



## 1. Application details

### 1.1. Permit application details

Permit application No.: 1764/1  
 Permit type: Purpose Permit

### 1.2. Proponent details

Proponent's name: Geoscience Australia

### 1.3. Property details

Property: SWAN LOCATION 3506 (House No. 603 QUIN YEAL 6503)  
 Local Government Area: Shire Of Gingin  
 Colloquial name:

### 1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
2		Mechanical Removal	Building or Structure

## 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
<p>Beard Vegetation Association:</p> <p>1014: Mosaic - Low woodland; banksia / Shrublands; tea-tree thicket (Hopkins et al. 2001, Shepherd 2006).</p>	<p>The proposed clearing consists of up to 2 ha of native vegetation within a 3.82 hectare area within State Forest 65 on 603 Quin Road, Yeal (CALM Lease 2197/97 and Swan Location 2506, Yeal), for the purpose of constructing a Geomagnetic Observatory. The boundary of the proposed clearing is within the boundary of a CALM lease 2197/97.</p>	<p>Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery 1994)</p>	<p>Description and condition of the vegetation under application was determined from the Site Inspection (2007). Vegetation within the area under application ranges in condition from 'pristine' to 'good' giving an overall rating of 'excellent'.</p>
<p>Hedde Vegetation Complex:</p> <p>Bassendean Complex - North: Vegetation ranges from a low open forest and low open woodland of Banksia species E. todiana to low woodland of Melaleuca species and sedgelands which occupy the moister sites (Hedde et al. 1980).</p>	<p>The majority of the area under application is rated 'pristine' with only a very small section at the southern limit of the area under application rated 'good', where an Observatory Detector Arm is located (Site Inspection 2007).</p>		
	<p>Within the area rated 'pristine' vegetation structure is intact and floristic diversity is high. Upper storey species include Eucalyptus todiana (Blackbutt), Banksia menziesii, B. attenuata and Nuytsia floribunda. The middle storey is absent and the lower storey is species rich consisting of herbs and shrubs including Allocasuarina humilis, Xanthorrhoea preissii, Adenanthos cygnorum, Stirlingia latifolia, Macrozamia riedlei, Acacia</p>		

pulchella, Calothamnus sanguineus, Petrophile macrostachya and Melaleuca trichophylla (Site Inspection 2007).

The area rated 'good' is due to the previous underground installation of the Observatory Detector Arm which required a length of vegetation approximately 50m long and 15 m wide to be cleared. Native species of herbs and shrubs are already recolonising this patch and a diversity of species is already established (Site Inspection 2007).

### 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 at variance to this Principle**

The area under application covers two hectares of low open forest and woodland in State Forest 65 comprising vegetation considered to be in 'good' to 'pristine' condition, and supporting a high diversity of flora, particularly in the understorey (Site inspection 2007).

The area under application is part of a corridor of intact native vegetation that is not represented elsewhere on the Swan Coastal Plain (Ecologia Environment 2006). This corridor encompasses many flora species and vegetation types of high conservation significance across the northern sector of the plain from the coast to the Gingin Scarp and the Dandaragan Plateau. Ecologia Environment (2006) determined that although the area under application was not shown to include any listed species of conservation significance or TECs, the conservation values of the bushlands are apparent with evidence of a disproportionately large number of significant species in a relatively small area.

Given the above the clearing is at variance to this Principle.

**Methodology**      Reference:

- Site Inspection (2007) (TRIM Ref. DOC21283)
- Ecologia Environmental (2006) (TRIM Ref. DOC 17459)

GIS Databases:

- Geomorphic wetlands (Mgt Categories) - Swan Coastal Plain - DOE 15/09/04
- Gingin 1m Orthomosaic - DLI 03
- Swan Coastal Plain North 1m Orthomosaic - DLI 01/04
- Hedde Vegetation Complexes - DEP 21/06/95

#### (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**

Two indigenous fauna species of significance are recorded within a 10 km radius of the area under application: priority 4 Western Brush Wallaby (*Macropus irma*) and priority 5 Western Brown Bandicoot (*Isopogon obesulus* subsp. *fusciventer*).

Site Inspection (2007) identified the area under application as containing a dense shrub layer, which is preferred by both the Western Brush Wallaby and the Western Brown Bandicoot, and thus both species are considered likely to be present in the area under application.

However, given that the small size of the area under application (~2 ha) is fragmented, including a hut, pillars, paths and sightlines within an area of 3.82 ha, and the fact that it is surrounded by large areas of unfragmented bushland of similar floristic composition and structure (State Forest 65), clearing is unlikely to be at variance to this Principle.

**Methodology**      Reference:

- Site Inspection (2007) (TRIM Ref: DOC 21283)

GIS Databases:

- SAC Bio datasets 10/04/2007
- DEC Fauna habitat notes.xls February 2007
- CALM Managed Lands and Waters - CALM 1/07/05
- Gingin 1m Orthomosaic - DLI 03

**(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**

Two species of Declared Rare Flora (DRF), two taxa of priority 1, one species as priority 2, one species as priority 3 and three taxa of priority 4 (Atkins 2006) occur within a 10 km radius of the area under application. The closest DRF to the area under application is a population of *Drakaea elastica* located 3 km south west of the site.

A Site Inspection (2007) identified the site as containing grey/white sands with no outcropping rocks and no areas of winter wet depressions, with the site supporting a low woodland of *Banksia* and *Eucalyptus todtiana* over low scrub. These characteristics make the site unsuitable habitat for all taxa of rare flora occurring within 10 km of the site (Brown et al. 1998; Western Australian Herbarium 1998-).

Ecologia Environment (2006) conducted a flora and vegetation survey of the Gingin Geomagnetic Observatory development site on September 25, 2007 and determined that no DRF are within the area under application.

It is therefore considered that clearing is not likely to be at variance to this Principle.

**Methodology References:**

- Atkins (2006)
- Brown et al. (1998)
- Western Australian Herbarium (1998-)
- Ecologia Environment (2006) (TRIM Ref: DOC17459)
- Site Inspection (2007) (TRIM Ref: DOC 21283)

**GIS Database:**

- SAC Bio datasets 10/04/2007

**(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**

There are two occurrences of Threatened Ecological Communities (TECs) within a 10 km radius of the area under application, the closest being 5.8 km from the application site. These TECs are SCP 26a: *Melaleuca huegelii* - *Melaleuca acerosa* shrublands on limestone ridges and SCP 07: Herb rich saline shrublands in clay pans.

The Site Inspection (2007) identified vegetation as comprising of Blackbutt (*Eucalyptus todtiana*), *Banksia menziesii*, *B. attenuata* and *Nuytsia floribunda*, with a species rich understorey consisting of herbs and shrubs including *Allocasuarina humilis*, *Xanthorrhoea preissii*, *Adenanthos cygnorum*, *Stirlingia latifolia*, *Macrozamia riedlei*, *Acacia pulchella*, *Calothamnus sanguineus*, *Petrophile macrostachya* and *Melaleuca trichophylla*.

The vegetation under application is not consistent with the species composition outlined within Gibson et al. (1994) for the two above listed TECs, or for other TECs endorsed by the Minister for the Environment (Department of Environment and Conservation 2007). The clearing as proposed is therefore not likely to be at variance to this Principle.

**Methodology References:**

- Site Inspection (2007) (TRIM Ref: DOC 21283)
- Gibson et al (1994)
- Department of Environment and Conservation (2007)

**GIS Databases:**

- SAC Bio dataset 10/04/2007

**(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**

Vegetation within the area under application is recognised as representing both Beard Vegetation Association 1014 and Heddle Vegetation Complex 'Bassendean Complex North', which are identified as having current representation levels of 52.9% and 72% respectively (Shepherd 2006; EPA 2006)

The State government is committed to the National Objective Targets for Biodiversity Conservation, which includes targets that prevent the clearing of ecological communities with an extent below 30% of that present pre-1750 (Department of Natural Resources and Environment 2002; EPA 2000).

Pre-European	Current area (ha)	Remaining % extent (ha)		Conservation % in reserves/DEC-status****	managed land
Swan Coastal Plain	1,529,235	657,450	38.1 *	Depleted	-
Shire of Gingin	315,560	177,688	56.3 *	Least Concern	-
Beard vegetation association					
1014	41,066	21,730	52.9 **	Least Concern	28.3
Hedde vegetation complex					
Bassendean Complex - North	74,147	53,384	72.0 ***	Least Concern	27.5

\* (Shepherd et al. 2001)

\*\* Shepherd (2006)

\*\*\* (EPA, 2006)

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

As the remaining vegetation is above the 30% threshold at both local and regional levels and is well represented in conservation reserves, the vegetation is not likely to be a significant remnant. The clearing therefore, is not likely to be at variance to this Principle.

#### Methodology

References:

- Department of Natural Resources and Environment (2002)
- EPA (2006)
- EPA (2000)
- Shepherd (2006)
- Shepherd et al. (2001)

GIS databases:

- Hedde Vegetation Complexes - DEP 21/06/95
- Pre-European Vegetation - DA 01/01
- Gingin 1m Orthomosaic - DLI 03

#### (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 not at variance to this Principle**

There are no wetlands or watercourses within the area applied to be cleared.

The nearest wetland to the area under application is a Conservation Category Wetland (CCW) located approximately 250 m east of the area under application.

The Site Inspection (2007) identified vegetation as comprising of a Eucalyptus - Banksia woodland with a species rich understorey consisting of herbs and shrubs, typical of upland vegetation. The vegetation applied to be cleared is representative of upland vegetation and is not growing in or in an environment associated with a wetland or watercourse.

##### Methodology

GIS Databases:

- Hydrography, linear DOE 1/2/04
- Geomorphic wetlands (Mgt Categories) - Swan Coastal Plain - DOE 15/09/04
- EPP, Wetlands 2004 (DRAFT) - DOE 21/7/04
- EPP, Lakes - DEP 1/12/92
- Topographic Contours, Statewide - DOLA 12/09/02
- Gingin 1m Orthomosaic - DLI 03

#### (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**

The vegetation under application lies within soil unit Cb39. Soils of unit Cb39 are associated with subdued dune-swale terrain with chief soils being leached sands on the low dunes (Northcote et al. 1960-68).

The area under application lies within a Class 2 Acid Sulphate Soil (ASS) Risk area. This Class is defined as having a moderate to low risk of ASS.

The area proposed for clearing is relatively small (~2 ha) and fragmented, including a hut, pillars, paths and sightlines within an area of 3.82 ha. Given the nature of the clearing and buffering effect of the surrounding vegetation, being located within State Forest 65, land degradation in the form of water and wind erosion is not

likely.

Therefore, clearing is not likely to be at variance to this Principle.

**Methodology** References:  
- Northcote et al. (1960-68)

GIS Databases:  
- Soils, Statewide - DA 11/99  
- Acid Sulphate Soil risk map, Swan Coastal Plain, DEC  
- CALM Managed Lands and Waters - CALM 1/07/05

**(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 at variance to this Principle**

The proposed development is located within State Forest 65 (Gnangara-Moore River State Forest) which is also part of the Gnangara Mound Crown Land Environmental Protection Policy area (EPA 1992). This policy protects native vegetation that is used as a refuge for many significant flora and fauna, in addition to native vegetation providing a biologically productive and genetically diverse natural environment .

As the proposed clearing involves clearing of vegetation within the State Forest 65 and the EPP area, it will impact on the environmental values of these conservation areas and is thus considered at variance to this Principle.

**Methodology** Reference:  
- EPA (1992)

GIS Databases:  
- CALM Managed Lands and Waters - CALM 01/07/05  
- BushForever - MFP 07/01  
- EPP, Areas - DEP 06/95  
- Clearing Regulations - Environmentally Sensitive Areas - DOE 30/5/05  
- Gingin 1m Orthomosaic - DLI 03

**(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 may be at variance to this Principle**

The area under application forms part of the Moore River Catchment in the Gingin Brook Sub-Catchment. The area under application drains north to a minor river that drains into Gingin Brook.

The area in which clearing is proposed receives approximately 700-800 mm of rainfall annually and is subject to approximately 2000-2200 mm of evaporation annually. However database searches indicate the site is not at risk of salinity.

The area under application is located in a P1 Public Drinking Water Source Area, the Gnangara Underground Water Pollution Control Area. The Department of Water (2007) have advised that there is no objection to the development of the Geomagnetic observatory within this area (TRIM Ref No.DOC30292).

The proposed area is also within the Gnangara Mound Environmental Protection Policy area. The EPP states that the clearing, destruction or removal of native vegetation on or from the policy area can cause the levels and quality of groundwater on or under the policy area to be reduced or degraded (EPA 1992).

A submission has been received from the proponent stating that the Observatory proposal has been designed to minimise environmental impacts and Geoscience Australia is prepared to adjust the locations of the buildings to further reduce on site impacts (TRIM Ref. DOC32416).

This application was referred to EPA with regards to the Gnangara Mound Environmental Protection Policy area the EPA advised that the referral was Not Assessed - Managed under Part V of the EP Act (Clearing) (TRIM Ref. DOC37298).

**Methodology** Reference:  
- EPA (1992)  
- Department of Water (2007) (TRIM Ref No DOC30292)  
- DEC (2007) Advice re clearing in Gnangara Mound EPP (TRIM Ref. DOC32364)  
- Submission (2007) (TRIM Ref. DOC32416)

GIS Databases:

- Hydrography, linear - DOE 01/02/04
- Hydrography, linear (hierarchy) - DOW
- Hydrographic Catchments, Sub-catchments - DOE 01/07/03
- Public Drinking Water Source Areas (PDWSAs) - DOW
- Evaporation Isopleths - BOM 09/98
- Isohyets - BOM 09/98
- Salinity Risk LM 25m - DOLA 00

**(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 at variance to this Principle**

The area in which clearing is proposed receives approximately 700-800 mm of rainfall annually and is subject to approximately 2000-2200 mm of evaporation annually. Site Inspection (2007) identified the site as containing transmissive sandy soils and not being located within the buffer of a wetland or in a depression in the landscape which may be prone to flooding.

Given the above and that the area applied to be cleared is relatively small (~2 ha) and will be well buffered by the surrounding vegetation, being located within State Forest 65, (>10,000 ha) clearing is unlikely to cause or exacerbate the incidence or intensity of flooding.

**Methodology References:**

- Site Inspection (2007) (TRIM Ref: DOC 21283)

**GIS Databases:**

- CALM Managed Lands and Waters - CALM 01/07/05
- Topographic Contours, Statewide - DOLA 12/09/02
- Evaporation Isopleths - BOM 09/98
- Isohyets - BOM 09/98
- Geomorphic wetlands (Mgmt Categories) - Swan Coastal Plain - DOE 15/09/04

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

**Comments**

There are no Registered Sites of Aboriginal Significance recorded within the area under application

SWAN LOCATION 3506 is located within State Forest 65; Geoscience have a lease agreement with the DEC (2197/97). DEC Property Unit advised that the proponent does not require any other approvals other than a clearing permit and an Indigenous Affairs heritage survey relating to aboriginal sites and heritage matters (TRIM Ref No. 29753). The proponents will be advised of the latter.

The City of Swan has advised that as the subject area is DEC owned and managed, Development Approval is not required (TRIM Ref No. DOC29692).

A submission has been received from the Gingin Land Conservation District Committee stating no objections to the construction of a Geomagnetic Observatory (Public Submission 2007).

There is no required RIWI Act Licence, Works Approval or EPA Act Licence that affects the areas under application.

**Methodology References:**

- Public Submission (2007) (TRIM Ref. DOC21686)
- Department of Environment and Conservation (2007) (TRIM Ref No. 29753)

**4. Assessor's comments**

Purpose	Method	Applied area (ha)/ trees	Comment
Building or Structure	Mechanical Removal	2	The clearing application has been assessed against the clearing principles, planning instruments and other matters in accordance with s51O of the Environmental Protection Act 1986. The clearing as proposed is at variance to Principle (a) , may be at variance to Principle (h) and (i) and is not and not likely to be at variance to the remaining Principles.

**5. References**

- Atkins, K. (2006). Declared Rare and Priority Flora List. Department of Conservation and Land Management, Western Australia.
- Brown, A., Thomson-Dans, C. and Marchant, N. (1998). Western Australia's Threatened Flora. Department of Conservation

- adn Land Management. Perth, Western Australia. pp119.
- Department of Conservation and Land Management. (2006). Lease Agreement 2197/97 - Geomagnetic Observatory - State Forest 65. Kensington, Western Australia. TRIM Ref 26943.
- Department of Environment and Conservation (2007). Naturebase: List of Threatened Ecological Communities (endorsed by the Minister - Jan 2004). <http://www.naturebase.net/>. Accessed Monday, 03 May 2007.
- Department of Environment. (2004). Water Quality Protection Note: Land use compatibility in Public Drinking Water Source Areas. Perth, Western Australia. <http://drinkingwater.water.wa.gov.au>. Accessed 25 June 2007.
- Department of Indigenous Affairs. (2007). Aboriginal Heritage Inquiry System. Perth, Western Australia. <http://www.dia.wa.gov.au/Heritage/Inquiry/>. Accessed 18 June 2007. TRIM Ref. DOC26040.
- Department of Natural Resources and Environment (2002) Biodiversity Action Planning. Action planning for native biodiversity at multiple scales; catchment bioregional, landscape, local. Department of Natural Resources and Environment, Victoria.
- Ecologia Environment. (2006). Gingin Geomagnetic Observatory Flora and Vegetation Survey. Ecologia Environment, Perth, Western Australia. TRIM Ref. DOC17459.
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- EPA (1992). Environmental Protection (Gnangara Mound Crown Land) Policy Approval Order 1992. [www.epa.wa.gov.au/](http://www.epa.wa.gov.au/).
- EPA (2000) Environmental protection of native vegetation in Western Australia. Clearing of native vegetation, with particular reference to the agricultural area. Position Statement No. 2. December 2000. Environmental Protection Authority.
- EPA (2006) Guidance for the Assessment of Environmental Factors -level of assessment of proposals affecting natural areas within the System 6 region and Swan Coastal Plain portion of the System 1 Region. Report by the EPA under the Environmental Protection Act 1986. No 10 WA.
- Gibson, N., Keighery, B., Keighery, G., Burbidge, A. and Lyons, M. (1994). A Floristic Survey of the southern Swan Coastal Plain. Department of Conservation and Land Management. Perth, Western Australia. Unpublished report for the Australian Heritage Commission.
- Hedde, E. M., Loneragan, O. W., and Havel, J. J. (1980) Vegetation Complexes of the Darling System, Western Australia. In Department of Conservation and Environment, Atlas of Natural Resources, Darling System, Western Australia.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- 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
- Public Submission. (2007). RE: Application to clear native vegetation, CALM Lease 2197/97, 603 Quin Road, Yeal. TRIM Ref. DOC21686.
- Shepherd, D.P. (2006). 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. Includes subsequent updates for 2006 from Vegetation Extent dataset ANZWA1050000124.
- Shepherd, D.P. (2006). 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. Includes subsequent updates for 2006 from Vegetation Extent dataset ANZWA1050000124.
- Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) Native Vegetation in Western Australia, Extent, Type and Status. Resource Management Technical Report 249. Department of Agriculture, Western Australia.
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- Site Inspection. (2007). Site Inspection Report, Department of Environment and Conservation (DEC). Perth, Western Australia. TRIM Ref. DOC21283.
- Submission. (2007). RE: Proponents response to the area under application being within the Gnangara Mound Crown Land Environmental Protection Policy area. TRIM Ref. DOC32416.
- Western Australian Herbarium (1998-). FloraBase - The Western Australian Flora. Department of Environment and Conservation. <http://florabase.calm.wa.gov.au/> (Accessed 3 May 2007).

## 6. 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

