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Planning an Oasis in the Desert: 
The Design and Planning of Roxby Downs

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INTRODUCTION

With the recent release of the Draft Guidelines / Issues Paper by Planning SA, the preparation phase for an Environmental Impact Statement (EIS) for the Olympic Dam expansion project has commenced under the management of BHP Billiton and ARUP. Of the overall 50 page document only 4 paragraphs specifically refer to and discuss the future of the town of Roxby Downs. This call for submissions, and the pending EIS that will be released in mid 2006, will include a ‘Roxby Downs Master Plan’ that will describe the future urban design and expansion issues for the town. The town presently comprises approximately 4,000 residents together with the Camp 1 construction camp at Olympic Dam that caters for an additional 800 people. As part of the overall development it is envisaged that the town will expand to 11,000 residents with a projected 3,000 construction camp workers and with Camp 1 being closed due to its incorporation within the mine expansion.1

In the most recent newspaper review on the prospective re-development of the Olympic Dam mine in South Australia, the media has finally shifted its attention from the uranium mine expansion to the future of the adjacent Roxby Downs town. Such is the nature of the current media debate about the project, that the town and its residents have been largely forgotten in terms of what will happen to them and how will the town accommodate this expansion. Mining projections are to increase gold production ‘from 80,000 ounces a year to 500,000 ounces, making it the one of the largest gold mines in Australia.’ Mining would also increase uranium production from ‘4,500 tonnes … to 15,000 tonnes per year,’ copper from 220,000 to 500,000 tonnes per annum of ore, silver from 800,000 to 2,900,000 ounces, and also increase the life of the overall mine from 70 years to 100 years.2

Situated in the arid zone of northern South Australia, Roxby Downs was developed by Western Mining Corporation (WMC) to accommodate workers and their families involved in the Olympic Dam uranium mining project. It was positioned 11km due south of the mine. Initially conceived to accommodate some 8,000 residents, it was developed to accommodate some 3,500 residents initially and has progressively grown to 4,000 residents in the last 5 years. The mine and town were established through the Roxby Downs (Indenture Ratification) Act 1982, with subsequent amendments in 1996, by the South Australian state government, and Kinhill-Stearns Roger undertook the preparation of the Olympic Dam Project Draft Environmental Impact Statement (1982) on behalf of Roxby Management Services Pty Ltd for the overall project. Since 1982 all new Australian mining ventures have been predicated on the basis of a fly-in-fly-out lifestyle as typified in the Pilbara and Kimberley regions of Western Australia in places like Paraburdo and Argyle mines. So the decision to proceed with a new town was both a challenge as also a philosophical commitment by WMC in providing a quality and efficient working environment for its employees and their families.3

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By 1997 the re-named WMC Resources (WMC) had decided to double the mining operations and commissioned a feasibility study and EIS as prepared by Kinhill Engineers. This EIS validated the existence and role of Roxby Downs as servicing the mining operations but also proposed extensions to the town to the south and east that enabled a different town character to evolve. This was an important shift in the urban design philosophy of the town. For, while the original town was seen as rotating from a central lineal core, with relatively standard typical Adelaide allotment sizes, curvilinear road patterns, conservation of significant Western Myall *Acacia papyrocarpa*) trees, overall road and house construction and planting by WMC in a co-ordinated manner, and a single storey environment set within a parkland setting, the second stage was markedly different. The second stage sought a much lower density, a set of subdivision estates that were further from the central core, varied allotment sizes, varied and more sweeping road patterns and introduced roundabouts, varied the logic of the parkland setting to one of a much more open landscape setting, and enabled individual builder developments in an estate that was constructed by WMC. Thus, the philosophical character of Stage 2 developments were much different than Stage 1 and today are also very different aesthetically and in terms of the appearance of density and housing form.

In early 2005 WMC was subject to a potential takeover by Swiss mining house Xstrata before BHP Billiton proposed an offer which was subsequentially accepted by WMC Resources board and their shareholders. On 1 September 2005 WMC Resources was officially acquired by BHP Billiton, and BHP Billiton has been proceeding to enable the expansion of the Olympic Dam and has determined that the fly-in-fly-out strategy is inappropriate wishing to create a quality residential environment adjacent to the mine for its employees and service contractors.

The terms of reference and scope of the present Olympic Dam expansion are set out in the *Draft Guidelines / Issues Paper (2005)* prepared by Planning SA.

The re-development of Roxby Downs has come at an interesting time in enabling a reconsideration of arid zone planning and design in South Australia. With the proposed Olympic Dam expansion, the town will double in population, a new set of planning and design issues will now arise many of which are linked to the original ideas behind the siting, layout, planning and form of Roxby Downs town.

**The Landscape of Roxby Downs**

Situated in the middle of northern South Australia, the landscape of Roxby Downs and Olympic Dam is arid. The town has an annual rainfall of 150mm and is located in a series of low dunal swales. Soils are mostly deep red sands varying from pH 7 to 8 with some clayey soils in the bottom of the swales with pH 8 to 9.5. On these dunes and swales grow a mixed open low woodland and tall shrubland vegetation community dominated by Native Pine (*Callitris glaucophylla*) on sand dunes, Western Myall (*Acacia papyrocarpa*) in swales and Mulga (*Acacia aneura*) in intermediate areas. Ground cover and shrub species include Native Apricot (*Pittosporum phylliraeoides*), Bullock Bush (*Alectryon oleaefolium*), various *Eremophila* species, Horse Mulga (*Acacia ramulosa*), Sandhill Wattle (*Acacia ligulata*), Narrow-leaved Hop Bush (*Dodonaea viscosa* ssp *angustissima*) and Quondong (*Santalum acuminatum*). Chenopods cover much of the heavier soils together with perennial grasses on the sands.
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Water supply for the mine operations and town is at present piped from bores at the Great Artesian Basin around Lake Eyre, and all other services are drawn in from the south via Pimba.

**History of Planning for Towns in South Australia: Theory and Context**

The theoretical position of the majority of towns in South Australia has been heavily influenced by the principles of a park land town model as devised by Surveyor General George Goyder in the 1860s. This model epitomised the systematic rationale settlement planning model upon which South Australia was envisaged by the South Australian Colonisation Commissioners, and that Goyder expressed in plan and word through instructions to his surveying teams in how to plan for the expansion of the colony's settlement. But it also draws from Light's now famous Adelaide city model which is deeply woven within and inspired this template.

The essence of this systematic colonisation of the colony was a rationale and efficient organisation of space that could enable settlement, development and particularly agricultural advancement. Goyder expressed the logic behind this surveying agenda as:

... the survey embracing the principle watercourses, most prominent hills and gaps in, or passes over the ranges as well as indicating lands or crossing over streams and gullies, and the position of the finest land would enable the necessary leading lines of road to be decided upon by the time that the survey of town lots had been completed.\(^8\)

Surveyed by Light, the template of Adelaide was apparently considered by Goyder an efficient model to transpose across the South Australian landscape. Goyder's tenure as Surveyor-General from 1861 to 1894 enabled the fruition of this agenda. This template, or variations of it, underpin nearly every country town in South Australia. The essence of the template is a semi-rectangular town survey, positioned on a watercourse or reliable water source, with a surrounding park land or common, and the town was positioned somewhat centrally within the Hundred to enable ease of access. This template varied occasionally according to topography or coastal location but the structure remained essentially the same even with the advent of railway lines. Perhaps the most radical variation of this template was the positioning of the park land in the centre of the town like at Strathalbyn, not surveyed under Goyder's administration, but which unconsciously applied the same archetype template with the same consequences.

With the appointment of Charles Reade as South Australian Government Town Planner in 1916, by the Labor administration, Reade sought to translate Ebenezer Howard's Garden City principles into South Australian situations, and in particular at Colonel Light Gardens and in the Riverland. Reade's presence re-awakened the Adelaide template, the theoretical model of Goyder, and the archetypal systematic settlement principles that underpin the spatial existence of South Australia. The park land city was celebrated but modernised bring to bear curvilinear streetscapes and modern principles of garden city theory but still incorporating park lands on the edges or within the town plan. Successive town planners to Reade continued this same template.\(^9\)

With a revival in strategic town planning allied to economic expansion following World War II these principles were re-visited in the design of Elizabeth. Elizabeth, modelled upon the garden city ideas of examples developed in England in particular
Welwyn City, epitomises the rationalist systematic settlement model as expressed by the Liberal administration under Playford. This celebrated settlement applied the same template along contemporary lines drawing park land threads into the settlement in deference to its placement surrounding Elizabeth. This derivation draws much from Colonel Light Garden wherein Reade transposed the park land into a series of parks and park land threads within the master design. Thus, the park land model had been deconstructed but its theoretical agenda had still been ensured by its direct incorporation within the town or settlement.  

This deconstructed park land model has, in the last fifty years, become the accepted theoretical model for further town, suburb or city development in South Australia. Where normally a planner would consider the placement of parks and gardens taking advantage of geographical features, as commonplace in Canberra, in South Australia the park land has become an absorbing element in any design or master plan even to the continued use of the term ‘park land’ as a textual expression of this archetype on all plans. This is distinctively a South Australian characteristic and one to which every South Australianconceptually understands the concept of and expects a ‘park land’ in every development and not simply the provision of a ‘park’ or ‘garden’. Thus, projects like Mount Osmond, Springfield, Monarto, the Multi-Functional Polis proposal, Golden Grove, and Mawson Lakes capture this modern template.  

Looking northwards from Adelaide, Port Augusta was surveyed similarly to Strathalbyn to incorporate dual park land squares around which the main portion of Port Augusta was developed. Northern Port Augusta, when surveyed also applied the edge park land model, whereas settlements such as Woomera and Leigh Creek sought to impose the deconstructed park land model within their master plans.  

To the casual observer, Roxby Downs does not express this model. It visually reads as piece of outer suburban Adelaide transposed upon the desert landscape. This is a visual myth. Instead the town exists with a central park land and recreational node jutting into the Richardson Place commercial precinct. Surrounding the commercial precinct each residential area has been draped over the intermediate portions of the approximately east-west orientated low lying dunal system leaving the crests and vales of the dunes for park lands and drainage purposes. The term ‘park land’ has even been transposed upon the original master plan for these open space areas, of which each is linked by a pedestrian circulation system.

Arid Design in Australia: Practice and Context

Arid Design is a little researched and considered topic worldwide. In approaching the design and development of contemporary communities in arid environments there has often been a tradition of imposing ideal garden city town principles into the environment and to create something that is not conducive, relevant nor responsive to the arid landscape. Around this, the community had to build in services, infrastructure, and building forms that were commiserate to non-arid environments. This contemporary strategy failed to draw upon past precedents when numerous historical settlements had been established in arid environments around water sources, trade routes and strategic geographical features. With the advent of mining ventures in arid Australia a non-arid logic was applied in town, house and landscape design in the 1950s-70s resulting in the transposition of the Canberra suburban model of an integrated village or suburb being developed in the Pilbara (including Paraburdoo, Kambalda, Leinster), northern Queensland (Moranbah) and Northern Territory (Ranger). A similar strategy was employed in places like Arizona, New Mexico, and
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the Persian Gulf in new community development where water was not seen as a physical or cost deterrent resulting in tracts of ‘lifestyle’ ‘sun-belt’ suburbia being created in the former and vast new cities in the latter.

In South Australia, the only deviation from this approach was the development of Woomera. Woomera was developed by the Commonwealth Government as part of the Joint United Kingdom-Australia Long Range Weapons Project (LRWP) reputedly from an international competition winning design prepared by a North American author very much modelled upon the existing southern central Californian town of Inyokern. This was a settlement drawn out of the celebrated surveying strategies and periphratic journeys of Len Beadell in the late 1940s. The site for Woomera was determined in 1947. It was designated ‘Woomera’ after a Pitjantjara Aboriginal word meaning ‘throwing stick’; the locality was the country of the Kokatha and not the Pitjantjara indigenous group. The actual design for Woomera was prepared by Commonwealth Government Department of Works & Housing staff in mid 1947 and construction commenced in October 1947 with families arriving in 1949, and was designed to accommodate a population of 6,500. The design is characterised by a series of interconnecting loop roads, the division of the town into quarters, clear zones for functions, and a central service and facility core shaped in an arc with an eastern outlook. The 250ha site is on relatively flat treeless plateau, with an annual rainfall of 191mm, sloping northwards, southwards and eastwards from the central core, with highly alkaline and saline soils of generally pH 9.

Between 1950 to 1953 some 17,000 trees and shrubs were planted in Woomera under horticulturist Rex Patterson, and prior research and trials at Port Augusta and on the Transcontinental Railway revegetation project, resulted in a replacement of 944 trees and a loss of 5% of plantings.

Patterson’s conclusion from these planting works was:

After twelve years of research and experimental work on vegetation in the arid zone, there can be no doubt that the soils of this area are capable of growing most forms of plant life, providing a limited form of irrigation can be made available.

By the 1970s a series of sustainability ideals, as articulated by the Rio de Janeiro declaration on Agenda 21, had been incorporated into the philosophical approach taken by the state government. This approach sought to create ‘sustainable’ and environmentally relevant communities in the state to cater for growth and infrastructure servicing. The catalyst for this approach grew out of the innovative and exhaustive investigations for Monarto, in a semi-arid environment, that resulted in a considerable body of research and thought. Monarto was envisaged as new city to accommodate the growth of Adelaide so that it would not spill out into the Barossa and Willunga Valleys. It was projected to accommodate a population of 500,000 in a semi arid undulating landscape, with clayey to loam saline soils pH 7 – 9, with an annual rainfall of 250mm. While such thought, designs and plans were not released, architect Philip Cox appropriated the knowledge and drew together several members of the Monarto planning and design research teams to devise the successful design for Yulara in arid Northern Territory adjacent to the Uluru-Kata Tjuta National Park.

In the interim the knowledge was also applied in the development of Leigh Creek in 1979-82 for ETSA to accommodate staff and families working on the Leigh Creek coal mines. Completed in 1985, the town was proposed to accommodate 2,000
residents but has dropped to 600 recently. Sited on a strongly undulating site focused around a ridgeline with aspect the northern Flinders Ranges to the south-east, the town receives an annual rainfall of 205mm, and is sited on highly alkaline saline often sodic soils of pH 8.1-10.0. Following completion the town attracted design awards as being “an excellent example of arid zone town planning, incorporating effective water conservation techniques, whilst maintaining a high standard of public landscaping.” The model also informed the rationale of the Development Guide for Arid Areas in South Australia (1983), around which water sensitive landscape design treatments were identified as essential. This rationale was more extensively detailed by Zwar and Jones in ‘Water Conservation and Arid Landscape Design’ (2003).18

Interestingly the design and planning agendas for Leigh Creek and Roxby Downs were very much the same but little communication occurred between the two teams that devised these towns. It is know that the Leigh Creek consultants together with staff from the SA Department of Environment & Planning provided report copies to WMC and visited the construction site of Roxby Downs, but they were not directly consulted on the design and planning of Roxby Downs. Despite this there were both similarities and dissimilarities in thought and approach applied in Leigh Creek and Roxby Downs.19

**History of Roxby Downs**

In 1975 deposits of uranium together with lesser amounts of copper and gold were discovered by the then Western Mining Corporation, now known as WMC Resources. By the early 1980s the deposits were proven viable and WMC entered into discussions with the South Australian state government wherein an Indenture was proposed setting out the arrangements for a town, and an Environmental Impact Statement (EIS) was prepared. The Indenture set out the mutual obligations of WMC and the state government in establishing and servicing the town including provision of a local government Council system to manage the town as WMC developed and thereupon released developed land and buildings to the Council. The Indenture specified an area of 110^2 km to form the Council jurisdiction carved from the larger WMC owned pastoral station leaseholds of Olympic Dam, Roxby Downs, Purple Downs and their associated mining leasehold.20

Land clearing, road construction and the first houses were erected in 1987. Many of the initial houses were prefabricated Alan Shepherd company stock houses. In addition, one of the first works was the erection of a rabbit proof fence of some 16km long around the agreed municipal precinct.21

In 1997 WMC proposed a further expansion of the mining operations at Olympic Dam. The immediate implications were a large expansion of the mine operation but also an increase in town population from 3,500 to 4,000.22

**Design of Roxby Downs**

In proposing the town of Roxby Downs the first EIS articulated a statement as to the intent of the ‘town design’:

In the conceptual design of the town, particular attention has been paid to mitigating the effects of climate and to the preservation of vegetation and dunes on the town site.
It is intended, from its inception, the town centre will provide the principal focus, and at the planned development size of around 9,000 people most of the population will live within 2 km of this centre.\textsuperscript{23}

Further, proposing a green habitat initiative, the first EIS proposed that:

The town will be fenced within a buffer zone to prevent access by rabbits and other herbivores. Particular attention will be given to structural and other land use control measures to ensure the preservation of an adequate green belt. Harmful land uses such as trail bike riding will be directed to suitable locations outside the town to prevent nuisance problems as much as vegetation destruction and dust generation.\textsuperscript{24}

This second statement highlights a concept to establish 'green belt' or park land surrounding the town; thereby embracing the distinct South Australian systematic planning model of park lands. The 16km long fence was erected, and is now in a semi-derelict condition. Within the town was established a series of internal park land segments that are interconnected by a system of pedestrian and cycle trails.

A key feature of Roxby Downs is its Richardson Place commercial precinct. This is a linear streetscape, aligned east-west along a wider than normal drainage swale, that was designed with a central 'green' plantation strip. On the southern side was envisaged a cluster of commercial facilities and businesses, including hotel accommodation, a tavern and a shopping centre. On the northern side was envisaged a series of community facilities, including swimming pool, auditorium, primary school, community library, and TAFE branch. These facilities have been constructed and are operational today.

Richardson Place was the central thread to the master plan and strategically was positioned in the middle of the Roxby Downs town development so that it was accessible by foot and cycle routes. It was also designed to accommodate angled parking as normal in South Australian country towns. The distinguishing feature missing was a clear strategy as to street tree planting to ensure shading of parking spaces as well as the plantation lawns itself. Seven metre wide verges were instead designed on the sides and central plantation.\textsuperscript{25}

A 'water borne sewerage collection system' was proposed and implemented for the town. This system matched well with the use of the dunal landscape pattern as it enabled a gravity fed supply of sewerage to collection points. The collection points fed to a series of facultative lagoons located west of Olympic Way, and re-use of the effluent was proposed for intensive recreation facilities by pumping the water back up the contours.\textsuperscript{26}

Planning for Roxby Downs

In investigating sites for a town associated with the Olympic Dam venture, 6 sites were considered adjacent to the mine together with Woomera and Andamooka. Woomera was rejected due to distance and its stark landscape character. Andamooka was rejected due to distance, its existing community character, and its extant mining assemblage. The six other sites were evaluated in terms of amount of developable land, impact on adjacent pastoral leases, proximity to the existing infrastructure corridor, ease of construction, risk of occasional inundation by flash-flooding, general amenity, and horticultural aspects. Two sites, 1 (Lake Blanche) and 4 (Axehead Dam), were the most ideal with the latter providing the largest developable land tract as well as significantly achieving the last two factors. Thus, amenity and character in
the first instance determined the actual siting of Roxby Downs which was to be developed on site 4.27


While the administrative structure of the town was clearly set out in the Indenture, the Indenture also set out the service and facility provision obligations of the state government and WMC. Under this arrangement John Harris was appointed in 1981 as ‘town development officer’ and thereby future resident voice and opinion; a position that was later re-titled as Town Administrator.28
Town planning for the town of Roxby Downs was largely passed to staff at Kinhill by WMC to prepare under the principle direction of engineer Brian Mackay. The requisite given by WMC to Kinhill was to create 'a typical South Australian country town, or a suburb of Adelaide' in character, image, services and quality of lifestyle 'to encourage people to stay' but which was 'relevant and responsive to the arid environment' it was to be situated within. Mackay saw the planning in three threads—social planning, engineering, and economic—and correctly perceived engineering as the most important in determining a successfully structure for the town and informing the road and drainage networks.29

The EIS identified a potential location, confirmed by site inspections, but it was only when formal engineering works commenced that several errors of logic were recognised in the EIS relating to the town design. These errors rotated around site drainage, appreciating the distinct dunal landscape and how to weave it into the subdivision design, and the desire by residents for the provision and conservation of park lands within the design. Also, as the town developed WMC progressively downgraded its population projections from 8,000 to 3,500, in line with new advances in mining excavation technologies that enabled greater returns for less human resources, enabling Kinhill to better consider the site but not address forward expansion with any sense of rigour.

Fig 2
Conceptual Town Layout, Environmental Factors. Source: Kinhill-Stearns Roger, Olympic Dam Project: Draft Environmental Impact Statement, Keswick, SA, Western Mining Corporation (Olympic Dam Corporation), Figure 11.7.

Central to this planning was not strict planning ideals but topography and rain. It may sound illogical to talk about rain being a constraint at a site that experiences only 150mm annual rainfall, but it is the density of falls and how the topsoil distributes and absorbs water that is are engineering constraints. Because the landscape has east-west aligned sand dunes, 3.0-9.0m high, on average 5.0m with a 1% average slope, with
drainage swales 50-200m wide within flowing westerly, efficient drainage is difficult when suburbia infrastructure is imposed upon this landscape. Where swales open up low lying drainage basins are common and these are major points of water accumulation during heavy downpours. Drainage therefore became a “major determinant in the layout of the streets” and it explains the often east-west circulation system in the town together with the orientation of housing that face principally north-north-west or south-south-east to not just gain solar orientation.

Coincidently the drainage structure of the site paralleled the extant tree cover that was principally Western Myall (Acacia papyrocarpa) trees in the swales and along swale edges with Native Pine (Callitris glaucophylla) trees on the dunal ridgelines. The dunal alignment also enabled natural ventilation as cool winds flowed from the west, and slopes enabled easy gravity feeding of water and sewer in a westerly direction.

These characteristics were also expressed in the first EIS whereby:

Climatic extremes and the relative isolation will require sensitive town planning and house design, and climatic factors will have a major influence on subdivision layouts, design and orientation of housing, and policies for the maintenance of existing vegetation.

The morphology of the proposed town site, with its pronounced pattern of sand dunes and swales, is an important environmental feature. The swale areas can more readily accommodate development, as once dune areas are disturbed they have the potential for sand movement.

Interesting, and which was not originally envisaged in the original EIS investigations, the main north-south town deviation road now called Olympic Way also approximately demarked a shift in the character of the drainage systems in the landscape. Along the road today is a series of three major water detention ponds. To the east of the Way was the town and its medium shallow undulating dunal swale system, and to the west was a low shallow dunal swale system with wide open basins where water tended to accumulate and settle.

The town was also envisaged as a single storey settlement so that it would nestle within the dunal landscape system, and that roof forms would not visually detract from the quality of the residential environment.

Open spaces were therefore easy to position. The ridgelines with their open shrubland to open forest Native Pine (Callitris glaucophylla) tree cloaked ridges and steeper slopes thereby became candidates for an open space system that enabled an internal pedestrian and cycle path system to be established. This was ideal as the Native Pine (Callitris glaucophylla) trees were not attractive backyard trees whereas the Western Myall (Acacia papyrocarpa) trees with their light foliage and wide manner enabled shade and a form reminiscent of a wide-spreading evergreen ornamental tree. This open space strategy was applied despite a conclusion in the EIS that “open space areas would be a nuisance to maintain.”
The overall design objectives for the design of Roxby Downs were:

- provision of developable allotments
- provision of social facilities
- provision of a hierarchical road system
- a 2km developable radius from the town centre
- development of an aesthetically pleasing physical environment
- development of a town centre with commercial, social and cultural facilities
- development siting on swales
- minimization of development on ridgelines
- avoidance of development in drainage depressions
- maintenance of existing vegetation, particularly Myall groves, Mulga, and Canegrass swamps
- minimization of flood damage

The main precedents used by Kinhill were Shay Gap, and Kambalda and Leinster in the Pilbara. The latter two were towns that had been developed by WMC so they very much informed the corporate premise of what Roxby Downs should be in the eyes of WMC. Lifestyle outcomes of these three towns were also informed by research by the CSIRO’s Remote Communities Environment Unit and Division of Building Research.

Leigh Creek was relevant but seen as a benchmark, and the Development Guide for Arid Areas in South Australia (1983) had not been published when planning was undertaken.

**Planning for Roxby Downs Extensions**

Arising from a WMC decision in the mid 1990s it was proposed to expand the Olympic Dam mine operation thus necessitating an expansion of the town. Immediately WMC fell back upon the now flawed assumptions as to town spread and form contained in the first EIS and commissioned Kinhill to prepare an further EIS that grappled with these flaws but did not come to a clear planning and design answer. Kinhill instead recommended a lower density allotment style development to enable choice to residents, a road pattern that was more curvilinear in form than previously applied echoing low-density contemporary suburbs in Adelaide, and expansion to the south. The difficulty with the latter decision was that the land opened up further with the swales getting wider, the greater propensity of coming across archaeological sites, there were less clumps and patches of Native Pines, and that any development to the south started inappropriately stretching the town and distancing residents and car movements further from the centre of the town. Characteristically the landscape to the south was similar in physical form to that to the west of Olympic Way but from a town planning perspective distanced its form and servicing far from the central Richardson Place commercial and service core.

These conclusions were not recognised at the time of the EIS preparation, did not draw upon the knowledge of Mackay and Harris who had shifted to the practice BC Tonkin and retired respectively. In Mackay’s mind, the expansion southwards meant ‘roads carved in hollows resulted in an inefficient subdivision; very spread out; [with] no care for open space.’ To further complicate the situation, it was noticed that many of the Western Myall (Acacia papyrocarpa) trees were dying. WMC
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environmental science staff concluding that some 80% of these trees may have been infested by White Fly which was the suspected source of the deaths. This was a major concern as it appeared that Western Myall (*Acacia papyrocarpa*) trees in the existing town were not largely affected but those to the south and along the perimeter road routes were tending to die leaving often swaths of trees in previously open space and drainage swale designated areas. This undevelopable land further exacerbated the low density character of the southern town expansion.  

**Future Expansion Issues and Directions**

While it is easy to say ‘let’s expand the town of Roxby Downs’ is not easy to achieve this objective by virtue of a number of previous planning and design decisions, and the environment of Roxby Downs itself. The challenge is now in front of BHP/B and the Town Council to guide and inform this planning and design process.

At Roxby Downs a true township has been created from the desert, with a settled populace and a defined character. The urban framework has been established and the mainly professional inhabitants have become proud of their ‘place in the desert’. The settlement is a deconstructed systematic park land model town that is shaped by the east-west aligned dunal landscape.

However, the town is now at a transition point. It is moving from its initial establishment phase to one of consolidated growth. From now on the town will face significant challenges, not least because of a doubling in its size. New people will arrive with new attitudes and demands, creating a significant need for new housing and for new housing typologies. Roxby Downs is a town that will need a strong and sustainable Urban Design Plan to guide its development, respond to the demands of its environment and create a place that is loved by its people.

Key planning elements for a new Master Plan will include:

- consideration of residential developments and density forms that maintain the ‘geographic heart’ of the town;
- incorporation of the dunal landscape system;
- a strong commitment to sustainability in all aspects of design, from infrastructure through to architecture and to the landscape itself;
- re-visitation of extant subdivision and residential units to consider more relevant residential typologies that may fit the needs of this change in lifestyle.
- relocation of the airport;
- achieving a balance between accommodating the needs of the environment and meeting the demands on space;
- rethinking locations of key services including sewer, education, recreation, commercial so that they are more efficient in access and synergistic in relationship;
- efficient access systems;
- crafting of enhanced entertainment and recreational opportunities; and,
- integration of the old with the new to avoid the development of large stretches of stereotypical unrelieved suburbia.
The key will lie in a mature translation of the park lands archetype and a careful embrace of the environment within which the town is situated.

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10. Alex Ramsay, ‘Factors affecting the siting and design of Elizabeth’, Proceedings of the Royal Geographical Society of Australasia (South Australian Branch), no 57, 1956, pp.5-14; Alan Hutchings, ‘Comprehensive Town Planning comes to South Australia,’ With Conscious Purpose, pp.61-83.


16 Patterson, *North West arid interior South Australia*, np.


20 Kinhill-Stearns Roger, *Olympic Dam Project*.


22 Kinhill Engineers, *Olympic Dam Expansion Project*.


29 Mackay pers comm 2005.


31 Kinhill-Stearns Roger, *Olympic Dam Project*, p.11-23.


33 Mackay pers comm 2005.


