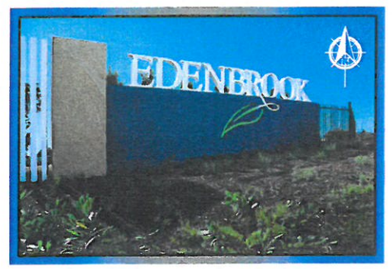

LOT 1
SP252938

254

BELMONT ROAD

EDENBROOK DRIVE

stage 9

253

253

LOT 253 & 254
SP41210

253

BELMONT ROAD

254

MCLAUGHLIN STREET

LOT 1
SP258300

0 1:7500 HORZ. 150

DATUM MGA94 ZONE 56; LEVELS AHD

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06-02-18
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FIGURE 1098-ROL1: Property Description
19/01/18 Rev 3

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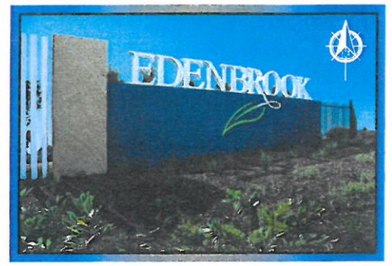
LEGEND EASEMENTS:

SEWER EASEMENT

SEWER & STORM WATER (ROOF WATER)

ROAD RESERVE



EDENBROOK DRIVE

PARKDALE TERRACE

SANDFORD AVE

WIRRAWAY DRIVE

96 828m2

175 865m2

174 880m2

173 880m2

172 1223m2

177 863m2

179 989m2

180 1336m2

181 800m2

182 1200m2

184 1118m2

191 1436m2

202 1000m2

203 1001m2

207 1338m2

208 800m2

209 1200m2

210 928m2

STAGE 9A

STAGE 9B

LOT 253 SP241210

LOT 254 SP241210

STAGE 9

PART PLAN OF LOTS 253 & 254 SP241210
NTS

0 1:1000 HORZ. 20

DATUM MGA94 ZONE 56; LEVELS AHD

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FIGURE 1098-ROL2: Proposal Plan
19/01/18 Rev 3

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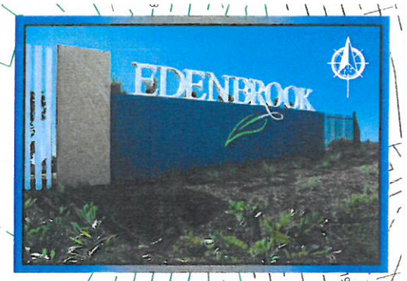

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EDENBROOK DRIVE
SANDFORD AVE (16/7.5)
PARKDALE TERRACE (18/7.5)
WIRRAWAY DRIVE
PADMOUNT SITE

96 177 202 203 179 175 207 180 174 208 173 181 209 172 182 210 184 191

1 2 3

LEGEND

- 150Ø WATER MAIN; CONNECTION TO LOT (W); HYDRANT(H); VALVE (V)
- UNDERGROUND ELECTRICAL, ALLOTMENT SERVICE TURRET (E), STREET LIGHT (70W)
- SEWER; MANHOLE,
- INTER-ALLOTMENT ROOF WATER DRAINAGE PIT & PIPE
- ROAD GULLY PIT & DRAINAGE PIPE
- 7.5/16 — NOM PAVEMENT WIDTH/ROAD RESERVE WIDTH
- CONNECTION TO EXIST SERVICES (COLOUR CODED)
- 1 — LEGAL POINT OF DISCHARGE/OUTLET
- EXISTING SERVICES SHOWN GREYED

0 1:1000 HORZ 20

DATUM MGA94 ZONE 56; LEVELS AHD

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FIGURE 1098-ROL3: Preliminary Infrastructure Details

19/01/18 Rev 3

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1. REFERENCES STORM WATER MANAGEMENT & HEALTHY WATERWAY REQUIREMENTS

The site based storm water management plan has been based on the following publications and guidelines:

- Healthy Waters Music Modeling Guidelines (HWMMG).
- State Planning Policy April 2016 (SPP)
- Queensland Urban Drainage Manual (QUDM)
- Water Sensitive Urban Design (WSUD)
- Storm water quality improvement devices are referred to as SQUID's.

2. OPPORTUNITIES, CONSTRAINTS & PRECEDENTS

The type of development complies with the Council standards for Residential subdivisional works. This development is the continuation of a staged development.

The principal pollutants likely to be generated from the site development will be hydrocarbons, metals, sediment and nutrients such as nitrogen and phosphorus fixed to the sediments.

- This development is part of a staged development. Existing downstream stages have either been constructed, are being constructed or approved for construction. Part of this stage connects to the existing downstream drainage system with previously constructed and approved storm water improvement devices (SQUID's) and has been included in the treatment capacities of the existing SQUID's;
- The existing downstream developments include underground storm water drainage collection systems that have been sized for a 1 in 10 year design storm and incorporate in-line SQUIDs sized for the ultimate catchment area(s);
- Road and allotment layout and sizing, soil types and functionality requirements precludes the practical and feasible use of above ground in-line and end of line SQUIDs (vegetated swales; bioretention beds; wetlands) installed in the road verge area;
- Current best practice policies in Queensland generally acknowledge that other than for small selected infill developments or specific isolated areas such as the central area of large roundabouts, the use of above ground SQUIDs (vegetated swales; bioretention beds) located within the road reserves, generally in the road verge area, are not a long term successful option and are high long term maintenance;
- Council can adopt and set storm water quality targets different to the those recommended in the State Planning Policy if considered more appropriate to the the site and available opportunities and constraints; and
- The storm water management strategy proposed for these current stages is the continuation of the same adopted and approved by Council for the existing constructed stages. Outlet/area 2 has already been included in the treatment provided for the constructed downstream stages.

3. RECEIVING WATERS

The nominated receiving waterway is Ramsay Creek. Although some infiltration of storm water is likely to occur at the site, use of groundwater does not occur downstream of the site. Consequently, only surface water Environmental Values (EVs) and water quality objectives (WQOs) have been identified.

4. PROPOSED STORM WATER TREATMENT

After consideration of the available opportunities & constraints, the treatment train will be the same as has been adopted and approved by Council for the downstream stages:

- In line SQUIDs within the pipe drainage system for gross pollutant, sediment and nutrient removal.

In accordance with SPP Appendix 3's AO1.1b, this is considered current best practice reflecting land use constraints in this case.

5. PROPOSED STORM WATER TREATMENT EVALUATION & SIZING

The evaluation & sizing of the components proposed and/or adopted for the treatment train has been carried out using the MUSIC Version 6 computer package and 6 minute rainfall for the period from 1 January 1970 to 31 December 2000. The pollutant types and concentrations evaluated for removal are -

- gross pollutants (GP);
- sediments and dissolved soilds, Total Suspended Solids (TSS);
- total dissolved nitogen (TN); and
- total dissolved phosphorus (TP).

All catchments have been modeled as 'Urban Residential' split catchments. The split catchment surface types & associated runoff generation parameters; pollutant concentrations and generation parameters applicable to these type of catchments and surface compositions recommended in Healthy Waters Music Modeling Guidelines have been adopted. Details of these areas are shown in Table 1.

Inline proprietary product SQUID HUMECEPTORS or equivalent have been nominated. The size of the unit(s) has been determined using the manufacturers software package based on a minimum 80% TSS removal rate and associated nitrogen and phosphorus removed being that component 'fixed' to the suspended solids.

6. PERFORMANCE EVALUATION

Details of the catchments applicable to this stage are summarised in Table 1. Details of the SPP suggested target water quality objectives (WQO) for storm water discharging from the site to the receiving waters based on nutrient load reduction are summarised in Table 2. Details of performance of the treatment train measured at the nominated receiving water for the whole of the upstream catchments are summarised in Tables 3 to 5. Tables 3 and 4 provide a comparison between the pre and post development scenario. Table 5 provides details of the post development pollutant load reductions for the proposed treatment train and evaluation in relation to target objectives in Table 2

7. CERTIFICATION

An assessment has been carried out of the impact from this proposed development stage on storm water quality (comparison between pre and post development loads) and the effectiveness of the proposed site water quality management in meeting the suggested SPP water quality standards for storm water management and healthy waterways. Details of the nominated standards, comparison between pre and post development pollutant loads & evaluation of the effectiveness of the proposals in meeting the standards have been provided. This is a stage update to the previously approved management for the whole development. Within the limits imposed by the available opportunities and constraints and existing precedents, the proposed storm water management should provide -

- Treatment comparable to the Council approved proposals for existing constructed stages;
- An acceptable water quality management strategy that is the best achievable, cost effective and within community and sensible expectations.

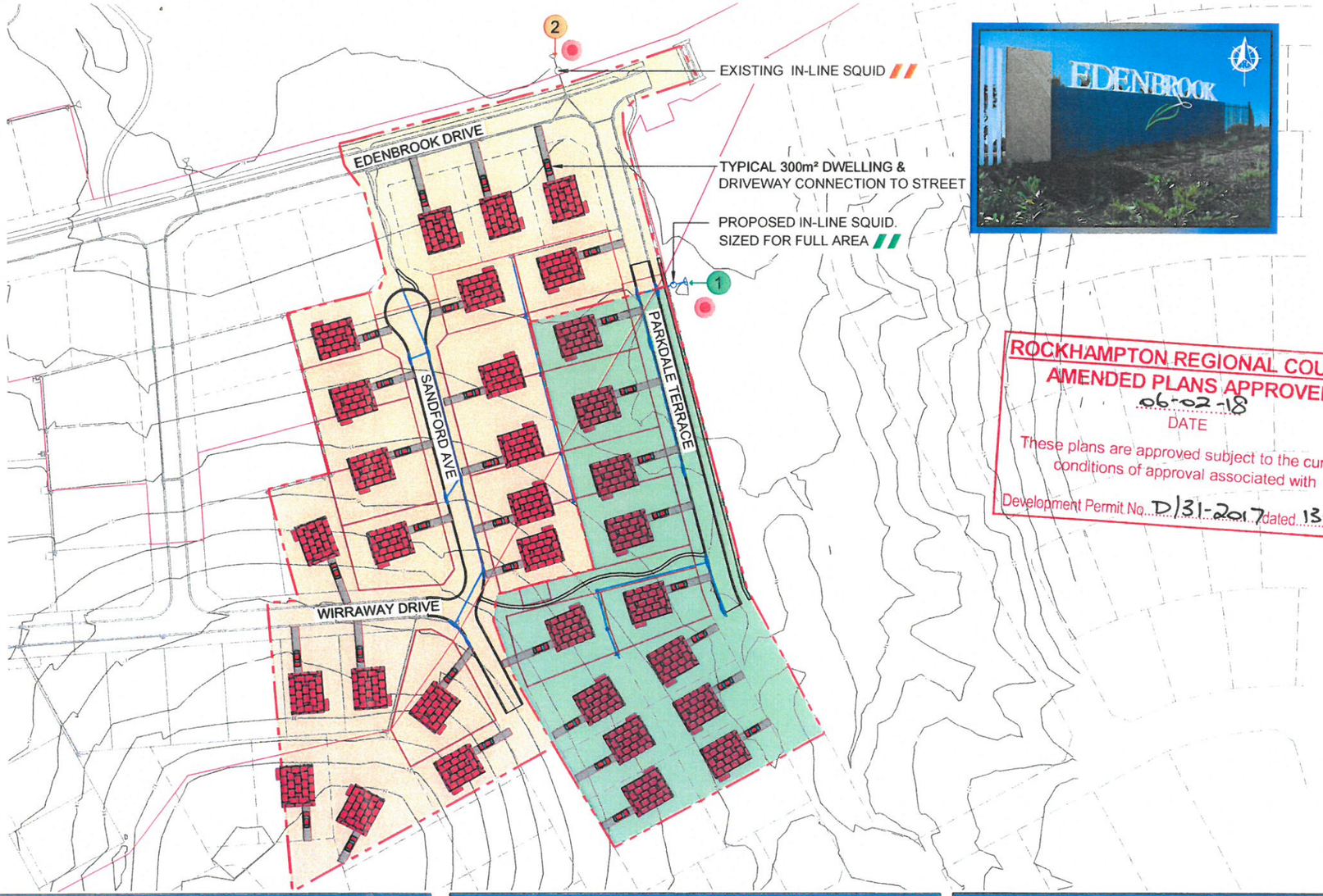

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TABLE 1: DESIGN AREAS (ha) (COLOUR CODED TO MATCH PLAN VIEW)

Outlet	Total	Roof	Roads	Ground level
1	1.639	0.360	0.237	1.042
2	3.200	0.600	0.757	1.843
Total	4.839 (100%)	0.960 (20%)	0.994 (21%)	2.855 (59%)

Outlet (Area) 2 included in capacity & treatment provided for the downstream stage & excluded from the treatment analysis.

TABLE 2: TARGET WATER QUALITY OBJECTIVES (WQO)

	Load Reduction (ref QWQG)
Indicator	% Reduction
Total Suspended Solids (TSS)	85
Total Nitrogen (TN)	45
Total Phosphorus (TP)	60
Litter, Gross Pollutants (GP)	90

TABLE 3: PERFORMANCE EVALUATION - POLLUTANT MEAN CONCs (mg/L)

	TSS		TN		TP	
PRE & POST COMPARISON	PRE	POST	PRE	POST	PRE	POST
At Nominated Receiving Waters combined wet & dry flows	7.99	3.00	0.282	0.565	0.030	0.076

TABLE 4: PERFORMANCE EVALUATION - POLLUTANT MEAN ANNUAL LOAD (kg/yr)

	TSS		TN		TP	
PRE & POST COMPARISON	PRE	POST	PRE	POST	PRE	POST
At Nominated Receiving Waters combined wet & dry flows	828	183	9.02	8.94	1.71	1.11

TABLE 5: PERFORMANCE EVALUATION - POLLUTANT REDUCTION (%)

	TSS	TN	TP	GP
At Nominated Receiving Waters combined wet & dry flows	85	40	40	>90
	Complies with Table 2 frequency requirements.			

LEGEND

- DRAINAGE PIPES AND GULLY PITS
- 1 — LEGAL POINT OF DISCHARGE; DRAINAGE SYSTEM OUTLET
- CONNECTED CATCHMENT
- PORTION OF CATCHMENT THESE STAGES
- NOMINATED RECEIVING WATER NODE

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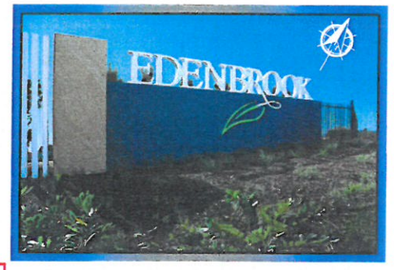
DATUM MGA94 ZONE 56; LEVEL

FIGURE 1098-ROL4: Storm Water Management - Water Quality

19/01/18 Rev 3



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BELMONT ROAD
SPRINGBROOK CLOSE
EDENBROOK DRIVE
NEW HAVEN WAY
MOSSVALE DRIVE
TWINVIEW TERRACE
OAKMONT WAY
SANDFORD AVE
PARKDALE TERRACE
WIRRAWAY DRIVE
HILLTOP RESERVE
MAYSBROOK CT
ASHCROFT CT
RIDGEWOOD TERRACE
PARK 251

Exist. road & pathway - Typical
Stage Number - Typical
Future road & pathway - Typical

0 1:2500 HORZ. 50

DATUM MGA94 ZONE 56; LEVELS AHD

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EMAIL:mail@ngga.com.au

FIGURE 1098-ROL5: Staging Details and Pathway Strategy

19/01/18 Rev 3

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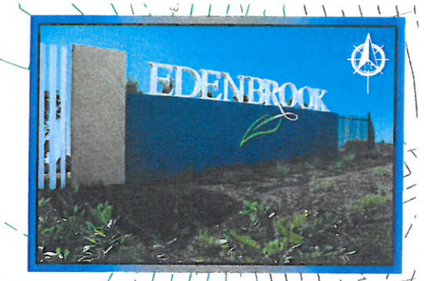

EDENBROOK DRIVE

SANDFORD AVE (16/7.5)

PARKDALE TERRACE (16/7.5)

WIRRAWAY DRIVE

ALLOTMENT COVERING/
VEGETATION - HYDROMULCH

FOOTPATH TURFING

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LEGEND

- HYDROMULCH/CHIP MULCH TO DISTURBED ROAD AND ALLOTMENT AREAS NOT COVERED WITH NEW WORKS
- FOOTPATH TREES. REFER TABLE THIS PLAN
- TURF & FOOTPATH TREATMENT
- S — UNDERGROUND SERVICES (SEWER)
- ROAD/ALLOTMENT DRAINAGE.

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DATUM MGA94 ZONE 56; LEVELS AHD

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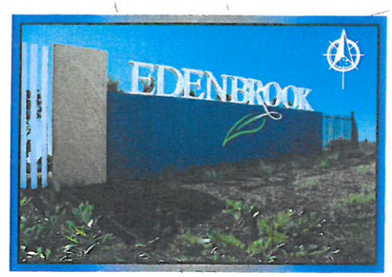
FIGURE 1098-ROL6: Concept Landscaping Plan

19/01/18 Rev 3



LEGEND EASEMENTS

SEWER EASEMENT

SEWER & STORM WATER (ROOF WATER)

ROAD RESERVE

EDENBROOK DRIVE

96 518m2

177 583m2

202 625m2

203 704m2

179 660m2

175 570m2

174 570m2

180 913m2

207 1022m2

208 544m2

173 570m2

181 510m2

209 856m2

172 788m2

182 803m2

210 655m2

184 745m2

191 1059m2

SANDFORD AVE

PARKDALE TERRACE

WIRRAWAY DRIVE

BUILDING ENVELOPE (TYP)

AREA OF ENVELOPE (TYP)

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BUILDING LOCATION ENVELOPE SETBACKS

- FRONT BOUNDARY - 6.0m UNO
- REDUCED FRONT BOUNDARY SETBACK - 4.0m UNO
- SIDE BOUNDARY - 1.5m (REFER NOTE 1. (II))
- REAR BOUNDARY - 2.0m UNO

ANNOTATED AREAS SHOWN WITHIN EACH LOT DENOTES THE RESPECTIVE BUILDING LOCATION ENVELOPE AREA FOR EACH LOT .

ALL SERVICES ARE CLEAR OF THE BUILDING LOCATION ENVELOPES

NOTES

1. ALL SETBACKS TO BUILDINGS OR STRUCTURES ARE TO BE IN ACCORDANCE WITH THE QDC MP 1.2, EXCEPT FOR THE FOLLOWING:-

   (I) ROAD, SIDE, REAR AND / OR ACCESS EASEMENT BOUNDARY SETBACK FOR STRUCTURES ARE AS DEPICTED ON THE PLAN

   (II) SIDE BOUNDARY SETBACKS TO THE OUTERMOST PROJECTION ARE:

   - WHERE THE HEIGHT OF THAT PART IS 4.5M OR LESS - 1.5M
   - WHERE THE HEIGHT OF THAT PART IS GREATER THAN 4.5M BUT NOT MORE THAN 8.5M - 2.0M

2. SITES WITH A GRADIENT GREATER THAN 15% WILL HAVE SPECIAL DESIGN NEEDS
3. SWIMMING POOLS ARE PERMITTED TO BE LOCATED WITHIN THE ROAD AND SIDE / REAR BOUNDARY SETBACK IN ACCORDANCE WITH QDC MP 1.2 REQUIREMENT

DEVELOPMENT CONDITIONS

A. MAXIMUM BUILDING HEIGHT FOR ANY DWELLING IS 7m ABOVE GROUND LEVEL TO THE EAVES AND 9m TO THE HIGHEST POINT ON THE ROOF.

B. NO PART OF THE DWELLING INCLUDING EAVES, MAY BE CONSTRUCTED OUTSIDE THE BUILDING LOCATION ENVELOPE.

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DATUM MGA94 ZONE 56; LEVELS AHD

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FIGURE 1098-ROL7: Building Setback Details

19/01/18 Rev 3

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EDENBROOK STAGES 9A & 9B

Planning & Engineering Report

ROL Application – 14 March 2017

Table of Contents

SECTION A – PLANNING REPORT

SECTION B – ENGINEERING REPORT

Appendix A – Drawings

SECTION A – PLANNING REPORT

1.0 INTRODUCTION

1.1 This report has been prepared to support an application for approval to reconfigure land described as Lot 253 & Lot 254 on SP241210 (having an overall area of 167.92ha) to create 17 new residential lots in two stages and two (2) balance area lots. Previously Stages 1, 2, 3, 4, 6 and 13 have been approved by Council.

1.2 The site is located off Parkdale Terrace and Oakmont Way, Parkhurst (refer page 3 of this report for Figures A and B – Locality Plan and Aerial View and also in Appendix A's FIGURE 1098-ROL1 wherein the outline of Stage 9 is shown to straddle the common boundary of Lots 253 and 254 thus resulting in the slightly unusual two (2) balance area lots.

1.3 The site involves relatively flat land with slopes generally less than 10%. Refer to Section B's Engineering Report's further comments.

1.4 The attached proposal plan FIGURE 1098-ROL2 shows the creation of 17 new lots in the following stages:

- Stage 9A - 11 lots on Sandford Avenue which connects to Wirraway Drive and then to Oakmont Way.
- Stage 9B - 6 lots on the extension of Parkdale Terrace which connects to Edenbrook Drive.

Note that these road names have previously been approved by Council.

1.5 This report addresses the various considerations relevant to the proposal and should be read in conjunction with the SPA application forms.

1.6 The subject land has previously been the subject of a Preliminary Approval overriding the Planning Scheme.

This Preliminary Approval created a number of precincts (eg "Residential Precincts – Conservation Residential" and "Residential Precincts – Traditional Residential".

The subject land is located within the Residential Precincts – Traditional Residential Precinct wherein the proposed subdivision will be subject to code assessment as each of the resultant lots will have areas in excess of 600 square metres.

1.7 The Preliminary Approval specifies that all Planning Policies and Codes of the Rockhampton City Plan gazetted version of August 2005 (and any updates of that version) are applicable to all Reconfiguration of a Lot and Operational Works applications for this land.

2.0 PROPOSED USE

2.1 It is proposed to subdivide two existing allotments into 17 new allotments and two allotments as resulting balance areas. The proposed lot layout appears in Appendix A as FIGURE 1098-ROL2 Proposal Plan and its location within the Edenbrook development is shown on FIGURE 1098-ROL1 Property description.

2.2 Access to the new lots will be from Oakmont Way, Wirraway Drive and Parkdale Terrace.

2.3 All standard infrastructure will be provided to the newly configured allotments, as outlined in the Engineering Section of this report.

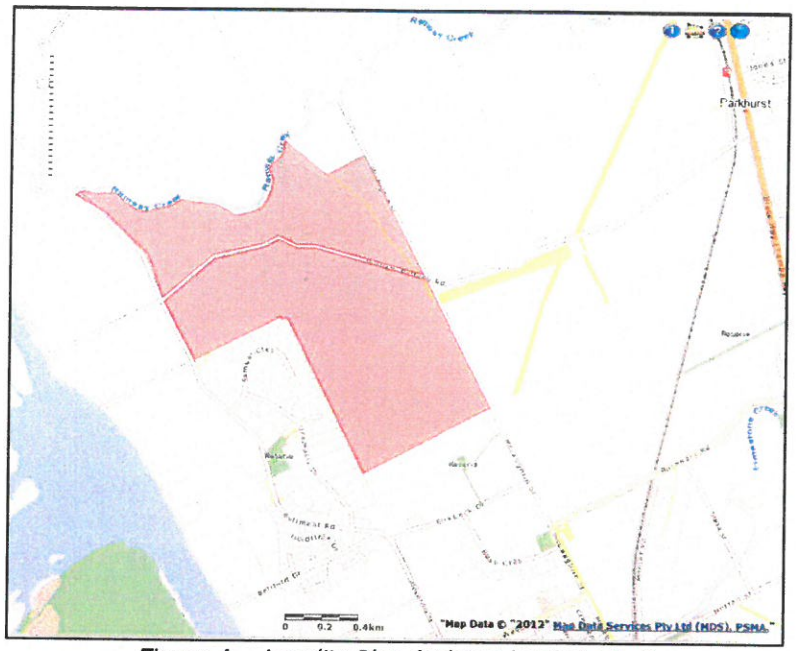

Figure A – Locality Plan (subject land shaded)

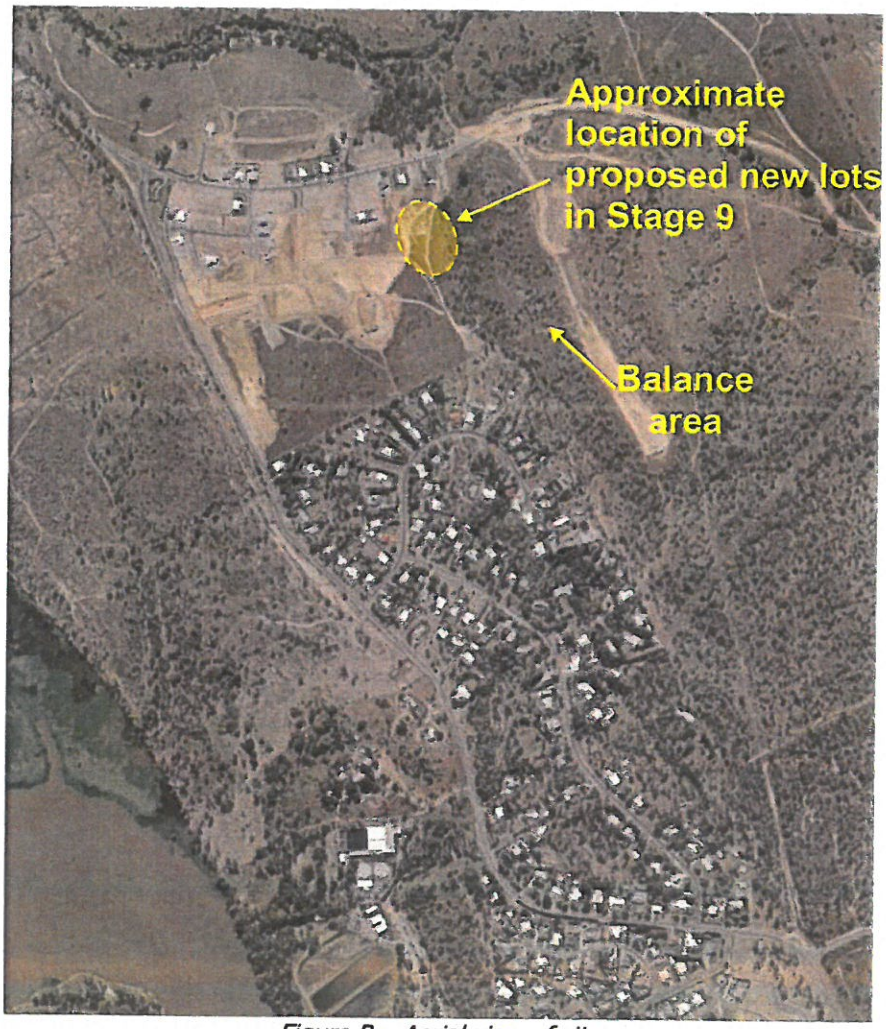

Figure B – Aerial view of site

3.0 COMPLIANCE WITH PLANNING SCHEME CODES

This section addresses the extent of compliance of the proposed development with the various relevant sections of the gazetted version of the August 2005 City Plan (and updates). The approved Preliminary Approval that varies the effect of the applicable planning scheme designates that the proposed subject development is code assessable, with assessment against only the Reconfiguration of a Lot Code required.

3.1 RECONFIGURING A LOT CODE

P1 Minimise need for fossil fuel

RESPONSE: The proposed new lots represent infill of an area approved for urban development rather than further expansion of the urban footprint. The applicable Rockhampton Bike Ways Policy Map does not show the subject land as part of the bikeway network. However pathways were provided in Stages 1, 2, 3 and 4 in accordance with an approved strategy.

This strategy will continue to be applied generally as shown in FIGURE 1098-ROL5 with an extension to the path up Parkdale Terrace off Edenbrook Drive. There is an existing pathway connection to the head of the cul-de-sac of Sandford Avenue. The proposed linking pathway connection between Sandford Avenue and Parkdale Terrace is primarily required as a corridor for high voltage power to allow a padmount transformer to be situated close to Sandford Avenue with a connection to the ringmain unit on the corner of Parkdale Terrace and Edenbrook Drive. The pathway link's secondary role is as a pedestrian connection.

P2 Subdivision is responsive to the characteristics, features, constraints and location of the site.

RESPONSE: The subject land is not in an environmentally sensitive area and so satisfies acceptable solution A2.1.1.

P3 Where subdivision does not create additional allotments, the subdivision provides an improvement to the existing situation.

RESPONSE: Not applicable – new lots are being created.

P4 Neighbourhoods / lots that respond to natural features and identified heritage values

RESPONSE:

A 4.1 The site has an existing waterway parallel and adjacent to Parkdale Terrace; this existing waterway is not being impacted and will remain unchanged.

A 4.2 The area of the proposed lots is well clear of the waterway.

A 4.3 The proposed subdivision does not create an allotment on or within five metres of a dam, pond, lagoon or wetland.

A 4.4 No land is proposed to be dedicated for public open space purposes, in accordance with the approved Preliminary Approval varying the effect of the Planning Scheme. Land has been set aside for this purpose in the Stage 1 approval.

A4.5 The proposed development satisfies the requirements of the Water Quality and Quantity Code (refer engineering submission for further commentary).

P5 Subdivision does not occur in areas of instability, highly visible land or where buildings will be difficult to access.

RESPONSE: The subject land is not mapped as steep or unstable.

P6 Pedestrian Movement

RESPONSE: There is a 'formal' pedestrian path off Edenbrook Drive connecting to the head of Sandford Avenue's cul-de-sac and also in Parkdale Terrace to which an extended connection will be made. This path extension along the Parkdale Terrace road frontage of the new residential lots will meet the Capricorn Municipal Development Guidelines requirements providing an appropriately designed connection to Stage 1; this ensures that this aspect is appropriately addressed.

P7 Impact of High Traffic Roads

RESPONSE: All the proposed new roads will be Access Streets or Access Places. No major streets affect the proposed lots.

P8 Enhanced Personal Safety and Minimised Crime Risk

RESPONSE: The Crime Prevention Through Environmental Design Code (CPTED Code) is referenced as part of the acceptable solution. Not all of the CPTED code is applicable to the proposed development, however, the following discusses the extent of compliance with the CPTED code:

P1. The proposed allotments will not be of a nature or scale where mixed land uses are appropriate or likely to occur;

P2. Windows of the future buildings will be able to offer casual surveillance of private and public spaces and will be the responsibility of future homeowners;

P3. Fencing – at the discretion of future owners and landscaping will offer a clear identification of the interface between public and private spaces;

P4. The proposed lots are residential and the normal placement of houses will result in those houses addressing onto the streets. Consequently the proposed configuration is sufficient in an residential area, providing adequate surveillance of private spaces as typical of residential allotments;

P5. The residential nature of the site will assist to reduce the risk of graffiti. No buildings are proposed as part of this application;

P6. No buildings are proposed as part of this application;

P7. No buildings are proposed as part of this application;

P8. Car parking for future houses will be determined by the owner and designer of the buildings, but is likely to be located within the house or between the building and the street servicing the allotment and will be in a location able to be monitored from the buildings;

P9. Not applicable to this application;

P10. Not applicable to this application;

P11. Not applicable to this application;

P12. The new lots are most likely to be fenced by new owners in the future. No fencing is proposed as part of this application.

P13. Not applicable to this application;

P14. Fencing will be at the discretion of future owners;

P15. Not applicable to this application;

P16. Not applicable to this application – exterior lighting of the future houses will be to owners' requirements and need to comply with the planning scheme;

P17. A pedestrian access connection is provided to Edenbrook Drive off Sandford Avenue, along Parkdale Terrace and between Parkdale Terrace and Sandford Avenue.

i. Lighting is part of an Operational Works application as lighting of such access ways is a Capricorn Municipal Development Guidelines requirement.
Hence this aspect will be addressed in an Operational Works application in conjunction with an ERGON approved conduit/cable design which determines in part the light locations and sources of power.

ii. There are no blind corners.

iii. There are no sudden changes of grade.

iv. The movement corridor off Sandford Avenue is less than 200 metres (about 40 metres) and between Sandford and Parkdale 80 metres.

v. Planting and landscaping will be part of a future landscaping Operational Works Application (the Sandford Avenue connection is already landscaped).

vi. The accesses are solely for pedestrian and cycle movement.

P18. The address of future lots will be clearly identified by placement of suitable numbers visible from streets on either future buildings or future fencing.

The proposed development satisfies the requirements of the CPTED code.

P9 Area and Dimension of Lots

RESPONSE: The proposed allotments satisfy the requirements of the preliminary approval varying the effect of the planning scheme as all lots exceed 600 square metres in area and all lots have a frontage of at least 20m.

P10 Rail Noise

RESPONSE: The site is beyond the influence of rail noise and the 'railway noise corridor' shown on Railway Noise Code Map 1 of the Planning Scheme.

P11 & P12 Open Space

RESPONSE: The preliminary approval that varies the effect of the planning scheme identified that land intended for parkland or open space for the whole development. The area of the proposed allotments does not require additional open space.

P13 Impact of Services on Biodiversity

RESPONSE: No additional infrastructure beyond that anticipated by the preliminary approval is required by this proposal.

P14 Provision and Design of Utilities

RESPONSE: All relevant services will be connected to the proposed lots in accordance with the engineering discussion in this report. Further detail will be provided when seeking approval for operational works.

P15 Not applicable

P16 Drainage

RESPONSE: See discussion of drainage in the Engineering Section of this report.

P17 Stormwater Management

RESPONSE: See discussion of stormwater in the Engineering Section of this report.

P18-34 Roads

The road layout is consistent with the layout within the Preliminary Approval that varied the effect of the Planning Scheme.

Adequate area is available for on street car parking and access. Roads are configured to be consistent with Appendix 1 and Appendix 2 of the Reconfiguring a Lot Codes, the Capricorn Municipal Development Guidelines and the standards and practices generally acceptable to the Council. Further details will be provided when seeking approval for operational works.

Allotment areas vary from approximately 880 square metres to approximately 1240 square metres, thereby providing a mix of allotment sizes to accommodate a variety of housing types. Further variation is provided within the preliminary approval that varies the effect of the planning scheme by establishing different precincts for differing types of residential area.

The layout of the proposed lots and roads is easily understood and will not lead to confusion in navigating through the area or recognising various orders of roads.

P35 Subdivision within Commercial or Industrial Area

Not applicable to this application

P36 Access to state controlled roads

The proposed development does not require additional direct access to or from a state controlled road.

In summary the proposed lot configuration satisfies the performance criteria and purpose of the code.

3.2 WATER QUALITY & QUANTITY CODE

Section B - Engineering Report provides a detailed response to this topic. The proposed development will satisfy the requirements of this code.

3.0 PLANNING CONCLUSION

In conclusion, the proposed development will:

1. Result in 'infill' development of an approved residential area;
2. Adequately service the resultant allotments with roads, water, sewerage, drainage, electricity and telephone; and
3. Create desirable allotments with safe building sites, and good access; and
4. Not compromise the character of the area.

In addition the proposed development is consistent with the Preliminary Approval varying the effect of the planning scheme on the subject land.

Planning approval of this application with conditions is warranted in a similar manner to the previous stages approvals.

SECTION B – ENGINEERING REPORT

1.0 INTRODUCTION

1.1 The proposed two stages (9A and 9B) of this development consist of a total of 17 new residential allotments off Parkdale Terrace and Sandford Avenue off Wirraway Drive and two (2) balance area lots which arise due to the existing two lots being impacted by this subdivision.

1.2 The proposed development provides for all the new lots to gain access from an extension to Parkdale Terrace and to Wirraway Drive and the creation of a new road called Sandford Avenue. Wirraway Drive was approved as part of Stage 2 (Stage 2C) and will need to be completed in advance of Stage 9A. Stage 2AB is complete.

1.3 The subject site is not constrained by slope, vegetation, water supply, sewerage, road access, traffic or stormwater management.
All services are available and can be conditioned accordingly.

2.0 ROAD ACCESS AND TRAFFIC

2.1 External Access

External access to the proposed development is via Belmont Road and then via Edenbrook Drive, Oakmont Way and Parkdale Terrace which are approved and completed works from Stages 1 & 2AB.

An existing Developer Infrastructure Agreement addresses in full the external access to the entire Edenbrook development including any and all upgrades and all necessary monetary payments. This agreement applies to all applications made before 25 March 2017.

2.2 The Belmont Road-Edenbrook Drive intersection is the main intersection for access to the proposed new development which is the subject of this application.

This intersection has been designed and its construction approved under a current Operational Works Permit. An analysis took into account the full development of Edenbrook. No further analysis is required.

2.3 Internal Roads for the New Development

Edenbrook Drive and Parkdale Terrace have been similarly designed and the construction approved under valid Operational Works Permits.

Parkdale Terrace was designed and approved in the Stage 1 Operational Works Permit at 7.5 metres wide within an 18 metre road reserve. Parkdale Terrace will eventually have a maximum catchment of about 40 lots in the overall full development. This road profile exceeds the requirements for an Access Street under the Capricorn Municipal Development Guidelines.

Sandford Avenue is proposed as a 7.5 metres wide road within a 16 metre reserve.

Wirraway Drive has been approved in a valid Operational Works Permit as a 7.5 metres wide road within an 18 metre reserve.

An indicative road design solution is shown on the attached FIGURE No 1098-ROL3 Preliminary Infrastructure Details.

3.0 DRAINAGE

3.1 The proposed lots are covered by a Site Based Stormwater Management Plan to meet in a practical manner the drainage and runoff quality requirements of the relevant and applicable Water Quality and Water Quantity Code. This is the code applicable to any approval on the subject land as set out in the Preliminary Approval varying the Planning Scheme.

3.2 FIGURE 1098-ROL4 shows the proposed Site Based Stormwater Management Plan that meets the Water Quality and Water Quantity Code and has been prepared using current best practice and to allow comparison with current Healthy Waters policy.

3.3 An indicative drainage layout is shown on the attached FIGURE 1098-ROL3 denoted Preliminary Infrastructure Details.

The immediate relevant points to note are:

a) Part of the catchment of Stage 9 that is captured and directed towards Stage 1 is consistent with the approved water treatment design of Stage 1. This the light brown shaded area on FIGURE 1098-ROL4.

b) A Q100 flood analysis has been previously submitted and approved in the Preliminary Approval overriding the scheme for the receiving waters of Ramsey Creek and the Fitzroy River.

The Fitzroy River Q100 flood event abuts against the Edenbrook Estate, intrudes just into the watercourse adjacent Parkdale Terrace and extends almost through to McLaughlin Street. The increase in runoff from the additional impermeable area and minor changes to catchments from within the Edenbrook development is insignificant not only in the context of the Ramsey Creek catchment but is also particularly insignificant in the context of the Fitzroy River Q100 event and the immediate proximity of its inundation line to this development.

In summary, the Fitzroy River's Q100 abuts the Edenbrook development and this stage and thus there will be no additional impact downstream external to the site and there will be no actionable nuisance to external land.

c) In regard to the Acceptable Solutions of the Water Quality & Water Quantity Code, the Site Based Stormwater Management Plan FIGURE 1098-ROL4 goes above and beyond the requirements for compliance. The development does not discharge directly into a designated waterway or wetland; the development does not interfere with any designated waterway or wetland; there is demonstrated no increase in pollutants; in fact there is a decrease as shown in the outcomes presented in Table 5.

d) Current Council practice has been to assume or adopt the default position of State Planning Policy as outlined in Healthy Waters (for the design objectives relevant to the climatic region) when assessing Operational Works applications.

The following observations are noted. State policy was first adopted and came into effect on 28 February 2010. This policy at that time made several clear unequivocal points:

i) That development made before this policy took effect was not subject to the policy (Section 4.1).

The master planning for Edenbrook occurred well before this policy came into being; Edenbrook's MCU was approved prior to this date (February 2007); the subsequent Stages 1 and 2 Operational Works application was submitted prior to this date (December 2010).

At that time a detailed SBSMP was submitted to Council, in the absence of any other detailed performance criteria, based on the Brisbane City Council Guidelines and related documents. Stage 9 in part drains into Stage 1, hence the water quality strategy for Stage 9 is in part already in place and it would be unreasonable to retrospectively modify Stage 1.

ii) That there are *acceptable circumstances for not fully achieving the policy outcomes* (Section 4.3) including if there is (prior to 28/2/10) a valid preliminary approval and/or for subsequent development necessary to give effect to a valid (prior to 28/2/10) development approval.

iii) That the policy aim is to avoid or minimise adverse impacts.

The policy options are <u>either</u> adoption of the design objectives relevant to the climatic region <u>OR</u> demonstrate current best practice reflecting factors such as land use constraints. Clearly the latter is a viable acceptable outcome and not against the intent of the policy.

iv) And that in the event of acceptable circumstances for not fully achieving the policy outcomes, the development would still be expected to achieve the water quality outcomes to the maximum extent possible.

With later revisions and updates of the policy many of these initial clearly stated and outlined provisions have become less obvious and less emphasised. But the main point remains that Edenbrook was planned and approved well before state planning policy came out; Stage 1 and 2's Operational Works application was submitted prior to this date and best practice within the development constraints is proposed.

e) The Site Based Stormwater Management Plan FIGURE 1098-ROL4 provides a practical feasible best practice response given:

i) Compliance with the approved layout within the preliminary approval overriding the scheme; and

ii) Council's clear stated preference to not have wetlands or bio-retention basins if at all possible and the ongoing maintenance costs associated with such structures.

f) FIGURE 1098-ROL4 shows that water quality from the subject development will be significantly improved. Table 5 displays the percentage reduction in all four (4) categories of TSS, TN, TP and GP albeit the improvement percentages in some do not reach the default benchmark levels for the climatic region.

i) Note several local authorities have varied the default benchmark levels and such decisions are even noted in current state planning policy.

3.4 By inspection, all stormwater can drain to a legal point of discharge as defined by the Queensland Urban Drainage Manual.

A legal point of discharge exists at Edenbrook Drive and Parkdale Terrace. This is clearly evident from a review of the contours on the submitted plans. Drainage Reserve or easement would be placed over any balance land affected as required.

4.0 WATER SUPPLY INFRASTRUCTURE

4.1 A water supply analysis using a variable speed booster station has previously been approved under an existing current Operational Works Permit. The proposed additional 17 lots are included in the original approved analysis.

4.2 An indicative water servicing layout is shown on the attached FIGURE No 1098-ROL3 Preliminary Infrastructure Details.

5.0 SEWERAGE INFRASTRUCTURE

5.1 A new sewerage pump station was built as part of the Stage 1 development. This pump station and its analysis catered for the proposed lots.

5.2 An indicative and preliminary proposed sewer servicing layout is shown on the attached FIGURE No 1098-ROL3 Preliminary Infrastructure Details.

5.3 A revised maximum threshold of 190 lots recently specified by Council to be directed to the Belmont Road sewerage pump station has not been exceeded.

Stages 1 and 2	43 lots
Stages 3 and 4	35 lots
Stage 6	14 lots
Stage 13	18 lots
TOTAL	110 lots

Adding Stage 5's 21 lots (if/when approved) = 131 lots.

Adding Stage 9's 17 lots = 148 lots. No further network analysis is required.

6.0 TELEPHONE AND ELECTRICITY

6.1 The existing supply has sufficient capability to service the proposed development and NBN has accepted the whole development into its network including Stage 9.

7.0 STATE PLANNING POLICY

7.1 Acid Sulphate Soils

The proposed development site is located between RL 13 and RL 33 AHD. Excavation below RL 5 AHD is not required to install services or construct this development. Hence acid sulphate soils are not an issue.

7.2 Slope Stability

There is no significant land with slope greater than 15% mapped by the relevant planning scheme.

7.3 Bushfire Management

The site will be serviced with fully constructed sealed roads and reticulated water supply providing firefighting abilities to the statutory regulatory requirements. Therefore evacuation can be undertaken safely and adequate and accessible water supplies will be available.

7.4 Flood

The site and access to the site is not affected by Q100 flooding.

Therefore there are no adverse impacts on people's safety.

8.0 SUMMARY

8.1 The submission herewith demonstrates that:-

a) There are no engineering impediments to the proposed development and Council's standard development approval conditions are sufficient to address the engineering aspects of the proposal; and

b) A future Operational Works Submission is sufficient to address the details of the site works proposed, the road construction, drainage, water and sewer servicing for the proposed new allotments.

Prepared and Signed by N. Gardner RPEQ No 2393
for and on behalf of

N G Gardner & Associates Pty Ltd

Date 14th March 2017

Attachments:-

Appendix A

FIGURE 1098-ROL1	Property Description
FIGURE 1098-ROL2	Proposal Plan
FIGURE 1098-ROL3	Preliminary Infrastructure Details.
FIGURE 1098-ROL4	Stormwater Management – Water Quality
FIGURE 1098-ROL5	Staging Details and Pathway Strategy
FIGURE 1098-ROL6	Concept Landscaping Plan
FIGURE 1098-ROL7	Building Setback Details