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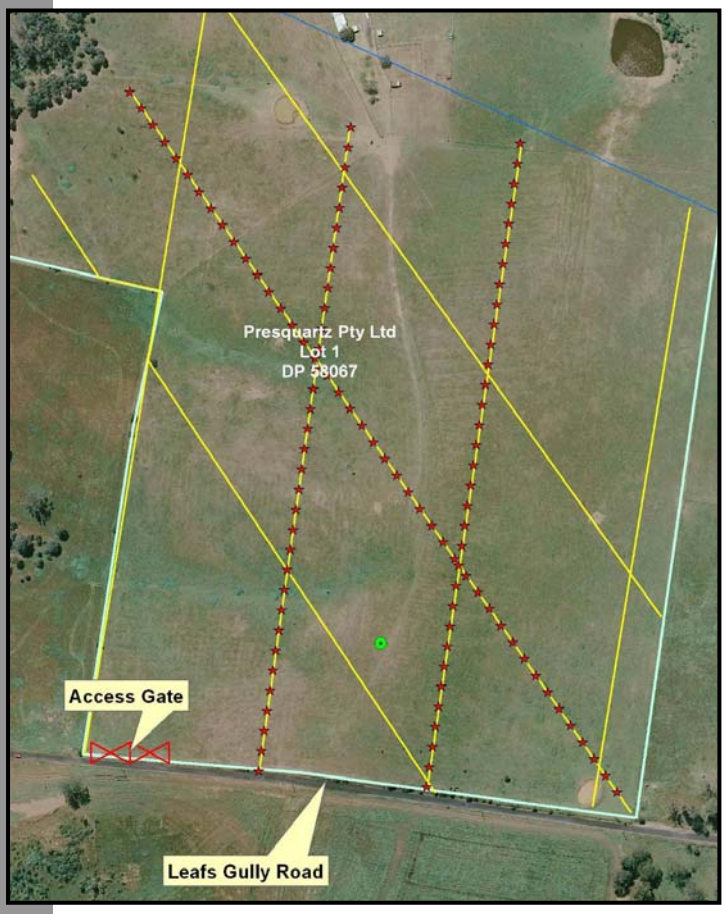

REVIEW OF ENVIRONMENTAL FACTORS

BHP Billiton – Illawarra Coal

Surface Exploration – Seismic Survey – Presquartz Property, Appin

May 2008

Natural & Cultural Heritage Consultants 8 Tate St Wollongong 2500

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Report for:

BHP Billiton Illawarra Coal and the NSW Department of Primary Industries

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Surface Exploration – Seismic Survey – Presquartz Property, Appin

May 2008

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- Chris Rudens (Department of Primary Industries)
- Peter Crowe (GIS Operator, Biosis Research)

ABBREVIATIONS

AHC	Australian Heritage Commission
AMG	Australian Map Grid
ANW	Atlas of NSW Wildlife
ATSIC	Aboriginal and Torres Strait Islander Commission
BP	Before Present
CAMBA	China-Australia Migratory Bird Agreement
DEC	Department of Environment and Conservation
DEH	Department of Environment and Heritage
DPI	Department of Primary Industries
EES	Environmental Effects Statement
EIS	Environmental Impact Statement
EP & A Act	*Environmental Planning and Protection Act*
EPBC Act	*Environment Protection and Biodiversity Act*
EVC	Ecological Vegetation Classes
GIS	Geographic Information System
ICO	Interim Conservation Order
ICOMOS	International Council on Monuments and Sites
IGAE	Intergovernmental Agreement on the Environment
IUCN	International Union for the Conservation of Nature
JAMBA	Japan-Australia Migratory Bird Agreement
LEP	Local Environmental Plan
LGA	Local Government Authority
NPWS	National Parks and Wildlife Service (now part of DEC)
REP	Regional Environmental Plan
RNE	Register of the National Estate
SIS	Species Impact Statement
Spp.	Species
TSC Act	*Threatened Species Conservation Act*

CONTENTS

APPENDIX

FIGURES

TABLES

1.0 SUMMARY

This Review of Environmental Factors (REF) relates to a proposal to conduct a small seismic survey on a property to the north of Appin, NSW associated with BHP Billiton Illawarra Coal's, West Cliff Colliery. The purpose of these investigations is to obtain further information on underground geological features to aid mine planning.

This report is a desktop assessment that:

1. Identifies the precise survey location.
2. Details the site conditions and development constraints.
3. Describes site specific management practices that will be employed for the site.

1.1 Conclusion and Declaration

The proposed exploration program is necessary to achieve accurate and safe mine planning.

BHP Billiton Illawarra Coal is committed to the long term viability of the areas within in which it operates. BHP Billiton Illawarra Coal will utilise all means to minimise the disturbance footprint of the exploration activities and to rehabilitate those areas that may be affected by the proposal to pre-disturbance condition.

On the basis of the information presented in this REF, it is concluded that it is unlikely the proposed works will result in any significant environmental impacts, provided all the environmental safeguards identified in this REF's are adhered to.

Peter Riley

Operations Manager – Exploration

BHP Billiton - Illawarra Coal

2.0 INTRODUCTION

BHP Billiton Illawarra Coal (BHPBIC) intends to undertake surface exploration activities within a single property within their mining lease area associated with West Cliff Colliery (Figure 1). The program will consist of seismic surveys only. A single borehole location has previously been assessed for development on the property and was subject to approval in 2006 by the Department of Primary Industries (DPI) through the REF process (see Exploration Program, Review of Environmental Factors, Douglas Area 7 Borehole Survey Program, Resource and Exploration, BHP Billiton Illawarra Coal). The borehole will be completed concurrent with the proposed seismic survey.

The purpose of the proposed exploration activities is to define underground geological conditions to aid with future mine planning.

The Department of Primary Industries (DPI) has advised BHPBIC that the minister for Primary Industries is the determining authority with respect to exploration activities of this nature and will assess the application to undertake the current proposal within the context of a Review of Environmental Factors (REF). The Guidelines for Review of Environmental Factors (DPI 2006) has formed the basis of the current assessment.

2.1 Locality

The proposed seismic survey program will be restricted in this instance to a single property on Leafs Gully Road, approximately 5 km to the north of Appin, NSW (Figure 1). Figure 2 shows the extent of the proposed activities within a single privately owned property. Previous land management practices within the region, and specifically at this site have included vegetation clearing and other agricultural pursuits which has lead to the subsequent loss of ecosystem resilience on most of the flat and undulating land.

The proposed exploration activities are not within:

- An area reserved or dedicated under the National Parks and Wildlife Act 1974;
- Land reserved or dedicated with the meaning of the Crown Lands Act 1989 for preservation or other environmental protection purposes;
- A World Heritage Area;
- Environmental Protection Zones within environmental planning instruments;
- Lands protected under SEPP 14 – Coastal Wetlands;
- Lands protected under SEPP 26 – Littoral Rainforest;
- Land identified as wilderness under the Wilderness Act 1987 or declared as wilderness under the National Parks and wildlife Act 1974;

- Aquatic Reserves dedicated under the Fisheries Management Act 1994;
- Wetland Areas dedicated under the Fisheries Management Act 1974;
- Land identified as State Forest under the Forestry Act 1916;
- Western Lands Release; or
- Crown Land.

2.2 Description of the Activity

2.2.1 Overview of Proposed Activity

The proposal involves the development of a 3D Seismic Survey program. The 3D Seismic program will involve drilling shallow shot holes within the cleared paddocks (indicated as yellow lines showing shot hole locations as red stars in Figure 2) and placing geophones non invasive recording instruments on the ground surface throughout the property (indicated as yellow lines in Figure 2).

Access to the property will be through gates installed on the boundary fence line by BHPB Billiton Illawarra Coal.

Equipment that will be used on site includes a compressed air drill rig and associated equipment (drilling rods, core boxes, generators, fencing and fuel tanks). Three main stages have been identified for this proposal. These stages are Site Preparation, Drilling Execution and Site Rehabilitation. A discussion of each of these stages is provided below. A discussion of the location, access issues, constraints and management activities to be employed at each site is provided in Table 1 below.

Stage 1: Site Preparation – Set Up

The seismic survey program will involve minimal disturbance to the lands surface. No vegetation clearing will be required. The process is described below:

1. Surveying and the installation of survey pegs at 10 to 20 metre intervals.

2. Shot holes of nominally 89 mm diameter and 14 m depth at an average 20 m spacing and placing recording devices (geophones) on the surface along lines. It should be noted the placement of geophones on the surface is a non invasive exercise. It simply requires personnel to walk along the proposed survey line and place a geophone unit (approximate size of a small lunch box) on the soil surface. Drilling should be completed within 3 days.

3. Placing a small charge at the bottom of each hole and filling the hole to the surface with a stone aggregate and the recording of seismic data using the geophones.

4. Removing the pegs and all other equipment and rehabilitating the area as required.

There will be no site preparation required for this rig in terms of levelling the site using excavators. The rig would avoid all vegetation and any potential habitat features such as fallen timber or rock outcrops. On a daily basis there will be a need to move personnel and equipment to the drilling sites. Water is not required on site for the purposes of drilling.

Filter cloth will be installed around appropriate areas of the drill sites to prevent any sediment runoff in the event of rain. Further, site fencing will be employed at all sites to prevent unauthorised person access to the site and also to exclude any livestock or native fauna from the site.

It should be noted that Figure 2 identifies two small drainage lines within the paddock that have limited potential to contain items of Archaeological significance. As the site will not be inspected by an Archaeologist or representatives of Aboriginal community to confirm the presence or absence of such items within the drainage lines, a precautionary approach has been adopted which will exclude surface disturbance activities from this area.

Stage 2: Survey Execution

Survey execution has been described above in stage 2 of the site set up. Survey execution simply involves firing the charges placed within the shot holes and allowing sufficient time for the geophones to record the relevant data.

Stage 3: Site Rehabilitation

Rehabilitation of the site aims to return the site to original state. Given the nature of the proposed works and the current state of the site as a cleared paddock, little if any rehabilitation is anticipated. If however rehabilitation is necessary it may involve:

- Restoring any disturbed soils to pre-survey state.
- Revegetation: Note the purpose of the revegetation is simply to facilitate the binding of soils from any disturbed site. The need for such work will be determined in consultation with the landowner. There is no need to re-instate native vegetation as such vegetation is absent from the survey area.

2.2.2 Work Location

As stated above, survey site is located north of Appin, NSW. The land on which the survey will occur is privately owned and located to the north of Leafs Gully Road (Figure 2). Table 1 discussed the site in more detail.

2.2.3 Activity, Duration, Working Times and Personnel

The exploration activity would occur over a period of approximately 1 – 2 weeks from 7.00am to 7.00pm.

Drilling of shot holes is not anticipated to require more than three (3) days.

All disturbed sites would be rehabilitated upon completion.

Personnel on site would be limited to a small drilling and survey team (2-4 people). Additional personnel may be required to assist with site set up and rehabilitation. BHP Billiton management personnel may periodically visit the site to inspect works.

2.2.4 Drilling Methods

Not applicable.

2.3 Justification of the Activity

The proposed exploration program has been designed to assist the definition of underground conditions for mine planning purposes. The site represents an area which has poorly defined underground structural data. The proposed seismic activity will supplement information obtained from the borehole which will be drilled concurrently on the property.

Exploration is an essential precursor for any mining activity as it determines the nature and extent of the resource as well as underground conditions and therefore confirms the viability of future mining operations in the area and facilitates safe mine planning.

2.4 Evaluation of Alternatives

There are no practical alternatives to the proposed exploration program for determining underground conditions at seam level.

Table 1: Site location, access and environmental and cultural heritage constraints for BHPBIC seismic survey site

Seismic Survey Site	Location and Access	Environmental and Cultural Heritage Issues	Controls and Safeguards
Presquartz Property – Leafs Gully Road Appin	***Location*** • The seismic survey is located within a cleared paddock. ***Access*** • Access to this survey site will be via Leafs Gully Road which runs off Appin Road, Appin. • Access to the property will be via gates installed by BHPBIC along the boundary fence as indicated in Figure 2. • Access to this site will not require vegetation clearance or track construction.	***Flora*** • There is no native vegetation at the survey location. No threatened plant species or native vegetation will be impacted by this proposal. ***Fauna*** • There is no important fauna habitat within the survey location. No threatened animal species or fauna habitat will be impacted by this proposal. ***Cultural Heritage*** • There are no cultural heritage sites within the survey location. • There is low potential for artefacts to occur within drainage lines. ***Archaeology*** • There are no archaeological sites recorded at or near this seismic survey location.	***Site Preparation*** • No site preparation is required. ***Environmental Controls*** • Access to the survey site will be via existing roads and tracks only. • Appropriate sediment controls will be placed at and around the survey site. ***Rehabilitation*** • Rehabilitation of the survey area is not anticipated or will be undertaken in consultation with the land owner. • Sterile cover crops may be utilised to provide a vegetated cover to areas of minimal disturbance. ***Rehabilitation*** • Sumps will be filled in with stockpiled soil. • Sterile cover crops may be utilised to restabilise soils.

3.0 PLANNING CONTEXT

BHPBIC is proposing to carry out mining exploration activities including seismic surveys which are a minimal disturbance activity within a cleared paddock. Previously the only approval required for such work was under the Mining Act 1992 via a Ground Disturbance Permit.

Discussion with the Department of Primary Industries (DPI) has identified that a Review of Environmental Factors (REF) under Part 5 of the Environmental Planning & Assessment Act (EP&A) 1979 is now required in addition to permission under the Mining Act 1992. DPI will be the consent authority under Part 5 for BHPBIC's proposed exploration works.

Other legislation, guidance and policies are applicable to BHPBIC's proposed exploration activities based on the nature of the work, environmental factors and geographical location. The relevant regulatory framework is discussed below.

3.1 Federal Legislation

3.1.1 Environmental Protection & Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is environment and heritage legislation which applies across Australia. This Act requires approval from the Department of the Environment, Water, Heritage and the Arts for any action that has, will have, or is likely to have, a significant impact on the seven listed 'controlled matters' of national environmental significance.

These matters are:

1. World Heritage properties
2. National Heritage places
3. Wetlands of international importance
4. Threatened species and ecological communities
5. Migratory species
6. Commonwealth marine or land areas
7. Nuclear actions (including uranium mining).

The location of the survey area is not a World Heritage site, a National Heritage

place, a wetland or a Commonwealth marine or land area.

Section 5.6 of this REF considers potential impacts on habitat for threatened species and ecological communities and confirms that the proposed development will not have any impact on such values. The proposal will not affect migratory species and will be concluded in a short period of time.

BHPBIC's proposed development does not have any relationship to nuclear actions.

As the exploration activity will not have any impact on controlled matters BHPBIC does not believe the proposed development requires referral or assessment in relation to the EPBC Act 1999.

3.2 NSW Legislation

Relevant state planning controls and strategic planning guidance is assessed below.

3.2.1 Environmental Planning & Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) legislates the Town Planning process for consideration of all developments within New South Wales. This Act is administered by the Department of Planning and defines the relevant consent authority for proposed developments.

The EP&A Act defines numerous objectives. The objectives relevant to the proposed seismic survey are to encourage:

- The proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment
- The protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats
- The sharing of the responsibility for environmental planning between the different levels of government in the State.

The proposed seismic surveys will permit BHPBIC to define underground conditions and ensure that mining activities are designed appropriately. This preliminary work will ensure BHPBIC's future developments are

properly managed to conserve resources and minimise impacts on communities and the environment.

As detailed above permission for these works are sort under Part 5 of the EP&A Act and DPI are the nominated consent authority under Clause 110A. This demonstrates the sharing of responsibility of environmental planning between different levels of State governance.

Clause 111 of the EP&A Act dictates that the consent authority must take specified matters into account prior to determining an application under Part 5. These matters and BHPBIC's compliance are assessed in Table 2.

Table 2: Compliance with Clause 111 of the EP&A Act.

Requirement of EP&A Act	BHPBIC Compliance
To the fullest extent possible, all matters affecting or likely to affect the environment due to the proposed activity.	All matters affecting or likely to affect the environment due to the proposed drilling activities have been assessed, no unacceptable impact to the environment has been identified.
Any conservation agreement entered into, or any plan of management under the National Parks and Wildlife Act 1974 applying to any part of the land to which the activity relates.	The land on which the activity is proposed is not subject to an agreement or plan of management under the NP&W Act.
Any joint management agreement entered into under the Threatened Species Conservation Act 1995.	The proposed activity has no impact on any agreement under the TSC Act.
Any biobanking agreement entered into under Part 7A of the Threatened Species Conservation Act 1995 that applies to any part of the land to which the activity relates.	The proposed activity has no impact on biobanking agreements.
The effect of an activity on any wilderness area in the locality in which the activity is intended to be carried on.	The activity does not affect any Wildness area.

Requirement of EP&A Act	BHPBIC Compliance
Critical habitat, threatened species or populations and ecological communities and any other protected fauna or protected native plants within the meaning of the National Parks and Wildlife Act 1974.	A number of threatened species, populations and ecological communities occur or have potential to occur in the region. The proposal will be confined to an area that does not provide habitat for any such values. An assessment of significance under Section 5A of the *Environmental Planning and Assessment* (1979) Act has determined that the proposed activities are unlikely to have a significant impact on any threatened species, population or ecological community (Appendix 1). The activity has no impact on the other listed matters.

This REF demonstrates that the proposed drilling activity is in accordance with Part 5 and particularly Clause 111 of the EP&A Act.

3.2.2 Mining Act 1992

As BHPBIC is a mining company, their activities are regulated by the Mining Act 1992. The Mining Act requires individuals or companies to obtain approval for exploration and leases relating to mining activities. This Act also directs matters which the Minister must take into account prior to granting an authority to carry out mining activities, it also controls exploration and mining activities through consent conditions.

Part 11 of the Mining Act relates to protection of the environment. Clause 238 empowers the Minister or delegated consent authority to include conditions on any exploration or mining authority to ensure the protection of flora, fauna, fish, fisheries, scenic attractions and features of Aboriginal, architectural, archaeological, historical or geological interest.

Clause 239 of the Mining Act permits conditions relating to the rehabilitation of land affected by exploration or mining to be included on any authority.

Approval for the proposed drilling work for exploration purposes is required under the Mining Act in addition to permission required under Part 5 of the EP&A Act. BHPBIC currently holds Exploration Authorisation No.A396 of which the lands that are the subject of this application fall under. The company

will meet the requirements of the Mining Act by complying with all conditions of their exploration authority.

3.2.3 Protection of Environment Operation Act 1997

The *Protection of Environment Operation Act 1997* (POEO Act) 1997 is a major aspect of the NSW Government's legislation to protect the environment. This Act is administered by the Environmental Protection Authority which is part of the Department of Environment and Climate Change. The POEO Act permits Environmental Protection Licences (EPL) to be granted for air pollution, water pollution, noise pollution and waste management.

In relation to the proposed exploration works an EPL is not required as there will be no pollution which requires control. This is because:

- The only air pollution will be from petrol or diesel engines used to power vehicles or the drilling rig
- The location of work is away from natural water courses and bodies
- The location of work is away from sensitive noise receivers
- Any waste generated will be taken away from site and disposed of in accordance with procedures relating to the type of waste.

3.2.4 National Parks & Wildlife Act 1974

The *National Parks & Wildlife Act* (NP&W Act) 1974 is administered by the National Park and Wildlife Service and manages:

- Conservation of nature
- Conservation of objects, places and features of cultural value
- Public appreciation, understanding and enjoyment of nature and cultural heritage
- Land reserved under this Act.

When determining applications under this Act consideration must be given to the objectives listed above, the public interest and appropriate management of the subject land of the application. This Act stringently controls activities which are carried out in designated Parks, Reserves and Aboriginal areas.

The proposed survey works are in accordance with the NP&W Act where

relevant.

BHPBIC's proposed exploration works will not be within a Park, Reserve or Area designated under Part 4 of the NP&W Act. The location of the seismic survey has been considered by an appropriately qualified ecologist and has been sited to ensure minimal impact on protected flora, fauna or habitats. This will ensure the proposed activities are in compliance with Parts 7, 8, and 8A of the NP&W Act.

The proposed works have been considered by a qualified archaeologist who is experienced in Aboriginal Cultural Heritage work. Appropriate cultural heritage registers have been checked and the general exploration area has not been found to contain places or items of value listed under Part 6 of the NP&W Act.

Due to BHPBIC's works having no impact on matters subject to this Act any further assessment or application is not required under the NP&W Act.

3.2.5 Threatened Species Conservation Act 1995

The *Threatened Species Conservation Act* (TSC Act) protects threatened species, communities and critical habitat in New South Wales. Protection is provided under this act for species, populations and ecological communities which are considered to be endangered, vulnerable or extinct. Any activity which may have an impact on protected animals, plants or locations is rigorously assessed to ensure the justification is strong enough to permit the impact to progress.

Appropriately qualified ecologists have reviewed the proposed exploration activity using high resolution air photos. The area where the seismic survey is proposed is devoid of all native vegetation and important fauna habitat. Further, the seismic survey area does not contain any:

- Endangered species or populations listed in Schedule 1 of the TSC Act
- Critically endangered species or ecological communities listed in Schedule 2 of the TSC Act
- Vulnerable species or ecological communities listed in Schedule 3 of the TSC Act.

BHPBIC has purposefully located the proposed seismic survey such that values under the TSC Act will not be significantly impacted.

Routes which do not impact on any protected flora, fauna or habitat protected by the TSC Act will be identified and used to transport personnel and drilling related equipment to exploration sites. As the proposed activity will not

have any impact on matters relating to the TSC Act a licence under Part 6 is not required.

3.2.6 Native Vegetation Conservation Act 2003

This Act protects trees, plants and understorey growth which are identified as being indigenous to Australia. The main aims of this Act are to manage and improve all native vegetation and protect areas of high quality. The Act specifically controls clearance of native vegetation. Part 2 of this Act defines clearing of native vegetation to include cutting down, felling, thinning, logging or removing.

No native vegetation will be affected by the proposal as the seismic lines will be developed in cleared paddocks. Approval under Part 3 of this Act is not required for the proposed works.

3.2.7 Fisheries Management Act 1994

This Act applies to all waters in NSW, the objectives are to conserve, develop and share the fishery resources of the State for the benefit of present and future generations. In particular the Act seeks to protect fish stocks, habitat and threatened communities whilst permitting fishing activities and promoting ecologically sustainable development and conservation of biodiversity. Only the following sections of this Act have any relation to the proposed exploration activities:

- Part 7A - legislates the protection of fish and marine environments
- Schedule 6 - lists key threatening processes which detrimentally impact fish and aquatic environments.

The seismic survey area is not within, or on the banks of, a water course or have any impact on aquatic life or environments. Additionally, the seismic survey does not constitute a key threatening process. Due to this no further assessment of BHPBIC's exploration works under this Act are required.

3.2.8 Water Management Act 2000

This Act came into force on 8 February 2000. On 4 February 2008 the Rivers and Foreshore Improvement Act 1948 was repealed as the Water Management Act 2000 provides the necessary and up to date controls.

The Water Management Act applies to designated water management areas within NSW. The majority of this Act provides legislation for the conservation of, and regulation of access to, water resources. The Act also promotes the

protection of aquatic environments and adjacent land and encourages ecologically sustainable development.

There are six water management areas in which this Act applies, these are within the regions of:

1. Barwon
2. Central West
3. Hunter
4. Murray Murrumbidgee
5. North Coast
6. South Coast

The closest water management area to the proposed exploration activities is in the South Coast region. Figure 3 depicts the area within the South Coast region in which the Water Management Act is applicable. BHPBIC's proposed activities appear to be just west of the, north-western boundary of this area and as such does not utilise any water resources which are controlled by this Act.

As the proposed exploration activities are not within an area which is controlled by the Water Management Act 2000 no further assessment is required.

3.3 State Environmental Planning Policies

3.3.1 State Environmental Planning Policy (Mining, Petroleum, Production & Extractive Industries) 2007

This SEPP is in place due to the importance of mining to NSW, it sets out aims and objectives to support the mining industry. The aims of the SEPP are:

a) To provide for the proper management and development of mineral, petroleum and extractive material resources for the purpose of promoting the social and economic welfare of the State

b) To facilitate the orderly and economic use and development of land containing mineral, petroleum and extractive material resources

c) To establish appropriate planning controls to encourage ecologically sustainable development through the environmental assessment, and sustainable management, of development of mineral, petroleum and extractive material resources.

This SEPP also provides conditional approval for certain types of related activities to be undertaken without requiring approval under the EP&A Act.

Guidance is also provided to consent authorities on relevant matters to be considered during the determination of a related application.

The proposed exploration activities are not exempt, complying or prohibited development as defined by this SEPP. This confirms consent is required under the EP&A Act (as detailed above). Clauses relevant to BHPBIC's proposed exploration activity from this SEPP are discussed below and assessment provided to confirm that the proposed development is compliant.

Clause 12 of the Mining, Petroleum and Extractive Industries SEPP details matters which the consent authority must consider prior to issuing a decision regarding an application under the EP&A Act. These matters are listed and considered against the proposed development in Table 3.

Table 3: Consideration of SEPP

Requirements of SEPP	BHPBIC Compliance
Consideration of existing and approved uses of land in the vicinity of the development.	The existing land use is rural open space. The exploration activities will not affect this use or constitute a development which prevents this use from continuation.
Consideration of significant impact on uses that is likely to be the preferred use of land in the vicinity of the development.	The exploration activities will not have a significant impact on the rural use of the land.
Any ways in which the development may be incompatible with any of those existing, approved or likely preferred uses.	The use of the land is rural and no rezoning is known to be proposed. The development will not be incompatible with existing land uses as the specific location for seismic has no significant value to the rural use and the land will be rehabilitated following works.
Evaluate and compare the respective public benefits of the development and the land uses referred to above.	Not applicable as the land use will not alter due to the proposed temporary activity.
Evaluate any measures to avoid or minimise incompatibility between proposed activity and existing use.	The specific survey locations have been selected with care to minimise impacts on the environment. Rural use of the land will be unaffected.

Clause 14 of this SEPP directs consent authorities that the following matters in relation to the protection of the environment must be considered prior to determining a development application under the EP&A Act:

- Impacts on significant water resources, including surface and groundwater resources, are avoided, or are minimised to the greatest extent practicable
- Impacts on threatened species and biodiversity, are avoided, or are minimised to the greatest extent practicable
- Greenhouse gas (GHG) emissions are minimised to the greatest extent practicable
- An assessment of greenhouse gas emissions.

BHPBIC's proposed development will not have any impact on water resources due to the nature of the activity. As detailed above there will be no significant impacts on threatened species or biodiversity.

The only greenhouse gas emissions directly related to the exploration works is from petrol or diesel engines powering vehicles and the drilling rig. It is not possible to avoid the requirement for these engines. To ensure emissions are minimised engines will be turned off when not required. The addition to GHG emissions from the exploration activities in this REF will be an insignificant percent of GHG emissions from NSW mining related activities.

Clause 17 dictates a consent authority must have regard to a potential requirement for the rehabilitation of land following conclusion of mining related activities. BHPBIC will reinstate topsoil in areas where disturbance has occurs prior to leaving site. Due to the minor nature of the works no additional rehabilitation works are required.

BHPBIC believe that this REF demonstrates the proposed exploration activities fully comply with relevant sections of SEPP (Mining, Petroleum and Extractive Industries) 2007. Upon the acceptance of this REF, DPI will have considered matters relevant to allow the application to be determined.

3.4 Regional Environmental plans

There are no Regional Environmental Plans which apply to the type of work proposed by BHPBIC or the location in which the work is proposed.

3.5 Local Planning Controls

3.5.1 Local Environmental Plan and Zoning

The entire exploration works are within Campbelltown City Council's administrative boundaries. The Site is zoned, Zone No.1 – Non-Urban under Interim Development Order No. 15 – City of Campbelltown.

As the proposed exploration activities are required in relation to mining and as the proposal is such a minor development with no significant environmental harm it is likely that the proposal is permissible under this zoning.

NB: the Interim Development Order No. 15 – City of Campbelltown – was not available from either the planning section of the Campbelltown City Council web page or the NSW Legislation online webpage at the date of this report. Any further correspondence received from Campbelltown City Council in relation to this matter will be forwarded to the DPI upon receipt.

3.5.2 Development Control Plans

Campbelltown Council Shire Council only has no Development Control Plan (DCP) which has any association with the proposed development.

3.6 Licenses and Approval Required

Section 3.0 describes the relevant process for the approval of the proposed exploration activities.

Relevant licences that apply to the proposed drilling operation include:

- Exploration Authorisation No.396.

3.7 Stakeholder Consultation

Consultation undertaken during the preparation of this REF involved:

- Discussions with the DPI regarding the level of environmental assessment required for the proposed exploration activities.
- Rulings of the Mine Wardens Court on the 25th of September 2007 granted access to the property for the purposes of undertaking the proposed survey work. Site access was eventually granted by the land holder on the 14th of May 2008. BHPBIC have engaged the landholder in

discussions since that time in order to facilitate access.

No other stakeholder consultation is considered necessary.

4.0 EXISTING ENVIRONMENT

4.1 Landform and Geology

4.1.1 Landforms

The exploration area is located on undulating hills and plains that are incised by tributaries of the Nepean Rivers.

4.1.2 Geology

The soils of the exploration area are derived from the Wianamatta shales. .

4.2 Climate

The climate is warm temperate (warm to hot summers and mild to cool winters).

5.0 ENVIRONMENTAL IMPACTS AND MANAGEMENT

5.1 Air Quality

Vehicle exhaust will be from the drill rig and personnel vehicles. The vehicle exhaust emissions will meet acceptable standards for registered vehicles.

The proposed works will not result in any significant impacts on air quality.

5.2 Green House Gas Emissions

After consultation with DPI, greenhouse gas emissions were assessed by examining the expected diesel consumption while under taking the drilling operation. The following quantities of diesel would be consumed:

- 3days drilling x 80L/day = 240L
- Personnel vehicles – estimate 20L/day x 5 days = 100L
- Site vehicle – estimate 20L/day x 5 days = 100L

Therefore, this results in an estimated total of 440L of diesel utilised for the exploration project.

The total full fuel cycle emissions generated from the consumption of the quoted figure of 440L of diesel are calculated using the Australian Greenhouse Office Factors and Methods Workbook (Dec 2006). Table 1 from this workbook states a energy content (conversion factor) of 38.6GJ/kl of automotive diesel oil. From this, we get 0.44kl * 38.6GJ/kl = 16.89GJ of energy. This table also makes note of Scope 1, Scope 3 and full fuel cycle (FFC) emission factors. The FFC emission factor for diesel is stated as being 77.2 kg CO2-e/GJ. As such, the emissions then can be calculated as: 16.89GJ * 77.2 kg CO2-e/GJ = 1311.16kg CO2-e or 27.713 tonnes CO2-e.

In terms of options for mitigation of these emissions, all diesel equipment utilised is fit for purpose for the task, with the machinery maintained for efficient operation. Given the small quantity of emissions generated, further mitigation efforts are not required.

5.3 Water

The proposed activity does not involve any significant soil excavation or disturbance. Furthermore, measures are proposed that will minimise any

surface soil disturbance. Vehicles will be kept on existing farm roads or within cleared areas.

All vehicles will be parked in a way so as not to damage any vegetation and will not impede the movements of other vehicles along tracks.

Water courses and drains in the vicinity of the sites will remain unaltered and there will be no dirty water runoff generated as a result of the activity during or after the works. Furthermore, appropriate run off control will be placed around any area considered at risk of erosion/disturbance in the event of rain.

There will be no use of chemicals or hazardous materials during the proposed works. The only consumables of concern involve fluids used by the vehicles necessary for the site works, such as diesel, petrol, oil and grease. All of these fluids are contained within the vehicle compartments designed for the purpose and will be inspected to ensure that there are no leaks prior to entry into the area.

As a further precaution bunding with sufficient capacity to completely contain any potential fuel spills will be located on site.

5.3.1 Surface water

The study area is located within the catchment of the Nepean River. None of the activities proposed will impact creeks, drainage lines, rivers or dams. As a further precaution, two minor depressions on the site of the seismic survey will be avoided altogether by the works.

Sufficient water management activities will be in place to ensure that the exploration activities do not interfere with or degrade the surface water of the local area.

5.3.2 Ground water

There will be no impact on local groundwater as shot holes are shallow and will not intercept any potential aquifers.

5.4 Soils

The soils of the exploration area are predominantly shale derived soils overlying sandstone. These soils are generally suitable for grazing and cultivation.

Given the nature of the survey program there is little potential for localised increased erosion and sedimentation.

Appropriate sedimentation and erosion controls will however be employed at any site where soil disturbance is considered likely. Appropriate control measures include:

- Minimal ground disturbance
- Sediment fences to be erected around any area where soils appear to be being impacted and
- If necessary the sites will be rehabilitated immediately after exploration activities have been completed.

5.5 Noise and Vibration

Potential noise and vibrations associated with the proposed activities may derive from development of the shot holes or the almost imperceptible vibrations that arise from the shot firing. These impacts are extremely localised and the implications of these impacts have been fully discussed with residents and landholders who may be affected.

In the event that any complaints are received in respect to noise, consultation and investigation would be undertaken to assess the nature of the concerns and identify options to mitigate the noise.

5.6 Flora and Fauna

The site of the proposed seismic survey was not inspected as aerial photography indicated that the site is completely devoid of all native vegetation and is subject to ongoing agricultural pursuits including grazing and or cropping for fodder production.

Figure 4 shows the vegetation of the area surrounding the survey site and indicates that number of Endangered Ecological Communities occur near to the site. Figure 5 shows the records of threatened plants previously recorded within 10 km of the survey site. Figure 6 shows threatened fauna previously recorded within 10 km of the survey site. The seismic survey area does not retain threatened plant species or habitat important for threatened fauna. Further the site does not contain any Endangered Ecological Communities or Endangered Populations. Therefore, impact assessments for such values have not been prepared.

5.7 Chemical and Hazardous Substance Management

Only limited quantities of hazardous substances will be utilised during the exploration activities. These substances include petrol and diesel fuels. All fuels will be contained.

Survey activities will be subject to a health and safety plan and Material Safety Data Sheets will be available for any potential hazardous materials used.

5.8 Contaminated Land

Past land use at the site of the proposed seismic survey has been confined to agricultural activities. No contaminated lands have been identified within the survey site and given the past land use of the area it is considered highly unlikely that contaminated lands would exits within the vicinity.

Only an unexpected escape of fuels or oils could have potential to cause land contamination. Any such escape would be quickly contained and recovered.

5.9 Waste Minimisation and Management

There will be no vegetation removal for the proposed seismic survey activities. Minimal waste is expected to be produced as a result of the survey program. Any wastes such as paper products, drums etc. if produced would be removed from the work site for proper disposal or recycling.

5.10 Natural Resource Use

Natural resources that will be utilised in the proposed drilling program include petroleum based products such as fuel and mechanical lubricants. The proposal will utilise an insignificant volume of such resources. Supplies of these resources are unlikely to be placed at risk by the proposal.

Fishery, agricultural, forestry and mining resources will not be placed at risk by the proposal.

5.11 Impact on the Community

5.11.1 Traffic

The project will span approximately a one to two week period and will include the arrival and departure of survey contractors and BHPBIC staff to the site each day and the delivery of materials as required. Several heavy vehicles

including the drilling rig, ancillary vehicles and equipment will be delivered to site and removed upon completion of the works. The survey contractor as well as BHPBIC will maintain the vehicles in a roadworthy condition and obtain all necessary approvals and licences for them.

BHPBIC has already installed two gates on the boundary of the survey property to ensure that vehicles, personnel and equipment do not impede access to the property by the landowner.

Leafs Gully Road is a little used rural road that is subject to traffic from local residents only. BHPBIC and its contractors will ensure that all vehicles travelling on this road abide by the road rules and park in such a way so as to ensure safe travel of residents and other road users up and down Leafs Gully Road. Further, given the rural nature of the survey area, traffic activity in the region is generally low. The proposed activities will not add considerably to the traffic of the survey area including Appin Road.

5.11.2 Socio-economic and Community Aspects

Due to the limited nature of the proposal, no significant socio-economic or community impacts would result from the proposal.

Notwithstanding, there would be a positive short term economic effect associated with the short term employment of survey contractors employees associated with the proposal and expenditure for accommodation, food and entertainment in the local area.

A compensation arrangement between BHPBIC has been reached.

5.12 Visual Assessment

Due to the short term nature of the proposal, potential visual impacts due to the operation of drill rigs would be limited. Given the location of the proposed survey and hours of operation, lighting will not be required at the survey site and the works will be undertaken out of view of traffic travelling along the Appin Road.

5.13 Heritage

5.13.1 Aboriginal Heritage

The proposed survey activities have been cited within cleared agricultural lands.

These areas have been extensively disturbed by past and continuing agricultural practices.

Background

The study area is located on Wianamatta shales and Hawkesbury sandstone of the Woronora Plateau. This landscape is predominantly characterised by gently undulating rises that have been cleared and used for agricultural purposes within the region. Hawkesbury sandstone also outcrops horizontally, as isolated blocks and cliff lines with overhang formations along the Bargo River and interlinking tributaries, such as Redbank creek within the study area. Typically along creek gullies and gorges, the land has been undeveloped and vegetation corridors remain. The principle soil type of the study area is the Blacktown Landscape (bt) (Hazelton & Tille 1990).

A number of previous archaeological assessments have taken place within the general area.

A review of the NSW Department of Environment and Climate Change (DECC) AHIMS register identified several previously recorded Aboriginal archaeological sites within 1 km of the study area (Figure 7). None of these sites will be impacted by the proposal.

A search of the following registers identified no historical items listed within the property of the proposed survey location:

- Commonwealth Heritage List
- National Heritage List
- Register of the National State
- NSW State Heritage Register and Inventory
- Campbelltown Council Heritage LEP

The following archaeological predictive model has been formulated based on the results of the location and type of sites that were recorded within the regional area (based on the relevant registry searches) and information obtained from previous archaeological work. This information has been broken down into patterns and compared to the environmental character of the study area to allow for an understanding of archaeological potential.

The following predictive model has been formulated for the study area;

Aboriginal

- Axe grinding grooves will be present where suitable open, fine grained sandstone outcrops occur, close to water sources. No such sites occur within the survey area.

- Stone artefact occurrences can occur anywhere within the landscape, but are more likely to be identified on prominent plateau or ridge lines, or in close proximity to water sources or drainage lines. No artefacts have been recorded on or directly adjacent to the Study Area though a suitably qualified Archaeologist (Mel Thomson, Biosis Research) has identified that limited possibility of the drainage lines of the study area retaining such features. As a precautionary measure and soil disturbance activities will be excluded from these areas as identified in Figure 2;

- Rock shelters with art and / or deposit are likely to be present where suitable sandstone overhangs occur. No such features occur on the survey site;

- Scarred trees are unlikely to occur due to the extensive land clearing for agricultural practices. No trees or dead stags occur on the survey site.

Historical

- Given the lack of early historical use and later development specific to the study area there is a low potential for historical archaeological sites to be present.

5.13.2 Other Cultural Heritage

Given the lack of early historical use and later development specific to the study area there is a low potential for historical archaeological sites to be present.

5.13.3 Stock Injury and Loss

Land use in the survey area includes but is not limited to grazing activities. As such the use of appropriate site fencing will exclude all domestic, agricultural and native fauna from accessing the drill sites and therefore prevent injury to these animals.

Consultation with the landholder how to best minimise disturbance to grazing stock will be undertaken prior to the commencement of any works and will be consultation will continue at regular intervals throughout the survey program as required by the landholder.

5.14 Cumulative Environmental Impacts

Given the land use history of the proposed seismic survey sites, cumulative impacts are not considered to be of consequence for the proposed seismic survey program.

5.15 Summary of Mitigating Measures

Development of the proposed seismic survey program is considered unlikely to have significant environmental impact. However, the proposed activities have the potential to result in extremely minor, short term and localised impacts including noise and sediment and erosion. Mitigation of such minor impacts is simple and has been described in Table 1.

6.0 REHABILITATION WORKS

On completion of the proposed exploration activities, all surface infrastructure and waste (such as litter, used materials and any contaminated soil) would be removed from the site. Where soil disturbance has occurred, the soil would be reinstated (topsoil and subsoil) and the areas re-contoured to its original or near-original landform (see Table 1).

Sediment and erosion control structures are not likely to be required. However, if requested by the landholder or where any risk to soil is considered likely, sediment and erosion control would be left in place until the potential for erosion and sedimentation is sufficiently reduced by site rehabilitation.

In consultation with the landowner, suitable sterile cover crops may be introduced to the survey area in order to facilitate the rapid development of soil binding vegetation (grasses etc) in order to prevent post development soil erosion.

7.0 SUMMARY OF IMPACTS AND CONCLUSIONS

The proposed seismic survey program will involve minor disturbance to areas of cleared grazing lands for a short period of time. The seismic survey will be in as short a time as possible which is likely to be 5-10 days. Following completion, any waste will be disposed of in accordance with regulatory requirements and all disturbance areas would be rehabilitated to the satisfaction of the DPI. The exploration activities will be conducted in accordance with suitable environmental management procedures and take into account the potential impacts associated with the activity. Accordingly, the proposed drilling activities can be undertaken with minimal impact to the environment.

APPENDICES

APPENDIX 1

ASSESSMENT UNDER PART 5A OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT

(a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

There is no native vegetation or important fauna habitats at the site of the proposed works.

The proposed action is **not** likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

There is no native vegetation or important fauna habitats at the site of the proposed works.

The action proposed **not** likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

There is no native vegetation or important fauna habitats at the site of the proposed works.

The proposal **not** likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

There is no native vegetation or important fauna habitats at the site of the proposed works.

The proposal is **not** likely to substantially and adversely modify the composition

of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

(d) In relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which the habitat is likely to be removed or modified as a result of the action proposed, and

There is no native vegetation or important fauna habitats at the site of the proposed works.

An area of habitat is **not** likely to be removed or modified as a result of the action proposed.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

There is no native vegetation or important fauna habitats at the site of the proposed works.

An area of habitat is **not** likely to become fragmented or isolated from other areas of habitat as a result of the proposed action.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.

There is no native vegetation or important fauna habitats at the site of the proposed works. **No** habitat will be removed, modified, fragmented or isolated by the proposal.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

There is no native vegetation or important fauna habitats at the site of the proposed works. The action proposed is **not** likely to have an adverse effect on critical habitat (either directly or indirectly).

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

As the proposal will not impact any threatened species, population or ecological community there are **no** recovery plans or threat abatements plans that require consideration.

(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The proposal will support possible future coal mining in the region. One Key Threatening Process (KTP) has been discussed below:

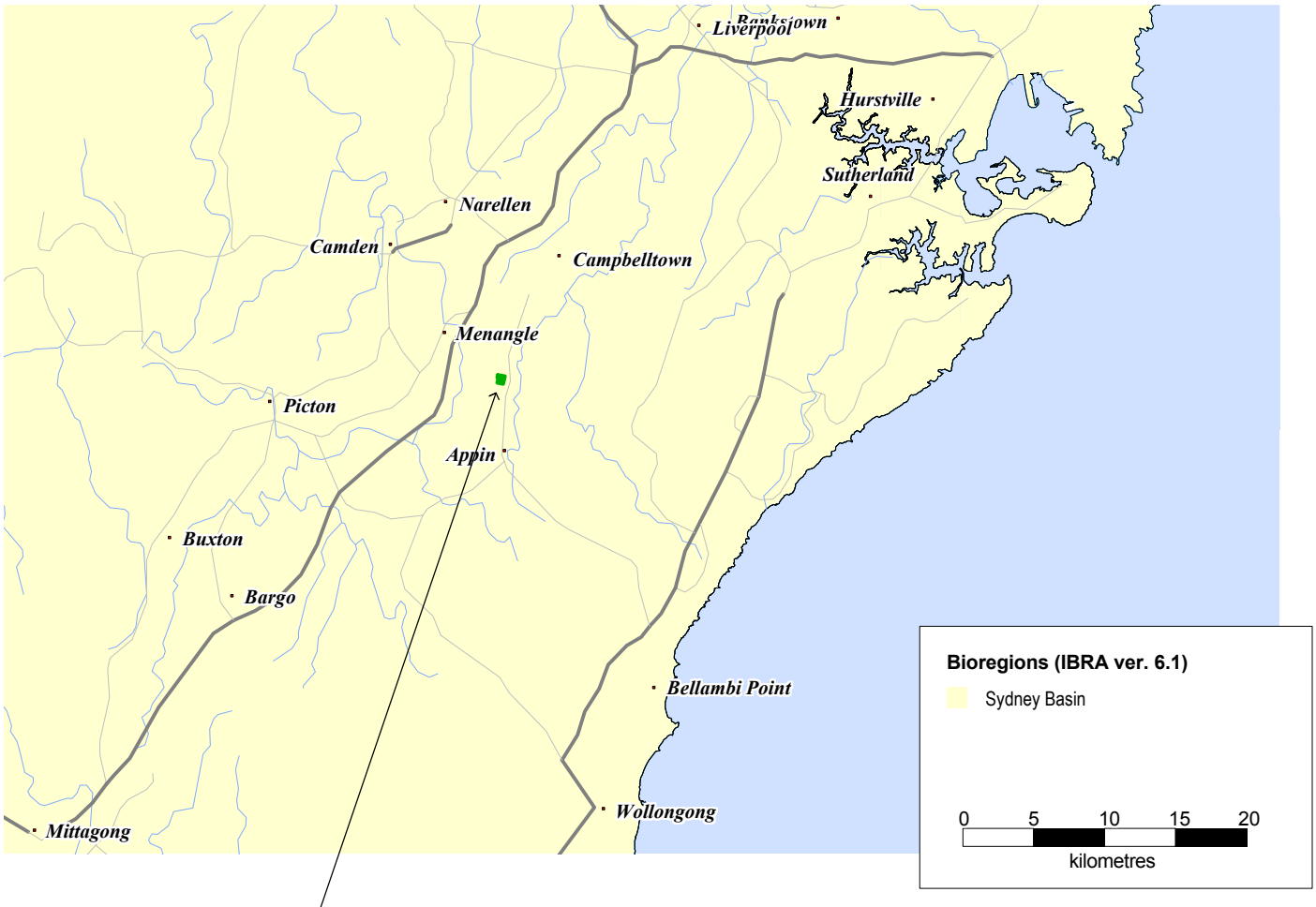
KTP : Alteration of habitat following subsidence due to longwall mining

The Subsidence Management Plan (SMP) process requires detailed consideration of the potential impacts of mining, specifically subsidence related to longwall mining. Any consideration of this KTP can only be undertaken following detailed mine planning and will be considered in the SMP process and assessment. It has not been discussed further here.

Conclusion

The proposed seismic survey program will not have a significant impact on any threatened species, populations or ecological communities listed on the TSC Act.

FIGURES



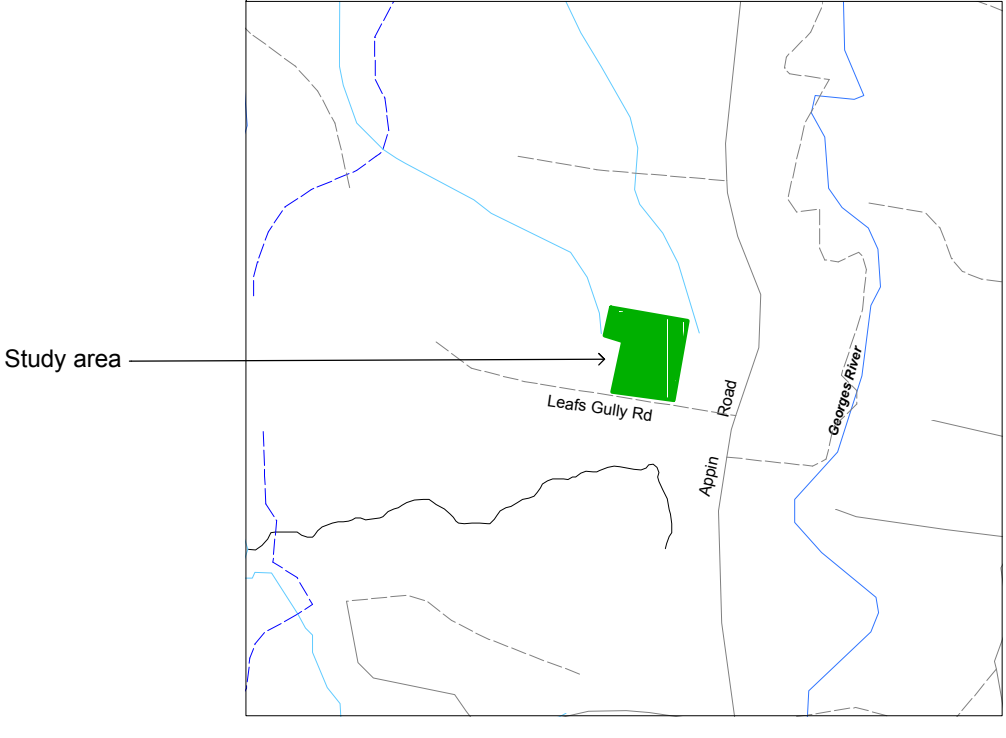


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Figure 1: Location of the Study Area in a regional context.

Location:-...\5093\Mapping\Presquartz_REF_DPI\S5093 Presquartz REF F1 Locality.wor

Date: 30 May 2008

Checked by: MR | File number: S5093

Scale: 0 0.5 1.0 1.5 2.0 kilometres

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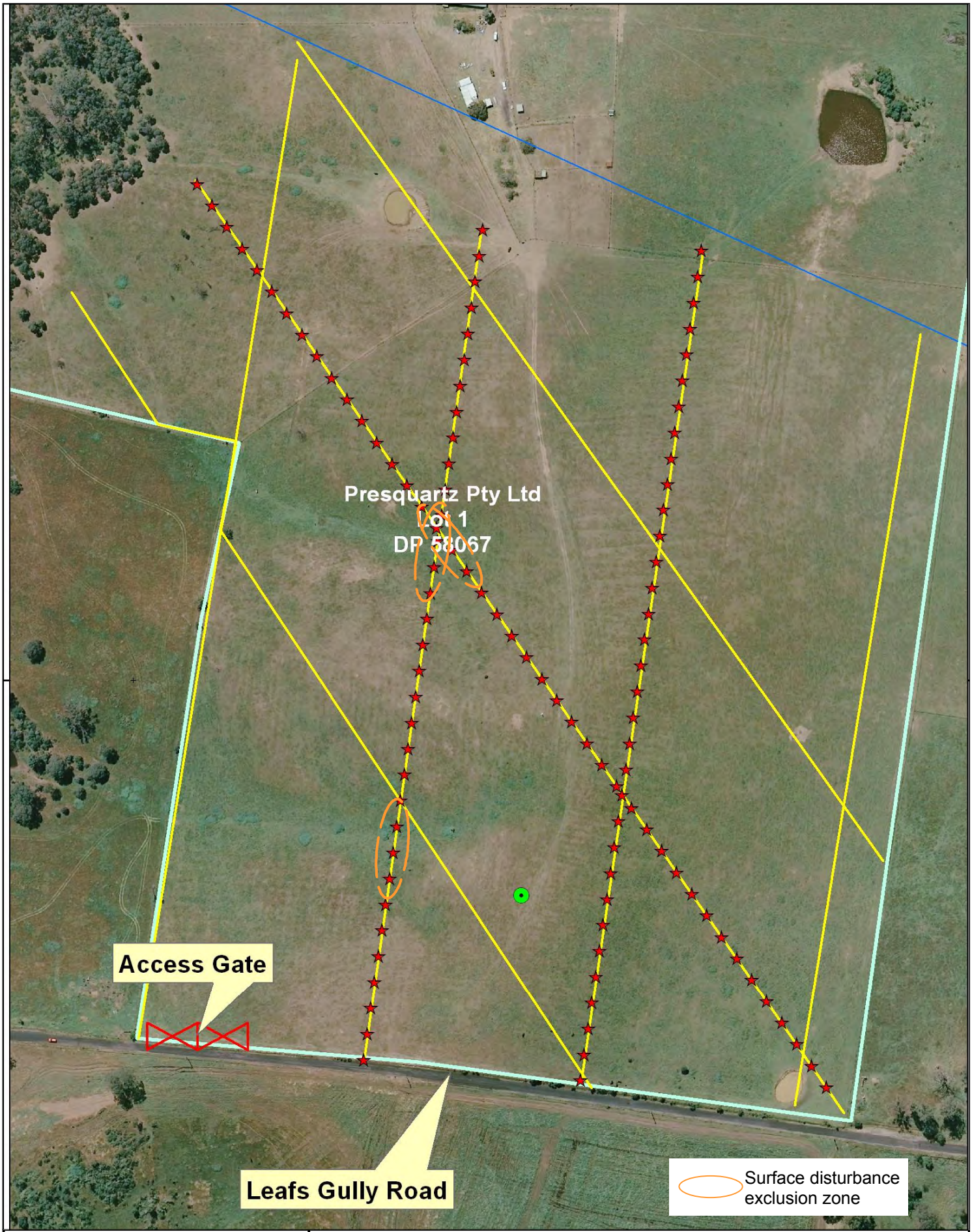

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Figure 2 : Proposed Seismic survey layout

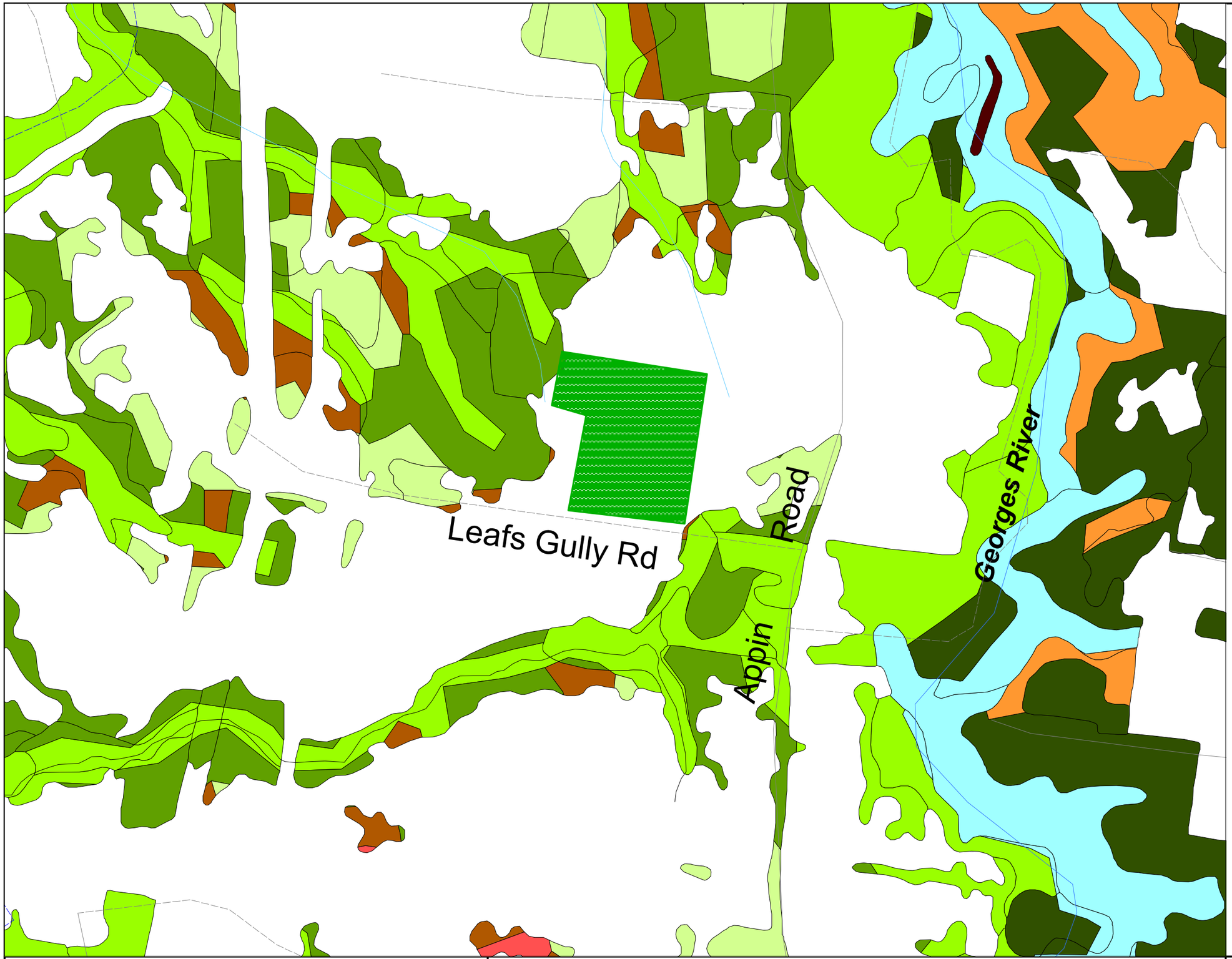
Date: 30 May 2008	Checked by: MR	File number: S5093

Location:\5000\5000s\5093\Mapping\Presquartz_REF_DPI \S5093 Presquartz REF F2 Survey Layout.wor

Scale: 0 30 60 90 120 metres

N W E S

Figure 3: South Coast Region Water Management Act 2000



Key
Vegetation communities

- Alluvial Woodland
- Moist Shale Woodland
- Riparian Forest
- Riparian Scrub
- Riparian Vegetation
- Sandstone Ridgetop Woodland
- Shale Hills Woodland
- Shale Plains Woodland
- Shale Sandstone Transition Forest (High Sandstone Influe
- Shale Sandstone Transition Forest (Low Sandstone Influer
- Upper Georges River Sandstone Woodland
- Western Sandstone Gully Forest

Legend

- Study area
- City/Town
- Locality
- Dual carriageway
- Major road
- Secondary/minor road
- Track
- Railway
- Rail tunnel
- Canal
- River/creek - perennial
- River/creek - ephemeral
- Area subject to inundation
- Lake
- Reservoir
- Saline coastal flat
- Swamp
- Watercourse/Ocean

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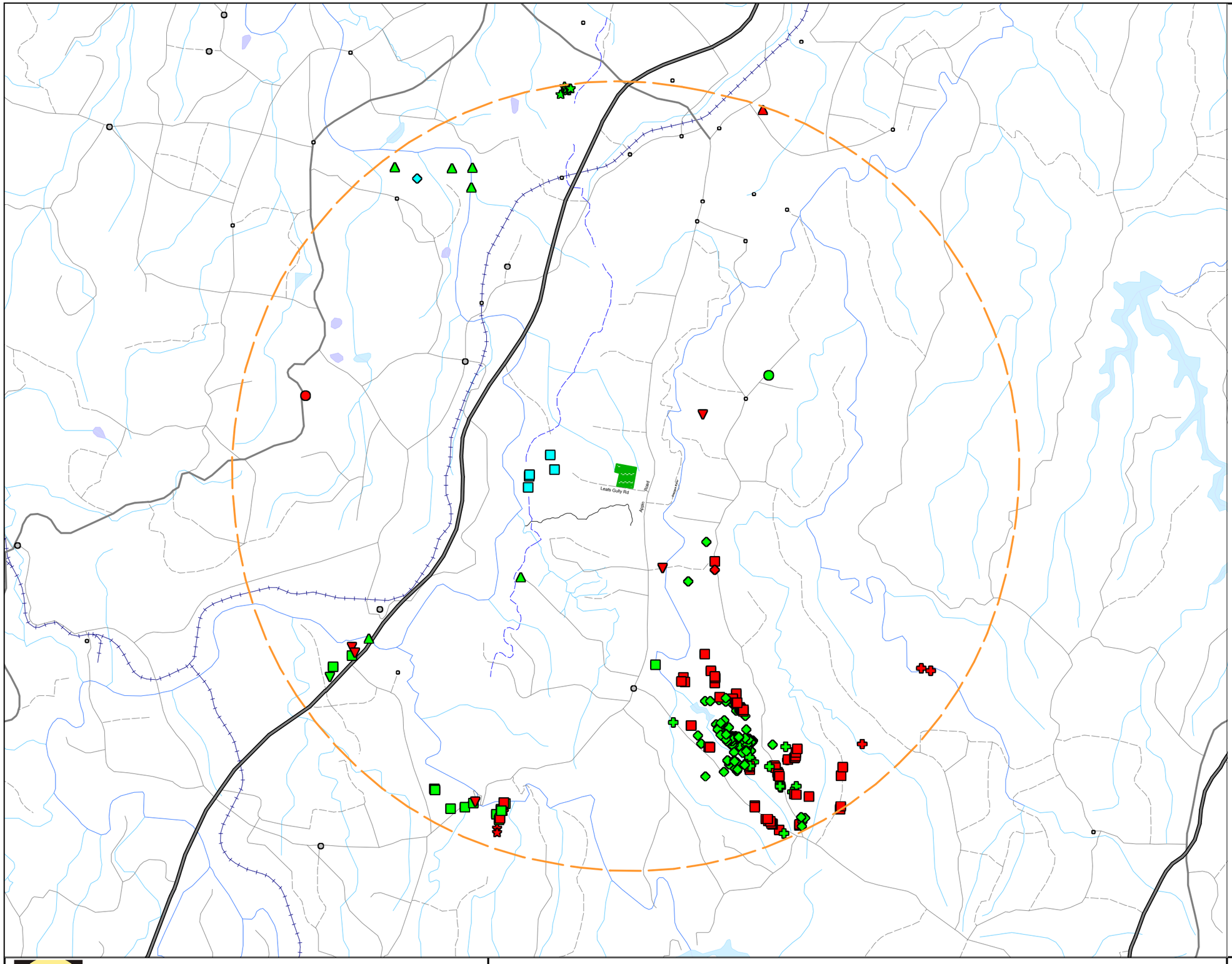
Figure 4 : Vegetation within 10km of the study area

Date: 30 May 2008
Checked by: MR
File number: S5093
Location:-..\5000\5000s\5093\Presquartz_REF_DPI\S5093 Presquartz REF F4 Vegetation Mapping.wor

Scale: 0 1 2 3 4 5 kilometres

N W E S

Figure 4 : Vegetation within 10km of the study area



Key

Threatened Flora

- Acacia bynoeana
- Callistemon linearifolius
- Cynanchum elegans
- Epacris purpurascens var. purpurascens
- Genoplesium baueri
- Grevillea parviflora subsp. parviflora
- Leucopogon exolasius
- Persoonia bargoensis
- Persoonia hirsuta
- Persoonia hirsuta subsp. hirsuta
- Pimelea spicata
- Pomaderris brunnea
- Pterostylis saxicola
- Pultenaea aristata
- Pultenaea pedunculata
- Thesium australe

Legend

- Study area
- 10km radius
- City/Town
- Locality
- Dual carriageway
- Major road
- Secondary/minor road
- Track
- Railway
- Rail tunnel
- Canal
- River/creek - perennial
- River/creek - ephemeral
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Figure 5 : Threatened Flora within 10km of the study area

Date: 30 May 2008

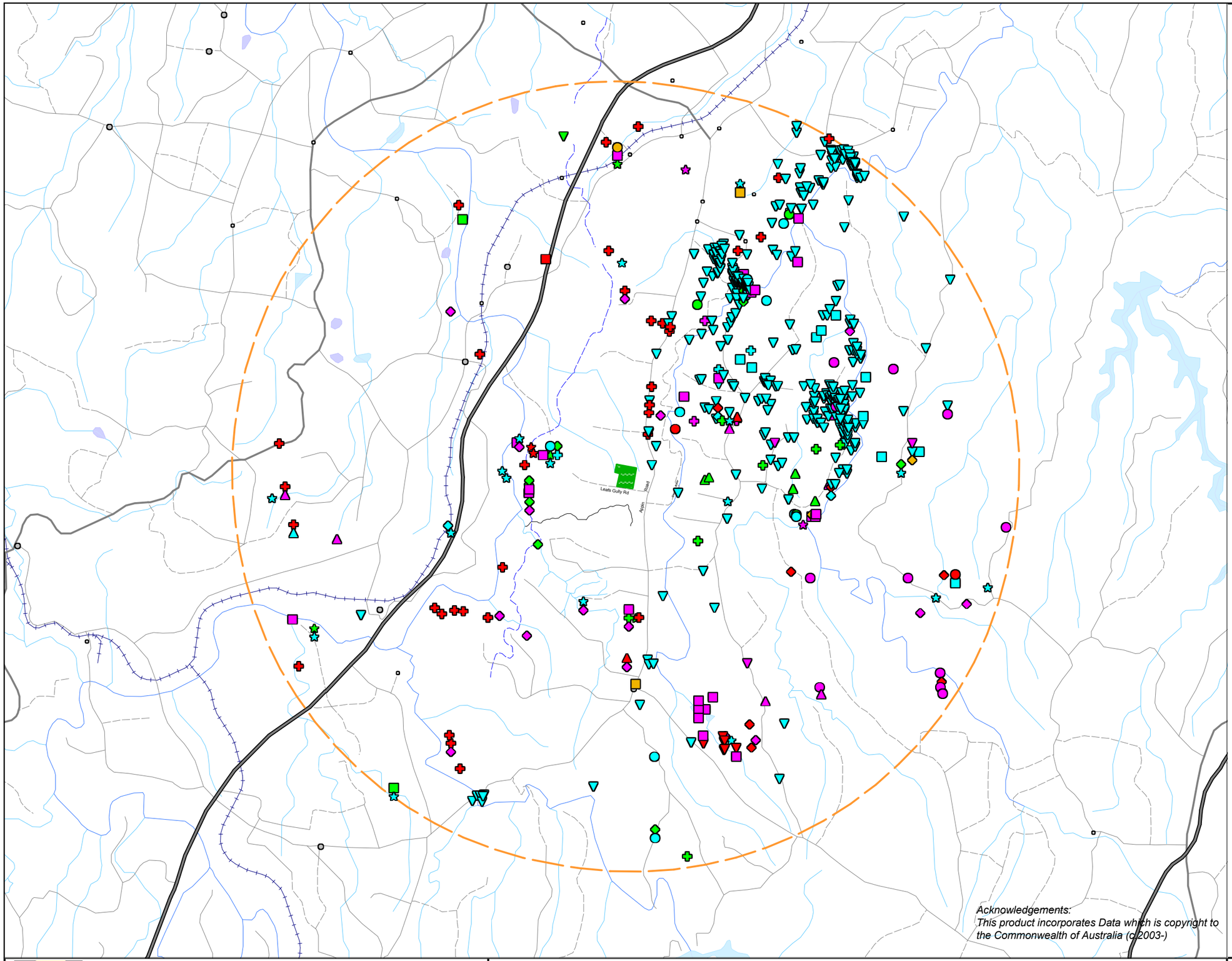
Checked by: MR | File number: S5093

Location:-..\5000\5000s\5093\Mapping\Presquartz_REF_DPI\S5093 Presquartz REF F5 Threatened Flora.wor

Scale: 0 1 2 3 4 5 kilometres

N W E S

Figure 5 : Threatened Flora within 10km of the study area



Key

Threatened Fauna

- Black-necked Stork
- Broad-headed Snake
- Brown Treecreeper
- Brown Treecreeper (eastern subspecies)
- Bush Stone-curlew
- Common Bent-wing Bat
- Cumberland Plain Land Snail
- Diamond Firetail
- Eastern Bentwing-bat
- Eastern False Pipistrelle
- Eastern Freetail-bat
- Eastern Pygmy-possum
- Freckled Duck
- Gang-gang Cockatoo
- Giant Burrowing Frog
- Glossy Black-Cockatoo
- Greater Broad-nosed Bat
- Grey-headed Flying-fox
- Hooded Robin
- Koala
- Large-eared Pied Bat
- Large-footed Myotis
- Powerful Owl
- Red-crowned Toadlet
- Regent Honeyeater
- Rosenberg's Goanna
- Speckled Warbler
- Spotted-tailed Quoll
- Squirrel Glider
- Swift Parrot
- Yellow-bellied Glider
- Yellow-bellied Sheathtail-bat

Legend

- Study area
- 10km radius
- City/Town
- Locality
- Dual carriageway
- Major road
- Secondary/minor road
- Track
- Railway
- Rail tunnel
- Canal
- River/creek - perennial
- River/creek - ephemeral
- Area subject to inundation
- Lake
- Reservoir

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Figure 6 : Threatened Fauna within 10km of the study area

Date: 30 May 2008

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File number: S5093

Location:-..\5000\5000s\5093\Mapping\Presquartz_REF_DPI\S5093 Presquartz REF F6 Threatened Fauna.wor

Scale: 0 1 2 3 4 5 kilometres

N W E S

Figure 6 : Threatened Fauna within 10km of the study area

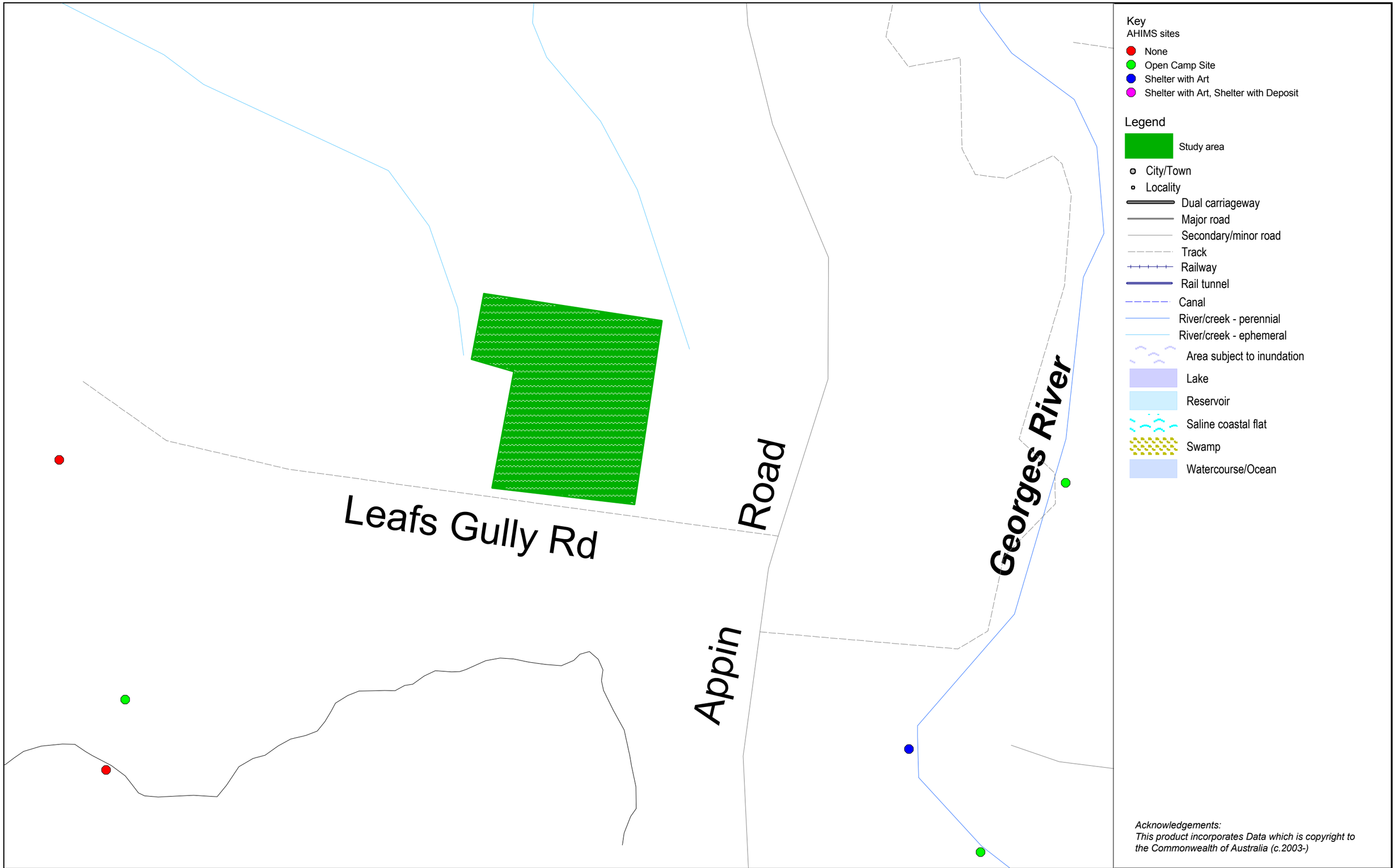

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Figure 7 : AHIMS data in the vicinity of the study area

Date: 30 May 2008

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Location:-..\5000\5000s\5093\Presquartz_REF_DPI\S5093 Presquartz REF F7 AHIMS data.wor

Scale: 0 0.1 0.2 0.3 0.4 0.5 kilometres

N W E S

Figure 7 : AHIMS data in the vicinity of the study area

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