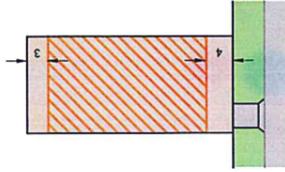


LEGEND

- Title Boundary (approx.)
- Existing contours (1m interval)
- Stage boundaries
- Stage numbers
- Lots
- Substation Kiosk Reserve
- Sewer Pump Station Reserve
- Naturestrip (indicative)
- Road pavement (indicative)
- Drainage reserve
- Unencumbered passive open space
- Tree reserve

- Notes:**
- This plan was prepared as a proposal only and should not be used for any other purpose.
 - This plan is subject to Council approval.
 - All dimensions and areas are subject to survey and final computations.
 - The drainage reserve shown has been preliminarily sized for the treatment and detention of stormwater to Council requirements. The layout and area required will be subject to engineering detail design and Council approval.
 - Existing dams located within construction areas will be filled during construction.
 - Further investigation may be required for fire buffers, vegetation retention and removal, site access and egress, and aboriginal and cultural heritage.
 - All roads are 16m local access level 1 unless noted otherwise.
 - The road pavement layout and intersection treatments are indicative only and subject to Council approval and detailed engineering design.
 - Arc dimensions shown are length of arc (not chord).



BUILDING ENVELOPE DETAIL
(APPLIES TO LOTS BETWEEN 300m² & 500m²)

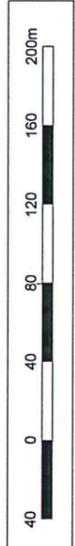
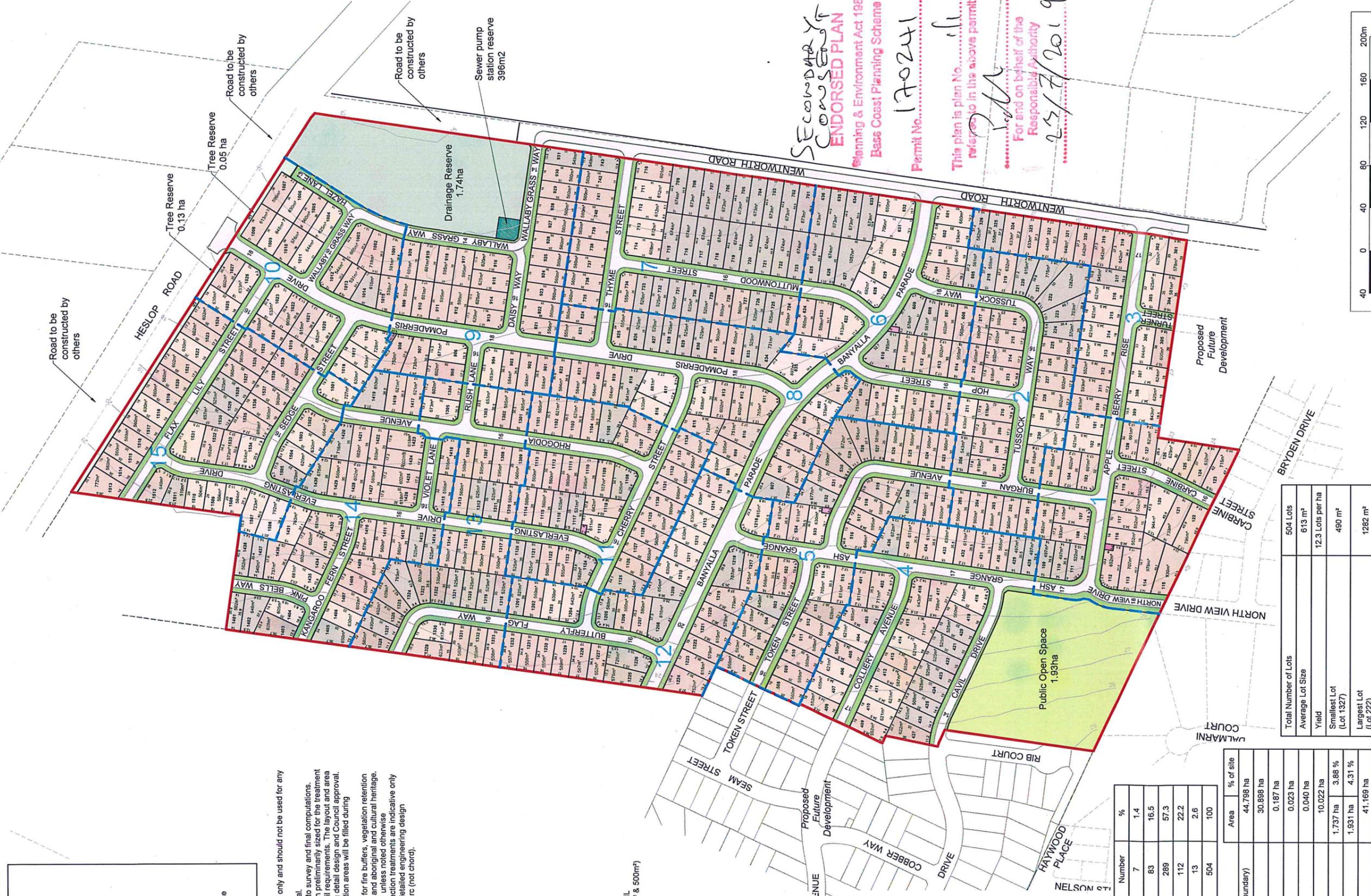
TOTAL number of lots	504
Stage 1	28
Stage 2	31
Stage 3	26
Stage 4	36
Stage 5	35
Stage 6	36
Stage 7	43
Stage 8	35
Stage 9	31
Stage 10	27
Stage 11	34
Stage 12	32
Stage 13	33
Stage 14	38
Stage 15	39

Lot Mix	Number	%
20m+ Frontage	7	1.4
18m Frontage	83	16.5
16m Frontage	289	57.3
14m Frontage	112	22.2
12.5m Frontage	13	2.6
Total	504	100

Site (Approx.) - (Proposed Future Title Boundary)	Area	% of site
• Standard Density Lots (504 Lots)	44,798 ha	88.8
• Tree Reserve	30,898 ha	60.8
• Substation Kiosks	0,187 ha	0.4
• Sewer Pump Station	0,023 ha	0.0
• Non-Arterial Roads	0,040 ha	0.1
Drainage Reserve	10,022 ha	20.0
Unencumbered Passive Open Space	1,737 ha	3.4
Net Developable Area	1,931 ha	3.8
	41,169 ha	81.3

* Indicates inclusion in NDA

Total Number of Lots	504 Lots
Average Lot Size	613 m ²
Yield	12.3 Lots per ha
Smallest Lot (Lot 1327)	490 m ²
Largest Lot (Lot 222)	1282 m ²



SECONDARY CONCEPT ENDORSED PLAN
Planning & Environment Act 1987
Base Coast Planning Scheme
Permit No. 170241
This plan is plan No. 11
For and on behalf of the Responsible Authority
25/7/2019

Version	Date	Description
08	26.06.19	Reviewed lot and stage boundaries
09	04.02.19	Revised to match 1001632 - Lots (23-12019) (09)
10	10.02.19	Internal comments
11	14.05.19	Street names amended
12	25.07.19	Street names amended
13	05.08.19	Stage 13, 14 Lots Amended, Stage 13 Re-drawn
14	05.08.19	Stage 10 Lots Amended
15	05.08.19	Lot, roads and stages amended
16	05.08.19	Lot, roads and stages amended
17	05.08.19	Building envelope detail added
18	05.08.19	Staging amended

Our Reference [REDACTED]

30 November 2020

Victorian Planning Authority
Re: Wonthaggi North East PSP
Level 25, 35 Collins Street
MELBOURNE VIC 3000

[REDACTED]
Melbourne Office
1 Glenferrie Road
PO Box 61
Malvern VIC 3144
Tel: (03) 9524 8888

beveridgewilliams.com.au

Dear John Petrakos,

**RE: SUBMISSION TO THE DRAFT WONTHAGGI NORTH-EAST PRECINCT STRUCTURE PLAN
PROPERTY ID #6 – HESLOP ROAD NORTH WONTHAGGI**

Beveridge Williams acts on behalf of Wentworth Pty Ltd in relation to the above matter.

Our client is the owner of a 45 hectare (approximate) parcel of land formally known as Lot 2 PS700899. This property is identified as parcel identification number 6 in the PSP and DCP. The site is currently under development for residential purposes and is known as Northern Views Estate.



Following a review of the Draft Wonthaggi North East PSP, the Draft Wonthaggi North East DCP and the proposed planning controls as they apply to Property ID # 6, our client strongly objects to Bass Coast Planning Scheme Amendment C152bascc. Details relating to this objection are identified below:

- Property ID No. 6 is currently zoned General Residential Zone Schedule 1 and is affected by the Development Plan Overlay Schedule 21. Development Plan Overlay Schedule 21 relates to the Wonthaggi North-East Growth Area.
- The Development Plan for the Northern Views Estate as well as Summerfields Estate (Property ID No.s 2, 3 and 4) and Property ID No. 5 which adjoins Heslop Road was approved by Council on 15 February 2012 . A Planning Permit for Northern Views Estate



for a 'Multi lot staged subdivision and removal of native vegetation in accordance with the endorsed plans' was issued on 21 February 2018 (Planning Permit No. 170241-1).

- As required by the current DPO21 and Condition 1 of Planning Permit No. 170241-1, the landowner was required to enter into a Section 173 Agreement for the provision of infrastructure and community services. The Section 173 Agreement was executed on 26 February 2020 and is expected to be titled imminently.
- Relevant to this submission is Clause 2.1 of the Section 173 Agreement which caps the Development Infrastructure Levy at \$4,311,398.82 (plus indexation). The Wonthaggi North East Development Contribution Plan notes a Development Contribution Levy of \$6,804,278.67. Our client strongly objects to the additional development contributions required under the Draft DCP and is supported in their argument to have the DCP removed in its entirety from Property No. 6 as per Clause 2.5 of the Section 173 Agreement which states:

The Parties to this Agreement covenant and agree that in the event that a Development Contributions Plan for the Subject Land is approved after the date of this Agreement, the payment of the contributions set out in this Agreement will be deemed to have satisfied the requirements of the Development Contributions Plan and no further development contributions would be required.

- Clause 2.5 of the Section 173 Agreement also invalidates the application of development contributions associated with the construction of Heslop Road. Specifically, the Draft Wonthaggi North East DCP identifies development contribution obligations over Property ID No. 6 for the construction of RD-01.
- The removal of funding obligations associated with RD-01 is supported by Condition 1(j) of the Planning Permit No. 170241-1 which states the following with regard to Heslop Road:

The developer of the land is not responsible for the construction of any part of Heslop Road, including any intersection works, unless otherwise agreed.

- Amendment C152basc proposes to amend the DPO21 to align it with standard PSP guidelines and requirements. The proposed amendment includes the provision of a preliminary site investigation for specific properties, including Property ID No.6. It is questioned why a preliminary site investigation would be required over this property as a planning permit for residential use has been issued and presumably, potential contamination or areas of concern were considered and assessed by Council prior to the issuing of planning permit No. 170241-1. It is requested that the subject site (identified as Property No. 4 in ESA/PSI) is removed from Table: Properties requiring a preliminary site investigation under Clause 3 of the Proposed DPO21.

In addition to the objections noted above, we raise the following questions and modification requests.

- Section 2.5.2 of the Engeny Drainage Strategy states that there is to be a high flow spillway across Wentworth Road as an interim measure. Please clarify if WL-04 is required to be sized to detain to predeveloped rates the 1% AEP flows or the 39% AEP flows in the interim and/or ultimate scenarios?
- Section 3.4 of the Engeny Drainage Strategy states that rain water tanks were not modelled for sub catchment 'O', which this property is situated within. As rain water tanks are required for reuse under the Section 173 Agreement to be registered on the title for this property will the size of the treatment assets that are actually required be less than stated in the strategy?
- We respectfully request a breakdown of the costing in the DCP for Pipe No. 39C-40-48



- Please amend the project land required for WL-04 in the DCP to be 1.74ha as per the approved Indicative Subdivision & Staging Plan (as attached). It is currently shown as 1.70ha.
- The location of Culvert CU-11 is incorrectly shown on the plans in the PSP & DCP opposite WL-03. As per the Engeny Drainage Strategy it is located opposite WL-04.
- Table 5 in the DCP shows two projects as CU-12. It appears CU-11 has been listed a second time as CU-12.
- If a land area of greater than 2.44% of NDHa of the property is required to be provided under the PSP how is this to be valued for reimbursement and what is the timing of the reimbursement?
- As per Section 3.2.2 of the DCP the PLEM valuation method is based around the average public land provision required for the PSP, with the land required for each property being calculated and compared against the average. Where is the average public land provision listed? Where is it shown for the properties providing public land if they are providing above or below the average and, if above, the area provided in excess of the average.

We thank you for the opportunity to register our submission to Amendment C152basc. Should the matters identified above remain unresolved and a planning panel is convened, we reserve the right to present our position to the independent panel.

Should you have any queries, please do not hesitate to contact me via email

[REDACTED]

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'FW'.

FIONA WIFFRIE
Senior Town Planner
BEVERIDGE WILLIAMS

enc: Endorsed Development Plan under DPO21.
1001632 – ISSP V12 (Endorsed)

[REDACTED]

Hi John

We are currently reviewing the costing of Pipe No's 39C-40 & 40-48 in the Development Contributions Plan (DCP) and noticed that Engeny have based the costings on using interlocking/flush jointed pipes.

We have spoken to Peter Bardwell at Council regarding this and he has informed us that Council would accept the use of interlocking/flush jointed pipes for those greater than 750mm in diameter. Council currently require that pipes that are 750mm or less in diameter to be rubber ring jointed pipes.

Review of the attached spreadsheet, as provided by Engeny in response to a request by Herbert Smith Freehills, shows there to be a difference in the cost of the different pipe types:

- 600mm Diameter Pipe 100% FCR Backfill – South East Region
 - Interlocking/flush jointed: \$307/m
 - Rubber ring jointed: \$381/m
- 750mm Diameter Pipe 100% FCR Backfill – South East Region
 - Interlocking/flush jointed: \$425/m
 - Rubber ring jointed: \$528/m

We request that the the costings in the DCP for all pipes, in particular Pipe No.'s 39C-40, 47-47A & 47A-40, that are 750mm or less in diameter be reviewed and revised to accord with the pipe type that Council will required to be installed.

We would welcome the opportunity to meet with the VPA & Council in the coming week to discuss all outstanding matters with a view to resolving them prior to the Standing Advisory Committee Hearing.

If you have any questions or require any further information regarding the above please do not hesitate to contact us.

Regards,



LINCON MORRIS

Project Manager/ Licensed Surveyor

A 134 Graham Street, Wonthaggi, VIC 3995

W beveridgewilliams.com.au

■ [REDACTED] ■ [REDACTED]



Proudly certified in Victoria for Quality ISO 9001, Safety AS/NZS 4801 and Environment ISO 14001



[REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

Hi John

Thank you for forwarding through the updated spreadsheet with submission responses.

In relation to the responses the VPA provided to the queries we raised on behalf of the owners of Property No.'s 6, 46, 47, 48, 49, 68 & 69 regarding the valuations can you please advise the following:

- We understand that a Property Broad Hectare "estimate of value" has been undertaken, as outlined under the Project Brief on Page 3 of the Estimates of Value Report dated 01/09/2020, to provide a valuation of land which is required by the DCP. We would like it clarified whether the same valuation method, which includes site specific acquisition estimates for properties "over" providing to the DCP, will be used to determine Market Value at the time of the land required by the DCP being acquired? We believe the valuation method for determining Market Value should be written into the PSP/DCP to provide clarity for all parties.
- We also would like to know when the individual property owners will be provided with a copy of the valuations for their property, including any site specific acquisition estimates for properties "over" providing to the DCP.

In relation to Submission No. 22.10 regarding the area in the land budget for the WL-04 we wish to clarify that the area required for the asset is 1.74ha and not 1.70ha, which is the area currently in the land budget. The area on 1.74ha is the area of the reserve as shown on the endorsed Indicative Subdivision & Staging Plan and it will not be reduced. We wish for the project land table to be updated to reflect the larger area to assure our client is properly compensated.

We would welcome the opportunity to meet with the VPA & Council in the coming week to discuss all outstanding matters with a view to resolving them prior to the Standing Advisory Committee Hearing.

If you have any questions or require any further information regarding the above please do not hesitate to contact us.

Regards,



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[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED]
[REDACTED]

Hi Lincon and Fiona,

Attached are what we will be sending the SAC regarding your 5 submissions.

I have asked Engeny to contact Lincon to discuss drainage matters and may be able to update the spreadsheet following any report back of that conversation.

I note you represent landowners who own parcels identified as 47 and 48 in the land use budget (Carbora Nominees and Robert John Edden). Please note, in response to your submission we have rectified the Environmental Audit Overlay error and put it on the correct property. If you could notify your clients about this and let me know if there are any issues, thanks.

Regards,

John Petrakos | Strategic Planning Manager

Regional Victoria

Level 25, 35 Collins Street, Melbourne VIC 3000

[REDACTED]



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[REDACTED]

Hi John

In relation to Submission Item No. 22.09 regarding the breakdown of the costing for DCP Pipe No.'s 39C – 40 & 40 – 48 we have prepared a cost estimate based on knowledge of the area following a feature & level survey, preliminary design and the construction of the sewer rising main along the same alignment.

As per the attached schedule we estimate that the pipes will actually cost in the vicinity of \$505,000 + GST to construct (\$49,000 + GST for Pipe No. 39C – 40 and \$456,000 + GST for Pipe No. 40 – 48). Please note that this is based on rates provided by the civil contractor working on the estate and does not include the earthworks required for Wentworth Road to be able to drain to the wetlands and provide the required coverage. It also does not include Council's fees, which at the estimated construction cost would be roughly \$16,000.

The following is a comparison of the cost estimate prepared from the preliminary design compared to the cost estimate in the Drainage Strategy:

- Pipe No. 39C – 40:
 - Drainage Strategy:
 - \$32,143 + GST
 - \$43,000 + GST incl. 35% contingency
 - Preliminary Design:
 - \$49,000 + GST (not including Council fees)
 - \$59,000 + GST incl. 20% contingency (not including Council fees)
- Pipe No. 40 – 48
 - Drainage Strategy:
 - \$333,600 + GST
 - \$450,000 + GST incl. 35% contingency
 - Preliminary Design:
 - \$456,000 + GST (not including Council fees)
 - \$547,000 + GST incl. 20% contingency (not including Council fees)

Please note that we believe that there also needs to be a contingency amount of at least 20% allowed on top of our cost estimate as it is only based on a preliminary design. This is shown in the comparison above.

In regards to the assumptions listed in the cost estimates in the Drainage Strategy prepared by Engeny we provide the following observations:

- Pipe diameters & types
 - Pipe No. 39C – 40
 - Our preliminary design agrees with the Drainage Strategy
 - We note that the drainage strategy nominates the pipe type to be a 600mm diameter interlocking flush jointed pipe but in discussions with Council they have confirmed that they do not accept this type of pipe for pipes that are 750mm or less in diameter
 - Pipe No. 40 – 48
 - Our preliminary design has determined that the first 180m will require a 900mm diameter pipe as per the Drainage Strategy but the remaining 439m will need to be a 1050mm diameter pipe due to the grade flattening out (see dot point below re slope)
- Length

- Overall the preliminary design length is practically the same as the Drainage Strategy. There is a 15-20m difference in the separate sections.
- Slope
 - Pipe No. 39C – 40
 - Drainage Strategy: 1 in 35
 - Preliminary Design: 1 in 30
 - Pipe No. 40 – 48
 - Drainage Strategy: 1 in 90
 - Preliminary Design: Commences at 1 in 46 and flattens out to approx. 1 in 300 to follow the proposed design of Wentworth Road (see attached preliminary long sections)
- Backfill
 - Cost comparison prepared using crushed rock backfill as per the Drainage Strategy
 - A separate comparison using select backfill was also prepared and determined this would be approximately \$40,000 + GST cheaper
- Ground Conditions (at a high level only and assumes rock generally unlikely)
 - Following construction of the sewer rising main along a similar alignment it is considered highly likely that rock will be encountered at depths greater than 1.5m to 1.8m for approximately 40%-50% of the length of Pipe No. 40-48
- Location of Construction
 - The Drainage Strategy assumes construction within a greenfield site but the pipe will actually be located within an existing used road reserve, being Wentworth Road. Construction rates within an active road reserve are higher as it has a significant effect on the length of pipe that can be laid within a day due to traffic management, additional OH&S considerations and the need to pack up the site each night.

On the basis of the above we request on behalf of our client that the cost allowance in the Wonthaggi North East DCP for Pipe No.'s 39C – 40 & 40 – 48 be checked and revised.

If you have any questions or would like to discuss the above further please do not hesitate to contact us.

Regards,



LINCON MORRIS

Project Manager/ Licensed Surveyor

A 134 Graham Street, Wonthaggi, VIC 3995

W beveridgewilliams.com.au



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Regards,

[Redacted signature block]

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Regards,

John Petrakos | Strategic Planning Manager

Regional Victoria

Level 25, 35 Collins Street, Melbourne VIC 3000

[Redacted contact information]



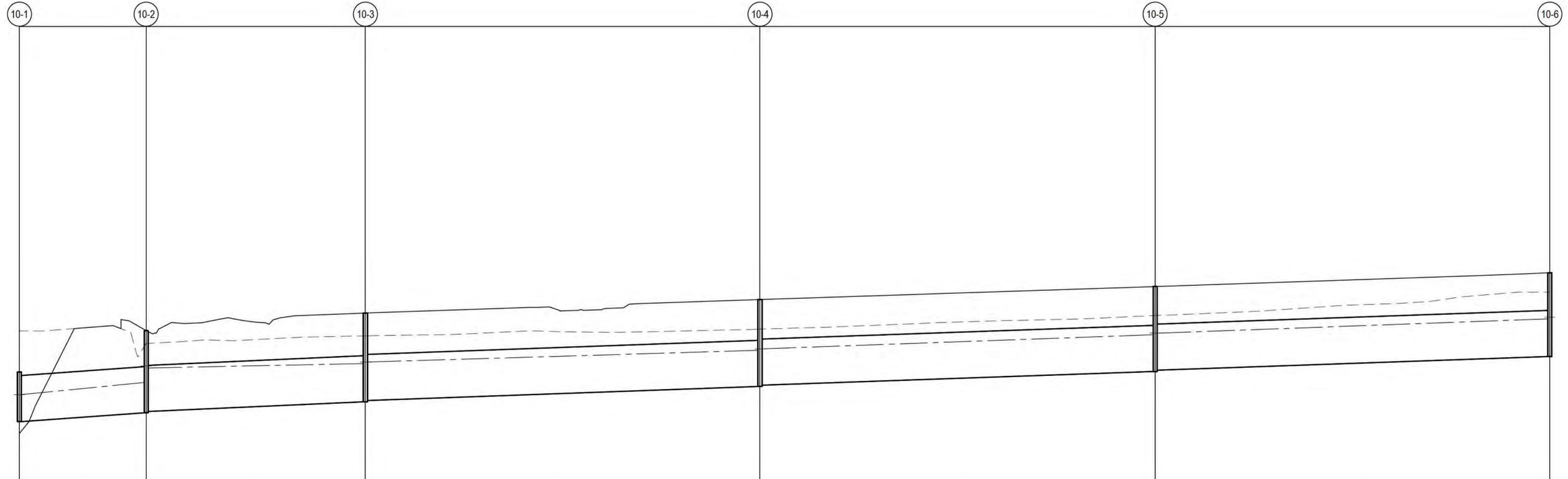
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NOTES:
 ALL STORMWATER DRAINS UP TO AND INCLUDING 750mm DIA. ARE TO BE CLASS 2 R.R.J. PIPES UNLESS NOTED OTHERWISE.

LEGEND	
	EXISTING SURFACE
	DESIGN SURFACE
	DRAINAGE PIPE/PIT
	EXISTING DRAINAGE PIPE/PIT
	HYDRAULIC GRADE LINE
	DENOTES 20mm CLASS 3 FOR BACKFILL

40-48



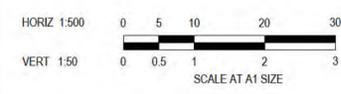
DESIGN FLOW (m ³ /s)	1.471	1.491	1.528	1.567	1.608	
CAPACITY (m ³ /s)	2.274	1.812	1.629	1.603	1.603	
AT GRADE VELOCITY (m/s)	2.63	2.09	1.88	1.85	1.85	
PIPE SIZE (mm)	10500	10500	10500	10500	10500	
PIPE GRADE DATUM	10.0	1 in 144	1 in 227	1 in 281	1 in 290	1 in 290

DEPTH TO INVERT	1.125 1.125	1.869 1.839	2.022 1.992	1.979 1.949	1.934 1.904	1.909 1.879
H.G.L.	13.915	14.190 14.596 14.521	14.621 14.656 14.655	14.923 14.956	15.278 15.312	15.639 15.677
INVERT LEVEL	13.300 13.300	13.500 13.530	13.750 13.780	14.100 14.130	14.440 14.470	14.780 14.810
FINISHED SURFACE	14.425	15.380	15.772	16.075	16.374	16.689
EXISTING SURFACE	15.365	15.079	15.260	15.405	15.714	16.250
PIPE CHAINAGE (Reach Length)	0.000 (28.868)	28.868	78.870 (50.002)	168.823 (89.953)	268.870 (90.047)	348.870 (90.000)

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REV	DESCRIPTION	DATE	DRN	APP	REV	DESCRIPTION	DATE	DRN	APP



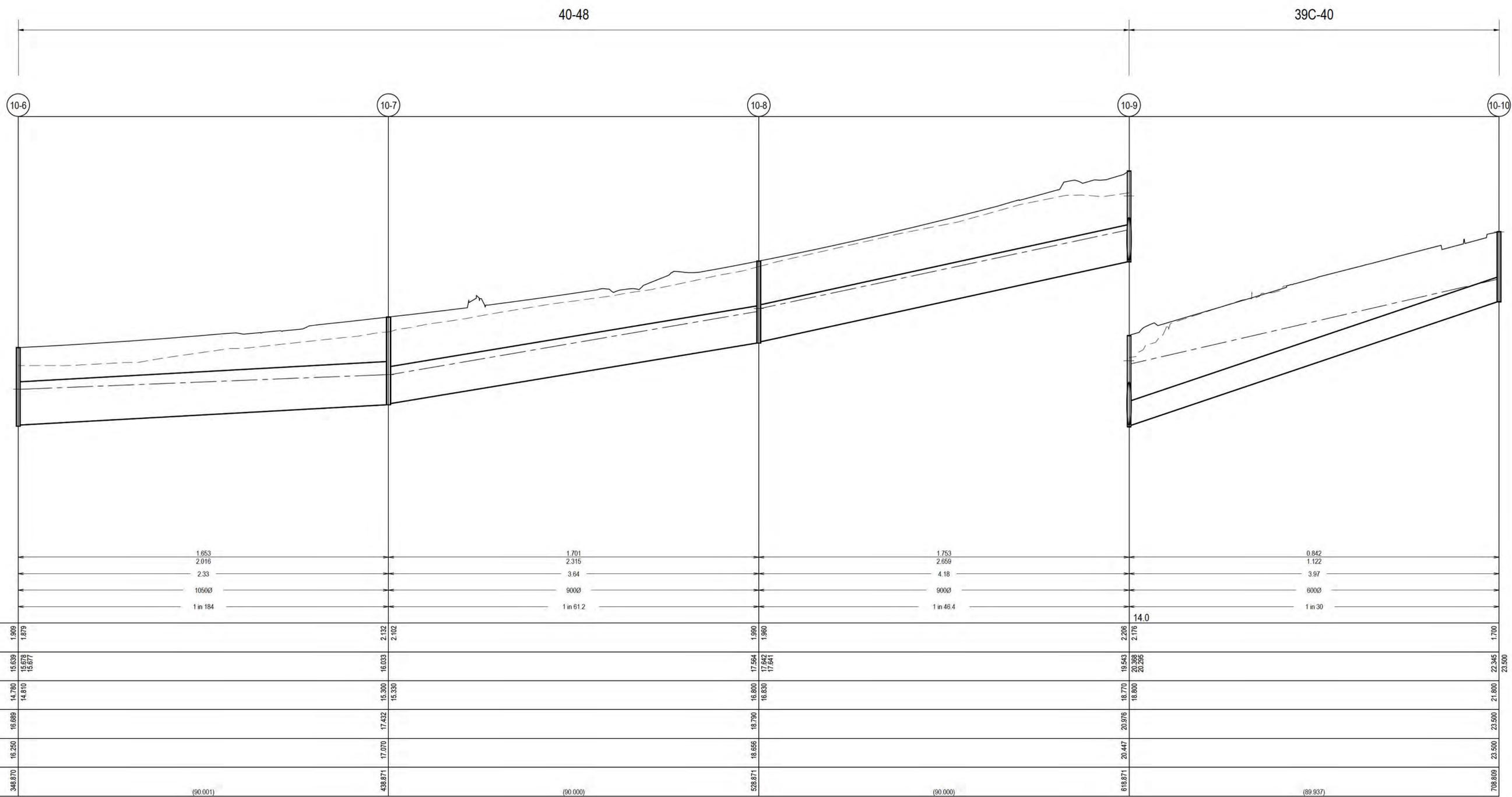
Designed Date
 J CLOTTU
 23.03.21
 Drawn
 J CLOTTU
 Approved Date
 M COYNE
 23.03.21
 PS Number

BW Beveridge Williams
 134 Graham Street
 Wonthaggi VIC 3995
 ph: 03 5961 1111
 www.beveridgewilliams.com.au

Project Details
 NORTHERN VIEWS ESTATE
 WENTWORTH PTY LTD
 BASS COAST SHIRE COUNCIL
 Drawing Title
 DRAINAGE LONG SECTIONS

Sheet 01 of 02
 Scale
 1:500 H 1:50 V @ A1
 Project Ref
 1001632
 Stage No
 FLP
 Drawing No
 400
 Rev
 P1

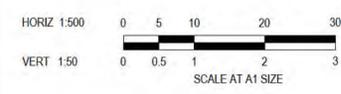
LEGEND	
	EXISTING SURFACE
	DESIGN SURFACE
	DRAINAGE PIPE/PIT
	EXISTING DRAINAGE PIPE/PIT
	HYDRAULIC GRADE LINE



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REV	DESCRIPTION	DATE	DRN	APP	REV	DESCRIPTION	DATE	DRN	APP
P1	ISSUED FOR INFORMATION	23.03.21	JC	MC					



Designed: J CLOTTU
Date: 23.03.21
Drawn: J CLOTTU
Approved: M COYNE
Date: 23.03.21
PS Number: -



Project Details: NORTHERN VIEWS ESTATE
WENTWORTH PTY LTD
BASS COAST SHIRE COUNCIL
Drawing Title: DRAINAGE LONG SECTIONS

Sheet 02 of 02
Scale: 1:500 H 1:50 V @ A1
Project Ref: 1001632
Stage No: FLP
Drawing No: 401
Rev: P1

**NORTHERN VIEWS ESTATE
ROAD & DRAINAGE (3) WORKS SCHEDULE
CONTRACT NO. 1001632**

The quantities given in the Schedule have been taken out with care but are not guaranteed. The contractor must take out his own quantities from the tender plans and adjust accordingly. This tender schedule is for a **Lump Sum**, the schedule provided is to be used for assessing progress claims and as a method of assessing variations. Quantities for provisional items are not to be altered.

CONTRACTOR DECLARATION

By signing below, I _____ of _____ confirm the Lump Sum provided below is based on the plans and any changes that have been made to the schedule including quantity and description have been highlighted.

Signed _____ Date : _____

ROAD & DRAINAGE (3) SUB TOTAL	\$504,741.00
G.S.T.	\$50,474.10
ROAD & DRAINAGE (3) TOTAL	\$555,215.10

SCHEDULE VERSION : A

ITEM	DESCRIPTION	QTY	UNIT	RATE	AMOUNT
1	DRAINAGE				\$504,741.00
	Supply and install drainage including testing, excavation, shoring, laying, backfilling, dewatering, removal of spoil and allowance for blanking of pipes with timber battens for future connection where required for the pipes specified below :-				
	Drainage Pipes				
(a)	Class 2 RCP RRJ with Select Backfill				
(i)	600mm dia 1.5 - 2.5m depth (Pipe 39C-40)	90	lin.m	\$ 494.00	\$ 44,460.00
(b)	Interlocking/flush jointed pipe with Select Backfill				
(i)	900mm dia 1.5 - 2.5m depth (Pipe 40-48)	180	lin.m	\$ 537.00	\$ 96,660.00
(ii)	1050mm dia 1.5 - 2.5m depth (Pipe 40-48)	119	lin.m	\$ 709.00	\$ 84,371.00
(iii)	1050mm dia 1.5 - 2.5m depth (Pipe 40-48) 0.4m-0.8mFILL	320	lin.m	\$ 675.00	\$ 216,000.00
	Drainage Pits				
(c)	Junction Pit as per Council Standard				
(i)	900 x 900 1.5 - 2.5m depth (Pipe 39C-40)	1	No.	\$ 4,450.00	\$ 4,450.00
(ii)	900 x 1200 1.5 - 2.5m depth (Pipe40-48)	8	No.	\$ 5,100.00	\$ 40,800.00
(d)	Precast Concrete (Headwall/Endwalls) Including energy dissipating rock beaching				
(i)	To suit 1050mm dia concrete pipe (40-48)	1	No.	\$ 10,000.00	\$ 10,000.00
(e)	Rock Outlet Pipe Including energy dissipating rock beaching				
(i)	To suit 1050mm dia concrete pipe (40-48)	1	No.	\$ 8,000.00	\$ 8,000.00



BASS COAST SHIRE COUNCIL

Drainage Strategy for Wonthaggi North East PSP

Stormwater Management Plan



October 2019

V2015_011-REP-001

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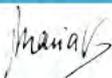
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JOB NO. AND PROJECT NAME: V2015_011 Wonthaggi North East PSP Drainage					
DOC PATH FILE: \\EGIMELAPP02\Melbourne_management\$\Projects\V2015 Bass Coast Shire\V2015_011 Wonthaggi NE Dev Advice\07 Deliv\Docs\Report\Revs\V2015_002-REP-001-11-Wonthaggi NE Final Drainage Report.docx					
REV	DESCRIPTION	AUTHOR	REVIEWER	APPROVED BY	DATE
Rev 11	Client Issue	Maria Matamala	Glenn Ottrey	Glenn Ottrey	21/10/2019
Signatures					



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1. INTRODUCTION

Engeny have been engaged by Bass Coast Shire Council (BCSC) to assess the drainage and stormwater treatment requirements for the Wonthaggi North East Development Precinct. The strategy describes the required infrastructure necessary to facilitate the development of this area and meet the legislative requirement for the management of stormwater.

1.1 Assumptions

Given that the planning for the Wonthaggi North East PSP area is occurring in parallel with the development of this drainage strategy a number of assumptions have been made about the final layout of the development area. This includes the following:

- Development density of 13 houses per hectare
- Fraction impervious of the final development area of 0.65 (in line with the housing density above)
- Existing conditions flood mapping reveals a large area of land within the development area adjacent to Korumburra Wonthaggi Road is subject to flooding in the 1 % AEP event. It has been assumed that this area can be used for stormwater treatment
- The development area will need to meet best practice treatment of stormwater prior to discharging into the Powlett River
- All drains discharging into an existing or proposed waterway will first receive primary sediment removal treatment (through sedimentation basins)
- Discussions with WGCMA have confirmed that there is no requirement to retard flows to predevelopment peak flows for major storm events (such as the 1 % annual exceedance probability (AEP) event) prior to discharge to the Powlett River. Increased runoff as a result of development in more frequent storm events could mean downstream land owners are subject to more frequent inundation, hence peak flows from the 63 % and 39 % AEP events have been analysed in order to ensure predevelopment peak flows in these events are not exceeded after development.

2. MANAGEMENT OF FLOWS

The Wonthaggi North East development area is in a location which is prone to widespread flooding in the 1 % Annual Exceedance Probability (AEP) event. **Appendix A** shows the 1 % AEP flood extent under current existing conditions. The catchments in the north western part of the development area was not included in the flood model as the terrain is well defined with clear valleys and distinct low points which represent the existing overland flow paths.

The flooding displayed in **Appendix A** is caused by the large upstream catchment areas, flat topography of the area and the existing Korumburra-Wonthaggi Road embankment. To enable the development of this land, the inflows from external catchments will need to be managed as will the runoff from the developing areas.

2.1 External catchments

There are a number of external catchments which will drain into the development area. To the west of the development area there are some existing urban catchments, while to the south and east there are large rural catchments. The external catchments which drain into the development area are shown in **Appendix B**. To ensure the dwellings within the development area are not impacted by flooding up to the 1 % AEP event the flows from the external catchments will need to be conveyed around and/or through the development area.

2.2 Pipes and roadways

The drainage design within the development areas should follow the major / minor principle set out in the Infrastructure Design Manual. Where 1 % AEP flows are less than 10 m³/s a combination of piping the 18 % AEP flows and having the “gap” flow to safely be conveyed along a future road has been adopted as a suitable drainage solution. Where flows are above 10 m³/s it is generally difficult to convey them safely along a road with a pipe underneath. In these areas open waterways have been proposed.

It is important that the development plans for these areas allow for a road network to convey runoff in major storms through to the waterways. This scenario applies for the existing urban catchments and for some of the smaller rural catchments which flow into the development area. **Appendix C** shows the proposed stormwater management strategy including the preliminary pipe flow locations entering the development area from the external urban and rural catchments. **Appendix D** includes the recommended points of discharge and pipe alignments connecting into primary treatment infrastructures for each internal catchment.

2.3 Constructed waterways

Engeny understands that the existing waterways within the development area have been significantly modified from their natural form and most are what would be classified as rural

drains. These drains are suitable for management of flows in a rural environment but do not provide an adequate level of service in an urban setting.

Where the flow in the 1 % AEP event is greater than 10 m³/s a constructed waterway is proposed. Constructed waterways should be sized to convey the full 1 % AEP flow with 600 mm freeboard to any adjacent dwellings. They should be designed with a pilot channel capable of conveying regular flows. Constructed waterways offer improved environmental and aesthetical outcomes over an open drain as they can provide habitat for native fauna and flora while still providing the drainage utility. Other benefits include public amenity and the opportunity for shared paths to link communities. Engeny recommend that Council adopt Melbourne Water’s Constructed Waterway Guidelines and Waterway Corridor Guideline documents as a basis for the design of waterways in the precinct given that Bass Coast Shire Council does not have its own guideline in this area.

Council should require roads be built on either side of the waterway corridor where possible to promote passive surveillance of the waterways to reduce the risk of rubbish dumping and also to allow for maintenance access along the waterway. With the current location of the eastern waterway roads will only be able to be built along the western side of the waterway within the development area as the eastern boundary is on the edge of the development area.

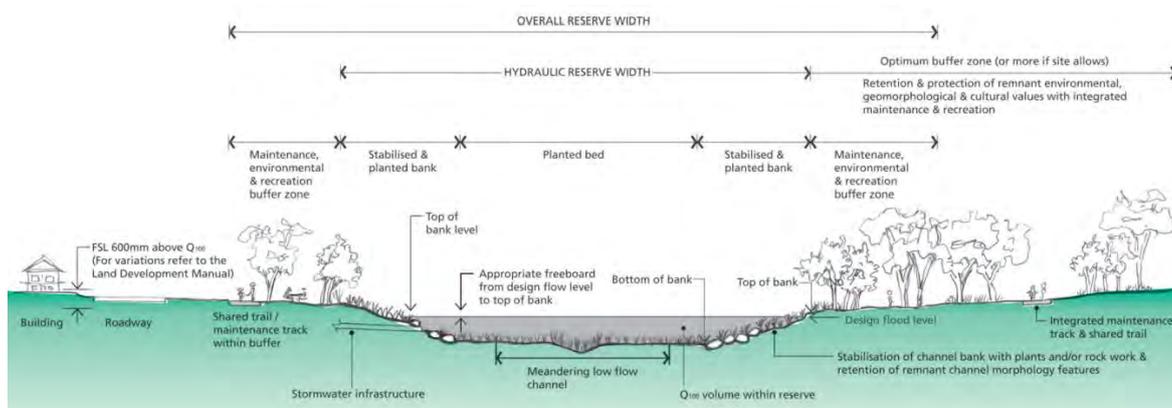


Figure 2.1 Schematic example of a constructed waterway (source MW constructed waterway guidelines)

Appendix C shows the proposed constructed waterway alignments. The development area will require two constructed waterways, referred to in this document as the east and west waterways. The west waterway more or less follows the existing waterway drainage lines through the area. The West Gippsland Catchment Management Authority (WGCMA) have requested a 60 m waterway corridor downstream of McGibbonys Road through to the proposed wetlands adjacent to the Korumburra Wonthaggi Road. Upstream of McGibbonys Road the proposed waterway corridor width varies between 55 and 23 m. Approved development plans for Parklea Estate and Powlett Ridge Estate have been provided by council indicating the land designated for the proposed west waterway. Although the overall waterway corridor width varies from Powlett Ridge Estate down to Parklea Estate, the land takes set out in the approved development plans have been adopted in this document.

The location of the east waterway is somewhat flexible in some areas given the very flat topography closer to the proposed wetlands. There is a defined low point in the Bass Highway where the upstream end of the waterway is proposed to begin. Downstream of this it is recommended that the waterway run along the edge of the development area where council has expressed a preference for locating the waterway within the development boundary. Although locating the waterway along the boundary of the development area is unusual, it will effectively ensure the shallow but widespread flow paths from the rural catchments are safely intercepted and conveyed, without sheet flow into urban properties. Alternatively, locating the waterway elsewhere would mean that the safe conveyance of these external flows would be significantly dependent on the capacity and location of the road networks within the development area.

Table 2.1 below summarises the required hydraulic widths and total corridor widths of the waterways within the development area. All Proposed corridor widths tabulated below (excluding waterway reaches 17-18, 22-23, 23-24) include an allowance for vehicle access on both sides of the waterway, alternatively if future road alignments already provide this access, waterway widths can be reduced in accordance with Melbourne Water's Constructed Waterways Guidelines Appendix C contains a plan showing the locations of each of the waterways.

Table 2.1 Waterway corridor widths

Waterway Reach	Required hydraulic width	Proposed corridor width
Eastern Waterway		
3-4	30	55
4-5	30	60
5-6	50	60
6-7	50	60
7-8	50	60
8-9	50	60
Western Waterway		
17-18	22	40
19-20	31	55
20-21	32	55
22-23	34	60

Waterway Reach	Required hydraulic width	Proposed corridor width
23A-23B	35	60
23C-24	35	60
24-25	35	60

The widths upstream of McGibbonys Road and through Powlett Ridge Estate on the western waterway have been documented in this report to match the widths and locations from previous work, approved development plans and from consultation with landowners as they hydraulically can still convey the 1 % AEP flows. Adjustments to the total corridor width in approved development areas may be required however to provide access to both sides of the waterway in accordance with Melbourne Water’s Guidelines.

The Eastern Waterway has been assumed to have a shared path/road on one side of the waterway across the entire length where the other side could require the addition of a shared trail or maintenance track as outlined in Melbourne Water’s Waterway Corridors Guideline (2013). The Eastern Waterway has been located on the edge of the development in order to protect the development area from flooding and to ensure that there are no adverse flooding impacts as a result of development on the existing land to the east of the development area. It may be possible to move the proposed waterway further west into the development area, however it will be very challenging to convey the shallow overland sheet flow from the farmland east of the development area into the waterway without increasing flood depths on the farmland. If the waterway was moved west dwellings to the east of the waterway would need to be built on fill pads set above the 1 % AEP flood level. Consideration would also need to be given to maintaining safe access to these dwellings during flood events.

2.4 Discharge to Powlett River

A detailed analysis of the peak 63 % AEP and 39 % AEP flows was undertaken using RORB. As the Wonthaggi North East Development area discharges through existing properties prior to discharging into the Powlett River, these flows were analysed in order to ensure sufficient flood storage was incorporated in the stormwater strategy such that flows did not increase from the existing predevelopment flows minimising impacts to downstream land owners and erosion to the receiving waterway.

2.4.1 RORB Model Validation

A key step in the development of the hydrologic model is the validation process. This process ensures that appropriate model parameters are adopted to reflect how runoff is routed through the catchment.

Three (3) separate RORB model’s were developed to represent the catchments draining into each of the proposed Wetland 1, Wetland 2 and Wetland 3 and 4 locations.

RORB Model for Wetland 1 Catchment

The existing conditions RORB model for the area draining into the proposed Wetland 1 location was validated using the Rural Rational method as per Australian Rainfall and Runoff at the Korumburra-Wonthaggi Road embankment located at the northern end of the development area. The peak 1 % AEP flow at this location was further confirmed with flows from TUFLOW. Table 2.2 summarises the hydrologic model validation process and shows that there is little difference between the 1 % AEP flow from the RORB model, rational method and Tuflow model outputs.

Table 2.2 Validation of existing conditions RORB model for Wetland 1 catchment

Parameter	Value
Catchment area	34 km ²
Adopted k_c	5.32
RORB (1 % AEP flow)	58.0 m ³ /s
Rural Rational Method (1 % AEP flow)	57.7 m ³ /s
Existing conditions TUFLOW (1 % AEP flow)	55 m ³ /s

Other key RORB parameters adopted in this model (based on Melbourne Water's Guidelines and Technical Specifications (November 2012)) are:

- $m = 0.8$
- Initial loss = 25 mm (For the Existing conditions RORB Model)
- Initial loss = 15 mm (For the Developed conditions RORB Model)
- RORB Runoff coefficients:
 - 100 year ARI runoff coefficient = 0.60
 - 50 year ARI runoff coefficient = 0.55
 - 20 year ARI runoff coefficient = 0.45
 - 10 year ARI runoff coefficient = 0.35
 - 5 year ARI runoff coefficient = 0.25
 - 2 year ARI runoff coefficient = 0.22
 - 1 year ARI runoff coefficient = 0.20

The developed conditions RORB model was setup based on this validated existing conditions RORB model where the development area was assigned a consistent fraction Impervious of 65 %. This adopted value aims to reflect the proposed general residential

zones occupying much of the overall development in addition to minor areas allocated to industrial and commercial land uses.

The peak 1 % AEP flows at the downstream ends of both west and east waterways were compared to the values derived from the urban rational method calculations used to size the waterways. Table 2.3, shown below provides a summary of the associated peak flows for each of the calculation methods. The table shows that the flows are comparable and a good match between the RORB model and the Rational Method calculation has been achieved.

Table 2.3 Summary of 1 % AEP peak flows derived from various calculation methods for developed conditions

Location	Urban Rational Method (m ³ /s)	RORB (m ³ /s)
D/S end of West Waterway (location 25 on plan in Appendix C)	22.8	21.8
D/S end of East Waterway (location 9 in plan in Appendix C)	36.0	38.8

RORB Model for Wetland 2 Catchment

The existing conditions RORB model for the catchment draining into the proposed Wetland 2 location was validated using the rational method. The following provides details on the parameters used, with Table 2.4 displaying the resultant comparison of flows:

- $K_c = 0.33$
- $m = 0.8$
- Initial loss = 15 mm (For the Existing conditions RORB Model)
- Initial loss = 10 mm (For the Developed conditions RORB Model)
- RORB Runoff coefficients consistent with those adopted for Wetland 1 catchment model

Table 2.4 Validation of existing conditions RORB model for Wetland 2 catchment

Calculation Method	1 % AEP Flow (m ³ /s)
Rational Method	5.2
RORB	5.1

RORB Model for Wetland 3 and 4 Catchment

The existing conditions RORB model for the catchment draining into the proposed Wetland 3 location was validated using the rational method. A value of 1.05 was adopted for the routing parameter where all other inputs were consistent with the modelling approach adopted for the modelling of the Wetland 2 catchment. Table 2.5 presents a comparison of the resultant flows using the rational method and validated RORB model.

Table 2.5 Validation of existing conditions RORB model for Wetland 3 and 4 catchment

Calculation Method	1 % AEP Flow (m ³ /s)
Rational Method	10.6
RORB	10.3

2.4.2 Required Retardation Storages

The retardation storages required to ensure development peak flows are retarded back to existing pre-development flows for the frequent flow events were modelled in RORB at each of the proposed wetland locations shown in **Appendix C**. The hydrologic model was rerun where the outlet configuration was modified until the outflow was equivalent to or lower than the existing pre-development 63 % AEP (1 year ARI) and 39 % AEP (2 year ARI) peak flows respectively. The resultant peak flood storages for the 39 % AEP have been recorded in Table 2.6.

Although Wetland 3 and 4 will be located on land which is owned by different developers, the assets will be linked with a culvert across Wentworth Road for future development conditions and two separate outfalls across Heslop road under interim conditions. As part of a separate scope of work, Engeny developed functional design plans for these wetlands. This design work included:

- 12D terrain modelling which allowed for the specific representation of batters, an embankment, maintenance tracks, sediment ponds and sediment drying areas.
- Estimate of the actual flood storage available within each wetland asset using the developed design Digital Elevation Model (DEM).
- Refined RORB modelling which included the stage versus storage relationship produced from the design DEM.
- Design of the Wetland outlet configurations for Wetland 4 and 3 across Wentworth Road and Heslop Road with consideration of surveyed data provided for the existing culvert crossing.

Based on the refined terrain and RORB modelling undertaken for the functional design of Wetland 3 and 4, these assets have the capacity to retard flows for the 69 % AEP and 39

% AEP events. Retardation of the peak 1 % AEP developed conditions flow back to the peak pre-developed flow was also possible by incorporating an embankment. Further discussion on the outfall arrangement for major storm events across Heslop Road is provided within Section 2.5.2.

The modelling and representation of stage versus storage relationships for Wetland 1 and 2 are of a conceptual level. Due to this the required retardation volume has not allowed for the retardation of 1 % AEP flows. Further design work could be undertaken to determine the extent of flood storage available at each location however it is not expected to be critical for downstream land owners as discussed within Section 2.4.4.

Table 2.6 Required 39 % AEP retardation storage volumes

Asset	39 % AEP Required Retardation Volume (ML)
WL1	191
WL2	8.21
WL3	12.4
WL4	9.18

As noted within Table 2.6 the retardation storage volume required for Wetland 1 is 191 ML. This has assumed the proposed filling of the low-lying areas adjacent to the retarding basin to enable development of that land. Figure 2.2 shows the proposed footprint that the retarding basin would require, with the existing 1 % AEP flood extent overlain in the background. The exact location and shape of the retarding basin and wetland could be refined in the detailed design to accommodate an alternative development layout provided that the total volume of storage is maintained. The current location is aimed at minimising the excavation costs by utilising low lying areas which are currently subject to flooding in a 1 % AEP event. The area of land required for the retarding basin is 18.4 ha, of which 4.8 ha is also being utilised as the wetland. This means that 13.6 ha will be required for retarding purposes only. This land will be subject to frequent inundation, occurring multiple times each year. Consideration should be given to how this area is landscaped as the infrastructure and vegetation will need to be able to survive regular periods of inundation. Swampy, floodplain or ephemeral vegetation would be best suited to these conditions.



Figure 2.2 Proposed retarding basin extent

2.4.3 Comparison of Existing and Developed Flows

Table 2.7, Table 2.8, Table 2.9 and Table 2.10 summarise the peak existing and developed conditions flows at each of the proposed wetland locations. These flows were obtained from RORB which was used to determine the food storages required at each outlet.

Table 2.11 provides a summary of the existing and developed peak flows for the 18 % and 1 % AEP storm events at different locations with reference to the plan in **Appendix C**. These flows were obtained using the Rational Method and formed the basis behind the sizing of the eastern and western constructed waterways.

Table 2.7 Wetland 1 Peak RORB Flows

Event	Existing Conditions Flows (m ³ /s)			Developed Conditions Flows (m ³ /s)		
	Inflow	Outflow	Culvert flow ¹	Inflow	Outflow	Culvert flow ¹
63 % AEP	6.3	4.8	6.8	10.1	4.5	6.8
39 % AEP	7.5	5.7	8.1	11.7	5.2	7.9
18 % AEP	10.7	8.9	12.7	16.7	11.6	15.4
1 % AEP	59.2	58.1	58.1	71.0	69.6	69.6

Table 2.8 Wetland 2 Peak RORB Flows

Event	Existing Conditions Flow (m ³ /s)		Developed Conditions Flow (m ³ /s)	
	Inflow	Outflow	Inflow	Outflow
63 % AEP	0.71	0.67	3.43	0.67
39 % AEP	0.90	0.86	4.12	0.86
18 % AEP	1.21	1.30	5.49	1.30
1 % AEP	5.13	5.80	13.45	5.80

Table 2.9 Wetland 3 Peak RORB Flows

Event	Existing Conditions Flow (m ³ /s)		Developed Conditions Flow (m ³ /s)	
	Inflow	Outflow	Inflow	Outflow
63 % AEP	1.21	0.90	2.09	0.90
39 % AEP	1.64	1.00	2.60	1.00
18 % AEP	2.21	1.41	3.65	1.41
1 % AEP	10.28	3.03	8.81	3.03

¹ Culvert flow refers to the total peak flows crossing Korumburra-Wonthaggi Road from the development area including the external catchment entering the channel which runs along the northern boundary of the development area.

Table 2.10 Wetland 4 Peak RORB Flows

Event	Existing Conditions Flow (m ³ /s)		Developed Conditions Flow (m ³ /s)	
	Inflow		Inflow	Outflow
63 % AEP	0.65		2.00	0.49
39 % AEP	0.85		2.51	0.57
18 % AEP	1.21		3.52	0.99
1 % AEP	6.08		8.56	3.68

Table 2.11 Comparison of existing and developed Rational Method flows

Location	Existing		Developed	
	18 % AEP (m ³ /s)	1 % AEP (m ³ /s)	18 % AEP (m ³ /s)	1 % AEP (m ³ /s)
Location 4	5.8	13.0	6.0	13.4
Location 5	5.7	12.8	6.0	13.3
Location 6	11.8	26.0	13.0	28.6
Location 7	11.7	25.6	13.0	28.5
Location 8	15.4	33.9	17.3	38.0
Location 9	14.7	32.1	16.5	36.0
Location 18	4.4	10.1	6.1	13.9
Location 20	5.4	12.3	7.6	17.1
Location 21	5.9	13.1	8.2	18.3
Location 23	7.5	16.5	10.7	23.7
Location 23B	7.5	16.6	10.9	24.0
Location 24	7.4	16.3	10.1	22.3
Location 25	7.5	16.6	10.4	22.8

2.4.4 Impacts on peak flows in major events

The WGCMA and BCSC were consulted extensively during the development of this drainage strategy. The WGCMA and BCSC have identified that the farmland north of Korumburra Wonthaggi Road and Heslops Road is subject to flooding. A large part of this land makes up the flood plain of the Powlett River, with the area subject to flooding shown in the land subject to inundation overlay (LSIO) which is part of the Bass Coast planning scheme. The land identified as being at risk of flooding is based on the 1 % AEP flood extent. Figure 2.3 shows the extent of the land impacted by the LSIO relative to the proposed development area and proposed infrastructure. There is currently no detailed flood modelling information available for the Powlett River floodplain which would help to define the expected extent of inundation in more frequent events.



Figure 2.3 Powlett River floodplain as shown by LSIO

The development of the Wonthaggi North East PSP will increase the peak 1 % AEP flows compared with existing conditions along the tributaries which discharge into the Powlett River system. Table 2.7, Table 2.8, Table 2.9 and Table 2.10 shown above displays the expected change in peak 1 % AEP flows at each of the proposed wetland discharge locations. Each of these proposed wetlands will discharge onto the Powlett River floodplain.

The existing drainage infrastructure to the north of Korumburra Wonthaggi Road and Heslops Road has not been sized to convey the existing 1 % AEP peak flows from the proposed development catchments. The existing drainage infrastructure is typical of what would be expected in a rural area, where frequent flows are conveyed through man made

open channels and larger flows will break out of the channels and be conveyed across the floodplain to the receiving waterway, in this case the Powlett River. The existing drainage infrastructure is configured in this way as it is relatively cheap to construct and maximises the land available for farming activities.

As discussed in Section 2.4.2 the peak flows cannot increase for the 63 % and 39 % AEP events which are the more frequent events. In events larger than the 39 % AEP event it is not proposed to retard the flows back to the existing condition flow. Further detailed terrain modelling may indicate the opportunity to incorporate more storage or embankments (as was the case for Wetland 3 and 4) however an allowance for this has not been made for the concept modelling undertaken for Wetland 1 and 2. This is particularly the case as provision of retarding for these larger events may require very large amounts of land and high expenditure to gain the storage volumes necessary. There will be an impact on the downstream landowner in the form of larger peak flows through the property in large storm events from these local catchments. The land that these flows would impact is currently flood prone and used for farming purposes. Based on the information available to Engeny we do not believe that any dwellings would be impacted by the calculated increase in peak flows. The proposed system is unlikely to significantly affect the flooding on the properties north of Korumburra – Wonthaggi road as the major flows, flood volumes and duration of flooding that affect this area are related to the very large rural catchment of the Powlett River and not the small area of development in Wonthaggi North East.

2.5 Level of Service to Existing and Proposed Roads

2.5.1 Korumburra-Wonthaggi Road

As shown in **Appendix A**, under existing conditions the north-eastern end of the development area is prone to flooding due to the relatively flat terrain which permits water to bank up behind the existing Korumburra-Wonthaggi Road embankment. According to the existing conditions TUFLOW model the 1 % AEP event water surface elevation in this area reaches a level of 16.3 m AHD.

RORB was used in order to assess the varying peak elevations for different AEP events in addition to the impact of development flows to the road's level of service. The existing conditions inflows and outflows were represented by including a storage node where a stage storage relationship of the relatively flat terrain was utilised ensuring the relationship covered the whole extent of the 16.3 m AHD water surface area. The outlet configuration of this storage was also represented with the two sets of existing culverts as well as a series of weirs representing the varying levels of the road embankment. Table 2.12 shown below provides a summary of these outlet parameters.

Table 2.12 Summary of outlet configuration for storage upstream of Korumburra-Wonthaggi Road

Outlet Type	Description
Culvert	3No. x 1200 mm x 1200 mm at invert level of 14.7 m AHD
Culvert	4No. x 1200 mm x 1200 mm at invert level of 14.3 m AHD
Culvert	1No. x 600 mm at invert of 14.5 m AHD
Road Embankment	Total Length of 770 m at elevations between 16.12 - 16.58 m AHD

Utilising this outlet configuration and the stage storage relationship, a 1 % AEP peak elevation of 16.28 m AHD was estimated at the upstream side of the road embankment, a very close match to the TUFLOW flood model water surface elevation of 16.30 m AHD. These similar peak elevations confirm the validity of the RORB model and thus the same storage parameters were used to assess the impact of the road embankment in different AEP events in addition to the impacts from the proposed development.

As shown in Table 2.13, under developed conditions, the peak flood elevation does not increase significantly in comparison to the existing conditions values in the 1 % AEP event. The flows have increased by 20 % in the 1 % AEP event as a result of increased runoff from the development area.

A scenario was run to determine the number of culverts required to ensure the existing road embankment does not overtop in the 1 % AEP event. An additional 14 x 1200 mm diameter culverts would be required to convey the full 1 % AEP flow of 64.4 m³/s under the road. This would result in a peak elevation of 16.10 m upstream of the road. This is just below the lowest point in the road and does not provide any significant freeboard to the road surface. The cost of these culverts assuming a length of 20 m and a contingency of 35 %, was estimated at \$895,000.

Table 2.13, shown below provides a summary of the 1 % AEP Results from the various RORB scenarios described above. The table shows that by conveying the flow under Korumburra-Wonthaggi Road with additional pipes the peak flow rate in the 1 % AEP event can be reduced slightly, compared to allowing the road to overtop under developed conditions. It has been assumed that these additional culverts would be located at Location 12-13 shown within **Appendix C**.

Table 2.13 Summary of 1 % AEP RORB results at proposed Wetland 1 Location

	Existing	Developed	Developed with no overtopping of Existing Road in 1 %AEP Storm event
Duration	12 hr	9 hr	9 hr
Peak Elevation	16.28 m	16.31 m	16.07 m
Peak Outflow	58.1 m ³ /s	69.6 m ³ /s	64.9 m ³ /s
Peak Storage	225 ML	268 ML	228 ML
Outlet Culverts	3No. x 1200 mm x 1200 mm 4No. x 1200 mm x 1200 mm 1No. x 600 mm	3No. x 1200 mm x 1200 mm 4No. x 1200 mm x 1200 mm 1No. x 600 mm	3No. x 1200 mm x 1200 mm 4No. x 1200 mm x 1200 mm 1No. x 600 mm 14No. x 1200 mm dia

2.5.2 Heslop Road

Wetland 2, 3 and 4 are located directly upstream of Heslop Road. As Engeny have completed a functional design of Wetland 3 and 4, the section below includes the culverts proposed from the functional level modelling undertaken. The Wetland 2 culvert outlet however includes the culvert size required to convey the peak 1 % and 18 % AEP developed flows. These options give Council an indication of what assets would be required to achieve the different levels of service for Heslop Road downstream of Wetland 2.

Wetland 2

The proposed culverts downstream of Wetland 2 are in addition to the existing 3 x 1500 mm diameter culverts currently present under Heslop Road. It has been assumed that these existing culverts at location 37-38 (as shown on the plan in Appendix C) are currently at capacity as they are conveying the flows from the catchment south of Korumburra-Wonthaggi Road. The timing of peak events between the local catchment and the larger catchment south of Korumburra Road could be further investigated as if the peaks do not coincide smaller culverts may be able to provide the same level of service.

The local catchment entering Wetland 2 (north of Korumburra-Wonthaggi Road) with a peak flow of 5.5 m³/s and 13.5 m³/s for the 18 % AEP and 1 % AEP events respectively require additional culverts to convey the retarded flows under Heslop Road. As a spillway set just above the 39 % AEP water surface elevation within the RORB model represents the high flow outlet structure of the wetland/ retarding basin, the area provides some retardation of the 18 % AEP and 1 % AEP flows. Table 2.15 summarises the culvert sizes required to convey these peak flows, noting that due to the low-lying road levels of 15.28 m AHD and the retarding basin peak 1 % AEP flood level of 15.76 m AHD, the raising of the road or an

embankment would be required particularly east of the existing Heslop Road culvert crossing. The table also includes a cost estimate for each crossing assuming a pipe length of 20 m and a 35 % contingency.

Table 2.14 Culvert sizing for Heslop Road downstream of Wetland 2 (Location 37-38)

Location		Culvert Required for 18 % AEP		Culvert Required for 1 % AEP		
Wetland 2	1No. x 750 Ø	1.3 m ³ /s	\$42,000	1No. x 1650 Ø	5.80 m ³ /s	\$134,000

Wetland 3 and 4

The functional design of Wetland 3 and 4 has allowed for further investigations into the existing culvert crossings and terrain level constraints. The following was proposed within the functional design plans submitted to Council:

- A 1050 mm diameter pipe outfall from Wetland 4 into an open channel running along the northern side of Heslop Road (intended to convey the 18 % AEP peak flows at a minimum under interim conditions whilst Wetland 3 is under construction).
- A high flow spillway across Wentworth Road from Wetland 4 into Wetland 3 (intended to function as the interim conditions high flow path under interim conditions prior to the construction of Wetland 3 and construction of 1050 mm diameter connection pipe).
- Addition of a new 1200 x 450 box culvert crossing Heslop Road beside existing 2No. x 1200 x 450 box culverts downstream of the proposed Wetland 3 location.
- An embankment along the north eastern boundary of Wetland 3 at 14.9 m AHD to achieve a 1 % AEP level of service for Heslop Road.

Table 2.15 provides a summary of the pipe capacity, size and associated cost for these Wetland 3 and 4 outfalls. The cost estimate for each crossing assumes a 35 % contingency.

Table 2.15 Culvert sizing for Heslop Road downstream of Wetlands 3 and 4

Location	Pipe Capacity (m ³ /s)	Size (mm)	Cost
Wetland 4 (location 49-50)	2.1	1No. x 1050 Ø	\$155,000
Wetland 3 (location 41-42)	3.03	3No. x 1200 x 450	\$426,000

3. STORMWATER TREATMENT

The stormwater runoff generated from the development will need to be treated in accordance with Clause 56 of the planning scheme and the State Environment Protection Policy Waters of Victoria. These documents require stormwater to be treated in accordance with the Best Practice Environmental Management Guidelines (BPEMG). This requires that pollutants be removed from the stormwater before it is discharged into “receiving waters”. The receiving waters for the development area is the Powlett River. Table 3.1 shows the required percentage reductions for the key pollutants.

Table 3.1 Required pollutant removal

Pollutant	Required percentage reduction
Total Suspended Solids (TSS)	80 %
Total Phosphorus (TP)	45 %
Total Nitrogen (TN)	45 %
Gross Pollutants	70 %

Engeny has created a MUSIC (Model for Urban Stormwater Improvement Conceptualisation) model of the development area to assess the effectiveness of different treatment units.

3.1 Required infrastructure

Council has expressed a preference for centralised stormwater treatment infrastructure to help minimise the maintenance associated with the assets. Providing centralised assets also helps to reduce the total overall cost and can allow for assets to be located in logical areas, such as within flood affected land which could otherwise not be developed.

To most effectively meet the best practice guideline criteria and to also protect the constructed waterways from high sediment loads it is proposed to use a series of sedimentation basins and wetlands. A Continuous Deflection Separation (CDS) unit (or similar) is also recommended to treat stormwater from Catchment G, upstream of Bass Highway as the catchment is relatively small and would seem impractical to pipe flows into the Downstream Sediment Basin. These units are propriety sediment removal devices which are installed underground requiring significantly less land take whilst achieving comparable sediment load reductions to small sedimentation basins.

Appendix C shows a layout plan with the location of the proposed assets. The installation of rainwater tanks connected to all new residential properties is also proposed. Although these rainwater tanks will not significantly reduce the peak runoff flows from the development area in major storms they will reduce the total runoff volume requiring

treatment and retardation in addition to providing a valuable water source alternative to potable water.

Table 3.2 shows the proposed size of each of the sedimentation basins. In order to protect the constructed waterways from high sediment loads all stormwater will be discharged into a sedimentation basin rather than directly into the waterways. This may result in the need to construct drainage pipes running in parallel to the waterway for short lengths to convey the stormwater to the sedimentation ponds and limit the number of discharge points into the waterway. The sizes of the sedimentation basins in the table refer to the area of each asset at Normal Water Level. The total land required for each asset, including allowances for maintenance tracks and battering was determined by providing a 10 metre buffer to each of the asset's area at Normal Water Level with an additional area corresponding to the sediment drying area based on the volume of sediment accumulated. The 10 metre buffer allowance assumes a 1 in 5 batter for a depth of 2 metres. This approach was appropriate for most of the sediment basins as they are located on relatively flat terrain.

Table 3.2 Sedimentation basin stormwater treatment assets

Asset ID	Area at Normal Water Level (m ²)	Area Required for Sediment Drying (m ²)	Estimated Total Asset footprint (allowing for 10 m buffer for maintenance and battering) (m ²)
SB1	600	325	2500
SB2	600	375	2500
SB3	500	262	2200
SB4	780	617	3100
SB5	740	550	2900
SB6	700	509	2900
SB7	840	675	3300
SB8	900	761	3400
SB9	600	293	2400
SB10	860	714	3300
SB11	750	582	2400
SB11A	900	732	2700
SB12	600	109	2200

Asset ID	Area at Normal Water Level (m ²)	Area Required for Sediment Drying (m ²)	Estimated Total Asset footprint (allowing for 10 m buffer for maintenance and battering) (m ²)
SB13	450	76	1900
SB14	450	84	1900

The total land required for the wetlands is shown in Table 3.3. This assessment took into consideration the slope of the existing terrain, the invert of proposed and existing culverts in addition to the downstream road levels. It was considered that a 25 % additional land take plus a 10 m buffer of the macrophyte treatment area (area at normal water level) should be made for land budgeting purposes. The exact land take requirements will need to be refined in the functional design stages with further consideration of the terrain.

Table 3.3 Wetland stormwater treatment assets

Asset ID	Wetland Area at Normal Water Level (m ²)	25 % Increase to Area(m ²)	Estimated Total Asset footprint (allowing for 10 m buffer for maintenance and battering) (m ²)
WL1	38,000	47,500	57,500
WL2	8,000	10,000	17,000
WL3	13,220	16,525	27,600
WL 4	5,850	7,313	16,500

The results from the MUSIC modelling including pollutant removal rates from the developing areas are shown below in Table 3.4.

The table shows that more than 100 % of total suspended solids and gross pollutants from the new development are being removed. This is due to the additional pollutant loads being treated by the wetlands from the external rural catchments in addition to the developing catchment. Note that gross pollutants do not just include litter from urban areas, but also includes leaf litter and vegetation from both urban and rural areas.

Table 3.4 Stormwater treatment results for development area only

	Pollutant Load from Developable Area (kg/yr)	Pollutant Load Removed (kg/yr)	% of Development Pollutant Load Removed
Total Suspended Solids (kg/yr)	656,630	727,000	110.7 %
Total Phosphorus (kg/yr)	1,401	1,310	93.5 %
Total Nitrogen (kg/yr)	10,274	4,700	45.7 %
Gross Pollutants (kg/yr)	134,218	245,995	183.3 %

Table 3.5 shows the treatment results for the entire catchment including the large external rural catchments draining into the development area. There is no requirement to treat the existing upstream rural catchments to best practice as part of the development.

Table 3.5 Stormwater treatment results for entire catchment including external rural catchment areas

	Pollutant Load from Entire Catchment (including External Rural Catchments) (kg/yr)	Pollutant Load Removed (kg/yr)	% of Entire Catchment Pollutant Load Removed
Total Suspended Solids (kg/yr)	1,360,000	727,000	53 %
Total Phosphorus (kg/yr)	3,390	1,310	39 %
Total Nitrogen (kg/yr)	25,200	4,700	19 %
Gross Pollutants (kg/yr)	246,000	245,995	100 %

3.2 Sedimentation Basins

The following design parameters have been used for the sedimentation basins:

- Extended detention depth: 0.35 m
- 1 in 8 batter slopes for the first 0.5 m of depth (for safety)
- 1 in 3 batter slopes below 0.5 m depth.

A clean out frequency of 3 years has been adopted for all sedimentation basins within the development area. They have also been sized to effectively treat both internal and external

catchments where applicable. This has been done to ensure that the maintenance frequency is not increased as a result of sizing the asset to only treat the developing area catchment when there are additional external catchments entering the area. This approach alternatively means that the sedimentation basins are sized to treat the developing catchment areas with a clean out frequency of 5 years.

3.3 Wetlands

The concept level design of the wetland, including estimates of land requirements have been undertaken in accordance with Melbourne Water's wetland design guidelines. The following design parameters have been used for each of the wetlands:

- Extended detention depth: 0.35 m
- Notional detention time of approximately 72 hours
- Inlet Pond Volume of zero as the sedimentation basins were modelled as individual units and sized using the above assumptions
- Permanent Pool depth of 0.4 m.

It should be noted that Wetland 1 in particular receives flows from large external rural catchments which behave in a hydrologically different way to developed catchments. Rural catchments tend to generate a greater base flow of runoff for many days or weeks following a rainfall event, whereas urban catchments will typically have a short sharp flow response and then stop flowing. The outlet arrangement on this wetland will need to allow for this large rural catchment to ensure that the water levels can rise and fall within the wetland and that it does not become drowned out permanently. Details of how the outlet arrangement connects to the Powlett River have not been considered explicitly as part of this study, however this should be further investigated during the functional design of these assets.

3.4 Rainwater tanks

Implementing rainwater tanks as part of this strategy is proposed in order to help reduce the total size and cost of treatment infrastructure by reducing the total annual volume of runoff requiring treatment. The rainwater tanks are to be installed on each property and should be plumbed to the toilets to ensure a regular reuse demand. They should also be available for garden irrigation. As irrigation demand can be highly variable depending on weather conditions and the habits of dwelling occupiers no reuse for gardening has been assumed in the modelling. The tanks will help to reduce the total volume of stormwater runoff entering the drains and waterways as some of the runoff will be captured by the rainwater tanks and will be reused by the residents of the dwelling. It has been assumed that the rainwater tanks would not reduce the peak runoff from the catchments during a storm event, as it is not proposed to mandate either low flow outlets or smart tanks in this area.

Engeny has modelled a scenario where each house is fitted with a rainwater tank plumbed to the toilet. The following assumptions were made

- 13 dwellings per hectare
- 200 m² of roof area per dwelling connected to a tank
- 2 kL tank per dwelling
- Reuse rate of 16.5 L/person/day from toilet flushing
- 3 people per house
- Total reuse rate of 49.5 L/dwelling/day.

Rainwater tanks were not modelled in areas where existing development or approved development plans exist as these have already been approved without the requirement of rainwater tank installations. These exclusions include sub-catchments K and Part of H, M, O, J, I and Q. These sub-catchments make up parts of the Parklea and Powlett Ridge Estates.

3.5 Benefits of Implementing Rainwater tanks

In order to clearly quantify the benefits of implementing rainwater tanks within the development area, Engeny has modelled an option excluding rainwater tanks where all runoff has been directed into the downstream sedimentation basin. By doing this, Wetland Area 1 would need to be increased in size to ensure the same pollutant removal targets are achieved. These reduced stormwater treatment results are summarised in Table 3.6.

Table 3.6 Stormwater treatment results for development area excluding Rainwater tanks

	Pollutant Load from Developable Area (kg/yr)	Pollutant Load Removed (kg/yr)	% of Development Pollutant Load Removed
Total Suspended Solids (kg/yr)	656,630	705,000	107.4 %
Total Phosphorus (kg/yr)	1,401	1,270	90.7 %
Total Nitrogen (kg/yr)	10,374	4,400	42.4 %
Gross Pollutants (kg/yr)	134,218	245,995	183.3 %

These results indicate that by excluding rainwater tanks, Wetland 1 area would need to be increased by 19 % where construction costs would in total cost \$690,000 more. This does not include the additional costs required for the retardation of the peak 63 % and 39 % AEP Flows.

3.6 Stormwater Harvesting

The large wetlands proposed for stormwater treatment provide an opportunity for stormwater harvesting. Wetland 1 in particular provides a significant opportunity given the current proposal for open space to be located in the vicinity of the wetland, which could be a possible reuse demand centre. The developing catchment flowing into wetland 1 is approximately 400 ha, in addition to the external catchments which will also flow into this wetland. It would be reasonable and beneficial to harvest the additional flows that the urbanisation of the development area will create. It will still be necessary to maintain outflows from the wetland system which are equal to the predevelopment outflows to ensure that the downstream waterway and water licence holders are not adversely impacted.

Based on a simple analysis using MUSIC modelling software it has been estimated that there is approximately 1,920 ML available for harvesting each year. This should be confirmed with a more detailed analysis and licencing requirements will likely apply for a stormwater diversion for harvesting. This volume of water would be far more than the demand for open space irrigation water in the immediate region.

If stormwater harvesting is implemented then additional water storage should be constructed adjacent to the wetland where harvesting is proposed. The most cost effective storage would be an open water body which would be integrated into the wetland system.

4. COST ESTIMATES

Engeny have undertaken a high level cost estimate for each of the stormwater treatment and conveyance assets proposed in this strategy. These indicative costs are based on the Melbourne Water DSS Costing Spreadsheet. **Appendix E** provides a summary of this spreadsheet. A plan displaying the relevant Asset IDs at each of the areas of interest has been provided in **Appendix F**.

The following assumptions have been applied to the cost estimates:

- Land acquisition costs have been excluded
- Additional excavation/fill requirements have been estimated based on assumed invert levels of existing pipes and 1 m contour data. Further functional design work should be undertaken to refine the cost estimates
- Costs of landscaping (other than wetland planting) and other infrastructure such as shared paths have been excluded, however an estimate of the total land area required has been made
- An excavation depth of 1.5 metres from the cutline to the normal water level of all stand-alone sediment ponds has been assumed. This assumption has been made to allow for pipes entering the sedimentation basin to daylight into the basin assuming a pipe diameter of approximately 750 mm with 750 mm of cover.
- Stand-alone sediment basins have not accounted for additional costs associated with the inclusion of a litter trap or high-flow bypass.
- A contingency of 35 % has been applied.

The total cost of the conveyance related drainage assets is \$25,284,000 and the total cost of stormwater treatment assets is \$10,070,000. Table 4.1 to Table 4.5 contain a breakdown of the indicative cost for each conveyance and treatment asset.

Table 4.1 Estimated costs of Constructed Waterway assets

Asset	Cost
East Waterway	
Waterway 3-4	\$633,000
Waterway 4-5	\$712,000
Waterway 5-6	\$2,627,000
Waterway 6-7	\$2,666,000

Asset	Cost
Waterway 7-8	\$1,062,000
Waterway 8-9	\$2,115,000
West Waterway	
Waterway 17-18	\$405,000
Waterway 19-20	\$752,000
Waterway 20-21	\$1,154,000
Waterway 22-23	\$1,723,000
Waterway 23A-23B	\$877,000
Waterway 23C-24	\$1,241,000
Waterway 24-25	\$422,000
Waterway Cost Subtotal	\$16,389,000

Table 4.2 Estimated costs of culvert assets

Asset	Size (mm)	Cost
Industrial Boulevard Crossing (Location 16-17)	3No. x 1350Ø	\$215,000
Bass Coast Highway (Location 18-19)	3No. x 1500Ø	\$255,000
Bass Coast Highway (Location 2-3)	3No. x 1500Ø	\$255,000
McGibbonys Rd (Location 21-22)	4No. x 1650Ø	\$494,000
Proposed Minor Road (Location 23-23A)	4No. x 1650Ø	\$494,000
Proposed Minor Road (Location 23B-23C)	4No. x 1650Ø	\$494,000
Proposed boulevard connector road (Location 24)	4No. x 1650Ø	\$494,000
Korumburra-Wonthaggi Road Embankment (Location 12-13)	14No. x 1200Ø	\$895,000
Heslop Road (Location 37-38) downstream of WL2	1No. 1650Ø	\$134,000
Heslop Road (Location 41-42) downstream of WL3	3No. x 1200 x 450	\$426,000

Asset	Size (mm)	Cost
Heslop Road (Location 49-50) downstream of WL4	1No. x 1050Ø	\$155,000
Heslop Road (Location 45-46) downstream of SB12	4No. x 750Ø	\$127,000
Culvert Cost Subtotal		\$4,438,000

Table 4.3 Estimated costs of drainage pipe assets

Asset	Diameter (mm)	Cost
1-2	1350	\$471,000
15-16	1050	\$472,000
14-16	1050	\$365,000
26-17	1350	\$233,000
27-28	1200	\$433,000
30-28	825	\$26,000
28-29	1200	\$196,000
31-32	1200	\$569,000
33-34	900	\$901,000
39A-39C	600	\$60,000
39C-40	600	\$43,000
47-47A	750	\$53,000
47A-40	750	\$127,000
40-48	900	\$450,000
43-45	450	\$58,000
Pipe cost Subtotal		\$4,457,000

Table 4.4 Estimated costs of Stormwater Treatment assets

Asset	Cost
SB1	\$207,000
SB2	\$208,000
SB3	\$186,000
SB4	\$227,000
SB5	\$219,000
SB6	\$230,000
SB7	\$239,000
SB9	\$207,000
SB12	\$206,000
SB13	\$175,000
SB14	\$175,000
Wetland 1 (incl. SB8)	\$3,439,000
Wetland 2 (incl. SB10)	\$1,017,000
Wetland 3 (incl. SB11)	\$1,935,000
Wetland 4 (incl. SB11A)	\$1,400,000
Total	\$10,070,000

Table 4.5 Estimated costs of Wetland 1 Retarding Basin

Asset	Cost
WLRB1	\$4,328,000

Note that at this stage no allowance has been made for the construction of a stormwater harvest holding storage which could be associated with Wetland 1. A copy of the costing spreadsheet has been provided to Council and a summary of the cost breakdown is included in **Appendix E**. It should also be noted that 35 - 45 % of the total cost of each of the wetland assets is in the disposal of excess cut. The assumption has been made that

80 % of the cut material will be disposed of offsite. If this material can be used for filling developable land nearby there could be significant cost savings for the construction of these assets.

5. CONCLUSIONS

Effectively managing stormwater and flooding issues will be important to ensuring successful development in the Wonthaggi North East PSP. A portion of the development area directly south of Korumburra Wonthaggi Road is subject to significant flooding under existing conditions. Managing the flooding risk in this area is an important part of the infrastructure proposed by the PSP.

Trunk drainage will be provided through the PSP by a network of constructed waterways and underground piped drainage. Stormwater treatment will be provided by a series of sedimentation basins located adjacent to the constructed waterways and upstream of the wetlands. Wetlands will provide the majority of the stormwater treatment and nutrient removal in the development area. Rainwater tanks are also proposed for all new dwellings within the development area. These tanks will help to contribute to an integrated water cycle management approach by reducing potable water demand and reducing total volumes of stormwater discharged into the receiving waterway. The proposed stormwater treatment infrastructure achieves the best practice management targets for nutrient removal for the precinct area.

The proposed stormwater infrastructure will ensure that there is no increase in the peak flow rates downstream of the development area for the 68 % and 39 % AEP events (1 year and 2 year ARI) by utilising retarding basins. This will ensure that regular flows through the properties downstream of the development area do not increase in magnitude. It is not proposed to prevent increases in flows for events more frequent than the 39 % AEP. The proposed development is unlikely to significantly affect peak flooding experienced on the properties north of Korumburra – Wonthaggi Road and Heslops Road as the major flows, flood volumes and duration of flooding that affect this area are related to the very large rural catchment of the Powlett River and not the relatively smaller area of development in Wonthaggi East. The land use in these areas is agriculture/farming and there are no dwellings that would be impacted by an increase in peak flows from the development area in events up to the 1 % AEP (1 in 100 year ARI) event. The drainage existing channel through this area is small relative to the existing and developed 1 % AEP event flows which are expected from the development area. In these large events the majority of the flow will be conveyed via wide relatively slow moving overland flow paths.

All lots that are to be developed to the south of Wonthaggi-Korumburra Road will need to be filled to 600 mm above the 1 % AEP flood level for this area. This will mean that all lots in this area should be filled to approximately 16.7 m AHD, 600 mm above the developed conditions 1 % AEP flood level of 16.1 m AHD at this location.

6. RECOMMENDATIONS

The results of this study recommend that a number of drainage and stormwater infrastructure works be constructed within the PSP.

Two constructed waterways are proposed through the development area to provide drainage outfalls. Table 6.1 shows the required hydraulic width (for flow conveyance) and proposed total waterway corridor width of each of these waterways. There are two developments within the Wonthaggi North East PSP area which were approved prior to this study (Parklea Estate and Powlett Ridge Estate). In these areas it is understood that waterway width may be narrower than would ideally be the case, however the width of the corridor is sufficient to accommodate the minimum hydraulically required width so the flows can be safely conveyed through these estates. The proposed waterway corridor widths are in accordance with Melbourne Water Constructed Waterway Guidelines. It is recommended that these guidelines be adopted for the waterways within the development area.

Table 6.1 Waterway corridor widths summary

Waterway Reach	Required hydraulic width	Proposed corridor width
Eastern Waterway		
3-4	30	55
4-5	30	60
5-6	50	60
6-7	50	60
7-8	50	60
8-9	50	60
Western Waterway		
17-18	22	40
19-20	31	55
20-21	32	55
22-23	34	60
23A-23B	35	60
23C-24	35	60

Waterway Reach	Required hydraulic width	Proposed corridor width
24-25	35	60

There is some flexibility in the final location of the eastern waterway through the development area. This waterway serves the dual purpose of providing a drainage outfall for the development and also incepts sheet flow from the large rural catchment to the east of the development area during flood events. The exact alignment of the waterway as it approaches Wetland 1 could be adjusted to suit a future development layout.

Table 6.2 shows the treatment size and total land area required for the sediment basins and wetlands which are proposed within the development area. These assets should be constructed in accordance with Melbourne Water’s Constructed Wetlands Design Manual or an approved alternative design criteria.

Table 6.2 Sediment Basin and Wetland stormwater treatment assets summary

Asset ID	Treatment area at NWL (m ²)	Total asset footprint (m ²)
SB1	600	2500
SB2	600	2500
SB3	500	2200
SB4	780	3100
SB5	740	2900
SB6	700	2900
SB7	840	3300
SB8	900	3400
SB9	600	2400
SB10	860	3300
SB11	750	2400
SB11A	900	2700
SB12	600	2200
SB13	450	1900

Asset ID	Treatment area at NWL (m ²)	Total asset footprint (m ²)
SB14	450	1900
WL1	38,000	57,500
WL2	8,000	17,000
WL3	13,220	27,600
WL4	5,850	16,500

In addition to the wetlands, 13.6 ha will be required for retardation at wetland 1. This area will be subject to frequent flooding (multiple times each year) and should be landscaped in a suitable manner. Paths or boardwalks through this area would need to be designed to withstand the effects of frequent inundation.

For this study the wetland and retarding basin have been located in the lowest lying areas to minimise the total excavation required and construction costs. The exact location and configuration of wetland 1 and the surrounding retarding basin area could be adjusted to suit the topography or proposed development layout in the future. The total sizes of the assets shown will need to be maintained even if the location is adjusted to better suit a proposed development layout.

Culverts have been sized for the crossings on Heslops Road and Korumburra-Wonthaggi Road to ensure that the 1 % AEP flow can be conveyed under the road. Table 6.3 shows the sizes and costs of the culverts required. The existing road is subject to frequent flooding, as such it may be necessary to raise the road in localised areas to prevent frequent inundation.

Due to the extensive upgrade, further consultation should be undertaken with VicRoads to determine if the 1 % AEP event needs to be conveyed under Korumburra-Wonthaggi Road or if a lower level of service would be acceptable, for example the 2 % AEP event. Consideration should also be given to the potential impact on the downstream waterway/drain of effectively concentrating the 1 % AEP flow at this point. Erosion protection works may be required through some sections of this channel or at the culvert outlet depending on the final design configuration adopted.

Table 6.3 Korumburra-Wonthaggi Road and Heslop Road Culvert sizing summary

Asset	Size (mm)	Cost
Korumburra-Wonthaggi Road (Location 12-13)	14No. x 1200Ø	\$895,000
Heslop Road (Location 37-38) downstream of WL2	1No. 1650Ø	\$134,000

Asset	Size (mm)	Cost
Heslop Road (Location 49-50) downstream of WL4	1No. x 1050 Ø	\$155,000
Heslop Road (Location 41-42) downstream of WL3	3No. x 1200 x 450	\$426,000
Heslop Road (Location 45-46) downstream of SB12	4No. x 750Ø	\$127,000

7. QUALIFICATIONS

- a. In preparing this document, including all relevant calculation and modelling, Engeny Water Management (Engeny) has exercised the degree of skill, care and diligence normally exercised by members of the engineering profession and has acted in accordance with accepted practices of engineering principles.
- b. Engeny has used reasonable endeavours to inform itself of the parameters and requirements of the project and has taken reasonable steps to ensure that the works and document is as accurate and comprehensive as possible given the information upon which it has been based including information that may have been provided or obtained by any third party or external sources which has not been independently verified.
- c. Engeny reserves the right to review and amend any aspect of the works performed including any opinions and recommendations from the works included or referred to in the works if:
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- g. This report does not provide legal advice.

8. REFERENCES

Infrastructure Design Manual, September 2016.

Constructed Waterways in Urban Developments Guidelines, 2009, Melbourne Water Corporation.

Constructed wetland design guidelines, 2017, Melbourne Water Corporation, <https://www.melbournewater.com.au/planning-and-building/standards-and-specifications/design-wsud/pages/constructed-wetlands-design-manual.aspx>

Waterway Corridors - Guidelines for Greenfield Development Areas within the Port Phillip and Westernport Region, 2013, Melbourne Water Corporation.

9. ABBREVIATIONS

AEP – Annual Exceedance Probability. The probability that a given rainfall total accumulated over a given duration or peak flow rate at a point in a catchment will be exceeded in any one year

AHD – Australian Height Datum. The datum that sets mean sea level as zero elevation. Mean sea level was determined from observations recorded by 30 tide gauges around the coast of the Australian continent for the period 1966–1968.

ARI – Annual Recurrence Interval. The average or expected value of the periods between exceedances of a given rainfall total accumulated over a given duration, or of a peak flow rate at a point in a catchment. It is implicit in this definition that the periods between exceedances are generally random.

BCSC – Bass Coast Shire Council

LSIO – Land Subject to Inundation Overlay

MUSIC – Model for Urban Stormwater Improvement Conceptualisation, used to model the effectiveness of proposed stormwater treatment assets

PSP – Precinct Structure Plan

RB – Retarding Basin

RORB – RunOff Routing Burroughs. An industry standard package used in hydrologic modelling (the “Burroughs” refers to the fact that the original software package was developed and maintained on a Burroughs B6700 computer)

SB – Sedimentation Basin

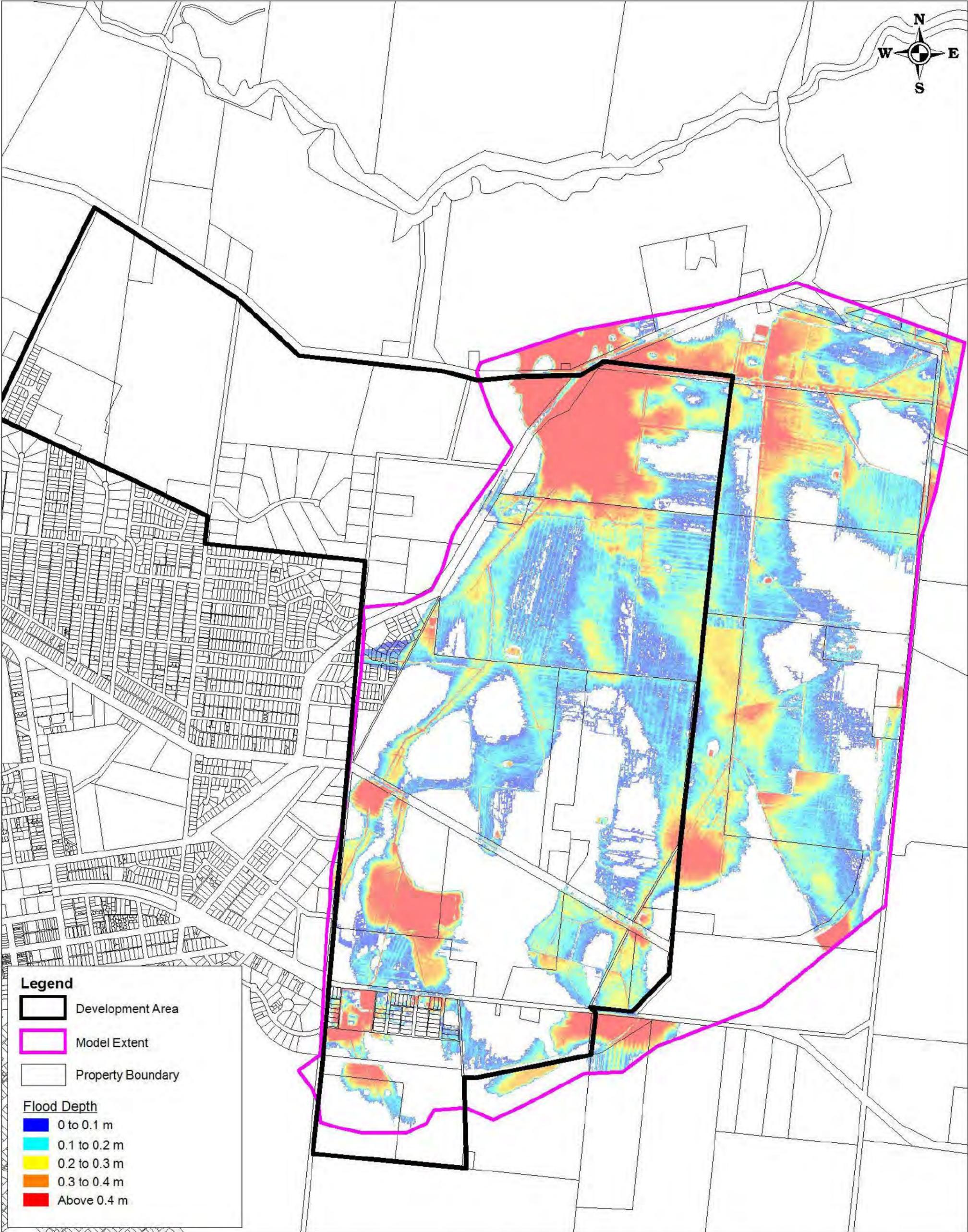
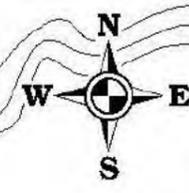
TUFLOW – Two-dimension Unsteady FLOW. The name of an industry standard flood modelling package

WGCMA – West Gippsland Catchment Management Authority

WL - Wetland

APPENDIX A

Existing Conditions 1 % AEP Flooding

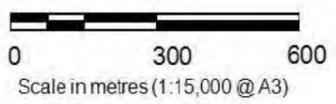


- Legend**
-  Development Area
 -  Model Extent
 -  Property Boundary

- Flood Depth**
-  0 to 0.1 m
 -  0.1 to 0.2 m
 -  0.2 to 0.3 m
 -  0.3 to 0.4 m
 -  Above 0.4 m

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Map Projection: Universal Transverse Mercator
 Horizontal Datum: Geocentric Datum of Australia 1994. (GDA94)
 Vertical Datum: Australia Height Datum
 Grid: Map Grid of Australia, Zone 55

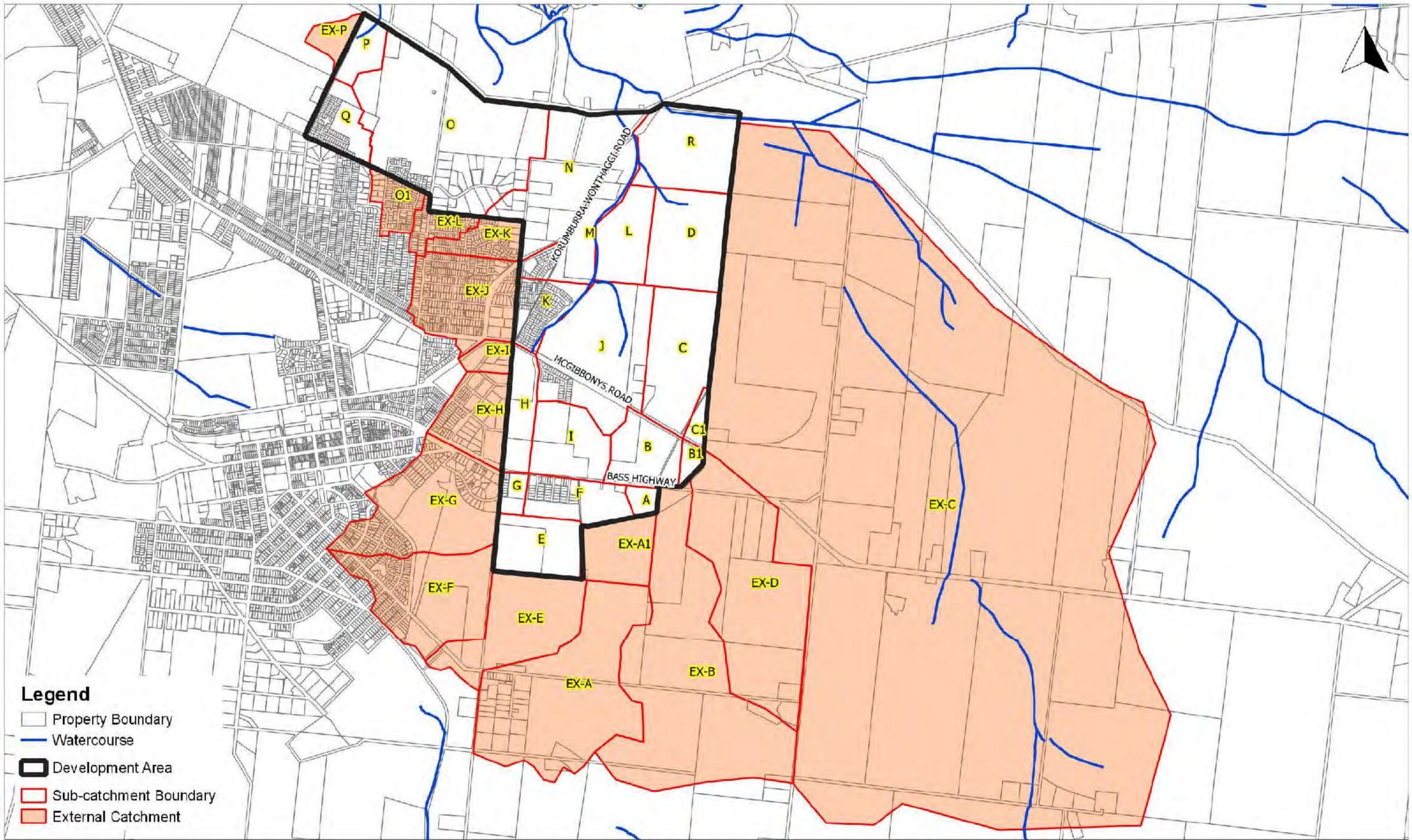
Wonthaggi North East PSP Drainage

**100yr ARI Existing Conditions
 Flood Depth**

Job Number: V2015_002
 Revision: 1
 Drawn: MM
 Checked: GO
 Date: 8 May 2017

APPENDIX B

External Catchments Map



Level 34, Tenancy 5, 360 Elizabeth St,
 Melbourne VIC 3000
 PO Box 12192, A'Beckett St
 VIC 8006
 www.engeny.com.au



200 0 200 400 600 800 m



Scale in metres (1:26000 @ A3)

Map Projection: Transverse Mercator
 Horizontal Datum: Geocentric Datum of Australia
 Vertical Datum: Australia Height Datum
 Grid: Map Grid of Australia, Zone 55

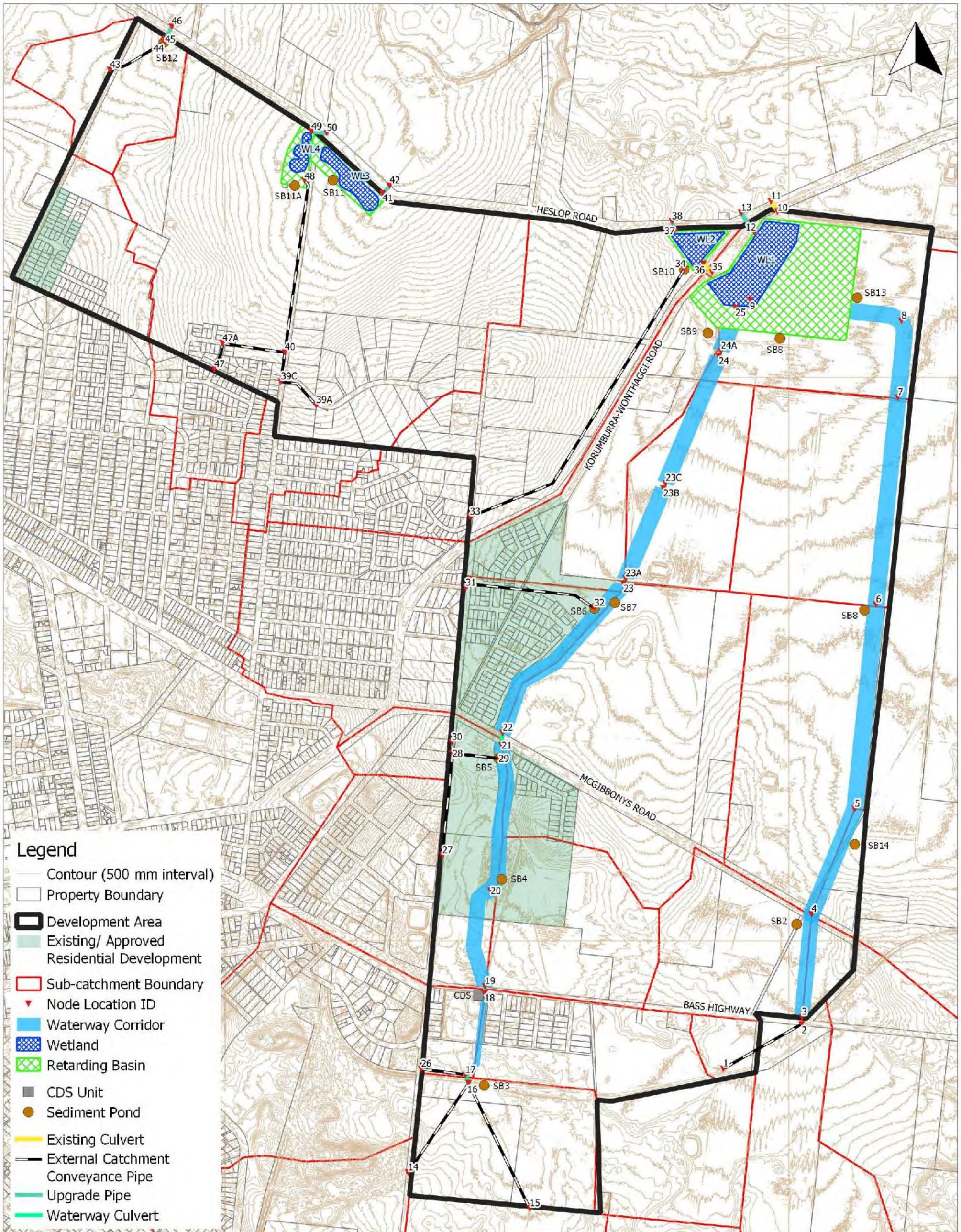
Wonthaggi North PSP Drainage

External Catchments Draining into Development Area

Job Number: V2015_002
 Revision: 2
 Drawn: MM
 Checked: GO
 Date: 24/9/2019

APPENDIX C

Proposed Stormwater Infrastructure Layout



Legend

- Contour (500 mm interval)
- Property Boundary
- Development Area
- Existing/ Approved Residential Development
- Sub-catchment Boundary
- Node Location ID
- Waterway Corridor
- Wetland
- Retarding Basin
- CDS Unit
- Sediment Pond
- Existing Culvert
- External Catchment Conveyance Pipe
- Upgrade Pipe
- Waterway Culvert

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240 0 240 m

Scale in metres (1:12000 @ A3)

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia
Vertical Datum: Australia Height Datum
Grid: Map Grid of Australia, Zone 55

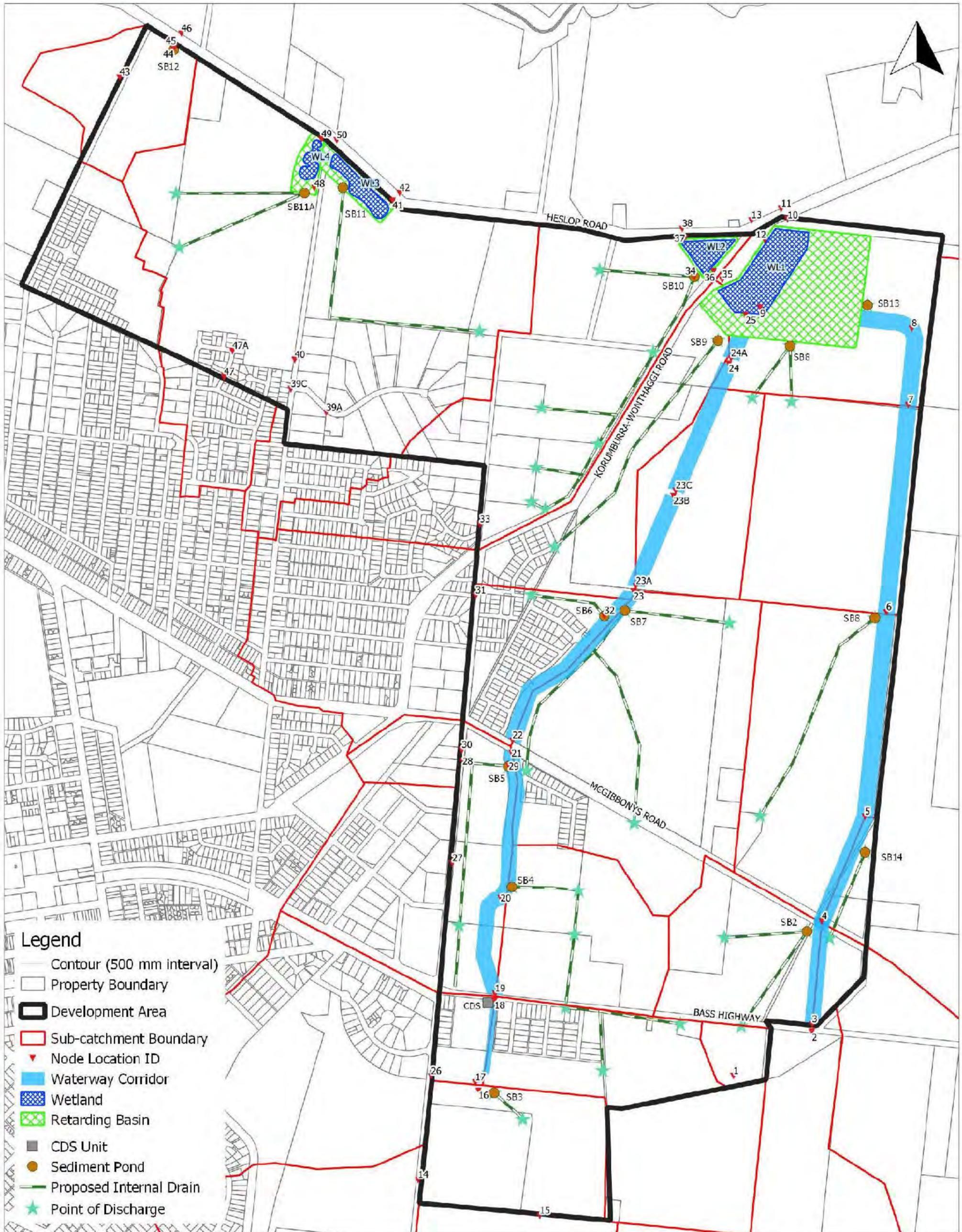
Wonthaggi North PSP Drainage

Proposed Stormwater Infrastructure
Layout Plan

Job Number: V2015_002
Revision: 2
Drawn: MM
Checked: GO
Date: 25/9/2019

APPENDIX D

Layout of Proposed Points of Discharge for Development



Legend

- Contour (500 mm interval)
- Property Boundary
- Development Area
- Sub-catchment Boundary
- Node Location ID
- Waterway Corridor
- Wetland
- Retarding Basin
- CDS Unit
- Sediment Pond
- Proposed Internal Drain
- Point of Discharge

240 0 240 m

Scale in metres (1:12000 @ A3)

Map Projection: Transverse Mercator
 Horizontal Datum: Geocentric Datum of Australia
 Vertical Datum: Australia Height Datum
 Grid: Map Grid of Australia, Zone 55

Wonthaggi North PSP Drainage

**Proposed Points of Discharge
 Layout Plan**

Job Number: V2015_002
 Revision: 2
 Drawn: MM
 Checked: GO
 Date: 21/10/2019

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APPENDIX E

Summary of Cost Estimates

Waterways detailed costs

Reference	Design Flow Q _{100 year} m ³ /s	Pilot Channel.																
		Design Flow Q _{1 year} m ³ /s	Length L m	NS Elev u/s m	NS Elev d/s m	Grade (1 in ..) m	Manning's 'n' m	Side Slope	Base Width (B ₁) m	Pilot Channel Depth (d ₁) m	Pilot Channel x-sect Area m ²	Velocity V _p m/s	Pilot Channel Top Width m	Pilot Channel Q _{full} m ³ /s	Volume m ³	Excavation Rate \$/m ³	Vegetation Rate \$/m ²	Cost \$
Eastern Waterway																		
3-4	13.35	2.67	367	22.00	20.02	185	0.050	3	6.5	0.50	4.0	0.82	9.50	3.27	1,466	8.20	13.40	\$58,677
4-5	13.26	2.65	404	20.02	17.83	185	0.050	3	7.0	0.50	4.3	0.82	10.00	3.49	1,718	8.20	13.40	\$68,253
5-6	28.64	5.73	729	17.83	16.79	700	0.050	3	10.0	0.90	11.4	0.61	15.40	6.99	8,336	8.20	13.40	\$218,853
6-7	28.50	5.70	740	16.79	15.74	700	0.050	3	10.0	0.90	11.4	0.61	15.40	6.99	8,457	8.20	13.40	\$222,034
7-8	38.00	7.60	274	15.74	15.34	700	0.050	3	10.0	1.00	13.0	0.65	16.00	8.44	3,565	8.20	13.40	\$88,018
8-9	36.03	7.21	545	15.34	14.56	700	0.050	3	10.0	1.00	13.0	0.65	16.00	8.44	7,089	8.20	13.40	\$175,041
Western Waterway																		
17-18	13.87	2.77	306	23.62	21.70	160	0.050	3	3.0	0.80	4.3	1.04	7.80	4.51	1,322	8.20	13.40	\$42,823
19-20	17.07	3.41	369	21.65	19.80	200	0.050	3	4.0	0.80	5.1	0.97	8.80	4.95	1,892	8.20	13.40	\$59,077
20-21	18.32	3.66	528	19.80	18.48	400	0.050	3	4.0	1.00	7.0	0.77	10.00	5.40	3,697	8.20	13.40	\$101,086
22-23	23.75	4.75	703	18.38	16.82	450	0.050	3	4.0	1.00	7.0	0.73	10.00	5.09	4,923	8.20	13.40	\$134,621
23A-23B	24.05	4.81	346	16.78	16.01	450	0.050	3	4.0	1.00	7.0	0.73	10.00	5.09	2,424	8.20	13.40	\$66,288
23C-24	22.29	4.46	488	15.96	14.88	450	0.050	3	4.0	1.00	7.0	0.73	10.00	5.09	3,419	8.20	13.40	\$93,493
24A-25	22.84	4.57	163	14.83	14.47	449	0.050	3	4.0	1.00	7.0	0.73	10.00	5.10	1,138	8.20	13.40	\$31,125

Reference	Main Channel													
	Design Flow Q ₁₀₀ - Pilot Channel Q _{full}	Main Channel Depth (d ₂)	Base Width (B ₂)	Manning's 'n'	Side Slope	Area A	Velocity v	Freeboard	Top Width with freeboard	Channel Capacity Q _{full}	Excavation Area	Excavation Volume V	Excavation and Disposal Rate	Cost
	m ³ /s	m	m			m ²	m/s	m	m	m ³ /s	m ²	m ³	\$/m ³	\$
Eastern Waterway														
3-4	10.09	0.60	17.50	0.05	5	12.3	0.95	0.60	30	11.71	28.2	10,335	\$24	\$243,913
4-5	9.76	0.60	18.00	0.05	5	12.6	0.95	0.60	30	12.02	28.8	11,642	\$24	\$274,740
5-6	21.64	0.90	35.00	0.05	5	35.6	0.65	0.60	50	23.25	63.8	46,493	\$24	\$1,097,232
6-7	21.50	0.90	35.00	0.05	5	35.6	0.65	0.60	50	23.25	63.8	47,169	\$24	\$1,113,180
7-8	29.56	1.10	33.00	0.05	5	42.4	0.73	0.60	50	31.11	70.6	19,345	\$24	\$456,538
8-9	27.58	1.10	33.00	0.05	5	42.4	0.73	0.60	50	31.11	70.6	38,471	\$24	\$907,914
Western Waterway														
17-18	9.36	0.80	7.80	0.05	5	9.4	1.11	0.60	22	10.52	20.7	6,340	\$24	\$149,632
19-20	12.12	0.80	16.80	0.05	5	16.6	1.08	0.60	31	17.96	33.3	12,310	\$24	\$290,518
20-21	12.92	0.80	18.00	0.05	5	17.6	0.77	0.60	32	13.52	35.0	18,485	\$24	\$436,244
22-23	18.65	1.00	18.00	0.05	5	23.0	0.82	0.60	34	18.93	41.6	29,259	\$24	\$690,521
23A-23B	18.95	1.00	19.00	0.05	5	24.0	0.83	0.60	35	19.86	43.2	14,961	\$24	\$353,090
23C-24	17.20	1.00	19.00	0.05	5	24.0	0.83	0.60	35	19.85	43.2	21,102	\$24	\$498,005
24A-25	17.74	1.00	19.00	0.05	5	24.0	0.83	0.60	35	19.87	43.2	7,025	\$25	\$172,820

Reference	Reinstatement						Pool and Riffle				Total Cost
	Revegetation Area	Revegetation Rate	Topsoiling	Topsoiling Rate	Cost	No. of Pools and Riffles	Rockwork Volume	Rockwork Rate	Cost	Total Estimated Basic Cost excluding Land Acquisition	
	m ²	\$/m ²	m ²	\$/m ²	\$	no.	m ³	\$/m ³	\$	\$	
Eastern Waterway											
3-4	7,330	\$12	7,330	\$3	\$113,615	2.48	262	200	\$52,370	\$468,575	
4-5	8,084	\$12	8,084	\$3	\$125,308	2.69	296	200	\$59,173	\$527,474	
5-6	25,234	\$12	25,234	\$3	\$391,124	2.92	1,194	200	\$238,731	\$1,945,939	
6-7	25,601	\$12	25,601	\$3	\$396,808	2.96	1,213	200	\$242,515	\$1,974,537	
7-8	9,323	\$12	9,323	\$3	\$144,503	1.10	487	200	\$97,367	\$786,427	
8-9	18,540	\$12	18,540	\$3	\$287,373	2.18	982	200	\$196,438	\$1,566,766	
Western Waterway											
17-18	4,284	\$12	4,284	\$3	\$66,402	2.81	205	200	\$40,908	\$299,764	
19-20	8,128	\$12	8,128	\$3	\$125,982	2.40	406	200	\$81,188	\$556,765	
20-21	11,619	\$12	11,619	\$3	\$180,096	3.30	687	200	\$137,440	\$854,865	
22-23	16,880	\$12	16,880	\$3	\$261,646	4.14	947	200	\$189,385	\$1,276,173	
23A-23B	8,658	\$12	8,658	\$3	\$134,203	1.98	481	200	\$96,240	\$649,821	
23C-24	12,212	\$12	12,212	\$3	\$189,282	2.79	693	200	\$138,588	\$919,368	
24A-25	4,066	\$12	4,066	\$3	\$63,015	0.93	229	200	\$45,842	\$312,802	

Drainage pipes detailed costs

Pipe Ref.	Upstream Area A	Cumulative Upstream Area ∑ A	5 Year ARI Runoff Coefficient C _s	ARI (y)	Effective Area A _e	Cumulative Effective Area ∑ A _e	Time of Concentration t _c	Rainfall Intensity I _y	Design Flow Q _y	Length L	NS Elev u/s	NS Elev d/s	Slope S	Pipe Diameter	Pipe Type/Backfill	No of Pipes	Full Flow Q _{full}	Full Velocity V _{full}	Time in Pipe t _{pipe}	Pipe/Crossing Cost		Total Estimated Basic Cost (incl. 35 % contingency)
	ha	ha			ha	ha														min	mm/hr	
1-2	138.79	138.790	0.23	5	32.30	32.298	51.31	24.73	2.22	320	22.84	22.00	380	1350	IFJ-100% FCR	1	2.74	1.91	2.79	Greenfields	\$349,120	\$471,000
15-16	53.77	53.770	0.20	5	10.75	10.754	36.47	30.33	0.91	490	28.25	27.25	490	1050	IFJ-100% FCR	1	1.23	1.42	5.74	Greenfields	\$349,513	\$472,000
14-16	61.81	61.810	0.30	5	18.54	18.539	15.41	49.04	2.53	379	31.70	27.00	81	1050	IFJ-100% FCR	1	3.04	3.51	1.80	Greenfields	\$270,156	\$365,000
26-17	72.69	72.690	0.50	5	36.45	36.455	18.75	44.20	4.48	158	28.25	26.75	105	1350	IFJ-100% FCR	1	5.20	3.63	0.72	Greenfields	\$172,269	\$233,000
27-28	29.00	29.000	0.43	5	12.41	12.406	14.25	51.05	1.76	360	23.50	22.26	290	1200	IFJ-100% FCR	1	2.29	2.02	2.97	Greenfields	\$320,760	\$433,000
30-28	7.91	7.910	0.48	5	3.79	3.793	10.95	58.17	0.61	40	22.40	22.26	286	825	IFJ-100% FCR	1	0.85	1.59	0.42	Greenfields	\$19,480	\$26,000
28-29	36.91	36.910	0.44	5	16.20	16.199	17.22	46.26	2.08	163	22.26	21.40	190	1200	IFJ-100% FCR	1	2.83	2.50	1.09	Greenfields	\$145,500	\$196,000
31-32	48.76	48.760	0.49	5	23.82	23.822	18.25	44.85	2.97	473	21.95	18.34	131	1200	IFJ-100% FCR	1	3.41	3.01	2.62	Greenfields	\$421,443	\$569,000
33-34	21.44	21.440	0.47	5	10.01	10.014	14.07	51.38	1.43	1200	23.50	14.60	135	900	IFJ-100% FCR	1	1.56	2.45	8.16	Greenfields	\$667,200	\$901,000
39A-39C	5.61	5.610	0.50	5	2.81	2.805	10.02	60.67	0.47	144	25.16	24.00	124	600	IFJ-100% FCR	1	0.55	1.95	1.23	Greenfields	\$44,208	\$60,000
39C-40	10.57	10.570	0.50	5	5.29	5.285	11.25	57.42	0.84	105	24.00	21.00	35	600	IFJ-100% FCR	1	1.04	3.68	0.47	Greenfields	\$32,143	\$43,000
47-47A	12.92	12.920	0.47	5	6.09	6.094	12.53	54.48	0.92	92	24.00	22.25	53	750	IFJ-100% FCR	1	1.54	3.48	0.44	Greenfields	\$39,100	\$53,000
47A-40	12.92	12.920	0.47	5	6.09	6.094	11.69	56.35	0.95	221	22.25	20.50	126	750	IFJ-100% FCR	1	0.99	2.24	1.64	Greenfields	\$93,713	\$127,000
40-48	23.49	23.490	0.48	5	11.38	11.379	13.36	52.74	1.67	600	20.50	13.85	90	900	IFJ-100% FCR	1	1.91	3.00	3.34	Greenfields	\$333,600	\$450,000
43-45	8.19	8.190	0.20	5	1.64	1.638	16.31	47.61	0.22	210	24.50	22.25	93	450	IFJ-100% FCR	1	0.30	1.86	1.89	Greenfields	\$43,260	\$58,000

Wetlands detailed costs

REFERENCE	TREATMENT POND SIZING (Using MUSIC)									
	NWL	Level outline	Extended Detention Depth	Permanent Pond Depth	Basin Area	Depth TED to Outline	Area at base	AREA at Top of EDD	Total Treatment Pond, incl. Batters	Treatment Pond Excavation Volume
	(m AHD)	(m AHD)	(m)	(m)	(m ²)	(m)	(m ²)	(m ²)	(m ²)	(m ³)
WL1	14.3	15.2	0.35	0.4	38000	0.55	34,693	40,215	44,969	62,049
WL2	14	14.7	0.35	0.4	8000	0.35	6,505	9,026	10,448	11,234
WL3	13.0	14.0	0.35	0.4	13220	0.65	11,286	14,533	17,938	37,472
WL4	13.3	15.5	0.35	0.4	5850	1.85	4,577	6,730	13,929	27,979

REFERENCE	PLANTING & EARTHWORKS													WETLAND FOOTPRINT AREA	Total Estimated Basic Cost incl. 35 % contingency
	Grassing Area	Aquatic Vegetation Area	Terrestrial Vegetation Area	Stripping and stockpiling of 250mm Topsoil	Topsoiling	Additional Excavation (top of cutline, if required)	Total Excavation Volume	Disposal of surplus soil	Clay lining @ 300mm thickness	Rockwork/Concrete Base Area	First clean out	Access Track Area	COST	TOTAL	
	(m ²)	(m ²)	(m ²)	(m ²)	(m ²)	(m ³)	(m ³)	(m ³)	(m ²)	(m ²)	\$	(m ²)	\$	m ²	\$
WL1	5,043	38,000	2,551	46,394	40,551		62,535	50,028	38,800	198	\$21,100	150	\$2,547,333	53,800	\$3,438,900
WL2	1,781	8,000	1,381	12,062	9,381	8,600	20,369	16,295	8,900	257	\$21,100	150	\$753,166	17,000	\$1,016,774
WL3	4,250	13,220	1,775	20,795	14,995		39,738	35,562	14,770	680	\$21,100	150	\$1,433,045	38,000	\$1,934,611
WL4	8,045	5,850	1,341	16,786	7,191		33,444	26,755	7,400	680	\$21,100	150	\$1,037,115	38,000	\$1,400,105

Retarding basin detailed costs

Ref	Description	Qty	Unit	Rate	Estimated Basic Cost	Estimated Basic Cost (incl 35 % Contingency)
				(\$/unit)	\$	\$
WL1						
Excavation Volume equals the storage required to retard developed 39 % AEP flows back to existing conditions flow	Land Acquisition					
	Developable land	0.00	ha	\$0		\$ -
	Land within drainage / electricity easement	0.00	ha	\$0		\$ -
	Embankment					
	Construction and Compaction	0	m ³	23.60	\$ -	
	Topsoiling	0	m ²	3.10	\$ -	
	Grassing	0	m ²	2.10	\$ -	
	Outlet Works (Select outlet type)					
	Pipe		m	0.00	\$ -	
	<input type="text" value="Input data here"/>		m	0.00	\$ -	
	Culvert - Base slab (For box type only)	0	m	0.00	\$ -	
	Culvert - Link slab (For box type only)	0	m	0.00	\$ -	
	Laying & Installation				\$ -	
	Inlet / Outlet Structures	2	no.	\$5,160	\$ 10,320	
	Construct Spillway	0	item	\$48,000	\$ -	
	Earthworks					
Excavation	201,000	m ³	8.20	\$1,648,200		
Disposal of surplus soil (50%)	100,500	m ³	15.40	\$1,547,700		
Grassing	0	m ²	2.10	\$ -		
			Subtotal		\$3,206,220	
			Subtotal (Incl. 35 % Contingency)		\$4,328,000	

Sedimentation basin detailed costs

POND SIZING (Using Fair & Geyer Equation)																
REFERENCE	Sediment Basin Type	Batter Slope (NWL to Base)	Upstream Untreated Residential Area	Q ₃ DESIGN FOR TREATMENT	Permanent Pond Depth, dp	Extended Detention Depth, de	Depth below permanent pool that is sufficient to retain sediment, d*	Hydraulic Efficiency (Λ)	Basin Area (NWL)	Capture Efficiency	Cleanout Frequency (years)	Storage volume for drying	Area for drying the sediments	Area at base	AREA at Top of EDD	Total Area, incl. batters & drying area
		1 in ...	(ha)	(m ³ /s)	(m)	(m)	(m)		(m ²)	%	years	(m ³)	(m ²)	(m ²)	(m ²)	(m ²)
SB1	Stand Alone	3	34.8	0.48	1.5	0.35	1.00	0.26	600	97 %	3.0	162	324	89	894	2,431
SB2	Stand Alone	3	40.00	0.44	1.5	0.35	1.00	0.26	600	98 %	3.0	188	376	89	894	2,483
SB3	Stand Alone	3	28.16	0.49	1.5	0.35	1.00	0.26	500	97 %	3.0	131	262	41	770	2,166
SB4	Stand Alone	3	66.60	0.79	1.5	0.35	1.00	0.26	780	97 %	3.0	310	620	187	1,112	3,073
SB5	Stand Alone	3	59.6	0.83	1.5	0.35	1.00	0.26	740	96 %	3.0	275	549	164	1,064	2,927
SB6	Stand Alone	3	55.23	0.79	1.5	0.35	1.00	0.26	700	96 %	3.0	254	509	142	1,016	2,811
SB7	Stand Alone	3	73	0.90	1.5	0.35	1.00	0.26	840	96 %	3.0	336	673	221	1,184	3,237
SB9	Stand Alone	3	31	0.31	1.5	0.35	1.00	0.26	600	99 %	3.0	147	295	89	894	2,402
SB12	Stand Alone	3	11	0.20	1.5	0.35	1.00	0.26	600	99 %	3.0	52	105	89	894	2,212
SB13	Stand Alone	3	8	0.12	1.5	0.35	1.00	0.26	450	99 %	3.0	38	76	19	707	1,875
SB14	Stand Alone	3	9	0.13	1.5	0.35	1.00	0.26	450	99 %	3.0	43	86	19	707	1,884

PLANTING & EARTHWORKS												
REFERENCE	Grassing Area	Terrestrial Vegetation Area	Stripping and stockpiling of 250mm Topsoil	Topsoiling	Additional Excavation (top of cutline, if required)	Inlet Pond Excavation Volume	Disposal of surplus soil	Clay lining @ 300mm thickness	Rockwork/Concrete Base Area	First clean out	Access Track Area	COST
	(m ²)	(m ²)	(m ²)	(m ²)	(m ³)	(m ³)	(m ³)	(m ²)	(m ²)	\$	(m ²)	\$
SB1	1,537	294	2,431	294		2,473	1,978	600	227	\$21,100	150	\$118,453
SB2	1,590	294	2,483	294		2,473	1,978	600	227	\$21,100	150	\$118,725
SB3	1,397	270	2,166	270		2,120	1,696	500	164	\$21,100	150	\$102,848
SB4	1,961	332	3,073	332		3,104	2,483	780	187	\$21,100	150	\$132,999
SB5	1,863	324	2,927	324		2,964	2,372	740	164	\$21,100	150	\$126,841
SB6	1,795	316	2,811	316		2,824	2,259	700	293	\$21,100	150	\$134,870
SB7	2,052	344	3,237	344		3,314	2,651	840	221	\$21,100	150	\$142,010
SB9	1,508	294	2,402	294		2,473	1,978	600	227	\$21,100	150	\$118,300
SB12	1,318	294	2,212	294		2,473	1,978	600	227	\$21,100	150	\$117,312
SB13	1,168	257	1,875	257		1,942	1,554	450	134	\$21,100	150	\$94,318
SB14	1,177	257	1,884	257		1,942	1,554	450	134	\$21,100	150	\$94,367

REFERENCE	OUTLET STRUCTURE							SED BASIN FOOTPRINT AREA	Total Cost	Total Cost
	No. of drop pits	Length of Pipe	Pipe Diameter	No. of Pipes	Qfull	Outlet Structures Allowance	COST			
SB1	1	25	600	1	0.43	\$10,320	\$35,245	2,431	\$153,698	\$207,493
SB2	1	25	600	1	0.43	\$10,320	\$35,245	2,483	\$153,970	\$207,860
SB3	1	25	600	1	0.43	\$10,320	\$35,245	2,166	\$138,093	\$186,425
SB4	1	25	600	1	0.43	\$10,320	\$35,245	3,073	\$168,244	\$227,129
SB5	1	25	600	1	0.43	\$10,320	\$35,245	2,927	\$162,086	\$218,816
SB6	1	25	600	1	0.43	\$10,320	\$35,245	2,811	\$170,115	\$229,656
SB7	1	25	600	1	0.43	\$10,320	\$35,245	3,237	\$177,255	\$239,295
SB9	1	25	600	1	0.43	\$10,320	\$35,245	2,402	\$153,545	\$207,286
SB12	1	25	600	1	0.43	\$10,320	\$35,245	2,212	\$152,557	\$205,952
SB13	1	25	600	1	0.43	\$10,320	\$35,245	1,875	\$129,563	\$174,910
SB14	1	25	600	1	0.43	\$10,320	\$35,245	1,884	\$129,612	\$174,976

Culverts detailed costs

Industrial Boulevard Crossing (Location 16-17)								
	Design ARI	100						
	Design Flow (m³/s)	9.1						
	Pipe diameter (mm)	1350						
	Installation (Laying)	RRJ-100% FCR	3	20	m	\$1,463	\$87,780.00	
	Headwalls & Endwalls		6	2.18	m³	\$2,676	\$35,002.08	
	Installation (Road, Rail factors)	Major Council Roads					\$26,334.00	
	Allowance for Service Alterations		Factor			1.00	\$0.00	
	Traffic management		item				\$10,290.00	
	Minor regrading of channel d/s of culverts					item		
						Subtotal	\$159,406	
						Subtotal (incl.35 % contingency)	\$215,000	

BASS COAST SHIRE
DRAINAGE STRATEGY FOR WONTHAGGI NORTH EAST PSP



Bass Coast Highway (Location 18-19)	Design ARI	100						
	Design Flow (m³/s)	13.9						
	Pipe diameter (mm)	1500						
	Installation (Laying)	RRJ-100% FCR	3	20	m	\$ 1,779	\$106,740.00	
	Headwalls & Endwalls		6	2.48	m³	\$ 2,676	\$39,818.88	
	Installation (Road, Rail factors)	Major Council Roads					\$32,022.00	
	Allowance for Service Alterations		Factor			1.00	\$0.00	
	Traffic management		item				\$10,290.00	
	Minor regrading of channel d/s of culverts					item		
	Subtotal							\$188,871
Subtotal (incl.35 % contingency)							\$255,000	

McGibbonys Rd (Location 21-22)								
	Design ARI	100						
	Design Flow (m ³ /s)	18.32						
	Pipe diameter (mm)	1650						
	Installation (Laying)	RRJ-100% FCR	4	20	m	\$2,127	\$170,160.00	
	Headwalls & Endwalls		6	4.3	m ³	\$2,676	\$92,054.40	
	Installation (Road, Rail factors)	Major Council Roads					\$51,048.00	
	Allowance for Service Alterations	Yes	Factor			1.25	\$42,540.00	
	Traffic management		item				\$10,290.00	
	Minor regrading of channel d/s of culverts					item		
						Subtotal	\$366,092	
						Subtotal (incl. 35 % contingency)	\$494,000	

**BASS COAST SHIRE
DRAINAGE STRATEGY FOR WONTHAGGI NORTH EAST PSP**



Proposed Minor Road (Location 23-23A)								
	Design ARI	100						
	Design Flow (m ³ /s)	23.04						
	Pipe diameter (mm)	1650						
	Installation (Laying)	RRJ-100% FCR	4	20	m	\$2,127	\$170,160.00	
	Headwalls & Endwalls		6	4.3	m ³	\$2,676	\$92,054.40	
	Installation (Road, Rail factors)	Major Council Roads					\$51,048.00	
	Allowance for Service Alterations	Yes	Factor			1.25	\$42,540.00	
	Traffic management		item				\$10,290.00	
	Minor regrading of channel d/s of culverts					item		
Subtotal							\$366,092	
Subtotal (incl. 35 % contingency)							\$494,000	

BASS COAST SHIRE
DRAINAGE STRATEGY FOR WONTHAGGI NORTH EAST PSP



Proposed Minor Road (Location 23B-23C)								
	Design ARI	100						
	Design Flow (m³/s)	28.92						
	Pipe diameter (mm)	1650						
	Installation (Laying)	RRJ-100% FCR	4	20	m	\$2,127	\$170,160.00	
	Headwalls & Endwalls		6	4.3	m³	\$2,676	\$92,054.40	
	Installation (Road, Rail factors)	Major Council Roads					\$51,048.00	
	Allowance for Service Alterations	Yes	Factor			1.25	\$42,540.00	
	Traffic management		item				\$10,290.00	
	Minor regrading of channel d/s of culverts					item		
Subtotal							\$366,092	
Subtotal (incl. 35 % contingency)							\$494,000	

BASS COAST SHIRE
DRAINAGE STRATEGY FOR WONTHAGGI NORTH EAST PSP



Proposed boulevard connector road (Location 24-24A)							
	Design ARI	100					
	Design Flow (m³/s)	24.01					
	Pipe diameter (mm)	1650					
	Installation (Laying)	RRJ-100% FCR	4	20	m	\$2,127	\$170,160.00
	Headwalls & Endwalls		8	5.08	m³	\$2,676	\$92,054.40
	Installation (Road, Rail factors)	Major Council Roads					\$51,048.00
	Allowance for Service Alterations	Yes	Factor			1.25	\$42,540.00
	Traffic management		item				\$10,290.00
	Minor regrading of channel d/s of culverts					item	
Subtotal							\$366,092
Subtotal (incl. 35 % contingency)							\$494,000

BASS COAST SHIRE
DRAINAGE STRATEGY FOR WONTHAGGI NORTH EAST PSP



Bass Coast Highway (2-3)							
	Design ARI	100					
	Design Flow (m³/s)	13.3					
	Pipe diameter (mm)	1500					
	Installation (Laying)	RRJ-100% FCR	3	20	m	\$2,127	\$106,740.00
	Headwalls & Endwalls		6	2.48	m³	\$2,676	\$39,818.88
	Installation (Road, Rail factors)	Major Council Roads					\$32,022.00
	Allowance for Service Alterations	Yes	Factor			1.25	\$0.00
	Traffic management		item				\$10,290.00
	Minor regrading of channel d/s of culverts					item	
Subtotal							\$188,871
Subtotal (incl. 35 % contingency)							\$255,000

**BASS COAST SHIRE
DRAINAGE STRATEGY FOR WONTHAGGI NORTH EAST PSP**



Korumburra-Wonthaggi Road Embankment (Location 12-13)	*Developed with no overtopping of Existing Road in 1 %AEP Storm event						
	Design ARI	100					
	Design Flow (m³/s)	SIZED USING RORB					
	Pipe diameter (mm)	1200					
	Installation (Laying)	RRJ-100% FCR	14	20	m	\$ 1,198	\$335,440.00
	Headwalls & Endwalls		28	1.77	m³	\$ 2,676	\$132,622.56
	Installation (Road, Rail factors)	Major Council Roads					\$100,632.00
	Allowance for Service Alterations	Yes	Factor			1.25	\$83,860.00
	Traffic management		item				\$10,290.00
Minor regrading of channel d/s of culverts					item		
Subtotal							\$662,845
Subtotal (incl. 35 % contingency)							\$895,000

**BASS COAST SHIRE
DRAINAGE STRATEGY FOR WONTHAGGI NORTH EAST PSP**



Heslops Road (Location 37-38) downstream of WL2								
	Design ARI	100						
	Design Flow (m3/s)	5.8						
	Pipe diameter (mm)	1650						
	Installation (Laying)	RRJ-100% FCR	1	20	m	\$2,127	\$42,540.00	
	Headwalls & Endwalls		2	4.3	m3	\$2,676	\$23,013.60	
	Installation (Road, Rail factors)	Major Council Roads					\$12,762.00	
	Allowance for Service Alterations	Yes	Factor			1.25	\$10,635.00	
	Traffic management		item				\$10,290.00	
	Minor regrading of channel d/s of culverts					item		
						Subtotal	\$99,241	
						Subtotal (incl. 35% contingency)	\$134,000	

Heslops Road (Location 49-50) downstream of WL4							
	Design ARI	>5yr					
	Design Flow (m³/s)	2.0					
	Pipe diameter (mm)	1050					
	Installation (Laying)	RRJ-100% FCR	1	65	m	\$955	\$62,075.00
	Headwalls & Endwalls		2	1.52	m³	\$2,676	\$8,135.04
	Installation (Road, Rail factors)	Major Council Roads					\$18,622.50
	Allowance for Service Alterations	Yes	Factor			1.25	\$15,518.75
	Traffic management		item				\$10,290.00
	Minor regrading of channel d/s of culverts					item	
Subtotal							\$114,641
Subtotal (incl. 35 % contingency)							\$155,000

Heslops Road (Location 41-42) downstream of WL3							
	Design ARI	100					
	Design Flow (m³/s)	3.03					
	Supply - Crown Units	1200 x 450	2	40	m	\$ 622	\$ 49,760
	Supply - Base Slab		3	40	m	\$ 505	\$ 60,600
	Supply - Link Slab		1	40	m	\$ 505	\$ 20,200
	Installation (Laying)		3	40	m	\$ 1,632	\$ 88,128
	Headwalls & Endwalls		6	1.31	m³	\$ 2,676	\$ 20,953
	Installation (Road, Rail factors)	Major Council Roads					\$ 65,606
	Allowance for Service Alterations	No	Factor			1.00	\$ -
	Traffic management		item				\$ 10,290
Subtotal							\$315,537
Subtotal (incl. 35 % contingency)							\$426,000

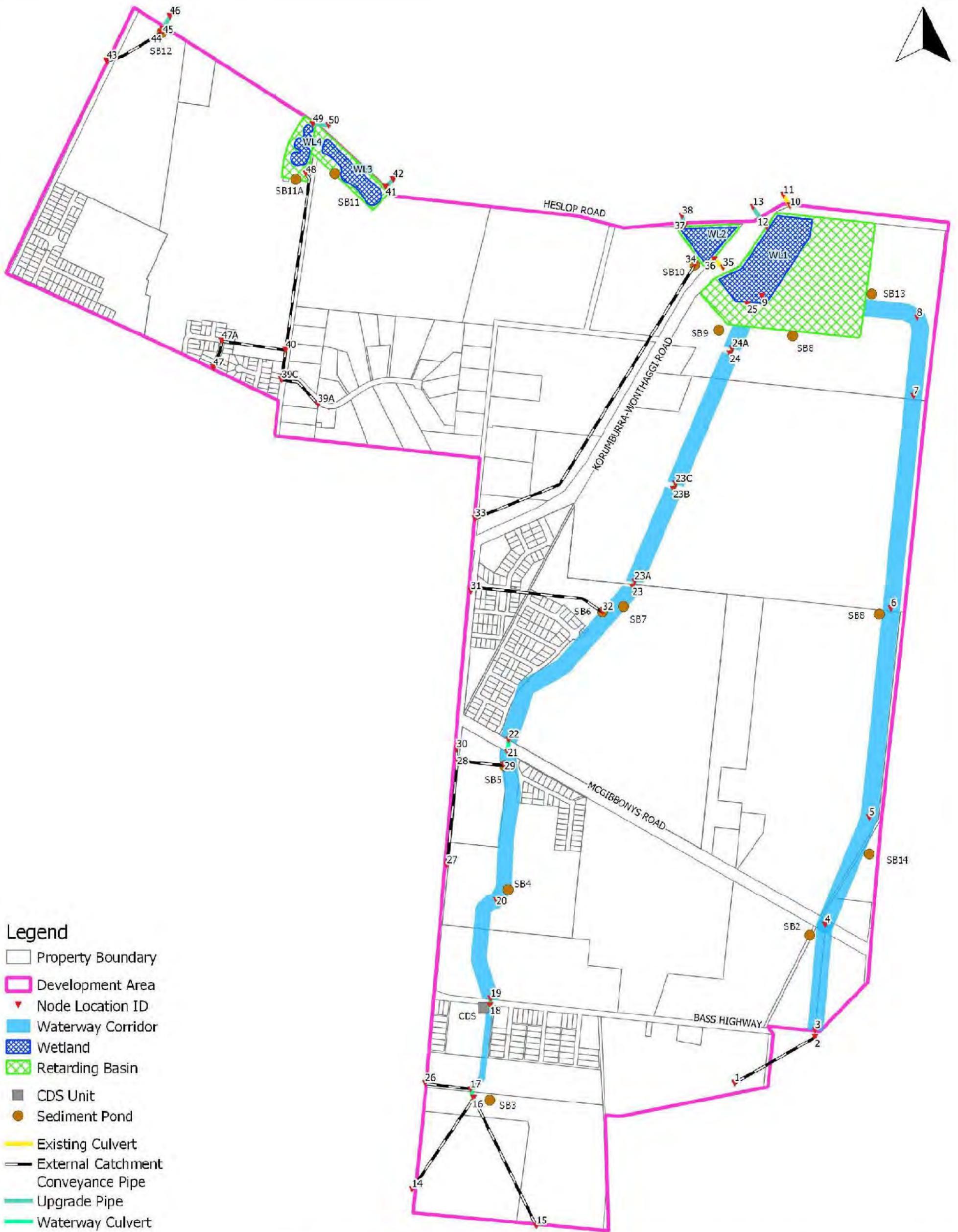
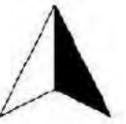
BASS COAST SHIRE
DRAINAGE STRATEGY FOR WONTHAGGI NORTH EAST PSP



Heslops Road (Location 45-46) downstream of SB12							
	Design ARI	100					
	Design Flow (m³/s)	3.14					
	Pipe diameter (mm)	750					
	Installation (Laying)	RRJ-100% FCR	4	20	m	\$528	\$42,240.00
	Headwalls & Endwalls		8	0.87	m³	\$2,676	\$18,624.96
	Installation (Road, Rail factors)	Major Council Roads					\$12,672.00
	Allowance for Service Alterations	Yes	Factor			1.25	\$10,560.00
	Traffic management		item				\$10,290.00
	Minor regrading of channel d/s of culverts					item	
Subtotal							\$94,387
Subtotal (incl. 35 % contingency)							<u>\$127,000</u>

APPENDIX F

Layout of Costing Asset IDs



Legend

- Property Boundary
- Development Area
- Node Location ID
- Waterway Corridor
- Wetland
- Retarding Basin
- CDS Unit
- Sediment Pond
- Existing Culvert
- External Catchment Conveyance Pipe
- Upgrade Pipe
- Waterway Culvert

Level 34, Tenancy 5, 330 Elizabeth St,
Melbourne VIC 3000

PO Box 17162, A'Beckett St VIC 3008

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240 0 240 m



Scale in metres (1:12000 @ A3)

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia
Vertical Datum: Australia Height Datum
Grid: Map Grid of Australia, Zone 55

Wonthaggi North PSP Drainage

Costing Node ID Locations
Layout Plan

Job Number: V2015_002
Revision: 2
Drawn: MM
Checked: GO
Date: 21/10/2019



PLANNING PERMIT

PERMIT No.



Page 1 of 16

PLANNING SCHEME

: BASS COAST PLANNING SCHEME

RESPONSIBLE AUTHORITY

: BASS COAST SHIRE COUNCIL

ADDRESS OF THE LAND

Heslop Road, North Wonthaggi VIC 3995 Lot 2 PS700899

THE PERMIT ALLOWS

Multi lot staged subdivision and removal of native vegetation in accordance with the endorsed plans.

THE FOLLOWING CONDITIONS APPLY TO THIS PERMIT

Section 173 Agreement

- I Before a statement of compliance is issued under the Subdivision Act 1988 the applicant must enter into an agreement with the Responsible Authority under section 173 of the Planning and Environment Act 1987. The agreement must be in a form to the satisfaction of the Responsible Authority. The Council must prepare the agreement at its own cost. The applicant is responsible for the expense of registration of the agreement. The agreement must be registered on the Title of the property so as to run with the land, and must provide for the following:
- (a) The total amount of infrastructure contributions to be paid by the owner is \$4,301,450. This figure is arrived at by multiplying the net developable area by \$104,724.40, and the portion attributable to any stage of the subdivision is to be calculated on the basis of this amount per net developable hectare for that stage.
 - (b) The contribution amounts as per this agreement must be adjusted on a compound basis upwards on 1 July each year after the commencement of this Agreement by reference to the Bureau of Statistics Producer Price Index, Output of General Construction Industry – Victoria, except as otherwise agreed in writing by the parties (Adjustment Index).

**NOTED: THIS PERMIT HAS BEEN AMENDED ON 07 MAY 2020:
(DOCUMENTED ON PAGE 16)**

Date Issued: 21 February 2018

Signature for the Responsible Authority: 

Note: Under Part 4 Division 1A of the Planning and Environment Act 1987, a permit may be amended. Please check with the Responsible Authority that this permit is the current permit and can be acted upon.

PERMIT No.

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PLANNING SCHEME

: BASS COAST PLANNING SCHEME

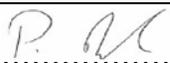
RESPONSIBLE AUTHORITY

: BASS COAST SHIRE COUNCIL

- (c) The Development Contributions must be paid prior to the issue of a Statement of Compliance for each stage of development on the subject land.
- (d) Construction of the wetlands and retarding basin within the development site includes a Development Contribution Credit to the developer of at least \$1,271,739 as per this agreement must be adjusted on a compound basis upwards on 1 July each year after the commencement of this Agreement by reference to the Adjustment Index. This amount does not include the land acquisition for the wetlands and retarding basin.
- (e) Construction of the drainage pipeline (40-47 as per the proposed Wonthaggi North East Development Contributions Plan) through the development site for development of the wider area includes a Development Contribution Credit to the developer of at least \$215,000 as per this agreement must be adjusted on a compound basis upwards on 1 July each year after the commencement of this Agreement by reference to the Adjustment Index.
- (f) Prior to the occupation of any dwelling a water tank of a minimum 2,000 litres must be provided for all residential buildings. The water tank must be plumbed to the toilet and made available for garden irrigation.
- (g) Prior to occupation of any dwelling the payment of \$1,150 per dwelling is made to the Responsible Authority, this payment is made for the provision of community facilities.
- (h) Where land is set aside for the purpose of wetlands or retarding basins a fair value for the transfer of this land is paid to the developer.
- (i) The accommodation of stormwater within the drainage reserve on the Subject Land, to the satisfaction of the Responsible Authority. The relevant stormwater will flow from Catchment O (as identified in the 'External Catchments Draining into Development Area' plan prepared by Engeny and dated 4 May 2017). More particularly, the relevant stormwater will flow from that portion of Catchment O which is located to the west and north-west of the site.
- (j) The developer of the land is not responsible for the construction of any part of Heslop Road, including any intersection works, unless otherwise agreed.
- (k) The developer of the land is not responsible for the construction of the kerb and channel and footpath works including any drainage works to the eastern side of Wentworth Road, unless otherwise agreed.

NOTED: THIS PERMIT HAS BEEN AMENDED ON 07 MAY 2020:
(DOCUMENTED ON PAGE 16)

Date Issued: 21 February 2018

Signature for the Responsible Authority: 

Note: Under Part 4 Division 1A of the Planning and Environment Act 1987, a permit may be amended. Please check with the Responsible Authority that this permit is the current permit and can be acted upon.

PERMIT No.

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PLANNING SCHEME

: BASS COAST PLANNING SCHEME

RESPONSIBLE AUTHORITY

: BASS COAST SHIRE COUNCIL

- (l) The developer of the land is not responsible for the construction of Wentworth Road adjacent to where the drainage reserve is proposed, this includes construction of any infrastructure under the road to connect the wetlands and retarding basins, unless otherwise agreed.
- (m) No further subdivision or more than one dwelling on a lot, except if area marked on the endorsed plan as a potential multi-dwelling site (Super Lot)
- (n) Council agrees not to propose, exhibit, adopt, or in any way support or allow any amendment to the planning scheme which applies to the Subject Land and which would have the effect of imposing development contributions, infrastructure contributions or the like in respect of the Subject Land.
- (o) The parties agree that the agreement will serve to supersede the existing Section 173 ██████████ dated 07/03/2012 insofar as it affects the Subject Land, and that the existing aforementioned agreement ██████████ be ended insofar as it affects the Subject Land.
- (p) Council agrees that it must apply all contributions paid under this agreement for the sole purpose of infrastructure projects identified in this agreement and any development contributions plan that may be proposed or approved from time to time applying to the Wonthaggi North East PSP area. In the event that such projects do not account for all funds raised, any excess funds must be applied as agreed by the owner of the land (or the owner of any balance lots of the land, in the event that parts of the land have been subdivided). Council agrees that all such contributions must be held and applied by Council, and accounted for, as though they were contributions under a Development Contributions Plan approved pursuant to the Act and the Scheme.
- (q) In the event that a PSP is approved, which specifies a public open space contribution of less than 5%, any over-contribution of public open space in respect of the portion of the subject land that has been subdivided up until the time of such approval will be repaid to the owner of any balance lot.

NOTED: THIS PERMIT HAS BEEN AMENDED ON 07 MAY 2020:
(DOCUMENTED ON PAGE 16)

Date Issued: 21 February 2018

Signature for the Responsible Authority: *P. M.*

Note: Under Part 4 Division 1A of the Planning and Environment Act 1987, a permit may be amended. Please check with the Responsible Authority that this permit is the current permit and can be acted upon.

PERMIT No.

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PLANNING SCHEME

: BASS COAST PLANNING SCHEME

RESPONSIBLE AUTHORITY

: BASS COAST SHIRE COUNCIL

Asset Management Conditions

Landscaping

- 2 Prior to subdivision works commencing for all stages, a landscape plan for that stage prepared by a landscape architect or suitably qualified person or firm must be submitted to the satisfaction of the Responsible Authority for approval. When approved, the plans will be endorsed and form part of the permit. The plans must be drawn to scale with dimensions and three copies must be provided (one copy must be A3 size). The plans must show:
- (a) Street trees must be provided on both sides of roads/streets in accordance with and not exceeding the following average intervals:
 - i Small trees (less than 10 metre canopy), at a 8-10 metre interval;
 - ii Medium trees (10-15 metre canopy), at a 10-12 metre interval; and
 - iii Large trees (canopy larger than 15 metres), at a 12-15 metre intervals
 - (b) A schedule of proposed species that are to be planted on the site including scientific names;
 - (c) 80 percent incorporation of locally indigenous species grown from local seed stocks;
 - (d) Quantities of all species to be planted on site including their size when mature; and
 - (e) A notation on the landscape plan providing that the permit holder will maintain all landscaping (including any replacement of dead or diseased plants) as per the endorsed landscape plan for a period of two years to the satisfaction of the Responsible Authority.
 - (f) The type of species to be used for street tree planting in various stages of the subdivision. All proposed street-tree planting using semi-advanced trees, with minimum container size of 45 litres.
 - (g) Entrance treatments.
- 3 The landscaping works shown on the approved landscape plan for any stage must be carried out and completed to the satisfaction of the Responsible Authority prior to the issue of a Statement of Compliance for that stage or any other time agreed in writing by the Responsible Authority.

NOTED: THIS PERMIT HAS BEEN AMENDED ON 07 MAY 2020:
(DOCUMENTED ON PAGE 16)

Date Issued: 21 February 2018

Signature for the Responsible Authority: 

Note: Under Part 4 Division 1A of the Planning and Environment Act 1987, a permit may be amended. Please check with the Responsible Authority that this permit is the current permit and can be acted upon.

PERMIT No.

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PLANNING SCHEME

: BASS COAST PLANNING SCHEME

RESPONSIBLE AUTHORITY

: BASS COAST SHIRE COUNCIL

Native Vegetation

- 4 Before works start, the permit holder must advise all persons undertaking the vegetation removal or works on site of all relevant permit conditions and associated statutory requirements or approvals.
- 5 The native vegetation permitted to be removed, destroyed or lopped under this permit is 0.874 hectares of native vegetation, which is comprised of 4 areas of remnant patch native vegetation with a strategic biodiversity score of 0.466.
- 6 To offset the removal of 0.874 hectares of native vegetation, the permit holder must secure the following native vegetation offset in accordance with Permitted clearing of native vegetation – Biodiversity assessment guidelines (DEPI 2013):
 - a. a general offset of that provides for 0.152 general biodiversity equivalence unit:
 - i. located within the West Gippsland Catchment Management boundary or Bass Coast municipal area
 - ii. with a minimum strategic biodiversity score of at least 0.373.
- 7 Before any native vegetation is removed, evidence that the required offset has been secured must be provided to the satisfaction of the Responsible Authority. This evidence must be one or both of the following:
 - a. an established first party offset site including a security agreement signed by both parties, and a management plan detailing the 10-year management actions and ongoing management of the site, and/or
 - b. credit extract(s) allocated to the permit from the Native Vegetation Credit Register.
- 8 A copy of the offset evidence will be endorsed by the Responsible Authority and form part of this permit. Within 30 days of endorsement of the offset evidence, a copy of the endorsed offset evidence must be provided to Planning Approvals at the Department of Environment, Land, Water and Planning Gippsland regional office via Gippsland.Planning@delwp.vic.gov.au.

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(DOCUMENTED ON PAGE 16)

Date Issued: 21 February 2018

Signature for the Responsible Authority: 

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9 Where the offset includes a first party offset, the permit holder must provide an annual offset site report to the Responsible Authority by the anniversary date of the execution of the offset security agreement, for a period of 10 consecutive years. After the tenth year, the landowner must provide a report at the reasonable request of a statutory authority.

Functional Layout Plan

10 Before the certification of Stage 3 of the plan of subdivision (and other future stages) a functional layout plan for the subdivision or the stage of subdivision must be submitted to and approved by the Responsible Authority. When approved the functional layout plan will be endorsed and will then form part of the permit. The functional layout plan must be drawn at a scale of 1:500 or at another scale which the Responsible Authority agrees with dimensions and three copies provided and an electronic copy (PDF) must also be provided. The functional layout plan must be generally in accordance with the application plans but incorporate the following:

- (a) A subdivision layout drawn to scale, including proposed street names, lot areas, lot numbers and widths of street reservations.
- (b) Topography and existing features, including contours for the subject land and any affected adjacent land.
- (c) The location of all trees (or group of trees) existing on the site, including dead trees and those that overhang the site from adjoining land.
- (d) Details of tree protection zones for all trees to be retained on site, in accordance with Australian Standard AS4970-2009 Protection of Trees on Development Sites.
- (e) Any trees proposed for removal from the site clearly designated.
- (f) Typical cross-sections for each street type, dimensioning individual elements, services offsets and any other spatial requirements identified in the proposed 'Wonthaggi North East Precinct Structure Plan' applying to the land.
- (g) A table of offsets for all utility services and street trees.
- (h) Location and alignment of kerbs, indented parking spaces, footpaths, shared paths, bus stops and traffic controls.
- (i) The proposed minor drainage network and any land required for maintenance access.

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- (j) The major drainage system, including any watercourse, lake, wetland, silt pond, and/ or piped elements showing preliminary sizing.
- (k) Overland flow paths (100 year ARI) to indicate how excess runoff will safely be conveyed to its destination.
- (l) Drainage outfall system (both interim and ultimate), indicating legal point of discharge and any access requirements for construction and maintenance; Preliminary location of reserves for electrical kiosks.
- (m) Works external to the subdivision, including both interim and ultimate access requirements.
- (n) Intersections with (Heslop Road) showing interim and ultimate treatments. Sites that are not adjacent to existing or approved infrastructure will be required to provide the following information in addition to the above standard requirements:
 - i Plans indicating the relationship between the subject subdivision stage and surrounding land.
 - ii Proposed linkages to future streets, open space, regional path network and upstream drainage

Civil Construction Plans

11 Prior to subdivision works commencing for each stage, detailed civil construction plans to the satisfaction of the Responsible Authority for that stage must be submitted to and approved by the Responsible Authority. All construction plans submitted for approval must be consistent with this permit and must confirm with the requirements of all servicing authorities, and in particular, water, sewerage, telephone and power supply authorities. The plans must be drawn to scale with dimensions and three copies must be provided. The plans must show:

- (a) Drainage of the subject land. Including:
 - i Compliance with the relevant Best Practice Environmental Management Guidelines for Urban Stormwater and Bass Coast Shire Stormwater Management Plan (2003), and the Stormwater Management Plan for Wonthaggi North East Precinct Structure Plan (Engeny Consultants 2017). The design and layout of roads, road reserves and public open space should optimise water use efficiency and long term viability of public landscaped areas through use of Water Sensitive Urban Design (WSUD) initiatives.

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- ii Polluted drainage must be treated and/ or absorbed on the lot from which it emanates to the satisfaction of the Responsible Authority. Polluted drainage must not be discharged beyond the boundaries of the lot from which it emanates or into a watercourse or easement drain.
 - iii Drainage computations shall include external catchments and discharge of all surface flows to the wetland retarding basin in the drainage design.
 - iv Works to achieve drainage outfall to the existing open drainage system including matching capacity for 1 in 100 year events or additional works as required to the satisfaction of the Responsible Authority after consultation with affected land owners.
 - v An underground pipe drain shall be provided to service the lowest corner of each lot and lots with easement drains provided with a grated house drain in accordance with Council's Standard Drawings.
- (b) Vehicle and pedestrian/bicycle access and car parking to the satisfaction of the Responsible Authority including:
- i All internal roads, car parking areas and access ways shall be fully constructed and drained including asphalt wearing course pavement, kerb and channel, underground drains, street trees, line marking, signage and bicycle and footpaths.
 - ii Wentworth Road is to be constructed along the site's built frontage up to but not including the section adjacent to the drainage reserve. Construction is to be in accordance with the proposed Wonthaggi North East Precinct Structure Plan 2017. Wentworth Road is designated as a Local Access Street Level 1, with a 20 metre wide road reserve (7.3 metre wide carriageway, and 1.5 metre wide footpaths on both sides). Kerb and Channel and Footpath works are required on the western side of Wentworth Road only, with a shoulder and table drain on the eastern side.
 - iii The Local Access Street Level 2 running east-west through Stages 6, 8 and 11 is to be constructed with a 6.0 metre wide carriageway, with 2.3 metre wide parking bays on both sides and 1.5 metre wide footpaths to both sides with nature strips dividing the road and pathway connections, the Local Access Street Level 2 will have a 20 metre wide cross section, as per the proposed Wonthaggi North East PSP.

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- iv Provide bicycle path and linkages through the subject land (on and off road) linking to existing networks or roads in accordance with the PSP and FLP.
- v Shared driveways are to cater for turn movements for a B99 standard vehicle and include car park spaces for abutting lots.
- vi Turning for emergency service vehicles and garbage trucks must be provided at courts heads and concrete bin pads where required to suit garbage collection for shared driveways.
- vii Indented parking bays on roads abutting reserves in accordance with the Functional Layout Plan.
- viii Traffic calming measures including roundabouts, modified T intersections and threshold treatments in accordance with the Functional Layout Plan.
- ix Road reserve widths to be provided in accordance with the approved Functional Layout Plan.
- x All roads, are to have 1.5 metre wide concrete footpaths on both sides, unless otherwise agreed to by the Responsible Authority
- xi A minimum 2.5 metre wide. pedestrian/bicycle concrete path through the reserve area within the subdivision.
- xii Concrete driveways to each lot in accordance with Council standard drawings.
- xiii Provide bollards along all road frontages of reserves with removable/lockable types at access points for Council maintenance purposes, keyed to the Council system.
- xiv Standard street lighting must be provided in accordance with Council's Street Lighting Policy.
- xv Car parking spaces and access lanes designed in accordance with the Australian Standard for on-street car parking AS2890.5-1993 and AS2890.2-2002 for commercial vehicles.
- xvi Referenced to existing PSM Survey marks where available, or alternatively a statement of accuracy describing how co-ordinates were derived.
- xvii Vehicle access to lots must be provide from a service road or local road where fronting Heslop Road.

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xviii Safe and convenient crossing points of connector roads and local streets are provided at all intersections and on key desire lines.

All works must be constructed or carried out in accordance with those plans.

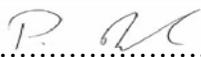
- 12 Vehicle, bicycle and pedestrian access and drainage to serve the subject land must be designed, constructed and maintained for defects until asset handover to the satisfaction of the Responsible Authority and in accordance with Council Standard Drawings.

Prior to Statement of Compliance

- 13 Before a Statement of Compliance is issued under the Subdivision Act 1988 for any stage of the subdivision permitted by this permit, the following must be undertaken:
- (a) All works in relation to drainage, road construction and footpaths (both internal and external) must be completed to the satisfaction of the Responsible Authority;
 - (b) "As constructed" drawings and supporting documentation must be submitted to the Responsible Authority;
 - (c) Reserves in each stage must be cleared of all rubbish, weeds, debris and spoil and must be landscaped in accordance with the landscape plan approved by the Responsible Authority under condition 2 of this permit for that stage to the satisfaction of the Responsible Authority.
 - (d) All relevant matters under the Section 173 Agreements attached to the subject land must be completed to the satisfaction of the Responsible Authority.
 - (e) All land to be filled and to be used for a dwelling must be filled and compacted in accordance with Australian Standard AS 3798. The results of the tests must be produced and be to the satisfaction of the Responsible Authority.
- 14 The developer must provide to the Responsible Authority transparencies and electronic files of the construction plans and PSM survey sketch plans with reduced levels prior to the issue of a Statement of Compliance. The transparencies must show any cut and fill that has been designed and alterations and additions made during construction.

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Environmental Management Plan

- 15 Prior to subdivision works commencing, an Environmental Management Plan prepared to the satisfaction of the Responsible Authority must be submitted to and approved by the Responsible Authority. The Environmental Management Plan must be developed in accordance with the below guidelines:
- (a) Best Practice Environmental Management Guidelines for Urban Stormwater;
 - (b) Environmental Guidelines for Urban Stormwater (EPA publication No. 480, December 1995);
 - (c) Construction Techniques for Sediment Pollution Control (EPA publication No. 275, May 1991); and
 - (d) Other Best Practice approaches.

General Asset Management Conditions

- 16 No mud, dirt, sand, soil, clay, stones, oil, grease, scum, litter, chemicals, sediments, gross pollutants, animal waste or domestic waste shall be washed into, allowed to enter, or discharged to the stormwater drainage system, receiving waters or surrounding land, during the construction works hereby approved to the satisfaction of the Responsible Authority.

Detailed Subdivision Layout Requirements

- 17 Where no impact on Private Open Space requirements occurs, any fencing of open space whether encumbered or unencumbered must be low scale, less than 1.2 m in height and visually permeable to facilitate public safety and surveillance.
- 18 Lots directly fronting a neighbourhood park or sporting reserve must provide for a primary point of access from footpath or shared path proximate to the lot boundary.
- 19 The minimum construction requirements for Bushfire Management are:
- (a) Constructed roads must be a minimum of 7.3 metres trafficable width where cars park on both sides, or a minimum of 5.4 metres trafficable width where cars park on one side only.
 - (b) A minimum of 3.5 metres width no parking and 0.5 metres clearance to structures on either side, and if this width applies there must be parking bays of at least 20 metres long, 6.0 metres wide and located not more than 200 metres apart.

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- (c) Roads must be constructed so they are capable of accommodating a vehicle of 15 tonnes for the trafficable road width.
 - (d) The average grade of a road must be no more than 1 in 7 (14.4% or 8.1 degrees).
 - (e) The steepest grade of a road must be no more than 1 in 5 (20% or 11.3 degrees) with this grade continuing for no more than 50 metres at any one point.
 - (f) Dips on the road must have no more than 1 in 8 grade (12.5% or 7.1 degrees) entry and exit angle).
- 20 Above ground utilities such as electricity substations and sewer pump stations must be identified at the subdivision design stage to enable the appropriate integration into the subdivision layout and minimise any adverse amenity impacts.

Subdivision Condition

- 21 (a) Prior to any works or certification of any plan of subdivision, a subdivision master plan must be provided and endorsed, generally in accordance with the plan prepared by Beveridge Williams dated 12 February 2018, identified as Version 6.
- (b) The layout and site dimensions of the hereby approved subdivision as shown on the endorsed plans must not be altered without the written consent of the Responsible Authority. There are no requirements to modify the endorsed plan if a plan is certified under the provisions of the Subdivision Act 1988 that is generally in accordance with the endorsed plans.

Permit Expiry

- 22 This permit will expire if:
- (a) the plan of subdivision for stage 1 is not certified within two (2) years of the date of this permit; or
 - (b) the plans of subdivision for any subsequent stage is not certified within two (2) years of the date of certification of the previous stage of the subdivision; or
 - (c) the registration of a plan of subdivision for any stage of the subdivision is not completed within five (5) years of the date of first certification of that stage.

The Responsible Authority may extend the periods referred to if a request is made in writing before the permit expires or within six (6) months afterwards if the development has not lawfully commenced prior to the expiry of this permit, or within 12 months afterwards if the development has lawfully commenced prior to the expiry of the permit.

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South Gippsland Water

- 23 The owner / applicant shall enter into a formal agreement with the South Gippsland Water Corporation for the provision of reticulation assets required to service each and every allotment to the design and satisfaction of the Corporation.
- 24 Prior to consent to the issue of a Statement of Compliance, the owner shall pay to the South Gippsland Water Corporation 'New Customer Contributions' for each new lot created, in accordance with the Corporation's approved tariffs.
- 25 Easements shall be created no less than 3.0 metres wide, in favour of the South Gippsland Water Corporation over the Corporation's proposed infrastructure located within the subdivisional lots.
- 26 The plan of subdivision submitted for certification must be referred to the Corporation in accordance with Section 8 of the Subdivision Act.

MultiNet Gas

- 27 Easements in favour of Multinet (Assets) Pty. Ltd. must be created on the plan to the satisfaction of Multinet Gas.
- 28 The plan of subdivision submitted for certification must be referred to Multinet Gas in accordance with Section 8 of the Subdivision Act 1988.

SP Ausnet

- 29 The applicant must enter into an agreement with SPI Electricity Pty Ltd for supply of electricity to each lot on the endorsed plan.
- 30 The applicant must enter into an agreement with SPI Electricity Pty Ltd for the rearrangement of the existing electricity supply system.
- 31 The applicant must enter into an agreement with SPI Electricity Pty Ltd for rearrangement of the points of supply to any existing installations affected by any private electricity power line which would cross a boundary created by the subdivision, or by such means as may be agreed by SPI Electricity Pty Ltd.
- 32 The applicant must provide easements satisfactory to SPI Electricity Pty Ltd for the purpose of "Power Line" in the favour of "SPI Electricity Pty Ltd" pursuant to Section 88 of the Electricity Industry Act 2000, where easements have not been otherwise provided, for all existing SPI Electricity Pty Ltd electric power lines and for any new power lines required to service the lots on the endorsed plan and/or abutting land.

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- 33 The applicant must obtain for the use of SPI Electricity Pty Ltd any other easement required to service the lots.
- 34 The applicant must adjust the position of any existing SPI Electricity Pty Ltd easement to accord with the position of the electricity line(s) as determined by survey.
- 35 The applicant must set aside on the plan of subdivision Reserves for the use of SPI Electricity Pty Ltd for electric substations.
- 36 The applicant must provide survey plans for any electric substations required by SPI Electricity Pty Ltd and for associated power lines and cables and executes leases for a period of 30 years, at a nominal rental with a right to extend the lease for a further 30 years. SPI Electricity Pty Ltd requires that such leases are to be noted on the title by way of a caveat or a notification under Section 88 (2) of the Transfer of Land Act prior to the registration of the plan of subdivision.
- 37 The applicant must provide to SPI Electricity Pty Ltd a copy of the plan of subdivision submitted for certification that shows any amendments that have been required.
- 38 The applicant must agree to provide alternative electricity supply to lot owners and/or each lot until such time as permanent supply is available to the development by SPI Electricity Pty Ltd. Individual generators must be provided at each supply point. The generator for temporary supply must be installed in such a manner as to comply with the Electricity Safety Act 1998.
- 39 The applicant must ensure that all necessary auditing is completed to the satisfaction of SPI Electricity Pty Ltd to allow the new network assets to be safely connected to the distribution network.

CFA

- 40 Prior to the issue of a Statement of Compliance under the Subdivision Act 1988 the following requirements must be met to the satisfaction of the CFA;
 - (a) Above or below ground operable hydrants must be provided. The maximum distance between these hydrants and the rear of all building envelopes (or in the absence of building envelopes, the rear of the lots) must be 120 metres and the hydrants must be no more than 200 metres apart. These distances must be measured around lot boundaries.
 - (b) The hydrants must be identified with marker posts and road reflectors as applicable to the satisfaction of the County Fire Authority.

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- 41 Prior to the issue of a Statement of Compliance under the Subdivision Act 1988 the following requirements must be met to the satisfaction of the CFA;
- (a) Roads must be constructed to a standard so that they are accessible in all weather conditions and capable of accommodating a vehicle of 15 tonnes for the trafficable road width.
 - (b) The average grade must be no more than 1 in 7 (14.4%) (8.1 degrees) with a maximum of no more than 1 in 5 (20%) (11.3 degrees) for no more than 50 metres. Dips must have no more than a 1 in 8 (12%) (7.1 degree) entry and exit angle.
 - (c) Curves must have a minimum inner radius of 10 metres.
 - (d) Have a minimum trafficable width of 3.5 metres and be clear of encroachments for at least 0.5 metres on each side and 4 metres above the access way.
 - (e) Roads more than 60m in length from the nearest intersection must have a turning circle with a minimum radius of 8 m (including roll-over kerbs if they are provided) T or Y heads of dimensions specified by the CFA may be used as alternatives.

Mandatory Subdivision Condition

- 42 The owner of the land must enter into an agreement with:
- (a) A telecommunications network or service provider for the provision of telecommunication services to each lot shown on the endorsed plan in accordance with the provider's requirements and relevant legislation at the time; and
 - (b) A suitably qualified person for the provision of fibre ready telecommunication facilities to each lot shown on the endorsed plan in accordance with any industry specifications or any standards set by the Australian Communications and Media Authority, unless the applicant can demonstrate that the land is in an area where the National Broadband Network will not be provided by optical fibre.

Before the issue of a Statement of Compliance for any stage of the subdivision under the Subdivision Act 1988, the owner of the land must provide written confirmation from:

- (c) A telecommunications network or service provider that all lots are connected to or are ready for connection to telecommunications services in accordance with the provider's requirements and relevant legislation at the time; and

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- (d) A suitably qualified person that fibre ready telecommunication facilities have been provided in accordance with any industry specifications or any standards set by the Australian Communications and Media Authority, unless the applicant can demonstrate that the land is in an area where the National Broadband Network will not be provided by optical fibre.

Aboriginal Cultural Heritage Significance

- 43 At all times during the construction of the development hereby permitted, the approved Cultural Management Heritage Plan prepared by Heritage Insight Pty Ltd (dated 22 December 2010) and endorsed as part of this permit, must be kept on site at all times to the satisfaction of the Responsible Authority and the requirements detailed in the endorsed CHMP must be implemented to the satisfaction of Aboriginal Affairs Victoria.

THIS PERMIT HAS BEEN AMENDED AS FOLLOWS:

Date of amendment	Brief description of amendment	Name of Responsible Authority that approved the amendment
07 May 2020	Variation to vegetation removal conditions Conditions 4-8 replaced with Conditions 4-9 Renumbering of all subsequent Conditions	Bass Coast Shire Council

Date Issued: 21 February 2018

Signature for the Responsible Authority:

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IMPORTANT INFORMATION ABOUT THIS PERMIT

WHAT HAS BEEN DECIDED?

The Responsible Authority has issued a permit

(Note: This is not a permit granted under Division 5 or 6 of Part 4 of the **Planning and Environment Act 1987**.)

Sch. 1

CAN THE RESPONSIBLE AUTHORITY AMEND THIS PERMIT?

The Responsible Authority may amend this permit under Division 1A of Part 4 of the **Planning and Environment Act 1987**.

WHEN DOES A PERMIT BEGIN?

A permit operates:

- from the date specified in the permit; or
- if no date is specified, from—
 - (i) the date of the decision of the Victorian Civil and Administrative Tribunal, if the permit was issued at the direction of the Tribunal; or
 - (ii) the date on which it was issued, in any other case.

WHEN DOES A PERMIT EXPIRE?

1. A permit for the development of land expires if—

- the development or any stage of it does not start within the time specified in the permit; or
- the development requires the certification of a plan of subdivision or consolidation under the **Subdivision Act 1988** and the plan is not certified within two years of the issue of the permit, unless the permit contains a different provision; or
- the development or any stage is not completed within the time specified in the permit, or, if no time is specified, within two years after the issue of the permit or in the case of a subdivision or consolidation within 5 years of the certification of the plan of subdivision or consolidation under the **Subdivision Act 1988**.

2. A permit for the use of land expires if—

- the use does not start within the time specified in the permit, or if no time is specified, within two years after the issue of the permit; or
- the use is discontinued for a period of two years.

3. A permit for the development and use of land expires if—

- the development or any stage of it does not start within the time specified in the permit; or
- the development or any stage of it is not completed within the time specified in the permit, or, if no time is specified, within two years after the issue of the permit; or
- the use does not start within the time specified in the permit, or, if no time is specified, within two years after the completion of the development; or
- the use is discontinued for a period of two years.

4. If a permit for the use of land or the development and use of land or relating to any of the circumstances mentioned in section 6A(2) of the **Planning and Environment Act 1987**, or to any combination of use, development or any of those circumstances requires the certification of a plan under the **Subdivision Act 1988**, unless the permit contains a different provision—
 - the use or development of any stage is to be taken to have started when the plan is certified; and
 - the permit expires if the plan is not certified within two years of the issue of the permit.
5. The expiry of a permit does not affect the validity of anything done under that permit before the expiry.

WHAT ABOUT REVIEWS?

- The person who applied for the permit may apply for a review of any condition in the permit unless it was granted at the direction of the Victorian Civil and Administrative Tribunal, in which case no right of review exists.
- An application for review must be lodged within 60 days after the permit was issued, unless a notice of decision to grant a permit has been issued previously, in which case the application for review must be lodged within 60 days after the giving of that notice.
- An application for review is lodged with the Victorian Civil and Administrative Tribunal.
- An application for review must be made on the relevant form which can be obtained from the Victorian Civil and Administrative Tribunal, and be accompanied by the applicable fee.
- An application for review must state the grounds upon which it is based.
- A copy of an application for review must also be served on the responsible authority.
- Details about applications for review and the fees payable can be obtained from the Victorian Civil and Administrative Tribunal.



Department of Environment, Land, Water & Planning

Electronic Instrument Statement

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APPLICATION TO RECORD AN INSTRUMENT

Jurisdiction	VICTORIA
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Instrument and/or legislation

RECORD - AGREEMENT - SECTION 173
Planning & Environment Act - section 173

Applicant(s)

Name	BASS COAST SHIRE COUNCIL
Address	
Street Number	76
Street Name	MCBRIDE
Street Type	AVENUE
Locality	WONTHAGGI
State	VIC
Postcode	3995

Additional Details

Refer Image Instrument



Department of Environment, Land, Water & Planning

Electronic Instrument Statement

The applicant requests the recording of this Instrument in the Register.

Execution

1. The Certifier has taken reasonable steps to verify the identity of the applicant or his, her or its administrator or attorney.
2. The Certifier holds a properly completed Client Authorisation for the Conveyancing Transaction including this Registry Instrument or Document.
3. The Certifier has retained the evidence supporting this Registry Instrument or Document.
4. The Certifier has taken reasonable steps to ensure that this Registry Instrument or Document is correct and compliant with relevant legislation and any Prescribed Requirement.

Executed on behalf of	BASS COAST SHIRE COUNCIL
Signer Name	DAVID VORCHHEIMER
Signer Organisation	PARTNERS OF HWL EBSWORTH LAWYERS
Signer Role	LAW PRACTICE
Execution Date	01 DECEMBER 2020

File Notes:

NIL

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Statement End.

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Document Identification	AT823177H
Number of Pages (excluding this cover sheet)	39
Document Assembled	

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HWL
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Deed of Agreement

Under s173 of the
Planning and Environment Act 1987

Bass Coast Shire Council

and

Wentworth Pty Ltd



AT823177H

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Deed of Agreement

Date

Parties	Bass Coast Shire Council of 76 McBride Avenue, Wonthaggi, Victoria 3995 <div style="text-align: right;">(Council)</div>
	Wentworth Pty Ltd [REDACTED] of 72 - 90 Billson Street, Wonthaggi, Victoria 3995 <div style="text-align: right;">(Owner)</div>

Recitals	<p>A. Council is the Responsible Authority pursuant to the Act for the administration and enforcement of the Planning Scheme, which applies to the Subject Land.</p> <p>B. The Owner is or is entitled to be the registered proprietor of the Subject Land, which is the land over which this Agreement is intended to be registered.</p> <p>C. On 21 February 2018, Council issued Planning Permit No. 170241 (Planning Permit) allowing for a 'Multi lot staged subdivision and removal of native vegetation in accordance with the endorsed plans' on the Subject Land.</p> <p>D. The Subject Land has an area of 41.169 hectares (Net Developable Area). The Planning Permit allows the subdivision of the Subject Land into 504 Residential Lots which equates to a dwelling density of 12.3 dwellings per hectare.</p> <p>E. As part of the development of the Subject Land, Council has required Development Contributions and will apply the Development Infrastructure Levy and the Community Infrastructure Levy.</p> <p>F. Condition 1 of the Planning Permit states that:</p>
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'Before a statement of compliance is issued under the Subdivision Act 1988 the applicant must enter into an agreement with the responsible authority under section 173 of the Planning and Environment Act 1987. The agreement must be in a form to the satisfaction of the responsible authority. The Council must prepare the agreement at its own cost. The applicant is responsible for the expense of registration of the agreement. The agreement must be registered on the Title of the

property so as to run with the land, and must provide for the following:

- a) *The total amount of infrastructure contributions to be paid by the owner is \$4,301,450. This figure is arrived at by multiplying the net developable area by \$104,724.40, and the portion attributable to any stage of the subdivision is to be calculated on the basis of this amount per net developable hectare for that stage.*
- b) *The contribution amounts as per this agreement must be adjusted on a compound basis upwards on 1 July each year after the commencement of this Agreement by reference to the Bureau of Statistics Producer Price Index, Output of General Construction Industry - Victoria, except as otherwise agreed in writing by the parties (Adjustment Index).*
- c) *The Development Contributions must be paid prior to the issue of a Statement of Compliance for each stage of development on the subject land.*
- d) *Construction of the wetlands and retarding basin within the development site includes a Development Contribution Credit to the developer of at least \$1,271,739 as per this agreement must be adjusted on a compound basis upwards on 1 July each year after the commencement of this Agreement by reference to the Adjustment Index. This amount does not include the land acquisition for the wetlands and retarding basin.*
- e) *Construction of the drainage pipeline (40-47 as per the proposed Wonthaggi North East Development Contributions Plan) through the development site for development of the wider area includes a Development Contribution Credit to the developer of at least \$215,000 as per this agreement must be adjusted on a compound basis upwards on 1 July each year after the commencement of this Agreement by reference to the Adjustment Index.*
- f) *Prior to the occupation of any dwelling a water tank of a minimum 2,000 litres must be provided for all residential buildings. The water tank must be plumbed to the toilet and made available for garden irrigation.*
- g) *Prior to occupation of any dwelling the payment of \$1,150 per dwelling is made to the Responsible Authority, this payment is made for the provision of community facilities.*
- h) *Where land is set aside for the purpose of wetlands or retarding basins a fair value for the transfer of this land is paid to the developer.*
- i) *The accommodation of stormwater within the drainage reserve on the Subject Land, to the satisfaction of the responsible authority. The*

relevant stormwater will flow from Catchment O (as identified in the 'External Catchments Draining into Development Area' plan prepared by Engeny and dated 4 May 2017). More particularly, the relevant stormwater will flow from that portion of Catchment O which is located to the west and north-west of the site.

- j) The developer of the land is not responsible for the construction of any part of Heslop Road, including any intersection works, unless otherwise agreed.
- k) The developer of the land is not responsible for the construction of the kerb and channel and footpath works including any drainage works to the eastern side of Wentworth Road, unless otherwise agreed.
- l) The developer of the land is not responsible for the construction of Wentworth Road adjacent to where the drainage reserve is proposed, this includes construction of any infrastructure under the road to connect the wetlands and retarding basins, unless otherwise agreed.
- m) No further subdivision or more than one dwelling on a lot, except if area marked on the endorsed plan as a potential multi-dwelling site (Super Lot)
- n) Council agrees not to propose, exhibit, adopt, or in any way support or allow any amendment to the planning scheme which applies to the Subject Land and which would have the effect of imposing development contributions, infrastructure contributions or the like in respect of the Subject Land.
- o) The parties agree that the agreement will serve to supersede the existing Section 173 Agreement AJ534369V dated 07/03/2012 insofar as it affects the Subject Land, and that the existing aforementioned agreement AJ534369V be ended insofar as it affects the Subject Land.
- p) Council agrees that it must apply all contributions paid under this agreement for the sole purpose of infrastructure projects identified in this agreement and any development contributions plan that may be proposed or approved from time to time applying to the Wonthaggi North East PSP area. In the event that such projects do not account for all funds raised, any excess funds must be applied as agreed by the owner of the land (or the owner of any balance lots of the land, in the event that parts of the land have been subdivided). Council agrees that all such contributions must be held and applied by Council, and accounted for, as though they were contributions under a Development Contributions Plan approved pursuant to the Act and the Scheme.

q) *In the event that a PSP is approved, which specifies a public open space contribution of less than 5%, any over-contribution of public open space in respect of the portion of the subject land that has been subdivided up until the time of such approval will be repaid to the owner of any balance lot.'*

- G. The Owner has entered into this Agreement to give effect to Condition 1 of the Permit, and provide for Development Contributions being the Development Infrastructure Levy and the Community Infrastructure Levy in accordance with this Agreement.
- H. The Parties agree that the maximum amount of Development Infrastructure Levy for the Subject Land is \$4,311,398.82 rather than the figure noted in condition 1 of the Permit.
- I. At the date of this Agreement, the Subject Land is encumbered by three agreements pursuant to section 173 of the Act being:
- (a) [REDACTED]
 - (b) [REDACTED]
 - (c) [REDACTED]
- J. The Parties intend to effect the ending of Existing Agreements insofar as the Existing Agreements apply to the Subject Land as part of a separate process in accordance with the Act.
- K. The Parties have agreed to enter into this Agreement:
- (a) to give effect to the requirements of the Planning Permit;
 - (b) to provide for Development Contributions being a Development Infrastructure Levy and Community Infrastructure Levy for the Subject Land; and
 - (c) to achieve or advance the objectives of planning in Victoria and the objectives of the Planning Scheme in respect of the Subject Land.

This deed witnesses that in consideration of, among other things, the mutual promises contained in this deed the parties agree as follows:

1 Definitions and interpretation clauses

1.1 Definitions

In this deed the following definitions apply:

Act	means the <i>Planning and Environment Act 1987</i> (Vic).
Agreement	means this Deed of Agreement and any Agreement executed by the Parties expressed to be supplemental to this Agreement.
Amendment	means amendment as defined in the Act.
Approved Plans	means Designs relating to an Infrastructure Project which are approved by Council pursuant to clause 8.6 of this Agreement.
Balance Lot	means that part or portion of the Subject Land that remains and is yet to be developed or subdivided into Residential Lots.
Bank Guarantee	means a bank guarantee or other form of security to the satisfaction of Council equating to five per cent (5%) of the Specified Value of the Infrastructure Project as set out in the Wonthaggi North East PSP for specific an Infrastructure Project.
Building Permit	means a building permit as in Part 3 of the <i>Building Act 1993</i> .
Business Day	means a day that is not a Saturday, Sunday or public holiday in Melbourne.
Catchment O	means catchment O as identified in the 'External Catchments Draining into Development Area' plan prepared by Engeny and dated October 2019 and shown in the plan at Schedule 3 to this Agreement.
Certificate of Practical Completion	means a written certificate issued by Council in its capacity as the development agency for an Infrastructure Project stating that an Infrastructure Project or a specified stage of the Infrastructure Project has been completed to the satisfaction of Council.
Claim	means any claim, action, proceeding or demand made against the person concerned, however it arises and whether it is present or future, fixed or unascertained, actual or contingent.
Community Infrastructure Levy	means the community infrastructure levy specified in clause 13.1 of this Agreement that is required to be paid in respect of each Dwelling in accordance with this Agreement.

Credit	means a credit in the amount of the Specified Value for the relevant Infrastructure Project or the Specified Infrastructure Project and the relevant Project Land or Wetland and Retarding Basin Land (as appropriate) against the Owner's Development Infrastructure Levy for the Subject Land.
Designs	means the detailed design and engineering plans and specifications of an Infrastructure Project approved by Council under clause 8.6 of this Agreement.
Development	means the development of the Subject Land in accordance with the Planning Permit.
Development Agency and Collecting Agency	have the same meaning as in the Act as though a Development Contributions Overlay applies to the Subject Land.
Development Contribution	means the collective total of the funds paid to the Responsible Authority by way of the Development Contribution Sum.
Development Contributions Plan	means a development contributions plan which affects the Subject Land which has been prepared in accordance with the Act and is incorporated into the Planning Scheme.
Development Contribution Sum	means the sum determined in Schedule 1 to this Agreement which is required to be paid pursuant to this Agreement and is only payable once on each Net Developable Hectare or Dwelling whichever the case may be.
Development Infrastructure Levy	means the development infrastructure levy specified in Clause 2 of this Agreement that is required to be paid in respect of each Net Developable Hectare in accordance with this Agreement.
Index	means the Bureau of Statistics Producer Price Index, Output of General Construction Industry - Victoria.
Drainage Pipeline 1	means the drainage pipeline referred to as 'PIPE' 47-47A and 47A to 40 in the Wonthaggi North East DCP and Engeny Drainage Strategy for the Wonthaggi North East PSP, October 2019.
Drainage Pipeline 1 Value	means a value of at least \$215,000 adjusted in accordance with the Index on a compound basis upwards on 1 July each year after the commencement of this Agreement, up until the provision of the Drainage Pipeline 1.
Dwelling	has the same meaning as defined in the Planning Scheme.

Infrastructure Project	means a project to be delivered by the Owner under this Agreement, identified in Wonthaggi North East PSP but does not include the Specified Infrastructure Projects.
Localised Infrastructure	means works, services or facilities necessitated by the subdivision or development of land including but not limited to provision of utilities.
Loss	means any loss, damage, cost, expense or liability incurred by the person concerned, however it arises and whether it is present or future, fixed or unascertained, actual or contingent.
Maintenance Period	means the period specified in Schedule 2 to this Agreement for each specified category of Infrastructure Project commencing on the date of the Certificate of Practical Completion of an Infrastructure Project to Council.
Mortgagee	means the person or persons registered or entitled from time to time to be registered by the Registrar of Titles as mortgagee of the Subject Land or any part of it.
Net Developable Hectare	means the total amount of land affected by the Wonthaggi North East PSP that is made available for development being the total precinct area (Gross Development Area), <ul style="list-style-type: none">(a) less land identified for community facilities, education facilities, open space and encumbered land in the Wonthaggi North East DCP; and(b) includes any land for Residential Lots, employment buildings, all local streets (including some connector streets) and any small parks defined at subdivision stage in addition to those outlined in the Wonthaggi North East PSP.
Occupancy Permit	means an occupancy permit issued pursuant to the <i>Building Act 1993</i> and the <i>Building Regulations 2018</i> .
Owner	means the person or persons registered or entitled from time to time to be registered by the Registrar of Titles as proprietor or proprietors of an estate in fee simple in the Subject Land or any part of it and includes a Mortgagee-in-possession.
Party or Parties	means the Owner and Council under this Agreement as appropriate.
Plan of Subdivision	means a plan of subdivision which creates an additional lot which can be disposed of separately.

Planning Permit	means the Planning Permit referred to in Recital C to this Agreement.
Planning Scheme	means the Bass Coast Planning Scheme and any other Planning Scheme which applies to the Subject Land.
Project Land	means the land area (in hectares) required to facilitate the Infrastructure Project as defined in the Wonthaggi North East DCP but does not include land that forms part of the open space contribution pursuant to the <i>Subdivision Act 1988</i> .
Residential Lot	means a lot created by subdivision of the Subject Land which, in the opinion of Council, is of a size and dimension intended to be developed as a housing lot without further subdivision.
Responsible Authority	has the same meaning as the Act.
Specified Value	means the amount specified in the Wonthaggi North East DCP as the value of an Infrastructure Project.
Specified Infrastructure Projects	means the Wetland and Retarding Basin and Drainage Pipeline 1.
Specified Infrastructure Projects Value	means the Wetland and Retarding Basin Value and Drainage Pipeline 1 Value (as appropriate).
Stage	is a reference to a stage of subdivision of the Subject Land.
Statement of Compliance	means a Statement of Compliance under the <i>Subdivision Act 1988</i> (Vic).
Subject Land	means the land known as the land referred to in Certificate of Title Volume 11591 Folio 793 otherwise known as Lot 2 on plan of subdivision 700899Q and any reference to the Subject Land in this Agreement includes any lot created by the subdivision of the Subject Land or any part of it.
Super Lot	means an area marked out on the Endorsed Plans as a potential multi - dwelling site that is able to accommodate more than one Residential Lot and/ or Dwelling.
VCAT	means the Victorian Civil and Administrative Tribunal.

VPA	means Victorian Planning Authority.
Wetland and Retarding Basin	means wetland WL-04 and sedimentation basin SB11A as identified in the Wonthaggi North East DCP and Engeny Drainage Strategy for the Wonthaggi North East PSP, October 2019
Wetland and Retarding Basin Value	means a value of at least \$1,400,000 adjusted in accordance with the Index on a compound basis upwards on 1 July each year after the commencement of this Agreement, up until the provision of the Wetland and Retarding, but excludes the value of the land acquisition for the Wetland and Retarding Basin.
Wetland and Retarding Basin Land	means the land required for the Wetland and Retarding Basin as identified in the Wonthaggi North East DCP.
Wonthaggi North East DCP	means the proposed Wonthaggi North East Development Contributions Plan as at the date of this Agreement or any approved Wonthaggi North East DCP (as amended from time to time).
Wonthaggi North East PSP	means the proposed Wonthaggi North East Precinct Structure Plan as at the date of this Agreement or an approved Wonthaggi North East PSP (as amended from time to time).

1.2 Interpretation

- (a) In this document, unless the context otherwise requires:
- (i) The singular includes the plural and vice versa.
 - (ii) A reference to a gender includes a reference to each other gender.
 - (iii) A reference to a person includes a reference to a firm, corporation or other corporate body and that person's successors in law.
 - (iv) If a Party consists of more than one person this Agreement binds them jointly and each of them severally.
 - (v) A term used in this Agreement has its ordinary meaning unless that term is defined in this Agreement. If a term is not defined in this Agreement and it is defined in the Act it has the meaning as defined in the Act.

- (vi) A reference to an Act, Regulation or the Planning Scheme includes any Acts, Regulations or amendments amending, consolidating or replacing the Act, Regulation or Planning Scheme.
 - (vii) The introductory clauses to this Agreement are and will be deemed to form part of this Agreement.
 - (viii) Headings are for guidance only and do not affect the interpretation of this Agreement.
- (b) The obligations of the Owner under this Agreement, will take effect as separate and several covenants which are annexed to and run at law and equity with the Subject Land; and
- (i) bind the Owner, its successors, transferees and permitted assigns, the registered proprietor or proprietors for the time being of the Subject Land; and
 - (ii) if the Subject Land is subdivided further, this Agreement must be read and applied so that each subsequent Owner of a lot is only responsible for those covenants and obligations which relate to that Owner's lot.

2. Owner's obligations

2.1 Development Infrastructure Levy and Community Infrastructure Levy

The Owner covenants and agrees that:

- (a) prior to the issue of a Statement of Compliance for each Stage of the Development of the Subject Land, the Owner will pay to Council the Development Infrastructure Levy as specified in Schedule 1 to this Agreement in respect of the Net Developable Hectare area of that Stage to Council (being the amount per Net Developable Hectare as set out in Schedule 1 to this Agreement plus Indexation in accordance with Clauses 2.2 and 18 of this Agreement) up to the maximum amount of \$4, 311,398.82 plus Indexation; and
- (b) prior to the issue of an Occupancy Permit for a Dwelling on the Subject Land, the Owner must pay to Council the Community Infrastructure Levy in respect of such Dwelling as specified in Schedule 1 and Clause 13 of this Agreement.

2.2 Indexation

The Owner covenants and agrees that the Development Infrastructure Levy amounts specified at Schedule 1 to this Agreement, the Specified Value and the Specified Infrastructure Projects Value will be adjusted on a compound basis on 1 July each year after the commencement of this Agreement by reference to the Index except as otherwise agreed in writing by the parties (**Indexation**).

2.3 Infrastructure Projects and Specified Infrastructure Projects

- (a) The Owner covenants and agrees that
 - (i) it will construct the Specified Infrastructure Projects in accordance with this Agreement and Council's specifications requirements and satisfaction; and
 - (ii) should it construct any of the Infrastructure Projects; it will undertake the construction of the Infrastructure Projects in accordance with this Agreement to Council's specifications, requirements and satisfaction.
- (b) The Owner acknowledges that the Council may, at its absolute discretion, enter into a future agreement with another party to provide for the delivery of an Infrastructure Project.

2.4 Specific Infrastructure Projects

- (a) Wetland and Retarding Basin
 - (i) The Owner covenants and agrees that:
 - (A) the Wetland and Retarding Basin is a Specified Infrastructure Project;
 - (B) the Owner will construct the Wetland and Retarding Basin prior to the issue of Statement of Compliance for the relevant Stage within which the Wetland and Retarding Basin is located;
 - (C) upon completion of the Wetland and Retarding Basin to the satisfaction of Council, the Owner will be entitled to a Credit that is equivalent to the Wetland and Retarding Basin Value; and
 - (D) the value of the Wetland and Retarding Basin Land will be calculated in accordance the Wonthaggi North East DCP in accordance with Clause 14.3 of this Agreement.
 - (b) Drainage Pipeline 1
 - (i) The Owner covenants and agrees that:
 - (A) Drainage Pipeline 1 is a Specified Infrastructure Project;
 - (B) the Owner will construct Drainage Pipeline 1 prior to the issue of Statement of Compliance for the relevant Stage within which the Wetland and Retarding Basin is located; and
 - (C) upon the issuing of a Certification of Practical Completion for Drainage Pipeline 1, the Owner will be entitled to a Credit that is equivalent to the Drainage Pipeline 1 Value.;

2.5 No further Development Contributions Payable

The Parties to this Agreement covenant and agree that in the event that a Development Contributions Plan for the Subject Land is approved after the date of this Agreement, the payment of the contributions as set out in this Agreement will be deemed to have satisfied the requirements of the Development Contributions Plan and no further development contributions would be required.

3. Council's Obligations

3.1 Payment of Development Contribution

Council covenants and agrees to:

- (a) accept the Development Contribution Sum for a Net Developable Hectare or per Dwelling in accordance with Clause 2 of this Agreement, whichever the case may be, in full and final settlement of the Owner's obligation to pay a Development Contribution:
 - (i) under the Agreement;
 - (ii) pursuant to the Planning Scheme;
 - (iii) pursuant to the Act; and
 - (iv) pursuant to all other legislation;
- (b) apply the Development Contribution to works, services or facilities necessitated by the developments and uses approved by the Responsible Authority as per the Wonthaggi North East DCP and the Wonthaggi North East PSP;
- (c) apply any excess funds as agreed by the Owner of any Balance Lot, only in the event that the works, services and facilities referred to in (b) do not account for all funds raised by Council pursuant to this Agreement; and
- (d) that all Development Contributions paid by the Owner pursuant to this Agreement, will be held and applied by Council as though it were a contribution under a Development Contributions Overlay pursuant to the Act and the Planning Scheme.

3.2 Council acknowledges that:

- (a) the Owner is not responsible for the construction of any part of Heslop Road, including any intersection works unless otherwise agreed in writing between the Parties;
- (b) the Owner is not responsible for the construction of the kerb and channel and footpath works including any drainage works to the eastern side of Wentworth Road unless otherwise agreed to in writing between the Parties; and

- (c) the Owner is not responsible for the construction of Wentworth Road adjacent to where the drainage reserve is proposed including any infrastructure under the road to connect the wetlands and retarding basins unless otherwise agreed in writing between the Parties.

4. Water Tank

The Owner covenants and agrees that:

- (a) prior to the occupation of any Dwelling, a water tank with a minimum capacity of 2,000 litres must be installed for such Dwelling and:
 - (i) be plumbed to the toilet; and
 - (ii) made available for garden irrigation

to the satisfaction of Council.

5. Stormwater

The Owner covenants and agrees that:

- (a) Stormwater must be accommodated within the drainage reserve on the Subject Land to the satisfaction of Council; and
- (b) Stormwater will flow from the portion of Catchment O which located to the west and north west of the Subject Land as illustrated in the plan at Schedule 3 of this Agreement;

to the satisfaction of Council.

6. Open Space Contribution

In the event that the Wonthaggi North East PSP is approved and specifies a Public Open Space Contribution of less than five percent (5%), Council covenants and agrees that any over-contribution of Public Open Space Contribution in respect of the portion of the Subject Land that has been subdivided, up until the date of approval of the Wonthaggi North East PSP, will be repaid to the Owner of any Balance Lot within 28 Business Days of the gazettal of the amendment to the Planning Scheme which implements the Wonthaggi North East PSP and Wonthaggi North East DCP.

7. Single Dwelling Restriction

The Owner covenants and agrees that:

- (a) with the exception of land marked out as a Super Lot,
 - (i) the Residential Lots must not be further subdivided; and
 - (ii) each Residential Lot must not contain more than one Dwelling at any one time.

8. Infrastructure Projects and Specified Infrastructure Projects

8.1 Infrastructure Projects

At Council's absolute discretion, the Owner,

- (a) may construct or cause to be constructed an Infrastructure Project and receive a Credit, for the value of that Infrastructure Project against the obligation to pay the Development Infrastructure Levy provided that Council, in its absolute discretion agrees in writing;
- (b) if constructing an Infrastructure Project must construct or cause to be constructed such project in accordance with Clause 8 of this Agreement; and
- (c) will be entitled to a Credit in accordance with Clause 15 of this Agreement.

8.2 Construction of Infrastructure Project or Specified Infrastructure Project

Where an Infrastructure Project is being constructed in accordance with Clause 8.1 of this Agreement or a Specified Infrastructure Project is being constructed, the Owner must construct the Infrastructure Project or Specified Infrastructure Project:

- (a) in accordance with the Designs approved by Council under Clause 8.6; and
- (b) to the satisfaction of Council in its capacity as the Development Agency.

8.3 Time for Completion of Infrastructure Project or Specified Infrastructure Project:

Where an Infrastructure Project is being constructed in accordance with Clause 8.1 of this Agreement or a Specified Infrastructure Project is being constructed, Council in its capacity as Responsible Authority may refuse to issue a Statement of Compliance for a Stage until the Infrastructure Project or Specified Infrastructure Project required for the development of that Stage is completed to the satisfaction of Council.

8.4 Obligation to complete Infrastructure Projects or Specified Infrastructure Projects once commenced

Once the Owner commences construction works associated with an Infrastructure Project or Specified Infrastructure Project, the Owner must complete the Infrastructure Project or Specified Infrastructure Project to the satisfaction of Council regardless of

whether the total cost of completing the Infrastructure Project exceeds the Specified Value of the Infrastructure Project or Specified Infrastructure Projects Credit.

8.5 Specified Value of an Infrastructure Project and Specified Infrastructure Projects Value

The Parties to this Agreement covenant and agree that the Specified Value of an Infrastructure Project and Specified Infrastructure Project Value is a fixed amount subject only to Indexation in accordance with this Agreement.

8.6 Design of Infrastructure Projects or Specified Infrastructure Projects

Where an Infrastructure Project is being constructed in accordance with Clause 8.1 of this Agreement or a Specified Infrastructure Project is being constructed, the Owner covenants and agrees that:

- (a) the Owner must, at the full cost of the Owner, prepare the Designs of the Infrastructure Projects or Specified Infrastructure Projects and submit the Designs to Council and any other relevant authorities for approval prior to the commencement of the Infrastructure Project or Specified Infrastructure Projects;
- (b) approval of the Designs will be reflected in a set of plans and specifications endorsed by Council as the Approved Plans;
- (c) the Owner must obtain all necessary permits and approvals for the Infrastructure Projects or Specified Infrastructure Projects; and
- (d) prior to awarding any contract for the Infrastructure Projects or Specified Infrastructure Projects, the Owner must submit to Council for approval to the satisfaction of Council:
 - (i) a copy of the terms and conditions of the contract to be awarded; and
 - (ii) a copy of the proposed construction program.

8.7 Variation of Approved Plans

The Owner covenants and agrees that upon the approval of the Designs there will be no further variations to the Approved Plans without the prior written consent of Council in its capacity as Development Agency.

8.8 Construction of Infrastructure Projects or Specified Infrastructure Projects

In carrying out the Infrastructure Projects or Specified Infrastructure Projects:

- (a) the Owner is responsible for all design and construction risks in relation to the Infrastructure Projects and Specific Infrastructure Projects; and

- (b) the Owner agrees to release Council from liability to pay any costs beyond the Specified Value of the Infrastructure Project or the Specified Infrastructure Projects Value.

8.9 Maintenance of Infrastructure Projects or Specified Infrastructure Projects

Upon completion of an Infrastructure Project or any stage of it as specified in this Agreement or a Specified Infrastructure Project, the Owner must maintain the Infrastructure Project or the Specified Infrastructure Project for the duration of the Maintenance Period to the satisfaction of Council in its capacity as Development Agency in accordance with this Agreement.

8.10 Certificate of Practical Completion

Where an Infrastructure Project is constructed in accordance with Clause 8.1 of this Agreement or a Specified Infrastructure Project is being constructed, Council agrees that it will issue a Certificate of Practical Completion for an Infrastructure Project or Specified Infrastructure Project when the Infrastructure Project or Specified Infrastructure Project, or any stage of it as specified in this Agreement, has been completed to the satisfaction of Council in its capacity as Development Agency subject to Clause 8.11 of this Agreement.

8.11 Construction Procedures

The Parties agree that:

- (a) upon the completion of an Infrastructure Project or Specified Infrastructure Project, the Owner must notify Council and any other relevant authority;
- (b) within 10 Business Days of receiving notice of the completion of an Infrastructure Project or Specified Infrastructure Project from the Owner, Council must inspect the Infrastructure Project or Specified Infrastructure Project and determine whether to issue the Certificate of Practical Completion;
- (c) if the Infrastructure Project or Specified Infrastructure Project requires approval from any other relevant authority, the Owner will obtain such approvals;
- (d) if Council is not satisfied with the Infrastructure Project or Specified Infrastructure Project, Council may refuse to issue a Certificate of Practical Completion provided Council:
 - (i) identifies in what manner the Infrastructure Project or Specified Infrastructure Project is not satisfactorily completed; and
 - (ii) what must be done to satisfactorily complete the Infrastructure Project or Specified Infrastructure Project;
- (e) before accessing land owned by Council or a third party for the purpose of constructing an Infrastructure Project or Specified Infrastructure Project or undertaking any maintenance or repair of defects in respect of the Infrastructure Project or Specified Infrastructure Project in accordance with this Agreement,

the Owner must satisfy Council or if requested by a third party that person, that the Owner has:

- (i) consent of the owner of land to access such land;
 - (ii) satisfied any condition of such consent; and
 - (iii) in place all proper occupational health and safety plans as may be required under any law of the State of Victoria;
- (f) subject to the Owner satisfying any conditions of consent to access land owned by Council, Council will provide all reasonable access as may be required to its land in order to enable an Infrastructure Project or Specified Infrastructure Project to be completed, maintained or repaired in accordance with the Approved Plans.
- (g) Council may, notwithstanding a minor non-compliance, determine to issue a Certificate of Practical Completion if Council in its capacity as Development Agency is satisfied that the proper construction of the Infrastructure Project or Specified Infrastructure Project can be secured or otherwise guaranteed to its satisfaction.

8.12 Standard of Work

In addition to any other requirement in this Agreement, the Owner agrees that all work for an Infrastructure Project or Specified Infrastructure Project must:

- (a) accord with the Approved Plans unless otherwise agreed in writing by Council;
- (b) be fit and structurally sound, fit for purpose and suitable for its intended use;
- (c) comprise best industry practice to the extent required by the Approved Plans;
- (d) not encroach upon any land other than the land shown in the Approved Plans; and
- (e) comply with any relevant current Australian Standards unless otherwise agreed in writing by Council in its capacity as Development Agency.

8.13 Obligations following Certificate of Practical Completion

Following the issue of a Certificate of Practical Completion for an Infrastructure Project or Specified Infrastructure Project, the Owner:

- (a) must provide Council with a copy of any maintenance information, operational manual or other material which is reasonably required for the ongoing operation and maintenance of the Infrastructure Project or Specified Infrastructure Project;
- (b) must provide Council with a copy of any certificate, consent or approval required by any authority for the carrying out, use or occupation of the Infrastructure Project or Specified Infrastructure Project; and

- (c) is responsible for the maintenance of the Infrastructure Project or Specified Infrastructure Project in good order, condition and repair to the satisfaction of Council until the end of the Maintenance Period or the transfer of the land containing the Infrastructure Project or Specified Infrastructure Project or the transfer of the Infrastructure Project or Specified Infrastructure Project in accordance with clause 8.14 whichever is the later.

8.14 Time for transfer or vesting of Infrastructure Project or Specified Infrastructure Project

- (a) Upon the satisfactory construction of an Infrastructure Project or Specified Infrastructure Project to the satisfaction of Council and the issuing of the Certificate of Practical Competition, the Owner must transfer to or vest the Infrastructure Project or Specified Infrastructure Project in Council.

8.15 Transfer or vesting of Infrastructure Project or Specified Infrastructure Project

Where an Infrastructure Project or Specified Infrastructure Project is constructed in accordance with Clause 8.1 of this Agreement and subject to Clause 8.14, the Owner must transfer to or vest in Council any Infrastructure Project or Specified Infrastructure Project:

- (a) free of all encumbrances, except as agreed by Council; and
- (b) in a condition that is to the satisfaction of Council in its capacity as Development Agency.

9. Bank Guarantee

9.1 Bank Guarantee

The Owner agrees that:

- (a) prior to the issue of a Statement of Compliance for the relevant Stage of the subdivision of the Subject Land in which an Infrastructure Project or Specified Infrastructure Project is delivered, the Owner must provide Council with a Bank Guarantee equating to five per cent (5%) of the Specified Value of the Infrastructure Project in respect of that Infrastructure Project or Specified Infrastructure Project;
- (b) if the Owner fails to comply with a written direction from Council to undertake maintenance to an Infrastructure Project or Specified Infrastructure Project, Council may at its absolute discretion use the Bank Guarantee to correct any defects;
- (c) if the Council uses the Bank Guarantee to correct any defects pursuant to clause 9.1(b) of this Agreement, the defects period resets in accordance with the timeframes at Schedule 2 of this Agreement; and

- (d) the Bank Guarantee will be returned to the Owner after the Maintenance Period, less any amount applied to correcting any defects in the Infrastructure Project or Specified Infrastructure Project.

10. Standard of Works

The Owner covenants to comply with the requirements of this Agreement and to complete all works required by this Agreement as expeditiously as possible at its own cost and to the satisfaction of the Council.

11. Council Access

11.1 Council Access

- (a) The Owner covenants to allow the Council and its officers, employees, contractors or agents or any of them, to enter the Land (at any reasonable time) to assess compliance with this Agreement.
- (b) The Council acknowledges that it will provide the Owner with two Business Days' notice in accordance with Clause 25 of this Agreement.

12. Indemnity

The Owner covenants to indemnify and keep the Council, its officers, employees, agents, workmen and contractors indemnified from and against all costs, expenses, losses or damages which they or any of them may sustain incur or suffer or be or become liable for or in respect of any suit action proceeding judgement or claim brought by any person arising from or referable to this Agreement or any non-compliance with this Agreement where any such suit action proceeding judgement or claim arises from or is found by any Court or Tribunal to be attributable to any act, omission or failure to act by the Owner, its officers, employees, agents, workmen and contractors.

13. Community Infrastructure Levy

The Owner acknowledges that a Community Infrastructure Levy is payable to the Council in relation to each Dwelling constructed as part of the Development of the Subject Land.

The Parties covenant and agree that:

- (a) prior to the issue of an Occupancy Permit in respect of a Dwelling, the Owner must pay the Community Infrastructure Levy in respect of that Dwelling pursuant to Schedule 1 to this Agreement;

- (b) the contribution is to be paid into a community development levy reserve account for the future provision of community facilities in the vicinity of the Development as though the payment was made under part 3B of the Act;
- (c) if the Community Infrastructure Levy is not paid by time an Occupancy Permit issues, it will until paid, accrue interest at the rate being the penalty rate prescribed in the *Penalty interest Rates Act 1983*; and
- (d) the Community Infrastructure Levy and any interest which accrues on it will be a debt by the Owner to Council until paid.

Council acknowledges that payment of the Community Infrastructure Levy represents a discharge by the Owner of any Obligation to pay any further levy imposed for the purposes of community infrastructure as set out at part 3B of the Act.

14. Project Land

14.1 Time for transfer or vesting of Project Land

Upon the satisfactory construction of the Infrastructure Project or Specified Infrastructure Project and at the issuing of a Certificate of Practical Completion to the satisfaction of Council the Owner must transfer to or vest the Project Land in Council unless otherwise agreed to in writing by the Council, at its absolute discretion.

14.2 Transfer or vesting of Project Land

Where an Infrastructure Project is constructed in accordance with Clause 8.1 of this Agreement or a Specified Infrastructure Project is constructed and subject to Clause 14.1 of this Agreement, the Owner must transfer to or vest in Council the Project Land:

- (a) free of all encumbrances, including any structure, debris, waste, refuse and contamination, except as agreed by Council; and
- (b) in a condition that is to the satisfaction of Council in its capacity as development agency.

14.3 Value for Project Land

Where an Infrastructure Project is constructed in accordance with Clause 8.1 of this Agreement or a Specified Infrastructure Project that includes Project Land is constructed, the Owner covenants and agrees that:

- (a) the Value of the Project Land:
 - (i) is defined in the Wonthaggi North East DCP;
 - (ii) is to be revised annually by a registered valuer based on the Public Land Equalisation Method for each lot that includes land for an

Infrastructure Project in accordance with the Wonthaggi North East DCP;

- (iii) is deemed to include all transfer costs, costs of plans of subdivision, registration fees and the like and any other amount specifically agreed to in writing by Council;
 - (iv) replaces the market value and any other method of calculating compensation payable to a person under the *Land Acquisition and Compensation Act 1986* and the Act in respect of the Project Land; and
- (b) upon payment being made in accordance with this Agreement whether as a monetary amount or by a Credit in respect of the Specified Value, no other compensation is payable for the effect of severance or for solatium as those terms or concepts are understood in the context of the *Land Acquisition and Compensation Act 1986* or for any other category of or form of loss or compensation in respect of the Project Land.

15. Credits

15.1 Credit

Where an Infrastructure Project is constructed in accordance with Clause 8.1 of this Agreement or a Specified Infrastructure Project is constructed, the Parties agree that:

- (a) the Owner will be entitled to a Credit for the Specified Value of an Infrastructure Project or Specified Infrastructure Project Value upon the issue of a Certificate of Practical Completion for the Infrastructure Project or Specified Infrastructure Project;
- (b) the Owner will be entitled to a Credit for the Value of Project Land and Wetland and Retarding Basin Land upon the transfer or vesting of Project Land in Council unless otherwise expressly agreed to in writing by the Responsible Authority;
- (c) where the Owner is entitled to a Credit, Council will provide the Owner the Specified Value or the Specified Infrastructure Project Value as a Credit in accordance with clause 15.2 and clause 15.3.

15.2 Timing for Credit

Council will apply the Credit against the Owner's Development Infrastructure Levy obligations under this Agreement upon the latter of:

- (a) the issue of a Certificate of Practical Completion for a Specified Infrastructure Project or Infrastructure Project;
- (b) if applicable, the vesting of Project Land in the Responsible Authority in accordance with Clause 14 of this Agreement;

- (c) the Owner's completion of all Infrastructure Projects and Specified Infrastructure Projects required to be carried out under this Agreement in relation to that stage of subdivision in the development of the Subject Land.

15.3 Rollover of Credit

The Parties agree that, if the Owner is entitled to a Credit:

- (a) Council may at its absolute discretion, and with the Agreement of both Parties, apply such Credit towards a Development Infrastructure Levy for any other parcel of land which is covered by the Development Contributions Plan and owned by the Owner;
- (b) if a Credit is to be applied to any other land parcel under clause 15.3(a), the Parties agree to use their best endeavours to amend this Agreement or enter into a new agreement containing substantially the same terms as appropriate as this Agreement, save that it:
 - (i) applies to the certificate of title of that other land; and
 - (ii) reflects the Infrastructure Projects that remain to be completed by the Owner.

15.4 Accrual of Credit

Any Credit accrued in accordance with this Agreement will be deducted from the total value of the Development Infrastructure Levy as set out in Schedule 1 to this Agreement.

15.5 Exhaustion of Credit

When the amount of the Development Infrastructure Levy payable in relation to a Stage exceeds the amount of the Credit remaining

- (a) Council must notify the Owner in writing that the Credit has been exhausted;
- (b) in relation to the Stage, the Owner must pay in cash an amount equal to the amount of the Development Infrastructure Levy payable in relation to that Stage that exceeds the amount of the Credit remaining prior to the issue of a Statement of Compliance; and
- (c) in relation to subsequent Stages, the Owner must pay the Development Infrastructure Levy in cash prior to the issue of a Statement of Compliance for each Stage or as otherwise agreed by Council.

16. Localised Infrastructure

16.1 Localised Infrastructure Projects

The Parties acknowledge that:

- (a) this Agreement is intended to relate only to the Infrastructure Projects identified in Wonthaggi North East PSP and Wonthaggi North East DCP, not Localised Infrastructure; and
- (b) compliance with the obligations in this Agreement does not relieve the Owner of any obligations imposed by Council or a Tribunal to provide Localised Infrastructure which may be imposed as a requirement of a planning permit for subdivision or development of the Subject Land.

17. Non-compliance

If the Owner has not complied with this Agreement within 30 Business Days after the date of service on the Owner by the Council of a notice which specifies the Owner's failure to comply with any provision of this Agreement, the Owner covenants:

- (a) to allow the Council its officers, employees, contractors or agents to enter the Land and rectify the non-compliance;
- (b) to pay to the Council on demand, the Council's reasonable costs and expenses ("**Costs**") incurred as a result of the Owner's non-compliance;
- (c) to pay interest at the rate of 2% above the rate prescribed under section 2 of the *Penalty Interest Rates Act 1983* on all moneys which are due and payable but remain owing under this Agreement until they are paid in full;
- (d) if requested to do so by the Council, to promptly execute in favour of the Council a mortgage to secure the Owner's obligations under this Agreement, and the Owner agrees:
 - (i) to accept a certificate signed by the Chief Executive Officer of the Council (or any nominee of the Chief Executive Officer) as prima facie proof of the Costs incurred by the Council in rectifying the Owner's non-compliance with this Agreement;
 - (ii) that any payments made for the purposes of this Agreement shall be appropriated first in payment of any interest and any unpaid Costs of the Council and then applied in repayment of the principal sum;
 - (iii) that all Costs or other monies which are due and payable under this Agreement but which remain owing shall be a charge on the Land until they are paid in full; and

- (e) if the Owner executes a mortgage as required by clause 17.1(d), any breach of this Agreement is deemed to be a default under that mortgage.

If the Council seeks to enter the land and rectify any non-compliance, the Council acknowledges that it will give the Owner two Business Days' notice in accordance with Clause 25 of this Agreement.

18 Indexation

The Parties agree that the capital cost of all Infrastructure Projects and Specified Infrastructure Projects are subject to Indexation on 1 July each year after the Commencement of this Agreement in accordance with this Agreement will be adjusted on a compound basis on 1 July each year after the commencement of this Agreement by reference to the Index, up until the date of the completion of the Specified Infrastructure Project or Infrastructure Project.

19. Existing Agreement

The Parties agree to remove and end the Existing Agreements in accordance with the Act in so far as they relate to the Subject Land.

20. GST

- 20.1 In this clause words that are defined in the GST Act have the same meaning as their definition in that Act.
- 20.2 Except as otherwise provided by this clause, all consideration payable under this Agreement in relation to any supply is exclusive of GST.
- 20.3 If GST is payable in respect of any supply made by a supplier under this Agreement, subject to clause 20.4 the recipient will pay to the supplier an amount equal to the GST payable on the supply at the same time and in the same manner as the consideration for the supply is to be provided under this Agreement.
- 20.4 The supplier must provide a tax invoice to the recipient before the supplier will be entitled to payment of the GST payable under clause 20.3.

21. Further obligations

21.1 Notice and registration

The Owner will bring this Agreement to the notice of all prospective purchasers, Mortgagees, lessees, charges, transferees and assigns of the Subject Land.

21.2 Giving effect to this Agreement

The Owner will do all things necessary to give effect to this Agreement, including executing any further documents and will comply with its obligations under this Agreement.

21.3 Recording by Registrar of Titles

The Owner will consent to Council making application to the Registrar of Titles to make a recording of this Agreement in the Register on the Certificate of Title of the Subject Land in accordance with s181 of the Act and do all things necessary to enable Council to do so including signing any further agreement, acknowledgement or document or procuring the consent to this Agreement of any Mortgagee or caveator to enable the recording to be made in the Register under that section.

22. Agreement under Section 173 of the Act

22.1 Agreement under the Act

Council and the Owner agree without limiting or restricting their respective powers to enter into this Agreement and, insofar as it can be so treated, this Agreement is made pursuant to section 173 of the Act.

23. Owner's warranties

23.1 Owner's warranties

Without limiting the operation or effect which this Agreement has, the Owner warrants that apart from the Owner and any other person which has consented in writing to this Agreement, no other person has any interest, either legal or equitable, in the Subject Land which may be affected by this Agreement.

24. Successors in title

24.1 Successors in title

Without limiting the operation or effect which this Agreement has, the Owner must ensure that until such time as a memorandum of this Agreement is registered on the title to the Subject Land, successors in title shall be required to:

- (a) give effect to and do all acts and sign all documents which will require those successors to give effect to this Agreement; and
- (b) execute a deed agreeing to be bound by the terms of this Agreement.

25. Notices

25.1 Service

A notice or other communication required or permitted to be served by a Party on another Party must be in writing and may be served:

- (a) by delivering it personally to that Party;
- (b) by sending it by prepaid post addressed to that Party at the address set out in this Agreement or subsequently notified to each Party from time to time; or
- (c) by sending it by facsimile provided that a communication sent by facsimile shall be confirmed immediately in writing by the sending Party by hand delivery or prepaid post.

25.2 Time of service

A notice or other communication is deemed served:

- (a) if delivered, on the next following Business Day
- (b) if posted, on the expiration of six Business Days after the date of posting, or
- (c) if sent by facsimile, on the next following Business Day unless the receiving Party has requested retransmission before the end of that Business Day.

26. Alternative Dispute Resolution

26.1 Referral to VCAT

In the event of any dispute between the parties concerning the interpretation or implementation of this Agreement, that dispute must be referred to VCAT for resolution to the extent permitted by the Act. In the event of a dispute concerning any matter which is not referable to VCAT pursuant to the Act, that matter will be referred for arbitration agreed upon in writing by the parties, or, in the absence of agreement, the Chairman of the Victorian Chapter of the Institute of Arbitrators, Australia, or his nominee, for arbitration.

26.2 Section 149 of the Act

Wherever provision is made in this Agreement that any matter be done to the satisfaction of the Council or any of its officers or any public authority and a dispute arises in relation to that matter, the dispute will be referred to VCAT in accordance with Section 149 of the Act.

26.3 Legal Representation

The parties will be entitled to legal representation for the purposes of any arbitration or referral referred to in sub-clauses 26.1 and 26.2 and, unless the Arbitrator, Chairman, Nominee or VCAT otherwise directs, each party will bear its own costs in relation to it.

27. Miscellaneous

27.1 Commencement of Agreement

Unless otherwise provided in this Agreement, this Agreement commences on the earlier of the following dates:

- (a) from the date of this Agreement; or
- (b) from the date this Agreement is recorded in the Register of Titles by the Registrar of Titles on the certificate of title of the Subject Land.

27.2 Default

- (a) If the Owner fails to comply with the provisions of this Agreement, Council may serve a notice on the Owner specifying the works, matters and things in respect of which the Owner is in default.
- (b) If the alleged default continues for 30 Business Days after the service of such notice, Council may, by its officers, employees, agents and contractors, enter the Subject Land and ensure that the works, matters and things are carried out. Council will give the Owner two Business Days' notice in accordance with Clause 25 of this Agreement.
- (c) The costs incurred by the Council in undertaking the works as a result of the Owner's default will be payable by the Owner.

27.3 Ending of Agreement

With the exception of the obligations at Clause 4 and 7 of this Agreement, this Agreement ends,

- on the date that the Council, at the request of the Owner pursuant to this clause, issues a letter confirming that the Owner has complied with all of its other obligations under this Agreement; or
- otherwise in accordance with the Act.

The obligations at Clause 4 and 7 of this Agreement will continue indefinitely.

27.4 Multiple lots

If this Agreement relates to more than one lot and the Owner of that lot has complied with all of the obligations in relation to that lot, the Owner of that lot may request Council to end this Agreement in relation to that lot.

27.5 Application to Registrar

As soon as reasonably practicable after the Agreement has ended, Council will, at the request and at the cost of the Owner make application to the Registrar of Titles under s183(2) of the Act to cancel the recording of this Agreement on the register.

27.6 No fettering of Council's powers

It is acknowledged and agreed that this Agreement does not fetter or restrict the power or discretion of Council to make any decision or impose any requirements or conditions in connection with the granting of any planning approval or certification of any plans of subdivision applicable to the Subject Land or relating to any use or development of the Subject Land.

27.7 No waiver

Any time or other indulgence granted by Council to the Owner or any variation of the terms and conditions of this Agreement or any judgment or order obtained by Council against the Owner will not in any way amount to a waiver of any of the rights or remedies of Council in relation to the terms of this Agreement.

27.8 Severability

- (a) If a court, arbitrator, tribunal or other competent authority determines that a word, phrase, sentence, paragraph or clause of this Agreement is unenforceable, illegal or void then it must be severed and the other provisions of this Agreement will remain operative.
- (b) Clause 27.8(a) will not apply if to do so will materially affect the commercial arrangement formed by this Agreement.

27.9 Proper law

This Agreement is governed by and the Owner submits to the laws of the State of Victoria.

Schedule 1

Levy	Amount per Net Developable Hectare	Total
Development Infrastructure Levy	\$104,724.40 per Net Developable Hectare	\$4, 311,398.82

Levy	Amount per Dwelling	Total
Community Infrastructure Levy	\$1,150.00 per new Dwelling	N/A

AT8231

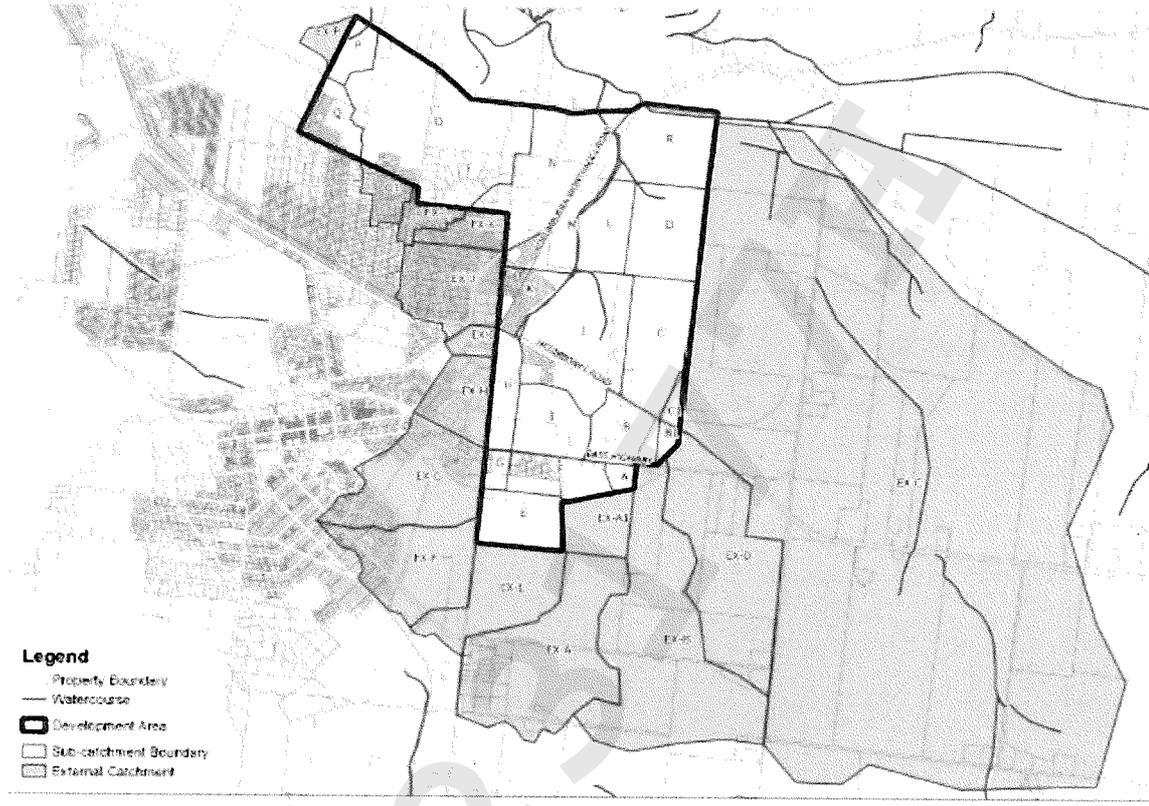
Schedule 2

Maintenance Periods		
Infrastructure	Landscape	Water Sensitive Urban Design
12 month	24 months	24 months

AT823177

Schedule 3

New Catchment Plan here



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Scale in metres (1:20000) @ A3
 Map prepared by: ENGENY
 19/03/2021
 15:32

Wonthaggi North PSP Drainage

External Catchments Draining into Development Area

Signing page

Executed as a deed

The COMMON SEAL of BASS COAST
SHIRE COUNCIL was affixed on 25/11/20)
in the presence of:)
)



Ali Wastie

Ali Wastie
Chief Executive Officer

AT823177E

Executed by Wentworth Pty Ltd

in accordance
with section 127 of the *Corporations
Act 2001* (Cth) by:

Keith Donohue

Signature of Director

Signature of Director/Company Secretary

KEITH DONOHUE

Full name (print)

Full name (print)

AT8231718