

Our Ref A10225/002 :MH

Contact Mark Harris

17 August 2007



Project Services
Department of Public Works
GPO Box 2906
BRISBANE, QLD 4001

Attention: Ms Tarla Jocumsen

Dear Madam

GATTON CORRECTIONAL PRECINCT DEVELOPMENT - PRELIMINARY SURVEY FINDINGS

A preliminary survey of part of Lot 240 on CA31519 and Lot 238 on CA31519 was completed on the 9th August 2007 by two appropriately qualified ecologists from Cardno (Qld) Pty Ltd. The purpose of the survey was to confirm the accuracy of vegetation community mapping documented by Natural Solutions in their May 2007 report entitled *Ecological Assessment – Spring Creek Gatton*. More specifically, the field survey focused on confirming:

1. the presence of the two patches of *Melaleuca irbyana*, which are identified by Natural Solutions as being analogous to an Endangered Ecological Community (i.e. Swamp Tea-tree (*Melaleuca irbyana*) Forest of South-east Queensland) pursuant to the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* ("EPBC Act") and an Endangered Regional Ecosystem (i.e. Regional Ecosystem ("RE") 12.3.3c – *Melaleuca irbyana* low open-forest or thicket) pursuant to Queensland's *Vegetation Management Act 1999* ("VM Act"); and
2. the accuracy or otherwise of the vegetation community mapping produced by Natural Solutions in Figure 5 of their Ecological Assessment, with specific attention given to the classification of Communities 7 and 8 as remnant *Endangered* vegetation (i.e. RE 12.5.2), when these communities are both currently identified on the Certified RE Map as remnant *Not of Concern* vegetation (i.e. RE 12.9-10.2).

Melaleuca irbyana Patches

The preliminary survey confirmed the presence, location and approximate size of the two patches of *M. irbyana* as reported by Natural Solutions. In this regard, and with respect to the findings of Natural Solutions, the following is noted.

- a. The two patches of *M. irbyana* are considered to be analogous to the description provided for the Endangered Swamp Tea-tree Forest Ecological Community pursuant to the Commonwealth's *EPBC Act*.
- b. Natural Solutions state that vegetation within the two *M. irbyana* patches is analogous to the following description provided for RE 12.3.3c.

RE 12.3.3c - *Melaleuca irbyana* low open-forest or thicket. Emergent trees may be present e.g. *Eucalyptus moluccana*, *E. crebra*, *E. tereticornis* and *Corymbia citriodora*. *Casuarina glauca* or *Acacia harpophylla* occasionally present. This RE occurs on **Quaternary alluvial plains**. This RE has an *Endangered* status pursuant to the *VM Act*.

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In this regard, it is relevant to note that the current geological vector data¹ identifies the section of the site which supports the *M. irbyana* patches as occurring on "Lithic labile and feldspathic labile sandstone" and "Quartzose sandstone, siltstone, shale conglomerate, coal". These geological descriptions are analogous to Land Zone 9, which the Queensland EPA describe as "fine-grained sedimentary rocks, generally with little or no deformation, forming undulating landscapes with a broad range of fine textured soils of moderate to high fertility. Siltstones, mudstones, shales, calcareous sediments, and lithic and labile sandstones are typical rock types although minor interbedded volcanics may occur".

Observations made during the field survey revealed that the landform on which the *M. irbyana* patches occur was not consistent with an alluvial plain, but rather a gently undulating plain, located outside of an alluvial bed or floodplain.

Natural Solutions have not provided any data or evidence to support their claim that the patches occur on alluvial soils.

Based on the available geological information, and in the absence of the results of geotechnical investigations which suggest otherwise, it would be more appropriate for the vegetation to be considered as being analogous to RE 12.9-10.11 which has an *Endangered* status pursuant to the *VM Act* and which is described as follows.

RE 12.9-10.2 - *Melaleuca irbyana* low open-forest or thicket. Emergent trees may be present e.g. *Eucalyptus moluccana*, *E. crebra* and *E. tereticornis*. *Casuarina glauca* or *Acacia harpophylla* occasionally present. This RE occurs on **Cainozoic and Mesozoic sediments**. This RE has an *Endangered* status pursuant to the *VM Act*.

- c. The approximate locations of the two *M. irbyana* patches (i.e. Patch A and Patch B) are presented on the attached Plan A. The patches are located amongst a dry Spotted gum (*Corymbia citriodora*), Narrow leaved red ironbark (*Eucalyptus crebra*) and Queensland blue gum (*E. tereticornis*) open woodland, which is presently identified as non-remnant vegetation on the Certified RE Map produced by the Environmental Protection Agency and relied upon by the Department of Natural Resources and Water in the administration of the *VM Act*. This woodland has been the subject of past selective vegetation clearance activities, which were made evident by numerous cut stumps. In this regard, it is relevant to note that the *VM Act* defines remnant vegetation as follows.

- 1 *Remnant vegetation, for an area of Queensland within a regional ecosystem map, means the vegetation mapped as being within remnant endangered regional ecosystems, remnant of concern regional ecosystems and remnant not of concern regional ecosystems shown on the map.*
- 2 ***Remnant vegetation, for an area of Queensland within a remnant map, means the vegetation mapped as remnant vegetation on the map.***
- 3 *Remnant vegetation, for an area of Queensland for which there is no regional ecosystem map or remnant map, means the vegetation, part of which forms the predominant canopy of the vegetation—*
 - (a) *covering more than 50% of the undisturbed predominant canopy; and*
 - (b) *averaging more than 70% of the vegetation's undisturbed height; and*
 - (c) *composed of species characteristic of the vegetation's undisturbed predominant canopy.*

It is noted that the patches occur within an area of Queensland within a remnant map and are mapped as non-remnant vegetation.

¹ Department of Natural Resources and Mines (2004) *Geological Survey of Queensland. Queensland Geological Mapping Data Regional & 1:100 000 Sheet Areas – July 2004. Geoscience Data.*

It is relevant to note that, at present, both *M. irbyana* patches are mapped as non-remnant vegetation. Natural Solutions have not, in their report, provided any data or relevant supporting evidence² (i.e. in accordance with the methodology that the Queensland EPA employ to survey and map REs) to support the claim that these two patches constitute remnant vegetation.

With this in mind, a preliminary assessment of the *M. irbyana* patches was undertaken for the purposes of determining whether these patches constituted remnant vegetation pursuant to the definition provided in the *VM Act*. A brief description of the results of this assessment is provided as follows.

Predominant canopy cover within both patches was fairly continuous and generally approximated 95-100%. Measurements of the height of the predominant *M. irbyana* canopy were recorded within both patches using an Opti-Logic Laser Rangefinder. The average tree heights for the Patches A and B were respectively recorded as 10.7m and 8.3m. Due to the relatively isolated nature of the patches, it was not possible to determine whether these tree heights approximated 70% of the undisturbed height of a reference *M. irbyana* community. In the absence of a reference site, the *Flora of South-eastern Queensland – Volume 2* was consulted to determine an approximate height of an adult *M. irbyana*. This resource describes *M. irbyana* as a “Shrub or small tree up to 8m tall”. As such, trees within the two patches average more than 70% of an indicative height for this species.

It is also noted that the methodology that the Queensland EPA employ to survey and map REs states the following.

For other urban or industrial areas, offshore islands, and coastal areas [which includes South East Queensland], the mapping aims for a scale larger than 1:100 000. These areas generally have better information (such as detailed local government mapping) and more vegetation landscape diversity, and development is usually at a finer scale. Map amendments over specific areas or updates of regional scale mapping may be delineated down to the size of 1 ha and/or 35 m in width.

In this regard, it is relevant to note that the Patches A and B respectively encompass areas of approximately 0.5ha and 0.1ha and, at their widest, are respectively 91m and 39m wide.

Given the above, the two patches of *M. irbyana* possess characteristics which could result in them being considered as analogous to remnant vegetation (and more specifically RE 12.9-10.11). However, it is relevant to note that in order for these patches to actually constitute remnant vegetation (pursuant to the definition of remnant vegetation provided within the *VM Act*) and for the removal of the patches to be constrained by the provisions of the *VM Act*, the Certified RE Map would need to be amended by the EPA such that the patches were shown as remnant vegetation.

As such, the clearance of vegetation associated with the patches of *M. irbyana* would not, at present, be constrained by the provisions of the *VM Act*.

It is relevant to note that the clearance of vegetation associated with these patches would be subject to constraints derived from the application of the Commonwealth *EPBC Act*.

- d. It is relevant to note that *M. irbyana* is listed as a *Rare* flora species pursuant to the *Nature Conservation Act 1992* (“*NC Act*”).

² Neldner, V.J., Wilson, B. A., Thompson, E.J. and Dillewaard, H.A. (2005) *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland*. Version 3.1. Updated September 2005. Queensland Herbarium, Environmental Protection Agency, Brisbane. 128 pp.

Specific constraints to the development or use of the section of the site that supports the *M. irbyana* patches, which are associated with the NC Act and the associated *Nature Conservation (Wildlife) Regulation 2006*, include a requirement that such development or use be consistent with the Declared Management Intent for Rare wildlife species.

Relevant aspects of the *Nature Conservation (Wildlife) Regulation 2006* Declared Management Intents for Rare wildlife species are listed as follows.

- (a) *To establish and maintain a database of information about the wildlife and its habitat.*
- (b) *To monitor and review information about the requirements for the conservation of the wildlife and its habitat.*
- (c) *To cooperate with the Commonwealth and other State agencies—*
 - (i) *for the ongoing protection and management of the wildlife and its habitat; and*
 - (ii) *to work towards a national conservation status for the wildlife and its habitat.*
- (d) *To regularly monitor and review the conservation status of the wildlife and its habitat.*
- (e) *To encourage scientific research likely to contribute to an understanding of the wildlife or its habitat including, for example, the requirements for conserving the wildlife or habitat.*
- (f) *If a threatening process is affecting the wildlife to the extent that it will, or is likely to, become classified as extinct in the wild wildlife—to manage the wildlife as if it were extinct in the wild wildlife until the wildlife is re-classified, under this regulation, as a class other than rare wildlife.*
- (g) *If a threatening process is affecting the wildlife to the extent that it will, or is likely to, become classified as endangered wildlife—to manage the wildlife as if it were endangered wildlife until the wildlife is re-classified, under this regulation, as a class other than rare wildlife.*
- (h) *If a threatening process is affecting the wildlife to the extent that it will, or is likely to, become classified as vulnerable wildlife—to manage the wildlife as if it were vulnerable wildlife until the wildlife is re-classified, under this regulation, as a class other than rare wildlife.*
- (i) *To protect the critical habitat, or the areas of major interest, for the wildlife.*
- (j) *To monitor and review environmental impact procedures to ensure they—*
 - (i) *accurately assess the extent of the impact, on the wildlife, of the activities to which the procedures relate; and*
 - (ii) *provide for effective measures to mitigate any adverse impact of the activities on the wildlife; and*
 - (iii) *if there is an adverse impact of the activities on an area in which the wildlife normally lives, provide for the enhancement of other areas where the wildlife normally lives.*

Status of Natural Solutions' Communities 7 and 8

With respect to the vegetation community mapping produced by Natural Solutions, the following is noted.

- a. In order for a mapped RE on the Certified RE Map to be altered from RE 12.9-10.2 to RE 12.5.2, it must be reasonably demonstrated that the relevant remnant vegetation occurs on Land Zone 5 as opposed to Land Zone 9-10. In this regard, it is relevant to note that Natural Solutions do not provide any data or evidence to support their claim that the geology underlying Communities 7 and 8 (illustrated on Figure 5 – Vegetation Communities) is analogous to Land Zone 5, except to state the following.

Site investigations identified that in fact Landzone 5 (5 – Plains and plateaus on Tertiary land surfaces, generally with medium to coarse textured soils) occupies the majority of the

site...with Landzone 9-10 only occurring within a small part in the western area of the site. Also as per the certified mapping the areas along the creek is still considered Landzone 3 (Alluvial plains); however an additional area of Landzone 3 was identified within a small part of the southern portion of the site.

- b. Current geological vector data³ identifies the section of the site which supports Community 7 as occurring partly on "Clay silt sand, gravel, floodplain alluvium" (i.e. Land Zone 3) and partly on "Quartzose sandstone, siltstone, shale conglomerate, coal" (i.e. Land Zone 9-10) and identifies the section of the site which supports Community 8 as occurring on "Quartzose sandstone, siltstone, shale conglomerate, coal" (i.e. Land Zone 9-10). Plan A, presented herewith, illustrates the current distribution of remnant vegetation within the site and overlaid with the current geological vector data for the site.
- c. Preliminary geotechnical investigations have been completed for the site by Douglas Partners. The results of these investigations were reviewed as part of the preliminary survey. None of the bore holes tested by Douglas Partners occurred within either Community 7 or 8. All bore holes were located to the north-west of Community 8, with the closest (i.e. Bore Hole 14) located approximately 125m north of Community 8. The draft test bore report for Bore Hole 14 indicated silty sand to a depth of 0.6m, over clayey silty sand to a depth of 1.5m, overtopping sandstone (described as "extremely low strength, extremely weathered orange-brown fine to medium sandstone"). It is relevant to note that the condition of the "weathering" was reduced to "highly weathered" at a depth of 8.5m and "moderately weathered" at a depth of 9.44m.

Land Zone 5 is defined⁴ as follows.

Central concept *plains and plateaus on Tertiary land surfaces, generally with medium- to coarse-textured soils*

Lay terminology *old loamy and sandy plains*

Extensive, uniform near level or gently undulating Cainozoic plains with sandy or loamy soils. Includes dissected remnants of these surfaces. Also includes plains with sandy or loamy soils of uncertain origin, and plateau remnants with moderate to deep soils usually overlying duricrust. Excludes Quaternary alluvial deposits (land zone 3), exposed duricrust (land zone 7), and soils derived from underlying bedrock (land zones 8 to 12). Soils are usually Tenosols and Kandosols, also minor deep sandy surfaced Sodosols and Chromosols. There may be a duricrust at depth.

With respect to the above, it is relevant to note that "duricrust" is defined⁵ as "a hard mineral – cemented crust occurring in weathered material or the soil zone, commonly composed of alcrete, calcrete, dolocrete, ferricrete, gypcrete, salcrete or silcrete. Formed by the mobilization and deposition of chemicals during deep weathering".

Land Zone 9 is defined as follows.

Central concept *gently undulating landscapes on more or less horizontally bedded fine-grained sedimentary rocks*

Lay terminology *undulating country on fine-grained sedimentary rocks*

Fine-grained sedimentary rocks, generally with little or no deformation, forming undulating landscapes with a broad range of fine-textured soils of moderate to high fertility. Siltstones,

³ Department of Natural Resources and Mines (2004) *Geological Survey of Queensland. Queensland Geological Mapping Data Regional & 1:100 000 Sheet Areas – July 2004. Geoscience Data*

⁴ Neldner, V.J., Wilson, B. A., Thompson, E.J. and Dillewaard, H.A. (2005) *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland*. Version 3.1. Updated September 2005. Queensland Herbarium, Environmental Protection Agency, Brisbane. 128 pp.

⁵ Kearey, P. (2001) *Dictionary of Geology 2nd Edition*. Penguin Books, Camberwell, Victoria.

mudstones, shales, calcareous sediments, and lithic and labile sandstones are typical rock types although minor interbedded volcanics may occur. Excludes areas of duricrust (land zone 7). Includes a diverse range of soils of moderate to high fertility, predominantly Vertosols, Sodosols and Chromosols.

Land Zone 10 is defined as follows.

Central concept *plateaus, scarps and ledges with shallow soils on more or less horizontally bedded medium- to coarse-grained sedimentary rocks*

Lay terminology *sandstone ranges*

Medium- to coarse-grained sedimentary rocks, with little or no deformation, forming plateaus, ledges and scarps. Includes siliceous sandstones, conglomerates and minor interbedded volcanics, and springs associated with these rocks. Excludes overlying Cainozoic sand deposits (land zone 5). Soils are predominantly shallow Rudosols and Tenosols of low fertility, but include sandy-surfaced Kandosols, Kurosols, Sodosols and Chromosols.

Despite Douglas Partners' reference to the "weathered" nature of the underlying sandstone, it is unclear from these draft results whether the soils described for Bore Hole 14 are representative of Land Zone 5 or Land Zone 9-10, particularly given the fact that no mention is made of duricrust in the draft test bore report.

Observations made during the field survey revealed that the land form in both Communities 7 and 8 is an undulating plain.

- d. The results of the preliminary vegetation survey generally concurred with the brief vegetation description provided for Communities 7 and 8 by Natural Solutions with the exception that Cardno (Qld) Pty Ltd identified an additional co-dominant canopy tree species, namely Brown bloodwood (*Corymbia trachyphloia*) and a suppressed canopy tree species, namely Narrow leaved red ironbark (*E. crebra*), within these communities. It is relevant to note that some sections of these communities have been recently subject to selective logging practices.

Confirmation is required from an appropriately qualified geotechnical consultant, as to whether the geology underlying Communities 7 and 8 is analogous to either Land Zone 5 or Land Zone 9-10. Based on the available geological information (i.e. the current geological vector data), and in the absence of geotechnical investigations which suggest otherwise, it would be more appropriate for the remnant vegetation within Community 7 to be considered as being analogous to RE 12.3.3 (where the geology mapping indicates alluvial soils) and RE 12.9-10.2 (where the geology mapping indicates sandstone) and for remnant vegetation within Community 8 to be considered as being analogous to RE 12.9-10.2. RE 12.3.3 is briefly described as "*Eucalyptus tereticornis* woodland to open forest on alluvial plains" and has an *Endangered* status pursuant to the *VM Act*. RE 12.9-10.2 has, as the Certified RE Map for the site indicates, a *Not of Concern* status pursuant to the *VM Act*.

Status of Remnant Vegetation in Site's Watercourse

During the preliminary survey, a 200m section of the site's central watercourse, adjacent to the southern boundary of Natural Solutions' Community 7, was traversed and descriptions of the vegetation recorded. Vegetation within the watercourse was characterised by a canopy consisting of *Eucalyptus tereticornis*, *Corymbia citriodora*, *Melaleuca quinquenervia* and *C. trachyphloia*, and an understorey dominated by *Lantana camara*, *Alphitonia excelsa* and acacia and eucalypt regrowth.

The Certified RE Map and Natural Solutions identify the watercourse as supporting RE 12.3.7, which is briefly described as "*Eucalyptus tereticornis*, *Callistemon viminalis*, *Casuarina cunninghamiana* fringing forest" and which has a *Not of Concern* status pursuant to the *VM Act*. It is relevant to note that neither *Callistemon viminalis* nor *Casuarina cunninghamiana* (with the exception of a single tree approximately 12m in height) were observed along the 200m transect. It is relevant to note that these two species must be present for the vegetation to be considered as being analogous to RE 12.3.7.

In this regard, it should be noted that the possibility exists that the watercourse has been incorrectly identified on the Certified RE Map and by Natural Solutions, and in fact supports the *Endangered* RE 12.3.3, which is briefly described as “*Eucalyptus tereticornis* woodland to open forest on alluvial plains”.

It is recommended that further detailed surveys be completed within the watercourse, in accordance with the remnant vegetation mapping methodology prescribed by the EPA, to accurately determine the appropriate RE for remnant vegetation within the watercourse.

Recent Logging Activity Within the Site

During the preliminary site survey, it was apparent that remnant vegetation, including that considered to constitute remnant *Endangered* vegetation by Natural Solutions, has been recently cleared as a consequence of selective logging activities. The clearance included the clearance of trees within the Ecologically Dominant Layer (“EDL”) and extends into the watercourse that flows through the central parts of the site.

It is relevant to note that, pursuant to Schedule 8, Table 4, Item 1A(b) of the *Integrated Planning Act 1997*, native remnant vegetation on freehold land can be cleared without obtaining approval under the *VM Act* provided that it is for a forest practice, other than on Indigenous land on which the State owns the trees. In this regard, a forest practice means:

- ...planting trees, or managing, felling and removing standing trees, on freehold land or Indigenous land, for an ongoing forestry business in a—*
- (a) plantation; or*
 - (b) native forest if, in the native forest—*
 - (i) all the activities are conducted in a way that is consistent with a code applying to a native forest practice; or*
 - (ii) if there is no code, all the activities are conducted in a way that—*
 - (A) ensures restoration of a similar type, and to the extent of the removed trees; and*
 - (B) ensures trees are only felled for the purpose of being sawn into timber or processed into another value added product (other than woodchips for an export market); and*
 - (C) does not cause land degradation.*

The term includes carrying out limited associated work including, for example, drainage, construction and maintenance of roads and vehicular tracks, and other necessary engineering works.

The term does not include clearing vegetation for the initial establishment of a plantation.

Selective logging activities undertaken within those sections of the site that support remnant vegetation must have been either:

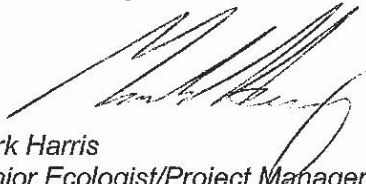
- compliant with the definition of forestry activities provided above; or
- the subject of an approval issued under the *VM Act*.

If the recently completed selective logging activities do not comply with the above definition, in the absence of a relevant approval to conduct such activities, it is likely that the current landholders have illegally cleared remnant vegetation within the site.

It is recommended that Project Services contact the current landholders and confirm the above, in order to avoid any chance of the State acquiring the land and thus being associated with illegal clearance of remnant vegetation.

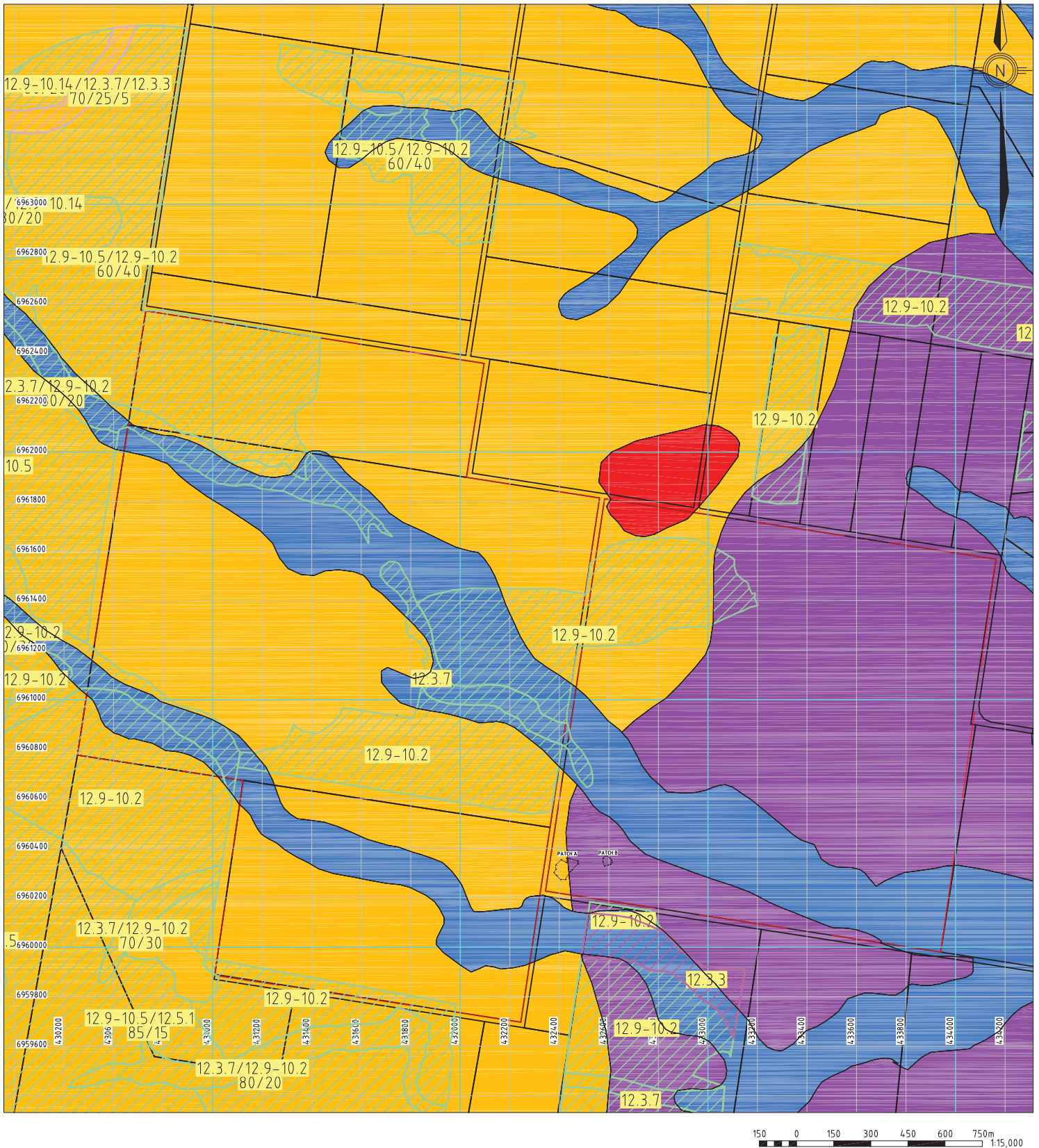
Please do not hesitate to contact the undersigned if you have any queries in relation to the above.

Yours faithfully



Mark Harris
Senior Ecologist/Project Manager - Ecology
for **Cardno**

Enc: Plan A - Extract of Certified RE Map Overlaid with Geological Vector Data



Map disclaimer: 2003 Regional Ecosystem Map, Date: August 2007. Regional ecosystem linework reproduced at scale greater than 1:100,000, except in designated areas, should be used as a guide only. The positional accuracy of RE data mapped at a scale of 1:100,000 is +/-10 metres. Regional ecosystem mapping reproduced with permission of Environmental Protection Agency 2007. While every care is taken to ensure the accuracy of the Information Product, the Environmental Protection Agency makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you might incur as a result of the product being inaccurate or incomplete in any way and for any reason.

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LEGEND	
	Site Boundary
REGIONAL ECOSYSTEMS	
	Dominant Endangered
	Sub-Dominant Endangered
	Not of Concern

UNDERLYING GEOLOGY	
	Clay, silt, sand, gravel: flood plain alluvium
	Lithic labile and feldspathic labile sandstone
	Quartzose sandstone, siltstone, shale conglomerate, coal
	Duricrusted old land surface: ferricrete, silcrete and indurated palaeosols at the top of a deep weathering profile on Woogaroo Subgroup

Scale 1:15,000 (A3)

EXTRACT FROM CERTIFIED RE MAP OVERLAID WITH GEOLOGICAL VECTOR DATA

PLAN A

Rev: Orig. Date: 17 August 2007

Department of Public Works

CAD FILE #: A10225; Acad. Communication: Plan A - Extract from certified RE Map overlaid with geology.dwg

XREF's: Base; redata 8.08.07

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