



25 January 2010

Appendix

Minmi Link Road and Stockrington

Lower Hunter Lands Project

Preliminary Environmental Assessment

Water Sensitive Urban Design, Flooding and Stormwater Management

1 Description of the proposal

It is proposed that the entire Coal & Allied Industries Limited (Coal & Allied) owned Minmi/Link Road and Stockrington sites be rezoned/listed as a 'State Significant Site' (SSS) in Schedule 3 of State Environmental Planning Policy (Major Development). A draft Schedule 3 listing will be prepared with the Concept Plan Application.

The Concept Plan for a residential subdivision of the Minmi/Link Road site will apply to the entire 537ha Minmi/Link Road and 2,247ha Stockrington site. The key parameters for the proposed development of the site are as follows:

- ▶ Dedication of 2,264ha of conservation land (less 300 ha biodiversity offset land to be transferred to RTA and then to DECCW) to the New South Wales Government (NSWG) that is identified in the Lower Hunter Regional Strategy and Lower Hunter Regional Conservation Plan, comprising 100% of the Stockrington site and approximately 17ha of the Minmi/Link Road site.
- ▶ Maximum dwelling yield of 3,300 dwellings over 520ha.
- ▶ Indicative development staging. The number of lots and extent of staging for release areas will be largely dictated by the service infrastructure requirements as well as responding to market forces.
- ▶ The provision of associated infrastructure.
- ▶ Torrens title subdivision of the Minmi/Link Road site. The Torrens title subdivision of Coal & Allied land will enable the following:
 - To dissect land on either side of the F3 Freeway and to separate the development lot from the conservation land.
 - To enable the transfer of approximately 17ha of land at Minmi/Link Road to the North of the Minmi Rural Fire shed to NSWG for conservation purposes.

Approval will not be sought under the Concept Plan for a specific lot layout. An indicative lot layout will indicate how the maximum dwelling yield of 3,300 dwellings could be achieved on the site.

Similarly, approval will not be sought under the Concept Plan for subdivision or construction of individual houses. However, the desired future character of the proposed concept plan will be included in Urban Design Guidelines. Urban Design Guidelines will be prepared to inform the Concept Plan in respect of urban form, built form, open space and landscape, access and movement and visual impact for the site.



It is proposed to dedicate land for conservation purposes as part of the Major Project Application via a Voluntary Planning Agreement (VPA) between Coal & Allied and the NSWG in accordance with s.93F of the Environmental Planning & Assessment Act, 1979 (EP&A Act).

The proposed Concept Plan and a Plan showing the proposed development areas and conservation areas is included in the Preliminary Environmental Assessment (PEA) prepared by Urbis.

2 Statutory Requirements

In addition to the statutory requirements under the Part 3A of the *Environmental Planning and Assessment Act 1979 (EPAA)* process, the discipline specific guidelines relating to Water Sensitive Urban Design, Flooding and Stormwater Management which should be considered include:

- ▶ Integrated Catchment Management Plan for the Central Coast 2002 and Draft Hunter Central Rivers Catchment Management Authority (HCRCMA) Catchment Action Plan 2006 – both plans are administered by the HCRCMA and prioritise investment in natural resource management for this area;
- ▶ NCC LEP and Development Control Plan 2005 - guides development across the Newcastle LGA, notably in the areas of flood and water management,
- ▶ Lake Macquarie City Council and Development Control Plans 1 and 2 – outlines requirements for development within or near water bodies, floodplains, steep lands, acid sulfate soils, mine subsidence districts and heritage conservation areas;
- ▶ The Australian and New Zealand Guidelines for Fresh and Marine Water Quality, 2000; and
- ▶ NSW Floodplain Development Manual, 2005 - which outlines guidelines relating to floodplain management.

3 Existing Environment

The Minmi and Link Road sites experience a sub-tropical climate with rainfall predominantly occurring in late summer and autumn. A typical operational daily rainfall station is located at Newcastle Nobby's Signal Station (BOM Stn 061055), which registered a mean annual rainfall of 1144.6 mm for the period 1862 to date. The mean monthly rainfall and number of rain days recorded by the Newcastle station shows elevated monthly rainfalls in the months of February to July, with the least rainfall being recorded in August to November. The mean number of rain days varies between approximately 10 and 12 days of rain days per month.

Topography is an important consideration when planning the location of stormwater management facilities, such as detention basins. On the Minmi sites, many land parcels have areas of steep gradients. In addition drainage catchments discharge at a number of locations from the site. In general slopes are highly variable and generally reflect a terrain that has been modified by past mining activity. The Link Road North site is located to the south of the existing Minmi village, at the extent of the Hexham Swamp catchment. This site slopes steeply towards the north. The Link Road South site, located south of Link Road, comprises more gentle slopes and drains towards the south and Lake Macquarie.



The watercourses draining the Minmi and Link Road North sites discharge into Hexham Swamp, a large wetland system of the Hunter River estuary.

The main channel of Minmi Creek flows through the Minmi West Precinct, to the west of the existing Minmi village area. Back Creek, a major tributary of Minmi Creek, rises on the Link Road North site, flows north through both the Minmi West and Minmi East Precincts, before entering Minmi Creek just prior to discharging into sensitive receiving environment of Hexham Swamp. There are a number of additional tributaries on the Minmi East Precinct, discharging directly to Hexham Swamp.

The geomorphic features of many of these creeks have been highly modified by past mining activities and construction of the stormwater system for the existing Minmi village. Typically the upper reaches show defined bed and banks, steep bed slopes and good riparian vegetation along their length.

The Link Road South site gives rise to a number of tributaries, which converge, into Brush Creek. Brush Creek eventually flows through the urban areas of Edgeworth and Argenton and enters Cockle Creek at the Waratah Golf Club. Cockle Creek flows into the northwest corner of Lake Macquarie.

Flooding of Minmi Creek and the other tributaries across the site is a risk that needs to be considered and managed, in accordance with the NSW Floodplain Development Manual, 2005. Flooding would be associated with a number of the tributaries draining towards and through the site. In the lower reaches, backwater effects from the Hunter River and Hexam Swamp would potentially affect flood risk.

Groundwater matters are considered in a separate Preliminary Environmental Assessment, being compiled by Douglas Partners.

4 Potential Impacts

Operational Impacts

The operational flooding and stormwater management impacts associated with the development would predominantly be restricted to the developable portion of the site and receiving waterways. As such, there are likely to be minimal impacts on the hydrology of the majority of the overall site, in particular the conservation area.

Development results in increased impermeable surfaces (roofs, driveways, roads, pavements etc.), which could affect the hydrology. If not managed effectively, this 'hardening' of the surfaces could lead to the following operational impacts:

- ▶ Increased stormwater peak flows, leading to increased flood risk and erosion (on-site and off-site);
- ▶ Increase stormwater runoff volumes, which could impact downstream sensitive habitats in terms of flushing regimes (frequency, volume and rate), water quality, and wetting cycles;
- ▶ Increased stormwater pollution discharged to receiving environments as a result of pollutant entrainment in the increased runoff. The type of development and associated activities may introduce differing pollutant profiles, for example vehicular traffic could increase hydrocarbon introduction. In general, typical pollutants include litter, sediment, suspended solids, nutrients, hydrocarbons and toxicants;
- ▶ Reduce rainfall infiltration to the soil leading to impacts to the water balance, (including groundwater recharge and salinity impacts); and
- ▶ Impact groundwater flow due to site compaction, fill, landform reshaping and underground structures.



Construction Impacts

During construction there are additional impacts to pollution, erosion and sedimentation. Increased erosion and sedimentation on account of landform disturbances and accidental spills within unbunded areas of the site could discharge to the receiving environment. Clearing and earthmoving activities have the potential to impact on surface water quality in the vicinity of the site, especially during high rainfall events. The activities and aspects of the works that have potential to lead to erosion, sediment transport, siltation and contamination of natural waters include:

- ▶ Earthworks undertaken immediately prior to rainfall periods;
- ▶ Work areas that have not been stabilised and clearing of land in advance of construction works;
- ▶ Stripping of topsoil, particularly in advance of construction works;
- ▶ Bulk earthworks and construction of pavements;
- ▶ Washing of construction machinery;
- ▶ Works within drainage paths, including depressions;
- ▶ Stockpiling of excavated materials;
- ▶ Storage and transfer of oils, fuels, fertilisers and chemicals; and
- ▶ Maintenance of plant and equipment.

To reduce the potential pollutant export during construction, a detailed temporary Sediment and Erosion control plan would need to be developed during the detail design phase of the project.

Existing flood risk would need to be managed appropriately for the development, which would include appropriate development levels and evacuation planning up to and including the Probable Maximum Flood. In addition the increased stormwater runoff would need to be managed before discharged from the site to maintain existing flooding conditions and not increase flood risk on and off-site.

The impacts of climate change need to be considered with respect increases in rainfall intensity and sea level rise. This could be addressed in accordance with the DECCW's Practical Consideration of Climate Change, October 2007 guidelines, which recommends that a sensitivity analyses be undertaken for sea level, and the NSW Sea Level Rise Policy Statement, 2009.

Assessing Potential Impacts and Supporting Studies

Water Sensitive Urban Design, Flooding and Stormwater Management assessments and the formulation of management strategies would more fully assess the issues identified above. The assessments and management studies would include:

- ▶ Flood Study – This would define existing flood regimes and would determine flood levels extents, flow velocities. In particular the flood study would define flooding for the 100-year ARI event to inform development levels and other infrastructure requirements and the Probable Maximum Flood to define flood liable land and inform flood evacuation planning. The flood study would be prepared in accordance with the NSW Floodplain Development Manual 2005 and would consider Climate Change impacts on rainfall peaks and volume together with sea level rise impacts on downstream backwater flooding from the Hunter River; and
- ▶ Water Sensitive Urban Design (WSUD) and Stormwater Management - WSUD encompasses all aspects of urban water cycle management including water supply, wastewater and stormwater



management. WSUD is a multi-disciplinary approach that promotes opportunities for linking water infrastructure, landscape design and the urban built form to minimise the impacts of development upon the water cycle and achieve more sustainable forms of urban development. This study would assess impacts of the development on surface runoff and develop strategies to mitigate these impacts in accordance with statutory requirements and guidelines.

These studies would influence the Concept Plan as follows:

- ▶ The Flood Study would identify flood liable land and influence the developable footprint and development levels. It would additionally influence road layouts and road crossings to facilitate evacuation; and
- ▶ Water Sensitive Urban Design (WSUD) and Stormwater Management would quantify and identify the management facilities to manage stormwater from the site, before discharge to the receiving environment. The study would also demonstrate that the design criteria in appropriate guidelines are met, and present a plan for management of stormwater runoff.

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