Griffith City Council

Proposed Tharbogang Quarry and Landfill Expansion

Planning Focus Meeting

Background Brief

HE00002AA.01 AA

14 November 2006

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1. Introduction

1.1 Background

Griffith is the largest centre in the Murrumbidgee Irrigation Area and is the service centre for the Western Riverina region of New South Wales (NSW). Griffith contributes $1.5 billion annually to the national economy and is the fastest growing inland city in Australia with a current annual growth rate of 2.4%.

Sustained rapid increase in the city's population and the development of industry within the city has substantially increased the rate of consumption of gravel for road construction and development. This increase has been paralleled by an increase in the volumes of waste disposed to the landfill site servicing the Griffith region. Due to this rapid growth, the Griffith City Council has identified a need to expand its quarry operations and waste management depot at the Tharbogang quarry. The quarry is located approximately 8.5 kilometres west of the town centre on the north wetsren end of the McPherson's Range. **Figure 1.1** illustrates the location.

Prior to proceeding with the expansion of the quarry operation and/or the long term operation of the waste depot, Council is required to gain approval for the expansion of the quarry/landfill operation from one or more Government authorities, including the Minister for Planning.

This background paper is designed to provide regulatory authorities with an outline of the proposed project, proposed location, the relevant planning and assessment regime, and the identification of key environmental issues.

1.2 Existing operations

1.2.1 Gravel Extraction

The existing quarry has been in operation since 1991 and has provided a reliable source of gravel material. Although the material does not strictly meet RTA specifications, it has proved a reliable source for the region. The existing hard rock quarry covers an area of approximately 3 hectares adjacent to the existing landfill and the southern boundary of the council's land. The quarry operation typically involves drilling and blasting, excavation, pneumatic rock breaking and crushing. The materials are stockpiled and dispatched from the site. The operation is carried out by a private operator under contract to the Council. **Figure 1.2** is a photo of the existing quarry site.

The equipment used on site by the contractor usually includes a mobile crushing plant, comprising a primary jaw crusher, secondary gyratory crusher and screening unit, an air compressor, rock drill, excavator (with pneumatic hammer), loader and heavy haulage trucks. The daily operations generally involve two or three personnel on site undertaking gravel extraction. The extracted road base is transported from the site by haulage trucks.

Gravel extraction rates at Tharbogang exceed the current licence administered by the EPA under the *Protection of Environment Operations Act 1997*, which specifies extraction of no more than 50,000 tonnes per annum, by 100,000 tonnes (see Section 1.3.3). **Table 1.1** illustrates recent extraction rates at the Tharbogang site.

Figure 1.1: Location Plan

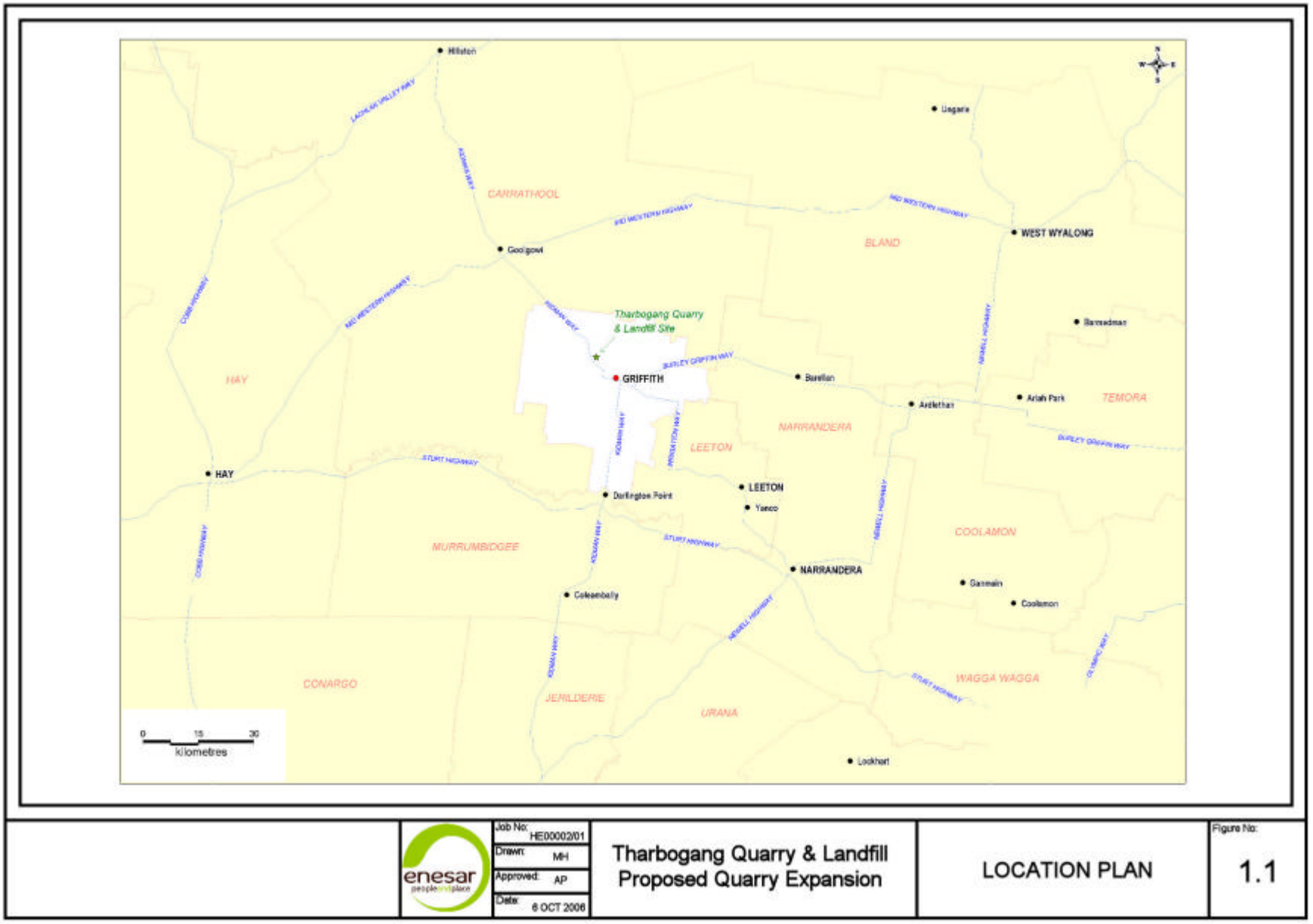


Figure 1.2: Existing and Proposed Quarry Site s

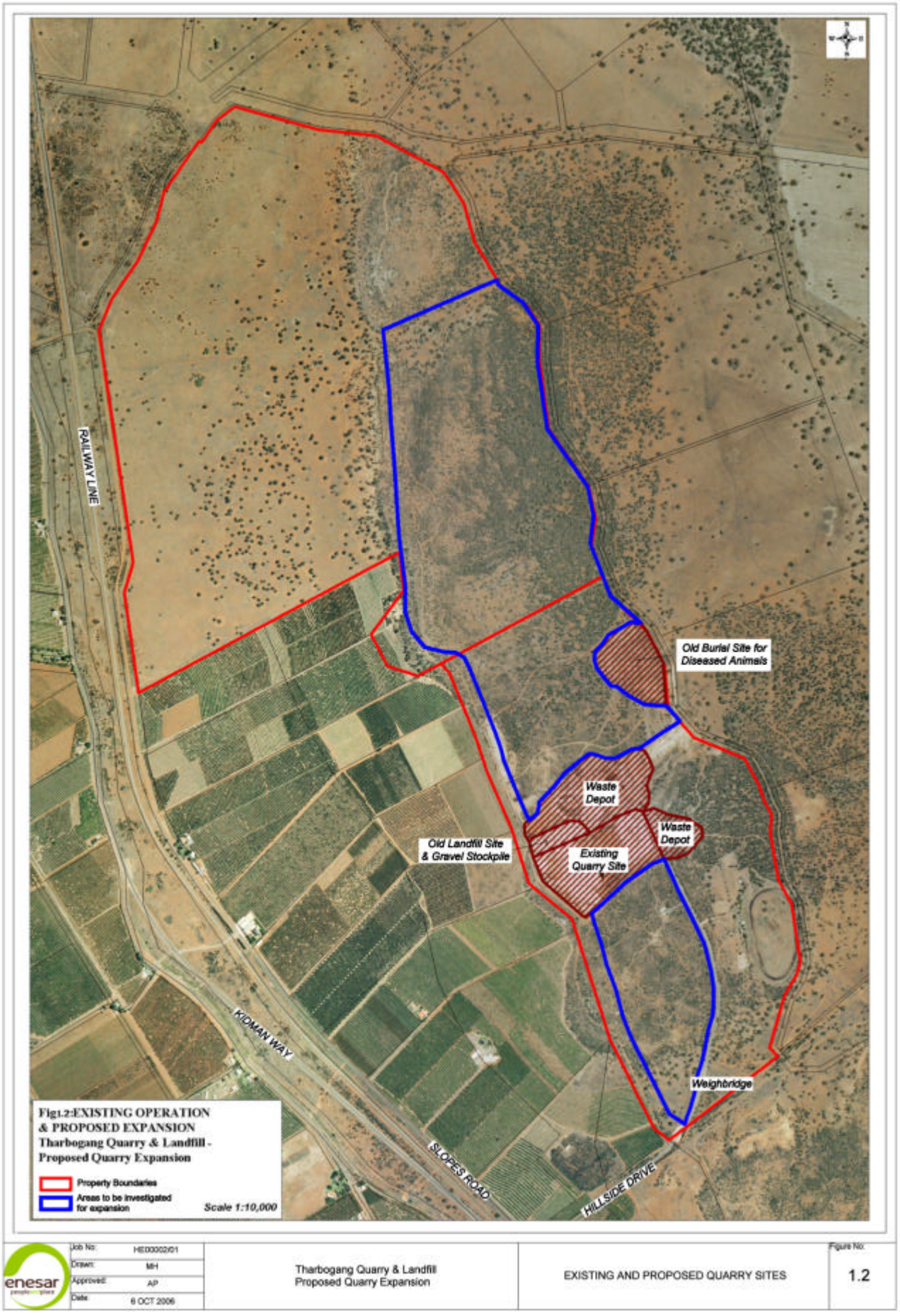


Table 1.1: Annual quantities of gravel extracted from Tharbogang.

GRAVEL EXTRACTION FORM THARBOGANG QUARRY

	Council Use			Private Use			Total Gravel Extraction
Year	Gravel-20 (tonnes)	Gravel-40 (tonnes)	**Total** (tonnes)	Gravel-20 (tonnes)	Gravel-40 (tonnes)	**Total** (tonnes)	(tonnes)
2002	10,250	75,786	**86,036**	8,463	22,343	**30,806**	**116,842**
2003	619	56,315	**56,934**	22,239	20,538	**42,777**	**99,711**
2004	1,436	73,586	**75,022**	22,625	42,743	**65,368**	**140,390**
2005	6,095	70,574	**76,669**	29,335	48,269	**77,604**	**154,273**

01January to 31 December every year

1.2.2 Landfill

The adjacent landfill is located in a naturally occurring gully on the site and covers an area of approximately 11.8 hectares. The landfill operation includes a public landfill for domestic waste, a leachate retention dam, modified surface drainage and an area for a stormwater and sedimentation basin. The putrescible waste burial site covers an area of approximately 7.5 hectares north of the landfill site.

The landfill has been in operation since 1984, however, there is little data regarding the mass and composition of waste material that has been deposited at the site. Currently the landfill is operated by council contractors and receives domestic and industrial waste generated from the region. The landfill is a combined cut and fill of sub-ground layers to bedrock using an advancing cell face for in and above-ground layers. Green waste is separated and chipped and stored on site for landscaping purposes. Materials from construction sites such as concrete, bricks and gravel is crushed and used for capping and landscaping around the site and steel is separated and sold as scrap metal. Currently there is limited recycling occurring at the site. The landfill site is almost at capacity with only 18 months remaining before additional landfill space will be required.

Figure 1.3 outlines the total amount of waste received at the landfill site per year which is currently no more than 16,000 tpa. The total amount of waste received at the site is within the limitations of the *Protection of the Environment Operations Act 1997 (POEO)* licence which specifies that the landfill can receive up to 100,000 tonnes of waste per year (see Section 1.3.3).

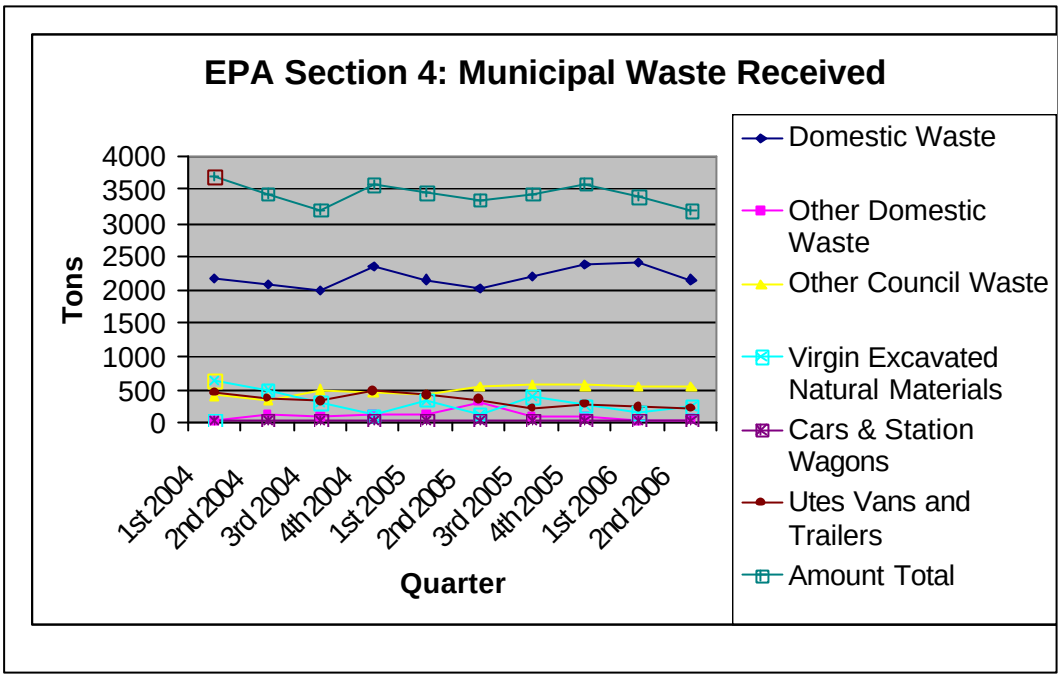


Figure 1.3: Total Amount of Waste Received at the Tharbogang Landfill Site.

The Griffith City Council Tharbogang Landfill Operational Procedures sets out the relevant administrative requirements and procedures that govern the Tharbogang Landfill operation. The procedures deal with conditions of entry, landfill procedures and ultimate disposal of waste at the Tharbogang landfill site.

1.3 Legislative Framework

1.3.1 Environmental Planning and Assessment Act 1979

The NSW *Environmental Planning and Assessment Act, 1979* and the Environmental Planning and Assessment Regulation set down the procedures for the approval of developments in NSW.

The expansion of the quarry and the landfill has been identified by the NSW Department of Planning as a Part 3A Major Project under the *Environmental Planning Assessment Act 1979 (EPA Act)* (*Extractive industries that obtain or process for sale, or reuse, more than 200,000 cubic metres of extractive material per year*). Major projects require the submission of an Environmental Assessment (EA) along with the Application and the public exhibition of the application.

The development will also have to be considered in relation to the Waste Avoidance and Resource Recovery Act and the following State Environmental Planning Policies (SEPP):

- SEPP No. 11 - Traffic Generating Developments;
- SEPP No. 33 - Hazardous and Offensive Development;
- SEPP 44 - Koala Habitat Protection;

- SEPP 48 - Major Putrescible Landfill Sites; and
- SEPP 55 - Remediation of Land.

1.3.2 Griffith City Council Local Environment Plan (GLEP)

The Griffith Local Environment Plan (GLEP) is a plan which identifies areas of land (zones) for different types of future development. It sets the principle rules regarding how land in these zones may, or may not, be used.

The requirements of GLEP do not apply for a Major Project except in so far as prohibition of a development is concerned.

Under the Griffith City Council Local Environmental Plan 2002, the proposed expansion site is zoned Rural Forest 1(f). The objectives of zone 1 (f) are detailed below. Within zone 1 (f), the development and operation of the landfill is permissible, and the development and operation of the quarry requires development consent. **Figure 1.4** illustrates the zoning of the proposed site and surrounding land.

Zone 1 (f) Rural Forest

1 Zone objectives

(a) To identify land that is presently being used for forestry and should be retained for forestry and associated activities, and

(b) To enable the development of land within this zone for forestry purposes, and

(c) To enable the development of extractive industries and mines.

2 Development within the zone

In Zone 1 (f) the following development is:

(1) Allowed without development consent
Development for the purpose of:

agriculture (not involving animal establishments and intensive livestock keeping establishments); environmental conservation; forestry; public utility undertakings.*

(2) Allowed only with development consent
Development for the purpose of:

camping grounds; extractive industries; mines.

(2) Prohibited
Any development not included in Item (1) or (2).

****public utility undertaking*** means any of the following undertakings carried on or permitted or suffered to be carried on by or by authority of any government department or under the authority of, or in pursuance of, any Commonwealth or State Act:

(a) railway, road transport, water transport, air transport, wharf or river

undertakings,
(b) undertakings for the supply of water, hydraulic power, electricity or gas or the provision of sewerage or drainage services or investigation services,
(c) emergency services,
(d) waste management facilities,
(e) telecommunications, radio and television transmission,
and a reference to a person carrying on a public utility undertaking shall be construed as including a reference to a council, county council, government department, corporation, firm or authority carrying on the undertaking.

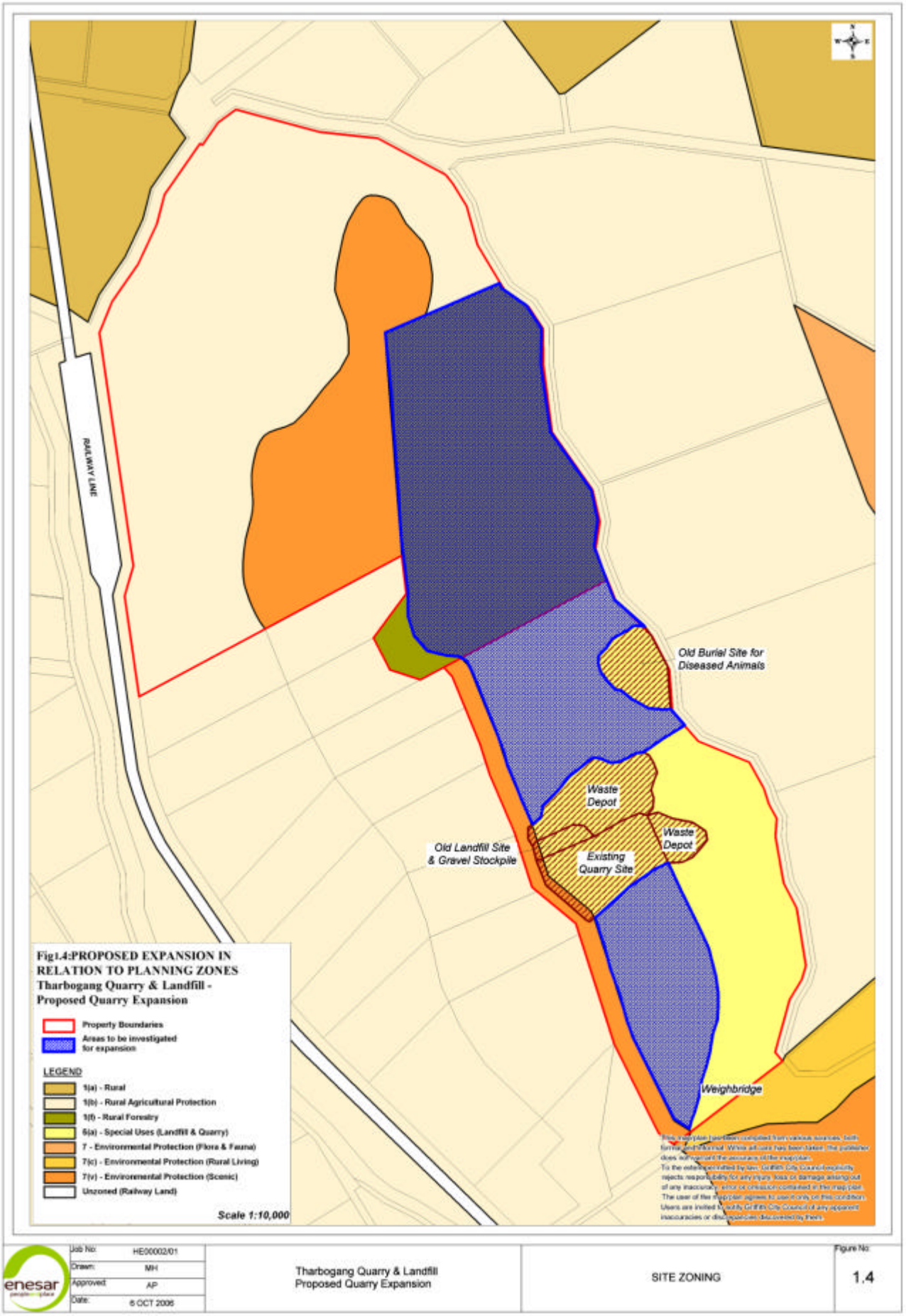
1.3.3 Existing Licences and Permits

Consent 78/91 was issued on 24 December 1991, for the operation of the Tharbogang quarry. Since that time, the zoning of the land that contains the existing quarry has changed from 1(a) Rural to 5(a) Special Uses – Quarry and Waste Depot.

A licence for the operation of the quarry has been issued under Section 55 of the *Protection of the Environment Operations Act 1997*. This licence is required because the extraction volumes exceed 30,000 tonnes per annum and because the landfill site will receive more than 5,000 tpa of solid or inert waste or more than 20,000 tpa of any waste. The licence authorises the Council to undertake:

- Solid Waste Landfilling (79) which involves receiving up to 100,000 tonnes per annum (tpa) of solid waste, and
- Hard Rock Gravel Quarrying (36) which involves the extraction of up to 50,000 tonnes per annum (tpa).

Figure 1.4: Site Zoning



2. Site context

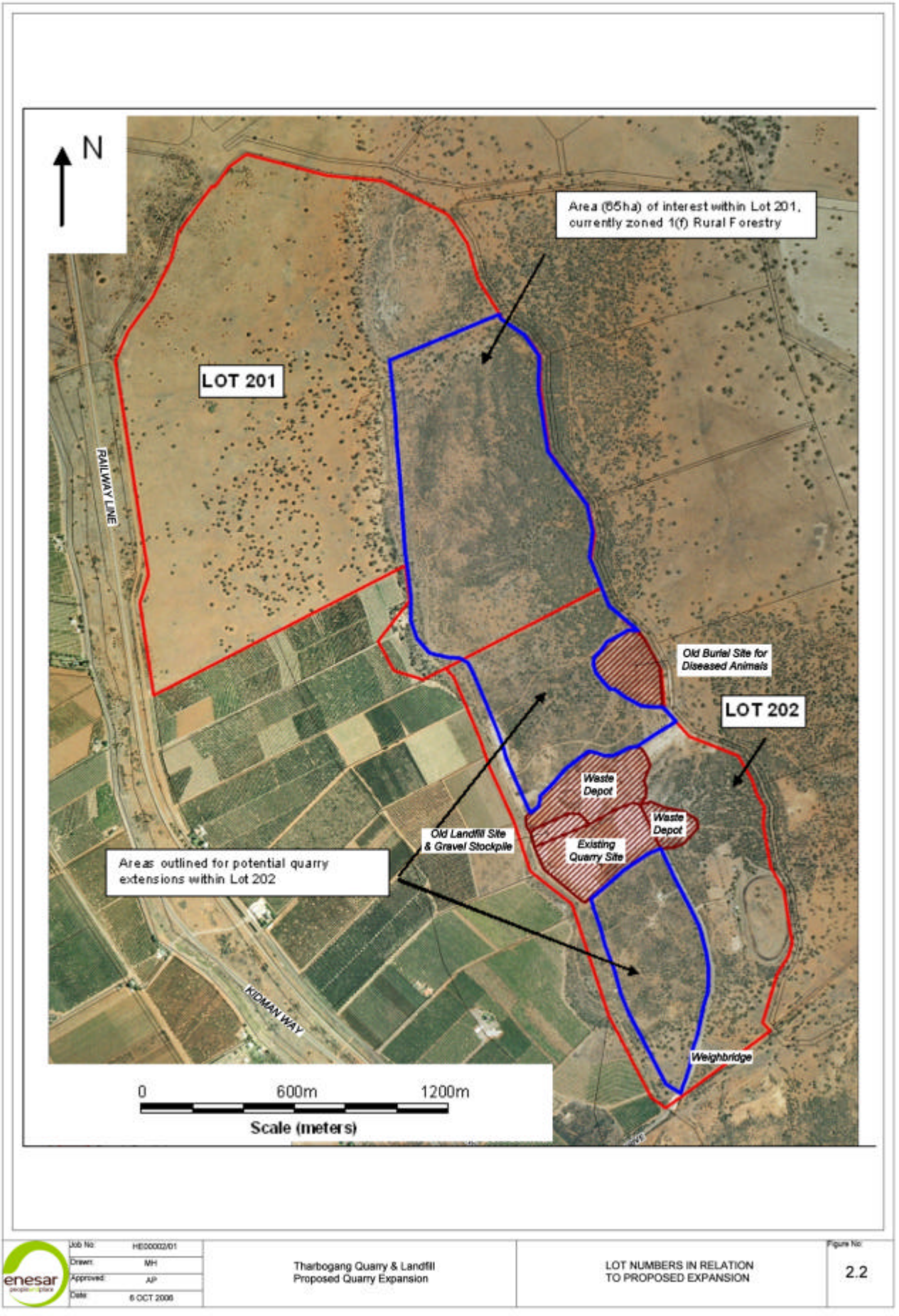
The proposed quarry/landfill site is located on the north western end of the McPherson Range which is situated approximately 8.5 km west of Griffith. **Figure 1.1** illustrates the regional context of the site. The proposed quarry/landfill would be located on portions of both Lot 201 and 202. The existing quarry and landfill are located on Lot 202. **Figure 2.2** shows the location of the proposed sites in relation to Lots 201 and 202.

The area to the north of the proposed site remains undeveloped and covers an area of approximately 100 hectares. This area has previously been cleared and surface gravel removed for road construction purposes. Regrowth vegetation has now covered the area with native woodland and open forest.

The land surrounding the proposed development is intensively farmed agricultural land. The closest private residence is located immediately adjacent to the south-western boundary of the 1(f) Rural Forest zone of the proposed extension of the quarry site. The land to the east of the site is zoned Rural Agricultural Protection which limits its use to agricultural practices.

A speedway is located in the south eastern part of the site and covers approximately 12 hectares. The speedway includes a racetrack and public amenities.

Figure 2.2: Lot Numbers in Relation to Proposed Expansion



3. Proposed Development

The development proposal is to expand the quarry and landfill operation to both the north west and south east areas of the existing site.

3.1 Quarry

The primary aim of the quarry expansion is to provide an economically and environmentally viable resource to the rapidly expanding infrastructure industry in the Griffith Region. Griffith's population is expected to increase by more than 50% in the next 30 years which demonstrates the need for a gravel source for the region.

The proposed quarry operation will involve the extraction of up to 400,000 tpa of gravel material from the site over the next 40 years.

Contractors will operate the extraction of gravel material. The extraction will involve the use of a mobile crushing plant, comprising a primary jaw crusher, secondary gyratory crusher and screening unit, an air compressor, rock drill, excavator (with pneumatic hammer), loader and heavy haulage trucks. The daily operations will generally involve two or three personnel on site with the extracted road base being transported from the site by haulage trucks.

3.1.1 Resource

Approximately 65 hectares (ha) of Lot 201 (see **Figure 22**) is currently zoned as 1(f) Rural Forestry. This area will be added to the reidue of Lot 202 for investigation for suitable road base materials. Due to the proximity of the site to the existing quarry footprint and the fact that outcrops of conglomerate can be observed across most of the area, it is considered probable that a considerable resource may be present within this site. Factors that could influence the size of the potential resource include the thickness of conglomerate, variations in rock type and strength, mining parameters and economic and environmental constraints.

Coffey Geosciences have completed some initial investigations into the availability of a resource that is appropriate for extraction. In 2000, Coffey undertook some resource exploration (drilling) in Lot 202 to the south east of the existing quarry. From site investigations and results from the drilling program, Coffey identified two potential quarry resources. Each of these resources is identified as Stage Two and Stage Three, with the active quarry site being referred to as Stage One. **Figure 3.1** illustrates the location of the proposed Stage Two and Three quarry sites. It is Council's intention to continue with this proposed staging and then progress into the northern section of the site.

Additional geotechnical assessment carried out by Coffey in 2006 focused on the two proposed extensions to the existing quarry footprint (Stage 2 Quarry & Stage 3 Quarry) and comprised twelve percussion drilled boreholes. The drilling program was designed to test, to a reasonable degree of confidence, the vertical and lateral extent of the Mailman Gap Conglomerate Member across the proposed Stage 2 Quarry and Stage 3 Quarry extensions. At the request of Griffith City Council, a number of boreholes were later relocated in order to test a wider portion of the Tharbogang site. Significant conglomerate intersections were identified in all of the boreholes with the exception of

BH5 (see Figure 3.1). This suggests that the proposed Stage 2 Quarry and Stage 3 quarry extensions (see **Figure 3.1**) contain a considerable resource.

The Coffey report noted that intermittent outcrops of conglomerate can be readily observed across the north-western side of Lot 202 (see Figure 3.2 for Lot boundaries in relation to proposed expansion) with the outcrops becoming more extensive towards the ridgeline of the McPherson Range. Significant and continuous conglomerate intersections have been encountered in the majority of the boreholes drilled within Lot 202 (Douglas, 1991; Coffey, 2006). The results of the borehole logging suggest that the proposed Stage 2 and Stage 3 quarry extensions contain a considerable conglomerate resource. A third area proximal to the Speedway and east of the main access road may also have quarrying potential.

Figure 1.2 illustrates the proposed quarry sites. The proposed sites will require further refinement following the proposed drilling program which will be completed after consideration of the flora and fauna assessment.

3.2 Landfill

The landfill operation will involve expanding the current landfill site (that is expected to reach capacity in approximately 18 months) into the adjacent quarry. Currently, the landfill facility receives approximately 20,000 tpa of waste which is predicted to increase at a rate of 1.5% - 2% annually for the life of the facility. The proposed landfill would utilise quarry voids and, depending on the quarry development, would be expected to operate for 40 to 50 years before reaching capacity.

The landfill will comprise the following components:

- landfill;
- green waste recycling;
- scrap metal recycling;
- building rubble stockpile;
- tyre stockpile;
- battery collection and disposal;
- paper, cardboard, cans and bottle recycling collection;
- animal carcass collection; and
- special waste such as asbestos and waste oils drums etc.

The proposed landfill expansion will provide a suitable waste service to the Griffith Local Government area and will also provide some fill for the rehabilitation of the quarry. It is proposed that following the extraction of gravel, the quarry sites would be progressively rehabilitated and if appropriate, landfill will be used in this process.

The landfill will initially be relocated into the currently active quarry. The quarry site will be lined with an appropriate clay liner and leachate collection system. Waste will be disposed at the landfill face where it will be pushed and compacted before a daily cover

is placed over it. Council engineers will identify design requirements for the landfill including compaction rates.

A Landfill Environmental Management Plan (LEMP) will be developed. The LEMP will include a Waste Management Strategy that will outline the strategic direction for waste management that will be adopted by the council including their commitment to reducing waste to landfill.

Figure 3.1: Location of Stage Two and Stage Three Quarry Sites

3.3 Development Justification

The primary aim of the quarry expansion is to provide an economically and environmentally viable resource to the rapidly expanding infrastructure industry in the Griffith region. Griffith is the fastest growing inland city in Australia which has resulted in an increased requirement for gravel for use in the construction and maintenance of infrastructure such as roads and buildings. Griffith's population is expected to increase by more than 50% in the next 30 years demonstrating the need for an economically and environmentally viable gravel source for the region. It is predicted that up to 400,000 tonnes per annum of gravel over the next 40 years will be required to meet the area's needs.

The primary aim of the Tharbogang landfill expansion is to provide a controlled facility for the re-use, recycling and disposal of municipal and industrial waste. The expansion of the landfill site will also allow for a practical solution to the future need for rehabilitation of quarry sites.

Ultimately council are aiming to reduce the amount of waste being disposed to landfill. As members of the Riverina Regional Organisations of Councils (RIVROC) Community and Industry Waste Management Solutions, council is aiming for a regional approach to waste reduction and management.

3.4 Development Alternatives

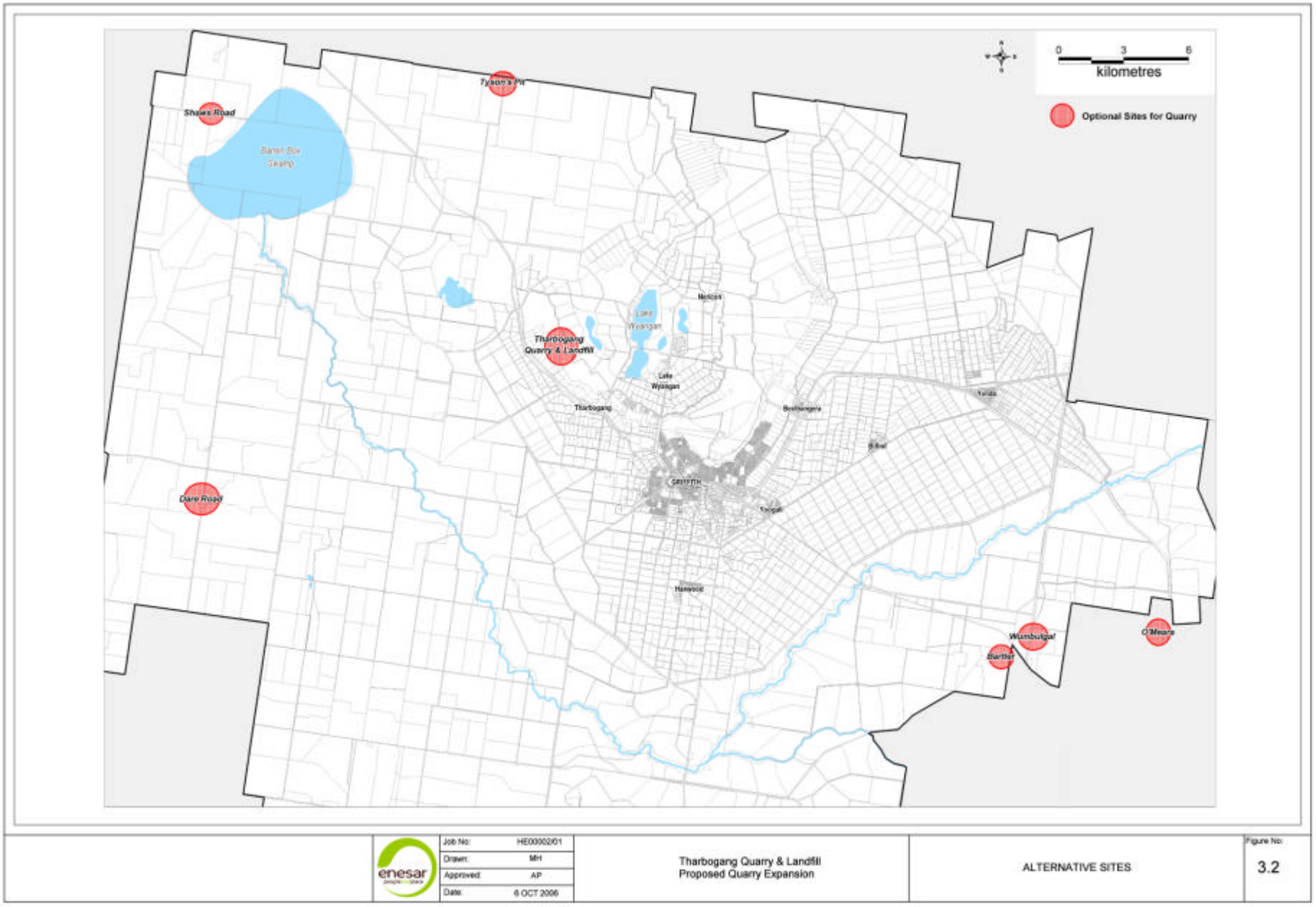
Council has investigated a number of options for the supply of hard rock material and gravel and has identified this site as the preferred site. A comprehensive assessment of options has been completed and the following attributes at each site were assessed:

- Location and planning.
- Type of material.
- Volumes available.
- Environmental factors.

Alternatives for expansion of the landfill have not been formally analysed due to the opportunity to utilise quarry voids adjacent to an existing landfill operation.

The detailed options analysis will form part of the environmental assessment for the expansion of the quarry. Tharbogang has been chosen as the preferred site due to availability of resource, proximity to Griffith, and accessibility.

Figure 3.2: Alternative Sites



4. Potential Environmental Impacts

The quarry and landfill expansion has the potential to cause environmental impacts arising from noise, dust, blasting and vibration, stormwater runoff and sediment, habitat destruction, transport of materials, erosion, and groundwater contamination.

4.1 Noise and Vibration

The hours of operation of the quarry and blasting activities are strictly controlled within the existing licence for the site. In addition, noise limits have been imposed by Department of Environment and Conservation (DEC). In 2000, the Coffey EIS (later withdrawn) concluded that the operation of the proposed extended quarry (and landfill) would be essentially the same as the existing activity and that exceedances of noise criteria during the expansion would be unlikely. Blasting would comply with the Australian Standard AS 2187.2 – 1993 "Explosives Storage, Transport and Use".

Noise and vibration assessment and modelling will be undertaken as part of the EA process. Recommendations relating to mitigation and management will be included in the operational procedures for the quarry.

4.2 Dust

Dust will be generated from blasting, excavation, crushing and screening. Dust control measures will be implemented to minimise dust to neighbouring agricultural properties through:

- Watering unsealed working areas, dust-generating equipment and roads.
- Ceasing operations under adverse weather conditions which favour the generation of dust.
- Rehabilitation measures, as soon as practicable.

4.3 Surface Water Management

Surface water from undisturbed areas of the site is currently directed around the quarry and landfill through a series of surface berms. Water associated with quarry operations is directed to two sedimentation ponds which trap and contain sediment. Surface water management will be addressed as part of the hydrology assessment of the site. Water needs will also be addressed in the EA.

4.4 Flora and Fauna

Two Flora and Fauna assessments have been carried out for the landfill and quarry expansion. The first assessment was conducted by Ettamogah Research Consultants (ERC), in December 2002. This assessments focussed on Lot 202. ERC estimated that the then proposed expansion of the quarry and landfill would have resulted in the removal of 50 hectares or 59% of existing regrowth native vegetation on the site.

ERC did not extend its investigations to the wider locality and did not assess the regional impact of the quarry operation on rare or endangered species.

ERC found that within the site, 70% of 'known' habitat utilised by the Grey-crowned Babbler would be removed and it was *likely* that a *significant effect* upon the species would occur within the study area. In addition, 60% of 'known' foraging habitat and potential roosting habitat for threatened bat species, recorded within the subject site, would be removed.

ERC proposed impact amelioration measures to be carried out, both before, and during proposed operations, including provision of reserve areas and establishment of wildlife corridors. ERC considered it *unlikely* that the development would have a *significant effect* on any threatened species, if these amelioration measures were carried out.

No Rare or Threatened Australian Plants (ROTAP) listed plant species were recorded by the survey during the 2002 investigations. The study suggested that there was potential to increase local species diversity and habitat as part of the rehabilitation process.

The second flora and fauna assessment was conducted by Ecosurveys Pty Ltd. They were commissioned to carry out a review of the previous studies in addition to an assessment of the area extending north west of the existing quarry (Lot 201) that had not previously been surveyed. Ecosurveys found that the previous studies carried out by ERC were comprehensive, of a high standard and used appropriate flora and fauna survey methods. However, the majority of the work contained in the studies completed by ERC did not apply to the flora and fauna of Lot 201.

Ecosurveys reviewed Eldridge's (2002) map on *Condition and Biodiversity of Vegetation Remnants in the Murrumbidgee Irrigation Area* and found that Lot 201 supported the Bimble Box – Pine (*Callitris glaucophylla)* community which is considered endangered within the MIA and Dwyer's Gum – Currawang (*Acacia doratoxylon)* community which is considered well retained within the MIA. Ecosurveys noted that both Eldridge's work, and a map of remnant vegetation produced by GCC, identified that vegetation located on Lot 201 forms part of a local corridor stretching from Tabbita State Forest in the west to McPherson Range in the east and that the vegetation is located on the edge of three Bioregions: Murray Darling Depression, Cobar Peneplain and Riverina.

Ecosurveys also carried out flora assessments of the site (see Figure 4.1) and noted fauna observed during the flora survey. Ecosurveys found no threatened flora within Lot 201 but did note that the three vegetation communities found in the area are considered medium or medium to high conservation value. Two noxious weeds were found on the site. There is no incidence of *Phytophthora cinnamomi.*

Ecosurveys noted that the threatened Grey-crowned Babbler (*Pomatostomus temporalis)* was recorded at two locations within the proposed development site. An additional four woodland bird species were also recorded, which although not listed as threatened, are considered to be in decline within the New South Wales wheat/sheep belt. Ecosurveys noted that the area contained several habitat features including variable vegetation structure, old hollow bearing trees (an outstanding feature), fallen timber, rock, drainage lines and mistletoe that contribute to faunal diversity.

Ecosurveys noted that the 'vegetation found on the proposed development site along with the rest of the vegetation on Lot 201 forms part of a much larger corridor linking the McPherson Range with remnant vegetation to the north of the proposed development site'. Ecosurveys consider that the value of such a corridor should not be underestimated and the removal of vegetation on the development site would result in a gap in the

corridor over which many woodland species, some threatened, would be incapable of traversing. Ecosurveys also note that 'the removal of this vegetation could also reduce the size of the remaining remnant vegetation on Lot 201 to a size that is incapable of supporting some species.'

Ecosurveys made a number of recommendations that could mitigate the impact of the proposal including:

- The maintenance of a narrow corridor.
- The preservation of key habitat areas.
- Improvement of remnant vegetation areas to the north of the proposed development
- Reestablishment of vegetation in areas of the site that are not to be developed.
- The protection of areas of Lot 201 not proposed for development, through a permanent covenant, and.
- Weed and feral animal control in the permanent covenant area.

A strategy that aims to enhance and conserve native vegetation will also be developed as part of the EA in order to mitigate potential impacts on flora and fauna. A flora offset strategy will form a critical part of the EA in order to address any significant loss of vegetation.

Council has only recently received the results of the geological and flora and fauna surveys and as such have not had sufficient time to accurately identify the proposed off-set site/s for the expansion. The results of these surveys will enable the development of a planned approach to the quarry development that provides for the preservation of significant flora and fauna habitat where feasible. Rehabilitation planning will include the revegetation of the site using local provenance species which will restore important habitat features.

NB. Council intends to define the project scope in parallel with the EA development to ensure the design complies with site environmental constraints.

4.5 Traffic

Development and operation of the quarry at higher production levels will create additional traffic within the site and on roads accessing the site. Operation of the landfill is unlikely to result in dramatically higher traffic levels than can already be attributed to the existing landfill operation. Future traffic levels are expected to increase in line with the long term growth of the City of Griffith but not beyond the capacity of the current road system and haulage routes.

4.6 Archaeological

There is no evidence of any significant archaeological sites or artefacts recorded at the site. The Griffith Aboriginal Land Council, in 2000, advised that following a site inspection for the Coffey EIA in 2000, "no evidence of aboriginal artefacts or sites was discovered during their investigation".

4.7 Visual

The Council landfill is, and will continue to be, subject to on-going rehabilitation works that are designed to improve the visual amenity of the site. In addition, Council maintains at least a 20 metre wide vegetation corridor around the perimeter of the site to provide a wildlife corridor and visual screening. A management plan and rehabilitation plan will be prepared and will address the issue of visual amenity.

4.8 Groundwater

Groundwater monitoring for the Tharbogang Landfill EIS was undertaken in 2000. Results indicated that there was no impact on groundwater from the landfill site. To ensure groundwater impacts are avoided with the proposed extension to the landfill, borehole testing and monitoring program will be developed including consultation with and subject to approval of Department of Natural Resources NSW. In addition, landfill cells will be constructed and lined with clay or another impervious material to achieve a permeability of no greater than $1x10^{-9}$ meters per second. A leachate collection and management system will be incorporated into the landfill design.

Figure 4.1: Area Covered by Flora and Fauna Assessments