



# Clearing Permit Decision Report

## 1. Application details

### 1.1. Permit application details

Permit application No.: 3828/3  
Permit type: Purpose Permit

### 1.2. Proponent details

Proponent's name: Chichester Metals Pty Ltd

### 1.3. Property details

Property: Exploration Licence 45/2652  
Exploration Licence 46/590  
Exploration Licence 46/611  
Exploration Licence 46/612  
Local Government Area: Shire of East Pilbara and Shire of Ashburton  
Colloquial name: Fortescue Marsh Eco-Hydrology Investigations

### 1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
8.54		Mechanical Removal	Eco-Hydrology Investigations

### 1.5. Decision on application

Decision on Permit Application: Grant  
Decision Date: 23 December 2010

## 2. Site Information

### 2.1. Existing environment and information

#### 2.1.1. Description of the native vegetation under application

**Vegetation Description** Beard vegetation associations have been mapped at a 1:250,000 scale for the whole of Western Australia. Two Beard vegetation associations have been mapped within the application area (GIS Database; Shepherd, 2007).

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

**676:** Succulent steppe; samphire (GIS Database; Shepherd, 2007).

The application area was surveyed in 2006 by Mattiske Consulting staff. The following vegetation types were identified within the application area:

**11:** Hummock grassland of *Triodia angusta* with patches of *Acacia victoriae*, *Acacia aneura* var. *aneura*, *Acacia xiphophylla* over *Atriplex codonocarpa*, *Eremophila cuneifolia* and mixed Chenopods;

**12:** Low Halophytic shrubland of *Halosarcia auriculata* and *Halosarcia indica* subsp. *leiostachya* with associated Chenopod species of *Maireana* species and *Atriplex flabelliformis* with *Muehlenbeckia florulenta* with patches of *Acacia victoriae* and *Acacia sclerosperma* subsp. *sclerosperma*;

**13:** Low Halophytic shrubland of *Halosarcia auriculata*, *Halosarcia indica* subsp. *leiostachya*, *Halosarcia halocnemoides* subsp. *tenuis* with patches of *Frankenia* species;

**14:** Hummock grassland of *Triodia angusta* with patches of *Acacia victoria* over *Atriplex codonocarpa* and mixed Chenopods and Poaceae species;

**19:** Scrub of *Acacia xiphophylla* over *Cenchrus ciliaris*, *Dissocarpus paradoxus* and *Halosarcia indica* subsp. *bidens*;

**20:** Scrub of *Acacia sericophylla* over *Meullerolimon salicorniaceum*, *Nicotiana occidentalis* and *Mimulus gracilis*;

**21:** Scrub of *Acacia ampliceps* over *Meullerolimon salicorniaceum*, *Halosarcia indica* subsp. *bidens*, *Nicotiana occidentalis* and *frankenia ambita*;

- 22:** Low shrubland of *Halosarcia indica* subsp. *bidens* and *Nicotiana occidentalis* over grasses with occasional stands of *Sesbania cannabina* and *Cullen cinereum*;
- 23:** Low shrubland of *Frankenia ambita*, *Halosarcia bidens* subsp. *leiostachya* and *Eragrostis dielsii* with emergent *Acacia sericophylla*;
- 24:** Low shrubland of *Halosarcia bidens* subsp. *leiostachya* with *Eragrostis dielsii*;
- 25:** Low shrubland of *Halosarcia auriculata*, *Halosarcia indica* subsp. *bidens* and *Frankenia ambita* over *Eragrostis dielsii*;
- 26:** Low shrubland of *Meullerolimon salicorniaceum* and *Halosarcia indica* subsp. *bidens*;
- 27:** Low shrubland of *Maireana carnososa*, *Atriplex codonocarpa* and *Sclerolaena cuneata* over *Eragrostis dielsii* and *Trianthema turgidifolia*;
- 28:** Hummock grassland of *Triodia angusta* with *Eremophila spongiocarpa* (ms) (P1) and *Halosarcia indica* subsp. *bidens*; and
- 29:** Hummock grassland of *Triodia angusta* with *Halosarcia bidens* subsp. *leiostachya*, *Cullen cinereum*, *Eragrostis dielsii* and emergent *Acacia synchronicia* (FMG, 2010).

<b>Clearing Description</b>	<p>Chichester Metals Pty Ltd is proposing to clear up to 8.54 hectares of native vegetation to undertake eco-hydrology investigations in the Fortescue Marsh. The application area consists of 8 separate drill pads, each approximately 40 metres x 30 metres, and approximately 19 kilometres of access tracks approximately 4 metres wide (FMG, 2010).</p> <p>Chichester Metals Pty Ltd have advised that a sonic drilling rig will be used throughout the program which will reduce the ground impact due to the low ground pressure of using a track mounted rig compared to a truck mounted rig or standard four wheel drive (FMG, 2010). Chichester Metals Pty Ltd have also advised that a Kubota tracked mini excavator fitted with a narrow (~500 millimetre) bucket will be used to undertake soil pit excavations (FMG, 2010).</p> <p>The proposed activities will include construction of nested groundwater bores/piezometers and soil pit excavations at existing University of Western Australia (UWA) research sites.</p> <p>These investigations will improve the knowledge of the hydrology of the marsh and also inform environmental impact assessment for Fortescue Metals Group Limited (FMG) mining operations.</p>
<b>Vegetation Condition</b>	<p>Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994);</p> <p>To</p> <p>Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery, 1994).</p>
<b>Comment</b>	<p>Clearing permit CPS 3828/1 was granted by the Department of Mines and Petroleum on 23 September 2010, and is valid from 23 October 2010 to 23 October 2015. The clearing permit authorised the clearing of 8.57 hectares of native vegetation. An application for an amendment to clearing permit CPS 3828/1 was submitted by Chichester Metals Pty Ltd on 26 October 2010. The proponent has requested a realignment of the access tracks to site 3 and site 19, relocation of a drill pad at site 19 and a reduction in area from 8.57 hectares to 8.25 hectares.</p> <p>Clearing permit CPS 3828/2 was granted by the Department of Mines and Petroleum on 4 November 2010, and is valid from 23 October 2010 to 23 October 2015. The clearing permit authorised the clearing of 8.25 hectares of native vegetation. An application for an amendment to clearing permit CPS 3828/2 was submitted by Chichester Metals Pty Ltd on 2 December 2010. The proponent has requested turnaround areas on access tracks to site 1, site 3 and site 9, and an increase in area from 8.25 hectares to 8.54 hectares, There were no additional environmental impacts as a result of this amendment.</p> <p>The application area is located in the Pilbara region of Western Australia and is situated approximately 74 kilometres south-south-west of Nullagine (GIS Database). The application area is located within the Fortescue Marsh which is listed as a wetland of national importance and a Priority Ecological Community (PEC) (GIS Database).</p>

### 3. Assessment of application against clearing principles

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

<b>Comments</b>	<p><b>Proposal may be at variance to this Principle</b></p> <p>The application area occurs within the Fortescue Plains (PIL2) subregion of the Pilbara Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). The Fortescue Plains subregion is characterised by alluvial plains and river frontage (CALM, 2002). The eastern portion of the subregion is comprised of</p>
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extensive salt marsh, mulga-bunch grass and short grass communities on alluvial plains, while deeply incised gorge systems comprise the western part of the drainage (CALM, 2002). An extensive calcrete aquifer feeds numerous permanent springs in the central Fortescue, supporting large permanent wetlands with extensive stands of river gum and Cadjeput Melaleuca woodlands (CALM, 2002).

The vegetation of the Fortescue Marsh is predominantly comprised of samphire communities, with extensive bare areas also common in the lowest elevation areas (FMG, 2010). Nine species of Priority flora were recorded as occurring or possibly occurring in the samphire communities in and adjacent to the Fortescue Marsh (FMG, 2010).

**P1** - *Eremophila spongiorca*, *Nicotiana heterantha*, *Peplidium* sp. Fortescue Marsh, *Tecticornia* sp. Christmas Creek, *Tecticornia* sp. Fortescue Marsh;

**P3** - *Atriplex flabelliformis*, *Rhagodia* sp. Hamersley, *Tecticornia* sp. Roy Hill; and

**P4** - *Eremophila youngii* subsp. *lepidota* (FMG, 2010; DEC, 2010a).

The impact to individuals of these species is unlikely to significantly and adversely impact on the survival of the population.

The application area occurs within a Priority Ecological Community (PEC), which is the Fortescue Marsh (GIS Database). The Fortescue Marsh PEC is described as an extensive, episodically inundated samphire marsh, approximately 100 kilometres long and 10 kilometres wide (CALM, 2002). The Fortescue Marsh PEC is listed as "Priority 1" (DEC, 2010b).

An ecological community will be listed as Priority 1 when they are communities with apparently few, small occurrences, all or most not actively managed for conservation and for which current threats exist. Communities may be listed as Priority 1 if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range (DEC, 2007).

The PEC is on the Fortescue River, east of Mulga Downs Pastoral Station, on Marillana and Roy Hill Stations (DEC, 2010b). The threats facing the PEC include but are not limited to; grazing pressure, feral animals and changes in hydrology (CALM, 2002).

Given the above threats, DEC identified several years ago that the lands comprising and surrounding the Fortescue Marsh PEC should be protected in the formal conservation reserve system. The Government is proposing the exclusion of a portion of Hillside, Mulga Downs, Marillana and Roy Hill Stations that contains the PEC from the pastoral lease through the 2015 pastoral lease exclusion process, for future protection as a conservation reserve. According to available GIS Databases, the application area forms part of the 2015 pastoral lease exclusion boundary (GIS Database).

The vegetation of the Fortescue Marsh is predominantly comprised of samphire communities, with extensive bare areas in the lowest elevation areas (FMG, 2010). These samphire vegetation types are locally restricted to the Fortescue Marsh and are unique to the central Pilbara region (FMG, 2010).

The Fortescue Marsh and surrounding areas are located on pastoral stations and as such have suffered some previous disturbance from cattle grazing (FMG, 2010; GIS Database). The impacts from cattle grazing on the Fortescue Marsh itself are generally low, mainly as a result of the stability and resilience of the clay soils (FMG, 2010).

Based on the above, the proposed clearing may be at variance to this Principle. Given the size of the proposed clearing in relation to the size of the Fortescue Marsh, the proposed clearing activities are unlikely to significantly impact the environmental conservation values for the Fortescue Marsh.

**Methodology** CALM (2002)  
DEC (2010a)  
DEC (2010b)  
DEC (2007)  
FMG (2010)  
GIS Database:  
- DEC Proposed 2015 Pastoral Lease Exclusions  
- IBRA WA (regions - subregions)  
- Threatened Ecological Sites Buffered

**(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**

The Fortescue Marsh is an extensive, episodically inundated samphire marsh, approximately 100 kilometres

long and 10 kilometres wide (CALM, 2002). The Fortescue Marshes have been designated as a wetland of national importance under Criteria 3 of the Directory of Important Wetlands in Australia as "it is a wetland that is important as the habitat for animal taxa at a vulnerable stage in their life cycles, or provides a refuge when adverse conditions such as drought prevail" (DEC, 2009; CALM, 2002; Environment Australia, 2001).

The Fortescue Marsh is a significant drought refuge area for native vertebrate fauna in the bioregion (DEC, 2009). The marsh is also known to support migratory waterbird species, including Clamorous Reed-warbler (*Acrocephalus stentoreus*), Great Egret (*Ardea alba*), Swamp harrier (*Circus approximans*) and Whiskered Tern (*Chlidonias hybridus*), as well as Sacred Kingfisher (*Todiramphus sanctus*). The marsh is also a major breeding area for the Australian Pelican (*Pelecanus conspicillatus*) and Black Swan (*Cygnus atratus*) (DEC, 2009). The Fortescue Marsh is the only Pelican breeding area in the Pilbara bioregion and is isolated by large distances from other Pelican breeding areas (Environment Australia, 2001).

Three species have further been identified as potentially having a special reliance on the habitat provided by the Marsh

- Night Parrot (*Pezoporus occidentalis*);
- Bilby (*Macrotis lagotis*); and
- Australian Bustard (*Ardeotis australis*) (FMG, 2010).

Given the extensive nature of the Fortescue Marsh (approximately 100,000 hectares), the vegetation within the application areas is unlikely to be considered as significant habitat for fauna. The low impact clearing activities covering up to 8.54 hectares are unlikely to significantly impact on the quality or availability of fauna habitats that are present within the application areas.

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

**Methodology** CALM (2002)  
DEC (2009)  
Environment Australia (2001)  
FMG (2010)

**(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**

According to available GIS databases there are no known records of Declared Rare Flora (DRF) within the application area (GIS Database).

The assessing officer conducted a search of DEC's online flora and fauna database (NatureMap) between the coordinates 119°59'26"E - 119°03'10"E, 23°13'0"S - 22°38'43"S, representing a 10 kilometre radius around the application area (DEC, 2010a).

This search revealed that the DRF species *Lepidium catapycnon* may occur within the application area or the surrounding 10 kilometres. *Lepidium catapycnon* is an open woody perennial shrub largely restricted to skeletal soils and hillsides (Western Australian Herbarium, 2010). The required habitat for *Lepidium catapycnon* was not observed within the application area during the vegetation survey conducted by Mattiske Consulting, therefore it is unlikely that this species occurs within the application area (Mattiske Consulting, 2007).

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

**Methodology** DEC (2010a)  
Mattiske Consulting (2007)  
Western Australian Herbarium (2010)  
GIS Database:  
- Declared Rare and Priority Flora List

**(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**

A search of available databases reveals that there are no Threatened Ecological Communities (TECs) within the application area (GIS Database). There are no TECs within a 70 kilometre radius of the application area (GIS Database).

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

**Methodology** GIS Database:  
- Threatened Ecological Sites Buffered

**(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 falls within the Pilbara Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). Shepherd (2007) reports that approximately 99.95% of the pre-European vegetation remains in this bioregion.

The vegetation within the application area is recorded as Beard vegetation associations:

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

**676:** Succulent steppe; samphire (GIS Database; Shepherd, 2007).

According to Shepherd (2007) approximately 100% of these Beard vegetation associations remain within the Pilbara bioregion (see table below).

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA Bioregion - Pilbara	17,804,188	17,794,647	~99.95%	Least Concern	~6.32%
IBRA Subregion - Fortescue	1,951,433	1,951,433	~100%	Least Concern	~0.55%
<b>Beard vegetation associations - State</b>					
29	7,903,991	7,903,991	~100%	Least Concern	~0.3%
676	2,063,389	1,958,293	~94.9%	Least Concern	~3.6%
<b>Beard vegetation associations - Bioregion</b>					
29	1,133,219	1,133,219	~100%	Least Concern	~1.9%
676	92,363	92,300	~99.9%	Least Concern	N/A

\* Shepherd (2007)

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

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

**Methodology** Department of Natural Resources and Environment (2002)  
Shepherd (2007)  
GIS Database:  
- IBRA WA (regions - subregions)  
- 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 application area occurs within the Fortescue Marsh, which is described as "an extensive, episodically inundated samphire marsh, approximately 100 kilometres long and 10 kilometres wide" (CALM, 2002; GIS Database).

The Fortescue Marsh has been identified as a wetland of national significance as it meets the following required inclusion criteria (Environment Australia, 2001):

- It is a good example of a wetland type occurring within a biogeographic region in Australia;
- It is a wetland which plays an important ecological or hydrological role in the natural functioning of a major wetland system/complex;
- It is a wetland which is important as the habitat for animal taxa at a vulnerable stage in their life cycles, or provides a refuge when adverse conditions such as drought prevail; and
- The wetland is of outstanding historical or cultural significance.

The Fortescue Marsh is known to contain habitat that is significant for endemic *Eremophila* species, as well as several near endemic and new to sciences samphires (DEC, 2010b). Several specific vegetation types have also been recorded from Mulga Downs Station as occurring only around the marsh, as well as an unusual system occurring downstream (DEC, 2010b).

Chichester Metals Pty Ltd have applied to clear up to 8.54 hectares of native vegetation, with the total clearing application area comprised of 8 separate drill pads, each approximately 40 metres x 30 metres, and approximately 19 kilometres of access tracks approximately 4 metres wide (FMG, 2010).

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

The proposed eco-hydrology investigations involve clearing for access tracks and drill holes within the Fortescue Marsh, and the surrounding vegetation. Chichester Metals Pty Ltd have advised that a sonic drilling rig will be used throughout the program which will reduce the ground impact due to the low ground pressure of using a track mounted rig compared to a truck mounted rig or standard four wheel drive (FMG, 2010). Chichester Metals Pty Ltd have also advised that a Kubota tracked mini excavator fitted with a narrow (~500 millimetre) bucket will be used to undertake soil pit excavations (FMG, 2010). The soil pits will be excavated to a depth of up to 3 metres and ~500 millimetres wide and will be backfilled with spoil at the completion of the pit assessment (FMG, 2010)

Although Chichester Metals Pty Ltd has advised that a raised blade clearing technique will be utilised, the driving of a track drill rig is likely to adversely impact on vegetation, and may also cause soil compaction. Localised areas of soil compaction may reduce the ability of the vegetation to re-establish during rehabilitation.

The Department of Water (DoW, 2010) has also advised that the following should be taken into consideration;

- No activity shall be undertaken which results in the loss of riverbank or wetland fringing vegetation, in particular construction of vehicular access tracks. Where possible, existing tracks are to be used;
- The area shall be returned to a state close as possible to that prior to the leaseholder activities and if necessary, be in accordance with an approved rehabilitation plan;
- Authorised staff of the Department of Water have right of access for the purpose of water resource inspection and investigation; and
- The Department of Water requests written notification of any activities that may go beyond those outlined in the conditions stipulated before initiation of activities (DoW, 2010).

The Assessing Officer considers the clearing activities to be minor and low impact. Given the size of the proposed clearing in relation to the size of the Fortescue Marsh, the proposed clearing activities are unlikely to significantly impact the environmental conservation values for the Fortescue Marsh.

**Methodology** CALM (2002)  
DEC (2010b)  
DoW (2010)  
Environment Australia (2001)  
FMG (2010)  
GIS Database:  
- ANCA, Wetlands  
- Clearing Regulations - Environmentally Sensitive Areas  
- Geodata, Lakes  
- Threatened Ecological Sites Buffered

**(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 application area has been surveyed by the Department of Agriculture and Food (Van Vreeswyk et al., 2004). The application area is composed of the following land systems (GIS Database);

- Cowra land system: Plains fringing the Marsh land system and supporting Snakewood and mulga shrublands with some halophytic undershrubs;
- Jamindie land system: Stony hardpan plains and rises supporting groved mulga shrublands, occasionally with spinifex understorey;
- Marsh land system: Lakebeds and floodplains subject to regular inundation, supporting samphire shrublands, salt water couch grasslands and halophytic shrublands;
- Turee land system: Stony alluvial plains with gilgaied and non-gilgaied surfaces supporting tussock grasslands and grassy shrublands; and
- Warri land system: Low calcrete platforms and plains supporting mulga and cassia shrublands (Van Vreeswyk et al, 2004).

The Marsh land system is subject to regular inundation and covers the majority of the application area (approximately 71%) (GIS Database). This land system has a low susceptibility to degradation and erosion except for some alluvial fans and drainage floors and some outer margins of flood plains which are moderately susceptible to erosion (Van Vreeswyk et al, 2004).

The Turee land system covers approximately 10% of the application area, with much of the system protected from erosion by stone surface mantles. However, the less stony parts of the hardpan plains, gilgai plains, saline stony plains and channelled drainage tracts land units are slightly to moderately susceptible to erosion (Van Vreeswyk et al, 2004).

The Cowra land system covers approximately 8% of the application area and is generally protected from erosion by surface mantles of gravel (Van Vreeswyk et al, 2004). However, if the mantle is removed or disturbed, particularly on the saline alluvial plains erosion can occur (Van Vreeswyk et al, 2004).

The Warri land system covers approximately 8% of the application area (GIS Database). The saline plains are moderately susceptible to erosion, those with loam over hardpan (hardpan plains) are less susceptible and calcrete tables are not normally susceptible though widely degraded (Van Vreeswyk et al, 2004).

The Jamindie land system covers approximately 3% of the application area (GIS Database). The drainage tracts land units are moderately susceptible to erosion, while some of the hardpan plains land units is slightly susceptible and other parts are inherently resistant (Van Vreeswyk et al, 2004).

Based on the above, the proposed clearing may be at variance to this Principle. The proponent proposes to clear 8.54 hectares. The proposed clearing will be for 8 drill pads, each approximately 40 metres x 30 metres, and approximately 19 kilometres of access tracks approximately 4 metres wide. The nature of the proposed clearing is unlikely to result in appreciable land degradation on a broader scale although localised erosion may occur. Potential land degradation impacts as a result of the proposed clearing may be minimised by the implementation of a rehabilitation program. The requirement for Chichester Metals Pty Ltd to rehabilitate the areas disturbed under this proposal is a condition of their tenements and as such is regulated under the *Mining Act 1978*.

**Methodology** Van Vreeswyk et al. (2004)  
GIS Database:  
- 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 likely to be at variance to this Principle**  
The proposed clearing is not located within a conservation reserve (GIS Database). The nearest known conservation reserve is Karijini National Park, located approximately 41 kilometres west (GIS Database).

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

**Methodology** GIS Database:  
- DEC 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**  
The application area is located within the Fortescue Marsh, an area of high ecological and environmental significance and a nationally important wetland and candidate for RAMSAR nomination (DoW, 2010). The Fortescue Marsh is an extensive intermittent wetland occupying an area around 100 kilometres long by typically 10 kilometres wide located on the floor of the Fortescue Valley (Aquaterra, 2005).

The Fortescue Valley is subjected to localised thunderstorm and cyclonic rainfall events which can produce very large runoff events. Following a significant rainfall event, runoff from the Upper Fortescue River Catchment drains to the marshes. For the smaller runoff events, isolated pools form on the marshes opposite the main drainage inlets, whereas for the larger events the whole marsh area may flood (Aquaterra, 2005).

Surface water runoff to the marshes is of low salinity and turbidity, though the runoff turbidity typically increases significantly during peak periods of flooding. Water stored on the marshes slowly dissipates through the processes of seepage and evaporation (Aquaterra, 2005). During the evaporation process, the water salinity levels increase and as the ponded areas recede, traces of surface salt can be seen. During the seepage process, as the ponds evaporate, increasingly more saline water is believed to seep into the valley floor alluvial deposits (Aquaterra, 2005).

According to available databases, the salinity of the application area is greater than 35,000 milligrams/Litre Total Dissolved Solids (TDS) (GIS Database). The alluvial aquifer beneath the Fortescue Marsh is considered to be saline to hypersaline (10,000 to 75,000 milligrams/Litre TDS) while the deeper aquifers are saturated with hypersaline water (75,000 to 160,000 milligrams/Litre TDS) (FMG, 2010). The hypersalinity is thought to result from the downward migration of salt due to the increased density of the solution (FMG, 2010).

The application area is located within the proclaimed Pilbara groundwater area and a proclaimed surface water area under the *Rights in Water and Irrigation Act 1914* (RIWI Act) (Dow, 2010; GIS Database). Any groundwater extraction and/or taking or diversion of surface water for the purposes other than domestic and/or stock watering is subject to licence by the Department of Water (DoW, 2010).

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

**Methodology** Aquaterra (2005)  
DoW (2010)  
FMG (2010)  
GIS Database:  
- Groundwater Salinity, Statewide  
- RIWI Groundwater 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**

The application area is located within the Fortescue Marsh which is a samphire marsh episodically inundated covering an area of approximately 100,000 hectares (Environment Australia, 2001; CALM, 2002; GIS Database). The average annual rainfall of Nullagine, which is situated approximately 74 kilometres north-north-east of the application area, is 334.7 millimetres and the area experiences a mean annual evaporation of approximately 3,200 millimetres (BoM, 2010). The application area experiences rainfall mainly during the summer months as cyclonic events (CALM, 2002). The Fortescue Marsh receives drainage from the Upper Fortescue River catchment which covers a total area of approximately 2,975,192 hectares (GIS Database; Aquaterra, 2005).

Given the low impact nature of the proposed clearing activities, it is unlikely that the clearing under this proposal will impact on drainage patterns for the Fortescue Marshes.

The proposed clearing is unlikely to cause or increase the incidence of flooding or result in an increase in peak flood height.

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

**Methodology** Aquaterra (2005)  
BoM (2010)  
CALM (2002)  
Environment Australia (2001)  
GIS Database:  
- ANCA Wetlands  
- Hydrographic Catchments - Catchments

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

**Comments**

There is one Native Title Claim (WC99/004) over the area under application. All claims have been registered with the National Native Title Tribunal on behalf of the claimant group. However, the mining 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.

There are no registered Aboriginal Sites of Significance within the application area (GIS Database). 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 and Conservation 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.

Clearing permit CPS 3828/1 was granted by the Department of Mines and Petroleum on 23 September 2010, and is valid from 23 October 2010 to 23 October 2015. The clearing permit authorised the clearing of 8.57 hectares of native vegetation. An application for an amendment to clearing permit CPS 3828/1 was submitted by Chichester Metals Pty Ltd on 26 October 2010. The proponent has requested a realignment of the access tracks to site 3 and site 19, relocation of a drill pad at site 19 and a reduction in area from 8.57 hectares to 8.25 hectares.

Clearing permit CPS 3828/2 was granted by the Department of Mines and Petroleum on 4 November 2010, and



is valid from 23 October 2010 to 23 October 2015. The clearing permit authorised the clearing of 8.25 hectares of native vegetation. An application for an amendment to clearing permit CPS 3828/2 was submitted by Chichester Metals Pty Ltd on 2 December 2010. The proponent has requested turnaround areas on access tracks to site 1, site 3 and site 9, and an increase in area from 8.25 hectares to 8.54 hectares. There were no additional environmental impacts as a result of this amendment.

The application area is located in the Pilbara region of Western Australia and is situated approximately 74 kilometres south-south-west of Nullagine (GIS Database). The application area is located within the Fortescue Marsh which is listed as a wetland of national importance and a Priority Ecological Community (PEC) (GIS Database).

**Methodology** GIS Database:  
- Aboriginal Sites of Significance  
- Native Title NNTT

#### 4. References

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#### 5. Glossary

##### Acronyms:

<b>BoM</b>	Bureau of Meteorology, Australian Government
<b>CALM</b>	Department of Conservation and Land Management (now DEC), Western Australia
<b>DAFWA</b>	Department of Agriculture and Food, Western Australia
<b>DEC</b>	Department of Environment and Conservation, Western Australia
<b>DEH</b>	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
<b>DEP</b>	Department of Environment Protection (now DEC), Western Australia
<b>DIA</b>	Department of Indigenous Affairs
<b>DLI</b>	Department of Land Information, Western Australia
<b>DMP</b>	Department of Mines and Petroleum, Western Australia
<b>DoE</b>	Department of Environment (now DEC), Western Australia
<b>DoIR</b>	Department of Industry and Resources (now DMP), Western Australia
<b>DOLA</b>	Department of Land Administration, Western Australia

<b>DoW</b>	Department of Water
<b>EP Act</b>	Environmental Protection Act 1986, Western Australia
<b>EPBC Act</b>	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
<b>GIS</b>	Geographical Information System
<b>ha</b>	Hectare (10,000 square metres)
<b>IBRA</b>	Interim Biogeographic Regionalisation for Australia
<b>IUCN</b>	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
<b>RIWI Act</b>	Rights in Water and Irrigation Act 1914, Western Australia
<b>s.17</b>	Section 17 of the Environment Protection Act 1986, Western Australia
<b>TEC</b>	Threatened Ecological Community

## **Definitions:**

{Atkins, K (2005). *Declared rare and priority flora list for Western Australia, 22 February 2005. Department of Conservation and Land Management, Como, Western Australia*} :-

- P1** **Priority One - Poorly Known taxa:** taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
- P2** **Priority Two - Poorly Known taxa:** taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
- P3** **Priority Three - Poorly Known taxa:** taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.
- P4** **Priority Four – Rare taxa:** taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years.
- R** **Declared Rare Flora – Extant taxa (= Threatened Flora = Endangered + Vulnerable):** taxa which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.
- X** **Declared Rare Flora - Presumed Extinct taxa:** taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

{Wildlife Conservation (Specially Protected Fauna) Notice 2005} [Wildlife Conservation Act 1950] :-

- Schedule 1** **Schedule 1 – Fauna that is rare or likely to become extinct:** being fauna that is rare or likely to become extinct, are declared to be fauna that is need of special protection.
- Schedule 2** **Schedule 2 – Fauna that is presumed to be extinct:** being fauna that is presumed to be extinct, are declared to be fauna that is need of special protection.
- Schedule 3** **Schedule 3 – Birds protected under an international agreement:** being birds that are subject to an agreement between the governments of Australia and Japan relating to the protection of migratory birds and birds in danger of extinction, are declared to be fauna that is need of special protection.
- Schedule 4** **Schedule 4 – Other specially protected fauna:** being fauna that is declared to be fauna that is in need of special protection, otherwise than for the reasons mentioned in Schedules 1, 2 or 3.

{CALM (2005). *Priority Codes for Fauna. Department of Conservation and Land Management, Como, Western Australia*} :-

- P1** **Priority One: Taxa with few, poorly known populations on threatened lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P2** **Priority Two: Taxa with few, poorly known populations on conservation lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not under immediate threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P3** **Priority Three: Taxa with several, poorly known populations, some on conservation lands:** Taxa which are known from few specimens or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.

**P4**            **Priority Four: Taxa in need of monitoring:** Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.

**P5**            **Priority Five: Taxa in need of monitoring:** Taxa which are not considered threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

**Categories of threatened species (*Environment Protection and Biodiversity Conservation Act 1999*)**

**EX**            **Extinct:** A native species for which there is no reasonable doubt that the last member of the species has died.

**EX(W)**        **Extinct in the wild:** A native species which:  
(a) is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or  
(b) has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.

**CR**            **Critically Endangered:** A native species which is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.

**EN**            **Endangered:** A native species which:  
(a) is not critically endangered; and  
(b) is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.

**VU**            **Vulnerable:** A native species which:  
(a) is not critically endangered or endangered; and  
(b) is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.

**CD**            **Conservation Dependent:** A native species which is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.