clearing as proposed is not at variance to this principle.

	Pre-European (ha)	Current Extent (ha)	Remaining (%)	Extent in DEC Managed Lands (%)
IBRA Bioregion*				
Pilbara	17 804 193	17 785 001	100	8
Shire*				
Shire of Ashburton	10 086 659	10 050 099	100	16
Beard Vegetation Association in Bioregion*				
29	1 133 220	1 133 220	100	2
82	2 563 583	2 563 583	100	11
175	507 036	507 006	100	5

*Shepherd, 2009

Methodology

References:
Shepherd (2009)

GIS Database:

- Local Government Authority
- Pre European Vegetation
- SAC Biodatasets - Accessed June 2011
- Western Australia Landsat Mosaic 25m - AGO 2006

(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 application area contains Duck Creek, tributaries of Duck Creek and a multitude of minor non-perennial watercourses. Caves Creek is located approximately 200 meters west of the proposed clearing.

Mattiske Consulting Pty Ltd (2011) has advised that no clearing of riparian and fringing vegetation associated with Duck Creek will occur.

Duck Creek is the largest drainage channel that runs through the application area. The vegetation along this creek line is of local significance as it represents a refuge for flora and fauna during times of drought (HGM, 1999).

A 50 m vegetated buffer will ensure that vegetation growing in association with Duck Creek is not impacted by the proposed clearing.

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

Methodology

References:
HMG (1999)
Mattiske Consulting Pty Ltd (2011)

GIS Database:

- Hydrography linear
- Hydrography linear (hierarchy)

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

Comments

Proposal is not likely to be at variance to this Principle

Four major soil type have been mapped within the application area;

Oc69 - Valley plains with occasional low flat-topped residuals that are often capped by iron ore formations but sometimes by calcrete (kunkar): hard alkaline red soils are dominant (Northcote, 1960-68).

Ja2 - chief soils are earthy clays (Northcote, 1960-68).

MM16 - Alluvial plains dominated by deep cracking clays (Northcote, 1960-68).

Oc68 - Dissected stony pediments with some steep stony hills: chief soils are hard alkaline red soils but quite large areas of hard neutral red soils occur to (Northcote, 1960-68).

The soil types present within the application area are not prone to erosion due to the dominance of clays.

It is the applicant's intention is to undertake raised blade clearing to allow safe access to sample locations (Mattiske Consulting Pty Ltd, 2011). Raised blade methods ensure that blades are above ground level to minimise soil displacement and erosion.

The proposal to clear 24.5 hectares of native vegetation within a larger footprint area of 1 176 hectares is not likely to cause appreciable land degradation.

The clearing as proposed is not likely to be at variance to this principle.

Methodology References:
Northcote (1960-68)
Mattiske Consulting Pty Ltd (2011)

GIS Database:
SAC Biodatasets - Accessed June 2011

(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 likely to be at variance to this Principle**

The closest recorded conservation reserve is Karajini National park which is located approximately 34km east of the area under application.

A large proportion of the vegetation in the Pilbara bioregion remains uncleared, approximately 100% (Shepherd, 2009). Therefore, It is unlikely that the application area provides an important buffer or ecological linkage to Karijini National Park.

Therefore, the clearing as proposed is not likely to be at variance to this principle.

Methodology References:
Shepherd (2009)

GIS Database:
- DEC Tenure
- Pre European Vegetation

(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**

The groundwater salinity within the application area is approximately 500 - 1,000 milligrams/Litre Total Dissolved Solids (TDS) (GIS Database). Given the size of the area to be cleared (24.5 hectares) compared to the size of the Hamersley Groundwater Province (10 166 833 hectares), the proposed clearing is not likely to cause salinity levels to alter.

Clearing of riparian vegetation around the major drainage lines may pose problems to surface water from increased sedimentation and runoff. Permit conditions will assist in ensuring that riparian vegetation is not cleared therefore reducing the risk of increased sedimentation.

The proposal to clear up to 24.5 hectares within a larger footprint area of 1 176 hectares is not likely to cause deterioration in the quality of surface or groundwater.

The clearing as proposed is not likely to be at variance to this principle.

Methodology GIS Database:
- Groundwater Salinity Statewide
- Hydrographic catchments, catchments
- Hydrography, linear

(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**

Natural flood events do occur in the Pilbara region following cyclonic activity. However, the proposed clearing is not expected to increase the incidence or intensity of such events.

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

Methodology GIS Database:
- Mean Annual Rainfall Isohytes

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

Comments

This application is related to the Nammuldi-Silvergrass Expansion Project, which is currently being formally assessed by the Environmental Protection Authority (EPA). This proposal is for investigative works and includes sample pits and infiltration testing for approximately 55 centre pivot spray locations to assess soil permeability and suitability for irrigation. As part of these investigative works tracks may also be required to be cleared were existing tracks can not be utilised. Raised blade clearing is proposed to allow safe access to sample locations.

The area under application falls within the Pilbara Groundwater Area which is an area proclaimed under the Rights in Water and Irrigation Act 1914. The application area is also within a proclaimed Groundwater Area.

The Department of Water (2011) has advised that they do not have any objections to the proposed clearing of 24.5 hectares of native vegetation as the proposal is not likely to have an impact on the quality or quantity of groundwater.

A Native Title claim exists over the application area. A letter has been sent to the Eastern Guruma Native Title Claimants requesting their comment on this application.

No Aboriginal Sites of Significance have been recorded within the application area.

No public submissions have been received in relation to this proposal.

Methodology References:
Department of Water (2011)
EPA (2011)

GIS Database:
- Aboriginal Sites of Significance
- Native Title Claims
- RIWI Act, Groundwater Areas

4. References

- DEC (2007) NatureMap: Mapping Western Australia's Biodiversity. Department of Environment and Conservation. URL: <http://naturemap.dec.wa.gov.au/>. Accessed June 2011.
- Department of Water (2011) Advice for clearing permit application CPS 4363/1. Department of Water, Pilbara Region, Western Australia (DEC Ref: A402730).
- EPA (2011) Authority to conduct minor and preliminary works associated with the Nammuldi-Silvergrass Expansion Project. Office of the Environmental Protection Authority, Western Australia (DEC Ref: A408113).
- HGM (1999) Nammuldi-Silvergrass Transport Corridor Vegetation and Flora Survey. Unpublished Report for Hamersley Iron Pty Ltd, Prepared by Halpern Glick Maunsell Pty Ltd, July 1999.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Mattiske Consulting Pty Ltd (2011) Flora and Vegetation Survey of the Greater Nammuldi Irrigated Agriculture Survey Area. Prepared for Rio Tinto Iron Ore, May 2011 (DEC Ref: A400912).
- Northcote, K. H. with Beckmann G G, Bettenay E., Churchward H. M., van Dijk D. C., Dimmock G. M., Hubble G. D., Isbell R. F., McArthur W. M., Murtha G. G., Nicolls K. D., Paton T. R., Thompson C. H., Webb A. A. and Wright M. J. (1960-68): 'Atlas of Australian Soils, Sheets 1 to 10, with explanatory data'. CSIRO and Melbourne University Press: Melbourne.
- Shepherd, D.P. (2009) Adapted from: Shepherd, D.P., Beeston, G.R., and Hopkins, A.J.M. (2001), Native Vegetation in Western Australia. Technical Report 249. Department of Agriculture Western Australia, South Perth.

5. Glossary

Term	Meaning
BCS	Biodiversity Coordination Section of DEC
CALM	Department of Conservation and Land Management (now BCS)
DAFWA	Department of Agriculture and Food
DEC	Department of Environment and Conservation
DEP	Department of Environmental Protection (now DEC)
DoE	Department of Environment
DoIR	Department of Industry and Resources
DRF	Declared Rare Flora
EPP	Environmental Protection Policy
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
TEC	Threatened Ecological Community
WRC	Water and Rivers Commission (now DEC)