Southern Distribution Business Park Environmental Assessment

Submission Report – May 2007

A Mariner project

SOUTHERN DISTRIBUTION BUSINESS PARK

GOULBURN NEW SOUTH WALES

MARINER | FINANCIAL

INVESTMENT BY DESIGN

Table of Contents

1. Introduction

Southern Distribution Hub Pty Limited (SDBP) is proposing the development of an integrated industrial logistics, warehousing and distribution business park, the Southern Distribution Business Park (SDBP), adjacent to the Hume Highway, four kilometres from Goulburn in New South Wales.

The concept plan application comprises two aspects:

- The subdivision, use and development of land; and
- A road interchange with the Hume Highway and associated roadworks, ancillary infrastructure and environmental measures on Council roads, for which a declaration as a "linear infrastructure project" is sought.

The project is being assessed under *Part 3A of the Environmental Planning and Assessment Act 1979 (the Act).* In accordance with the requirements of the Act, an Environmental Assessment (EA) was prepared to assess the potential environmental effects of the project on the surrounding environment and to satisfy the concurrent granting of Concept Approval and an Approval for the project described in the application.

The SDBP will have a maximum gross floor area of 1,500,000 square metres spread over 263.06 hectares within four precincts and 10.70 hectares within a community title area. An interchange will be constructed on the Hume Highway as an integral part of the project at the site previously identified by the Roads and Traffic Authority (RTA).

The EA was submitted to the Department of Planning (DoP) and placed on public exhibition from 14th February 2007 to 19th March 2007. Following

exhibition, the DoP provided SDBP with a copy of submissions received in relation to the EA.

This Submission Report provides:

- A response to the key issues identified by the Department of Planning and
- A summary of the submissions made by the public and government agencies and the SDH's responses to those submissions.

There are no plans to modify the EA. Acknowledgement is made of an error referring to a lot number of a neighboring property in Volume 1, and a reference to an alternative access along Long Street in the Visual Assessment report.

2. Strategic Issues

2.1 Federal and State Strategic Planning Reasons for identifying Goulburn and the SDBP Site

AusLink is Australia's first National Land Transport Plan. By linking transport performance outcomes to projected economic growth and development, it has transformed the way Australian Governments fund major road and rail systems infrastructure. As well as increased investment in land transport, improved long-term planning AusLink encourages the best ideas and solutions, and targets investments to achieve optimal outcomes. Integrated and strategic, AusLink combines essential transport elements for a competitive and efficient economy, and well connected cities, regions and communities.

The Australian Government is investing $15 billion in AusLink to mid-2009 and is focussed on long-term improvement to the critically important

national land transport system. This investment will develop long-term corridor strategies which are:

- Focused on the whole corridor;
- Intermodal;
- Identifying major bottlenecks and deficiencies;
- Assessing alternative solutions; and
- Considering the land transport corridor within the broader transport system.

The National Corridor Strategies take a broader, longer-term and cross-modal context for managing the total transport needs of a corridor by the most efficient means available, rather than a modally based approach. .This is based on a strategic focus and framework where different levels of government can cooperatively plan and negotiate a corridor's priorities, projects and funding This approach provides an effective context for planning and implementing improved linkages between the National Network and State, Territory and local government networks and represents the basis for better integration of land use and transport planning. It also forms an effective basis for involving the private sector in infrastructure planning and delivery, and improves transparency and accountability of decision-making.

Goulburn is strategically placed along the Sydney-Canberra and Sydney-Melbourne Corridors, a fact that is acknowledged by the recent completion of the new $50m Coles-Myer Distribution Centre. The Southern Distribution Business Park (SDBP) project provides a unique, greenfield opportunity for Goulburn to consolidate its position as a multi-modal distribution hub, and at the same time contribute to the Auslink strategy to improve the capacity and performance of the vitally important eastern

seaboard north-south interstate corridors, by improving intermodal integration.

The Strategic Advantages of Goulburn's location are highlighted in the NSW Department of Regional Development's Regional Distribution Centre Strategy.

These advantages are:

- Strategic location;
- Excellent transport links;
- Available and affordable land;
- Stable workforce; and
- A supportive planning regime.

These advantages are strengthened by the implications of Australia's future freight task which is expected to double in the years to 2020, to approximately 84 billion tonne-kilometres. This poses complex challenges for transport infrastructure planning and investments for the respective land transport modes. Growth in container traffic through the major capital city ports is a specific example of pressures on infrastructure capacity. Ports including Botany and Port Kembla are already being affected by increases in vessel sizes, limited port land and congested access. The SDBP project provides a unique opportunity to assist in alleviating this congestion.

Capital city container traffic is also expected to grow very rapidly. Auslink has identified that the total number of containers handled through Australia's ports is expected to increase by 66 per cent by 2013—from 2.9 million containers in 2002–03 to 4.8 million in 2012–13. Most of this growth will occur in the Melbourne and Sydney regions. In 2002–03, the

ports of Melbourne and Sydney each handled around one million containers a year. The expected significant growth in container throughput could potentially lead to changes in the nature of the rail task in urban and regional areas to help ease the capacity constraints on capital city container ports.

The location of the Marulan Checking Station plays an important role in the supply chain responsibility regime, and in the Occupational Health and Safety issues raised by the Australian Trucking Association and the TWU in response to the Auslink Green Paper. The Australian Logistics Council (ALC) Strategy also features a range of measures aimed at leading the development of logistics in Australia and to create competitive advantage for Australian companies and the Australian economy. One of the critical measures relates to driver safety and supply chain responsibility.

The introduction of the Federal Interstate Registration Scheme (FIRS) allows higher mass limits for certain trucks on designated routes, the boundaries of which are generally the outer metropolitan local government boundaries. Triple axle vehicles need to drop-off one bogey before exiting these designated routes. Long haul vehicles will be accommodated under FIRS, at the SDBP. In this way, a large logistics company could provide national inter-modal services to one client, regional multi-modal services to another client and locally integrated services for a third client all from the SDBP.

2.2 Site Selection for the SDBP

Table 1 highlights the process of selecting the proposed site, when all available sites were available for consideration, and the advantages of the final site.

Table 1 Site Selection for the Southern Distribution Business Park

Criteria	Features of selected site
Access to the Hume Highway	Adjacent to the Hume Highway at a point where the land was already in the ownership of government authorities (RTA and Goulburn Council) and provision had been made for an RTA interchange, at that location for access to future industrial expansion.
Access to Rail	Rail connection to the site will be subject to a separate application to the GMC and the Department of Planning.
Access to Airport	Goulburn airport is close to the site.
Appropriate zoning for land use	Contemplated land use is not prohibited under the current zoning. No private land to be acquired for construction of the interchange.
Appropriate topography	Land survey of the Goulburn area identified this site as the most appropriate location in terms of topography, changed land use; access, amenity and geology. Site topography is concave, water flows through natural channels to a single lower corner of the site providing an opportunity for a best practice innovative water solution. This enables to project to capture sufficient stormwater to negate the requirement for Goulburn Mulwaree Council to provide water services.
Environmental Considerations	Compliance with the EPBC Act. EA studies have confirmed that all environmental issues are manageable. Topography suits containment of any environmental event.
Heritage considerations	NSW Heritage Council confirmed there are no heritage items on or adjacent to the site and that the proposal to widen the road to protect the Motor Cycle Grand Prix memorial is acceptable.
Possible integration of road, rail and air logistics and transport services – a future full inter modal.	The site is adjacent to the existing airport ARTC has signed an MOU to provide access of the Goulburn Railyards. Potential to connect to the existing underutilised rail yard infrastructure
Infrastructure requirements	Access to main power substation, gas ,optic fibre and other utilities Expansion capacity in the future Safe site access for proposed B-Triple truck movements
Water demands	Topography and design provide opportunity for a best practice innovative water solution removing pressures on Goulburn Mulwaree Council to

Criteria	Features of selected site
	provide water services. The self supporting water solution is sustainable and affordable at no cost to Goulburn Mulwaree Council, with capacity to support some parts of the Council area if required.
Minimal impact on residential zones	4km from Goulburn with appropriate buffers.
Minimal impact on urban and CBD area	Minimal truck and vehicle impact on the Goulburn CBD area. No truck movements on the old Hume Highway or built up area.
Workforce availability	Workforce studies indicate availability and ease of access to site.
User demand	Independent research supports user demand.
Commercial viability	Economic modeling highlights the economic advantages of the location: • Availability of appropriately sized parcel of land to meet the large space requirements demanded by the major logistic operators • Affordability of land and the inherent business efficiencies.
Industry Acceptance	The Coles decision to locate 50,000m2 at Goulburn reflects SDBP current industry market research

2.3 Water and Sewerage Infrastructure ownership

SDH through a long term investment entity, will own the water and sewage treatment plants. SDH intend to enter into a long term agreement with a licensed operator with relevant experience in the operation and maintenance of this type of plant. It is expected that the pricing of water to the users will reflect the costs of operation and maintenance. Early indications from an operator are that at a similar price as Goulburn Mulwaree Council charges, the plant will cover the operation and capital maintenance expenses. SDH and the operator recognise the potential and benefit for this plant to be a part of the GMC area water solution. Early discussions with GMC officers encouraged this, however their response to DoP reflects a position of not wishing to be involved. Recent discussions with the General Manager of GMC indicate that Council has an interest in being the operator of this plant. SDH would prefer to explore this

solution... A meeting between Goulburn Mulwaree Council, SDH and the water facility operator is scheduled for June 2007.

Following discussions with GMC a draft Voluntary planning agreement is being prepared for submission to GMC to reflect the above and other issues such as statutory contributions.

2.4 Rail Infrastructure

Considerable research and analysis has been undertaken in respect of linking SDBP into the existing Goulburn railyard infrastructure. This has resulted in a signed memorandum of understanding MOU with ARTC to further explore the master planning and upgrade of the railyards to interface with the road transport logistics and distribution hub. This will facilitate a true fully integrated inter-modal transport system.

Work has been done on initial technical design and routes confirming that a future transport link can be constructed from the railyards to the SDBP. Further detailed work is being undertaken with ARTC and identified logistic hub operators. Rail connection to the site will be subject to a separate application to the GMC and the Department of Planning. Detailed design for that application would consider all environmental impacts, including traffic movements

3. Consultation

3.1 Activities during EA and Exhibition

SDH has been working collaboratively with the Department of the Environment and Heritage, State and local government agencies as well as the local community for over twelve months to incorporate their input into the planning of the SDBP.

As part of the preparation of the EA extensive consultation took place with agencies, government and the local community. The purpose of these activities was to raise awareness of the project proposal and provide opportunities for input from State Government agencies and the community. Since the submission of the EA, SDH has continued to undertake further community consultations.

Table 2 below lists the key consultation activities conducted during the preparation of the EA and during the exhibition period.

Table 2 Consultation Activities

Activity	Date
Project briefing day held with NSW Government Agencies (coordinated by NSW Dept of Planning)	July 2006
Project meetings with DoP	Nov 2006; Dec 2006; Jan 2007; Feb 2007; Mar 2007.
Project briefing meetings with Goulburn Mulwaree Shire Council staff	Sept 2005 - Present
Briefings with Federal government agencies	Nov 2006,Dec 2006 Jan 2007, Feb 2007
Meetings with landowners for Project	Sept 2005 - Present
Meetings with neighbors in surrounding area	July 2006 – Present
Meetings with Indigenous Land Council	Feb 2007
Meet Standing Com Transport and Regional Services	6 Sep 2006
Presentations to community leaders	July 2006 – Present
Presentation to business organisations and individuals	July 2006 – Present
Presentations to community organisations	July 2006 – Present
Media interviews and stories	July 2006 – Present
Presentations to Goulburn Mulwaree Council Elected Members	Feb 2007 Apr 2007
Advertisement of public exhibition of EA	Feb 2007
Project website established	Sept 2006
Public exhibition of EA	14 February – 29 March 2007
Advertisements in local media	Feb, Mar 2007
Retail Information Office in Goulburn	Dec 2006 –Mar 2007

Agency Briefing 15th July 2006

Consultation during the Period of Exhibition

3.2 Public Exhibition of the Environment Assessment

The EA was exhibited from 14th February to 19th March 2007 inclusive at:

- 278 Auburn Street Goulburn (Exhibition Office);
- Goulburn Mulwaree Shire Council Chambers;
- Department of Planning, Sydney;
- Department of Planning website: www.planning.nsw.gov.au; and
- SDBP website: www.sdh.net.au.

Exhibition Office

The Southern Distribution Business Park Exhibition office at 278 Auburn Street Goulburn was opened on 15th December 2006 between the hours of 10 am and 4 pm Monday to Friday and 9 am to 12 noon on Saturdays. Over two thousand people visited the office and 406 signed support petitions and postcards. Six people wrote letters of support which were forwarded to the Department of Planning.

Photographs 1 and 2 – Inside SDBP Exhibition Office

Advertisements

DoP placed an advertisement in the Goulburn Post on 14th and 16th February 2007. The advertisement announced the public exhibition on the EA and provided details on how to view a copy of the EA and make a submission. It also provided contact details for members of the community who required more information on the project or the exhibition and approvals process.

SDBP placed advertisements in the Goulburn Post on 21, 23 February, and 2,7,9,12 and 16 March 2007 providing details and a summary of the main project outcomes. The advertisement included the exhibition office address and invited further enquiry from the public.

Direct Mail

CD copies of the EA were sent to agencies nominated by the Department of Planning in February 2007. A letter outlining the proposed project and its potential benefits to Goulburn was delivered to all households in the greater Goulburn area during the exhibition period.

Project Website http:// www.sdh.net.au

The project website was updated in February 2007 to include an electronic copy of the Environmental Assessment including Volume 1 Main Report and Volume 2 Appendices (specialist reports), the project application to the DoP, facts sheets about the project and the community newsletter. The website also provided details on how to contact the Department of Planning with queries and how to obtain further information.

4 Submissions

4.1 Response to Submissions

Table 2 lists the number of response letters made available from the Department of Planning to SDH at the end of the submission period.

Table 2: Number of Submissions

Submissions	Number
DNR Road Transport Authority Sydney Catchment Authority Dept of State & Regional Development ARTC Goulburn Mulwaree Council (GMC) Urbis	**7**
Individuals to DoP and website	**47**

After comprehensive review of the submissions, the SDBP project team analysed and categorised the submissions according to subject matter, and prepared the following responses in accordance with *Section 75H(6) of the Environmental Planning and Assessment Act 1979.*

4.2 Water Supply

Given extensive and national publicity about the situation surrounding the supply of water to the city of Goulburn, it was anticipated that this issue would be foremost in the minds of both government agencies and the general public when considering the information contained in the SDBP EA.

Issues: A number of the submissions expressed concerns about the availability of rainwater to supply the project, given the drought conditions experienced in the region in the last five years.

The Goulburn Mulwaree Council (GMC) responding as a Water Supply Authority, indicated its reluctance to consider maintaining or operating any treatment facility or reticulation system constructed to service the development and argued that the proposed onsite treatment facilities would present a significant ongoing liability to the community of Goulburn.

GMC also stated that the proposed treatment facilities will require approval and licensing from State Government agencies such as the Department of Environment and Conservation (DEC), Health, Sydney Catchment Authority (SCA) and the Department of Natural Resources (DNR). As noted by GMC these agencies will require satisfaction that the legislative frameworks governing water quality, public health, and environment are addressed on an ongoing basis. The SCA also identified the need for suitable sustainable arrangements for the infrastructure, in particular the proposed Sewage Treatment Plant (STP).

GMC asserts that the proponent will need to demonstrate the capacity to maintain supply through changing climatic conditions and operational incidents, including firefighting requirements.

GMC suggests that the impact of growth projections on Goulburn's existing water and sewerage systems will be significant; servicing workers at work being only half the equation.

SCA also noted in their response that there should be sufficient capacity in the infrastructure to ensure a greater capacity is catered for or sufficient restrictions to limit the population to ensure water quality issues are suitably addressed.

The ultimate responsibility for management and maintenance of the water and sewage treatment plants were raised by GMC and the SCA. Council expressed its concern regarding financial impactions if any present or future responsibility of this infrastructure fell on Council and the community. SCA also highlighted the importance of management of supply to ensure water quality objectives are met.

SCA stated in their submission that self-sufficiency in basic infrastructure is commendable however it should be integrated with the city system to allow excess water harvesting to be shared with the urban areas and the city system to provide emergency back up water supply.

Response: SDH recognises the importance of developing a sustainable water management strategy for the project that does not impact negatively on Goulburn's water supply. This proposal is built around the development of a viable water plan.

Using minimal rainfall the water balance calculations in the EA (Volume 1 Figure 4.10 and Volume 2, Appendix E) demonstrates that sufficient water will be available for the development. The proposed installation of efficient rainwater capturing and recycling systems on the site were acknowledged by the Department of State and Regional Development submission in their following statement:

" The Concept proposes some innovative water harvesting and reuse measures for the development."

There are no plans for the SDBP to tap into the Council water reticulation system. A significant obstacle to population and economic growth in the Goulburn region is securing a sustainable water supply. The development will be matched to capability of treatment facilities to ensure water quality discharges meet neutral or beneficial impact criteria. Licensing requirements have been acknowledged in the EA report.

The proponents, through a long term investment entity, will own the plant and enter into a long term agreement with a licensed operator with relevant experience in the operation and maintenance of the proposed type of plant. It is expected that the pricing of water to the users will reflect the costs of operation and maintenance. Early indications from an operator are that at a similar price as GMC charges, the plant will cover the operation and capital maintenance expenses. SDH and the operator recognise the potential and benefit for this plant to be a part of the GMC area water solution.

The GMC response to DoP reflects a position of not wishing to be involved, however discussions with Council officers and recent discussions with the General Manager of GMC indicate that Council has an interest in being the operator of this plant. Council could also elect to participate in the design of the plant.

The collection of roof and stormwater will exceed the SDBP requirements so that excess capacity of potable and grey water could be available to the City. This would be beneficial to the City and could contribute significantly to Goulburn's water solution

A meeting between Goulburn Mulwaree Council, SDH and the water facility operator is scheduled for June 2007.

Council's concerns about Water Sensitive Urban Design and security of supply for firefighting are noted and have been addressed.

4.3 Water quality

Issue: The Sydney Catchment Authority (SCA) requested that the MUSIC modelling of potential water quality pre and post development be re-run so that the Department could confirm neutral or beneficial impacts to downstream water quality.

The SCA is concerned that inappropriate use of the recycled water may result in water quality issues and requests that the recycled water be restricted to uses as proposed in Volume 2, Appendix E (6.3) of the Environmental Assessment. The SCA requests that a strong compliance role be established in regards to the recycled water use with the appropriate regulatory authority and in any conditions of consent.

Response: A revised MUSIC model has been prepared by Boyden & Partners (Appendix A) which is consistent with the proposed development. The revised report (April 2007) was prepared after consultation with SCA officers at Goulburn on 4th April 4, 2007. The model is based on the parameters specified by the SCA at the April meeting i.e. Pre-development and post development water quality has been determined. Two scenarios were modelled, a 6 minute storm and 1 wet year of above average rainfall.

Bore water will only be used for the filling of fire fighting tanks and initial construction requirements. Quality testing by an independent testing laboratory (see Volume 2 Appendix O) demonstrates that bore water meets relevant quality standards. Recycled water will be treated to meet quality limits specified by regulatory authorities.

4.4 Flooding and Hydrology

Issues: SCA raised the potential impact of construction activities and the development of large areas of hardstand to cause local flooding of land adjacent to Gundary Creek and its major tributaries during heavy rainfall events as well as increases to flow velocities.

An adjoining landowner, expressed concern that the main drainage line of the site runs parallel to Mountain Ash Road, directly through and provides a major source of water for his property.

Response: Hydrological modelling will be a key input into the detailed design considerations for the development. Measures will be put in place to ensure no increase in discharge velocities offsite during storm events and no reduced availability of water to adjacent property from the site as a result of the development.

The proponents have not relied on damming the existing creeks for water supply. The hydraulic capacities of the existing creeks are to be maintained for small to medium flows. The proponents have not placed any development within the Mulwaree River floodplain and therefore there will be no impact on private property in a major flood event.

Issues: The Department of Natural Resources noted that there is a major focus on pre and post development flood behaviour in the Environmental Assessment report, but no reference to stream stability status within the existing natural drainage network. DNR requested future hydrological studies to model a range of flow regimes and their likely impacts on watercourses under a developed catchment scenario.

Response: The proponents will undertake hydrological studies in the phase between planning approval and submission of detailed designs for development approval within each precinct. These hydrological studies will model the outflow off the developed areas into the natural drainage network and the impact on the existing gullies. Detailed design will be prepared for approval prior to construction and remediation works for gullies requiring bank and bed stabilization works.

The MUSIC model report prepared by Boyden & Partners in April 2007 demonstrates that there will be significant beneficial impacts on water quality and these gains will be supplemented by proposed bed and bank stabilization works to further improve water quality throughout the site. The proposed storages onsite (pondages and below floor tanks) will assist in attenuating the peak flow rates and will be taken into account in the hydrological studies.

4.5 Gully Diversion

Issue: The SCA stated that they would prefer the drainage lines to remain in their current location and improved as necessary. The SCA requested that prior to realignment, the proponent provide SCA with details of construction methods, staging, proposal with dealing with rain events during construction.

Response: This information will be supplied to SCA during detailed design as requested, for further assessment, prior to finalisation of any proposed alignment

4.6 Groundwater

Issues: GMC questioned the sustainability of the aquifer to supply the project with water during construction and for fire fighting purposes without impacting supply to neighbours and adjacent watercourses. Queries were also raised by other submissions regarding the quality of the groundwater, whether the proponents had bore water licences for extraction and impacts of the project on recharging of the aquifer.

Response: The ultimate water supply to the SDBP will be achieved predominantly through rainwater collection, and harvesting and augmented by groundwater, if required. Pump tests conducted at a bore on an adjacent property reported *2.23 litres per second*.

Watermin Drillers conducted pump tests on Badger's Holt bore that would be used to supply groundwater for the initial phases of the development. Watermin's emailed report which is attached in **Appendix C** states

"Over the weekend of 2nd and 3rd December 2006 this company carried out a 24 hour pumping and recovery test of the 'Badgers Holt' bore. This bore was pumped at 1800GPH, or 2.23 litres per second, which it maintained well. This bore would withstand continuous pumping at this rate, however from hydrogeological information, Watermin have on the general area, we are confident that we could produce far greater flows with further drilling in the area".

The Director General's requirements issued by the Department of Planning did not specify the need to assess the sustainability of the groundwater supply for the Environmental Assessment report. This was further confirmed at a pre-lodgement meeting with Ms Jacqueline Ingham of the Department of Planning.

Water conservation practices will be implemented to ensure the use of groundwater is minimised. Rain water tanks will be part of the overall water strategy, please refer to Volume 2, Appendix E Environment Assessment Report for more detail and refer to previous comments on groundwater. Initial capacity tests indicate that there is sufficient groundwater available.

As agreed with the Department of Planning, on approval of the EA, the proponent will apply for bore licenses to conduct pump tests at a number of locations on the site. The groundwater sourcing plan will ensure the local bores are not impacted.

SDH accepts that groundwater sustainability testing be conducted as a consent condition. The methodology and licence applications will be presented to the Department of Natural Resources on approval of the EA

4.7 Visual Impacts

Issues: The Goulburn Mulwaree Council requested that the proponent consider visual impacts from the Rocky Hill Museum Lookout, from Memorial Road view, from West Goulburn Trinity College, St Patrick's Campus).

Concerns expressed by the Sustainable Development for Goulburn (sd4g) Group about visual amenity are expressed on their website : www.sd4g.com.au, and have been quoted in several of the individual submissions to the Department.

Response: In response to concerns raised about visual amenity, SDH engaged Connybeare Morrison to take additional photographs and prepare the attached photomontages **Appendices B** - E from the suggested vantage points listed below.

View from St Patrick's Campus looking South East, over the Ken Jordan Pool. The proposed site is visible but is very far away.
View from outside 46 Mountain Ash Road looking South East. Showing proposed tree and shrubs screening much of the development from view.
View from outside 100 Mountain Ash Road looking North. Showing proposed tree and shrubs screening much of the development from view.
Views from the tallest hill in front of the Rocky Hill War Museum Tower looking South East. The Museum tower was closed at the time of photographing, so photos were taken from the tallest rocky hill. The proposed site is still well hidden from that vantage point as shown on the photomontage.

Most views to the proposed site from the city would be blocked by natural ridge lines to the north, north east and west of the site.

The site came into view most prominently on the southern section of Memorial Road, adjacent to the northern ridge line. This was illustrated with 3D photomontages in Appendix F1 and F2 of Volume 2 of the Environmental Assessment, Appendix K, Visual Assessment Report (Feb 07), showing the visual impact of the development.

The photo taken from the base of the tower accurately reflects what was written in the report, where views to the development will be blocked by existing trees and rock mound. The tower itself was not accessible when the photo was taken, and is only accessible from 11am to 3pm on weekends, public and school holidays.

With the site situated in a shallow valley within the gently undulating open slopes of the Goulburn Plains, the visual impact of the development will be lessened by screen planting along the site perimeter and between lots. The location is in a valley adjoining Goulburn and relatively hidden from pubic view once visual buffers, landscape screening and other screening buffers are in place. The larger built elements are located deep within the site and will be adequately masked by smaller surrounding developments and visual screening.

However, since the tower is a further 1.9 kilometres north of the Memorial Road view location, the visual impact, if any, would be considerably less than that location. Most of the residences nearby did not have the same high elevation of the Memorial Road view, and their views will be blocked by the natural ridge lines and perimeter planting of the development. Those with the highest visual impact would be the residences (less than 10 in number) immediately adjacent to the proposed development.

Nos. 46 and 100 Mountain Ash Road appear to be the most affected properties. Visual screening will be in the form of tree and shrub planting in conjunction with earth mounds, and smaller buildings on the boundaries adjoining these rural residences.

Photos entitled “green lung” as posted on the www.sd4g.com.au website are intentionally misleading since the views about “The Jewel in Goulburn’s Crown” and “The Green Lung” were actually views of Goulburn City looking North West from Rocky Hill Museum Lookout.

4.8 Erosion and Sediment Controls

Issue: SCA has requested to be consulted when proposed erosion and sediment control measures are designed for the proposed development. The SCA suggests that bio retention pipes should not be used and that sedimentation basin systems be used. SCA also requests that the basin and wetland approach should be sufficiently designed to cater for a minimum of a 1 in 10 year ARI event, and supports the use of the grass swales and on-site detention as proposed.

Response: The revised MUSIC model prepared by Boyden & Partners (**Appendix A**) addresses the SCA requirements to “clearly demonstrate a Neutral or Beneficial effect". The catchment areas were broken down into roofwater, hardstand and green belts to model the effects on erosion and sedimentation. Wetlands and sediment basins are to be placed "offline". The proponents are aware that the proportions of these areas are to remain the same for the final design stages. The proposed erosion and sediment controls measures result in a significant reduction in the quantity of sediment in the watercourses.

4.9 Riparian Vegetation

Issues: The Department of Natural Resources noted that whilst the existing natural drainage system throughout the proposed development footprint is largely devoid of riparian vegetation, the Statement of Commitments does not appear to provide any detail on proposed riparian rehabilitation measures.

DNR agreed with the EA in that the re-establishment of vegetation along the creek corridors will not only provide ecological benefits, it will also provide added aesthetic amenity and improved water quality outcomes.

Response: The Construction Management Plan will provide details of proposed riparian rehabilitation measures. Refer also to Volume 2, Appendix K, Section 1.5.4 of the Environment Assessment Report.

4.10 Flora and Fauna

Issues: Six individual responses raised the issue of potential impacts on flora and fauna, including wedge tail eagles and the striped legless lizard The submission also noted that there are remnants of native grassland on the site and under the relevant legislation native grassland is an area that is dominated by native groundcover and suggested that this should be assessed during a time of the year when the native groundcover is most dominant. The respondent also requested greater considerations (surveys) be conducted to determine the presence of Temperate Native Grasslands.

A respondent noted that the Gundary TSR is one of the few areas that host the ecological community, 'Natural Temperate Grassland of the Southern Tablelands' proposed by the *Federal Department of the Environment and Heritage* that this community be listed on *Schedule 2* of the *Endangered Species Protection Act*.

Response As detailed in Volume 2, Appendix I of the EA, detailed fauna and flora studies were undertaken and a fauna management plan will be developed prior to construction commencing on site. The flora survey undertaken was based upon methodologies recommended by the Department of Environment and Conservation (2004) and the Department of Land and Water Conservation (1999).

Grasslands surveyed within the subject site were found to be degraded and highly modified as a consequence of agricultural and grazing practices. A total of only five native species were recorded within the transects and quadrates (compared with 19 exotic species) whereas previous surveys and studies undertaken within the adjoining Gundary Traveling Stock Reserve recorded approximately 136 species of native herbs, grasses and lichens. (Rehwinkel, 1998, Taws & Crawford,1999 &

2000, Crawford, 2005 and Rowell et al., 2000).

The survey assessed the potential presence of Natural Temperate Grassland of the Southern Tablelands (NSW and ACT) as defined by the Department of Environment and Conservation (DEC, 2007).

The subject site was surveyed in August 2006. Section 42 of the Native Vegetation Regulation 2005 requires that calculations of the percentages of groundcover be 'made at the time of year when the proportion of the amount of indigenous vegetation in the area to the amount of non-indigenous vegetation in the area is likely to be at its maximum.' Sharp et al (2005 p.14) also suggest that 'if a site is surveyed when conditions are not best for identification, repeat the survey in spring or when grazing is removed and plants have been allowed to flower.'

4.11 Traffic

Issue 1: The RTA noted that the project will generate the need for a number of traffic facilities and roadworks including the replacement of Lansdowne Bridge. While the RTA has these works scheduled to commence in the 06/07 financial year, they have advised that the proponent should not assume that the RTA will undertake these works prior to the operation of the proposal and that the works may not start before the SDBP Project commences or may even be deferred indefinitely.

The proposed heritage value of the Lansdowne Bridge was the subject of several individual submissions.

Response 1: The proponent acknowledges that the RTA has advised GMC that the Lansdowne bridge requires replacement (as part of the state wide RTA policy of replacing timber bridges) regardless of whether the SDBP project proceeds. The RTA says that the bridge must be replaced because of significant maintenance costs. Any contribution from the proponent towards its funding is a matter for negotiation.

Issue 2: The RTA has requested an additional concept plan about the proposed interchange on the Hume Highway to assess the potential property issues associated with ramps and deceleration/acceleration lanes.

The RTA has requested that the design of the interchange must allow for the future provision of three (3) lanes in either direction on the Hume Highway. This is in addition to the necessary interchange acceleration and deceleration lanes and appropriate setbacks provided to allow any necessary maintenance activities to be carried out within the road reserve.

A cadastral survey will also need to be carried out to define for gazettal purposes, the amended controlled access boundaries and proclaimed access points.

Response 2: Figure 7 of Appendix J of the Environmental Assessment Report provides an indication of ramp length and indicative land requirements. The proponent will prepare a comprehensive concept design following approval in principle of the development. The concept design will need to be preceded by a topographic survey, as the RTA has limited records of the Federal Highway construction. The time and cost of survey and concept design make it impractical to undertake this work in advance.

The provision for 3 lanes on the Hume Highway can be accommodated by narrowing the median, as is usual practice on RTA freeways.

Design will be undertaken using the nominated standards.

Issue 3: The RTA proposes that all costs associated with this development and future development of this site, including design, land acquisitions, gazettal of new boundaries and access points, construction and project management would be at no cost to the RTA. In addition, the applicant would be required to provide an upfront 40 year maintenance contribution for the interchange.

Response 3: SDH has agreed to meet the reasonable costs of the RTA, however, believes that an upfront payment for 40 years of maintenance is both unreasonable and unacceptable. This will be the subject of further discussions with the RTA.

Issue 4: RTA has advised that the proponent would need to attain section 13B Approval under the Roads Act, 1993 from Council with RTA concurrence for works within the classified road reserve. Direct RTA approval would be required for all roadworks and traffic control facilities within the classified road reserve and in this regard, the proponent would need to enter into a Works Authorisation Deed with the RTA.

Response 4: All appropriate approvals and works authorization deeds will be sought for all roadworks and traffic control facilities within the classified road reserve.

Issue 5: Access into one of the properties along Mountain Ash Road was raised as an issue, with particular reference to the safe movement of cattle trucks and traffic movements during foggy conditions. Safe movement of local traffic was also noted as a concern during shift changes and truck traffic.

Response 5: The issue of safe access will be addressed during detailed design to ensure there are no safety issues in relations to access to properties along Mountain Ash Road. Roundabouts and street lighting will be constructed to minimize the safety risks involved with mixing truck traffic with passenger traffic. However, the segregation of the SDBP access from Bungonia Rd minimizes the conflicts between local traffic and truck traffic. Roundabouts and street lighting will be constructed to minimize the safety risks involved with mixing truck traffic with passenger traffic. By providing free flow ramps with extra acceleration distance, acceptable truck merge speeds with the Highway can be achieved with ramps of reasonable length.

Issue 6: The Goulburn Mulwaree Council reiterated the upgrading requirements of Bungonia Road to a suitable standard, to ensure it adequately caters for increased traffic movements attributable to the project. Other respondents also recognized the need for nominated local roads to be upgraded and sought reassurances from the proponent that there will be minimal environmental impact during construction. Traffic access along Bungonia Road between the City and the site during flood events was questioned.

One resident requested that a cycle way be incorporated into the traffic design.

Response 6: Calculation of heavy vehicle movements was based on a building footprint of 1,446,800 m^2 which is expected to be utilized as warehouse/industrial. SMEC agrees that in assessing staff trips reference should be made to Bungonia Road to the west / northwest of the development area rather than to east / southeast.

The proponent has committed to implementing the Statement of Commitments and a Construction Environmental Management plan to ensure the impacts associated with construction of the interchange and upgrading of the local roads is minimised.

The majority of trucks are expected to be using the Hume Highway and the proposed new interchange. Load limits are suggested for Bungonia Road. Long Street/Common Street was not intended for use as a significant access route to the SDBP.

SMEC analysis developed an intersection option to improve the level of

service at intersections. With these improvements, it is not expected to have major road capacity issues for these roads.

A cycleway in the area of road under our control is proposed as part of the design.

Issue 7: Goulburn Mulwaree Council noted it their submission that the Lansdowne Bridge over the Mulwaree River is programmed for replacement by the RTA in 2007/08. Council pointed out that the Visual Assessment Report (Appendix K) indicated that the Long Street/Common Street route will also provide connectivity to the site, however this route was not examined in the Traffic Report (Appendix K).

Response 7: Bungonia Rd will require upgrading, including replacement of the Lansdowne Bridge (as already proposed by the RTA). The proponent suggests that the RTA and Council impose load limits on this bridge to reduce the likelihood of impact on its integrity.

Lansdowne Bridge is remote from the site. B triple trucks associated with the SDBP will not be using the bridge with weight restrictions. It is noted that a proposal from RTA exists to replace this bridge. The bridge requires replacement regardless of whether the SDBP project proceeds.

4.12 Heritage

Issues: Concerns were expressed in individual submissions about the impact on nearby heritage houses, the original Motor Cycle Grand Prix and Lansdowne Bridge. Mr. Taylor advised that the Taylor home was built in the 1890s.

Response: The Heritage Council noted that their search of the State Heritage Register has revealed that the Lansdowne Bridge (C1900-1904) on Bungonia Road is not listed on the State Heritage Register, nor are there any heritage listed homes near the proposed site that would be impacted.

The submission from the Heritage Council notes that the closest item on the State register is Lansdowne Bridge, which is about two kilometres from the site. There are no private graves, features or outbuildings that require preservations. The Heritage Council also stated that the proposed development would have no impact on the heritage of Springfield Station due to its distance from the development.

In relation to the 1924 Motor Cycle Grand Prix memorial, SDH accepts the recommendation from the Heritage Council that any road widening will retain the memorial within a reasonable cartilage and retain the views to and from the memorial.

4.13 Planning

Issue 1: The Goulburn Mulwaree Council and several individual submissions note that the proposal does not take into account the Council's LEP, or draft 2020 strategy for residential and industrial development. GMC has called for a regional review to independently determine the best location and whether three such proposals are sustainable in the Sydney –Canberra Corridor and has called for the State Government strategic planners to provide direction (i.e. either confirm Council's direction is correct or provide supporting reasons for an alternate approach).

Response 1: The 2020 strategy was not available to the proponent for consideration during the EA process, and has still not been made publicly available. The Goulburn Mulwaree Council supported the project at the Council meeting of 20 March 2007, and the proposed land use is not prohibited by the current LEP.

SDH believes that this Part 3A process will form part of the consideration by Department of Planning. The Environmental Assessment report outlines the reasons for the selection of the preferred site by the proponent.

The Department of State and Regional Development has supported the Concept Plan and is keen to support major investment that will lead to employment creation in regional areas. DSRD acknowledges that the proposal has logistical advantages, including direct highway access to the Hume Highway avoiding need for road transport to use Goulburn town streets; access to a population base of approximately 26,500 in Goulburn Mulwaree Council area to source its future workforce; and no impact on residential areas of Goulburn.

DSRD also highlights that this project provides an opportunity to plan a purpose built warehousing and logistical complex for long term future use.

In 2005 the Department released its Regional Distribution Centres Attraction Strategy – Goulburn. This Strategy was developed following comprehensive research and analysis of Goulburn and other key areas of the State that were perceived as having distinct advantages for establishing major distribution centres. The Southern Distribution Business Park proposal compliments the Department's efforts to attract investment and developments of this nature that will lead to future employment and economic growth in regional areas.

Issue 2: Submissions received from supporters of the Murray's Flat project in relation to traffic movements, questioned the selection of the preferred SDBP site. This issue was also raised in the GMC submission. Urbis noted that with appropriate design and planning it is possible to provide a grade separated interchange to facilitate future development of the Murrays Flat site

Response 2: The Environmental Assessment report outlines the reasons for the selection of the preferred site by the proponent.

The application report for the Murrays Flat project did not include details of an interchange. There has been no exhibition of a scheme containing an interchange.

Issue 3: Goulburn Mulwaree Council raised issues about urban design, arguing that while no details of buildings or structures at the site have been submitted because these would be subject to separate approvals, the Concept Plan details design objectives and criteria to be met (not dissimilar to a Development Control Plan). These development standards may be varied however an alternate means of achieving the design objectives must be demonstrated (again similar to a DCP).

Response 3: GMC want to amend the building controls to bring them into line with the existing DCP. In many instances, the proponent is proposing better quality design than that required by the DCP. However the following amendments are also sought by Council:

- site coverage of 50% (SHD requested 60%);
- setbacks to be minimums not maximums- the proponent accepts this.
- setback to rural properties- the Council request is justifiable; however this will restrict flexibility with the development of some smaller lots. SDH suggest that a minimum distance be established to any existing rural dwelling.
- Elevation treatment, GMC comment is acceptable
- Loading Docks, GMC comment is acceptable
- Other building comments by GMC are acceptable

Issue 4: GMC proposes a series of variations to the concept proposal.

- Building site coverage limited to 50%
- Building setbacks to be minimums (not maximums)
- Building setbacks to adjoining rural land to be 20m (minimum) with a 10m landscape buffer
- Street elevations of buildings to incorporate a variety of external finishes (materials and colours to be consistent with the rural landscape)

- No loading docks to face a roadway (internal or external)
- Where car parking is provided between the building and any roadway there shall be a minimum landscape area equal to whichever is the greater of
  - Width of any noise attenuation mound or 5 metres
- Security fencing at any street frontage to be located behind or integrated within the landscape area. Side and rear security fencing to be black coloured cyclone chain mesh.
- Noise barriers to be landscaped earth mounds not wall or fence structures.
- No public address systems to be used through out the development
- Business advertising signs are:
  - Not to project beyond the roofline
  - Flush wall signs on buildings restricted to the frontages only
  - Single free standing pole sign within the main frontage setback only

Response 4: Building areas have been based on a maximum of 60% site coverage. This may not be achievable on smaller lots given set backs and landscaping requirements, but is necessary to allow the efficient development of the larger lots.

Set back to adjoining rural buildings; we suggest a minimum setback to boundary of 10m and minimum to any existing dwelling of 30m.

Sound barriers to roads to be wall type construction, unless requested by adjacent landowners, otherwise Council amendment is acceptable.

The proponent concurs with the other comments.

Issue 5: GMC expressed concern about additional noise impacts of the development. This issue is also raised in several individual submissions. Council suggests that the use of wall/fence barriers to minimise noise impacts are not considered appropriate for a rural landscape from a design perspective. Noise buffers should be landscaped mounds, which are more in keeping with the rural landscape

Response 5: SDH notes these concerns and agrees that landscaped mounds will be used where requested by adjacent landowners, if appropriate as a noise minimisation measure.

Issue 6: Concerns were raised by some of the adjoining landholders about building heights and setbacks

Response 6: Sensitive designs in the use of materials and articulation of

building elements will be used to reduce the apparent height and scale of external walls.

The larger building units with the possible height of 18 metres will be located deeper into the site and screened by trees and smaller buildings located at site boundaries.

The closest residence in the adjoining rural land is at least 50 metres setback away from the development site boundary

4.14 Land Use

Issue: Local landowners did not agree with the statement in the Environmental Assessment that the level of production is comparatively low and that the majority of the farms were hobby farms or for recreational activities.

Response: The proponent acknowledges the response by the local landowners, however the fact remains that the soil classification for this area varies from category 4 to 5 which is land suited for grazing where the level of production is comparatively low.

4.15 Rail

Issue: The Department of State and Regional Development noted that rail access to the site from the main Southern Rail Line could be difficult, may require crossing of two main waterways (Gundary Creek and Mulwaree River) and two main roads (Windellama Road and Braidwood Road) to achieve the shortest link. The Department also noted that the length of a bridge complex over Gundary Creek would be quite long due to the broad flooding nature of this creek and would need to match the height of the Hume Highway land bridges over the same area.

Another respondent commented that any proposed rail link would need to cross a floodplain, be built up with embankments and could be expensive to build.

The issue of increased heavy traffic movements to and from a new intermodal hub for rail at the Goulburn Station Goods Handling was also highlighted as a concern.

ARTC advised in their submission that they would consider a formal application for:

- Lease of certain Down Sidings in Goulburn Yard;
- License for construction and ongoing occupation of hardstand area adjacent to sidings;

- Deed for loading/unloading wagons and
- Safety Interface Agreement between ARTC and proponent

ARTC pointed out that the proponent would need to be mindful that certain railway lands in this vicinity are already leased to other parties and other nearby sidings are subject to negotiation at this moment and the proponent would also be responsible for provision of services (e.g. power, etc).

Response: Rail connection to the site will be subject to a separate application to the GMC and the Department of Planning. Detailed design for that application would consider all environmental impacts, including traffic movements

4.16 Employment

Issue: One respondent sought clarification on the predicted level of employment at the final completion of the development and how this number was derived.

Clarification was also requested on what industries will be allowed to be established within the industrial park. The opportunity for locals to be employed at the SDBP was raised as was the types of skills required and the training opportunities that will be available

Response: Employment at the SDBP is predicted to reach 3,160 people by Year 15. The proposal is for an integrated logistics, warehouse, industrial, transport and distribution hub and not just a warehouse development.

The industry standards for persons working in the various industries expected to occupy the land are well known and are available in many recent industry, state and federal government studies. In calculating the industry mix Logistics Bureau utilized these industry "norms" to calculate the jobs based on the area of the development and the industry mix projected to locate on the site. The 3,160 jobs number is the outcome of studies carried out by industry professionals using well accepted industry standards.

The Gross Floor Area is expected to be about1, 446,800m² of low density broad acre development. The employment density is expected to be 5 per acre (12 per hectare) of developable land. If this is applied to the SDBP land area of 263 hectares, employment of 3,156 persons can be expected as experienced in warehouse dominated developments in Sydney.

Details of the potential industries that may be attracted to the site are listed in Chapter 3 of Volume 1. The proponent is committed to maximizing the employment of locals and providing relevant skills training

4.17 Commercial viability

Issue: Several respondents opposed to the development sought clarification on the structure of ownership of lots within the SDBP development site.

Clarification was also sought about the extent to which the project was reliant on government funding for commercial viability of the project and whether the state and local government landholdings should/would be sold to the proponent to facilitate the development of the site, and whether there is a risk the development would only partially develop.

A query was received on the how much of the $1 billion will be retained the local economy.

Response: The development could include tenants occupying SDH owned buildings and land, or tenants occupying their own buildings on SDH land, or tenants buying parcels of land within the site. All development will be under the conditions specified in the Environmental Assessment approval.

Statements made by Mr Shaw (Mariner) and quoted in one submission are factually correct, but have been taken out of context. His comments in respect of infrastructure funding were in relation to the rail link to reactivate the rail yard infrastructure in Goulburn and not in connection with the Part 3A Application in question. The proponent reiterates all interchange, roads and infrastructure services as shown on the plans submitted are to be provided by the proponent at no net cost to state or local government.

The cost of project infrastructure has been fully costed in the feasibility studies and the proponent is comfortable with its assumptions.

The possibility of a Federal Infrastructure fund was raised by the Standing Committee on Transport and Regional Services in respect of assisting the private sector to contribute towards creating hubs to facilitate the overall aim of increasing the movement of freight by rail. The proponent will avail itself of any Federal and State assistance and subsidies wherever possible to assist in the projects delivery however is not reliant on this funding for development.

The proponent has satisfied itself that the project is commercially viable by the use of industry experts such as Logistics Bureau and Jones Lang Lasalle to complete feasibility and comprehensive Demand Studies that was supported by both economic and transport industry data, refer to Volume 2, Appendix B of the Environment Assessment Report (Feb 07).

The quantum of money retained in the local community is dependent on that community's ability to respond to the change in spending that flows from the development. Based on a discretionary disposable income of $100 per week per employee this would be at least $18m per annum in 2007 values.

SDH has a policy that a bias will be built into its project purchasing policy to give advantage to local suppliers and trades

5. Conclusion

This response addresses all issues raised through the public exhibition process and the key issues in respect of:

- Strategic Planning;
- Water Supply/Quality;
- Rail infrastructure; and
- The ownership and maintenance of the infrastructure to be provided by the proponent;

in accordance with the Part 3A assessment process.

Appendix A – Revised MUSIC Model

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Water Quality Management Strategy for The Southern Distribution Business Park, Goulburn NSW

Prepared for

Mariner Financial Limited for SDH Pty Ltd

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TABLE OF CONTENTS

Attachments

Tables

Figures

1.0 Introduction

Boyden & Partners (Coast) have been engaged by Mariner Financial Ltd on behalf of SDH Pty Ltd to prepare a stormwater quality management strategy for the proposed integrated industrial, logistics, service, warehousing and distribution hub adjacent to the Hume Highway along the Sydney to Canberra corridor, approximately 4km from Goulburn in New South Wales. The information presented is complimentary to our Stormwater Quality Concept **Plan No. 7027**, one sheet only, which has been included within **Attachment A** to this report.

The following sections of the report outline the stormwater management methodology and techniques utilised to assess the anticipated runoff quality of the stormwater generated from the proposed development. This report addresses the modelled water quality impacts of the development only. Water quantity issues, including the proposed water re-use and associated treatment plant details have been addressed separately by Parsons Brinckerhoff in their Preliminary Integrated Water Cycle Management Plan, dated August 2006. Please note that that the MUSIC modelling described in this report supersedes the modelling and results presented in the Parsons Brinckerhoff report.

This report has been prepared based on current survey and concept development layout information supplied by BG & E Engineers Pty Ltd. Any changes to the development layout will not dramatically alter the stormwater quality management philosophy, but may impact on the detailing of the proposed stormwater treatment measures proposed. SDH Pty Ltd will consult with Boyden and Partners during detailed design to ensure the water quality objectives are met.

2.0 Study Area

The proposed development site is approximately 95km north of Canberra, 195km south of Sydney, and approximately 4km south of Goulburn. The site comprises of a parcel of land with a site area of approximately 430ha in size, with approximately 263ha to be divided into four precincts for subdivision, and the remainder to be used for the construction of a new highway interchange, associated roadwork, a water treatment plant and sewage treatment plant.

The site is located on gently undulating to flat grasslands and ranges in elevation from about 630m to 676m above sea level. Most of the natural vegetation has previously been cleared for pasture and grazing, with only small remnants of lightly scattered timber stands remaining. Slopes range from the low-lying areas adjacent to Windellama Road and the Hume Hwy to approximately 10% in the more steeply sloping landforms to the east and south of the proposed precinct zones.

Low-lying areas to the north and west of the proposed subdivision areas are subject to periodic inundation due to the conveyance of upstream flows through Gundary Creek via numerous ephemeral streams that traverse the site.

Stormwater runoff generated on the site is routed north-west into Gundary Creek via a series of culvert crossings underneath Windellama Road before being conveyed northwards into the Mulwaree River.

3.0 Proposed Stormwater Quality Principles

The subject site falls within the bounds of the Sydney Catchment Authority (SCA) area of operations. Under the Sydney Water Catchment Management (Environment Protection) Regulation 2000, the SCA is able to provide certain directives in relation to pollution sources from developments that may impact on the quality of stormwater runoff within the catchments under its control.

During a meeting held with SCA officers at the Goulburn office on April 4 2007, it was stated that the development would need to adhere to a "neutral or beneficial impact" policy for the subject catchment in regard to stormwater runoff quality.

SDH Pty Ltd adopted this recommendation as the basis of our approach to stormwater quality treatment for the proposed development. Therefore the minimum objective of the stormwater quality management strategy is to restrict post development pollutant export loads to existing levels.

The development will utilise, wherever practical and relevant, current best practice Water Sensitive Urban Design (WSUD) principles to reduce the impact of the developed site on existing hydrological and hydraulic processes.

All proposed downpipes on buildings will be routed to underground storage systems for transportation to the water treatment plant, prior to being re-used within the site. The proposed method of collection and treatment of roofwater has been detailed in the aforementioned Parsons Brinckerhoff report. Whilst it is intended that much of the collected runoff from roof areas will be re-used, runoff in excess of the proposed storage volume and daily usage will be discharged after treatment back into the system via either groundwater recharge or release into Gundary Creek. To mimic the re-use of the roofwater, runoff from roof areas has been modelled as being passed through a rainwater tank with a nominal capacity of 7-days demand, with runoff in excess of daily requirements being routed back into the system at the grass swale stage of the treatment train within each precinct.

Runoff from driveways, car parking areas and other impervious areas will be routed through landscaped buffer zones, where appropriate, and then into grass swales and bio-retention trenches systems to encourage the maximum removal of pollutants by filtration. The trenches will be graded to a series of off-line sedimentation basins within

each precinct before the treated runoff is discharged into the existing ephemeral watercourse adjacent to Mountain Ash Road and then into Gundary Creek.

The proposed revegetation, and possible construction of offline wetlands, within the vicinity of the watercourse adjacent to Mountain Ash Road will assist with further stripping of nutrients from the stormwater runoff from each precinct, however as the downstream boundary of each precinct has been assumed to be the end of the treatment train, this additional treatment measure has not been included in the MUSIC modelling undertaken.

To-date, the proposed stormwater quality measures have only been sized to ensure adherence to the neutral or beneficial requirement of the SCA. As part of the detailed design for the development, the combined capacity of the swales and bio-retention trenches will be re-checked to ensure that they can safely convey the 10-year Average Recurrence Interval (ARI) design storm event without resulting in nuisance ponding within any of the precinct areas. Perforated pipelines will be placed at the base of the bio-retention trenches and may also result in the size of the trench and/or swale being increased, however this can only result in beneficial impacts on the quality of runoff exiting the site. The placement of the pipelines at the base of the trenches will also reduce the potential for runoff to infiltrate into the subsoil, reducing the potential for salinity issues.

The proposed sedimentation basins have been conservatively sized in excess of the recommendations of the Soils and Construction - Managing Urban Stormwater, March 2004 “the Blue Book”, however these could also be increased in size to treat runoff from less frequent, higher rainfall events, if required. Typically, however stormwater quality measures are only designed to treat runoff up to the 1-year ARI event.

4.0 Stormwater Runoff Quality Methodology

4.1 Quality Modelling Methodology

The 'Model for Urban Stormwater Conceptualisation' (MUSIC) was used for estimating the pollutant export from the site under both existing (agricultural) and developed (urban) scenarios and for estimating the effectiveness of the proposed stormwater treatment measures. MUSIC has been developed by the CRC for Catchment Hydrology and can be used to simulate both the quality of runoff from a catchment and the effects of a wide range of treatment facilities on runoff water quality.

The 'MUSIC manual' (2005) states that MUSIC is to be used as an aid to the decision-making process in regard to water quality treatment strategies. MUSIC is used to assess if the conceptual design of the stormwater management measures proposed are capable of achieving the objective of limiting the pollutant export from post-development to pre-development to within acceptable levels. Whilst MUSIC evaluates the effectiveness of the proposed water quality measures, design guidelines such as Australian Runoff Quality (2004) will be utilised for the detailed design of each of the water quality treatment measures.

The manual also recommends that a continuous simulation approach be adopted for water quality modelling. This approach is recommended because the impacts from poor stormwater quality on aquatic ecosystem health are associated with cumulative pollutant loads. For this study, both the 'mean annual' pollutant loads (kg/year) and cumulative frequency graphs have been considered in determining the adherence to the 'no worsening' philosophy adopted.

MUSIC was used to simulate the pollutant generation for Total Suspended Sediment (TSS), Total Phosphorous (TP), Total Nitrogen (TN) and Gross Pollutants (GP) and to assess the effectiveness of the stormwater management treatment techniques proposed to improve the quality of the developed site runoff.

Climate data was sourced from the Bureau of Meteorology for the closest pluviograph to the site, which is located at Bungonia, approximately 20km east of the subject site. In accordance with our discussions with the SCA, the MUSIC assessment was undertaken for both a 5-year period of average rainfall and a "wet" year. The mean annual rainfall for the average case was approximately 850mm, which is actually higher than the Goulburn average of just under 700mm, however this was considered

to be conservative in terms of pollutant generation. The rainfall for the wet year was 1050mm, which is much higher than the average received in the area.

4.1.1 Existing Site Water Quality.

The MUSIC model for the existing site scenario was developed to provide a base-flow measurement of the existing mean annual loads for the pollutants considered.

The existing site was divided into 4 sub-catchments representative of the proposed precinct areas of the development. For the purpose of defining the catchment source nodes in the MUSIC model, the whole site was classified as being 'agricultural'. This was considered appropriate based on the lack of any substantial vegetation stands and the history of grazing activities in the area.

In lieu of any site-specific data for the area, the default pollutant export values in MUSIC for 'agricultural' source catchments were adopted for the purpose of the assessment of the existing catchment. The site was assumed to be 95% pervious, with the remaining 5% representing any roads, houses, sheds, rock outcrops and other hardstand areas. A schematic of the adopted MUSIC model structure is shown below.

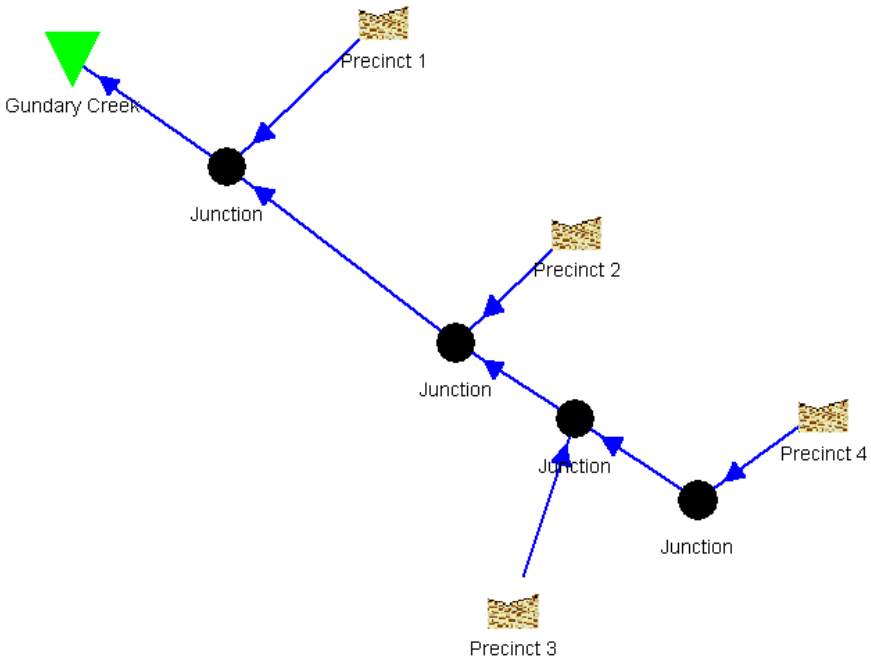


Figure One – Existing Site MUSIC Model Layout

The results of the existing case MUSIC analysis for both the average rainfall and wet year scenarios are presented below in **Table One**.

Table One – Estimated Mean Annual Loads (MAL) for Existing Site

Pollutant	Average Rainfall	Wet Year
Flow	839 (ML/yr)	1,250 (ML/yr)
Total Suspended Solids	174,000 (kg/yr)	248,000 (kg/yr)
Total Phosphorus	471 (kg/yr)	690 (kg/yr)
Total Nitrogen	3,240 (kg/yr)	4,750 (kg/yr)
Gross Pollutants	3,900 (kg/yr)	5,300 (kg/yr)

The pollutant loads indicated above illustrate that the generation of pollutants from the catchment is highly dependent upon the amount of rainfall received, with the wet year scenario generating up to 50% more pollutants as the average case.

4.1.2 Post-development Water Quality

The MUSIC model developed for the post-development scenario was used to provide a guide in the selection of appropriate stormwater treatment measures for this particular site and development type.

To assess the impact that the proposed development would have on the existing water quality generated from the site, the same catchment delineation was adopted as for the existing case, however the source catchment type was changed to 'urban'. These sub catchments were further separated into roof catchments that will discharge to precinct-based rainwater storage tanks and road catchments comprising of the remaining impervious and pervious areas that will be conveyed to Gundary Creek via the stormwater management measures constructed for the development.

Source pollutant data for the developed scenario has been adopted from recommendations contained in Technical Report 4/08[1]. This was in accordance with discussions held with SCA officers. A schematic of the adopted MUSIC model structure for the post-developed site is presented below.

[1] Stormwater flow & quality, and the effectiveness of non-proprietary stormwater treatment measures – A review and gap analysis, December 2004, Fletcher et. al.

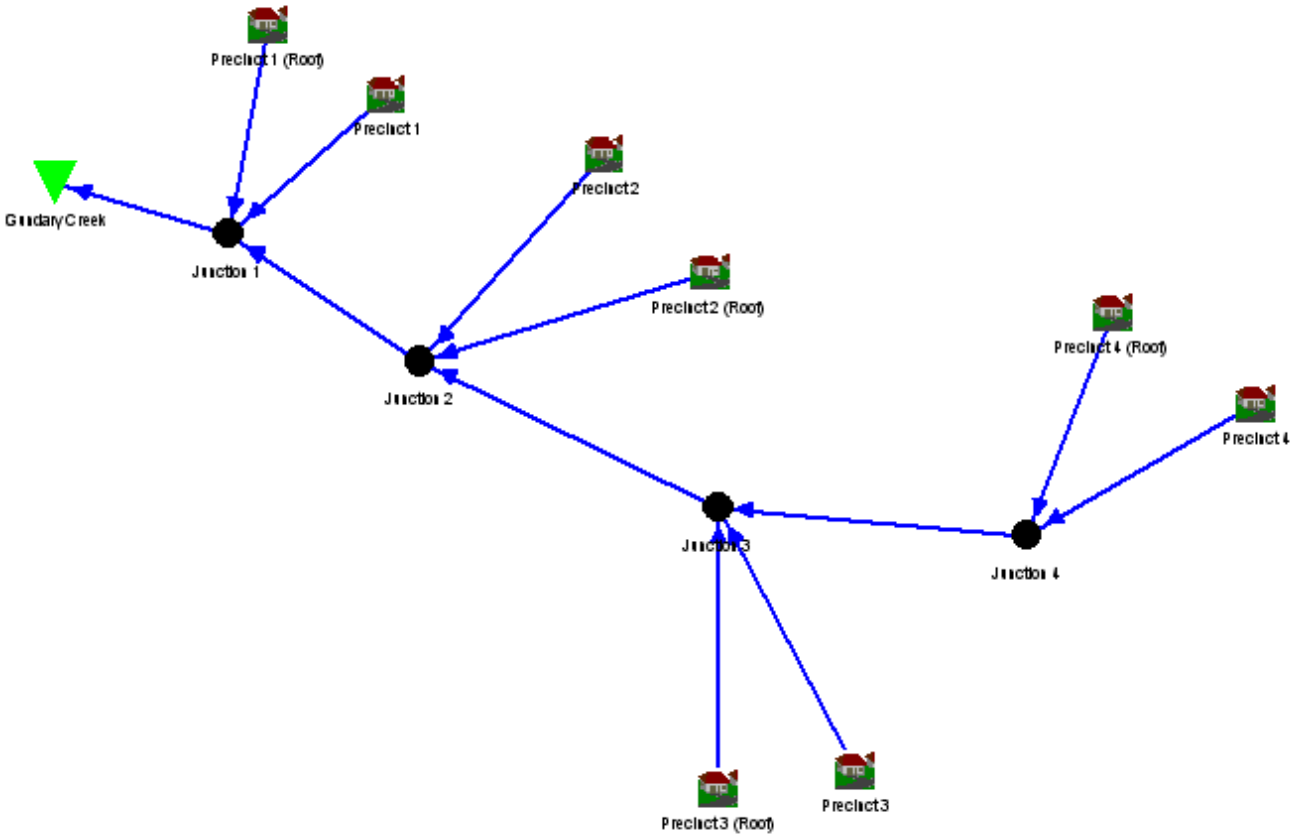


Figure Two – Post-Developed Site MUSIC Model Layout

In order to quantify the impact of the development on the pollutant export from the site, the parameters adopted in the pre-development MUSIC model were modified to reflect the projected increase in impervious surfaces as a result of the development. **Table Two** summarises the adopted development areas, as taken from Chapter 4 of the Environmental Assessment prepared for the development.

Table Two – Adopted Development Building Areas

Precinct No.	Subdivision Area	Roof Area	Additional Area
Precinct 1	25.48 ha	12.74 ha	12.74 ha
Precinct 2	54.48 ha	27.24 ha	27.24 ha
Precinct 3	136.67 ha	68.34 ha	68.34 ha
Precinct 4	46.43 ha	23.22 ha	23.22 ha

The total impervious area within the precinct development will be made up of 131.54 hectares of roof area, approximately 70 hectares of hardstand areas, and up to 13 hectares of internal roads and landscaping.

The additional areas as noted in Table Two, which will consist of parking and hardstand areas, roads and landscape buffer zones have conservatively been assumed to be 63% impervious, with the remaining 37% consisting of landscaped buffer zones.

The results of the post-developed case analysis for both the average rainfall and wet year scenarios are presented below in **Table Two**.

Table Three – Estimated Mean Annual Loads (MAL) for Developed Site

Pollutant	Average Rainfall	Wet Year
Flow	1,750 (ML/yr)	2,240 (ML/yr)
Total Suspended Solids	318,000 (kg/yr)	404,000 (kg/yr)
Total Phosphorus	509 (kg/yr)	648 (kg/yr)
Total Nitrogen	3,830 (kg/yr)	4,880 (kg/yr)
Gross Pollutants	50,200 (kg/yr)	58,900 (kg/yr)

The pollutant loads indicated above illustrate that the generation of pollutants from the developed catchment is not quite as dependent upon the amount of rainfall received as the existing undeveloped catchment is, with the wet year scenario generating up to 30% more pollutants as the average case, compared with up to 50% for the existing scenario.

The phosphorus levels generated from the developed site in the wet year scenario were estimated to be approximately 6% less than from the existing site in a wet year. This can be attributed to the high rate of phosphorus runoff generated from the existing agricultural activities, which is exacerbated during periods of high rainfall.

Based on a comparison between the existing and post-developed cases assessed, the following percentage reduction would be required to limit the pollutant export to pre-developed levels in average rainfall conditions.

- Total Suspended Solids – 45% reduction

- Total Phosphorus – 8% reduction
- Total Nitrogen – 15% reduction
- Gross Pollutants – 92% reduction

The next section of the report evaluates appropriate stormwater treatment current best management practices for the runoff quality plan to achieve the required reduction in pollutant export.

4.2 Evaluation of Stormwater Treatment Best Management Practices

4.2.1 General

The stormwater management strategy for this development requires the integration of a range of current Best Management Practices, in a 'treatment train' approach, to achieve the objective of a neutral or beneficial result on pollutant export from the site.

4.2.2 Water Re-use

Providing water for an increasing population in Australian climatic conditions is becoming a significant issue, and the re-use and recycling of water is therefore considered an important Best Management Practice for all developments.

We understand that SDH Pty Ltd is proposing for the site to be completely "self-sufficient" in regards to water supply, with water being collected from roof areas (and groundwater extraction initially) and recycled for use throughout the site. A preliminary detailing of the proposed water re-use strategy has been undertaken by Parsons Brinckerhoff[2].

4.2.3 Preservation of Native Vegetation.

All native vegetation will be retained on site wherever possible, in particular any riparian vegetation associated with the existing ephemeral watercourses is to be retained. The retention of native vegetation will aid in the treatment and promote infiltration of overland stormwater flow. As outlined in the Environmental Assessment, native vegetation will also be used for onsite landscaping.

[2] Preliminary Integrated Water Cycle Management Plan, August 2006, Parsons Brinckerfoff

4.2.4 Buffer Strips

Buffer strips are grassed or vegetated areas used to treat stormwater overland flow before entering downstream treatment measures or discharge points. Buffer strips are used to slow flows, filter pollutants and promote infiltration. Flow across a buffer strip will be well distributed with shallow flow depths. For this development buffer strips are to be either native vegetation or grassed areas, used for treatment of overland stormwater runoff from hardstand areas.

4.2.5 Swales

Swales are vegetated conveyance channels that remove pollutants by filtration through the grass, infiltration into the soils and settling of sediments. They also reduce runoff volumes and peak flows by attenuating runoff velocity and promoting infiltration. They are often used as an alternative to kerb and gutter along roadways but can also be used to convey stormwater flows in recreation areas and car parks. Vegetation of the swales can either be grasses or native shrubs, depending on the landscaping theme of the development.

4.2.6 Bioretention Systems

Bioretention systems provide both stormwater treatment and conveyance functions. A bioretention system consists of a swale or ponded area that is designed to convey and detain runoff following storm events and an infiltration trench with a perforated collection pipe often installed in its invert, to collect and discharge the filtered runoff.

The swale component of the system provides pre-treatment of stormwater to remove coarse particulates and associated contaminants via settlement and screening, while the bioretention trench system removes finer particulates and fixed contaminants via filtration and absorption.

As the bioretention system is designed to capture the filtered runoff, a geomembrane will be placed at the interface between the filter media and surrounding soil. The geomembrane will retain the filtered runoff and retard the ingress of ground water into the system.

4.2.7 Sedimentation Basins & Wetlands

Sedimentation basins and wetlands are stormwater Best Management Practice devices often used for the removal of suspended solids and associated pollutants, as well as soluble pollutants. If adopted, the constructed wetlands will be designed with

two zones, the deep-water zone and the macrophyte zone, in accordance with The Constructed Wetland Manual (1998) prepared by the Department of Land and Water Conservation, NSW.

4.2.8 Non – Structural Best Management Practice Strategies

Non-structural techniques aim to reduce the pollution entering the stormwater drainage system. If these management measures are successful, they will reduce the need for structural quality treatment techniques. Their aim is to change the community's behaviour.

For this development the use of nutrient based fertilisers on landscaped areas will be restricted.

4.3 Stormwater Quality Strategy

4.3.1 General

This section of the report outlines the stormwater management strategy treatment train proposed for the developed site, based on the above evaluation of Best Management Practices with regard to the measures considered appropriate for the site.

4.3.2 Stormwater Quality Concept Plan

The proposed stormwater management strategy treatment train for the developed precincts is shown on the Stormwater Quality Concept Plan No. 7027, one sheet only, which has been included in **Attachment A**. The proposed stormwater treatment train for the Southern Distribution Business Park is as follows;

1. Stormwater runoff collected from roof areas will be collected into precinct-based rainwater storage tanks, prior to being conveyed to the proposed water treatment plant using a gravity pipeline. Roof runoff will be filtered through first flush devices, with leaf guards to be provided on all gutters of the buildings.

   For the purpose of the assessment, it has been assumed that each precinct tank would store a volume equivalent to 7-days worth of the pro-rata total daily roofwater runoff of 0.46ML/day. This average daily runoff has been taken from Figure 4.10 of the Environmental Assessment. Furthermore, the modelling undertaken assumes that any overflows from the rainwater tank would be directed to the downstream drainage system at the grass swale stage of the treatment train.

2. Runoff from other areas including parking and hardstand areas and the road reserves will be conveyed to grass swales located throughout the site. Where practical, runoff will be conveyed to the swales via overland sheet flow, passing through vegetated buffer strips positioned adjacent to the swales. A buffer strip width of 5m has been adopted over the full length of the proposed bio-retention trenches.

   In situations where excessive travel path length or other physical constraints do not permit overland flow through buffer strips, runoff will be collected in surface inlet pits and conveyed to the swales via pipeline. Swales have been modelled in MUSIC as a trapezoidal channel with a base width of 1.5 metres wide, side batters of 1:4 and a depth of 0.3 metres. This will ensure that the swales can be traversed by vehicles as well as being easily maintained.

3. Swales will be positioned above bio-retention trenches adjacent to roads and on the downslope side of development lots. Runoff will infiltrate through the base of swale into the sand medium below. Pollutants will be stripped from the runoff as it infiltrates down through the trench and into a perforated pipeline at the base of the trench. The pipeline will then convey the stormwater to downstream offline sedimentation basins or constructed wetlands within each precinctAlthough the final sizing of the bioretention trench and swale will be sized to the 10-year ARI event, a preliminary size of 1.5m wide by 1.2m deep has been assumed for modelling purposes. The length of the trench has been based on the locations shown on the attached Stormwater Quality Concept Treatment Plan, which facilitates the maximum collection and treatment of runoff generated from the business park.

4. Modelling undertaken to-date has been based on the use of sedimentation basins as an ‘end-of-line’ treatment measure. The basins have been sized using the NSW government Soils and Construction handbook, March 2004. The basin size is appropriate for the construction phase of the development, however it is recommend that they be maintained as a treatment measure once the site is fully developed. Overflows from the basins will be directed to the ephemeral watercourses adjacent to Mountain Ash Road and ultimately Gundary Creek and the Mulwaree River. **Table Four** below indicates the

sedimentation basin areas and volumes adopted in the MUSIC modelling. The indicative basin footprint has also been included on the attached Stormwater Quality Concept Plan.

Table Four – Sedimentation Basin Sizing Adopted in MUSIC Modelling

Precinct	Basin Area (m^2)	Basin Volume (m^3)
Precinct 1	1260	2520
Precinct 2	2700	5400
Precinct 3	6750	13500
Precinct 4	2325	4650

An alternative option is to convert the sedimentation basins into constructed wetlands once construction has been completed. This would provide an additional treatment measure whilst also providing wildlife habitat and an opportunity for passive recreational activities.

To further assist in the review and understanding of the water quality assessment undertaken, substantial explanatory notes have been included in the actual MUSIC model for each of the treatment nodes utilised.

4.4 Results from MUSIC Analysis of Stormwater Management Strategy.

A schematic of the adopted MUSIC model structure for the post-developed site with the treatment measures described in the previous section is presented below.

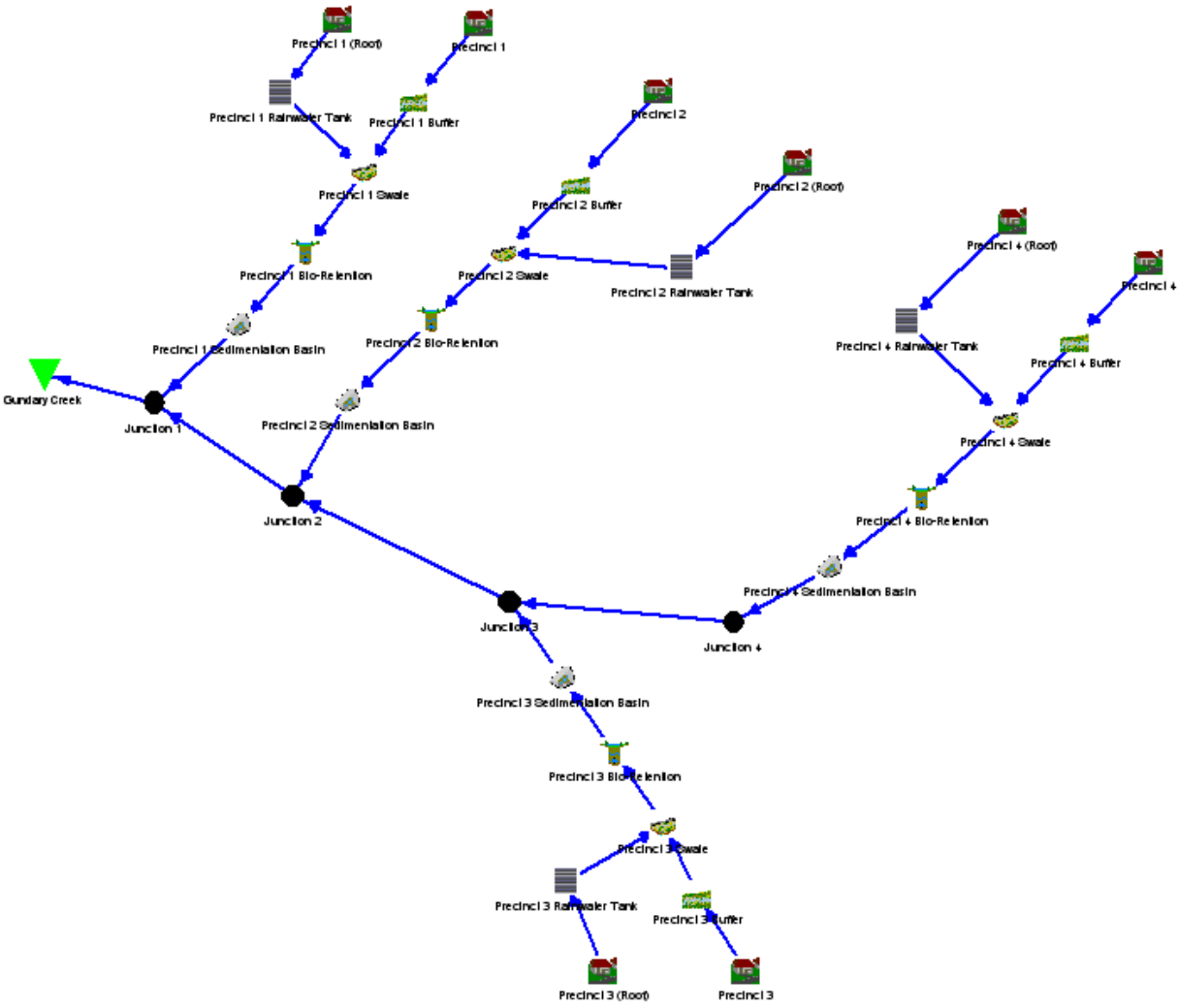


Figure Three – Post-Developed Site MUSIC Model with Treatment Measures

The results of the post-developed case with the proposed treatment measures in-place for both average rainfall and wet year scenarios are presented below in **Table Five**.

Table Five – Estimated Mean Annual Loads (MAL) for Developed Site with Treatment Measures In-Place

Pollutant	Average Rainfall	% Reduction	Wet Year	% Reduction
Flow	185 (ML/yr)	89.5	300 (ML/yr)	86.6
Total Suspended Solids	6,190 (kg/yr)	98.0	9,430 (kg/yr)	97.7
Total Phosphorus	25 (kg/yr)	95.2	39 (kg/yr)	94.1
Total Nitrogen	280 (kg/yr)	92.7	463 (kg/yr)	90.6
Gross Pollutants	0 (kg/yr)	100.0	0 (kg/yr)	100.0

The results above illustrate that the proposed treatment measures would result in a significant reduction in the mean annual pollutant loads leaving the site when compared to the loads that would exist if no measures were implemented for the development. These reduction rates are in excess of the removal targets set out in the Goulburn City Council Stormwater Management Plan (now Goulburn Mulwaree Council), which only requires a removal of 45% of nitrogen and phosphorus, 90% of gross pollutants and 80% of sediment.

Table Six shows a comparison between the mean annual loads from the developed site with the proposed measures in-place and the loads from the existing site.

Table Six – Comparison between Mean Annual Loads (MAL) from Developed Site with Water Quality Measures In-place and Existing Site

Pollutant	Average Rainfall		Wet Year	
	Existing Case	Post-Developed Case	Existing Case	Post-Developed Case
Flow	839 (ML/yr)	185 (ML/yr)	1,250 (ML/yr)	300 (ML/yr)
TSS	174,000 (kg/yr)	6,190 (kg/yr)	248,000 (kg/yr)	9,430 (kg/yr)
Total Phosphorus	471 (kg/yr)	25 (kg/yr)	690 (kg/yr)	39 (kg/yr)
Total Nitrogen	3,240 (kg/yr)	280 (kg/yr)	4,750 (kg/yr)	463 (kg/yr)
Gross Pollutants	3,900 (kg/yr)	0 (kg/yr)	5,300 (kg/yr)	0 (kg/yr)

The above results indicate that for both average and high rainfall conditions, the construction of the water quality treatment measures proposed for the business park would result in the mean annual loads generated from the site being significantly reduced from those that currently exist.

Whilst mean annual loads are an important consideration in the export of pollutants from the development, cumulative frequency graphs provide a more informative summary of treatment performance. By graphing the cumulative frequency of a pollutant concentration for both the existing and post-developed case, the frequency of compliance with the neutral or beneficial impact requirement can be determined. Using a spreadsheet prepared by the SCA, cumulative frequency graphs have been prepared

for each of the source pollutants assessed. The graphs are presented below in **Figure Four**, **Figure Five** & **Figure Six**.

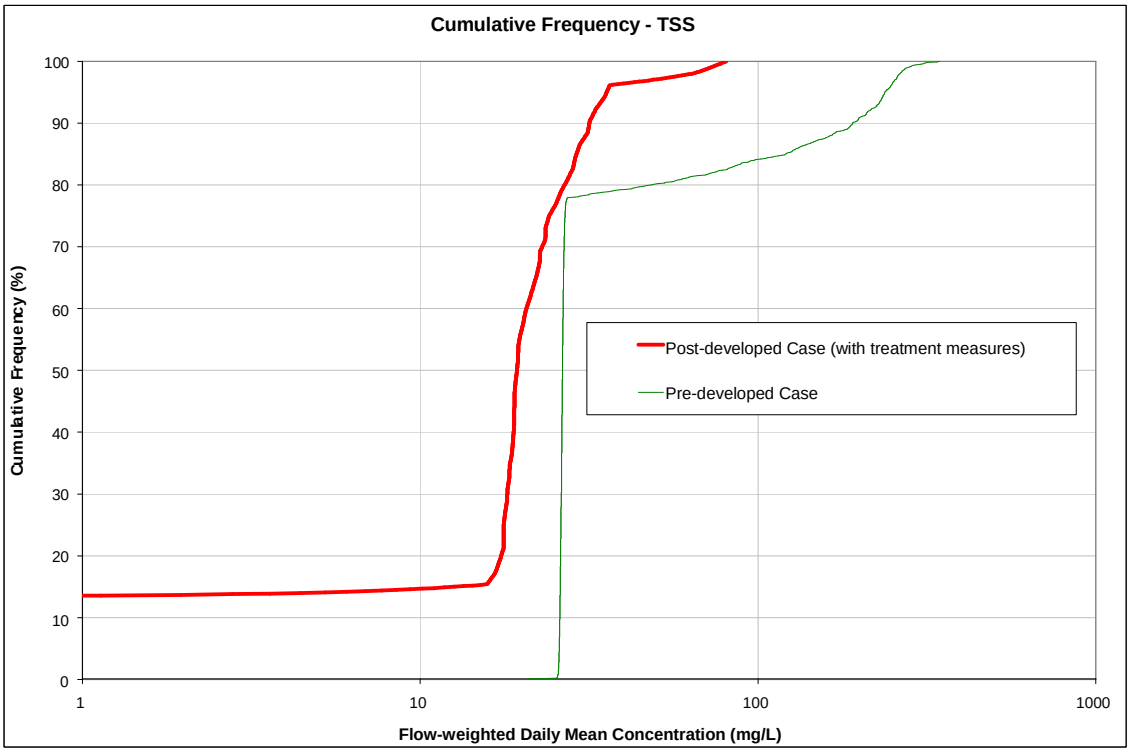


Figure Four – Log Chart of Cumulative Frequency for Total Suspended Solids

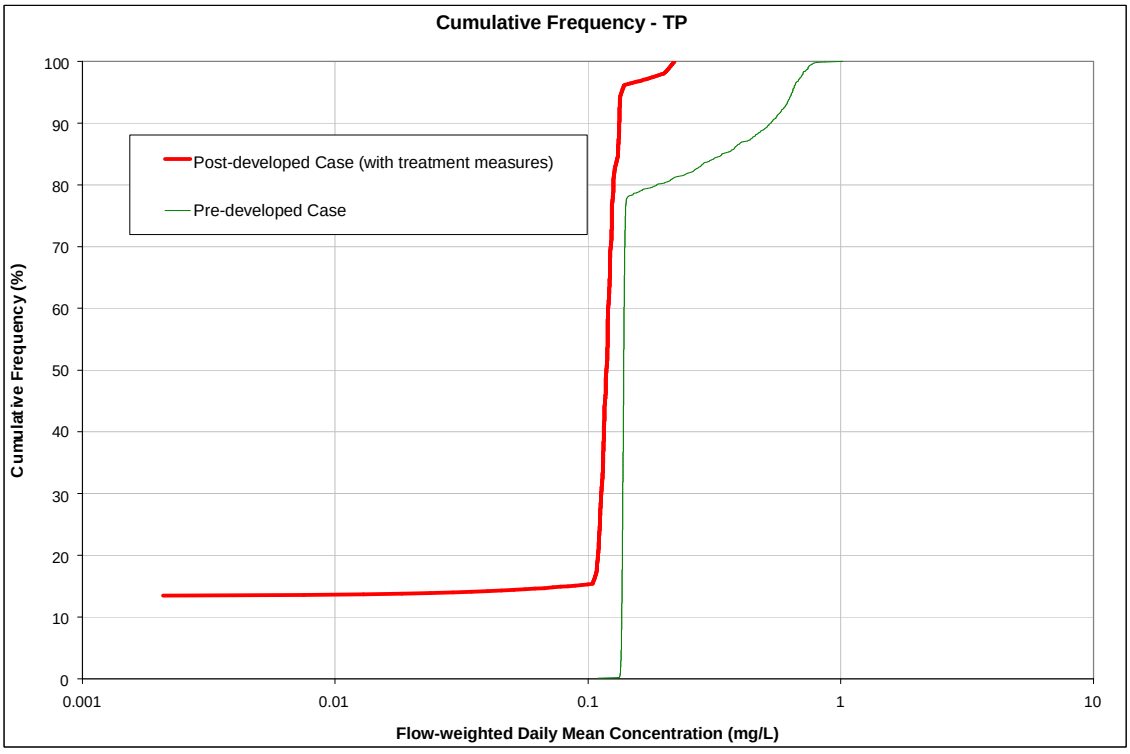


Figure Five – Log Chart of Cumulative Frequency for Total Phosphorus

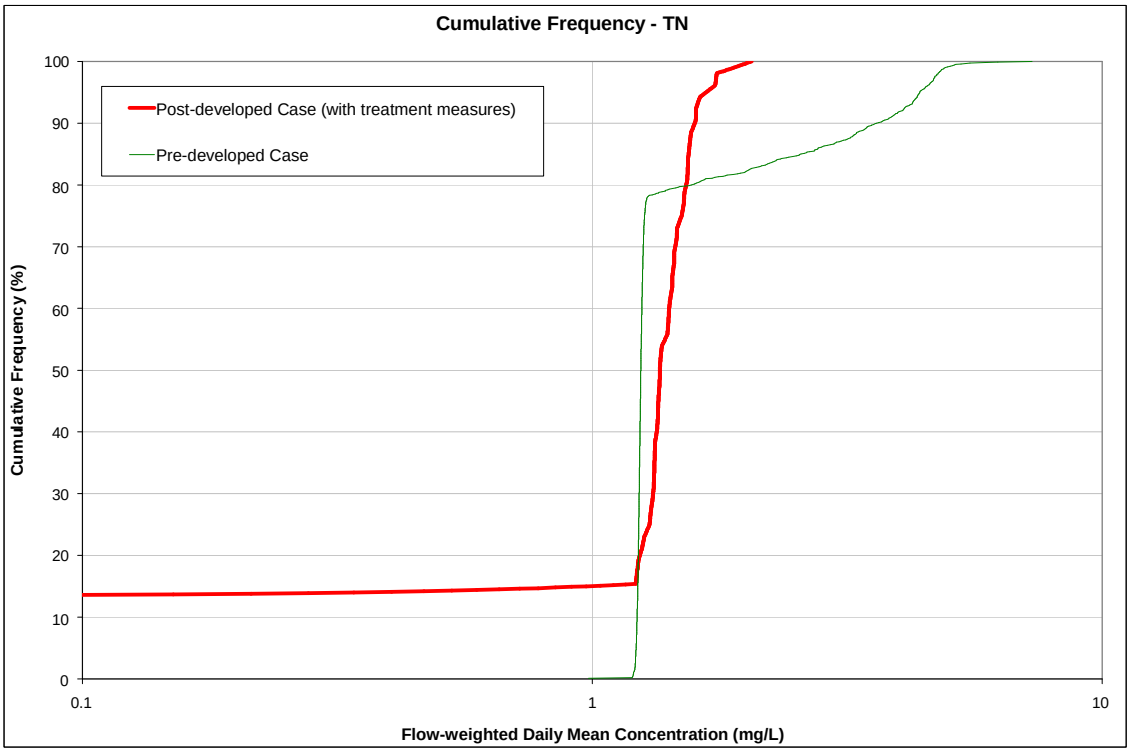


Figure Six – Log Chart of Cumulative Frequency for Total Nitrogen

It can be seen from **Figure Four** and **Figure Five** that after the implementation of the proposed treatment measures for the Southern Distribution Business Park the frequency of compliance of the neutral or beneficial (NorBE) requirement for total suspended solids and total phosphorus would be 100%.

Figure Six illustrates that total nitrogen levels would be less than or equal to approximately 1.5mg/L 80% of the time, whilst in the existing case they would be less than or equal to 1.3mg/L 80% of the time. This does not strictly adhere to the NorBE criteria, however total nitrogen levels would be less than 1.6mg/L over 90% of the time, whereas in the existing case they would be in excess of 3.6mg/L 10% of the time. Therefore, whilst the development could result in higher concentrations of nitrogen some of the time, the maximum concentration levels achieved will be reduced. Please note that these results are based on preliminary treatment measure sizing only and will be re-visited at the detail design stage, which will improve the frequency of compliance.

5.0 Conclusion

This report outlines the stormwater quality management strategy to be adopted for the proposed Southern Distribution Business Park adjacent to the Hume Highway, in Goulburn, New South Wales. The stormwater quality modelling undertaken using the MUSIC computer model indicates that the proposed stormwater management system would achieve the objective of limiting pollutant export loads from the development to below existing levels.

We have prepared the stormwater strategy based on our evaluation of best management practices for stormwater quality control in regard to the site constraints of the development, Goulburn City Council (now Goulburn Mulwaree Council) stormwater quality targets and the requirements of the Sydney Catchment Authority regarding water quality within the catchment area of the site.

The analysis of the proposed stormwater quality measures predicts that the provision of water quality measures constructed using a 'treatment train' approach would reduce the mean annual pollutant loads exported from the development and discharging into Gundary Creek, for all pollutants assessed.

We recommend that the stormwater management strategy detailed in this report, including the accompanying Stormwater Quality Concept **Plan No. 7027**, one sheet only, be accepted as an appropriate approach to providing a stormwater quality management strategy for the development taking into account all relevant stormwater quality issues that impact the site and adjoining properties.

REFERENCE

1. The Institution of Engineers, Australia (1987) Australian Rainfall and Runoff: A Guide to Flood Estimation Volume 1 and 2

2. CRC for Catchment Hydrology (2005) MUSIC User Guide

3. Institution of Engineers Australia (2004) Australian Runoff Quality

4. Department of Land and Water Conservation, NSW (1998) The Constructed Wetland Manual

5. Landcom, NSW (March 2004) Soils and Construction – Managing Urban Stormwater

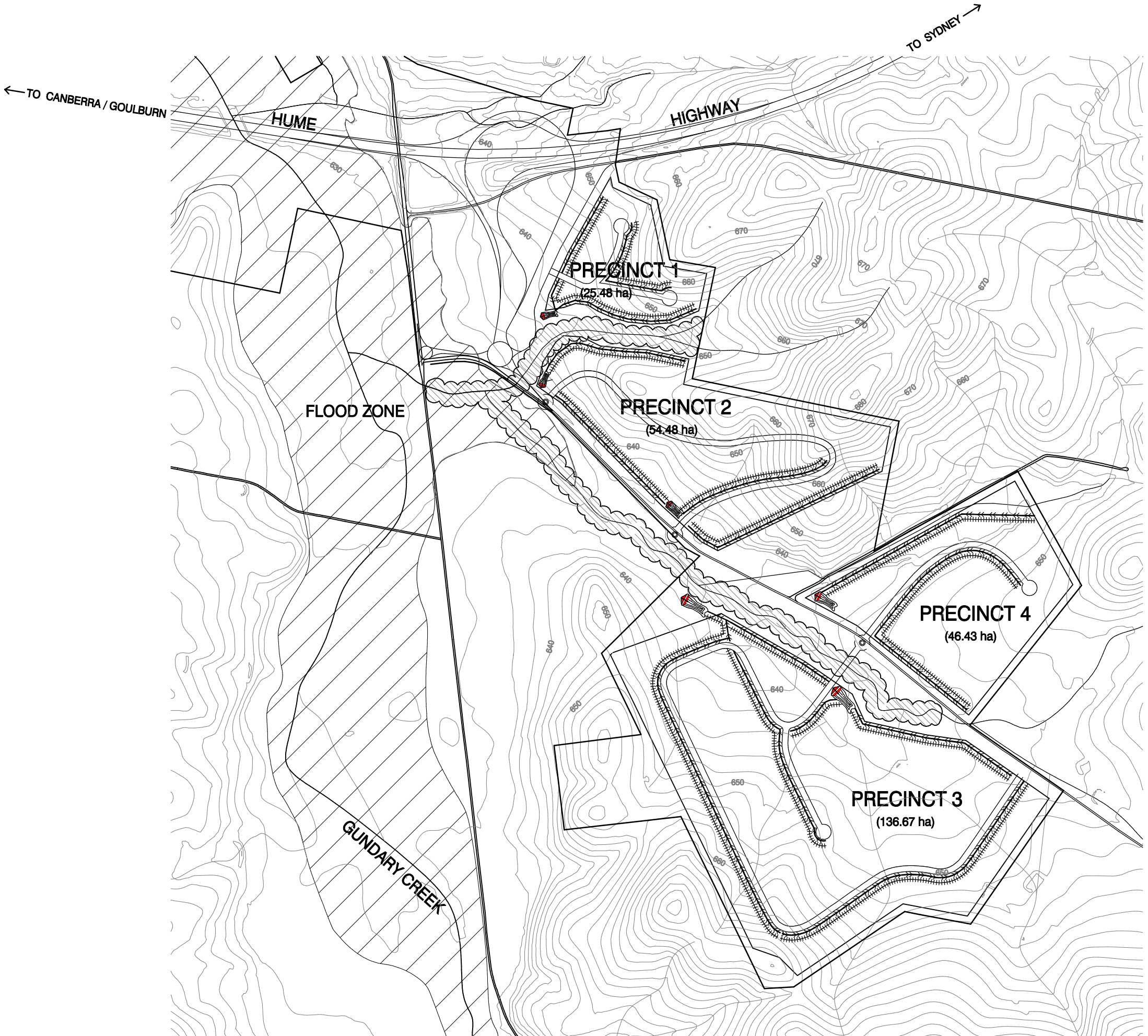
6. Parsons Brinckerhoff, (2006) Southern Distribution Business Park – Preliminary Integrated Water Cycle management Plan

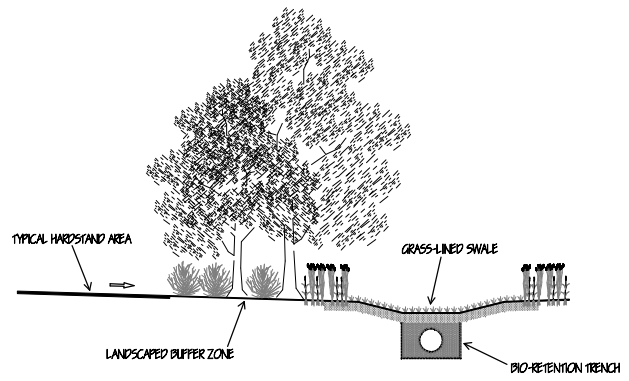
7. Monash University, (2004) Stormwater flow and quality, and the effectiveness of non-proprietary stormwater treatment measures – A review and gap analysis

8. CQ Environmental (2007) Southern Distribution Business Park Environmental Assessment

Attachment A –

Stormwater Quality Concept Plan No. 7027, one sheet only





SCHEMATIC OF PROPOSED TREATMENT MEASURES
NTS

LEGEND

- SEDIMENTATION BASIN
- BIO-RETENTION TRENCH
- LANDSCAPE BUFFER ZONE

REVISION	DETAILS	DATE
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Boyden & Partners (Coast)
CONSULTING CIVIL ENGINEERS
UNIT 2, 54 WILLIAM STREET GOSFORD P.O. BOX 1837 GOSFORD NSW 2250
T (02) 4323 4540 F (02) 4323 4531 email: coast @ boydens.com.au

PROJECT
SOUTHERN DISTRIBUTION HUB
HUME HIGHWAY
GOULBURN

DRAWING TITLE
STORMWATER QUALITY CONCEPT PLAN

SCALES

SURVEY	B.G.&E.
DATUM	AHD.
DESIGN	B.P.
DRAWN	B.P.
APPROVED	20-04-07
CAD FILE No.	7027_01.DWG

SHEET No. 1 OF 1

"WARNING"
BEFORE ANY EXCAVATION IS UNDERTAKEN, "DIAL BEFORE YOU DIG" MUST BE CONTACTED FOR LOCATION OF UNDERGROUND SERVICES.

PROJECT No. 7027

REVISION .

Appendix B – New Photomontages

1. View from St Patrick's Campus looking South East (before)

2. View from St Patrick's Campus looking South East (after)

3. View from outside 46 Mountain Ash Road looking South East (before)

4. View from outside 46 Mountain Ash Road looking South East (after)

5. View from outside 100 Mountain Ash Road looking North (before)

6. View from outside 100 Mountain Ash Road looking North (after)

7. Views from the tallest hill in front of the Rocky Hill War Memorial Tower looking South East. (before)

8. Views from the tallest hill in front of the Rocky Hill War Memorial Tower looking South East. (after)

Appendix C – Email from Watermin Drillers

From: Watermin Drillers [mailto:watermin@bigpond.com]
Sent: Monday, 4 December 2006 2:29 PM
To: patrice.brown@bigpond.com
Cc: bstephens@sdh.net.au
Subject: Bob Stephens - pump test

Attention Patrice Brown / Bob Stephens

Over the weekend of 2nd and 3rd December 2006 this company carried out a 24 hour pumping and recovery test of the 'Badgers Holt' bore.
This bore was pumped at 1800GPH, or 2.23 litres per second, which it maintained well.

This bore would withstand continuous pumping at this rate, however from Hydrogeological information, Watermin have on the general area, we are confident that we could produce far greater flows with further drilling in the area.

If you wish to further discuss your total long term plans, we would be able to assist with recommendations prior to expensive alternatives to achieve the supply of water required for your proposed project.

Your sincerely

Max Jones
Managing Director
WATERMIN DRILLERS PTY LTD