
**LEGACY MINING AREAS ON THE URBAN FRINGE:
A STUDY OF IPSWICH, QUEENSLAND**



Rhys Worrall

PhD Student, Centre for Mined Land Rehabilitation

David Neil

Program Director, Department of Geographical Sciences and Planning

Andrew Grigg

Research Fellow, Centre for Mined Land Rehabilitation

David Breerton

Director, Centre for Social Responsibility in Mining

Centre for Social Responsibility in Mining

CSRM is part of the Sustainable Minerals Institute (SMI) a multidisciplinary research institute at the University of Queensland.

www.csrn.uq.edu.au

ABSTRACT

The principles of sustainable development and land use planning are now widely accepted across the government and private sectors. However, the Australian mining industry has struggled with the translation of sustainable development rhetoric into on-the-ground practice. There are few accepted methodologies or approaches to resolving these often-conflicting factors to achieve optimal outcomes.

A number of existing case studies serve to illustrate the integration of social concerns and preferences into the decision-making process. However, these are relatively simple in terms of their context, post-mining land-use options and number of interest or 'stakeholder' groups. The situation becomes more complex when areas disturbed by mining activities are close to major, and expanding, centres of human population where strong and competing land use pressures exist.

The legacy coal-mining areas adjacent to the growth area of Ipswich, located immediately to the southwest of Brisbane, represent just such a complex land management challenge. The purpose of this paper is to describe this area of legacy mined land, the current and likely future pressures it will face, and to discuss possible land management approaches that could be taken.

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1. INTRODUCTION

The principles of sustainable development and land use planning are now widely accepted across all levels of government and in the private sector, yet there remains much debate as to how these principles should be applied. The Australian mining industry has struggled with the translation of sustainable development rhetoric into on-the-ground practice (Minerals Council of Australia 2002, 2003). There is general agreement that decisions surrounding the use of land for mining activities must take into account the 'triple bottom line' of economic, environmental and social concerns, but there appear to be few accepted methodologies or approaches to resolving often conflicting interests and needs to achieve optimal outcomes.

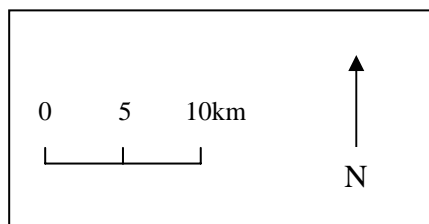
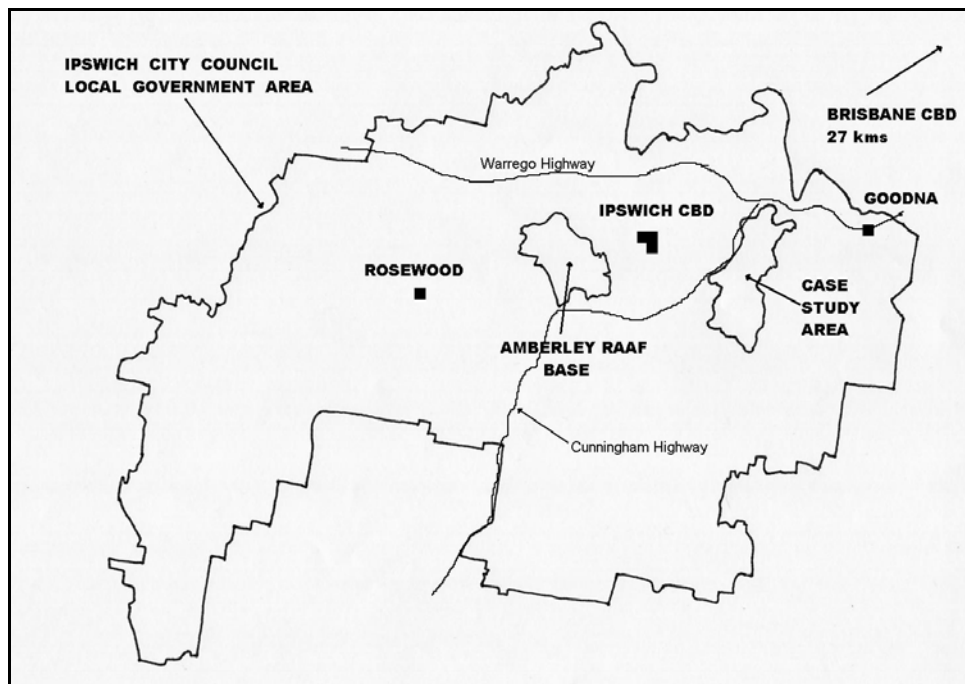
A number of existing Australian case studies of mine closure serve to illustrate the integration of social concerns and preferences into the decision-making process, such as Wesfarmers Collie coal mine in Western Australia and Placer Domes's Kidston gold mine in Queensland (Minerals Council of Australia 2002, 2003). However, these are relatively simple in terms of their context, post-mining land-use options and number of interest or 'stakeholder' groups. The situation becomes more complex and assumes a degree of urgency when areas disturbed by mining activities are close to major, and expanding, centres of human population where strong and competing land use pressures exist.

The legacy coal mining areas adjacent to the growth area of Ipswich, and located immediately to the west of Brisbane, form an example of where the principles of sustainable development should be applied in an effort to gain optimal outcomes for the community. The purpose of this paper is to describe this area of legacy mining, its mining history, current and likely future pressures, and to discuss possible sustainable land management approaches that could be taken.

2. DESCRIPTION OF STUDY AREA

The case study area is located 27 km south west of the Brisbane CBD, and 7km east of the Ipswich CBD (Figure 1). It consists of approximately 2,000ha of disturbed former open cut coal mining land extending for some 12km from the New Chum/Dinmore area to Swanbank. Much of this area had been mined by underground operations, prior to open cut operations remaining the area from the 1960s. Whilst reshaping and revegetation has been undertaken on some of this disturbed land, the majority of the land has not been rehabilitated. As many of the companies responsible for this disturbance have long since dissolved, it is unlikely that rehabilitation will be undertaken by anyone other than Government, or new landowners and leaseholders prepared to accept liability for this land. A variety of industrial uses currently occur on this land, primarily waste disposal and clay mining. Adjacent land use is predominantly urban. To the north and northwest are the suburbs of Dinmore, Bundamba and the Ipswich CBD; to the west lies the Amberley RAAF base. To the south and southeast, the land is dominantly rural and semi-rural in nature, and includes the White Rock Conservation Park. To the northeast and east lie the suburbs of Redbank, Goodna, Collingwood Park and Redbank Plains.

Figure 1. Locality map showing extent of Ipswich Local Government Area, case study area and important features of the general area



2.1 Environmental Factors & Physical Setting

The climate of the Ipswich area is sub-tropical, with average rainfall of 877mm, mean daily maximum temperatures of 27.1°C, and mean daily minimum temperatures of 13.7°C (Bureau of Meteorology, 2004).

The region surrounding the study area is undulating terrain of generally low relief (<100m), with significant topographic modification by the open cut mining process. It is drained predominantly from south to north, and whilst most of the case study area falls within the Bundamba Creek sub-catchment of the Bremer River, the area appears to be predominantly internally draining, with several large mining voids filled with water. Alluvial materials (silt, sand and gravel) dominate areas adjacent to and within watercourses, whilst the case study area falls within the Upper Triassic Ipswich Coal Measures, comprised of shales, coal, conglomerates and sandstones (Anon, 1972). Soils in the area are dominated by dark, medium to shallow cracking clays (Anon, 1972).

Vegetation in the area is predominantly eucalyptus woodland, dominated by mixtures of *E. crebra*, *E. intermedia*, *E. tereticornis* and *E. tessellaris*. Watercourses in the general area are dominated by *Eucalyptus tereticornis/E. moluccana* associations, together with *Callistemon sp.*, *Allocasuarina sp.* and *Melaleuca sp.* (Elsol, 1991).

Vegetation in the region has been severely disturbed since European settlement. Only minor native vegetation remnants remain in the case study area, none of which could be considered to be in pristine condition.

2.2 *Social & Cultural Description*

Ipswich is one of the oldest European settlements in Queensland, established in 1829 (then known as Limestone). Initially a penal colony, the area was opened up for free settlement in 1842. Land use was predominantly pastoral, but from the mid-19th and through to the mid 20th century, industrial activities, particularly coal mining and rail-related activities, grew in importance, and were major employers in the area. In recent years these industrial activities have declined markedly, with the result that the area is now in a transitional phase (Anon, 2003a).

The Ipswich City Council local government area (LGA) covers an area of 1207km² with a population of 137,000, supported by approximately 49,000 jobs (ICC, 2004). Housing is dominated by freestanding dwellings, which account for approximately 85% of all private housing in the area (PIFU (a), 2004).

Between June 1996 and June 2001, the number of older people (aged 65 and over) increased by 11.8%, while the number of working age people (15-64 years) increased by 2.1% over the same timeframe. 24.4% of people in the area were aged 0-14 years. In 2001, more than 60% of the population aged over 15 years was in the workforce, with an unemployment rate at the time of 8.4% (compared to 8.2% for the whole of Queensland). In occupational terms, 21.7% of the Ipswich City workforce were professionals or associate professional, 18.6% were intermediate clerical or service workers, approximately 28% were in service industries and over 11% in production industries. In educational terms, 24.4% of the total population were attending an educational institution in 2001, with 5% of the total population undertaking technical or tertiary education (PIFU (a), 2004).

The population of Ipswich is ageing, with the median age of the population expected to grow from 32 in 2001 to 39 in 2026. In addition, the proportion of people aged 45-64, and in particular 65+ will grow – from 21.3% and 9.3% in 2001 to 22.9% and 19.9%, respectively, by 2026. This represents a nearly four-fold increase in the population aged 65+. All other population age ranges – 0-14, 15-24 and 25-44 – will have falling proportions of the overall Ipswich population (PIFU (b), 2004).

3. MINING HISTORY

Coal was first positively identified in Queensland in 1825, in outcroppings along the Brisbane River and subsequently, in 1828, on the Bremer River at Ipswich (Whitmore, 1981). Coal mining commenced in 1843, on the Brisbane River at Redbank (Whitmore, 1981) and subsequently on the opposite bank of the Brisbane River, at Moggill, continuing until the late 1850s or early 1860s (Whitmore, 1981). Early mines concentrated near the river, which afforded easy access to the coal seams and to transport. Coal mining in Queensland remained a small scale industry into the 1870's, when coal production in Ipswich was still only around 17,000 tonnes per annum (despite the industry existing for thirty years), employing less than 150 men, and primarily servicing a growing steamship trade and small local industry needs (Whitmore, 1981). Gradually mining moved away from the riverbanks and into the Bundamba and Dinmore areas (the site of the study area). Development remained on a

relatively small and haphazard scale until work from the Geological Survey from 1950 to 1970 more accurately delineated the resource (O’Flynn & Thornton, 1990). From the 1950’s, with the introduction of diesel rather than steam locomotives, coal production switched to supplying electricity generators at stations such as Tennyson, Bulimba and eventually Swanbank, which is located within the study area. The Ipswich coalfield remained the principal producing coalfield in Queensland until the 1960s, when overtaken by the much larger Bowen Basin coalfield of central Queensland (O’Flynn and Thornton, 1990). Until this time, the bulk of production had been from underground mines, with the first significant opencut production occurring in the Dinmore area from 1966. Underground coal mining in the Ipswich district ceased in 1997 (O’Flynn, 1998) and open cut coal mining in the study area ceased in 2003, drawing to a close 160 years of coal production from the Bundamba/New Chum/Swanbank coalfields east of Ipswich. Whilst coal resources remain, it is unlikely that production from this area will resume, given continuing urban growth in the area, land use pressures and changing community acceptance of mining activity.

4. CONTEMPORARY LAND MANAGEMENT ISSUES

This section of the paper will discuss internal issues affecting the case study area (current landuses, environmental and social risks) and external issues that influence land management options for the site (Council and State Governments plans and policies, social issues and post-mining landuse).

4.1 *Internal Issues*

Coal mining in the case study area ceased during 2003. However, industrial use of the land continues, dominated by the clay mining and waste disposal operations mentioned earlier, and the presence of the Swanbank power station, located at the southern end of the case study area.

Environmental risks in the area are an ongoing issue. The site exhibits a typical array of potential environmental impacts arising from the mining and industrial exploitation of the land. The erosion potential for many of the landforms is high and in evidence, as little of the land has been rehabilitated to a stage where wind or water erosion is reduced. This has the potential to affect the water quality of the numerous water filled pits in the case study area. Additional off-site impacts could arise in the form of erosion and sediment transport via local watercourses reaching the Brisbane River, the generation of airborne dust, and spontaneous combustion causing fires. Much of the vegetation in the area has been cleared, and what remains is dominated by a mixture of natural regrowth, small areas of rehabilitation carried out up to decade ago, and isolated patches of remnant vegetation. The management and rehabilitation of local vegetation communities, and the attendant benefits to native fauna, need to be viewed as an internal environmental issue which will be strongly influenced by wider regional environmental management issues.

Given the open nature of much of the mined land in the case study area, public incursions onto mined land are inevitable. Much of the land remains unfenced, and there is significant public risk attached to unstable landforms, large open voids, and areas of spontaneous combustion. Social risks also arise when potential environmental risks are not adequately managed or remediated, in some cases leaving the public, through Government bodies, responsible for rehabilitating and managing landscapes degraded by the process of coal mining.

4.2 External Issues

Along with most of southeast Queensland, the Ipswich district is growing rapidly, with population numbers expected to increase from the current 137,000 to between 155-180,000 by 2016 (Anon, 2003b), and between 204-245,000 by 2026, with average annual growth exceeding 2% between 2006 and 2026. (PIFU (a), 2004). This is part of a trend to increased urbanization in the area, and a blurring of the distinction between Brisbane's outer boundaries and those of the Ipswich district. Much of the urban growth in the Ipswich district is concentrating in the eastern areas of the City, i.e. those areas closest to Brisbane, major shopping centres and transport links, with subsequent increased pressure on infrastructure.

Plans for long term population growth for the LGA indicate significant population growth and urban development virtually enveloping the case study site, with a large planned development to the southwest increasing the current population of 2,000 to 110,000, and eastern suburbs population numbers expanding from a current 42,000 to 121,000 (ICC, 2004). The Ipswich City Council, in conjunction with land developers and current landowners, has been investigating possible future industrial land uses for the area which the council designates as 'regionally significant business and industry lands' (ICC, 2004).

At a state level, the Department of Natural Resources, Mines and Energy has designated the study area as a 'Key Resource and Industrial Area', which protects the resource and industrial potential of the area and excludes residential development on the land (O'Flynn, 1998). In addition, the Department of Local Government and Planning has designated Ipswich as a 'Key Metropolitan Centre', which is intended to attract priority government services, infrastructure and facilities through changes to current planning schemes, and encourage private sector investment (Anon, 2003b).

The cessation of mining activity in the case study area draws to a close one of the oldest mining districts in Australia. Whilst one can argue over the legacy of mining activities that disturb large areas of land, there can be no doubt that coal mining in the area was of great importance to the development of Ipswich and Brisbane, and for a long time was a major direct and indirect employer with significant economic ramifications. Younger generations of people living in the Ipswich area may no longer have the close links to coal mining that earlier generations did, but the character of the area remains heavily influenced by mining. In time, a changing relationship with the landuse history of the area, coupled with increasing land values, wealth and social aspirations, may see increased pressure for this large area of disturbed land to be effectively managed in a way which enhances the social and environmental, as well as economic potential of the area.

Whilst a great deal of work has been undertaken in Australia in recent decades on rehabilitation strategies for former mining land (see Mulligan, 1996, for a comprehensive overview), much of this research has limited application to the case study area, due to the nature of its location in the major urban corridor of Ipswich-Brisbane. In many of the major mining provinces in Australia – the Hammersley iron ore mines in Western Australia, the bauxite mines of the Cape York area, the sand mining areas of south west Western Australia, the silver-lead-zinc mines in and around Mt Isa, and the coal mines of the Bowen Basin in the central and northern districts of Queensland – the communities are far smaller, much more remote, and often established mainly in support of the mining operations. The pressures and

options for post-mining land use are therefore likely to be less complex than those that exist in the Ipswich district.

5. THE PATH TO SUSTAINABILITY

The concepts behind the term ‘sustainable development’ can be traced back until at least the 1960s, with the publication of Rachel Carson’s book *Silent Spring* in 1962, and the growth in community awareness of environmental degradation. Sustainable development has been defined as development that ‘*meets the needs of the present without compromising the ability of future generations to meet their own needs*’ (WCED, 1987). The Ecologically Sustainable Development (ESD) strategy outlined in Australia during the early 1990’s expands on this, and defines ESD as ‘*using, conserving and enhancing the communities resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased*’ (Anon, 2004).

Managing legacy mining areas has been identified as an important issue for the mining industry (MMSD, 2002). The challenge for managing the legacy coal mining areas near Ipswich is to successfully plan for long term sustainable land uses for this highly disturbed urban post-mining landscape. Therefore, consideration of post-mining land uses have to go well beyond the minimum of site stabilization, maintenance of acceptable water quality and establishment of vegetation cover considered sufficient at most Australian mining operations, and include socially acceptable and environmentally sustainable options. Decision makers are faced with critical landuse planning issues, working within a complex matrix of diverse land ownership, regional ecological issues, environmental management needs, urban growth pressures and economic potential.

6. FUTURE DIRECTIONS

A variety of landuse options or scenarios for the case study area are possible; they range from an expansion of present industrial activities into an industrial park with new industries, through continuing use of the land with the present established industries, to use of the land for recreational activities, to significant landscape rehabilitation and the establishment of wildlife corridors, amongst many others. This section will discuss some of these possibilities, but does not aim to provide answers at this stage, as this is the focus of continuing investigation.

One option for the land might include an expansion of the industrial uses currently taking place. Waste disposal could be an ongoing industry for some time, although it is limited by the amount of appropriate pits available for such use. Similarly, there are substantial clay resources in the area, and it seems likely that clay mining will be present in the area in the medium to long term. Swanbank Power Station will continue to provide power to the State’s electricity grid for some time to come. Additional industrial uses for the land have been proposed, and the presence of rail infrastructure may enable other industries to establish on appropriate land. As an example, the proposed Swanbank industrial park (which includes a one billion dollar paper pulp mill) may provide employment opportunities for 14,000 people – equivalent to almost 30% of current employment in the whole LGA (ICC, 2004).

It is possible that industrial use of the land as it now exists, may continue on for the longer term, with little or no new industries developing in the area. This may particularly be the case if insufficient land of suitable quality is available for new industry.

Recreational use of some of the land has been considered (Strategic Leisure Australia, 1998). Social benefits may be derived from the conversion of some of the areas into public open space such as ovals or walking tracks, recreation facilities such as sports fields, or through the utilization of land for hobbies and pursuits such as four-wheel drive tracks, motorcycle, motorcross or cycling tracks, etc. The water bodies may present opportunities for water based recreation activities such as swimming, diving or canoeing. Cultural opportunities may arise through acknowledgement of the site as having historical significance in the development of industry and employment in southeast Queensland. An expansion of green space with conservation values would also have positive social implications.

There is an opportunity for targeted rehabilitation works to return part of this area to a reasonably representative native vegetation community, with the attendant wildlife benefits. Despite the case study area being seriously disturbed by coal mining over an extended period of time, there remain patches of native vegetation throughout the area. Several of the disused pits have filled with water and provide a series of water bodies throughout the area. This may aid in the creation of wildlife corridors, taking advantage of the sites close proximity to the Brisbane and Bremer Rivers, and the White Rock Conservation Park, and several local parks and other creeks. An area of environmental value may also have increasing value as urban development encroaches on the area and more vegetation is cleared to make way for it.

The challenge will remain getting the balance right between the economic potential of the area (industrial or otherwise), the need to address current and future environmental concerns and issues, and the need to accommodate increased urbanisation in the adjacent areas. It is quite possible that a mixed landuse option will be the most suitable and sustainable outcome for this area.

7. CONCLUSIONS

The Ipswich area has had a long relationship with coal mining, which has only recently ended. That relationship has brought employment, wealth and development, but has left a substantial legacy of disturbed land that needs to be carefully managed.

It is unlikely that a single, fixed plan or landuse option will be suitable for the area. A flexible approach, that establishes environmental and social baselines and benchmarks, in which changing preferences and attitudes for land use can be accommodated, will be needed. This is especially the case given the fact that the whole region is growing rapidly in both population and economic terms.

Interest in this area is at present high – from landowners, developers, local and state Government, and the local community. The opportunity for sustainable thinking and planning exists now. Therefore, determining appropriate processes, which take account of these numerous intersecting interests, will be key in determining reasonable sustainable development outcomes for the area.

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