

Integrated Water Cycle Management Strategy

Proposed SupaGas Expansion Project

For

Manildra Group

Site address

**Lot 143 in DP 1069758 , 220 Bolong Road,
Bomaderry**

Date

18/03/2025

Project Reference: 131401



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Table of Revisions

Initial	Rev	Date	Details
WRM	0	18/3/2025	Client Review



1.0 INTRODUCTION

Allen Price (AP) has been engaged by SupaGas to prepare an Integrated Water Cycle Management Strategy for the SupaGas Stage #2 Expansion Project.

The proposed SupaGas Stage #2 Expansion Project is located adjacent to the existing SupaGas processing plant at No 220 Bolong Road, being Lot 143 in DP 1069758.

The provisions of Table 5 in section 6.1 of Chapter G2 of DCP2014 defines the proposal as a large scale development.

This report references the following Shoalhaven City Council (SCC) standards and technical advice:

- D5 Engineering Standards document and DCP2014,
- Chapter G2 of DCP2014,
- Supporting document *Sustainable Stormwater Technical Guidelines*.

2.0 SITE AND LOCALITY

2.1 GENERAL DESCRIPTION

The site for the proposed SupaGas Stage #2 expansion is within the existing Manildra processing plant precinct in Bolong road, Bomaderry.

Internal access to the SupaGas site is available from within the existing Manildra maintenance facility (former dairy factory) via a channelised intersection with Bolong Road.

The site location and overall layout is presented in Figure 2.1.

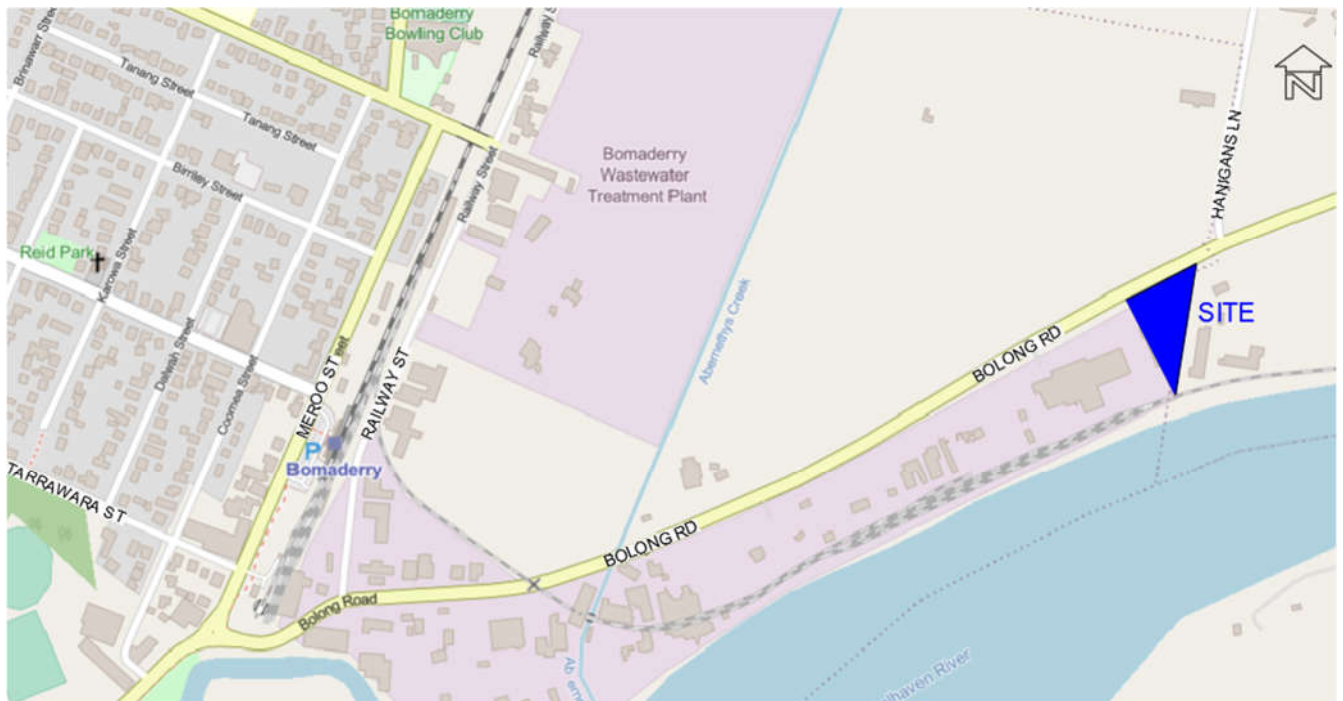


Figure 2.1
Site Locality Sketch
(source Six Maps)

Flooding impacts have been assessed by others and are not addressed by this report.

Flood levels in the vicinity of the site (Terara Gauge) for current climate conditions are presented in Table 10.1 of the Lower Shoalhaven (*Cardno Nov 2022*) as follows:

- 1% AEP flood level at RL 5.19.
- 5% AEP flood level at RL 4.61.
- 10% AEP flood level at RL 3.99.
- 20% AEP flood level at RL 2.87.



Flood levels in the vicinity of the site (Terara Gauge) for the period 2050–2100 are presented in Table 10.2 and Table 10.3 of the Lower Shoalhaven Flood Study (*Cardno Nov 2022*) as follows:

- 1% AEP flood level at RL 5.19 (2050 – 2100).
- 5% AEP flood level at RL 4.61 (2050–2100).
- 10% AEP flood level at RL 4.0 (2050 – 2100).

The elevation of the site varies from RL 4.8 in the southern part of the site to RL 4.7 in the northern part of the site.

2.2 PROPOSED DEVELOPMENT

The proposal is for the Stage #2 expansion of the Bomaderry SupaGas plant and will involve the following works:

- a. Cooling towers and pumps
- b. Carbon vessels
- c. CO₂ liquification and compressor
- d. Dryer
- e. Catalytic Oxidiser (CATOX) unit
- f. Nitrogen oxides (NO_x) trap
- g. Wastewater tank
- h. MCC room
- i. Storage tanks
- j. Transformer
- k. Refrigerant compressor
- l. Associated site works such as pavement, stormwater and services construction.

Flood sensitive components can be installed to be above the 1% AEP flood level.

SupaGas drawing BRA-LAY-IND-BOM-04-RevA presents the general site layout and is presented in Appendix A.



3.0 STORMWATER QUALITY

The works associated with the proposed SupaGas Stage #2 expansion are wholly within the existing Manildra site and immediately adjacent to the Manildra Maintenance Facility (former Dairy Factory site)

Runoff from all components of the proposed Stage #2 expansion will drain to the existing stormwater system and stormwater quality improvement device within the former dairy factory.

Post development runoff will be mitigated to maintain the existing peak discharge. Therefore, no additional permanent stormwater quality measures are proposed

Short term, temporary stormwater quality impacts are likely during the construction phase. Conventional sediment and erosion controls in close proximity to the individual components during construction will mitigate the potential for sediment export from the site.

3.1 Erosion and Sediment Control Concept

Stormwater quality may be protected during construction through the minimisation of disturbed area and staged implementation of erosion and sediment control measures generally as follows:

Step 1.

- a. Establish internal access routes on sealed pavements within the existing operational area and also within the Maintenance Facility site.
- b. Establish wheel shaker / wheel-wash on all entry / exit routes from which sediment may be mobilised from vehicle traffic.
- c. Establish perimeter fencing and tree protection fencing as required.

Step 2.

Establish erosion and sediment control measures which will be in place for the duration of the construction period such as but not limited to:

- a. Install sediment traps and / or mesh and gravel filters to existing pits
- d. Install temporary all weather pavements.

Step 3.

Bulk earthworks:



- a. Limit the extent of work areas to ensure that the exposed area at any one time is not greater than 2,500 m². In this regard, the general works sequence will be :
- b. Strip topsoil and place in temporary stockpile. Given that only limited respreading of topsoil on the site will occur, excess topsoil should be removed from the site progressively during the stripping operation. Excess topsoil may be stockpiled on the Manildra Environmental Farm.
- c. Undertake Bulk earthworks operations. Given that only limited filling is to be placed on the site, excess spoil should be removed from the site progressively during the bulk earthworks operation. Excess spoil may be stockpiled on the Manildra Environmental Farm.
- d. Construct foundations for new plant components.
- e. Install new stormwater pits and pipes.
- f. Prepare subgrade for new pavements.
- g. Building works and roof water connections.
- h. Stabilise disturbed areas with grass seeding.
- i. Maintain erosion and sediment control measures.

A concept Erosion and Sediment Control Plan (ESCP) has been prepared to mitigate stormwater quality impacts. The concept ESCP is presented in Appendix B.



4.0 STORMWATER QUANTITY MODELLING

4.1 CATCHMENT CHARACTERISTICS

Existing Stage #1 of the SupaGas site discharges to the existing stormwater system within the Manildra Maintenance facility. This stormwater system discharges to the Shoalhaven River through an existing stormwater quality improvement device and outfall.

The Stage #2 development will connect to this existing stormwater system.

The pre-development and post development characteristics of the site are presented in Table 4.1 and Table 4.2 below.

**Table 4.1
Existing Site Characteristics**

EXISTING SITE				
Catchment Description	Sub-Catchment Area		Imperv	Remarks
	m ²	ha	%	
Turning Area	874	0.087	100	Existing part of Stage #1 works
Stage #1 Plant	1,455	0.145	60	Existing plant with gravel infill between components
Stage #1 Access	159	0.016	100	Existing access
Grass	1,705	0.170	0	Undeveloped Stage #2 area
Catchment Total	4,192	0.419		
Imperv area (m ²)	1,905			
Imperv %	45.5			



**Table 4.2
Developed Site Characteristics**

PROPOSED DEVELOPMENT				
Catchment Description	Sub-Catchment Area		Imperv	Remarks
	m ²	ha	%	
Turning Area	874	0.087	100	Existing part of Stage #1 works
Stage #1 Plant	1,455	0.145	60	Existing plant with gravel infill between components
Stage #1 Access	159	0.016	100	Existing concrete access
Stage #2 Plant expansion	775	0.077	60	New plant with gravel infill between components
Stage #2 Access	930	0.093	100	New concrete access
Catchment Total	4,192	0.419		
Impervious area (m ²)		3,141		
Impervious %		74.9		

4.2 SITE RETENTION REQUIREMENT

The retention requirement calculations are presented in Table 4.3 below.

The site retention requirement can be achieved by way of one 8kL rainwater tank accepting roof runoff from the MCC building.

Table 4.3

RETENTION REQUIREMENT DCP G2 Table 2 <i>(Industrial Development)</i>	
Additional Imperv Area (m ²)	1,236
Retention depth (m)	0.006
Retention volume (m ³)	7.42



4.3 RUNOFF MITIGATION

A concept DRAINS model was established in order to estimate the increase in runoff resulting from the incremental increase in the impervious area.

The DRAINS hydrological parameters are as follows:

- Impervious depression storage: 1mm
- Pervious depression storage: 5mm
- Soil Type : 3

The DRAINS model estimates the pre-development site discharge from the site and the post development discharge from the site with and without Onsite Detention (OSD).

The increase in site discharge can be mitigated by way of an OSD system comprising using 3 x 525mm dia pipes approximately 34.2m long with a 100mm dia outlet pipe.

The DRAINS model results are presented in Table 4.4 below.

Table 4.4
Site Discharge

SITE CONDITION	SITE DISCHARGE (m ³ /s)				
	4EY	20% AEP	10% AEP	5% AEP	1% AEP
Pre - Development	0.020	0.086	0.109	0.136	0.220
Post Development (No OSD)	0.035	0.113	0.138	0.166	0.241
Post-Development (with OSD)	0.025	0.075	0.088	0.104	0.199

The concept DRAINS model structure is presented in Appendix C.



5.0 DCP2014 COMPLIANCE TABLES

The following table is prepared to demonstrate compliance with DCP2014 Chapter G2 – Sustainable Stormwater Management.

DCP2014 Chapter G2 – Sustainable Stormwater Management – 5 Controls	
5.1 Stormwater	
5.1.1 Minor and Major Systems Design	
Acceptable Solutions	Compliance
<p>A1.1 Runoff from impervious areas must not be concentrated or directed onto neighbouring properties</p>	<p>Runoff from the development site will drain to the existing SQID and existing stormwater outfall to the Shoalhaven River.</p> <p>Runoff will be contained on the site and will not be directed onto adjoining properties.</p> <p>Complies</p>
<p>A1.2 For residential and rural residential areas, the drainage must be designed to cater for a 5 year ARI event.</p>	<p>Not applicable for industrial development.</p>
<p>A1.3 For mixed residential/commercial and industrial development, the drainage must be designed to cater for a 10 year ARI event.</p>	<p>Runoff from the development site will drain to the existing SQID and existing stormwater outfall to the Shoalhaven River.</p> <p>Roof gutters and down pipes for the MCC building can be designed to comply with AS/NZS 3500.3.</p> <p>The OSD system will not overflow during the 10% AEP design burst ensembles.</p> <p>Can Comply.</p>
<p>A1.4 Kerb and gutters are required if soil permeability is not sufficient to allow natural infiltration of stormwater runoff without causing adverse impacts onsite or to neighbouring properties.</p>	<p>Runoff from the development site is contained within existing kerb and gutter and will drain to the existing SQID and existing stormwater outfall to the Shoalhaven River.</p> <p>Complies</p>

	<p>Detail design of the Stage #2 access pavement can be arranged to have a central fall, fall to a kerb and gutter or a combination.</p> <p>Site works will require the adjustment of a small section of the existing kerb and gutter associated with the former Dairy Factory in order to allow smooth transition for the Stage #2 access pavement.</p> <p>The associated stormwater system can be detailed to capture stormwater generated from the access pavements and integrated into the existing stormwater system within the former Dairy Factory site.</p> <p>Can Comply.</p>
<p>A1.5 Runoff from roof gutters and downpipes can be directed to an existing or proposed stormwater system, when it can be proved that the systems design capacity is not exceeded.</p>	<p>Runoff from the development site will drain to the existing stormwater system and SQID to the existing stormwater outfall to the Shoalhaven River.</p> <p>No runoff will be directed onto neighbouring property.</p> <p>Complies.</p>
<p>A1.6 Where onsite infiltration/absorption is proposed for stormwater disposal, supporting geotechnical reports are submitted with a development application to assess the suitability of the proposal</p>	<p>Runoff from the development site will drain to the existing SQID and existing stormwater outfall to the Shoalhaven River.</p> <p>Stormwater disposal via Infiltration / absorption not proposed.</p> <p>N/A</p>
<p>A1.7 Stormwater inlet structures must be designed with a blockage factor provision in accordance with the latest version of Australian Rainfall and Runoff (ARR) guidelines</p>	<p>The concept DRAINS model has applied 50% blockage for surface inlet pits.</p> <p>Detailed design of the stormwater system for the construction certificate can make allowance for pit blockage factors.</p> <p>Can Comply.</p>



<p>A1.8 Major system drainage must be designed for a 1:100 year ARI event</p>	<p>Runoff from the development site will drain to the existing SQID and existing stormwater outfall to the Shoalhaven River.</p> <p>The provision of an OSD system will maintain peak site discharge at or below the peak pre-development site discharge for design storms of AEP 20%, 10%, 5% and 1%.</p> <p>Can Comply</p> <p><i>It is noted that the site will be inundated during a riverine flood of magnitude 1% AEP.</i></p>
<p>A1.9 Trunk stormwater systems, which include open channels, large conduits and overland flow paths are designed for storms up to 100 year ARI event.</p>	<p>Trunk drainage not required</p> <p>N/A</p>
<p>A1.10 The following overland flow paths shall be utilised as Major system flow routes;</p> <ul style="list-style-type: none"> • Roadways including footpath; • Pathways; and • Parkland or open space. 	<p>No new public roads, pathways nor public open space will be created.</p> <p>N/A</p>
<p>A1.11 Flow paths must be designed to ensure a velocity depth product of less than 0.3m²/s for a 100 year ARI storm event.</p>	<p>The 1% AEP post development discharge from the site into the existing kerb and gutter in the former Dairy Factory site is 0.16 m³/s with a DxV of 0.09 m²/s.</p> <p>Complies</p> <p>It is noted that the site will be inundated during a 1% AEP riverine flood</p>
<p>A1.12 The continuity of the overland flow paths must not be obstructed by fences, walls, footpaths and the like.</p>	<p>Continuity of other overland flow paths will not be restricted.</p> <p>Complies</p>
<p>5.1.2 Disposal of Stormwater from Development sites</p>	



<p>A2.1 Roof water collection and disposal.</p>	<p>Roof gutters and downpipes for the MCC building can be designed to AS/NZS 3500.3 and will discharge to the existing stormwater system in the former Dairy Factory site.</p> <p>Can Comply</p>
<p>A2.2 Surface water from paved areas.</p>	<p>Surface water from the Stage #2 access pavement will be collected by new stormwater pit and pipes and directed to the existing stormwater system and SQID within the former Dairy Factory.</p> <p>An existing stormwater pit will be adjusted or replaced as required in order to connect new stormwater pipe to the existing system.</p> <p>In this regard, detail design will be undertaken for the construction certificate.</p> <p>Can Comply</p>
<p>A2.3 Rainwater harvesting.</p>	<p>The proposed MCC building provides an opportunity to harvest 8 kL of rainwater.</p> <p>Complies</p>
<p>5.1.3 Climate Change Controls</p>	
<p>A3.1 Climate change impacts, such as changes to rainfall intensity, shall be considered in system design as per relevant policies and/or Australian Rainfall & Runoff (ARR) Guidelines.</p>	<p>The new stormwater system and roof gutters be designed with consideration to climate change impacts and to AS/NZS 3500.3</p> <p>In this regard, detail design will be undertaken for the construction certificate.</p> <p>Can comply</p> <p>It is noted that the predicted year 2100 climate change impact on riverine flooding is a flood level rise of 0.1m for a 1%AEP flood.</p>



<p>A4.1 Where relevant major and minor system design must consider the impact of sea level rise.</p>	<p>The SCC flood certificate dated 23 Sep 2015 indicates that the existing and 2100 PMF level is RL8.0.</p> <p>SCC flood certificate dated 23 Sep 2015 indicates that the existing 1% AEP flood level is RL5.7 and 2100 1% AEP flood level is RL5.8.</p> <p>Sea level rise and climate change will not significantly increase flood impact on the site.</p> <p>Flood sensitive components may be set at or above RL 5.8.</p> <p>Complies</p>
<p>5.1.4 Onsite Stormwater Detention (OSD)</p>	
<p>A5.1 OSD is to be sized to match pre-development peak flow rates for the 5, 20 and 100 year ARI rain events for the site</p>	<p>Provision of an Onsite Detention system will ensure that pre-development discharge is not exceeded.</p> <p>(Refer to Table 4.4 and Appendix C)</p> <p>Can Comply</p>
<p>A5.2 For development other than subdivision, pre and post-development peak flow calculations must be based on the impervious percentages (as outlined below) or the actual impervious surface area (whichever is greater) as detailed on development plans.</p>	<p>Actual increase in impervious area used in runoff calculations.</p> <p>It is noted that gravel infill will be used as a weed control measure between components of plant.</p> <p>The gravel infill will increase the initial loss prior to runoff from pervious surfaces occurring.</p> <p>Can comply</p>



<p>A5.3 For subdivisions, pre and post-development peak flow calculations must be based on the impervious percentages as outlined below. Area impervious:</p> <ul style="list-style-type: none"> • Open Space – 25% • Low and Med density residential – 80% • Industrial areas – 80% • Commercial areas – 90% • Half width road reserve – 95% 	<p>Not a subdivision development.</p> <p>Not applicable</p>
<p>A5.4 OSD design must consider downstream boundary conditions for the 100 year ARI level of the receiving water.</p>	<p>The Shoalhaven River 1% AEP flood level at the site is RL 5.8 (2100). Noting that the elevation of the site varies from RL 4.8 to RL 4.7, in the event of a 1% AEP riverine flood, the entire site will be inundated.</p> <p>Not applicable for this development</p>
<p>A5.5 Detention storage must be located at a level above the 5 year ARI flood level</p>	<p>Table 10.1 of The Lower Shoalhaven Flood Study (<i>Cardno Nov 2022</i>) indicates that the current 20% AEP Shoalhaven River flood level in the vicinity the site is RL 2.87.</p> <p>The invert level of the OSD will be approximately RL 3.57 which is above the 20% AEP flood level.</p> <p>Noting the relatively small ‘climate change’ flood level increase presented in Table 10.2 & Table 10.3 of The Lower Shoalhaven Flood Study (<i>Cardno Nov 2022</i>) the OSD will remain above the 20% AEP Shoalhaven River flood level.</p> <p>Complies</p>
<p>A5.6 If OSD is provided in landscaped areas, the desirable maximum depth of ponding under design conditions is 300mm.</p>	<p>No OSD proposed for landscaped areas.</p> <p>N/A</p>
<p>A5.7 Despite A5.6 the desirable maximum depth of ponding can be increased to 1200mm provided that site slopes of the basin are $\geq 1:6$, or the provided storage is fenced off.</p>	<p>No OSD proposed for landscaped areas.</p> <p>Complies</p>



<p>A5.8 For subdivisions OSD shall be:</p> <ul style="list-style-type: none"> • Designed at the subdivision stage • Constructed at the individual dwelling stage where OSD is proposed on each lot • Constructed at the subdivision stage where OSD is proposed to be provided through dedicated detention storage 	<p>Not a subdivision development.</p> <p>Not applicable</p>
<p>A5.9 50% of any retention volume can contribute towards the OSD volume required for the development, provided the systems are interconnected.</p>	<p>Not applied for OSD calculations</p> <p>N/A</p>
<p>5.2 Stormwater Quality and Waterway Protection</p>	
<p>5.2.1 Erosion and Sediment Control</p>	
<p>A6.1 Where vegetation exists on the site, buffer zones of vegetation shall be retained along the boundaries of the site where practicable, particularly those adjacent to creeks and street gutters</p>	<p>The works are on land Zoned E4 (General Industrial) which has generally been cleared.</p> <p>The works are within the existing Manildra precinct and is separated from the Shoalhaven River by the existing rail corridor.</p> <p>The development site is at least 35m from the top of the Shoalhaven River bank and is to the north of the existing rail corridor.</p> <p>The Stage #2 extension will require the removal of 12 trees but will retain the trees along the eastern boundary of the site. The trees to be removed are more than 65m from the Shoalhaven River bank.</p> <p>Complies</p>
<p>A6.2 Sediment and erosion control measures shall not adversely impact on stormwater management measures of the site or any existing public drainage structures of systems</p>	<p>The concept erosion and sediment control plan demonstrates that all erosion and sediment control measures can be contained wholly within the site.</p> <p>A detailed erosion and sediment control plan can be developed in conjunction with the detailed construction certificate design for the works.</p> <p>Complies.</p>



5.2.2 Stormwater Retention and re-use	
<p>A7.1 The volume of retention storage provided is to be equal to or greater than: [storage depth*] X [increase in impervious surfaces compared to pre-development] *as outlined below (refer to Sustainable Stormwater Technical Guidelines for further details).</p> <ul style="list-style-type: none"> • Alterations, additions, auxiliary structures & second storey additions (10mm) • Single dwelling & dual occupancy (10mm) • Medium Density (9mm) • High Density (8mm) • Industrial (6mm) 	<p>Impervious area increase is 1,236 m².</p> <p>Retention storage depth is 0.006m.</p> <p>Retention storage requirement is 7.42 kL.</p> <p>An 8kL slimline tank is readily available.</p> <p>Can comply</p>
<p>A8.1 Residential development shall install rainwater tanks to meet a portion of supply such as outdoor use, toilets, laundry</p>	<p>Not applicable for Industrial development.</p>
<p>A8.2 Any overflow from rainwater tanks shall be directed into an existing stormwater system where possible, alternatively the overflow will be managed so that it does not cause nuisance to neighbouring properties</p>	<p>Overflow from the rainwater tank will be directed to the new and existing stormwater system</p> <p>Can Comply</p>
5.2.3 Small/medium scale development – Not Applicable (Assessed as Large scale development)	

5.2.4 Large Scale Development	
<p>A10.1 For development within Sydney’s drinking water supply catchments, a neutral or beneficial effect must be demonstrated in accordance with the State Environmental Planning</p>	<p>Development is not within a Sydney Water drinking water supply catchment.</p> <p>Not applicable.</p>



<p>Policy (Sydney Drinking Water Catchment) 2011.</p>	
<p>A10.2 For development outside Sydney's drinking water supply catchments, pollutant load reduction must be a minimum reduction of the load of the post development average annual load of pollutants in accordance with Table 3 and the following as relevant:</p> <ul style="list-style-type: none">• For greenfield sites or sites draining to a natural stream of 3rd order or lower, the 1.5 year ARI predevelopment peak discharge must be maintained.• For development discharging to a natural stream, the post development duration of stream forming flows must be no greater than a stream erosion index of 2	<p>Runoff from the development site will drain to the existing stormwater outfall to the Shoalhaven River.</p> <p>Complies.</p> <p>Runoff from the development site will drain to the existing stormwater outfall to the Shoalhaven River.</p> <p>Complies.</p>



<ul style="list-style-type: none"> • For development discharging to a tidal area or natural watercourse, outlets must be designed to limit erosion and sedimentation at the discharge point 	<p>Runoff from the development site will drain to the existing stormwater outfall to the Shoalhaven River via an existing SQID.</p> <p>Complies.</p>
<ul style="list-style-type: none"> • For development discharging to St Georges Basin, Swan Lake, Lake Conjola, Burrill Lake, Lake Tabourie, Willinga Lake and Wollumboola Lake a higher Total Phosphorus reduction target of 65% must be achieved 	<p>The site does not drain to these catchments.</p> <p>N/A</p>
<ul style="list-style-type: none"> • For a development discharging into an area of significant biodiversity value, the post development residual pollutant concentrations must not exceed the ecological trigger values listed in the A & NZ guidelines for fresh and Marine Water Quality 	<p>The site does not drain to an area of significant biodiversity.</p> <p>N/A</p>
<ul style="list-style-type: none"> • Un coated metal roofs, facades and/or downpipes are not supported 	<p>Uncoated metal roofs, facades or downpipes are not proposed.</p> <p>Complies.</p>

5.2.5 Design and Maintenance of Stormwater Treatment Measures

<p>A11.1 Where practicable, trunk drainage is to be provided as a natural vegetated stable channel; and</p>	<p>Trunk drainage not required.</p> <p>Not applicable</p>
<p>A11.2 Where practical due to adequate catchment area, constructed wetlands are preferred over the use of bio-retention basins and water quality ponds. The preference between a water quality pond and bioretention</p>	<p>Short term construction impacts can be mitigated by conventional erosion and sediment control measures.</p> <p>Runoff from the development site will drain through the existing SQID and existing stormwater outfall to the Shoalhaven River.</p>



<p>device will depend on site specific constraints</p>	<p>Complies</p>
<p>A11.3 An Operation and Maintenance Plan is submitted to Council for all stormwater treatment measures proposed, whether remain in private ownership or to be handed over to Council; and</p>	<p>The existing Shoalhaven Starches Environmental Procedure - <i>Stormwater Management Plan</i> (EN-P-0180 1.0.1 dated 31 Jan 2024) for Zone 6 Central can be updated to meet this requirement.</p> <p>Can Comply</p>
<p>A11.4 System design allows for maintenance (i.e. access and room to operate safely) at all times; and</p>	<p>Complies.</p>
<p>A11.5 Stormwater treatment measures must not be connected until the majority of catchment infrastructure is completed and landforms stabilised with impervious or fully established grassed surfaces. Bioretention devices and constructed wetlands must be established offline from inflows until they are fully established</p>	<p>Not applicable</p> <p>No new bioretention devices nor constructed wetlands are proposed.</p>
<p>A11.6 Where the development is staged, sacrificial zones must be included in the design of the stormwater treatment measures. Sacrificial zones are to be rectified upon completion of development at the developer's cost; and</p>	<p>Not applicable</p> <p>No sacrificial zones are proposed.</p>
<p>A11.7 Structural stormwater treatment measures must be able to bypass flows in excess of the design discharge with negligible afflux resulting from over topping or blockage of the device; and</p>	<p>Not applicable.</p>



<p>A11.8 Trash racks are generally preferred over proprietary GPT's by Council</p>	<p>Trash racks not proposed. Not applicable.</p>
<p>A11.9 In the event of a stormwater discharge, structure stormwater treatment measures must not allow the release of any previously trapped material.</p>	<p>Complies.</p>
<p>A11.10 Stormwater treatment measures must consider mosquito control in their design. Designs should consider:</p> <ul style="list-style-type: none"> • Permanent water ponding; • Water depth; • Exposure to sunlight and wind; and • Proximity to residential development 	<p>Complies.</p>
<p>A11.11 All filter media used in bioretention stormwater treatment measures must meet the current specifications of the Guidelines for filter media in adoption guidelines for biofiltration systems or a demonstrated equivalent, verified by a soil laboratory registered by the National Association of Testing Authorities; and</p>	<p>Not applicable.</p>
<p>A11.12 Design of stormwater treatment measures is in accordance with Sustainable Stormwater Technical Guidelines.</p>	<p>An existing SQID is to treat stormwater runoff. N/A</p>
<p>A11.13 Development adjacent to a watercourse or stormwater drain addresses environmental impact upon the water body.</p>	<p>Erosion and sediment control measures implemented during construction will address the short term impacts. Can Comply.</p>



<p>A11.14 Constructed wetlands and bioretention basins must be located in a treatment train approach immediately downstream of a sediment basin/forebay.</p>	<p>Not applicable.</p>
<p>A11.15 Bioretention devices must be designed in accordance with the latest version of the Adoption Guidelines for stormwater systems (CRC for water sensitive cities) and Facility for advancing water biofiltration (FAWB) Guidelines</p>	<p>Not applicable.</p>
<p>5.3 Waterfront Land</p>	
<p>5.3.1 Development on Waterfront land</p>	
<p>A12.1 The minimum width of the core riparian zone is in accordance with Table 4 or as specified by the Water Management Act 2000</p>	<p>That part of the site that is within the riparian zone is within an area currently used for general industrial purposes.</p> <p>The proposed works will not prevent additional re-vegetation of the riparian zone.</p>
<p>A12.2 The core riparian zone must be maintained or restored or rehabilitated using appropriate local species with a range of canopy, understorey and ground cover species to enable a healthy and diverse ecosystem</p>	<p>That part of the site that is within the riparian zone is within an area currently used for industrial purposes.</p> <p>The proposed works will not prevent additional re-vegetation of the riparian zone.</p>
<p>A12.3 Topsoil shall be reused from the development site where it contains known or potential seedbank on the development site</p>	<p>Not applicable.</p> <p>Topsoil does not have the potential for seedbank of native or useful exotic species.</p>
<p>A12.4 Transport infrastructure and services (ie sewer, electricity, gas and communications) shall be located outside the core riparian zone</p>	<p>That part of the site that is within the riparian zone is within an area currently used for industrial purposes.</p> <p>The proposed works will not prevent additional re-vegetation of the riparian zone.</p>



<p>A12.5 Despite A12.4, where services must traverse the core riparian zone, the development application must demonstrate that there will be minimal impact on the function and integrity of the core riparian zone</p>	<p>That part of the site that is within the riparian zone is within an area currently used for and zoned for industrial purposes.</p> <p>The proposed works will not prevent additional re-vegetation of the riparian zone.</p>
<p>A12.6 Pathways, cycleways and pervious recreational area shall be located outside core riparian zone unless all of the following is satisfied:</p> <ul style="list-style-type: none"> • An opportunity exists for the community to connect with and explore the watercourse in a strategic location • There will be minimal impact on the riparian function • The integrity of the riparian land is maintained 	<p>No footpaths or cycleways encroach into the riparian zone.</p> <p>Not applicable</p>
<p>A12.7 Bushfire asset protection zones shall be located outside the core riparian zone or vegetated buffer and should be incorporated into the development footprint</p>	<p>No APZ proposed.</p> <p>Not applicable.</p>
<p>A12.8 Crossings of waterways or other activities must have regard to the minimum structure requirements for fish passage in accordance with relevant NSW state government guidelines</p>	<p>No waterway crossings proposed.</p> <p>Not applicable.</p>
<p>A12.9 Works carried out on waterfront land comply with the Water Management Act 2000</p>	<p>That part of the site that is within the riparian zone is currently used for industrial activities conducted in accordance with current approvals.</p>
<p>A12.10 Stormwater disposal over/across/through public waterfront reserves should be avoided to prevent erosion and need for remedial actions</p>	<p>Runoff from the development site will drain to the existing SQID and existing stormwater outfall to the Shoalhaven River.</p> <p>No new stormwater outlets across waterfront land are proposed.</p> <p>Complies .</p>



5.3.2 Coastal areas –development discharging to coastal cliffs or coastal dunes.
This Section Is Not Applicable

6.0 CONCLUSION

This report has assessed the stormwater quality and quantity impacts of the proposed SupaGas Stage #2 expansion against Chapter G2 of the SCC DCP.

Operational activity SupaGas Facility and associated works are unlikely to generate stormwater pollutants within the site.

Potential short term stormwater quality impacts from the construction works can be mitigated by the implementation of erosion and sediment control plan and staged earthworks such that the performance objectives and criteria in Ch G2 can be satisfied.

The proposal is considered adequate from a stormwater management perspective and is recommended to be supported by the NSW Department of Planning, Housing and Infrastructure.

Wal Mullany
BE, Grad Dip LGE, ME(Hons), MCP, MIE Aust, CPEng, NER

For Allen Price Pty Ltd

18 March 2025



APPENDIX A – DEVELOPMENT PLAN

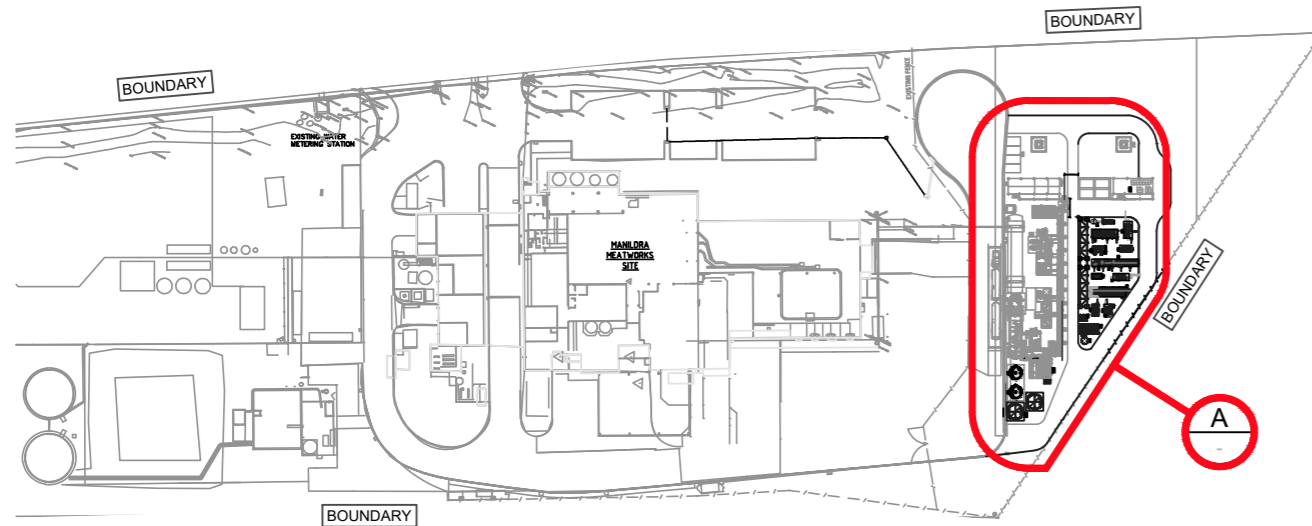


LEGEND

- STAGE 1 - EXISTING SITE.
- STAGE 2 - PROPOSED SITE.

NOTES:

1. ALL DIMENSION IN mm UNLESS OTHERWISE NOTED.



SITE LOCATION - PLAN

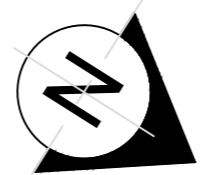
SCALE 1:1500



A SITE DETAIL
SCALE 1: 150

POS.	DESCRIPTION
1	LOW PRESSURE / AMMONIA SECTION
2	CO2 COMPRESSOR
3	GUARD CARBON BED
4	CATOX UNIT
5	DRYER
6	REFRIGERANT COMPRESSOR
7	CO2 LIQUEFACTION
8	AMMONIA RECEIVER
9	NOX TRAP
10	CO2 LIQUID PUMP
11	POWER PANEL / MCC ROOM
12	KO DRUM
13	CO2 BLOWER
14	TRANSFORMER
15	CO2 VAPORISERS (1 No)
16	STORAGE VESSELS (2 NO's)
17	COOLING TOWERS
18	COOLING WATER PUMP (2 NO's)
19	WASTE WATER TANK

DRAWING NUMBER	DRAWING DESCRIPTION
BRA-LAY-IND-BOM-05	BOMADERRY PROPOSED SITE ELEVATIONS "C" & "D"
BRA-LAY-IND-BOM-04	BOMADERRY PROPOSED SITE ELEVATIONS "A" & "B"
BRA-LAY-IND-BOM-03	BOMADERRY SITE - PROPOSED STAGE 2 WITH SURVEY
BRA-LAY-IND-BOM-02	BOMADERRY SITE - PROPOSED STAGE 2
BRA-LAY-IND-BOM-01	BOMADERRY SITE - SITE SURVEY PLANT INFORMATION



REV	DATE	INITIAL	REVISION DESCRIPTION	JL	YS	SCALE
A	07.02.25		INITIAL ISSUE	JL	YS	AS SHOWN
				DRN	CHK	

DESIGNED SUPAGAS
DATE 07.02.25
DRAWN J.LITTLE
DATE 07.02.25
CHECKED Y.SHARMA
DATE 07.02.25
APPROVED BY R.POURDARVISH
DATE 07.02.25
PRO APP'D BOMADERRY
DATE 07.02.25

SUPAGAS
YES WE CAN!

© SupaGas Pty Ltd.
5 Benson Rd, Ingleburn NSW 2565
Phone: (02) 8788 4413
email: rezapour@supagas.com.au
web: www.supagas.com.au

SHEET SUPAGAS PROPOSED STAGE 2 SITE
BOMADERRY SITE
220 BOLONG ROAD, BOMADERRY
NEW SOUTH WALES

DWG NO BRA-LAY-IND-BOM-02

REV A



APPENDIX B – CONCEPT ENGINEERING

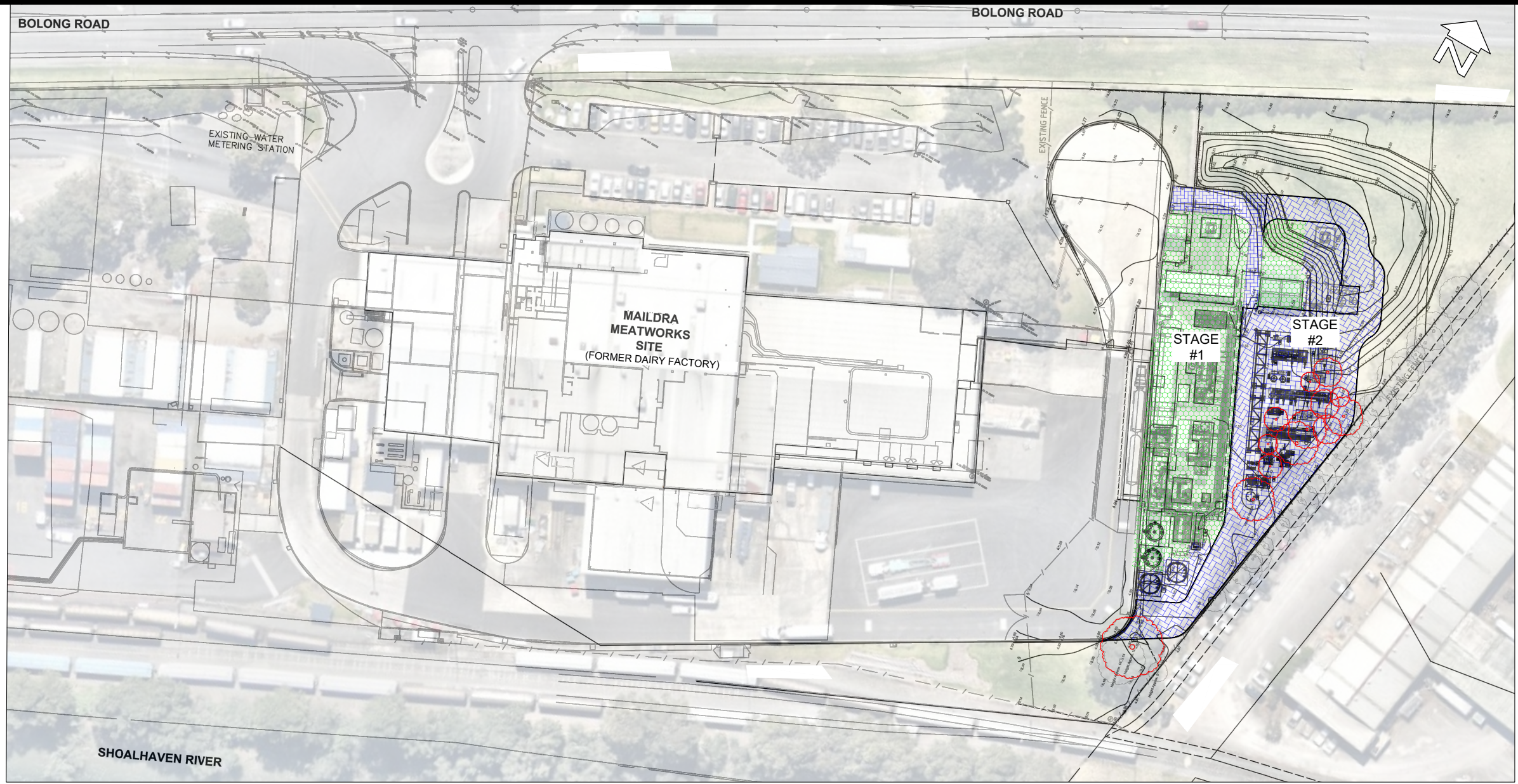
131401-401: LOCALITY SKETCH AND SITE PLAN

131401-402: STORMWATER CONCEPT PLAN

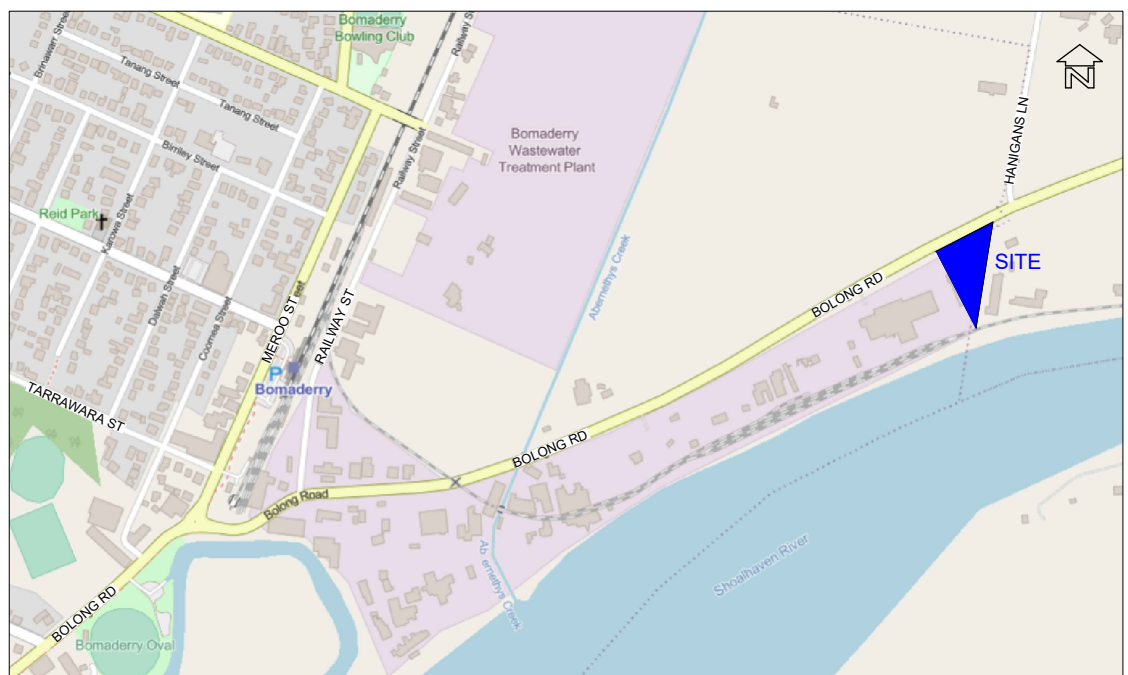
131401-403: STORMWATER CALCULATIONS

131401-404 : CONCEPT EROSION AND SEDIMENT CONTROLPLAN

131401-405: CONCEPT EROSION AND SEDIMENT CONTROL STANDARD DETAILS



SITE PLAN
SCALE 1:500



LOCALITY SKETCH

LEGEND

EXISTING	PROPOSED
— 25.0 — EXISTING CONTOURS	— — — SEDIMENT FENCE
— NBN — EXISTING NBN	▨ PROPOSED STRAW BALE BARRIER
— T — EXISTING TELSTRA	○ TEMPORARY TOPSOIL MOUND
— U/G — EXISTING ELECTRICITY - UNDERGROUND	→ PIPE FLOW DIRECTION
— E/O/H — EXISTING ELECTRICITY - OVER HEAD	⇨ OVERLAND FLOW DIRECTION / TABLE DRAIN FLOW DIRECTION
— S — EXISTING SEWER	○ STORMWATER PIT
— W — EXISTING WATER	□ RWT
— D — EXISTING STORMWATER - PIPE , PIT	— D — STORMWATER LINE
▨ EXISTING CONCRETE PAVEMENT	— — — CUT-OFF DRAIN
○ EXISTING TREE TO BE RETAINED	— — — TABLE DRAIN
	▨ NEW ALL WEATHER PAVEMENT
	▨ STAGE #1
	▨ STAGE #2
	○ TREE TO BE REMOVED

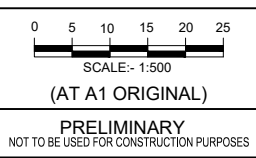
IN THE PREPARATION OF THESE DESIGN PLANS, ALLEN PRICE HAVE RELIED UPON SURVEY INFORMATION SUPPLIED BY OTHERS. ALLEN PRICE HAVE NOT ATTEMPTED TO VERIFY THE VALIDITY OF THIS INFORMATION. WE CANNOT GUARANTEE THE ACCURACY OF SUCH INFORMATION AND THEREFORE CANNOT TAKE RESPONSIBILITY FOR ANY INHERENT ERRORS THAT MAY BE CONTAINED WITHIN THAT INFORMATION.

BEWARE!
THE CONTRACTOR IS TO VERIFY THE LOCATION OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF CONSTRUCTION AND SHALL BE RESPONSIBLE, AT THE CONTRACTOR'S EXPENSE, FOR ANY REPAIRS TO DAMAGE CAUSED DURING CONSTRUCTION.



SITE LOCATION AND SITE PLAN
SUPAGAS EXPANSION
Over Part Lot 143 in DP1069758
At 220 BOLONG ROAD BOMADERRY
For MANILDRA P/L

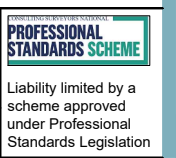
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OTHERS	WRM	WRM	MAK

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Kiama Office • 1/28 Bong Bong St, Kiama NSW 2533
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(02) 4421 6544 • consultants@allenprice.com.au • allenprice.com.au

DATUM	ORIGIN
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131401-401	1
	ISSUE
	0



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- NOTES:
1. EXISTING SURFACE CONTOURS PROVIDED BY CLIENT.
 2. EXISTING SURFACE CONTOUR INTERVAL IS 0.25 m.
 3. AERIAL PHOTO FROM NEARMAP.

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STORMWATER CONCEPT PLAN

SCALE 1:250

AllenPrice
Development Consultants

STORMWATER CONCEPT PLAN
SUPAGAS EXPANSION
Over Part Lot 143 in DP1069758
At 220 BOLONG ROAD BOMADERRY
For MANILDRA P/L

ISSUE	DESCRIPTION	BY	DATE
0	FOR CLIENT REVIEW	WRM	4 FEB 25

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(AT A1 ORIGINAL)						
PRELIMINARY						
NOT TO BE USED FOR CONSTRUCTION PURPOSES						

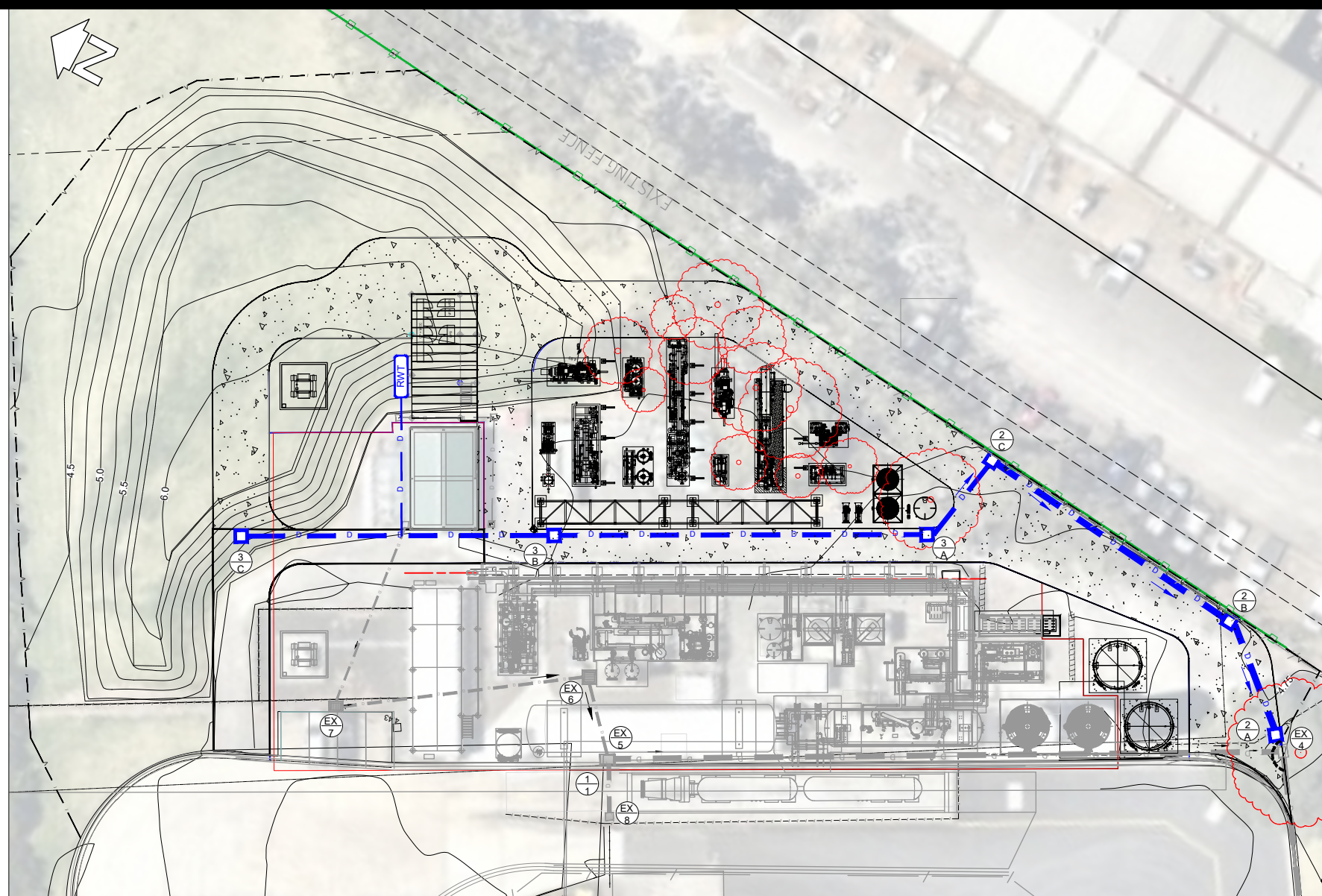
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OTHERS	WRM	WRM	CEG	AUSTRALIAN HEIGHT DATUM	SSM 32610
ALLEN PRICE PTY LTD				DATE OF PLAN	RL 3.25
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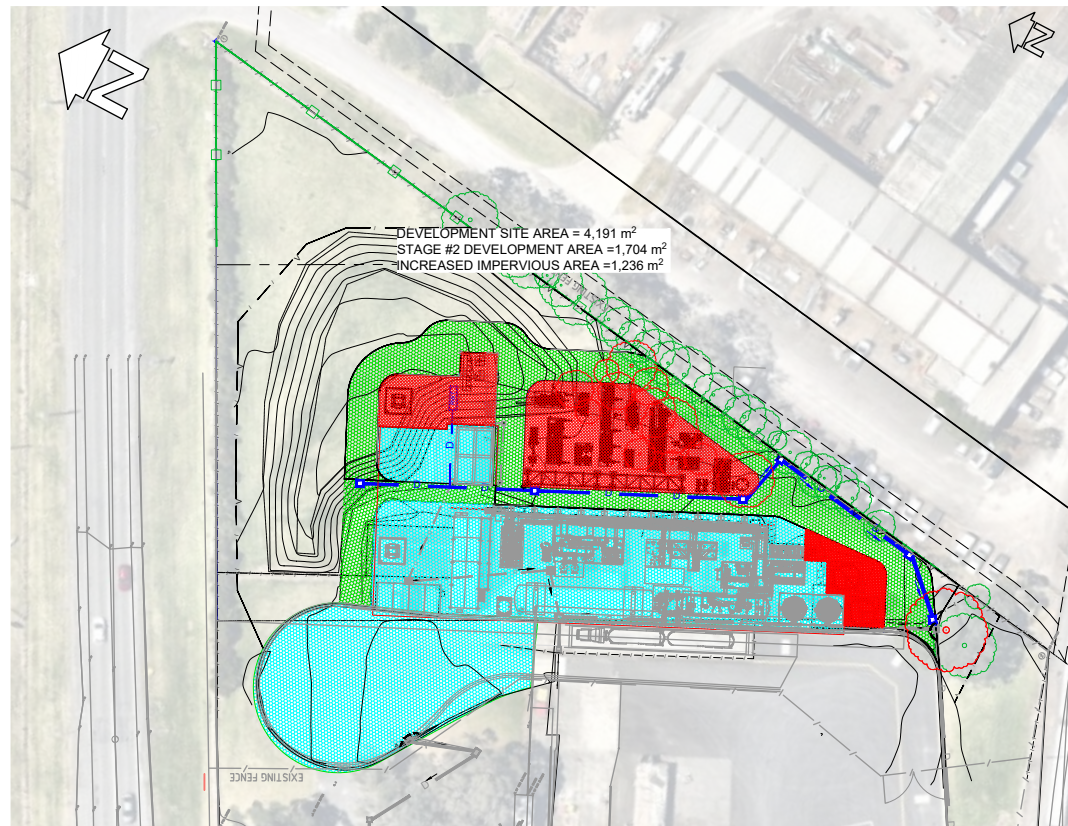
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PRE-DEVELOPMENT SITE
SCALE 1:600



SITE PLAN
SCALE 1:250



POST-DEVELOPMENT SITE
SCALE 1:600

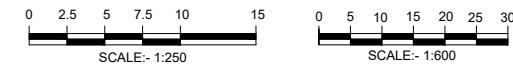
- STAGE #1
- STAGE #2 ACCESS
- STAGE #2 PLANT & BUILDINGS

EXISTING SITE				PROPOSED DEVELOPMENT					
Sub-catchment Description	Sub-Catchment Area		Imperv %	Remarks	Sub-catchment Description	Sub-Catchment Area		Imperv %	Remarks
	m ²	ha				m ²	ha		
Turning Area	873.7	0.0874	100.0	Part of stage #1 works	Turning Area	873.7	0.0874	100.0	Roof drains to Rain Water Tank
Stage #1 Plant	1,454.7	0.1455	60.0	Existing plant	Stage #1 Plant	1,454.7	0.1455	60.0	Existing plant
Stage #1 Access	158.6	0.0159	100.0	Existing access	Stage #1 Access	158.6	0.0159	100.0	Existing access
Grass	1,704.7	0.1705	0.0	Stage #1 development area	Stage #2 expansion	774.7	0.0775	60.0	
					Stage #2 Access	929.9	0.0930	100.0	
Catchment Total =	4,191.6	0.4192			Catchment Total =	4,191.6	0.4192		
Imperv area (m ²) =	1,905.1				Imperv area (m ²) =	3,141.3			
Imperv % =	45.5				Imperv % =	74.9			

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RETENTION REQUIREMENT DCP G2 Table 2 (Industrial Development)	
Additional Imperv Area (m ²)	1,364.9
Retention depth (m)	0.006
Retention volume (m ³)	8.19

SITE CONDITION	SITE DISCHARGE (m ³ /s)				
	4EY	20% AEP	10% AEP	5% AEP	1% AEP
Pre - Development	0.02	0.086	0.109	0.136	0.220
Post Development (No OSD)	0.035	0.113	0.138	0.166	0.241
Post-Development (with OSD)	0.025	0.075	0.088	0.104	0.199



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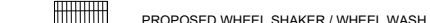














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DRAWING NUMBER	SHEET
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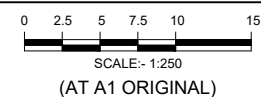
-  PROPOSED ORANGE PARA-WEB FENCE
-  PROPOSED INTERNAL ACCESS ROUTE
-  PROPOSED WHEEL SHAKER / WHEEL WASH
-  SITE VEHICLE TRAVEL DIRECTION
-  PROPOSED ALL WEATHER ACCESS
-  PROPOSED COIR LOG
-  PROPOSED TEMP TOPSOIL STOCKPILE
-  PROPOSED WORKS AREA
-  PROPOSED STORMWATER PIPE
-  PROPOSED STORMWATER PIT
-  PROPOSED STORMWATER HEADWALL
-  OVERLAND FLOW ROUTE
-  PROPOSED SEDIMENT FENCE
-  PROPOSED STRAW BALE BARRIER
-  PROPOSED SEDIMENT TRAPS
-  PROPOSED TREE PROTECTION FENCE
-  TREE TO BE REMOVED

- NOTES:
1. EXISTING SURFACE CONTOURS PROVIDED BY CLIENT.
 2. EXISTING SURFACE CONTOUR INTERVAL IS 0.25 m.
 3. AERIAL PHOTO FROM NEARMAP.



CONCEPT SEDIMENT AND EROSION CONTROL PLAN

SCALE 1:250



BEWARE!
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CONCEPT SEDIMENT AND EROSION CONTROL PLAN
SUPAGAS EXPANSION
Over Part Lot 143 in DP1069758
At 220 BOLONG ROAD BOMADERRY
For MANILDRA P/L

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SURVEY	DESIGN	DRAWN	CHECK'D	DATUM	ORIGIN
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PRELIMINARY NOT TO BE USED FOR CONSTRUCTION PURPOSES				DRAWING NUMBER 131401-404	SHEET 4
				ISSUE 0	Liability limited by a scheme approved under Professional Standards Legislation

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SEDIMENT AND EROSION CONTROL

- ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH LANDCOM'S SOILS AND CONSTRUCTION VOLUME 1, 4TH EDITION, MARCH 2004.
- SEDIMENT AND EROSION CONTROL MEASURES AS DETAILED ON THIS PLAN ARE TO BE IMPLEMENTED PRIOR TO CONSTRUCTION WORK COMMENCING.
- THE CONTRACTOR SHALL TAKE ALL REASONABLE MEASURES TO MINIMISE THE EFFECTS OF DUST EMISSIONS FROM THE SITE INCLUDING THE SPREADING OF MULCH IN AREAS WHERE CONSTRUCTION HAS BEEN COMPLETED.
- ALL TOPSOIL FROM THE CONSTRUCTION AREAS IS TO BE STRIPPED AND STOCKPILED.
- STOCKPILES OF TOPSOIL ARE TO BE GRASS SEEDED OR MULCHED.
- TOPSOIL STOCKPILES ARE TO BE LOCATED OUTSIDE AREAS OF CONCENTRATED STORMWATER RUNOFF. STOCKPILES ARE TO BE PLACED IN LOTS OUTSIDE THE BUILDING AREA WHERE POSSIBLE OR IN PROPOSED PUBLIC RESERVES. REFER TO TYPICAL TOPSOIL DETAIL.
- THE MOVEMENT OF MACHINERY OVER THE SITE IS TO BE LIMITED TO THE CONSTRUCTION AREAS, UNLESS AUTHORIZED BY THE SUPERINTENDENT. TO AVOID DISTURBANCE TO EXISTING VEGETATED AREAS, NO-GO AREAS, AS NOTED ON THE PLAN, ARE TO BE MARKED OFF PRIOR TO COMMENCEMENT OF WORKS.
- AREAS OF THE SITE THAT ARE DISTURBED BY CONSTRUCTION WORKS ARE TO BE TOPSOILED, SEEDED AND FERTILIZED IMMEDIATELY AFTER CONSTRUCTION WORKS IN THE PARTICULAR AREA HAVE FINISHED AND NOT LEFT TILL THE END OF THE OVERALL CONSTRUCTION.
- CONSTRUCTION AREAS SHALL NOT BE LEFT IN AN OPEN AND DISTURBED STATE FOR MORE THAN FOURTEEN (14) DAYS. AREAS EXPECTED TO BE LEFT OPEN FOR PERIODS LONGER THAN THIS ARE TO BE SEEDED.
- STORMWATER PITS ARE TO HAVE TEMPORARY SEDIMENT CONTROL DEVICES PLACED AROUND THE TOP DURING CONSTRUCTION. THIS WILL TAKE THE FORM OF STRAWBALES OR MESH AND GRAVEL FILTERS. PLACED TO PREVENT SEDIMENT FROM THE CONSTRUCTION AREAS LEAVING THE SITE. THESE ARE TO REMAIN UNTIL THE ABOVE COVERAGE IS ACHIEVED OR THE ROADS ARE OPENED TO THE PUBLIC, WHICHEVER OCCURS FIRST.
- ANY EXISTING BARE OR DISTURBED AREAS OF THE SITE NOT AFFECTED BY THE CONSTRUCTION WORKS ARE TO BE TOPSOILED, SEEDED AND FERTILIZED AND MAINTAINED TO PROMOTE GROWTH.
- TEMPORARY MESH AND GRAVEL SEDIMENT BARRIERS ARE TO BE PLACED AT KERB INLET PITS AFTER THE ROAD WORKS HAVE BEEN COMPLETED UNTIL GRASS COVER ON THE FOOTPATHS HAS BEEN ESTABLISHED.
- SEDIMENT & EROSION CONTROL STRUCTURES ARE TO BE MAINTAINED ON A DAILY BASIS DURING CONSTRUCTION AND ON A MINIMUM OF WEEKLY BASIS DURING THE SIX MONTH LIABILITY PERIOD (OR AS REQUIRED DEPENDING UPON WEATHER CONDITIONS AND STABILISATION LEVEL). ALL MATERIAL REMOVED FROM THE TRAPS IS TO BE SPREAD AND GRASS SEEDED OR DISPOSED OF OFF SITE IN AN APPROVED MANNER. UPON THE SALE OF EACH INDIVIDUAL LOT TO A THIRD PARTY PURCHASER, THE RESPONSIBILITY OF THE STABILISATION OF THE LOT BECOMES THE RESPONSIBILITY OF THE NEW PROPERTY OWNER.
- ALL IMPORTED FILL IS ASSUMED TO BE A MATERIAL OTHER THAN DISPERSIVE CLAY. ALL FILL MATERIAL IS TO BE TESTED FOR DISPERSABILITY PRIOR TO PLACEMENT ON THE SITE AND IF FOUND TO BE DISPERSIVE THE SUPERINTENDENT IS TO BE NOTIFIED PRIOR TO PLACEMENT OF ANY FILL FOR ADVICE ON TREATMENT OF DISPERSIVE SOILS.
- ALL ACCESS TO SITE MUST BE VIA "STABILIZED SITE ACCESS".
- TEMPORARY STRAWBALE SEDIMENT FENCES AND/OR COIR LOGS TO BE PLACED EVERY 30m DURING BOXING OUT OF PAVEMENT WHEN PAVEMENT WORKS ARE NOT TAKING PLACE OR SITE IS INACTIVE. SECURE STRAWBALES WITH STAKES. SECURE COIR LOGS WITH STAKES OR SANDBAGS.

SITE FILLING NOTES

- ALL WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH COUNCIL'S DEVELOPMENT CONSTRUCTION SPECIFICATION AND ENGINEERING DESIGN SPECIFICATION(D6).
- ALL WORKS ARE TO BE CONDUCTED TO THE REQUIREMENTS OF THE DEVELOPMENT MANAGER OR DELEGATE.
- EXISTING TOPSOIL IN AREA OF PROPOSED FILLING WORKS IS TO BE STRIPPED AND STOCKPILED IN AN AREA APPROVED BY THE SUPERVISOR. TOPSOIL IS TO BE USED FOR RE-SPREADING OVER THE FILLED AREA AT THE COMPLETION OF WORKS.
- FILL MATERIAL IS TO BE APPROVED BY THE SUPERVISOR.
- ALL FILLING WORKS TO BE PLACED AND COMPACTED IN LAYERS NO GREATER THAN 150mm IN THICKNESS.
- ALL FILL IS TO BE PLACED UNDER LEVEL 1 SUPERVISION IN ACCORDANCE WITH AS3798.
- ALL LOTS FILLED ARE TO HAVE A GEOTECHNICAL ASSESSMENT FOR LOT CLASSIFICATION IN ACCORDANCE WITH AS2870.
- THE CONTRACTOR IS TO ENSURE COMPACTION IS CARRIED OUT TO A MINIMUM 95% STANDARD PROCTOR AND PROVIDE THE SUPERINTENDENT WITH SUITABLE GEOTECHNICAL EVIDENCE.
- THIS SITE IS TO BE RE-GRADED TO DESIGN CONTOURS AND/OR SPOT LEVELS AS SHOWN ON PLAN.
- IN THE AREA OF PROPOSED FILLING AND/OR RE-GRADING EXISTING VEGETATION IS TO BE CLEARED. ALL EXISTING VEGETATION AFFECTED BY CONSTRUCTION WORK AND LARGE TREES AS IDENTIFIED BY THE SUPERVISOR ARE TO BE REMOVED AND DISPOSED OF OFF SITE OR MULCHED ON SITE. NO GREEN WASTE TO BE BURNT ON SITE.
- CARE IS TO BE TAKEN TO PROTECT STOCKPILES AND DISTURBED AREAS THAT HAVE HAD TOPSOIL TYPE MATERIAL REMOVED ESPECIALLY DURING PERIODS OF HIGH WIND.
- ALL DISTURBED AREAS ARE TO BE GRASS SEEDED AND FERTILISED AT THE COMPLETION OF THE WORKS WITH NATIVE GRASS SEED MIX AND STERILE COVER CROP FOR INITIAL STABILISATION.

SUGGESTED SEED MIX FOR COVER CROP STABILISATION OF DISTURBED AREAS

SUMMER(SEPT-MAR):
60% SORGHUM
30% MILLET
10% BUCKWHEAT

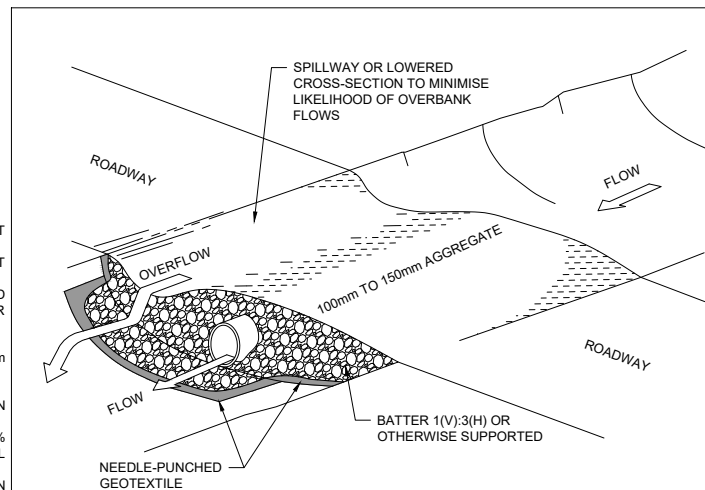
WINTER(APR-AUG):
80% OATS
10% CEREAL RYE
10% WHEAT

SEED SOWING RATE: 3-5KG/HA
PLUS MULTIGROW FERTILISER @ 200KG/HA

SUGGESTED NATIVE SEED MIX FOR RE-VEGETATION OF DISTURBED AREAS

20% GRIFFIN WEEPING GRASS (MICROLAENA STIPODES VAR)
20% OXLEY WALLABY GRASS (RYTIDOSPERMA GENICULATUM)
20% REDGRASS (BOTHRIOCHLOA MACARA)
15% WINDMILL GRASS (CHLORIS TRUNCATA)
15% KANGAROO GRASS (THEMEDA AUSTRALIS)
10% QUEENSLAND BLUEGRASS (DICANTHIUM SERICEUM)

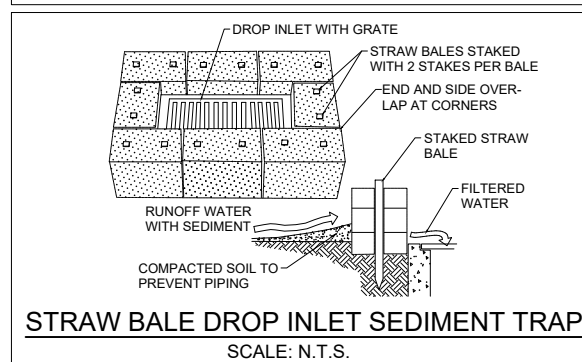
SEED SOWING RATE: 12KG/HA
SOW ALL YEAR ROUND WITH IRRIGATION
SOW AUTUMN - SPRING AFTER RAIN



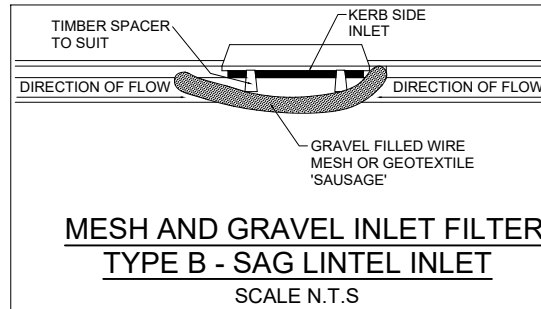
CONSTRUCTION NOTES:

- PROHIBIT ALL TRAFFIC UNTIL THE ACCESS WAY IS CONSTRUCTED.
- STRIP ANY TOPSOIL AND PLACE A NEEDLE-PUNCHED TEXTILE OVER THE BASE OF THE CROSSING.
- PLACE CLEAN, RIGID NON POLLUTING AGGREGATE OR GRAVEL IN THE 100MM TO 150MM SIZE CLASS OVER THE FABRIC TO A MINIMUM DEPTH OF 200MM.
- PROVIDE A 3-METRE WIDE CARRIAGEWAY WITH SUFFICIENT LENGTH OF CULVERT PIPE TO ALLOW LESS THAN A 3(H):1(V) SLOPE ON SIDE BATTERS.
- INSTALL A LOWER SECTION TO ACT AS AN EMERGENCY SPILLWAY IN GREATER THAN DESIGN STORM EVENTS.
- ENSURE THAT CULVERT OUTLETS EXTEND BEYOND THE TOE OF FILL EMBANKMENTS.

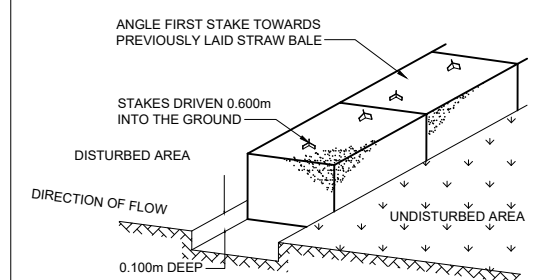
TEMPORARY WATERWAY CROSSING SD5-1 SCALE: N.T.S.



STRAW BALE DROP INLET SEDIMENT TRAP SCALE: N.T.S.

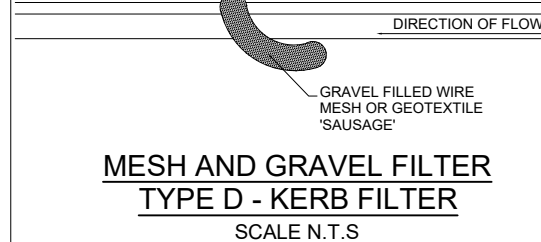


MESH AND GRAVEL INLET FILTER TYPE B - SAG LINTEL INLET SCALE: N.T.S.

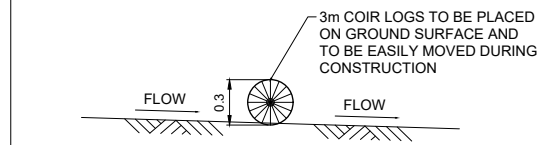


STRAW BALE SEDIMENT BARRIER SCALE: N.T.S.

FABRICATE A SLEEVE MADE FROM GEOTEXTILE OR WIRE MESH. FILL THE SLEEVE WITH 25MM TO 50MM GRAVEL. FORM AN ELLIPTICAL CROSS SECTION ABOUT 150MM HIGH X 400MM WIDE. FORM A SEAL WITH THE KERBING OR EXISTING SURFACE AND PREVENT SEDIMENT BYPASSING THE FILTER.

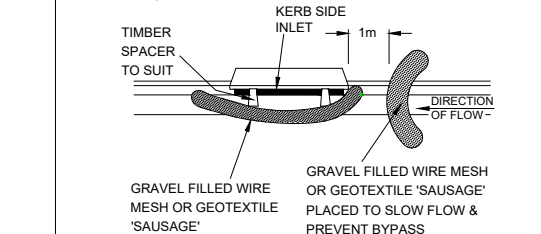


MESH AND GRAVEL FILTER TYPE D - KERB FILTER SCALE: N.T.S.

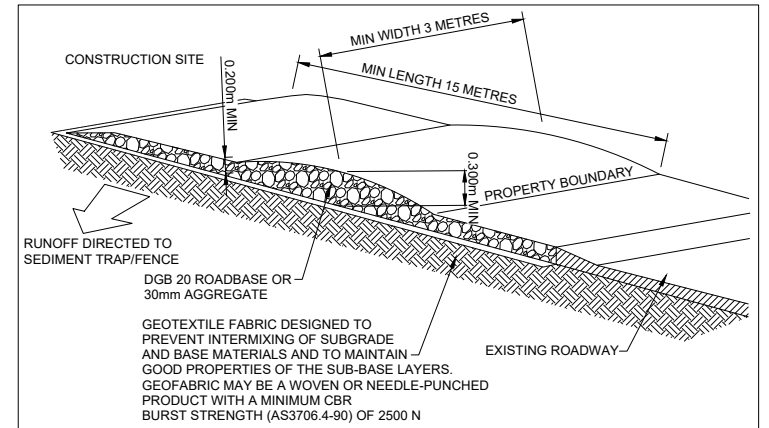


TYPICAL COIR LOG SEDIMENT TRAP SCALE: N.T.S.

FABRICATE A SLEEVE MADE FROM GEOTEXTILE OR WIRE MESH LONGER THAN THE LENGTH OF THE INLET PIT. FILL THE SLEEVE WITH 25MM TO 50MM GRAVEL. FORM AN ELLIPTICAL SECTION ABOUT 150MM HIGH X 400MM WIDE. PLACE THE FILTER UPSTREAM OF THE KERB INLET LEAVING A 100MM GAP AT THE TOP TO ACT AS AN EMERGENCY SPILLWAY. FORM A SEAL WITH THE KERBING AND PREVENT SEDIMENT BYPASSING THE FILTER.



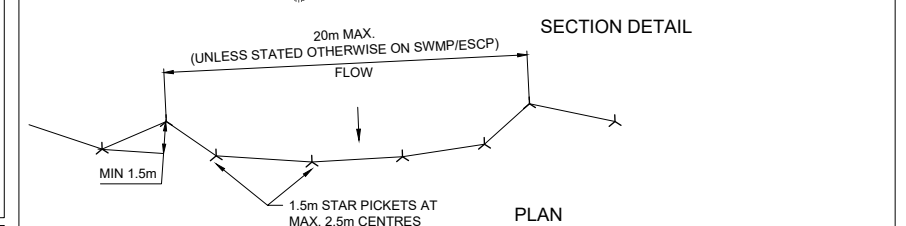
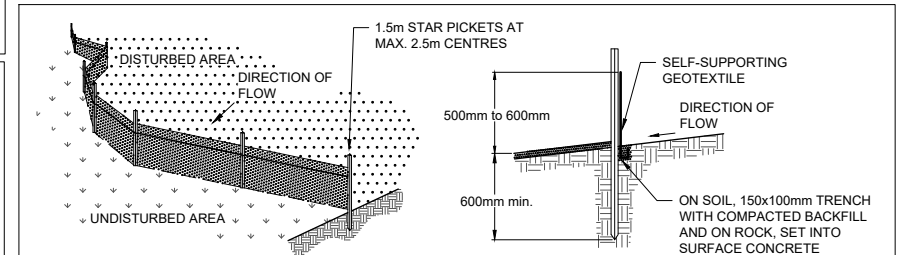
MESH AND GRAVEL INLET FILTER TYPE A - LINTEL INLET SCALE: N.T.S.



STABILISED SITE ACCESS SCALE: N.T.S.

STABILISED SITE ACCESS NOTES

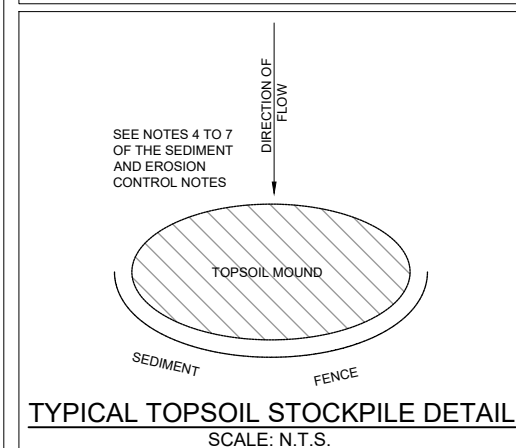
- STRIP THE TOPSOIL, LEVEL THE SITE AND COMPACT THE SUBGRADE.
- COVER THE AREA WITH NEEDLE-PUNCHED GEOTEXTILE.
- CONSTRUCT A 200MM THICK PAD OVER THE GEOTEXTILE USING ROAD BASE OR 30MM AGGREGATE.
- ENSURE THE STRUCTURE IS AT LEAST 15 METRES LONG OR TO BUILDING ALIGNMENT AND AT LEAST 3 METRES WIDE.
- WHERE A SEDIMENT FENCE JOINS ONTO THE STABILISED ACCESS, CONSTRUCT A HUMP IN THE STABILISED ACCESS TO DIVERT WATER TO THE SEDIMENT FENCE.



CONSTRUCTION NOTES:

- CONSTRUCT SEDIMENT FENCES AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING TO LIMIT THE CATCHMENT AREA OF ANY ONE SECTION. THE CATCHMENT AREA SHOULD BE SMALL ENOUGH TO LIMIT WATER FLOW IF CONCENTRATED AT ONE POINT TO 50 LITRES PER SECOND IN THE DESIGN STORM EVENT, USUALLY THE 10-YEAR EVENT.
- CUT A 150MM DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
- DRIVE 1.5m LONG STAR PICKETS INTO GROUND AT 2.5m INTERVALS (MAX) AT THE DOWNSLOPE EDGE OF THE TRENCH. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.
- FIX SELF-SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POSTS ENSURING IT GOES TO THE BASE OF THE TRENCH. FIX THE GEOTEXTILE WITH WIRE TIES OR AS RECOMMENDED BY THE MANUFACTURER. ONLY USE GEOTEXTILE SPECIFICALLY PRODUCED FOR SEDIMENT FENCING. THE USE OF SHADE CLOTH FOR THIS PURPOSE IS NOT SATISFACTORY.
- JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.
- BACKFILL THE TRENCH OVER THE BASE OF THE FABRIC AND COMPACT IT THOROUGHLY OVER THE GEOTEXTILE.

SEDIMENT FENCE SD6-8 SCALE: N.T.S.



TYPICAL TOPSOIL STOCKPILE DETAIL SCALE: N.T.S.

BEWARE!

THE CONTRACTOR IS TO VERIFY THE LOCATION OF ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF CONSTRUCTION AND SHALL BE RESPONSIBLE, AT THE CONTRACTOR'S EXPENSE, FOR ANY REPAIRS TO DAMAGE CAUSED DURING CONSTRUCTION.

AllenPrice
Development Consultants

CONCEPT SEDIMENT & EROSION CONTROL STANDARD DETAILS
SUPAGAS EXPANSION
Over Part Lot 143 in DP1069758
At 220 BOLONG ROAD BOMADERRY
For MANILDRA P/L

ISSUE	DESCRIPTION	BY	DATE
0	FOR CLIENT REVIEW	WRM	18 MAR 25

AS SHOWN (AT A1 ORIGINAL)
PRELIMINARY NOT TO BE USED FOR CONSTRUCTION PURPOSES

SURVEY	DESIGN	DRAWN	CHECK'D	DATUM	ORIGIN
OTHERS	WRM	WRM	MAK/CEG	AUSTRALIAN HEIGHT DATUM	SSM 32610
ALLEN PRICE PTY LTD Nowra Office • 75 Plunkett St, Nowra NSW 2541 Kiama Office • 1/28 Bong Bong St, Kiama NSW 2533 Wollongong Office • SE 1 L2 83-85 Market St, Wollongong NSW 2500 (02) 4421 6544 • consultants@allenprice.com.au • allenprice.com.au				DATE OF PLAN 18 MARCH 25	RL 3.25
				DRAWING NUMBER 131401-405	SHEET 5
					ISSUE 0

Liability limited by a scheme approved under Professional Standards Legislation	
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APPENDIX C-1 – CONCEPT DRAINS MODEL STRUCTURE

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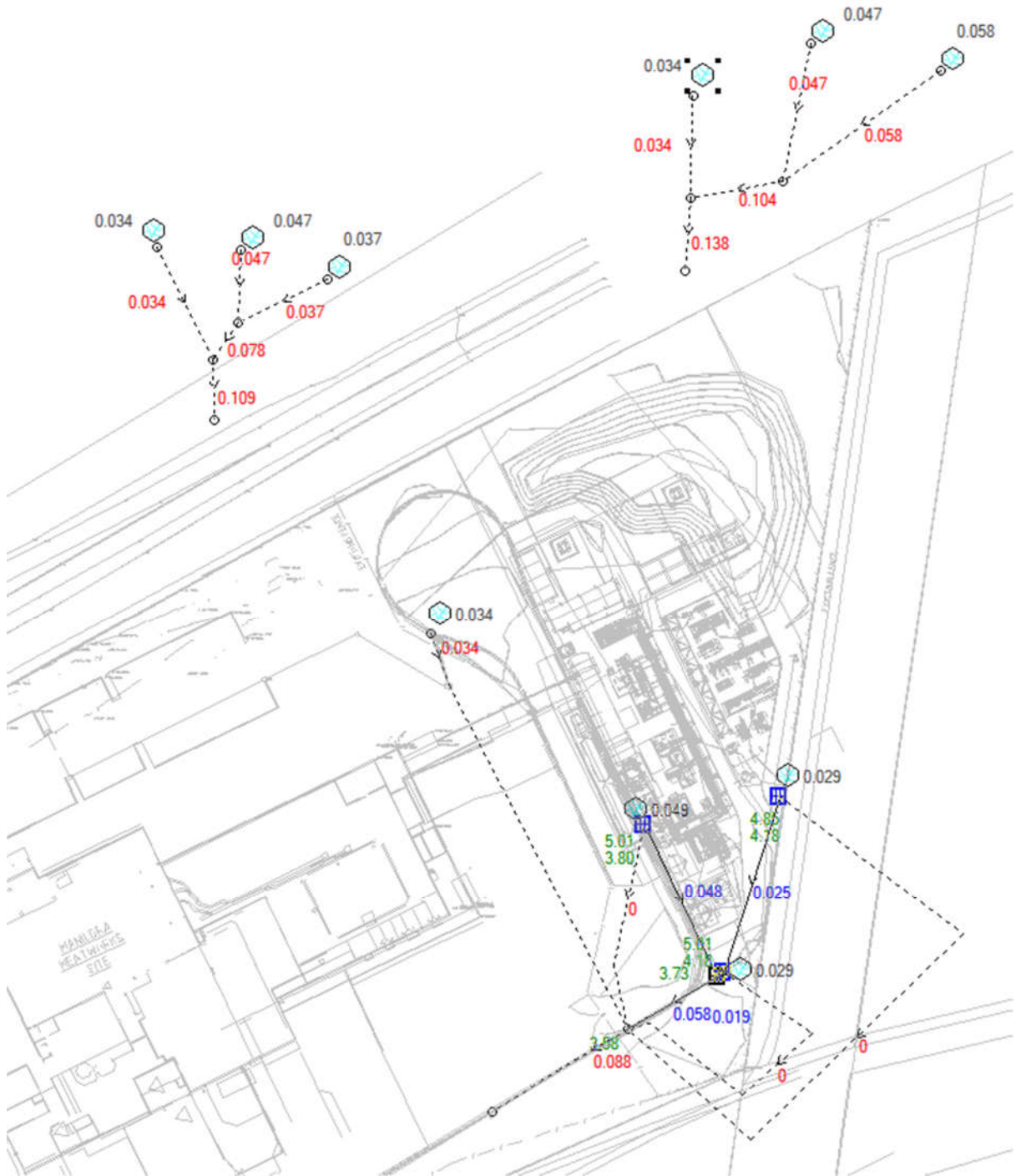
APPENDIX C-2 – CONCEPT DRAINS MODEL 10% AEP RESULTS

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Results for median storm in critical 10% AEP ensembles using Lite hydraulic model.





APPENDIX C-3 – CONCEPT DRAINS MODEL 1% AEP RESULTS

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Results for median storm in critical 1% AEP ensembles using Lite hydraulic model.

