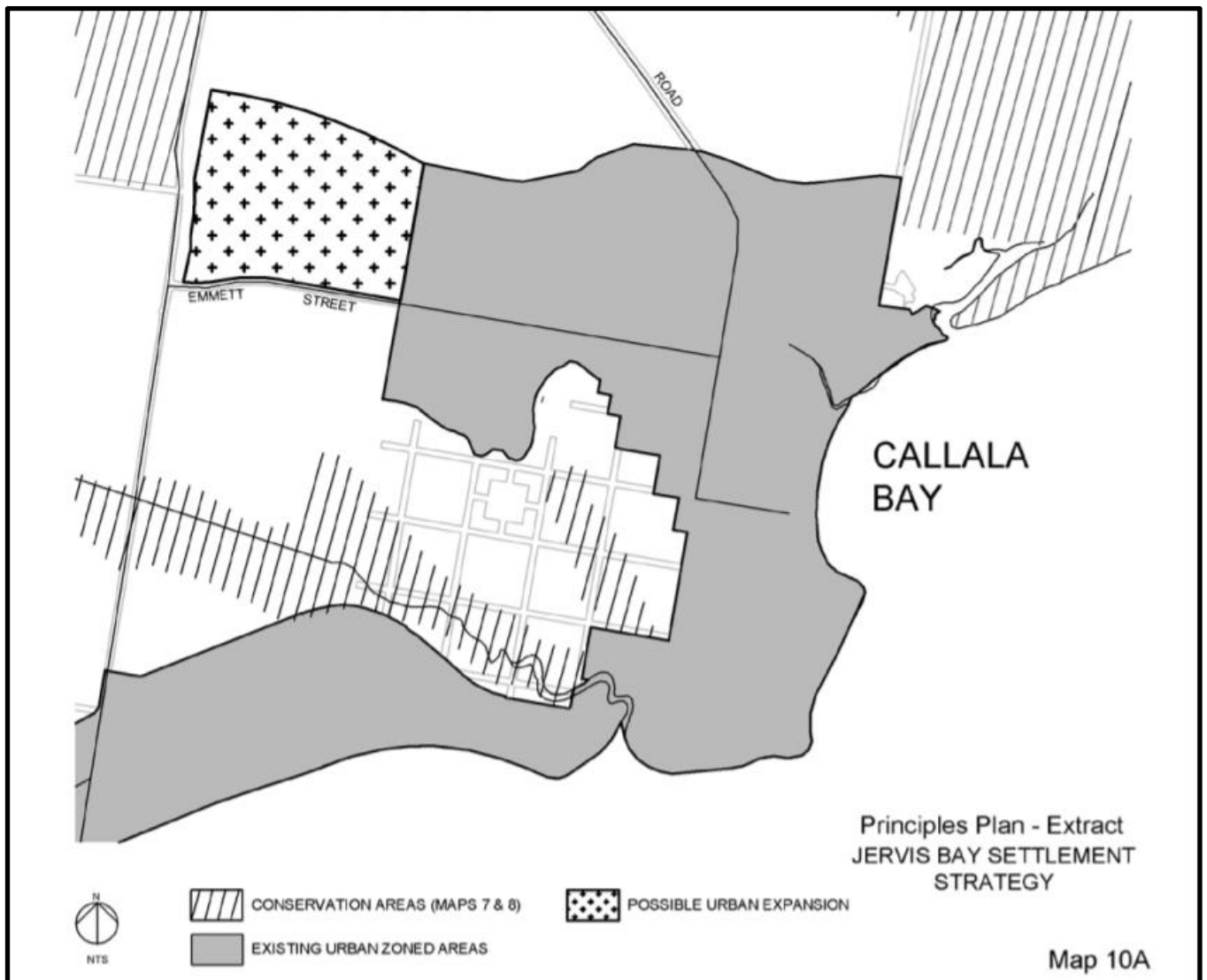


INFRASTRUCTURE ASSESSMENT

Planning Proposal



Callala Bay Expansion Area For Sealark Pty Ltd



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Table of Revisions

Rev	Date	Details
00	25-02-2021	For Council review
01	08-09-2021	Incorporate Council feedback dated 13 July 2021
02	05-10-2021	Incorporate Shoalwater feedback dated 5 October 2021
03	19-01-2022	Incorporate Council feedback dated 13 July 2021

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Introduction

This report has been prepared to support a Planning Proposal for expansion of the Callala Bay residential land on the western edge of the village for Sealark Pty Ltd.

The purpose of this report is to address the infrastructure needs of the proposal and to assess how those needs will be addressed. The report considers:

- Sewer reticulation;
- Water supply;
- Electricity supply;
- Public open space & community facilities.

Roads and drainage infrastructure are assessed in other reports.

Further to the above requirements, a separate maintenance assessment of the bushfire asset protection zones accompanies this report.

Existing Site & Locality

The Callala Bay Expansion area (site) is made up of the following lots, being;

- part lot 20 DP 1263402;
- Lots 9, 10, 11, 17, 18 DP 253793,
- Lots 599-628 DP 11388.

As shown in the images below (Figure 1), the site is approximately 36.8ha in area and is bordered to the east by current land zoned R1 - General Residential, to the north is a native forest, to the west Callala Beach Road and to the south part land zoned RU2 – Rural Landscape / part Emmett Street.

The site is identified under Shoalhaven Local Environment Plan 2014 as a “Deferred Matter” and the previous Shoalhaven Local Environment Plan 1985 applies and identifies the site as a 1(d) Rural (General Rural) Zone.

The site’s northern boundary has been determined by an edge of ridge line that forms the current northern boundary of Callala Bay which also forms a delineation of natural water catchments i.e. stormwater in the subject area will generally run south towards Jervis Bay. North of this ridge line stormwater generally runs east towards Wowley Creek. The approximate height of this ridge line is 20m AHD and in general the site falls towards Emmett Street. Included in the site is a number of paper subdivision lots which front Callala Beach Road.

Callala Bay is constrained to the south and east by Jervis Bay, and to the south-west by a substantial wetland and low-lying flood liable land. The land to the north is heavily vegetated and has wetland to the east.

Nearby villages of Callala Beach, Myola and Currarong rely on services/shops of Callala Bay. As shown in the image below (Figure 2), the site is identified in close proximity to these villages.



Figure 1 – Aerial Image of Site

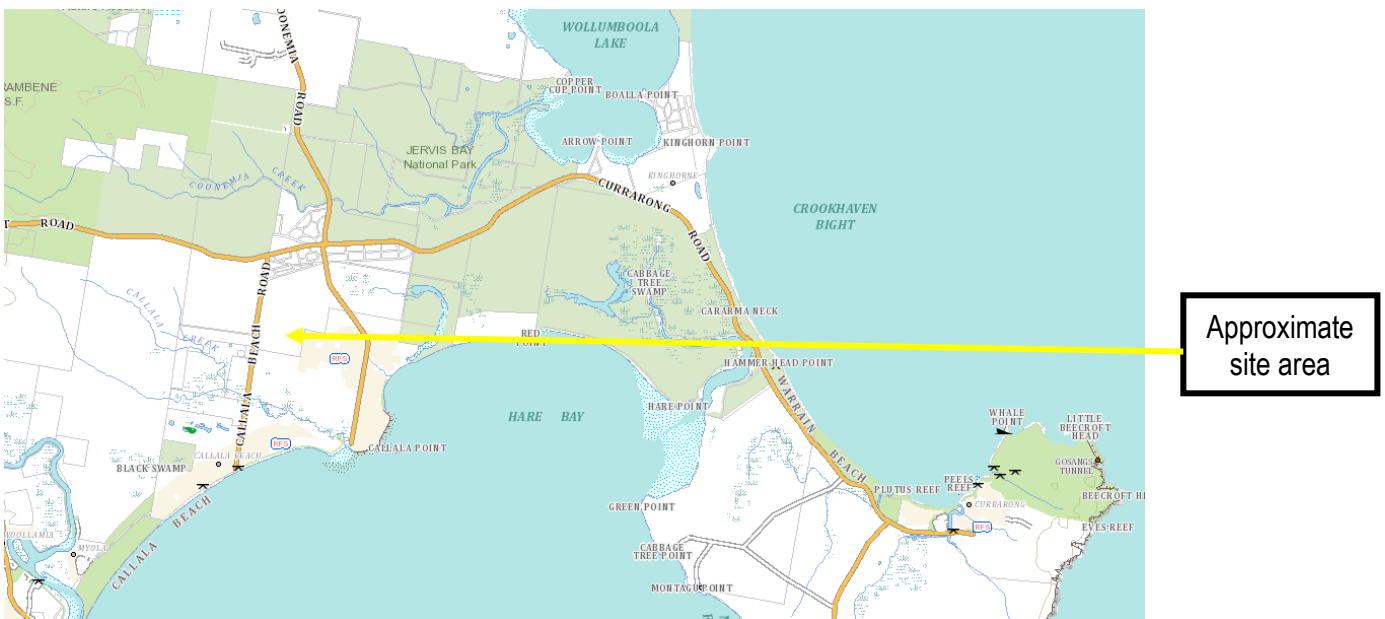


Figure 2 - Site locality

The site consists of mainly remanent native vegetation which has been thinned on the urban fringes to minimise bushfire fuel loads. Vegetation within the site is largely identified for clearing with vegetation north of the site to remain in current / natural condition.

Proposed Rezoning

The Planning Proposal seeks to rezone the site to achieve following outcomes:

- Residential lot sizes ranging a minimum of 400m² to 1,935m²;
- Public reserves;
- Drainage reserve; and
- Biobank site.

The site has been identified in the Shoalhaven Growth Management Strategy, 2012 and Jervis Bay Settlement Strategy (as shown in Figure 3 below) as an area to support further expansion of Callala Bay. The Strategy identified approximately 35 hectares of land to the north and west of Callala Bay as potential urban expansion. A key strategic outcome of this document recommended to investigate possible expansion of Callala Bay to the west and resolve the existing small lot rural subdivision in association with any rezoning.

Whilst only to be used as a guide for site potential, initial scoping investigations indicate an approximate lot yield (as shown below) in the order of around 374 resident lots, with supporting public and drainage reserves. Based on average of 2.3 persons per dwelling, the expansion area could accommodate in the order of 860 residents. A complete concept site master plan is shown in Figure 3.

The full concept plan of the planning proposal is shown in **Appendix A** and separate plans are provided for viewing as part of the accompanying plans to the proposal.

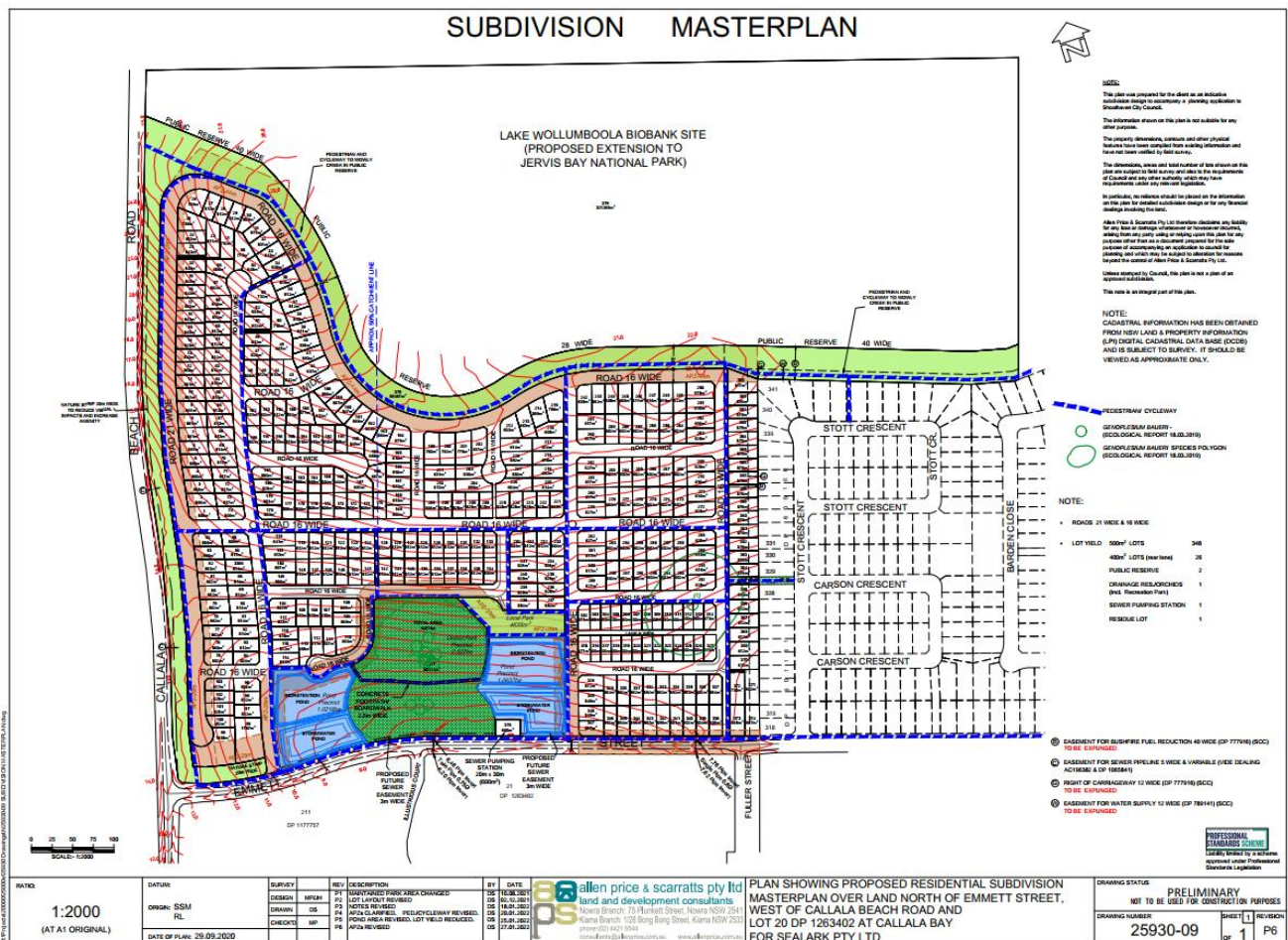


Figure 3 – Extract from Concept Site Master Plan

Proposed Public Utility Infrastructure Assessment

This section of the report assesses the following matters with respect to public utility infrastructure:

- Impact assessment;
- Needs assessment;
- Capacity assessment;
- Delivery plan;
- Maintenance assessment; and
- Consultation.

Public utility infrastructure is defined in the Shoalhaven LEP 2014 to include water, sewerage and electricity infrastructure only.

Water Supply Infrastructure

Impact assessment

Currently the site is not directly serviced with water supply infrastructure to support the future development. However, water supply reticulation connection exists at the north east corner of the site. The water supply will include the extension of the 200mm NS water main (behind the rear of Lot 345 DP 805160 - 55 Stott Cres) to the boundary of the proposed Callala Bay Expansion area.

Further to the above connection location, the site has the potential for water reticulation connection along its frontage with Emmett Street. Shoalhaven Water's Development Servicing Plan has indicatively programmed mains water connection to the site in the year 2022/23. It is noted that an updated Development Servicing Plan is being prepared by Shoalhaven Water but at this time is unable to be reviewed.

Needs assessment

The future development of the site will require the supply of essential services including water supply infrastructure to all proposed lots. In addition, this supply is likely to be required for firefighting hydrants.

It is proposed that water supply infrastructure for future lots will be designed to the requirements of the water supply authority for the area being Shoalhaven City Council.

Capacity assessment

To demonstrate that the water supply system has adequate capacity to service the proposal, Cardno has been engaged to assess the impacts on the water supply network.

Cardno's report entitled *Water Supply Development Impact Assessment* dated 5 August 2021 has been attached as Appendix B to this report.

Cardno was provided with data from Shoalhaven Water's existing Infoworks WSPPro hydraulic model. Cardno has then reviewed this model and made adjustments to the model as required to undertake a development analysis of the proposed Callala Bay URA.

The aim of this impact assessment was to:

- Determine existing system performance
- Identify the impact, if any, the proposed develop has on existing levels of service
- Identify the capacity of the internal reticulation system to provide firefighting flows in line with AS2419.1

The impact to the water networks were defined by utilising the updated hydraulic model and comparing simulations with and without the development area. Based on these modelling simulations, it is predicted that:

- The development has no detrimental impact on minimum pressures within the Large Coonemia Reservoir WSZ
- Pipe velocities and headlosses are consistent with the existing network, and the Callala Bay URA is not predicted to cause additional areas of deficiency.
- The Large Coonemia Reservoir has sufficient capacity to provide emergency storage requirements.
- Firefighting flow assessment predicts that the Callala Bay URA will not generate additional areas of incapacity within the Large Coonemia Reservoir WSZ.
- Under a maximum day demand, 95%ile scenario, the reticulation network has the ability to support firefighting activities within Callala Bay URA.

Cardno's hydraulic model predicts that the hydrant pressures in the high-elevated areas achieve the desired pressures for single and dual operation. No additional augmentation to the existing system is deemed necessary to support the connection of the proposed development.

Delivery plan

A preliminary plan (taken from Council's Development Servicing Plan) demonstrates strategic water supply is available and is shown in Appendix B.

The location of the proposed trunk main water offtake is also shown in Appendix B.

Maintenance assessment

Once the proposed water supply infrastructure is delivered, associated ongoing maintenance will be the responsibility of Shoalhaven City Council. Shoalhaven City Council will recoup these maintenance cost via levying Water Availability Charges on the new allotments in accordance with its standard practice.

Consultation

During the preparation of this assessment, consultation occurred with Shoalhaven Water's Project/Development Unit Manager Ljupco Lazarevski on 30 October 2018 to ascertain background information on the status of Council's Development Servicing Plan and capacity of the existing system. This consultation involved presenting a concept master plan to Council staff to seek feedback in the preparation of this assessment.

Sewerage Infrastructure

Impact assessment

Currently the site is not serviced with sewerage infrastructure to support the future development. However, Council's Development Servicing Plan has identified the Planning Proposal site is a future investigation area for connection to sewer reticulation.

In addition, existing sewer reticulation infrastructure is in close proximity to the site but available capacity at this stage is unknown. It is noted that an updated Development Servicing Plan is being prepared by Shoalhaven Water but at this time is unable to be reviewed.

Needs assessment

The future development of the site will require the supply of essential services including sewerage infrastructure to the proposed lots.

It is proposed that sewerage infrastructure be supplied to the future lots to the requirements of the relevant authority for the area being Shoalhaven City Council.

Capacity assessment

Shoalwater has advised that the initial sewer main investigation has identified the opportunity to flow downstream to a future sewer pumping station to be located near the entry to Callala Beach (i.e. near Club Callala) which is identified in Council's Delivery Servicing Plan.

Further to the above feedback, Shoalwater has advised that future sewerage infrastructure will be supplied by Council's Delivery Servicing Plan and include a future sewage pumping station, associated components and rising main to a designated discharge point. The majority of the site will drain via pipes in a southerly direction and it is anticipated that it will be gravity flow to a future pumping station.

Delivery plan

A preliminary plan (taken from Council's Development Servicing Plan) demonstrates the site is identified as a future investigation area as shown in Appendix C.

As indicated in the above feedback from Shoalwater, Council's Delivery Servicing Plan includes the delivery of a connection to the site with a future sewage pumping station, associated components and rising main to a designated discharge point.

A sewer pumping station site has been included in the masterplan for the proposed subdivision.

Maintenance assessment

Once the proposed sewerage infrastructure is delivered, ongoing maintenance of those assets will be the responsibility of Shoalhaven City Council. Shoalhaven City Council will recoup these maintenance cost via levying Sewerage Availability Charges on these new allotments in accordance with its standard practice.

Consultation

During the preparation of this assessment, consultation occurred with Shoalhaven Water's Project/Development Unit Manager Ljupco Lazarevski on 30 October 2018 to ascertain background information on the status of Council's Development Servicing Plan and capacity of the existing system. This consultation involved presenting a concept master plan to Council staff to seek feedback in the preparation of this assessment.

Electrical Infrastructure

Impact assessment

Currently the site is not serviced with electricity infrastructure to support future residential development. The site is located approximately 4.0km south from Endeavour Energy's Culburra Zone Substation.

The load estimation for the site using an after diversity maximum demand (ADMD) assessment (approximately 381 Lots) has been determined as being 2.5MVA.

The development is situated in an existing 11kV network area. There is an 11kV feeder CLD2 located along the Emmett St frontage.

Needs assessment

The future development of the site will require the supply of electrical infrastructure in the forms of high voltage (HV), low voltage (LV) and street lighting (SL) networks to the proposed lots.

It is proposed that electricity infrastructure will be supplied to the future lots to the requirements of the electrical authority for the area being Endeavour Energy. As outlined in the supporting Endeavour Energy assessment (see Appendix D) some upstream infrastructure may need to be provided/funded by this proposal.

Capacity assessment

At present, there is available capacity on feeder CLD2 to supply the load of 2.5MVA. This information is based on no other neighbouring developers submitting a new application prior to related subdivision application. Depending on the load demand for the area in the future, Endeavour Energy may need to perform some upstream works.

Electricity reticulation in the forms of high voltage (HV), low voltage (LV) and street lighting (SL) networks are within close proximity of the site.

Delivery plan

It is proposed that a more detailed electricity supply assessment will be prepared at the subdivision application and construction certificate stage that will outline proposed electrical works/infrastructure.

It is proposed that a HV loop would be provided through the proposed development site from the existing HV network as required by Endeavour Energy. Anticipating that electrical substations will be required, details of these locations will be subject to the detailed electrical design of the subdivision following Development Consent for any subdivision as per normal practice.

LV and SL will be reticulated around the development site from the substations to the requirements of Endeavour Energy.

Maintenance assessment

Once the proposed electrical infrastructure is delivered, ongoing maintenance of those assets will be the responsibility of Endeavour Energy. Endeavour Energy will apply network service/maintenance charges as per its standard practice.

Consultation

As outlined in Appendix D, consultation and assessment has occurred with Endeavour Energy's Network Connections staff and it is noted that further consultation with Endeavour Energy will be required as this proposal progresses through the approval process.

Bushfire Asset Protection Zone

Impact assessment

Whilst the site is not currently serviced with a bushfire Asset Protection Zone (APZ), the landowner (Sealark) maintains an existing 40m wide APZ that extends approximately 1.5km to the east which protects Callala Bay's northern boundary.

The impact of Council accepting the proposed and current 1.5km long APZ will ensure the existing northern boundary of Callala Bay will continue to be maintained and protected from bushfire for future generations. The combined area of the existing and proposed APZs is 8.7ha.

Needs assessment

The need to continue maintenance of the proposed and existing northern APZ of Callala Bay is significant and beyond the ability of the current landowner when considering the remaining land to the north is proposed to be handed over to National Park in the future.

Capacity assessment

At present, the landowner has limited ability to continue existing APZ maintenance requirements and as the Sealark land portfolio is reduced this maintenance needs to be handed over to a public authority to manage with as an appropriate funding mechanism.

Delivery plan

It is proposed that a more detailed APZ assessment and handover outline will be prepared at the subdivision application and construction certificate stage.

Maintenance assessment

As outlined in the separate accompanying APZ Management Plan from Eco Logical Australia, the estimated cost for annual maintenance of the established APZ is \$15,000 for 2 sessions per year and is based on available access to the APZ i.e. if access is good with access for a large machine (e.g. 8t tritter or slasher behind tractor).

Consultation

Consultation is ongoing with Council regarding the appropriate timing and arrangement for handover of the existing and proposed APZs to protect the northern boundary of Callala Bay from bushfire.

Public Open Space & Community Facilities Assessment

Introduction

This section of the report assesses public open space & community facilities at a strategic re-zoning level and specifically addresses the following key requirements which have been initially requested by Council:

- Impact assessment;
- Needs assessment;
- Delivery plan;
- Maintenance assessment; and,
- Consultation.

In addition to the above requirements, and earlier strategic discussion in this report, further strategic context and justification is provided to assist Council understanding the reasoning and benefits of the proposal's public open space & community facilities outcomes for both existing and future community living within the rezoning area. These outcomes reference benchmark standards from Council's *Community Infrastructure Strategic Plan (CISP)* in recognition that this document does not specifically address or guide rezoning requirements. Assumptions for the public open space & community facilities outcomes are based on the Callala Bay expansion area (proposal) having the capacity to provide in the order of 860 residents (374 residential lots) which as this stage can only be used as a guide.

Key findings of this document are therefore aimed for strategic planning proposal assessment which identifies if existing infrastructure, programmed infrastructure delivery within the Contributions Plan/CISP are adequate or whether additional infrastructure embellishment / supply may be required.

Strategic context

As demonstrated in the Jervis Bay Settlement Strategy (October 2003), approximately 35 hectares (as shown in Figure 4) was nominated in Callala Bay for potential urban expansion and provision of approximately 429 dwellings/lots. The Planning Proposal is consistent with this strategy.

As shown in Figure 5, the subject rezoning will complete the Callala Bay village that borders the ridgeline to the north and extends the urban area west along Emmett Street to the intersection with Callala Beach Road. Further the proposal provides the opportunity for entry treatments to the village as shown in Figure 6 and a significant local reserve and parkland as shown in Figure 7.

The strategic importance of the Callala Bay urban growth area has been further endorsed in the Shoalhaven Growth Management Strategy (December 2012). This strategy in particular recommended investigating expansion west of Callala Bay which this proposal is consistent with.

With limited growth opportunities, Callala Bay is valued by both its residents and visitors for its proximity to bushland and marine park environments. Hence, where possible this proposal builds and seeks to embellish connections to these bushland and marine park environments.

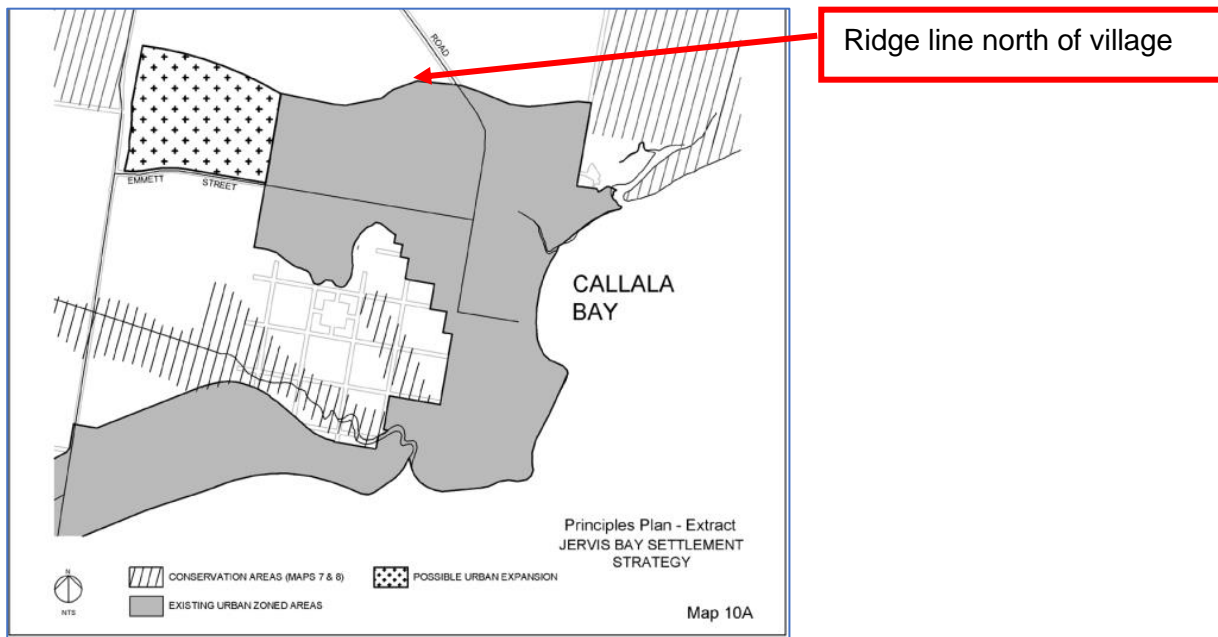


Figure 4 – Callala Bay Expansion Area as identified in the Jervis Bay Settlement Strategy (October 2003)

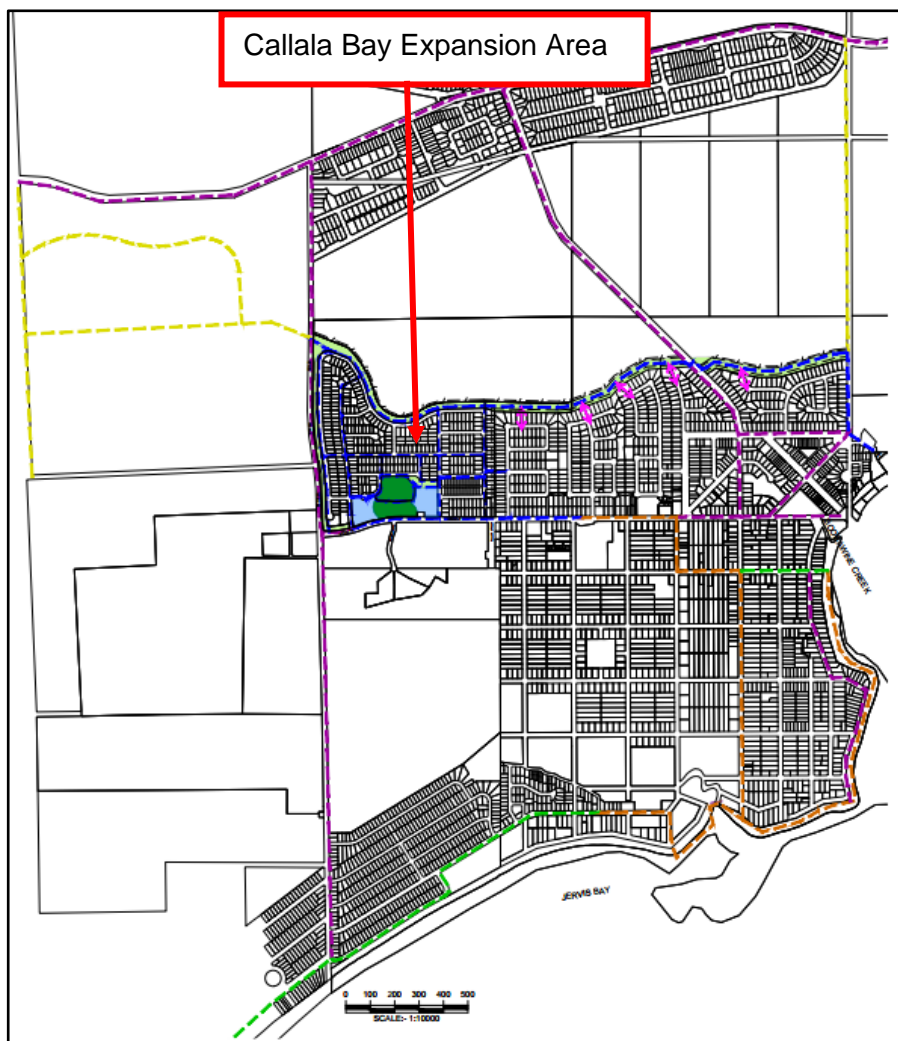


Figure 5 – Callala Bay Expansion Area – Shown in the village contact with existing and proposed shared pathway networks (Shown in more detail in Appendix A and separate plans are provided as part of the accompanying plans to the proposal)

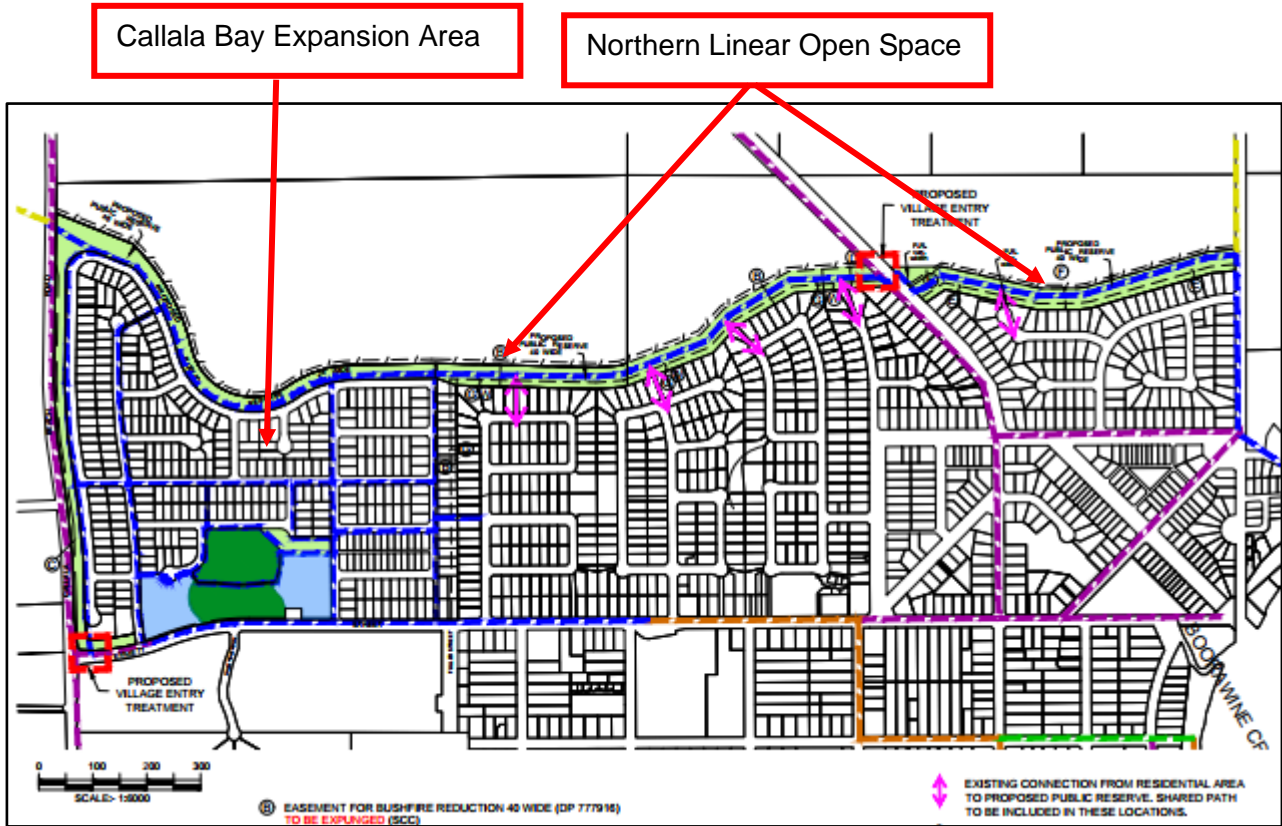


Figure 6 – Callala Bay Expansion Area – Showing northern boundary and existing/proposed linear open space network to be embellished with a shared pathway networks (Shown in more detail in Appendix A and separate plans are provided as part of the accompanying plans to the proposal)

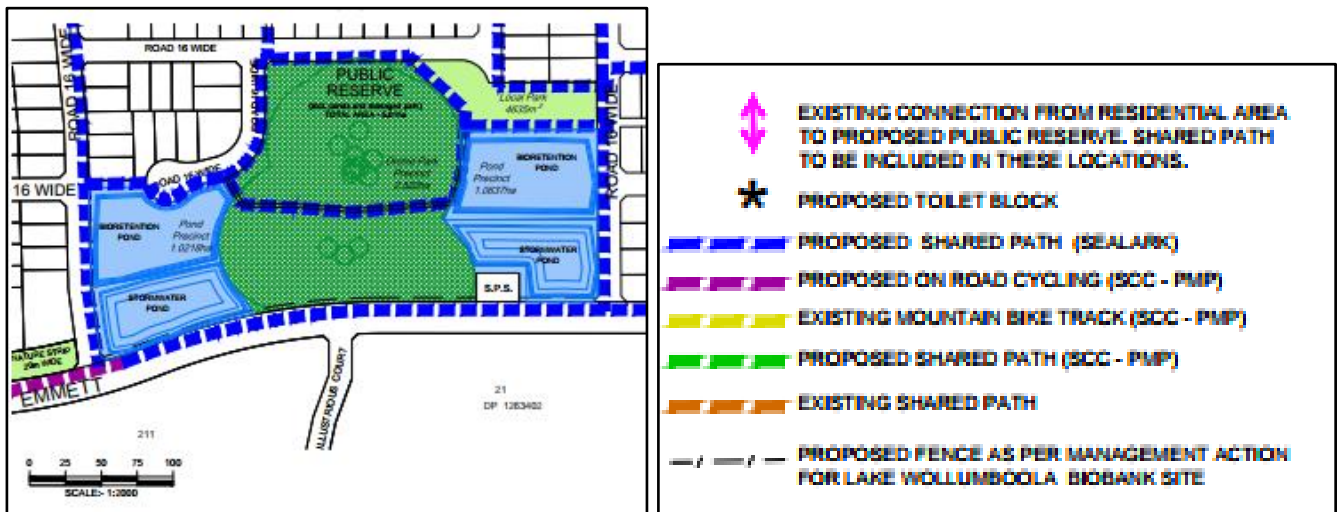


Figure 7 – Callala Bay Expansion Area – Showing central public system (Shown in more detail in Appendix A and separate plans are provided as part of the accompanying plans to the proposal)

Strategic Vision

Building on identification of the above expansion area, this proposal with the associated land rezoning allows the opportunity to provide additional infrastructure supply within the rezoning area and also complete and embellish existing public open space & community facilities within the village. In addition, the proposal has the ability to build on the synergies of continuing to connect the local community to bushland and marine park environments via an extensive linear open space network.

As shown in Figures 5-7 and plans shown in Appendix A, the proposal provides a significant public reserve system that includes:

- An embellished parkland and playground as per benchmark requirements of the CISP;
- An embellished bushland park and pond system which will provide biodiversity conservation outcomes via the long-term protection of the threatened Bauers Midge Orchid *Genoplesium baueri*, protection of downstream water quality along with broader amenity and recreation opportunities;
- An embellished shared path network as per benchmark requirements of the CISP both within the rezoning area and surrounds includes connecting both proposed and existing residents to adjacent bushland, marine park as well as building on existing connection to the adjacent village area;
- Village entry treatments.

Key strategic outcomes of the proposal's public open space & community facilities are to:

- Build on and embellish existing walking / bike riding networks with the provision of linear open space with supporting shared path infrastructure that connects the entire village;
- Provide quality embellished public open space for proposed and existing residences;
- Avoid duplication of existing open space and community building that are identified as oversupply;
- Provide open space that both embraces and continues interpretation and connection to surrounding bushland and marine values;
- Embellish or financially contribute to existing sportsgrounds and community facilities.

Strategic Assessment Considerations

The proposal's assessment has considered the following relevant strategic planning documents:

- Shoalhaven Local Environmental Plan 2014;
- Shoalhaven Access & Mobility Plan (PAMP);
- Shoalhaven Bike Plan 2013;
- Round the Bay Walks Implementation Plan 2012;
- Shoalhaven Contributions Plan (SCP) 2019; and
- Council's Community Infrastructure Strategic Plan (CISP) 2017-2036.

Strategic Population Forecasts

When reviewing Council's forecasts, the proposal is consistent with current population projection for Planning Area 2 which includes Callala Bay providing for an increase of 1,102 people by 2051.



Figure 8 – Extract from Council's .idcommunity population forecast.

Strategic Supply Forecast

Upon reviewing current forecast supply of public open space & community facilities it is recognised that the SCP has used broad population assumptions that includes development yield for the planning proposal site which generates a nexus to the following community infrastructure project (see Appendix E) specific to Callala Bay and additional four (4) regional facilities. The regional facilities have not been assessed in detail due to no immediate local nexus existing and where future residents will be required to travel out of the village to use these facilities.

The Callala Bay specific projects are:

- 02AEREC0004 - Planning Area 2 - Recreation facilities upgrade various locations (\$450,000 identified to upgrade / embellishment Callala Bay Sportsground)

Regional community facilities (where future residents will need to travel to Nowra), that the proposal will contribute to includes:

- CWAREC0005 - Shoalhaven Community and Recreational Precinct SCArP Cambewarra Road Bomaderry
- CWCFA0007 - Shoalhaven Regional Gallery
- CWCFA0002 - Shoalhaven Multi Purpose Cultural & Convention Centre
- CWFAC0006 - Shoalhaven City Library Extensions, Berry Street, Nowra

Upon considering the contributions projects within Callala Bay the Callala Bay Sportsground is within 600 metres of the planning proposal site and the site is within these project benefit (collection) areas. Hence, the proposal site has been forecasted to contribute funds from the demand created by associated development. In addition, the Callala Bay Community and Child Care Centre is located at this sportsground.

As no open space contributions project is identified by the SCP for the planning proposal site, the proposal's concept master plan (Figure 9 shows zoomed in extract) has been used to identify and provide a centrally located large open space reserve for future embellishment at subdivision. As shown in Figure 10 (zoomed in extract), the proposed open space reserve will provide functions to provide amenity, recreation / exercise areas, parkland, drainage and bushland park with an overall area of approximately 4.5ha.

The parkland component of the proposal's reserve will meet benchmark standard requirements of the CISP for a local recreation park (as outlined in Appendix F) being at least 0.4ha (4,775m²) in area for the proposed 860 new residents of the expansion area. This reserve will provide the largest and most embellished local park in Callala Bay with access to Emmett Street and located within a 650m radius of all proposed residential lots.

In recognition of the opportunity to embellish surrounding land already used by the community to access the adjacent bushland, marine park and the adjacent village area, a linear open space link across the northern boundary of Callala Bay provides a dual function of a maintained Asset Protection Zone (APZ) and provides a significant community asset with a proposed shared path link from the Callala Beach Road to Wowley Creek (see Figure 6). As outlined in feedback from local community members and observations onsite, this existing linear space is already well utilised and will be further embellished to meet provision standard requirements of the CISP for linear open space (as outlined in appendix F).

In addition to the above public open space & community facilities, the proposal will also connect both existing and proposed residents to the Callala Bay Public School and village centre facilities via a proposed shared path along Emmett Street Road Reserve (see Figure 6).

To assist further facilitating walking access/connection from the adjacent existing residential area, walking path links will be to Stott Crescent (via Lot 334 DP 801131 – between 21 & 23 Stott Crescent) are to increase and enhance connection the existing residences.



Figure 9 – Proposed Concept Master Plan (zoomed in extract - Shown in more detail in Appendix A and separate plans are provided as part of the accompanying plans to the proposal)

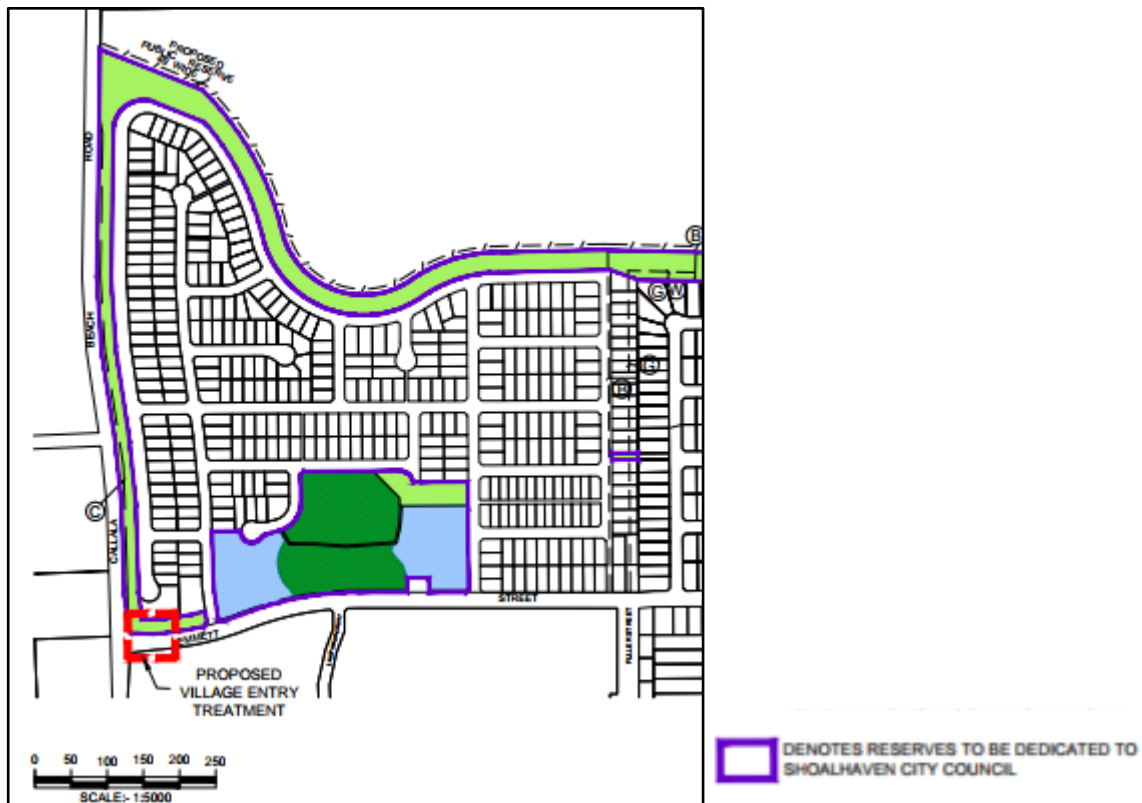


Figure 10 – Proposed open space reserve (zoomed in extract - Shown in more detail in Appendix A and separate plans are provided as part of the accompanying plans to the proposal)

Key Findings

- Located within the benefit area of contributions project 02AEREC0004 – Planning Area 2 - Recreation facilities upgrade various locations (\$450,000 identified to upgrade / embellishment Callala Bay Sportsground), this is the relevant mechanism to provide associated sportsground improvements generated by this proposal.
- The proposal's centrally located public reserve and linear open space will be embellished as per benchmark requirements of the CISP to provide a strategic recreation link across its northern boundary (ridgeline) of Callala Bay to provide a significant recreation asset for existing and future residents.
- The proposal's linear open space will be embellished to complete a walking / cycling route that surrounds Callala Bay and provides and connects the local community to its surrounding bushland and marine park environments.
- As part of the proposal's embellishment works, provide village entry treatments and related embellishments to the Callala Bay Community and Child Care Centre.

Strategic Impact Considerations

Impact assessment of the proposal on existing public open space & community facilities has involved a desktop review of key facilities already provided in Callala Bay and a review against Council's CISP's recommendations and in particular the community infrastructure summary by town/village which is outlined below in Figures 11 & 12.



Figure 11 – CISP – Community Infrastructure Mapping – Callala Bay

Callala Bay

Community infrastructure

Name	Type	Future work	Recommendation
Open space			Total = 6.70ha
Bicentennial Park	Local recreation park	Yes	investigate the addition of exercise equipment along the foreshore path, Bicentennial Path
Callala Beach Road Reserve	Local recreation park	No	-
Callala Creek Bicentennial Park	Local recreation park	No	-
Marine Parade Reserve	Local recreation park	No	-
Parkes Crescent Circle Reserve	Local recreation park	No	-
Progress Park	District recreation park	No	-
Callala Sportsground and Community Centre	District sports park	Yes	upgrade the Ground to attract summer sporting codes
Gowlland Crescent Reserve	Natural open space	Yes	remove play equipment
Community buildings			Total = 3 buildings
Callala Community Centre	Local community centre	No	-
Callala Bay Progress Hall	Local community centre	Yes	investigate implementing one of the rationalisation options
Callala Beach Community Centre	Local community centre	No	-

Figure 12 – CISP – Community Infrastructure Analysis – Callala Bay

When considering the impact of the proposal, this assessment has reviewed relevant infrastructure in close proximity to the site. This impact is based on the anticipated demand for associated infrastructure which has the potential to increase by 39% when understanding the existing Callala Bay population in 2016 according to the Australian Bureau of Statistics was 2,196 and assuming that all 860 new residents will live permanently in the expansion area and increase the population to 3,056.

Table 1 -Open Space Analysis (Summary of the current open space 6.7ha identified in the CISP, page 157).

Infrastructure type	Provision standard	2,196 person requirements	3,021 person requirements	Estimated current area from CISP	Assessing comment
District Sportsground	1.3ha/1,000	2.8ha	3.9ha	2ha	Whilst Callala Bay is currently undersupplied with District Sportsground facilities, it relies on co-sharing these facilities with Culburra Beach and examples of this are the league and cricket fields that residents of Callala Bay use at Crookhaven Park. This usage is backed up in the Planning Area 2 findings where Callala Bay and Culburra Beach provide the only district facilities and current land use findings indicate the Planning Area is in surplus by 0.82ha. This co-sharing of facilities is well established and will continue with or without this proposal going ahead. We further understand that the estimated future District Sportsground facilities land shortfall of 0.56ha in the year 2036 in Planning Area 2 will be met by a new sportsground proposed to be delivered in the West Culburra proposal (pending master plan).
Local Recreation Park	0.5ha/1,000	1.0ha	1.5ha	0.1ha	Note the village is under supplied with local recreation parks and the proposal's parkland of 0.47ha meets the requirement for the proposed new population and assists in reducing the overall shortfall.
District Recreation Park	0.6ha/1,000	1.3ha	1.8ha	4.6ha	Note the village is over supplied and the proposal does not contribute further to this supply

Table 2 -Community Buildings Analysis

Infrastructure type	Provision standard	2,196 person requirements	3,021 person requirements	Current building supply identified in CISP	Assessing comment
Local	1/10,000	1	1	2 being: Callala Community Centre; Callala Bay Progress Hall	Note the village is over supplied and the proposal does not contribute further to this supply.

As outlined above, the proposal provides its own passive open space to service associated park/playground needs of its future residents which will be detailed in future subdivision applications and meeting benchmark requirements of the CISP. The proposal also contributes via development contributions Callala Bay Sportsground and proposed embellishments the land to be dedicated and embellishments to the Callala Bay Community and Child Care Centre (Emmett Street). Therefore, in part associated community facilities impacts are addressed by these projects and Council has the ability to consider additional projects with a development contribution nexus.

Impact assessment has also reviewed larger/popular public open space & community facilities used by the wider Callala Bay community and residents of this proposal which are not covered in the CISP or SCP and primarily relate to foreshore and water access infrastructure. As shown in Figure 13, the proposal's site is in proximity (i.e. within 1.2-2.2km) to main beach access areas as shown in Figure 7 and being:

- Eastern end of Monarch Place;
- Eastern end of Sheaffe Street;
- Callala Bay; and,
- Southern end of Lackersteen Street.

Nearby beach access is also available at Callala Beach however, is more likely to be accessed via vehicle due to limited if any shoulder on the road.

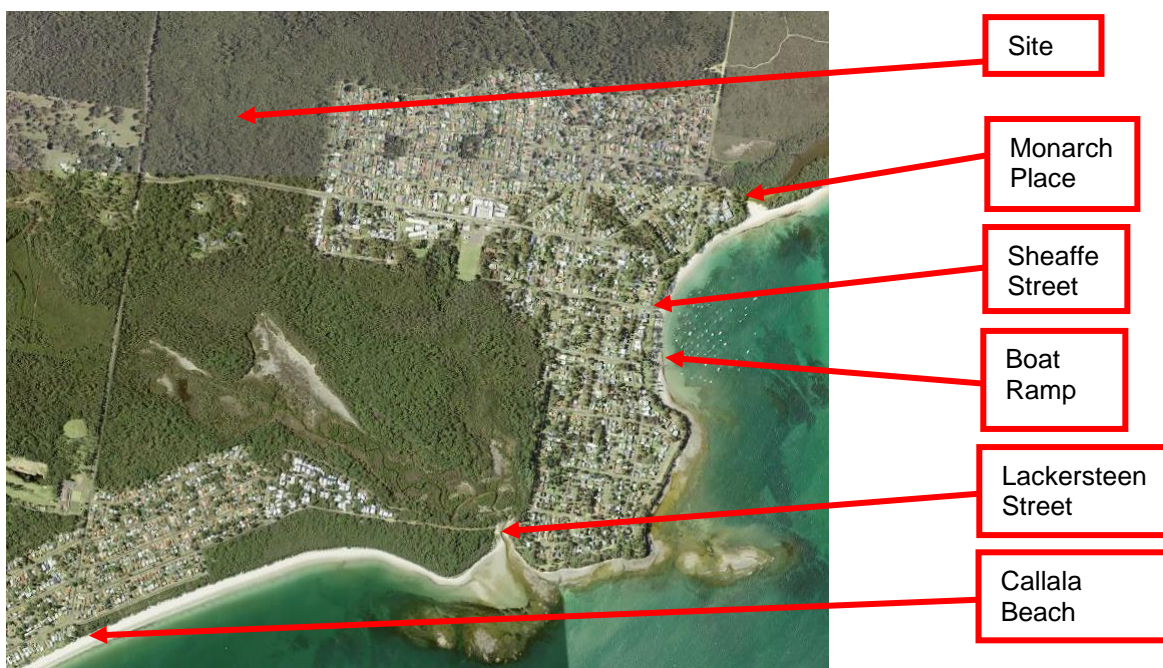


Figure 13 – Main beach access points at Callala Bay

Upon review of the above beach access sites, and proximity to the site, it is reasonable to conclude that this proposal will generate increased use of these beach access areas. However, when understanding the options available, the overall impact is anticipated to be minimal with the usage spread potentially across five (5) sites.

Key Findings

- The proposal will not duplicate surrounding public open space & community facilities or add to any existing oversupply.
- Where possible, the proposal should contribute to the embellishment of community infrastructure in close proximity to the proposal (where a clear nexus is identified) via funding mechanisms such as development contributions or in-kind works agreements. This includes embellishing both the proposed local recreation park and linear open space as per benchmark requirements of the CISP.
- Council has the ability to consider additional public open space & community facilities with a nexus to levy development contributions to mitigate associated impacts from the proposal.

Strategic Needs Considerations

Needs assessment of public open space & community facilities has involved a desktop review of relevant SCP projects and Callala Bay location specific recommendations outlined in the CISP. This assessment decision is based on the recent and relevant work which is now informing Council's strategic planning to meet community / future residential needs to the year 2036 that this proposal is consistent with.

Relevant information from the CISP has been used to inform the standards, appropriate level of infrastructure provision to meet future needs for the proposal site and surrounds.

Open space

Chapter 8 of the CISP identifies the top five most used sport, recreation buildings and open space needs beings:

- Beaches;
- Natural area/bushland;
- Tracks, trails and boardwalks;
- Aquatic centres; and,
- Foreshore parks.

With the exception of aquatic centre which are considered beyond the reasonable supply of this proposal, this document has considered infrastructure needs related to access to beaches, natural area/bushland and foreshore parks via provision and extension of the linear open space systems.

In addition, the CISP also identifies the following key strategic directions (see Figure 14) that form needs for the provision of open space with key outcomes to address oversupply, rationalisation and developer contributions to supplement future works. In addition, there is a need identified for shared paths to connect to large parks instead of providing smaller parks and where possible embellish existing open space assets.

Future direction

- Council is generally over supplied with local and district recreation parks. With limited resources to maintain the existing network, future focus should be to provide good quality district recreation parks (refer to appendix F), with a variety of play embellishments for all ages and picnic buildings, as opposed to numerous local parks, that are often limited in play experiences. Recreation corridors (appendix F) or shared footpaths should provide connections to these larger parks and increase the walkability of the neighbourhood.
- unused local recreation parks in poor condition should be rationalised (play equipment is removed and discarded or relocated to a nearby district recreation park), the land can then sold, with the funds being reinvested back into the district recreation park that serves the surrounding community or into upgrading connections to the district recreation park
- need to embellish existing sporting facilities to encourage greater use
- need to consider the rationalisation of sportsgrounds which are used for one season only and low usage
- despite their heavy usage, Council should develop an aquatic strategy that looks at the feasibility of their aquatic buildings as they are expensive assets to run and maintain with little or no financial return
- developer contributions towards open space should focus on embellishing the existing recreation parks and sporting facilities to encourage use and ensure they meet the demands of future residents.

Figure 14- Extract from *Community Infrastructure Strategic Plan* (page 44)

In addition to the above, the CISP also recommends three open space upgrades (see Figure 15) in Callala Bay that may benefit residents of this proposal. This table outlines key recommendations however at this time exact details of associated embellishments and estimated costs are unknown and would need further investigation by Council to determine apportionment to this proposal and possible inclusion in the SCP.

Locality	Action	Justification	Recommendation
Callala Bay	Rationalise	The Hall is in a fair building condition and there are other community centres offering the same services nearby. Focus on making Callala Community Centre the community hub for the area	Callala Bay Progress Hall – investigate implementing one of the rationalisation options
	Upgrade	Community consultation identified the need for outdoor exercise equipment	Bicentennial Park – investigate the addition of exercise equipment along the foreshore path, Bicentennial Path
	Upgrade	Upgrades will increase the usage capacity of the Sports Ground	Callala Bay Sports Ground – upgrade the Ground to attract summer sporting codes – embellishments to include outdoor gym equipment

Figure 15- Extract from *Community Infrastructure Strategic Plan* (page 83)

Further the analysis done in the CISP, Table 1 of this infrastructure assessment identifies the following needs relate to district sportsgrounds and local recreation parks:

District sportsground	Payment of Development Contributions to further embellish the Callala Bay Sportsground when under understanding that part of the sportsground shortfall will be met by a new sportsground to service Planning Area 2 residents in the West Culburra proposal, which is only a short drive from Callala Bay/Beach (approx. 13km or about 10 minutes).
Local recreation park	The proposal's parkland of 0.47ha meets the requirement for the proposed new population and contributes to reducing Callala Bay's overall shortfall.

Community buildings

Chapter 9 of the CISP identifies the top five most used community buildings and spaces are:

- Libraries;
- Public halls and community centres;
- Art galleries;
- Community buildings; and,
- Tourist information centres.

It is noted that Callala Bay is already oversupplied having two (2) community centres.

Chapter 9 of the CISP also identifies the following key strategic directions (see Figure 1) for provision of community buildings.

Future direction

- ☐ With a high percentage of community buildings being used below capacity and some small towns having more than one building servicing the community, the rationalisation of community buildings is required. Rationalisation of these assets would not only benefit Council financially, but would produce better quality buildings for the community. A number of ways Council can conduct this process include;
 - the integration of buildings, making them more multi-purpose
 - rezone the land to allow commercial use of the building
 - the decommission of buildings that are in very poor or poor condition and past their effective asset life.
- ☐ developer contributions towards community buildings should focus on embellishing the existing buildings to encourage use and ensure they meet the demands of future residents.

Figure 16 - Extract from *Community Infrastructure Strategic Plan* (page 54)

As outlined above, the proposed subdivision resulting from the planning proposal is adjacent to an existing village and understanding a large catchment area is needed for community building infrastructure, and identified oversupply of similar infrastructure, this outcome does not justify the need for such additional infrastructure. Therefore, consideration of future related embellishments to the Callala Bay Community and Child Care Centre (Emmett Street) maybe appropriate to provide for associated community facility needs.

Key Findings

- Infrastructure provision for sportsground improvements within close proximity to the proposal should be consistent with benchmark standards as identified in the CISP.
- The proposal should connect to surrounding recreation parks and sportsgrounds via both physical linkages and supporting infrastructure (i.e. shared path in the road reserve or proposed linear open space system).
- Exact details of associated sportsgrounds embellishments for consideration with a development contribution nexus requires further investigation by Council to determine apportionment to this proposal.

Strategic Delivery Plan Considerations

The following delivery plan assessment related to public open space & community facilities has been derived from the above initial desk top review of the concept master plan and outcomes of needs assessment. The outcome summary of this assessment is listed below to inform strategic master planning related to the proposal and more detailed assessments will be required as the development approval progresses:

- Located within the benefit area of contributions project 02AEREC0004 – Planning Area 2 - Recreation facilities upgrade various locations (\$450,000 identified to upgrade / embellishment Callala Bay Sportsground), this is the relevant mechanism to provide associated sportsground improvements generated by this proposal.
- Located in close proximity to the site, the Callala Bay Community and Child Care Centre is identified to receive embellishments from this proposal.
- The proposal's centrally located public reserve and linear open space will be embellished as per benchmark requirements of the CISP to provide a strategic recreation link across its northern boundary (ridgeline) of Callala Bay to provide a significant recreation asset for existing and future residents.
- The proposal's linear open space will complete a walking / cycling route that surrounds Callala Bay and provides and connects the local community to its surrounding bushland and marine park environments.
- Provide village entry treatments.
- The proposal will not duplicate surrounding public open space & community facilities or add to any existing oversupply.
- Where possible, the proposal should contribute to the embellishment of community infrastructure in close proximity to the proposal (where a clear nexus is identified) via funding mechanisms such as development contributions or in-kind works agreements. This includes embellishing both the proposed local recreation park and linear open space as per benchmark requirements of the CISP.
- Council has the ability to consider additional public open space & community facilities with a nexus to levy development contributions to mitigate associated impacts from the proposal.
- Infrastructure provision for sportsground improvements within close proximity to the proposal should be consistent with benchmark standards as identified in the CISP.
- The proposal should connect to surrounding recreation parks and sportsgrounds via both physical linkages and supporting infrastructure (i.e. shared path in the road reserve or proposed linear open space system).
- Exact details of associated sportsgrounds embellishments for consideration with a development contribution nexus requires further investigation by Council to determine apportionment to this proposal.

Maintenance Considerations

Maintenance assessment of proposed public open space & community facilities provided by this proposal is based on the above concept information and strategic analysis hence, it is a desk top review only to future subdivision planning. Therefore, no detailed assessment is able to be undertaken and the following information is to assist in providing strategies to minimise maintenance for future infrastructure. In addition, determination of "ongoing and life cycle costs" cannot be accurately predicted or costed at this preliminary planning stage.

However, in recognition that Biodiversity Certification is being proposed for the site which relates to the assessment of the bushland park/reserve, it has identified (on page 67) key management actions that could be conditioned in a future subdivision approval to include a Construction Environment Management Plan for the developer to undertake with actions including:

-
- installation of sediment fencing
 - installation of temporary exclusion fencing
 - installation of no-go signs
 - inclusion of a biodiversity component to all site inductions
 - management of any weeds on-site prior to the commencement of construction
 - strict hygiene protocols to prevent the inadvertent spread of weeds
 - management of weeds in the bushland park
 - monitoring of the population by a suitably qualified ecologist
 - reporting consistent with the approval requirements.

Once established by the proponent, the ongoing management of the bushland park will comprise weed control, maintenance of track, signage and fencing and is expected to cost annually approximately \$10,000 and will be enhanced by the establishment of a Local Bushcare Group.

The estimated annual maintenance cost of the established APZ Linear Reserve is \$15,000 and is described in the above section of this report relating to the Bushfire Asset Protection Zone (page 10).

Key strategic maintenance guidelines:

- Seek installation of quality infrastructure with known anticipated lifespan;
- Implement a maintenance program tailored to specified constructed infrastructure;
- Regular routine inspections to identify defects;
- Initiate additional maintenance inspections of issues raised by users;
- Prioritise repair of any defects based on risk/economic assessment;
- Seek (where possible) skilled community volunteer labour;
- Prepare appropriate work schedules and record periodical maintenance; and,
- Undertake regular maintenance work.

Key Findings

- A proactive maintenance program needs to be implemented by Council (as final asset owner) and funded from surrounding residential rated areas.
- Where possible, consider assistance of community volunteer initiatives such as Bushcare and/or Parkcare groups and the alike which have the ability to reduce some maintenance costs (i.e. labour).

Consultation

When undertaking this assessment, consultation has occurred with the Callala Bay Progress Association (Callala Rezoning Assessment Group) to better understand the future needs of residents living in the village.

The Association and Callala Rezoning Assessment Group have identified a number of needs which were identified in the Callala community engagement when undertaking the “Creating Callala” Strategic Plan (community lead planning document) in 2013.

The “Creating Callala” document is shown as Appendix G, has the aim of formulating a strategic plan or vision for the Callala area. Relevant key outcomes identified in this Plan, in no priority order, are:

- *To establish a sporting complex consisting of - Soccer 2nd field & clubhouse, Cricket nets & pitch, Tennis courts, Netball courts, playground associated with sports fields.*
- *To establish a gymnasium - that is accessible to the community, appropriately equipped, with hydrotherapy pool.*
- *To improve the amenity of the foreshore for all users: by 1. Footpaths; 2. Signs / guidance; 3. Parks Play Equip.; 4. Drinking water; 5. Showers (rinse after swim); 6. Picnic tables; 7. Benches only; 8. Barbeques; 9. Toilets, Fitness Station.*
- *To improve businesses' viability & sustainability.*
- *To make available accessible and adapted housing: independent, or assisted, or specialised residential care, on commercial, cooperative or non-profit basis.*
- *To find more opportunities for new residential land, to make better use of large blocks, to adapt housing, to possibly provide residential care facility and/or in-home services.*
- *To improve safety for pedestrians, cyclists and motorists. To improve access to major locations and link villages. To promote walking and cycling as part of a healthy lifestyle.*

The proposal has the opportunity to build on some of the key outcomes identified in the "Creating Callala" Strategic Plan and some of which are identified in Council's relevant contribution projects and CISP.

Conclusion

This report has been prepared to support a Planning Proposal for the site identified for future expansion of Callala Bay. The proposal concludes that it will result in an increase of load to various items of infrastructure including water, sewer, and electricity networks along with various items of community infrastructure.

The assessment concludes that various upgrades and extensions to items of infrastructure will be required to facilitate the proposed development however, at a planning proposal level these upgrades are consistent with the outcomes of the proposal and achievable upon reviewing the information available in this report. Delivery of such infrastructure upgrades has the ability to be funded by the proposal or related development contribution mechanisms, as appropriate.



APPENDIX A

Concept Plans of Planning Proposal

(Note - larger plans are provided separate to this document)

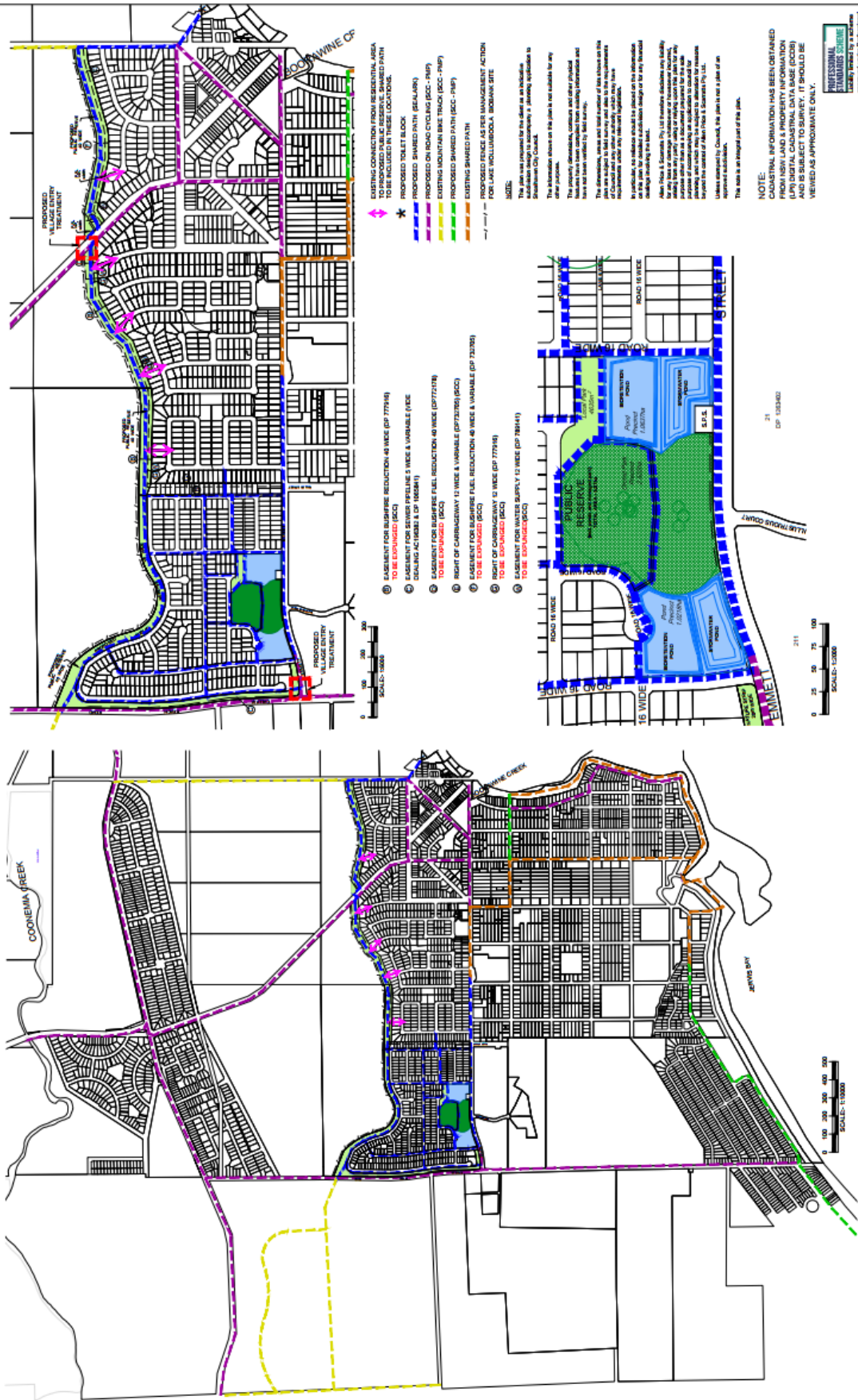
SUBDIVISION MASTERPLAN

LAKE WOLLUMBOOLA BIOBANK SITE
(PROPOSED EXTENSION TO
JERVIS BAY NATIONAL PARK)



1:2000 (AT A ORIGINAL)	DATE: 25.05.2020	ORIGIN: SSM PL	SURVEY DESIGN DRAWN CHECKED	REV DESCRIPTION P1 P2 P3 P4 P5 P6	BY DATE	 aerial price & scarratts pty ltd Land and Development Consultants 1000 Beach 7th Floor Karna Branch: 128 Burg Ring Street, Karna NSW 2201 www.aerialpriceandscarratts.com.au	PLAN SHOWING PROPOSED RESIDENTIAL SUBDIVISION MASTERPLAN OVER LAND NORTH OF EMMETT STREET, WEST OF CALLALA BEACH ROAD AND LOT 20 DP 1263402 AT CALLALA BAY FOR SEAL RPT 1 LTD	DRAWING NUMBER 25930-09	DRAWING STATUS PRELIMINARY NOT TO BE USED FOR CONSTRUCTION PURPOSES	PROJECT 1 OF P6
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PROPOSED SHARED PATH EXTENSIONS



NOTE: CADASTRAL INFORMATION HAS BEEN OBTAINED FROM NEW LAND & PROPERTY INFORMATION (LPI) DIGITAL CADASTRAL DATA BASE (DCDB) AND IS SUBJECT TO SURVEY. IT SHOULD BE VIEWED AS APPROXIMATE ONLY.

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STANDARDS SCHEME**
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Standards Legislation

LEARNING STATUS

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NOT TO BE USED FOR CONSTRUCTION PURPOSES

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**PROPOSED SHARED PATH EXTENSIONS
OUTLINED IN PLANNING PROPOSAL
FOR CALLALA BAY EXPANSION AREA
FOR SEALARK PTY LTD**

Fallen price & scarratts pty ltd
land and development consultants
Nowra Branch: 75 Humeville Street, Nowra NSW 2541
Karrila Branch: 1/28 Bering Bung Street, Karrila NSW 2533
phone: (02) 4421 6141



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APPENDIX B

Strategic Water Supply Plan

Water Supply Development Impact Assessment

Callala Bay Urban Release Area

WI22015AP



Prepared for
Sealark Pty Limited

31 January 2022

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Our report is based on information made available by the client. The validity and comprehensiveness of supplied information has not been independently verified and, for the purposes of this report, it is assumed that the information provided to Cardno is both complete and accurate. Whilst, to the best of our knowledge, the information contained in this report is accurate at the date of issue, changes may occur to the site conditions, the site context or the applicable planning framework. This report should not be used after any such changes without consulting the provider of the report or a suitably qualified person.

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1 Introduction

The Callala Bay Urban Release Area (Callala Bay URA) is a 374 lot residential development located on the shores of Jervis Bay. The planning proposal for the proposed development has been lodged to Shoalhaven City Council as part of the Callala Bay Residential Expansion Area (West Callala) – PP028.

Shoalhaven Water's assessment of the planning proposal has provided the following concerns that need to be addressed by the developer:

Low hydrant pressure is expected at higher elevations if ~381 dwellings are proposed. Additional advice is needed that considers the water pressure (fire flow) concerns at higher elevations and how/when these will be addressed in the development process

To address the concerns of Shoalhaven Water, Cardno has worked with Allen Price and Scarratts to determine the ideal sizing of the reticulation network. This sizing of the reticulation network is based on retaining an optimum daily performance, while providing maximum capacity to support firefighting efforts.

In addition to this, Cardno have undertaken an assessment for the existing network performance to ensure current levels of service are retained for existing customers. This impact assessment will consider:

- > Peak day performance
- > Peak hour performance
- > Firefighting flow performance.

It should be noted that Shoalhaven Water does not have a legislative requirement to provide firefighting flows. As such water networks are not specifically designed to meet the requirements of the Fire Hydrant Installations Australian Standard (AS2419.1 – 2017). However, as part of a *duty of care* to the community they serve, firefighting flows are used to assess the performance of networks during planning stages. This can often limit the extent of development areas, particularly in areas of higher local elevations.

1.1 Location

The Callala Bay URA is located 19 km south east of the Nowra CBD, on the shores of Jervis Bay. The development is a proposed 374 lot subdivision, made up of predominately single residential lots, in addition to community parks and open space.

The location of the proposed development is shown in Figure 1-1, with the proposed layout shown in Figure 1-2.

The area is part of the Large Coonemia Reservoir water supply zone (WSZ). This WSZ supplies the communities of Callala Bay, Callala Beach, Moyla, Culburra Beach and Orient Point. This equates to an existing maximum day demand of approximately 56 L/s, or 4.8 ML/day.

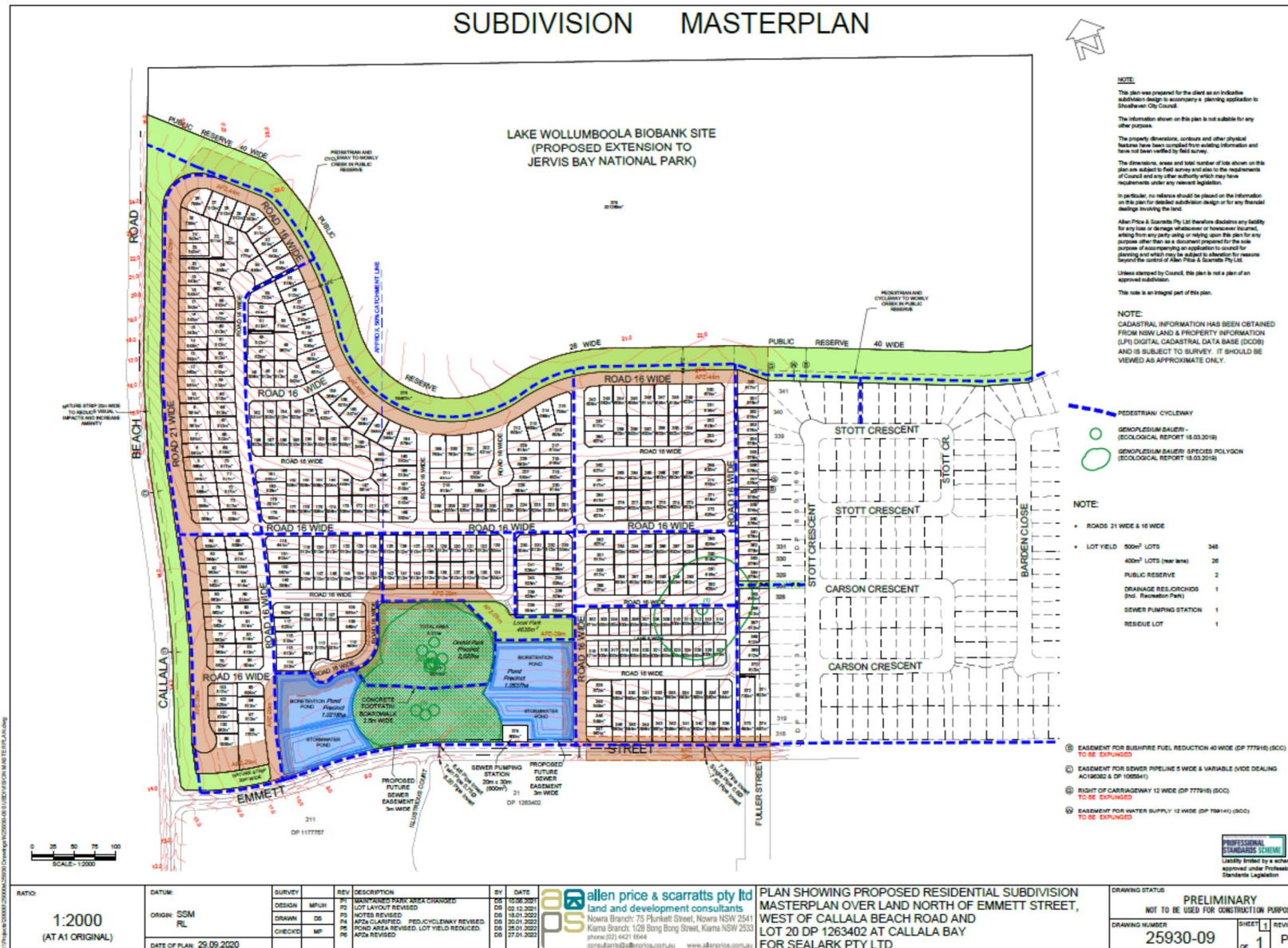
The community of Callala Bay are connected the Large Coonemia Reservoir via a DN450 water main that runs along Coonemia Road. An existing DN300 off-take is located to the north of the existing Callala Bay residential development. The DN300 main runs along the entirety of the northern rear boundary of the Callala Bay development. At the western margin of the existing development, it is capped off to facilitate future connections. This capped off DN300 main will be the primary water source for the proposed development area.

In addition to the DN300, there is also a DN150 installed along Emmett Street. This DN150 has a capped end at the border of the proposed development area. To provide good water circulation and water supply resilience, it is proposed that the new development will also connect into the DN150, extending it along Emmett Street towards Callala Beach Road. The configuration of the proposed reticulation network is provided in Section 2.4.

Figure 1-1 Callala Bay URA Development Location



Figure 1-2 Subdivision Layout



2 Water Supply System

2.1 Background

Shoalhaven Water's InfoWorks hydraulic model of their water supply system was used as the basis of this assessment. As part of the preliminary works, this model was updated to reflect the existing condition, with the inclusion of the development area. The model was utilised to undertake a number of hydraulic simulations in order to optimise the size of the proposed reticulation network. This was undertaken to cater for daily operation and for firefighting scenarios.

The water network in Callala Bay is located within the Large Coonemia Reservoir WSZ. The Large Coonemia Reservoir has a storage capacity of 13 ML, with operational levels ranging from a top water level of 56.85 m AHD to a bottom water level of 53.11 m AHD. This accounts for the top 35% of the storage volume, or 4.5 ML of operational volume.

These reservoirs service a maximum day demand of 56 L/s or 4.8 ML/day. The maximum day demand is approximately 40% of the storage capacity, which is within the existing storage requirements for Council's reservoirs.

The Large Coomeria Reservoir is supplied by the Brundee Pump Station, which is currently configured to operate during off-peak times to provide Shoalhaven Water with operational savings.

2.2 Shoalhaven Design Standards

The Shoalhaven Water design standards applied in this assessment are as follows:

Table 2-1 SW design standards

Item	Criteria	Requirements
Supply Pressure	Minimum Pressure - MDD	≥15 m (Minimum) ≥30 m (desirable)
	Maximum Pressure - ADD	60 m (desirable) 90 m (maximum)
Reservoir Storage	Operating Storage	Up to 1/3 MDD
	Reserve Storage	Minimum of 1/3 MDD
Headloss	≤ DN150	< 5 m/km
	≥ DN200	< 3 m/km
Maximum velocity	Transfer mains	≤ 4 m/s
	Reticulation mains	≤ 2 m/s
	Optimal	0.8 m/s to 1.4 m/s
Fire Flow Enquires	Commercial	20 L/s @ 150kPa (95%ile MDD)
	Residential	10 L/s @ 150 kPa (95%ile MDD)

Based on the determined development land-use and development footprint, the water demand in terms of Equivalent Tenements (ET) was determined. The estimated water demands are provided in Table 2-2.

Table 2-2 Estimated Water Demands

Parameter	
Development yield (ET)	374
Development EP	1,496
ADD	2.6 L/s or 224 kL/day
MDD ^{#1}	5.6 L/s or 480 kL/day
MHD ^{#1}	11.2 L/s or 40 kL/hr

Note #1: Peaking factors derived from models representation of the Coonemia WSZ and typical signal residential max hour usage (MDD = 2.138 x ADD, MHD = MMD * 2.02)

2.3 Model update

The existing hydraulic model was constructed in 2013. To ensure the model reflects the existing conditions, the existing GIS network files and populations were sourced from Shoalhaven Water. These were used to compare the modelled network within the Large Coonemia Reservoir WSZ, to 2021 conditions.

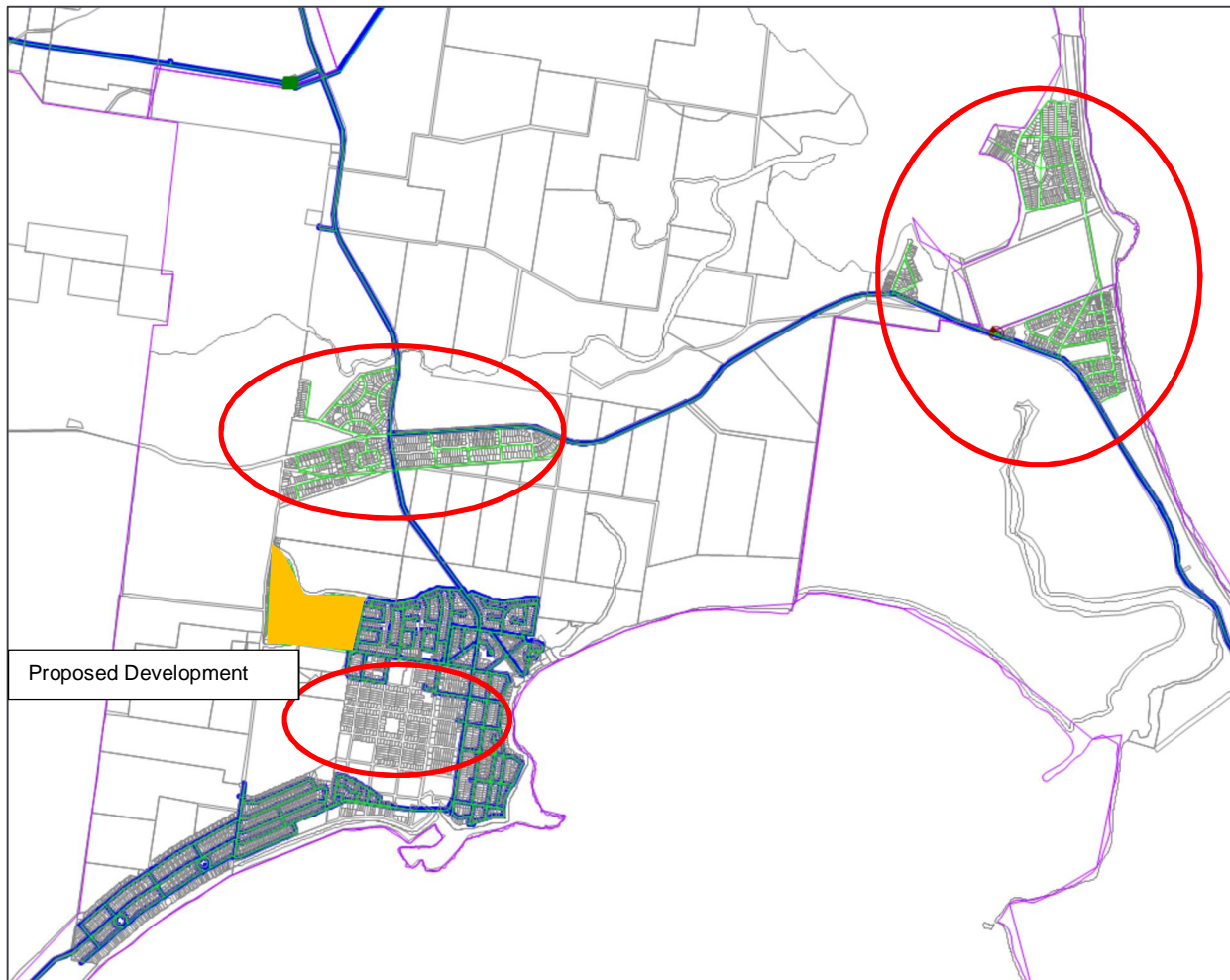
The model was found to be reflective of the existing Shoalhaven Water GIS, and no additional updates were needed.

It should be noted that there are zoned lots within the Cadastre to the north and north east of Callala Bay. These lots form part of the Lake Wollumboola Biobank site, and as such would not be developed.

The area to the south of the Callala Bay URA are classified as flood prone lands, zone E2. Although this area has designated lots within the Cadastre, they will not support residential development.

The Cadastre areas that will not be developed are shown in Figure 2-1. The **Blue** line represents the extent of Shoalhaven Water's GIS water network.

Figure 2-1 Additional Development Areas



In the analysis of the existing and development, the modelled 2021 demand set was used (Forecasted Average Day Demand 2021). This is considered to be a true representation of system demands during average and peak periods.

2.4 Model configuration

The model was configured to represent the existing control and logic configuration, with the project 2021 population demands loaded onto the network. Peaking factors were also applied to the network demands, to ensure maximum day/hour demand conditions were used in sizing the reticulation network.

The modelling files used were:

- > Forecasted Average Day Demand 2021
- > Demand Diagram
- > Peak Tourist Day Demand Scaling

The development was modelled with an ET of 374, as per the proposed development layout provided by Allen Price and Scarratts. This layout is consistent with the layout issued to Council as part of the planning proposal submission.

It has been assumed that the water mains within the development would be PVC-O PN12.5 rated pipework. PVC-O pipe materials was used for the modelling of internal diameter only, as this material is common in residential developments of this scale. The actual pipe materials should be selected during the design phase of the development, in accordance with Shoalhaven Water's design specifications.

The reticulation network was modelled with internal pipe diameter obtained from manufacturer's specifications. Internal diameters are preferred to nominal diameters as they provide a clearer understanding of system performance, and negate confusion at later stages in the design process.

The existing reticulation design was modelled based on the road layout to the development. The reticulation network was developed in the model as a DN150, or ID167.9 PVC-O water main ring main connecting the existing DN300 to the DN150 main in Emmett Street.

The DN150 ring main was connected to a DN100, or ID115.4 PVC-O reticulation network that provides internal connectivity of the development.

Hydrant locations or junctions have not been designed at this point in the planning proposal. Hydrants have been indicatively modelled in the development, to allow potential points of limited pressure to be identified. Each hydrant is modelled as an 80 mm hydrant with a level set to 1 m above provided details topographical site survey.

The modelled configuration is shown in Figure 2-2.

Figure 2-2 Development configuration in the model



3 System Performance

3.1 Existing Water System Performance

3.1.1 Existing System Performance – minimum pressures

The existing system, without the proposed development connection, was modelled for the 2021 MDD demand scenario. The model was run with the pre-populated simulation parameters provided in the hydraulic model. The results of this simulation predicts that the majority of the Large Coonemia Reservoir WSZ network complies with Council's Design standards, with minimum pressures of 30 to 60 m predicted.

The areas in the vicinity of the reservoirs and along the DN450 are predicted to have pressures less than 30 m. This is related to ground elevation, rather than system incapacity.

The minimum pressure contours based on the modelled predictions are shown in Figure 3-1.

3.1.2 Existing System Performance – Velocity and Headloss

The model predicts at under 2021 conditions, no water mains in the Large Coonemia Reservoir WSZ are predicted to have a velocity greater than 2 m/s

The model predicts that 16 mains within the Large Coonemia Reservoir WSZ have a headloss greater than 2 m/km, but less than 5 m/km. Of these 16 mains, asset 30467, which is a DN300 pipe connecting the two reservoirs at Coonemia Reservoir, is the only larger diameter main. All other pipes are within the DN100 reticulation networks.

The DN450 supply main from the Large Coonemia Reservoir and the DN300 off-take are predicted to have the following velocities and headlosses:

- > DN450 – 0.32 m/s, with a maximum headloss of 0.23 m/km
- > DN300 – 0.20 m/s, with a maximum headloss of 0.15 m/km

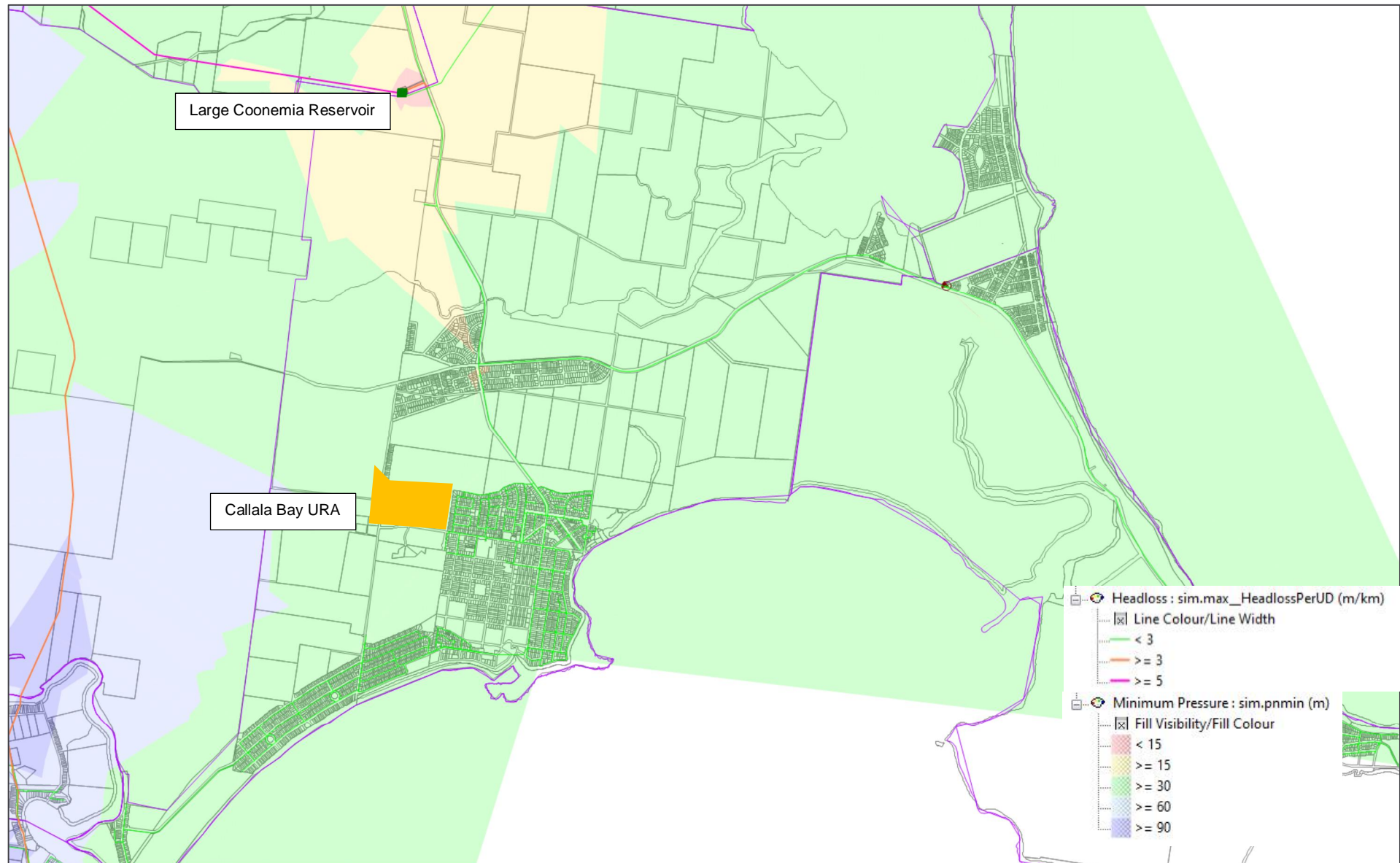
3.1.3 Reservoir Storage

The Large Coonemia Reservoir is the primary water supply reservoir that supports the development area. This reservoir has a storage volume of 13 ML.

The MDD for Large Coonemia Reservoir existing catchment is 4.8 ML/day. Based on this MDD, the existing reservoir has sufficient capacity to meet Council's design standards for total storage volume.

The minimum operational volume of the reservoir is set at 53.11 m AHD, and a reserve floor level of 45 m AHD. Based on these levels, the reservoir provides 8.4 ML of reserve storage. This volume is larger than the 8 hour at MDD requirement (or 1.6 ML).

Figure 3-1 Predicted minimum pressure contours – Existing



3.2 Existing Water System Performance – With Development

The hydraulic model was updated with the proposed connection and demands from the proposed Callala Bay URA. Simulations consistent with the existing system performance analysis were undertaken to determine the impact, if any, the proposed development has on the Large Coonemia Reservoir WSZ.

3.2.1 Minimum pressure impact

The MDD simulation was run within the hydraulic model. The diurnal water demand pattern and peaking factors applied to the development, are consistent with the existing residential developments in Callala Bay.

The model predicts minor changes in minimum pressures with and without the development. The predicted minimum pressure at the DN300 connection point (SW_103059) and at the DN150 connection point along Emmett St (SW_102830) are shown in Table 3-1.

Table 3-1 Connection point pressure change

Asset ID	Predicted Minimum Pressure (m)	
	Pre-development	Post Development
SW_103059 (DN300)	31.75	31.43
SW_102830 (DN150)	42.30	41.90

The predicted minimum pressure contours for the modelled 2021 MDD scenario with the development area shown in Figure 3-2, and the minimum pressure difference between the existing and with development scenarios are shown in Figure 3-3.

The changes in pressure within the Large Coonemia Reservoir WSZ are typically less than 0.25 m, with the local area immediately around the proposed connection points reducing by 0.5 m.

3.2.2 Headloss and Velocity impact

The inclusion of the development area does not have adverse impacts on predicted velocities in the Large Coonemia Reservoir WSZ. There are no additional pipes predicted to have velocities greater than 2 m/s.

There are zero mains identified as having a headloss greater than 5 m/km, with the inclusion of the development.

The DN450 supply main from the Large Coonemia Reservoir and the DN300 off-take are predicted to have the following velocities and headlosses with the inclusion of the Callala Bay URA:

- > DN450 – 0.40 m/s, with a maximum headloss of 0.36 m/km
- > DN300 – 0.37 m/s, with a maximum headloss of 0.43 m/km

3.2.3 Reservoir Storage impact

The Large Coonemia Reservoir has a capacity of 13 ML that currently has a MDD of 4.8 ML/day. The calculated MDD for the Callala Bay URA is 484 kL/day, increasing the large Coonemia WSZ MDD to 5.3 ML/day. Based on this, there is sufficient total storage in the reservoir to support the new development.

The calculated reserve storage at Large Coonemia Reservoir is 8.4 ML. This is sufficient to accommodate the 8 hour MDD of the existing system, including the proposed development (or 1.8 ML).

3.2.4 Water Supply Assessment Summary

The assessment of the Callala Bay URA proposed creation of 374 residential lots, was undertaken using the updated hydraulic model and design standards. The outcomes of the modelling works predicts that the Callala Bay URA will not adversely impact on the performance of the existing water supply network.

No augmentation to the existing Large Coonemia Reservoir WSZ network is deemed necessary to facilitate the connection of Callala Bay URA.

Figure 3-2 Predicted minimum pressure contours – with development

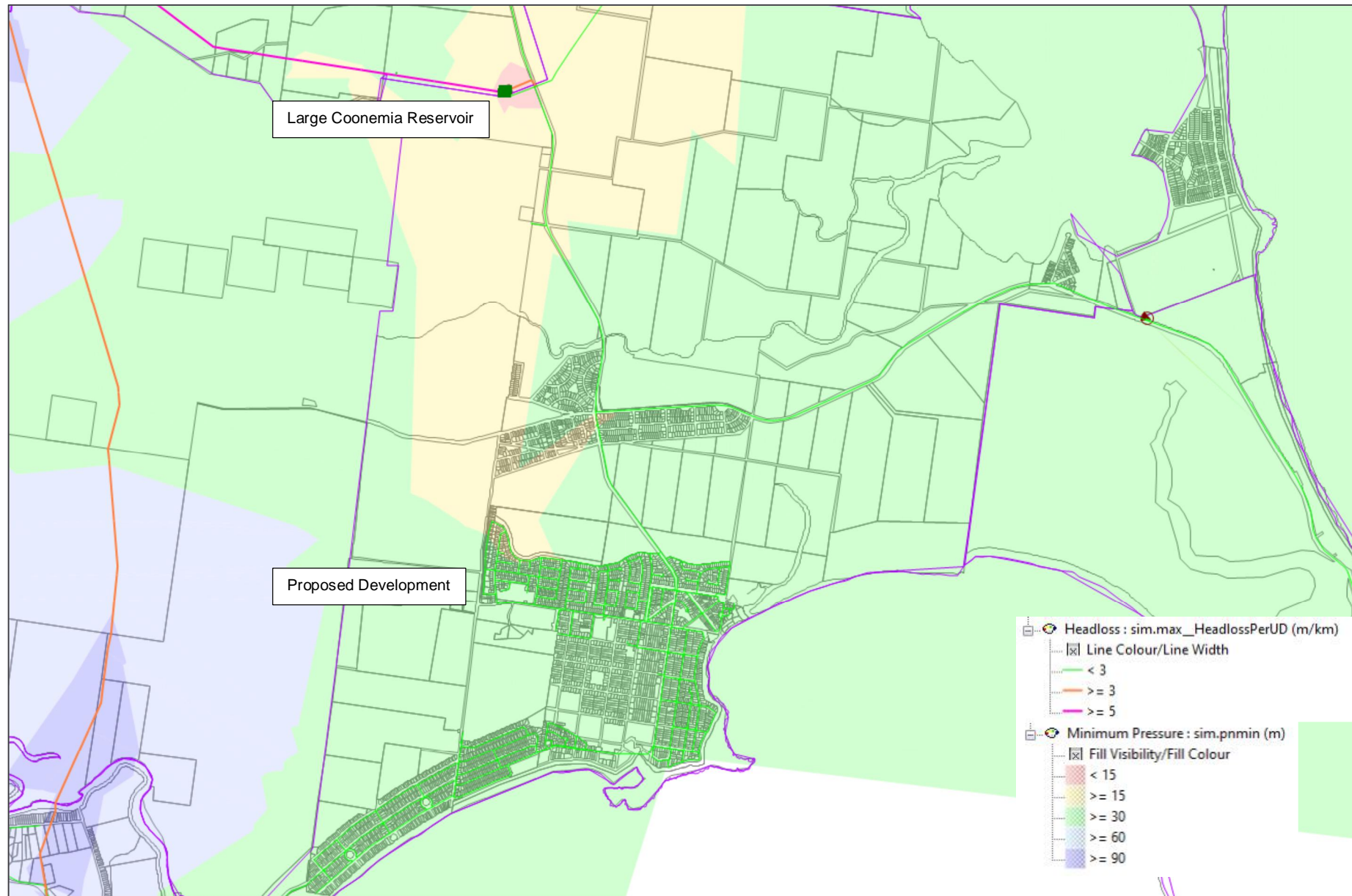
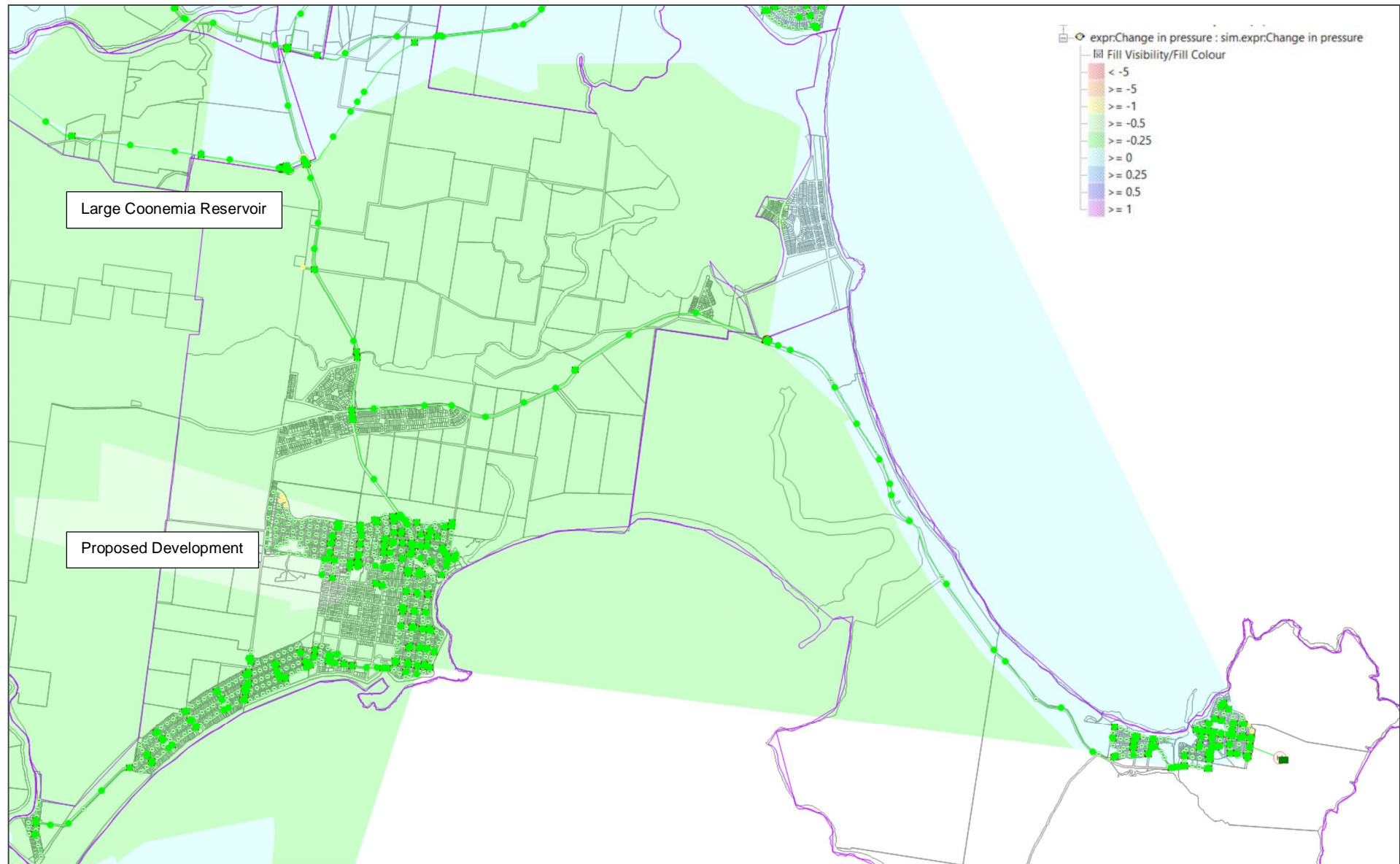


Figure 3-3 Predicted minimum pressure difference contours – with and without the development



3.3 Firefighting Flow Assessment

The model was configured to simulate hydrant activation under 95%ile maximum hour conditions. This approach is an industry standard for the assessment of hydrant performance, and is considered the best approach for this investigation.

Each of the proposed hydrants within the development were assessed using this method to determine their residual pressure under 10 L/s discharge, as per AS2419.1. This flow is consistent with buildings with a floor area of > 1000 m² with a height no greater than two (2) storeys.

3.3.1 Existing Shoalhaven Water Network

The firefighting flow assessment was undertaken with and without the development. This has been undertaken to ensure that the Callala Bay URA does not impact on the existing levels of service provided to current Shoalhaven Water's customers.

There are currently 802 hydrants in the Large Coonemia WSZ. The model predicts that all of the hydrants have the capacity to discharge 10 L/s, while retaining residual pressure greater than 150 kPa. This satisfies the requirements for an assisted feed hydrant in NSW, as per AS2419.1.

The predicted hydrant pressure results for the Large Coonemia Reservoir WSZ is provided in Appendix A.

The model predicts that 20 hydrants in the WSZ cannot support dual hydrant operation (20 L/s) while maintaining a pressure of 150 kPa. These hydrants are located in Myola and Culburra Beach.

The hydrants in Callala Bay and Callala Beach are all able to support 20 L/s discharge while retaining 150 kPa.

3.3.2 Existing Shoalhaven Water Network – with Development

The firefighting simulation was undertaken with the Callala Bay URA included. This assessment has been undertaken to:

- a. Confirm the demands of the Callala Bay URA do not generate firefighting flow deficiency in the existing network.
- b. Confirm the Callala Bay URA reticulation network has the capacity to support firefighting flows (10 L/s at 150 kPa).

The updated hydraulic model was used to undertake the firefighting flow assessment.

The existing system, with the Callala Bay URA is predicted to have sufficient pressures to support firefighting flows (10 L/s at 150 kPa). The comparison of model pressure predictions with and without the development are provided in Appendix A.

The predicted firefighting pressures for the modelled hydrants within the development shown in Appendix B.

The model predicts that 20 hydrants are not able to support dual hydrant flows, or 20 L/s at 150 kPa. This is consistent with the existing system performance.

The existing hydrants in Callala Bay and Callala Beach are all predicted to support firefighting flows of 20 L/s at a residual pressure > 150 kPa.

3.3.3 Internal reticulation performance

The maximum capacity of the water supply reticulation network was assessed using a firefighting flow assessment tool in the hydraulic modelling software. Each hydrant was set to free discharge, in order to identify the maximum allowable discharge from each hydrant. This individual capacity could then be conservatively expressed in terms of hydrants operating simultaneously.

The performance of each hydrant was assessed against the predicted 95%ile demands as per the existing system firefighting assessment. The internal reticulation system was modelled as per the configuration described in Section 2.4.

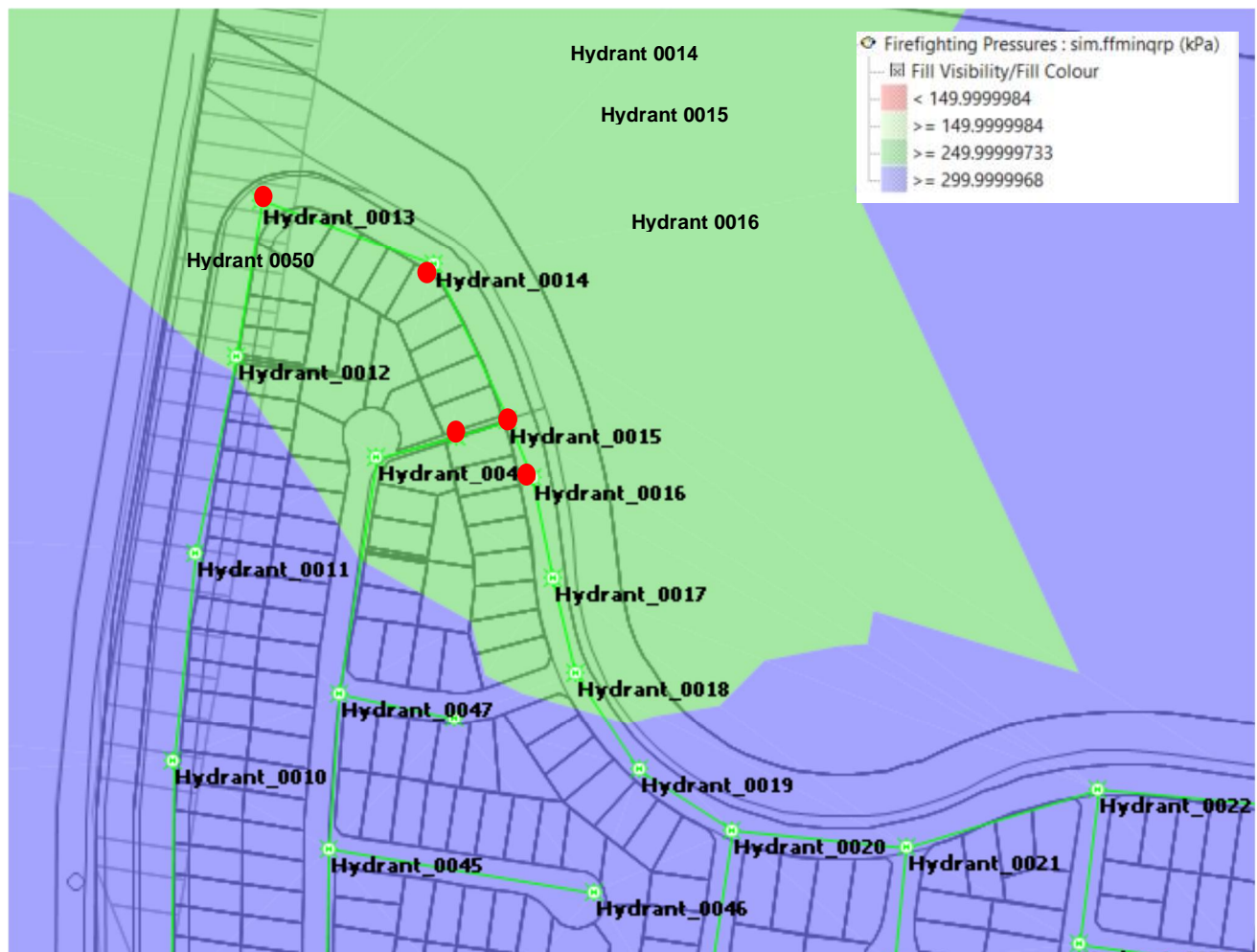
The model has 54 hydrants representing the Callala Bay URA development area. This was undertaken as the reticulation design has not been completed. The 54 hydrant locations provide a representation of the entire reticulation network, to allow areas of weakness/constraint to be identified.

The results of the model predictions are provided in Appendix B, with a summary of the five (5) worst performing hydrants shown in Table 3-2 and their locations in Figure 3-4.

Table 3-2 Summary of Callala Bay URA Hydrant Performance

Hydrant ID	Residual Pressure at 10 L/s	Residual Pressure at 20 L/s	Available Flow at 150 kPa
Hydrant_0014	240.36	221.39	44.80
Hydrant_0015	242.01	223.44	45.97
Hydrant_0050	247.67	224.34	40.79
Hydrant_0016	259.44	241.15	51.20
Hydrant_0013	266.10	246.43	50.45

Figure 3-4 Lowest Capacity Hydrants in Callala Bay URA at 20 L/s



The predicted areas of the lowest hydrant capacity are in the North West corner of the development. This corresponds with ground levels, with the highest hydrant elevation being Hydrant0014 with a ground elevation of 28.85 m.

The predictions of the model show that the proposed Callala Bay URA is able to meet the requirements of AS2419.1. This is achieved through the installation of a DN150 ring main that connects the DN300 capped main at the rear of Stott Crescent, to the DN150 main in Emmett Street.

4 Conclusion

The hydraulic analysis was undertaken for the proposed development at Callala Bay. This development is for 374 residential lots and supporting services.

Shoalhaven City Council, in response to the lodged planning proposal Callala Bay Residential Expansion Area (West Callala) – PP028, provided the following comment.

Low hydrant pressure is expected at higher elevations if ~381 dwellings are proposed. Additional advice is needed that considers the water pressure (fire flow) concerns at higher elevations and how/when these will be addressed in the development process.

Cardno utilised and updated Shoalhaven Water existing Infoworks WSPro hydraulic model to undertake a development analysis of the proposed Callala Bay URA.

The aim of this impact assessment was to:

- > Determine existing system performance
- > Identify the impact, if any, the proposed develop has on existing levels of service
- > Identify the capacity of the internal reticulation system to provide firefighting flows in line with AS2419.1.

The impact to the water networks were defined by utilising the updated hydraulic model and comparing simulations with and without the development area. Based on these modelling simulations, it is predicted that:

- > The development has no detrimental impact on minimum pressures within the Large Coonemia Reservoir WSZ
- > Pipe velocities and headlosses are consistent with the existing network, and the Callala Bay URA is not predicted to cause additional areas of deficiency.
- > The Large Coonemia Reservoir has sufficient capacity to provide emergency storage requirements.
- > Firefighting flow assessment predicts that the Callala Bay URA will not generate additional areas of incapacity within the Large Coonemia Reservoir WSZ.
- > Under a maximum day demand, 95%ile scenario, the reticulation network has the ability to support firefighting activities within Callala Bay URA.

The hydraulic model utilised for this assessment predicts that the hydrant pressures in the high-elevated areas achieve the desired pressures for single and dual operation. No additional augmentation to the existing system is deemed necessary to support the connection of the proposed development.

APPENDIX

A

HYDRANT PRESSURE AND FLOW PREDICTIONS

Hydrant	Residual Pressure at Minimum Fire Flow (kPa)			Available Fire Flow (l/s) at 150 kPa		
	Existing	With Development	Difference	Existing	With Development	Difference
WH30383	192	192	-0.32	13.04	13.02	-0.02
WH30513	186	185	-0.31	13.36	13.33	-0.03
WH29638	279	279	-0.31	13.81	13.81	0.00
WH37134	216	216	-0.31	14.60	14.59	-0.01
WH29652	310	310	-0.31	14.98	14.97	-0.01
WH30498	195	195	-0.32	15.09	15.06	-0.03
WH29667	323	323	-0.32	16.40	16.39	-0.01
WH31071	354	348	-5.37	16.84	16.66	-0.18
WH30387	239	239	-0.32	17.33	17.31	-0.02
WH31069	364	357	-6.45	17.38	17.19	-0.19
WH30501	205	205	-0.31	17.57	17.54	-0.03
WH29686	338	338	0.12	17.75	17.74	-0.01
WH30373	206	205	-0.32	17.78	17.74	-0.04
WH30906	345	345	-0.32	18.30	18.29	-0.01
WH31058	403	397	-5.98	18.58	18.40	-0.18
WH30907	384	384	-0.31	18.85	18.84	-0.01
WH31065	381	375	-5.97	19.02	18.80	-0.22
WH31051	387	381	-5.96	19.42	19.21	-0.21
WH31062	413	407	-5.97	19.57	19.37	-0.20
WH34846	391	385	-5.96	19.90	19.68	-0.22
WH30909	363	362	-0.31	20.23	20.22	-0.01
WH30393	228	227	-0.32	20.29	20.25	-0.04
WH30516	369	368	-0.31	20.33	20.32	-0.01
WH31064	395	389	-6.42	20.75	20.51	-0.24
WH30384	340	340	-0.31	20.83	20.82	-0.01
WH37135	288	288	-0.32	21.32	21.30	-0.02
WH31054	403	397	-6.02	21.55	21.30	-0.25
WH37087	441	441	-0.31	21.73	21.73	0.00
WH30657	244	242	-1.89	22.05	21.85	-0.20
WH30363	273	273	-0.32	22.27	22.24	-0.03
WH30512	365	365	-0.31	22.28	22.26	-0.02
WH30366	365	365	-0.31	22.29	22.27	-0.02
WH30359	367	367	-0.31	22.58	22.57	-0.01
WH30912	376	376	-0.31	22.62	22.61	-0.01
WH30381	368	368	-0.31	22.72	22.71	-0.01
WH30510	270	270	-0.31	22.86	22.83	-0.03
WH30884	361	360	-0.31	22.98	22.96	-0.02
WH31063	412	406	-6.06	23.25	23.02	-0.23
WH30364	292	292	-0.31	23.31	23.29	-0.02
WH37088	440	440	-0.31	23.47	23.46	-0.01
WH30901	328	328	-0.31	23.50	23.48	-0.02
WH37086	386	385	-0.31	23.60	23.58	-0.02
WH30385	373	372	-0.31	23.65	23.64	-0.01
WH35150	396	390	-5.84	23.89	23.60	-0.29
WH30399	358	358	-0.31	23.91	23.90	-0.01

Hydrant	Residual Pressure at Minimum Fire Flow (kPa)			Available Fire Flow (l/s) at 150 kPa		
	Existing	With Development	Difference	Existing	With Development	Difference
WH31057	417	411	-5.98	24.20	23.92	-0.28
WH30367	317	316	-0.31	24.79	24.77	-0.02
WH30361	410	410	-0.31	24.93	24.92	-0.01
WH29685	263	263	-0.31	24.93	24.90	-0.03
WH30903	336	336	-0.31	24.98	24.97	-0.01
WH37089	395	394	-0.31	25.74	25.72	-0.02
WH37074	367	367	-0.31	25.93	25.92	-0.01
WH30915	392	392	-0.32	25.95	25.93	-0.02
WH30379	406	405	-0.32	25.95	25.94	-0.01
WH30506	291	291	-0.31	25.95	25.93	-0.02
WH37107	441	440	-0.32	26.07	26.06	-0.01
WH30897	363	362	-0.31	26.15	26.13	-0.02
WH31060	425	419	-5.99	26.26	25.94	-0.32
WH30374	311	311	-0.32	26.30	26.27	-0.03
WH31007	423	417	-6.01	26.83	26.50	-0.33
WH37155	318	318	-0.31	27.35	27.33	-0.02
WH35152	422	416	-6.00	27.65	27.28	-0.37
WH31002	426	420	-6.20	27.73	27.45	-0.28
WH30392	339	339	-0.31	28.20	28.18	-0.02
WH30955	465	465	-0.31	28.84	28.82	-0.02
WH37077	420	420	-0.31	28.94	28.93	-0.01
WH30417	385	384	-0.32	29.14	29.14	0.00
WH30500	376	375	-0.32	29.20	29.19	-0.01
WH30499	370	369	-0.31	29.29	29.27	-0.02
WH30613	382	382	-0.42	29.31	29.29	-0.02
WH35129	363	355	-7.53	29.48	28.92	-0.56
WH30412	349	348	-0.31	29.50	29.47	-0.03
WH35036	339	332	-7.28	29.70	28.97	-0.73
WH30397	401	400	-0.31	29.88	29.86	-0.02
WH30508	402	402	-0.31	30.07	30.05	-0.02
WH30952	415	414	-0.32	30.16	30.14	-0.02
WH30380	391	391	-0.31	30.16	30.14	-0.02
WH30365	417	416	-0.31	30.42	30.40	-0.02
WH31061	446	440	-5.85	30.45	30.08	-0.37
WH36277	423	417	-6.08	30.46	30.06	-0.40
WH30511	418	418	-0.31	30.47	30.46	-0.01
WH30377	393	393	-0.31	30.47	30.45	-0.02
WH37079	411	411	-0.31	30.48	30.46	-0.02
WH30443	325	324	-0.32	30.48	30.45	-0.03
WH37158	383	382	-0.32	30.48	30.46	-0.02
WH30505	394	394	-0.31	30.56	30.54	-0.02
WH30389	414	413	-0.31	30.63	30.76	0.13
WH29682	290	290	-0.31	30.64	30.60	-0.04
WH30395	392	392	-0.31	30.80	30.77	-0.03
WH30398	393	393	-0.31	31.27	31.25	-0.02

Hydrant	Residual Pressure at Minimum Fire Flow (kPa)			Available Fire Flow (l/s) at 150 kPa		
	Existing	With Development	Difference	Existing	With Development	Difference
WH37090	413	412	-0.31	31.28	31.26	-0.02
WH37159	386	385	-0.31	31.29	31.26	-0.03
WH29688	309	308	-0.24	31.33	31.30	-0.03
WH30402	394	393	-0.31	31.34	31.32	-0.02
WH30517	368	367	-0.45	31.49	31.46	-0.03
WH37157	397	396	-0.31	31.63	31.60	-0.03
WH30413	396	396	-0.31	31.76	31.74	-0.02
WH30922	408	408	-0.31	31.88	31.86	-0.02
WH30386	393	393	-0.31	32.09	32.07	-0.02
WH30439	350	349	-0.31	32.13	32.10	-0.03
WH30427	365	365	-0.31	32.17	32.14	-0.03
WH30497	365	365	-0.31	32.17	32.14	-0.03
WH29684	329	329	-0.16	32.24	32.19	-0.05
WH37108	458	458	-0.31	32.32	32.31	-0.01
WH30401	396	396	-0.31	32.33	32.31	-0.02
WH36297	457	450	-6.70	32.44	32.63	0.19
WH30615	380	380	-0.31	32.53	32.51	-0.02
WH40815	478	477	-0.31	32.56	32.55	-0.01
WH31860	439	433	-5.96	32.73	32.29	-0.44
WH34988	399	399	-0.32	32.74	32.72	-0.02
WH30447	339	339	-0.31	32.82	32.79	-0.03
WH30416	397	396	-0.31	32.92	32.90	-0.02
WH30743	477	471	-5.98	33.01	32.63	-0.38
WH35147	394	387	-6.25	33.07	32.55	-0.52
WH30562	469	469	-0.31	33.10	33.08	-0.02
WH35072	454	448	-5.95	33.16	32.74	-0.42
WH37073	411	410	-0.32	33.16	33.13	-0.03
WH30406	400	399	-0.31	33.18	33.16	-0.02
WH37156	405	405	-0.31	33.23	33.21	-0.02
WH29687	387	387	-0.32	33.53	33.51	-0.02
WH30403	400	400	-0.31	33.63	33.61	-0.02
WH30629	448	448	-0.31	33.76	33.75	-0.01
WH31055	441	435	-5.92	33.78	33.31	-0.47
WH30560	415	415	-0.32	34.12	34.10	-0.02
WH35146	426	420	-6.24	34.17	33.70	-0.47
WH30409	410	409	-0.31	34.40	34.38	-0.02
WH30610	446	445	-0.31	34.90	34.88	-0.02
WH30404	402	402	-0.31	34.95	34.92	-0.03
WH37078	435	435	-0.31	35.10	35.08	-0.02
WH30425	321	321	-0.31	35.29	35.26	-0.03
WH30436	387	387	-0.31	35.50	35.48	-0.02
WH30894	430	429	-0.31	35.72	35.70	-0.02
WH31730	438	432	-5.96	35.89	35.39	-0.50
WH31750	441	435	-5.97	36.12	35.62	-0.50
WH30636	421	420	-0.32	36.33	36.31	-0.02

Hydrant	Residual Pressure at Minimum Fire Flow (kPa)			Available Fire Flow (l/s) at 150 kPa		
	Existing	With Development	Difference	Existing	With Development	Difference
WH30415	414	413	-0.31	36.37	36.35	-0.02
WH36278	433	428	-5.97	36.44	36.07	-0.37
WH36296	459	453	-6.67	36.57	36.95	0.38
WH35080	452	446	-5.93	36.81	36.43	-0.38
WH37131	478	478	-0.32	37.13	37.11	-0.02
WH37040	461	461	-0.31	37.24	37.22	-0.02
WH40816	487	486	-0.31	37.28	37.15	-0.13
WH30448	444	444	-0.31	37.30	37.28	-0.02
WH30616	367	367	-0.31	37.40	37.37	-0.03
WH30445	442	442	-0.40	37.48	37.46	-0.02
WH30442	426	426	-0.31	37.63	37.70	0.07
WH30414	308	308	-0.32	37.92	37.88	-0.04
WH37109	466	465	-0.31	37.96	38.04	0.08
WH30565	477	477	-0.31	38.08	38.06	-0.02
WH30434	402	402	-0.31	38.09	38.06	-0.03
WH30641	444	444	-0.31	38.33	38.39	0.06
WH29681	294	293	-0.32	38.49	38.44	-0.05
WH30614	432	431	-0.31	38.51	38.49	-0.02
WH30525	444	438	-5.96	38.65	38.17	-0.48
WH30534	446	440	-5.96	38.76	38.21	-0.55
WH30452	455	455	-0.31	38.82	38.80	-0.02
WH30642	442	442	-0.32	39.20	39.18	-0.02
WH35017	460	460	-0.32	39.60	39.58	-0.02
WH31799	447	441	-6.01	39.64	39.07	-0.57
WH31741	448	442	-5.98	39.67	39.09	-0.58
WH30611	453	452	-0.31	39.83	39.81	-0.02
WH37493	238	237	-0.31	40.11	40.02	-0.09
WH31727	449	443	-5.97	40.48	39.89	-0.59
WH30639	482	482	-0.32	40.53	40.51	-0.02
WH30640	486	486	-0.31	40.57	40.55	-0.02
WH31810	449	443	-5.96	40.62	40.02	-0.60
WH30848	331	331	-0.31	40.68	40.64	-0.04
WH35135	407	401	-5.90	40.83	40.13	-0.70
WH30760	454	448	-5.99	40.98	40.38	-0.60
WH37091	431	431	-0.31	41.02	40.99	-0.03
WH30756	485	479	-5.98	41.23	40.69	-0.54
WH30752	453	447	-5.97	41.28	40.68	-0.60
WH30766	453	447	-5.99	41.43	40.84	-0.59
WH30421	410	409	-0.31	41.44	41.41	-0.03
WH35639	310	306	-4.29	41.49	40.71	-0.78
WH30622	371	371	-0.31	41.64	41.60	-0.04
WH35133	421	416	-5.70	41.90	41.13	-0.77
WH30925	394	393	-0.32	41.92	41.89	-0.03
WH35073	452	446	-5.95	41.93	41.34	-0.59
WH30423	413	413	-0.32	41.97	41.94	-0.03

Hydrant	Residual Pressure at Minimum Fire Flow (kPa)			Available Fire Flow (l/s) at 150 kPa		
	Existing	With Development	Difference	Existing	With Development	Difference
WH35043	390	383	-6.27	42.00	41.30	-0.70
WH30453	472	472	-0.32	42.16	42.14	-0.02
WH37112	481	480	-0.31	42.21	42.19	-0.02
WH30644	452	451	-0.32	42.39	42.36	-0.03
WH30428	417	417	-0.32	42.39	42.36	-0.03
WH35029	355	348	-6.63	42.42	41.39	-1.03
WH31662	451	445	-6.13	42.43	41.70	-0.73
WH31667	452	446	-5.97	42.48	41.75	-0.73
WH30931	422	422	-0.32	42.48	42.45	-0.03
WH35136	394	387	-6.13	42.50	41.82	-0.68
WH36294	440	434	-6.64	42.67	43.50	0.83
WH37083	426	426	-0.31	42.67	42.64	-0.03
WH30844	362	362	-0.27	42.96	42.93	-0.03
WH31718	452	446	-5.97	43.02	42.40	-0.62
WH35055	412	405	-6.61	43.15	42.36	-0.79
WH30618	379	379	-0.32	43.15	43.11	-0.04
WH31826	451	445	-5.98	43.16	42.61	-0.55
WH35653	459	453	-5.95	43.27	42.69	-0.58
WH36295	448	441	-6.64	43.35	44.27	0.92
WH30750	460	454	-5.97	43.38	42.78	-0.60
WH30537	452	446	-6.12	43.60	42.98	-0.62
WH30771	455	449	-5.99	43.82	43.13	-0.69
WH35064	438	431	-6.61	43.91	43.15	-0.76
WH31678	453	447	-5.96	44.00	43.36	-0.64
WH35052	405	398	-6.56	44.07	43.21	-0.86
WH35037	372	365	-6.57	44.16	43.15	-1.01
WH35025	351	345	-6.58	44.34	43.21	-1.13
WH37167	416	409	-6.37	44.39	46.32	1.93
WH35087	460	454	-5.94	44.54	43.91	-0.63
WH31660	456	450	-5.95	44.58	43.95	-0.63
WH36293	454	447	-6.69	44.58	45.44	0.86
WH35555	398	398	-0.32	44.60	44.57	-0.03
WH30470	456	450	-5.92	44.80	44.17	-0.63
WH35128	372	364	-7.53	44.98	44.12	-0.86
WH35104	453	447	-6.65	45.12	46.25	1.13
WH36321	457	452	-5.86	45.14	44.50	-0.64
WH35075	449	442	-6.49	45.29	44.55	-0.74
WH37070	392	392	-0.27	45.30	45.27	-0.03
WH30841	384	384	-0.31	45.42	45.38	-0.04
WH36320	460	454	-6.07	45.46	44.80	-0.66
WH30429	446	445	-0.32	45.56	45.53	-0.03
WH40824	407	406	-0.31	45.59	45.56	-0.03
WH31654	457	451	-5.95	45.64	45.04	-0.60
WH36322	472	466	-5.97	45.70	45.13	-0.57
WH30710	442	436	-6.02	45.82	45.17	-0.65

Hydrant	Residual Pressure at Minimum Fire Flow (kPa)			Available Fire Flow (l/s) at 150 kPa		
	Existing	With Development	Difference	Existing	With Development	Difference
WH35125	482	476	-6.00	45.99	45.43	-0.56
WH35141	388	382	-5.90	45.99	45.07	-0.92
WH35654	486	480	-6.22	46.02	45.46	-0.56
WH37111	483	483	-0.22	46.09	46.07	-0.02
WH31682	455	449	-5.94	46.11	45.38	-0.73
WH36168	443	437	-6.54	46.15	47.59	1.44
WH37092	484	484	-0.31	46.59	46.56	-0.03
WH35139	423	417	-5.89	46.65	45.86	-0.79
WH30742	458	452	-5.97	46.76	46.05	-0.71
WH36319	459	453	-5.95	46.76	46.03	-0.73
WH30475	457	452	-5.90	46.77	46.06	-0.71
WH35134	424	418	-5.96	46.79	45.99	-0.80
WH30457	477	477	-0.21	46.80	46.78	-0.02
WH35040	366	360	-6.62	46.90	45.72	-1.18
WH31710	455	449	-5.84	47.02	46.29	-0.73
WH34838	464	464	-0.31	47.04	47.01	-0.03
WH36314	464	458	-6.07	47.15	46.44	-0.71
WH37166	405	398	-6.47	47.16	49.69	2.53
WH35078	440	433	-6.54	47.20	46.35	-0.85
WH30628	500	500	-0.31	47.41	47.39	-0.02
WH30524	438	432	-5.96	47.44	46.66	-0.78
WH37169	447	441	-6.41	47.49	49.91	2.42
WH30431	451	451	-0.31	47.49	47.46	-0.03
WH40817	488	488	-0.32	47.58	47.56	-0.02
WH35044	387	380	-6.60	47.60	46.50	-1.10
WH37082	430	429	-0.32	47.61	47.58	-0.03
WH35099	481	476	-5.70	47.64	46.97	-0.67
WH37133	504	504	-0.31	47.66	47.63	-0.03
WH35552	407	407	-0.32	47.71	47.68	-0.03
WH30476	443	437	-5.94	47.76	46.99	-0.77
WH31685	445	439	-5.95	47.76	46.99	-0.77
WH35142	401	395	-5.96	47.83	46.94	-0.89
WH34837	490	490	-0.31	47.87	47.84	-0.03
WH35089	462	456	-6.00	47.95	47.23	-0.72
WH36292	462	455	-6.78	48.08	49.37	1.29
WH31737	445	439	-5.95	48.22	47.43	-0.79
WH37072	449	448	-0.31	48.22	48.20	-0.02
WH36312	460	454	-5.98	48.27	47.52	-0.75
WH35137	426	420	-5.92	48.27	47.44	-0.83
WH30526	457	451	-5.90	48.28	47.51	-0.77
WH35554	417	417	-0.31	48.28	48.25	-0.03
WH31679	457	451	-5.96	48.32	47.55	-0.77
WH30645	468	468	-0.32	48.32	48.30	-0.02
WH36323	476	470	-5.99	48.39	47.67	-0.72
WH35045	368	361	-7.45	48.39	47.13	-1.26

Hydrant	Residual Pressure at Minimum Fire Flow (kPa)			Available Fire Flow (l/s) at 150 kPa		
	Existing	With Development	Difference	Existing	With Development	Difference
WH35140	418	412	-5.89	48.41	47.56	-0.85
WH35102	482	476	-5.74	48.59	47.90	-0.69
WH37172	354	346	-7.95	48.76	47.23	-1.53
WH30769	479	473	-6.00	48.83	48.12	-0.71
WH31648	460	454	-5.98	48.95	48.20	-0.75
WH35144	444	438	-5.92	49.02	48.23	-0.79
WH35050	403	395	-7.50	49.19	48.16	-1.03
WH37033	468	468	-0.31	49.22	49.19	-0.03
WH37038	492	491	-0.32	49.26	49.23	-0.03
WH30438	449	448	-0.31	49.35	49.32	-0.03
WH37174	383	375	-7.92	49.38	48.18	-1.20
WH37184	487	487	-0.29	49.41	49.38	-0.03
WH31752	448	442	-5.99	49.41	48.60	-0.81
WH35149	463	457	-5.92	49.52	48.77	-0.75
WH35046	391	385	-6.60	49.52	48.37	-1.15
WH30460	454	454	-0.31	49.57	49.53	-0.04
WH35033	354	347	-6.64	49.71	48.38	-1.33
WH30634	432	431	-0.31	49.80	49.76	-0.04
WH30564	429	429	-0.32	49.84	49.81	-0.03
WH37037	503	502	-0.31	49.86	49.84	-0.02
WH35054	411	405	-6.51	49.90	48.88	-1.02
WH36324	472	466	-6.08	49.95	49.21	-0.74
WH37039	474	474	-0.32	50.05	50.03	-0.02
WH35093	446	439	-6.55	50.12	52.24	2.12
WH29683	315	315	-0.31	50.21	50.14	-0.07
WH30459	473	472	-0.31	50.35	50.32	-0.03
WH31668	443	437	-5.94	50.40	49.57	-0.83
WH35549	405	405	-0.31	50.50	50.46	-0.04
WH30462	486	485	-0.31	50.56	50.53	-0.03
WH31722	445	439	-5.95	50.58	49.77	-0.81
WH30531	443	437	-5.86	50.64	49.82	-0.82
WH36315	470	464	-5.95	50.81	50.08	-0.73
WH35076	459	453	-5.94	50.87	50.11	-0.76
WH31844	457	450	-6.10	50.97	50.15	-0.82
WH31700	440	434	-5.97	50.98	50.11	-0.87
WH35550	418	418	-0.31	51.04	51.00	-0.04
WH30441	439	439	-0.32	51.12	51.09	-0.03
WH30467	446	440	-5.96	51.14	50.30	-0.84
WH37093	487	486	-0.31	51.22	51.19	-0.03
WH31643	445	439	-5.86	51.44	50.59	-0.85
WH37095	462	461	-0.31	51.47	51.44	-0.03
WH35132	383	376	-6.09	51.51	50.43	-1.08
WH37105	432	432	-0.32	51.60	51.57	-0.03
WH30731	445	439	-5.96	51.62	50.77	-0.85
WH30519	460	454	-5.99	51.63	50.81	-0.82

Hydrant	Residual Pressure at Minimum Fire Flow (kPa)			Available Fire Flow (l/s) at 150 kPa		
	Existing	With Development	Difference	Existing	With Development	Difference
WH37173	384	376	-7.83	51.81	50.84	-0.97
WH37168	447	440	-6.39	51.93	55.27	3.34
WH36311	462	456	-6.00	51.96	51.14	-0.82
WH35113	450	444	-6.23	51.98	51.13	-0.85
WH37036	509	508	-0.31	52.17	52.14	-0.03
WH35553	438	438	-0.31	52.22	52.18	-0.04
WH30986	445	439	-5.92	52.36	51.48	-0.88
WH35111	474	468	-6.38	52.44	51.64	-0.80
WH30617	412	412	-0.24	52.63	52.60	-0.03
WH30626	483	483	-0.31	52.69	52.66	-0.03
WH35094	478	472	-5.94	52.84	52.05	-0.79
WH35158	469	463	-5.92	52.96	52.14	-0.82
WH36310	467	460	-6.02	53.13	52.30	-0.83
WH35138	376	370	-5.97	53.17	52.01	-1.16
WH37176	440	432	-7.58	53.24	52.39	-0.85
WH31802	457	451	-5.95	53.26	52.38	-0.88
WH31693	459	453	-5.86	53.34	52.47	-0.87
WH35059	422	415	-7.51	53.38	52.92	-0.46
WH30917	433	433	-0.31	53.41	53.37	-0.04
WH36318	462	456	-5.99	53.44	52.58	-0.86
WH35548	430	430	-0.31	53.45	53.42	-0.03
WH30738	446	440	-5.98	53.48	52.58	-0.90
WH30621	400	399	-0.31	53.62	53.58	-0.04
WH37032	467	466	-0.31	53.72	53.69	-0.03
WH36291	471	464	-6.76	53.82	55.54	1.72
WH37057	471	471	-0.32	53.82	53.79	-0.03
WH37041	459	459	-0.31	53.89	53.86	-0.03
WH35027	355	349	-6.63	53.92	52.39	-1.53
WH37066	444	443	-0.29	53.95	53.91	-0.04
WH36307	482	476	-6.02	54.13	53.31	-0.82
WH37110	479	478	-0.31	54.14	54.11	-0.03
WH35551	464	464	-0.31	54.23	54.20	-0.03
WH36313	475	469	-6.00	54.25	53.41	-0.84
WH31704	459	453	-5.98	54.26	53.36	-0.90
WH37212	435	435	-0.31	54.35	54.32	-0.03
WH37069	411	410	-0.31	54.45	54.41	-0.04
WH37059	496	496	-0.31	54.63	54.60	-0.03
WH35145	415	409	-5.96	54.77	53.72	-1.05
WH37058	480	480	-0.31	54.84	54.81	-0.03
WH30723	447	441	-5.97	55.00	54.07	-0.93
WH30739	470	464	-5.88	55.06	54.17	-0.89
WH35035	357	350	-7.29	55.13	53.37	-1.76
WH35108	481	475	-6.51	55.22	54.43	-0.79
WH35065	430	424	-6.56	55.30	54.30	-1.00
WH35126	480	474	-5.99	55.47	54.81	-0.66

Hydrant	Residual Pressure at Minimum Fire Flow (kPa)			Available Fire Flow (l/s) at 150 kPa		
	Existing	With Development	Difference	Existing	With Development	Difference
WH31649	446	440	-5.97	55.48	54.73	-0.75
WH40808	472	467	-5.45	55.48	60.27	4.79
WH31713	443	437	-5.98	55.51	54.76	-0.75
WH37076	474	474	-0.32	55.54	55.51	-0.03
WH35143	395	389	-5.96	55.58	54.74	-0.84
WH36309	475	469	-5.94	55.60	54.97	-0.63
WH36169	446	439	-6.48	55.62	57.80	2.18
WH30478	461	455	-5.98	55.66	55.02	-0.64
WH30868	432	432	-0.31	55.71	55.69	-0.02
WH35039	356	349	-7.46	55.72	54.40	-1.32
WH35151	421	415	-5.97	55.72	55.06	-0.66
WH31645	464	458	-5.99	55.77	55.17	-0.60
WH30781	464	458	-5.91	55.92	55.31	-0.61
WH30783	448	442	-5.95	55.96	55.32	-0.64
WH36306	476	470	-5.99	56.00	55.41	-0.59
WH37035	501	501	-0.31	56.16	56.14	-0.02
WH31658	447	441	-6.06	56.17	55.52	-0.65
WH35051	412	404	-7.50	56.19	55.80	-0.39
WH35114	436	429	-6.18	56.20	55.54	-0.66
WH37060	509	508	-0.31	56.29	56.27	-0.02
WH37106	467	467	-0.31	56.34	56.32	-0.02
WH38318	454	453	-0.32	56.37	56.34	-0.03
WH40810	448	443	-5.43	56.39	61.81	5.42
WH30982	464	458	-5.88	56.54	55.92	-0.62
WH37213	436	436	-0.31	56.54	56.52	-0.02
WH30735	502	496	-5.98	56.55	55.99	-0.56
WH30791	464	458	-5.92	56.63	56.01	-0.62
WH30623	408	408	-0.32	56.64	56.62	-0.02
WH35068	451	444	-7.48	56.67	56.47	-0.20
WH37115	434	433	-0.31	56.67	56.64	-0.03
WH30843	468	468	-0.31	56.72	56.70	-0.02
WH35131	358	352	-5.98	56.81	56.00	-0.81
WH30874	416	415	-0.31	56.90	56.88	-0.02
WH35048	406	400	-6.59	56.97	56.15	-0.82
WH37211	448	448	-0.31	56.99	56.97	-0.02
WH35074	450	444	-5.93	57.00	56.35	-0.65
WH30746	505	499	-5.98	57.03	56.46	-0.57
WH30978	449	443	-5.98	57.05	56.40	-0.65
WH30975	429	423	-5.93	57.16	56.48	-0.68
WH37062	503	503	-0.31	57.36	57.34	-0.02
WH37065	463	462	-0.31	57.38	57.36	-0.02
WH37175	358	351	-7.80	57.39	56.83	-0.56
WH30761	465	459	-5.98	57.40	56.77	-0.63
WH31847	458	452	-6.09	57.41	56.75	-0.66
WH30890	426	426	-0.32	57.43	57.41	-0.02

Hydrant	Residual Pressure at Minimum Fire Flow (kPa)			Available Fire Flow (l/s) at 150 kPa		
	Existing	With Development	Difference	Existing	With Development	Difference
WH30767	465	459	-5.95	57.48	56.85	-0.63
WH30974	429	423	-5.97	57.53	56.83	-0.70
WH30977	465	459	-5.96	57.62	56.98	-0.64
WH40809	431	425	-5.40	57.68	63.88	6.20
WH30940	492	492	-0.31	57.72	57.70	-0.02
WH37121	442	442	-0.31	57.80	57.78	-0.02
WH37206	436	436	-0.31	57.81	57.79	-0.02
WH30949	433	432	-0.32	57.98	57.95	-0.03
WH30797	465	459	-5.97	58.00	57.36	-0.64
WH30585	468	467	-0.32	58.04	58.02	-0.02
WH37056	464	464	-0.31	58.06	58.04	-0.02
WH35056	421	415	-6.55	58.15	57.35	-0.80
WH30631	434	433	-0.32	58.18	58.16	-0.02
WH37171	352	344	-7.97	58.26	56.99	-1.27
WH30789	465	459	-5.96	58.34	57.69	-0.65
WH37208	437	436	-0.32	58.35	58.33	-0.02
WH30768	449	443	-5.98	58.41	57.75	-0.66
WH36317	469	463	-5.98	58.46	57.82	-0.64
WH30950	491	491	-0.32	58.53	58.51	-0.02
WH30849	481	480	-0.32	58.54	58.52	-0.02
WH30606	472	472	-0.31	58.63	58.60	-0.03
WH31663	444	438	-5.98	58.66	57.96	-0.70
WH30774	466	460	-5.90	58.68	58.03	-0.65
WH37193	434	434	-0.32	58.71	58.69	-0.02
WH35130	363	357	-5.88	58.81	57.97	-0.84
WH30568	436	435	-0.31	58.99	58.97	-0.02
WH30883	422	422	-0.31	59.07	59.05	-0.02
WH37117	435	435	-0.31	59.09	59.06	-0.03
WH30520	464	458	-5.97	59.10	58.43	-0.67
WH30989	466	460	-5.96	59.16	58.50	-0.66
WH30983	432	426	-5.98	59.17	58.46	-0.71
WH30929	493	493	-0.31	59.22	59.20	-0.02
WH35109	489	483	-5.98	59.26	58.63	-0.63
WH37194	443	443	-0.31	59.34	59.32	-0.02
WH35086	470	464	-5.94	59.37	58.71	-0.66
WH30725	494	488	-5.98	59.38	58.76	-0.62
WH37116	435	435	-0.31	59.40	59.37	-0.03
WH35067	455	449	-5.94	59.41	58.75	-0.66
WH30643	479	479	-0.31	59.48	59.46	-0.02
WH37170	339	331	-7.98	59.50	58.27	-1.23
WH37094	487	487	-0.31	59.57	59.55	-0.02
WH37192	435	434	-0.32	59.58	59.55	-0.03
WH30561	436	435	-0.31	59.59	59.56	-0.03
WH37061	510	510	-0.31	59.59	59.56	-0.03
WH30895	446	446	-0.32	59.60	59.58	-0.02

Hydrant	Residual Pressure at Minimum Fire Flow (kPa)			Available Fire Flow (l/s) at 150 kPa		
	Existing	With Development	Difference	Existing	With Development	Difference
WH30559	434	434	-0.31	59.68	59.66	-0.02
WH31716	447	441	-6.05	59.74	59.03	-0.71
WH37226	478	478	-0.31	59.74	59.72	-0.02
WH35159	449	443	-5.93	59.75	59.05	-0.70
WH37098	483	482	-0.31	59.88	59.86	-0.02
WH30754	449	443	-5.94	59.91	59.21	-0.70
WH30765	456	450	-5.93	59.94	59.25	-0.69
WH35122	451	445	-5.97	60.09	59.39	-0.70
WH37177	470	462	-7.44	60.13	59.77	-0.36
WH30933	483	483	-0.32	60.14	60.12	-0.02
WH30896	423	422	-0.31	60.21	60.18	-0.03
WH30958	434	434	-0.32	60.21	60.19	-0.02
WH30965	457	451	-5.99	60.27	59.58	-0.69
WH37118	435	435	-0.31	60.39	60.37	-0.02
WH30910	466	466	-0.31	60.56	60.54	-0.02
WH30736	451	445	-5.98	60.58	59.87	-0.71
WH30918	402	402	-0.32	60.71	60.68	-0.03
WH35148	413	407	-5.96	60.73	59.97	-0.76
WH30887	421	421	-0.31	60.74	60.72	-0.02
WH37104	460	460	-0.31	60.77	60.75	-0.02
WH35066	435	428	-6.48	60.79	60.02	-0.77
WH30728	450	444	-5.97	60.85	60.14	-0.71
WH31819	462	456	-5.98	60.99	60.27	-0.72
WH30707	451	445	-5.94	61.06	60.36	-0.70
WH30732	455	450	-5.93	61.09	60.38	-0.71
WH36308	486	480	-5.98	61.16	60.50	-0.66
WH35112	490	484	-5.93	61.21	60.55	-0.66
WH35047	398	391	-6.97	61.22	63.35	2.13
WH30976	453	447	-5.97	61.25	60.54	-0.71
WH30692	451	445	-5.97	61.27	60.57	-0.70
WH30788	431	425	-5.97	61.33	60.58	-0.75
WH30722	450	444	-6.03	61.36	60.62	-0.74
WH37120	454	454	-0.32	61.41	61.39	-0.02
WH35100	459	452	-6.64	61.42	60.70	-0.72
WH30762	508	502	-5.96	61.43	60.80	-0.63
WH30773	467	461	-5.98	61.44	60.74	-0.70
WH35105	490	484	-5.97	61.47	60.81	-0.66
WH31835	461	456	-5.88	61.48	60.76	-0.72
WH30987	445	439	-5.98	61.51	60.78	-0.73
WH30753	467	461	-5.96	61.52	60.81	-0.71
WH30620	489	488	-0.31	61.58	61.56	-0.02
WH35063	449	443	-5.94	61.60	60.88	-0.72
WH30881	476	476	-0.31	61.72	61.69	-0.03
WH35160	453	447	-5.96	61.79	61.07	-0.72
WH37205	438	438	-0.32	61.97	61.94	-0.03

Hydrant	Residual Pressure at Minimum Fire Flow (kPa)			Available Fire Flow (l/s) at 150 kPa		
	Existing	With Development	Difference	Existing	With Development	Difference
WH35071	461	454	-7.43	62.03	61.96	-0.07
WH34843	435	435	-0.31	62.10	62.07	-0.03
WH30785	438	432	-5.97	62.11	61.35	-0.76
WH30961	467	461	-5.98	62.15	61.43	-0.72
WH30945	438	438	-0.32	62.16	62.13	-0.03
WH35079	460	454	-5.97	62.26	61.54	-0.72
WH37099	488	488	-0.31	62.28	62.25	-0.03
WH31673	451	445	-5.98	62.29	61.53	-0.76
WH30850	492	492	-0.31	62.47	62.44	-0.03
WH31690	465	459	-5.98	62.53	61.79	-0.74
WH37096	466	466	-0.31	62.59	62.57	-0.02
WH35110	440	434	-6.00	62.63	61.87	-0.76
WH37122	436	436	-0.31	62.64	62.61	-0.03
WH35082	435	429	-6.37	62.67	61.87	-0.80
WH37224	438	438	-0.31	62.67	62.64	-0.03
WH30942	435	435	-0.32	62.80	62.78	-0.02
WH30921	489	488	-0.31	62.88	62.86	-0.02
WH37130	476	476	-0.31	63.00	62.97	-0.03
WH30980	432	426	-5.98	63.11	62.31	-0.80
WH37034	489	489	-0.31	63.14	63.12	-0.02
WH30780	467	461	-5.96	63.21	62.48	-0.73
WH30878	419	418	-0.32	63.21	63.18	-0.03
WH30751	452	446	-5.93	63.22	62.46	-0.76
WH30920	439	439	-0.31	63.24	63.22	-0.02
WH35120	451	445	-6.00	63.34	62.59	-0.75
WH37207	440	439	-0.32	63.36	63.33	-0.03
WH30706	492	486	-5.99	63.38	62.69	-0.69
WH30968	467	461	-5.99	63.38	62.64	-0.74
WH35119	459	453	-5.99	63.39	62.64	-0.75
WH37220	461	460	-0.31	63.39	63.36	-0.03
WH30468	455	449	-5.98	63.46	62.70	-0.76
WH30970	456	450	-6.04	63.46	62.70	-0.76
WH30755	475	469	-5.98	63.48	62.75	-0.73
WH35061	449	443	-6.13	63.48	62.70	-0.78
WH30882	477	477	-0.31	63.52	63.49	-0.03
WH37042	458	458	-0.31	63.60	63.57	-0.03
WH37081	444	443	-0.32	63.60	63.57	-0.03
WH30775	464	458	-5.98	63.64	62.90	-0.74
WH30957	493	493	-0.31	63.68	63.66	-0.02
WH35041	398	392	-6.30	63.70	62.78	-0.92
WH30973	451	445	-5.97	63.84	63.08	-0.76
WH30625	436	436	-0.31	63.89	63.87	-0.02
WH30619	475	474	-0.31	64.11	64.08	-0.03
WH37132	438	438	-0.31	64.11	64.08	-0.03
WH37186	438	438	-0.31	64.22	64.19	-0.03

Hydrant	Residual Pressure at Minimum Fire Flow (kPa)			Available Fire Flow (l/s) at 150 kPa		
	Existing	With Development	Difference	Existing	With Development	Difference
WH37119	437	437	-0.32	64.23	64.21	-0.02
WH30703	452	446	-6.01	64.24	63.46	-0.78
WH36316	479	473	-5.99	64.26	63.53	-0.73
WH40811	433	428	-5.28	64.28	74.05	9.77
WH30716	452	446	-5.97	64.30	63.53	-0.77
WH35155	435	430	-5.92	64.38	63.58	-0.80
WH35042	359	352	-7.55	64.39	63.47	-0.92
WH37114	510	509	-0.32	64.49	64.47	-0.02
WH37064	480	480	-0.32	64.56	64.53	-0.03
WH35023	361	355	-5.97	64.58	63.59	-0.99
WH35058	428	422	-6.32	64.62	69.76	5.14
WH37225	462	462	-0.32	64.63	64.60	-0.03
WH35123	472	466	-6.00	64.66	63.92	-0.74
WH37046	490	489	-0.31	64.70	64.68	-0.02
WH30941	438	438	-0.32	64.76	64.73	-0.03
WH37222	460	459	-0.32	64.78	64.76	-0.02
WH35084	436	430	-6.24	64.79	63.96	-0.83
WH37189	489	488	-0.31	64.83	64.81	-0.02
WH37052	426	426	-0.31	64.87	64.84	-0.03
WH30872	490	489	-0.31	64.89	64.86	-0.03
WH34845	437	436	-0.31	64.89	64.86	-0.03
WH30963	476	470	-5.98	64.90	64.16	-0.74
WH37190	486	486	-0.31	64.98	64.96	-0.02
WH30892	462	462	-0.31	64.99	64.97	-0.02
WH30701	453	447	-5.98	65.07	64.28	-0.79
WH30699	487	481	-5.99	65.17	64.44	-0.73
WH35096	436	430	-6.22	65.22	64.39	-0.83
WH30944	436	436	-0.31	65.27	65.25	-0.02
WH40814	484	484	-0.32	65.33	65.32	-0.01
WH37191	489	489	-0.32	65.58	65.56	-0.02
WH35092	492	486	-5.95	65.66	64.94	-0.72
WH37067	435	434	-0.32	65.68	65.66	-0.02
WH35053	424	417	-7.50	65.95	65.51	-0.44
WH34842	438	437	-0.31	65.98	65.95	-0.03
WH30711	495	489	-5.95	66.08	65.35	-0.73
WH37219	462	462	-0.31	66.18	66.15	-0.03
WH37210	495	494	-0.31	66.20	66.17	-0.03
WH37048	445	444	-0.32	66.21	66.18	-0.03
WH30871	506	505	-0.31	66.25	66.23	-0.02
WH35060	447	439	-7.42	66.30	66.18	-0.12
WH35085	476	470	-6.06	66.34	65.57	-0.77
WH30926	457	457	-0.31	66.37	66.35	-0.02
WH30985	469	463	-5.98	66.38	65.59	-0.79
WH30698	454	448	-6.01	66.40	65.59	-0.81
WH37161	439	433	-6.07	66.44	73.14	6.70

Hydrant	Residual Pressure at Minimum Fire Flow (kPa)			Available Fire Flow (l/s) at 150 kPa		
	Existing	With Development	Difference	Existing	With Development	Difference
WH30877	485	485	-0.31	66.55	66.53	-0.02
WH30792	437	431	-5.98	66.61	65.76	-0.85
WH37218	459	459	-0.32	66.61	66.58	-0.03
WH37123	438	438	-0.32	66.62	66.59	-0.03
WH37054	458	457	-0.31	66.65	66.62	-0.03
WH35127	390	383	-7.56	66.67	65.88	-0.79
WH30747	462	456	-5.99	66.73	65.93	-0.80
WH30888	420	420	-0.31	66.76	66.73	-0.03
WH35077	450	444	-6.18	66.81	65.98	-0.83
WH30796	446	440	-5.97	66.83	65.99	-0.84
WH35361	437	431	-6.34	67.03	66.14	-0.89
WH37214	473	473	-0.31	67.07	67.06	-0.01
WH37185	439	439	-0.32	67.10	67.07	-0.03
WH31813	465	459	-6.05	67.16	66.34	-0.82
WH30717	453	447	-5.98	67.24	66.42	-0.82
WH35118	454	448	-5.98	67.27	66.45	-0.82
WH30770	470	464	-5.98	67.34	66.54	-0.80
WH30880	468	468	-0.31	67.38	67.35	-0.03
WH35106	455	449	-5.98	67.39	66.56	-0.83
WH35062	462	456	-5.95	67.42	66.62	-0.80
WH35095	437	431	-6.36	67.53	66.64	-0.89
WH30937	440	440	-0.32	67.59	67.56	-0.03
WH30588	506	506	-0.31	67.63	67.60	-0.03
WH37050	428	428	-0.31	67.69	67.66	-0.03
WH37162	443	437	-6.01	67.86	75.12	7.26
WH35156	437	432	-5.87	67.96	67.09	-0.87
WH30715	466	460	-5.97	67.98	67.16	-0.82
WH37103	448	448	-0.31	67.99	67.96	-0.03
WH30902	459	458	-0.31	68.07	68.05	-0.02
WH35362	437	431	-6.15	68.10	67.19	-0.91
WH30905	453	452	-0.31	68.13	68.10	-0.03
WH30992	470	464	-5.98	68.17	67.35	-0.82
WH30947	438	437	-0.31	68.22	68.19	-0.03
WH30967	458	452	-5.98	68.33	67.48	-0.85
WH30869	505	505	-0.31	68.50	68.47	-0.03
WH30694	477	471	-6.02	68.55	67.74	-0.81
WH30719	453	447	-5.98	68.60	67.74	-0.86
WH30924	454	453	-0.31	68.61	68.58	-0.03
WH37129	439	438	-0.31	68.67	68.64	-0.03
WH30718	453	447	-5.97	68.68	67.82	-0.86
WH37084	450	450	-0.32	68.77	68.74	-0.03
WH37221	460	459	-0.32	68.77	68.74	-0.03
WH30900	451	451	-0.32	68.92	68.89	-0.03
WH31801	466	460	-5.96	69.11	68.25	-0.86
WH30741	474	468	-5.96	69.15	68.32	-0.83

Hydrant	Residual Pressure at Minimum Fire Flow (kPa)			Available Fire Flow (l/s) at 150 kPa		
	Existing	With Development	Difference	Existing	With Development	Difference
WH30782	470	464	-5.98	69.46	68.61	-0.85
WH35038	362	354	-7.39	69.70	68.23	-1.47
WH30919	447	447	-0.31	69.73	69.70	-0.03
WH30798	470	464	-5.98	69.83	68.98	-0.85
WH30911	460	460	-0.31	69.87	69.85	-0.02
WH37163	456	450	-6.33	69.88	75.61	5.73
WH36636	439	439	-0.31	69.97	69.94	-0.03
WH30695	461	455	-5.98	70.06	69.19	-0.87
WH35116	447	441	-6.09	70.08	69.17	-0.91
WH37188	493	493	-0.32	70.10	70.07	-0.03
WH30946	439	438	-0.32	70.15	70.12	-0.03
WH37223	441	441	-0.31	70.16	70.13	-0.03
WH30749	472	466	-5.97	70.29	69.44	-0.85
WH37055	449	449	-0.32	70.40	70.37	-0.03
WH30744	506	500	-5.97	70.64	69.85	-0.79
WH30466	470	464	-5.96	70.85	69.97	-0.88
WH37178	470	462	-7.34	71.04	71.40	0.36
WH35097	455	449	-6.11	71.29	70.38	-0.91
WH37164	467	460	-6.53	71.37	76.18	4.81
WH37100	500	500	-0.31	71.40	71.37	-0.03
WH30607	505	505	-0.31	71.68	71.65	-0.03
WH35360	429	423	-6.23	71.69	70.67	-1.02
WH37053	442	442	-0.31	71.73	71.70	-0.03
WH37063	500	499	-0.32	71.74	71.71	-0.03
WH35098	494	488	-5.96	71.78	70.95	-0.83
WH31747	464	458	-5.97	71.83	70.91	-0.92
WH30914	466	466	-0.31	72.15	72.12	-0.03
WH37085	459	459	-0.32	72.15	72.12	-0.03
WH39935	447	447	-0.32	72.15	72.11	-0.04
WH37043	457	456	-0.31	72.39	72.36	-0.03
WH30866	514	514	-0.31	72.46	72.43	-0.03
WH30916	470	470	-0.31	72.46	72.44	-0.02
WH30638	488	488	-0.32	72.55	72.52	-0.03
WH37165	475	468	-6.61	72.58	76.95	4.37
WH30678	329	324	-4.13	72.60	71.71	-0.89
WH37102	448	448	-0.31	72.63	72.60	-0.03
WH37125	440	439	-0.31	72.92	72.89	-0.03
WH36245	484	478	-5.98	72.95	72.07	-0.88
WH37187	502	501	-0.32	73.00	72.97	-0.03
WH37126	473	473	-0.31	73.10	73.07	-0.03
WH30876	452	451	-0.32	73.16	73.13	-0.03
WH35117	456	450	-6.01	73.19	72.25	-0.94
WH35858	471	465	-5.97	73.33	72.41	-0.92
WH30913	463	462	-0.31	73.37	73.34	-0.03
WH30567	494	494	-0.31	73.58	73.55	-0.03

Hydrant	Residual Pressure at Minimum Fire Flow (kPa)			Available Fire Flow (l/s) at 150 kPa		
	Existing	With Development	Difference	Existing	With Development	Difference
WH37215	443	443	-0.31	73.63	73.60	-0.03
WH30748	491	485	-5.98	73.65	72.77	-0.88
WH30786	471	465	-5.97	73.71	72.79	-0.92
WH37113	513	513	-0.32	73.71	73.69	-0.02
WH30943	440	440	-0.31	73.81	73.77	-0.04
WH35070	466	460	-6.06	73.87	72.93	-0.94
WH37124	440	440	-0.31	74.03	74.00	-0.03
WH35091	439	432	-6.50	74.14	73.11	-1.03
WH35028	341	334	-7.74	74.58	72.64	-1.94
WH30787	474	469	-5.97	74.74	73.81	-0.93
WH37183	485	478	-7.10	74.74	75.34	0.60
WH36957	513	507	-5.99	74.80	73.94	-0.86
WH35153	440	434	-5.97	74.99	73.98	-1.01
WH37180	482	475	-6.86	75.09	78.52	3.43
WH30953	442	442	-0.31	75.18	75.15	-0.03
WH35796	471	464	-6.96	75.37	74.79	-0.58
WH35030	348	340	-7.66	75.47	73.56	-1.91
WH37209	508	507	-0.31	75.52	75.49	-0.03
WH31734	461	455	-5.98	75.59	74.59	-1.00
WH30981	472	466	-5.99	75.70	74.73	-0.97
WH37182	489	482	-7.13	75.74	76.68	0.94
WH30956	441	440	-0.32	75.77	75.74	-0.03
WH37128	441	441	-0.31	75.77	75.73	-0.04
WH35103	496	490	-5.99	75.81	74.90	-0.91
WH30863	501	500	-0.31	75.85	75.83	-0.02
WH37045	490	490	-0.31	76.32	76.29	-0.03
WH34840	457	457	-0.32	76.43	76.40	-0.03
WH37080	427	427	-0.31	76.47	76.44	-0.03
WH37049	464	463	-0.31	76.53	76.50	-0.03
WH37097	452	452	-0.32	76.53	76.50	-0.03
WH37127	441	441	-0.32	76.67	76.63	-0.04
WH30889	423	423	-0.31	76.75	76.71	-0.04
WH31720	460	454	-5.98	76.78	75.76	-1.02
WH36246	498	492	-5.96	77.07	76.14	-0.93
WH30939	443	443	-0.31	77.08	77.05	-0.03
WH30930	444	444	-0.31	77.28	77.25	-0.03
WH35032	364	356	-7.47	77.51	75.66	-1.85
WH37181	496	489	-7.12	77.51	78.95	1.44
WH30759	474	468	-5.96	77.56	76.56	-1.00
WH37179	484	477	-7.18	77.63	79.18	1.55
WH31709	462	456	-5.96	77.66	76.62	-1.04
WH37101	448	448	-0.32	77.78	77.75	-0.03
WH35026	364	358	-6.24	77.82	76.42	-1.40
WH35031	364	356	-7.29	77.86	76.07	-1.79
WH30566	442	441	-0.31	77.91	77.87	-0.04

Hydrant	Residual Pressure at Minimum Fire Flow (kPa)			Available Fire Flow (l/s) at 150 kPa		
	Existing	With Development	Difference	Existing	With Development	Difference
WH37044	475	474	-0.31	78.30	78.27	-0.03
WH35024	364	357	-6.83	78.50	76.86	-1.64
WH35652	364	358	-6.23	78.58	77.16	-1.42
WH37216	444	443	-0.31	78.70	78.67	-0.03
WH31699	465	459	-5.96	78.75	77.69	-1.06
WH30899	435	435	-0.32	78.90	78.87	-0.03
WH30954	443	443	-0.31	79.01	78.97	-0.04
WH35022	364	358	-6.46	79.01	77.48	-1.53
WH35034	381	375	-6.27	79.01	77.65	-1.36
WH30563	443	443	-0.31	79.46	79.42	-0.04
WH31687	468	462	-5.97	79.84	78.77	-1.07
WH35083	440	433	-6.66	79.88	78.73	-1.15
WH35090	440	433	-6.73	80.14	79.01	-1.13
WH30948	443	443	-0.32	80.16	80.12	-0.04
WH31680	465	459	-5.99	80.26	79.18	-1.08
WH30627	443	442	-0.31	80.54	80.50	-0.04
WH35069	440	434	-6.57	80.59	79.40	-1.19
WH37217	445	444	-0.31	80.59	80.55	-0.04
WH31670	466	460	-5.93	81.12	80.02	-1.10
WH31665	468	462	-5.97	81.52	80.41	-1.11
WH35057	441	434	-6.45	81.84	80.61	-1.23
WH30541	470	464	-5.97	81.95	80.85	-1.10
WH30522	466	460	-6.01	82.12	81.00	-1.12
WH30529	469	463	-5.96	82.12	81.01	-1.11
WH30474	465	459	-5.97	82.32	81.19	-1.13
WH35049	422	416	-6.37	82.35	81.05	-1.30
WH35154	441	435	-5.94	82.37	81.21	-1.16
WH30908	458	458	-0.31	82.51	82.48	-0.03
WH30935	444	444	-0.32	82.55	82.51	-0.04
WH30469	466	460	-5.97	82.59	81.46	-1.13
WH37047	481	480	-0.31	82.73	82.70	-0.03
WH35273	474	468	-6.01	82.75	81.64	-1.11
WH30870	478	478	-0.31	82.87	82.84	-0.03
WH30632	443	443	-0.31	82.97	82.93	-0.04
WH36404	443	443	-0.31	83.14	83.11	-0.03
WH31657	471	465	-5.97	83.35	82.21	-1.14
WH31650	473	467	-5.97	83.83	82.69	-1.14
WH34839	452	452	-0.31	83.99	83.95	-0.04
WH30936	446	445	-0.31	84.19	84.15	-0.04
WH31656	474	468	-5.98	84.39	83.24	-1.15
WH30633	518	518	-0.31	84.45	84.42	-0.03
WH31651	474	468	-5.99	84.49	83.34	-1.15
WH31646	474	468	-5.99	84.59	83.44	-1.15
WH31244	474	468	-5.99	84.70	83.55	-1.15
WH30865	493	492	-0.31	84.82	84.78	-0.04

Hydrant	Residual Pressure at Minimum Fire Flow (kPa)			Available Fire Flow (l/s) at 150 kPa		
	Existing	With Development	Difference	Existing	With Development	Difference
WH30988	474	468	-5.98	84.82	83.66	-1.16
WH30969	475	469	-5.99	85.15	83.99	-1.16
WH30959	475	469	-5.99	85.29	84.13	-1.16
WH30793	475	469	-6.01	85.41	84.25	-1.16
WH37075	494	494	-0.32	86.24	86.21	-0.03
WH30932	446	446	-0.31	86.28	86.24	-0.04
WH37071	484	484	-0.32	86.82	86.78	-0.04
WH30713	459	453	-5.98	87.26	86.03	-1.23
WH30704	459	453	-5.97	87.43	86.19	-1.24
WH30700	459	453	-5.97	87.57	86.33	-1.24
WH35124	459	453	-5.98	87.76	86.52	-1.24
WH35121	460	454	-5.97	87.93	86.68	-1.25
WH30724	470	464	-5.98	88.13	86.90	-1.23
WH35115	463	457	-5.97	88.46	87.21	-1.25
WH37068	462	462	-0.31	88.47	88.43	-0.04
WH37051	443	443	-0.31	88.78	88.74	-0.04
WH35157	458	452	-5.95	89.12	87.85	-1.27
WH30951	505	504	-0.31	89.32	89.29	-0.03
WH30779	494	488	-5.98	89.63	88.43	-1.20
WH30776	492	486	-5.98	89.70	88.50	-1.20
WH30734	490	484	-5.98	89.93	88.72	-1.21
WH35088	474	468	-5.97	90.32	89.06	-1.26
WH30923	450	450	-0.31	90.43	90.39	-0.04
WH30898	455	455	-0.31	90.64	90.60	-0.04
WH35101	483	477	-5.98	90.88	89.63	-1.25
WH35081	479	473	-5.96	90.99	89.73	-1.26
WH35107	487	481	-5.98	90.99	89.75	-1.24
WH30757	505	499	-6.00	91.04	89.84	-1.20
WH34841	450	450	-0.32	91.19	91.15	-0.04
WH30885	465	464	-0.32	91.28	91.25	-0.03
WH30928	501	501	-0.31	92.39	92.36	-0.03
WH30938	482	482	-0.32	92.68	92.64	-0.04
WH30624	479	479	-0.32	93.83	93.79	-0.04
WH30861	512	511	-0.31	96.07	96.04	-0.03
WH30873	506	506	-0.32	96.58	96.55	-0.03
WH30862	527	527	-0.30	97.23	97.19	-0.04
WH30867	526	525	-0.30	97.40	97.36	-0.04

APPENDIX

B

CALLALA BAY HYDRANT
PERFORMANCE



Hydrant	Residual Pressure at 10L/s Fire Flow (kPa)	Residual Pressure at 20L/s Fire Flow (kPa)	Available Hydrant Flow (L/s)	Residual Pressure at Available Fire Flow (kPa)
Hydrant_0014	239.45	220.02	44.02	149.97
Hydrant_0015	249.13	230.42	48	150.14
Hydrant_0050	252.34	230.43	43.68	149.91
Hydrant_0016	258.54	239.99	50.81	150.14
Hydrant_0013	263.83	243.89	49.6	150.13
Hydrant_0049	265.63	240.78	42.84	150.14
Hydrant_0017	271.64	253.37	54.79	150.15
Hydrant_0018	281.83	263.96	56.39	157.37
Hydrant_0012	283.56	263.43	53.97	150.15
Hydrant_0048	285.32	243.7	34.42	150.11
Hydrant_0019	295.02	277.76	58.36	168.57
Hydrant_0020	299.72	283.36	59.69	176.33
Hydrant_0046	301.02	244.83	30.97	149.87
Hydrant_0023	305.11	291.67	63.14	197.3
Hydrant_0024	305.36	293.2	64.75	207.51
Hydrant_0021	305.62	290	60.96	183.9
Hydrant_0047	308.73	280.81	47.36	149.87
Hydrant_0022	313.57	299.32	63.26	198.04
Hydrant_0040	316.69	287.44	46.5	149.92
Hydrant_0039	321.37	304.69	61.25	185.66
Hydrant_0051	322.15	302.18	57.74	164.97
Hydrant_0011	326.01	305.98	58.89	171.61
Hydrant_0045	332.62	306.72	53.73	150.15
Hydrant_0038	333.82	317.45	62.69	194.51
Hydrant_0042	341.14	321.82	60.76	182.7
Hydrant_0041	344.67	325.58	61.32	186.08
Hydrant_0043	352.94	330.27	58.65	170.21
Hydrant_0036	353.19	336.78	64.91	208.55
Hydrant_0052	358.54	337.54	60.36	180.31
Hydrant_0010	358.72	339.16	62.39	192.67
Hydrant_0044	362.19	343.34	63.47	199.38
Hydrant_0037	369.3	351.13	64.32	204.77
Hydrant_0030	375.23	349.99	58.33	168.38
Hydrant_0009	376.22	357.68	65.1	209.75
Hydrant_0029	377.64	349.87	56.57	158.39
Hydrant_0026	382.05	354.9	57.34	162.73
Hydrant_0035	384.23	365.43	65.09	209.67
Hydrant_0053	389.03	366.43	61.47	187
Hydrant_0025	389.61	369.62	64.58	206.43
Hydrant_0008	394.85	376.22	66.67	220.01
Hydrant_0007	399.74	381.33	67.34	224.41
Hydrant_0034	401.13	380.92	65.08	209.63
Hydrant_0028	402.22	345.07	39.58	149.93
Hydrant_0027	402.83	361.31	47.51	149.95

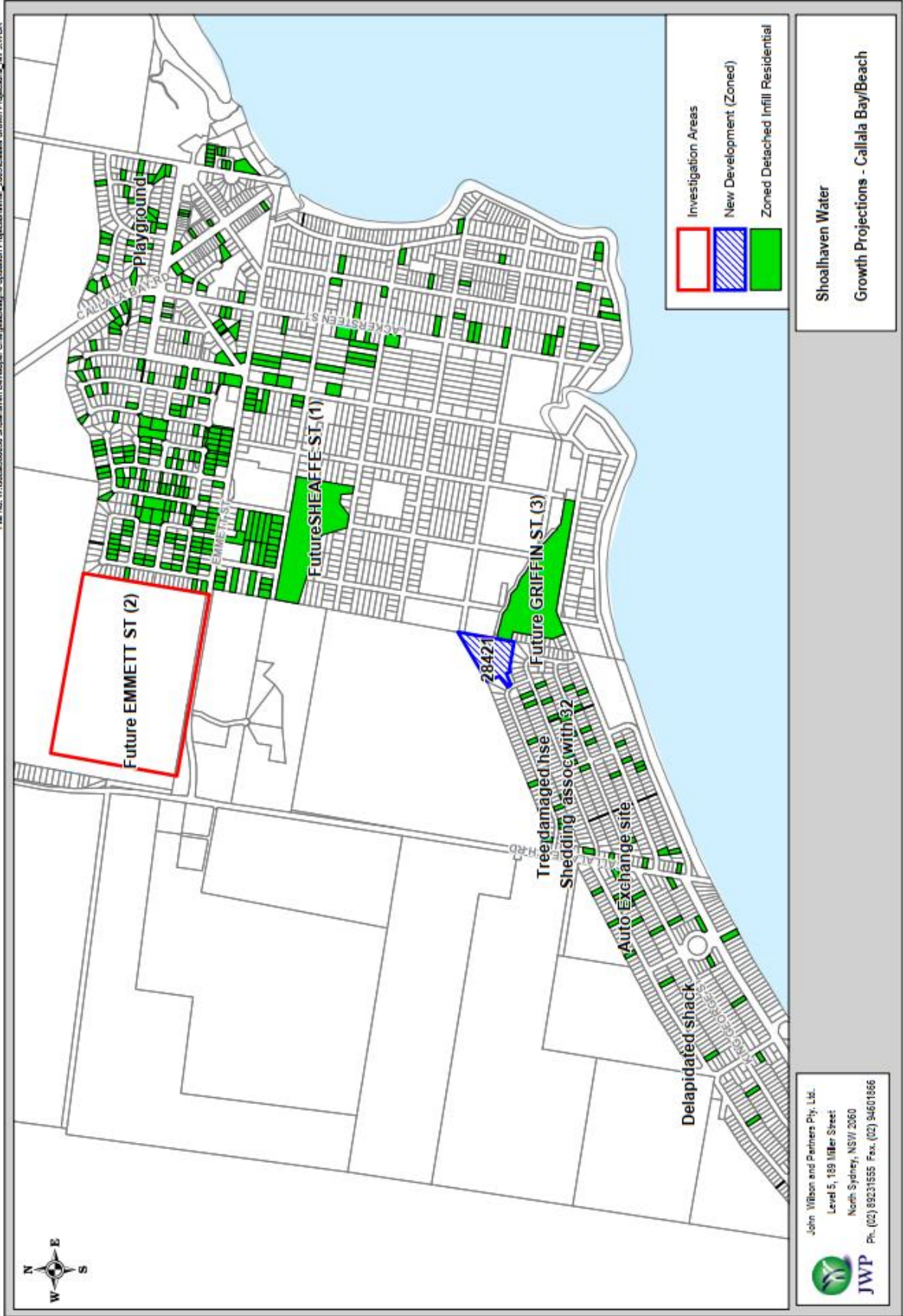
Hydrant	Residual Pressure at 10L/s Fire Flow (kPa)	Residual Pressure at 20L/s Fire Flow (kPa)	Available Hydrant Flow (L/s)	Residual Pressure at Available Fire Flow (kPa)
Hydrant_0031	405.6	362.79	46.74	149.93
Hydrant_0054	412.44	388.32	62.05	190.56
Hydrant_0006	414.52	396.85	69.37	238.15
Hydrant_0033	417.22	392.65	62.04	190.47
Hydrant_0032	417.4	398.87	68.22	230.33
Hydrant_0005	423.29	405.49	69.99	242.43
Hydrant_0001	443.81	428.81	74.85	277.29
Hydrant_0003	448.56	432.28	73.87	270.05
Hydrant_0004	448.78	431.67	72.92	263.13
Hydrant_0002	453.3	438	75.57	282.65



APPENDIX C

Strategic Sewer Supply Plan

File No. W/Local300503 Shoalhaven Development Change/Design/Regulation Project/Ref No. 2009/Callala Growth Projections rev 3.1/10/08





APPENDIX D

Strategic Electrical Assessment (Endeavour Energy Assessment)

27 November 2018

Endeavour Energy Ref: ENL3199 – 2014/02306/001

Allen Price & Associates
PO Box 73
NOWRA NSW 2541

Attention: James Harris

TECHNICAL ENQUIRY REVIEW

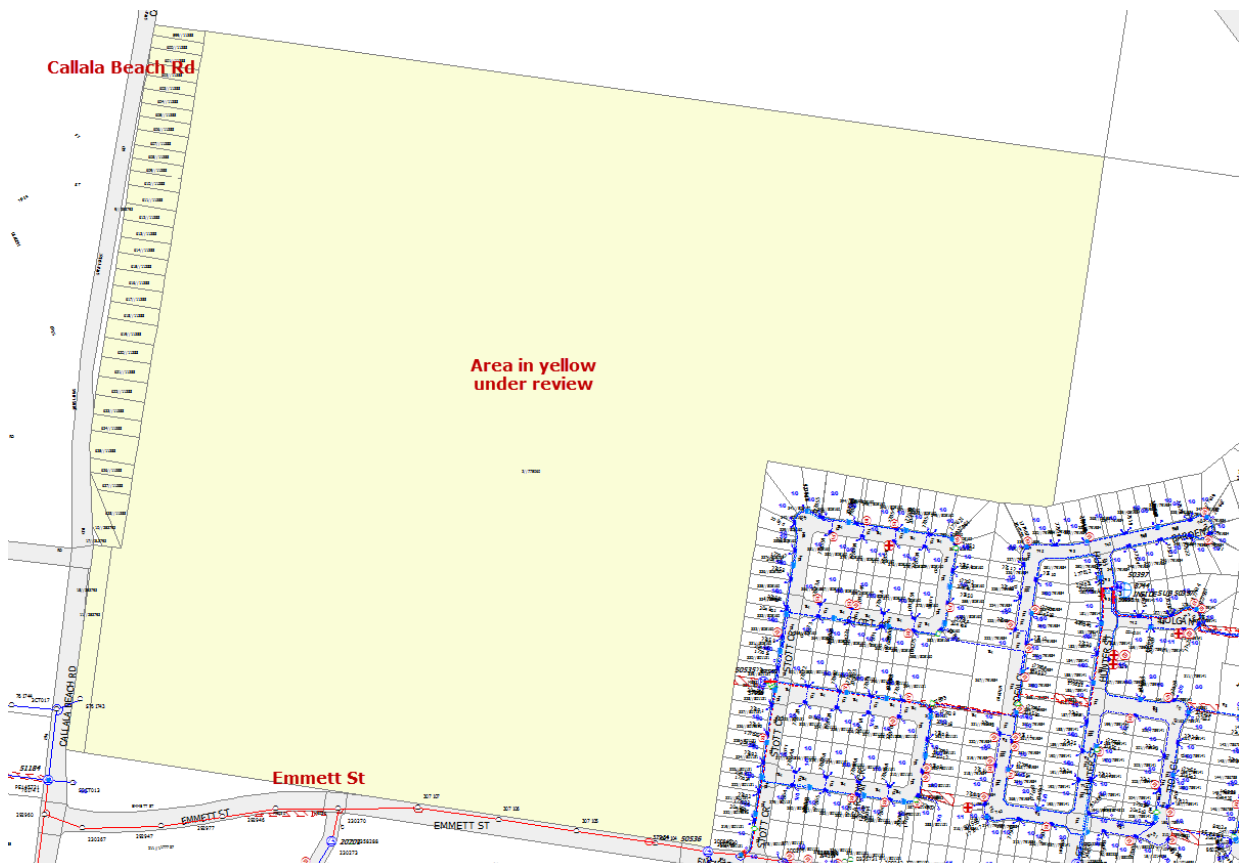
ENL3199 – Callala Beach Road, CALLALA BAY

Thank you for your enquiry application and the payment of fees to facilitate the enquiry request at the above location. Your application has been registered under ENL3199. Please quote this reference number on all future correspondence.

Your enquiry requires a review of supply needs for Callala Bay expansion area provide current planning proposal investigations.

The proposed Greenfield residential development (381 lots) is located approximately 4.0km south from Endeavour Energy's Culburra Zone Substation.

The size of the load needs to be assessed to determine network requirements. The load estimation for 367 500sqm Lots and 14 large Lots is provided using an after diversity maximum demand(ADMD) assessment. The 367 Lots have been determined at 6.5kVA and the 14 large Lots have been determined at 10kVA with a total load of 2.5MVA.



The development is situated in an existing 11kV network area. There is an 11kV feeder CLD2 located along Emmett St frontage. At the present time, there is available capacity on feeder CLD2 to supply the load of 2.5MVA. This information is based on no other neighbouring developers submitting a new application prior to application to this subdivision. Depending on the load demand for the area in the future, Endeavour Energy may need to perform some upstream works.



The above works will be contestable and anticipated to be customer funded and constructed.

If you wish to proceed with this project, a developer or developer representative will need to submit an Application for Subdivision to Endeavour Energy via fax or email as detailed on the form.

Once the application is processed and a Supply Offer has been issued by Endeavour Energy, which is essentially a brief desktop assessment of the load provided on the application form, you will need to engage a level 3 Accredited Service Provider who will submit a formal Method of Supply.

A list of the Accredited Service Providers is available at the NSW Trade and Investment website: <http://www.energy.nsw.gov.au/electricity/network-connections/contestable> or can be obtained via phone 13 77 88.

Please note this enquiry is only a preliminary assessment and does not guarantee supply availability or final conditions of supply. Exact determination of supply will be made once an Application for Subdivision is submitted to Endeavour Energy.

Should you have any enquiries regarding your application please contact me.

Yours faithfully,

M Grimwood

Regards,

Matt Grimwood

Contestable Works Project Manager

Network Connections

T : 98537916

E : matthew.grimwood@endeavourenergy.com.au





APPENDIX E

Relevant Contributions Projects For Consideration



CODE	02AREC0004
PROJECT AREA / PROJECT CATEGORY	Area 2 / Active Recreation
LOCATION	Various
DESCRIPTION	Planning Area 2 - Recreation facilities upgrade (various locations)
STRATEGY	To provide active recreation facilities to meet anticipated demand from development.
PROJECT ESTIMATE	\$1,286,000.00 in July 2018
INDEXED ESTIMATE	\$1,328,772.36
APPORTIONMENT	The apportionment to development is 21.13%.
NEXUS	The population accommodated in Planning Area 2 in both existing and future development up to 2036 will generate the demand for this project. The contribution rate calculation therefore reflects this planning philosophy.
SUPPORTING INFORMATION	See the Community Infrastructure Strategic Plan for more detail. Supporting Information can be viewed here
LAND ACQUISITION ESTIMATE	\$0.00
TIMING	Development dependent.



[VIEW LARGER MAP](#)

Contribution Rate

FINANCIAL YEAR	CONTRIBUTION RATE TYPE	CONTRIBUTION RATE	EXISTING ET / M2 / SP	FUTURE ET / M2 / SP	TOTAL ET / M2 / SP
2020	Equivalent Tenement	\$424.46	3131	662	3793



APPENDIX F

Level Of infrastructure Provision Local Parks & Linear Passive

Local Recreation Park Considerations

Extract from Community Infrastructure Strategic Plan (page 108 & 109)

Local recreation park

Description and intent

Local passive recreation open space (parks) provide a range of recreation opportunities for local residents. These parks contain limited infrastructure, yet offer local community benefits.

Local passive recreation parks are intended to offer residents a complementary open space to their backyards. They are likely to attract users from a small catchment area (about 400m radius) and generally cater for short visits by small groups.

Local passive recreation parks will be centrally located to the catchment or as hubs along recreation corridors where such corridors exist. There are many cost and land efficiencies (such as from dual use of land and consolidation of embellishments) that can be gained by developing hubs along pathways that connect key community areas such as: residents to schools, retail hubs etc.

Where a number of parks are to be provided, or are to receive embellishment upgrades within an area or community, community recreation master plans should be developed. These plans will ensure that the park embellishment suitably and collectively meets the needs and demands of the community. Furthermore, each park should complement nearby open space and be relevant to the local area, its character and demographic.

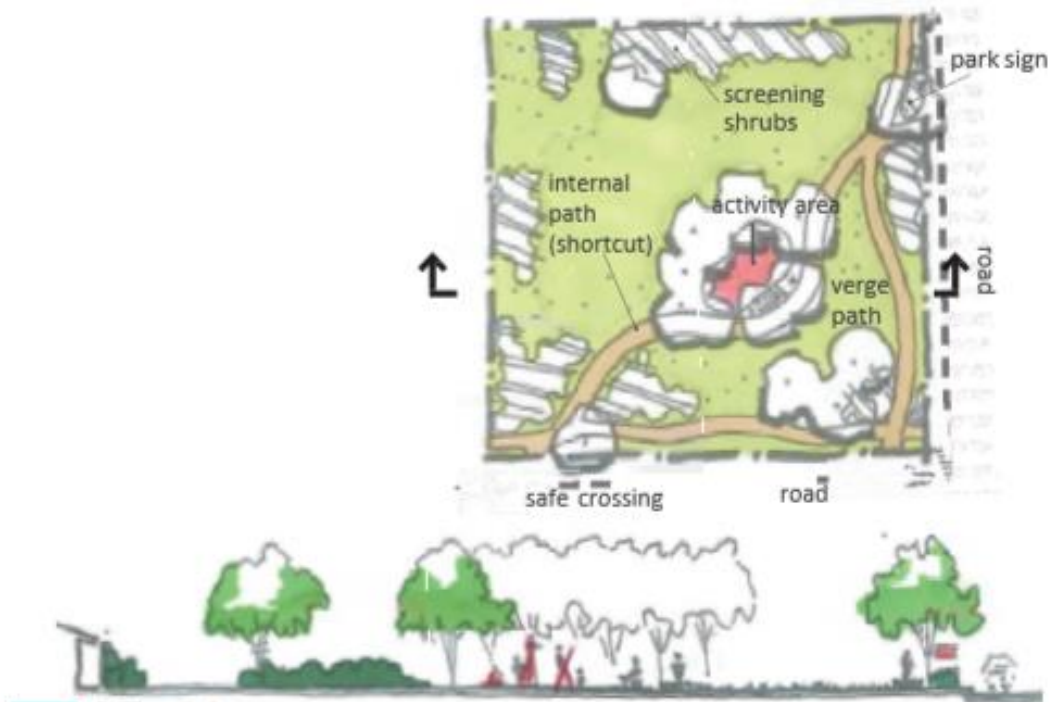
Design considerations

The following elements should be considered when designing and developing a local passive recreation openspace:

- ☐ park to be located in a residential area and easy for residents to walk and ride to
 - ☐ recreation buildings to be clustered in an activity area, ideally located under natural shade where possible
 - ☐ mix of 3 activity options, such as:
 - basic toddler play (spring toy, slide and swing)
 - rebound wall
 - path circuit
 - flat kick-about area
 - multi-generational equipment to service a range of age groups
 - multi-functional equipment which can be used for both play and exercise (e.g. parkour equipment, monkey bars)
 - ☐ picnic table and seats to be located where they can oversee and access the activity area (preferably under a shade tree), along the internal path
 - ☐ surveillance of the majority of the park should be available from adjacent properties and from the road
 - ☐ internal paths to connect to on-road pathway system and connect to the key activity area in the park. If the park can act as a short cut for pedestrians it may also encourage them to stop and utilise the buildings
 - ☐ embellishments in the parks complement those in nearby parks (increasing the range of buildings available to nearby residents) and be relevant to the local area's character and demographic
-

- ☐ design and embellishment of parks reflect the demographic desires of the local catchment
- ☐ landscape edge treatments in the form of screening shrubs will improve the aesthetics of the park, soften the edges and provide some buffering to nearby residents.

Description of embellishments	Quantity	Unit of Measurement	Cost (chargeable)
Mix of activity nodes	3	nodes	\$86,250
Fencing - bollards or log and rail to prohibit car access	400	Lm	\$22,000
Shade clustered trees near activity nodes	30-50	%	\$10,000
Turf*	20	%	\$18,000
Gardens low maintenance	5-10	%	\$15,000
Lighting	1	item	\$20,000
Internal pathways (1.5m wide)	225	m ²	\$27,000
Signage	2	item	\$3,600
Water bubbler/tap (includes connection)	1	item	\$5,000
Bench seats	2	item	\$4,400
Picnic shelter	1	item	\$18,000
Picnic seating and table	1	item	\$6,000
Bins	1	item	\$750
Total indicative cost			\$236,000
* Turf is to be planted around activity areas and picnic embellishments. Grass seedlings or runners will be planted in the remaining areas of the local recreation park			



Soccer

Linear Passive Considerations

Extract from Community Infrastructure Strategic Plan (page 116 & 117)

Linear passive

Description and intent

Linear passive recreation open space provides pedestrian connectivity and can link open spaces, local residences, community infrastructure and commercial areas. The land contains infrastructure to facilitate recreation use, including a formed path, signage and seating and offers an attractive recreation setting.

In areas like Melton City where the potential benefits of linear open space have been embraced, these open space types have the potential to create a 'green web' across the community. A large portion of the network is often located along riparian areas, drainage corridors and other easements (rail, telecommunications). Subsequently, the land usually has dual-functionality.

Linear open space provides health and environmental benefits. Walking and cycling continue to be the preferred physical activity options for all areas of Australia, with no trend to support a shift. Linear parks can encourage more (off-road and tree lined) walking, cycling and other wheel-based movement experiences.

Linear parks should link and be located so they are easily accessed. As such, consideration must be given to where people live and where they are most likely going to walk and/or cycle. Linking residential areas to retail/commercial hubs and social hubs (schools, sporting buildings, shops, pools etc) can provide important green pedestrian and cycle corridors. It is also beneficial to create a series of circuits rather than up-and-back paths. A number of interconnecting circuits can offer an array of options for users of different abilities, from short, easy circuits to longer and more-challenging ones.

Linear parks must link with the on-road path network, however, to keep the feel of the linear park, the development of 'Park Streets' should be considered where possible. The 'Park Street' concept takes advantage of wide streets that have sufficient space to accommodate a pedestrian path (and other park-like embellishments such as seating).

Linear parks may also aid in providing ecological corridors and links for flora and fauna due to the provision of green inter-connectivity.

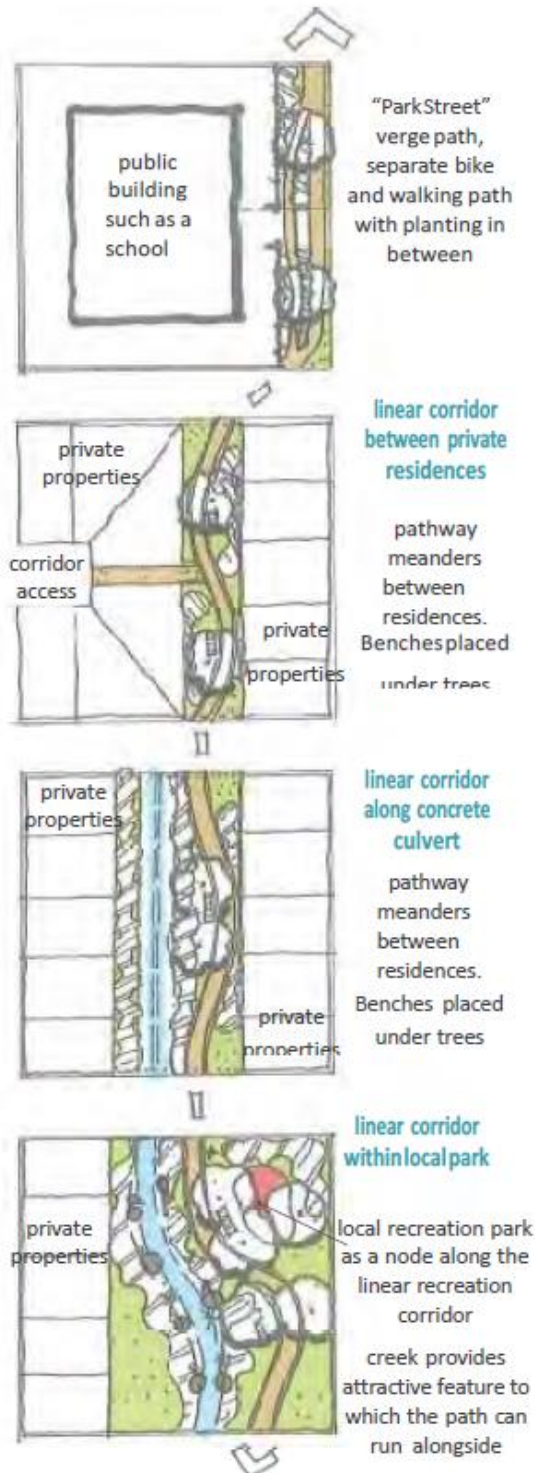
Design considerations

It is important that linear passive open space is well planned and designed to provide a safe and functional linear park network. It is critical that geography, topography, geomorphology and hydrology are considered in the planning and design of pathways and other landscape treatment in linear parks.

The physical alignment and construction requirements of the pathway needs to be investigated at the commencement of a development and take into account appropriate offsets from waterways, flooding, bank erosion and stability. In some cases, the location of a development may need to move to adequately accommodate linear park infrastructure and embellishments.

The following elements should be considered when designing and developing a linear passive open space corridor:

- ☐ ensure the corridor is suitable for people of all abilities
- ☐ pathways should follow contour lines, to provide limited grade - preferably not be steeper than 1:20 along any pathway
- ☐ appropriate vehicle access for maintenance is required
- ☐ create pathways and routes that connect to destinations and directly link residential areas to retail nodes and social hubs
- ☐ create circuits within the network, where appropriate
- ☐ ensure the corridors are safe for people to use and provide adequate visibility throughout the park (e.g. clear sight lines through the park, including selective clearing of vegetation where necessary and in accordance with relevant vegetation protection and environmental management plans)
- ☐ some areas should be lit (high visitation areas and social hubs)
- ☐ encourage different settings and experiences along the corridor, including taking advantage of views and vistas
- ☐ create a legible network by
 - creating clear and obvious path connections
 - use of continuous path materials
 - signage, where appropriate
 - use of trees and avenues and tall elements to aid in wayfinding and navigation
 - themed entry statements (can be minimal embellishment such as a totem pole).

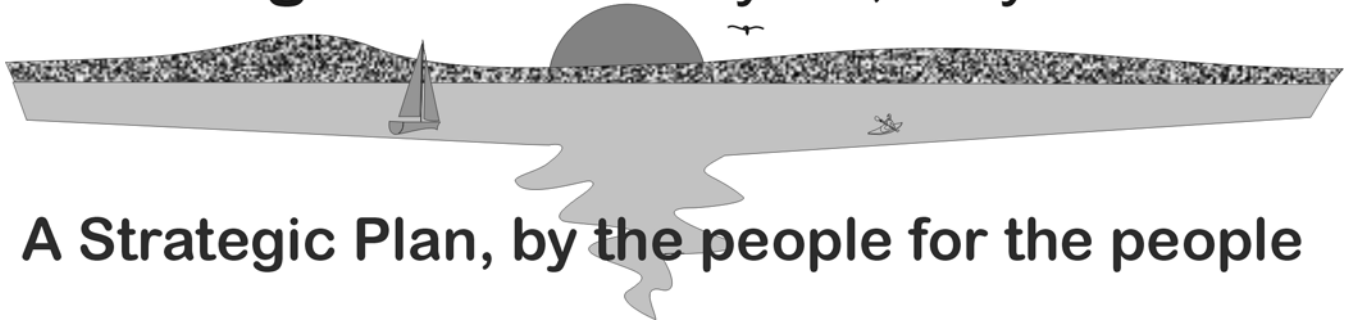




APPENDIX G

“Creating Callala” Strategic Plan

Creating Callala - Myola, Bay & Beach



A Strategic Plan, by the people for the people

Creating our own Callala

Local associations of people working with a strategic plan for your home town.

Aims

One of the first aims of Creating Callala was to formulate a strategic plan or vision for our area. Having a plan we, the public, have agreed on means the local Associations such as the Callala Beach Progress Association and the Callala Bay Community Association have clear directions on what the public wants. This makes decision making on project priorities much easier. The Associations can work on projects with confidence, knowing they are heading in the right direction.

Allies

In the last year both of the Callala Beach and Callala Bay Associations have been working on projects which are high priorities in the strategic plan that has arisen from the Creating Callala process. These have included:

- Providing support for the Soccer Club for the construction of another field
- Supporting the Business Chamber on various projects to promote our area
- Making great progress on paths and cycleway projects in the area
- Initiating a community veggie garden – for friendships, learning and food
- Research on causes of foreshore erosion, storm protection, and repair strategies

Results

The Creating Callala Strategic plan is helping both groups (Bay and Beach-Myola) to recognise the assets, the wishes and the problems of the area, so that they can work together towards creating the Callala of your dreams.

The vision from the workshops:

“Callala is a united community that values community well-being, respects its natural environment, and supports sustainable lifestyles.”

From there to where ?

After two big meetings, and a big summary of all the ideas floated on those days, came a vision, some goals, and an organised but undigested lump of information. This lump was handed to the Creating Callala Committee. After months of working in sub-groups with other local citizens, the issues and objectives are back to you with timelines proposed, as well as partners and other details identified.

- For more about “how” see page 2.
- Overall strategies are briefly summarised at pages 6-7.
- Each Theme or Interest area is reported in the following pages – see Contents on page 3.

Which brings us to the **NEXT BIG PUBLIC EVENT.**

On Sunday, 19 May 2013, Creating Callala & helpers invite you to come, discover details, discuss these ideas, and get involved in realising the future of Callala-Myola area.

See event information at bottom of this page.

Local associations and many individuals will be needed to achieve our goals.

You can be involved.

**Sunday
19 MAY
2013**

Find details of the PLAN.
Discuss the PLAN topics.
Meet like-minded people.
Get involved with ACTIONS.

**Drop in
between
9:00 am
& 2:00 pm**

Callala Bay shops precinct, Emmett St

Planning by the people, for the people

Local residents and ratepayers are planning their own future. The “Creating Callala” process has actively involved both full and part-time residents from all parts of our district - from Myola, Callala Beach, and Callala Bay. The focus has been on what we as a community value, what we are missing or need, what goals are more important for our future, and how we can get there. The aim is a practical, achievable plan.

How it has happened

Advertising and invitations were extended to all concerned people in the area. On 4 February 2012, a first public workshop was attended by 170 residents.

The many positive ideas and concerns were organised afterwards, and brought back to a further workshop on 10 March 2012. At that second general workshop, 60 residents began detailing the ideas. From there, a volunteer working party was organised to carry the planning process forward.

Residents identified what they saw as the drivers, the problems, the assets and opportunities. Original topic groupings (in alphabetical order) included

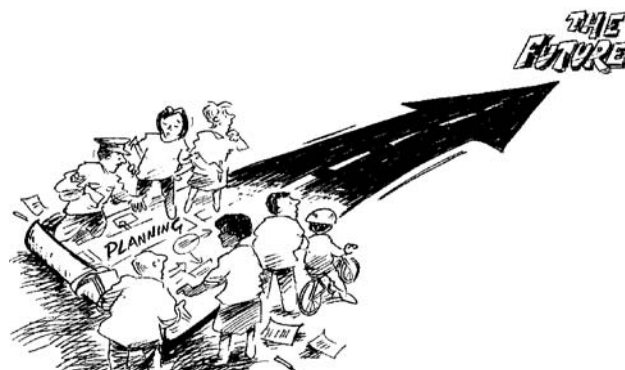
- Business, including tourism, marketing
- Development that is sustainable & conserving
- Environment, care and preservation
- Health, social well-being
- Mature-Aged Citizens needs
- Safety or Policing
- Sporting facilities and activities
- Town appearance, including public spaces
- Youth – positive opportunities & activities

This planning process started through Callala Bay Community Association, in cooperation with Callala Beach Progress Association, assisted by the regional operations of NSW Dept of Trade and Investment.

From April 2012, the process has been carried forward by a Creating Callala Committee. These volunteers worked as subgroups analysing workshop ideas, then gathering more specific information from participants, from local community groups, from research and from government agencies.

This document briefly summarises the results. Under topic headings, it outlines some practical outcomes already started, and further plans or priorities.

Which brings us to the **NEXT BIG FORUM EVENT**.



Our people, our plan, and our partners:

On Sunday, 19 May 2013, Creating Callala & helpers invite you to come, discover details, discuss these ideas, and get involved in realising the future of Callala-Myola area.

See event information at the bottom of front page.

This local planning, driven by our community, affirms what we can agree is needed and desired, what we will work to achieve. It does not have the force of law, but it has “people power”.

This plan lets our community resolve what is important to us, telling that to local, state and federal governments. We want a say in guidelines for development, and in the use of our rates and taxes.

In achieving our goals, primary partners will be local residents and businesses, Shoalhaven City Council, and NSW state agencies. Their forward budgeting of funds will be required, as well as community support and energy.

Local associations and many individuals will be needed to achieve our goals. **You can be involved.**

Overall strategies are summarised at pages 6-7.

Further detail of who, what, and raw data is on-line at <http://creatingcallala.weebly.com/>

An electronic copy of this document is also available on-line at that site.

Contact for the Creating Callala group is creatingcallala@gmail.com.

This document (see above), was produced by volunteers in Creating Callala Committee (CCC), who also worked with many others in our community to analyse the workshop data, and compile the detailed Plan and this brief summary.

Printing was made possible by a grant of \$500 from Shoalhaven City Council, and the balance of publishing costs was achieved by sponsorship from our advertisers.

We thank these plan project backers most sincerely.

Printing by Ulladulla Printing Services

DISCLAIMER: Information collated and views expressed in this Strategic Plan discussion paper arise from many sources and are provided for general background and to support a community process. Creating Callala Committee, and its auspicing body, Callala Bay Community Association, Shoalhaven City Council & our advertisers accept no liability whatsoever in relation to that information, those views, possible future actions, developments or events, or any decisions or actions taken by other parties based on that information or those views. This is NOT a legal or government planning document.

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Contact Greg Westlake on 4423 5533
Email: gregw@pacificwestlake.com

Designing Your Future

Contents

Page 1	Highlights of Creating Callala, and Next Big Information Forum on Sunday 19 May 2013.
Page 2	This planning process, supporters and partners
Page 3	Table of Contents; and Festivals
Page 4	Shared paths & cycleways ; Population & dwellings
Page 5	Foreshores
Page 6	Overall planning priorities table
Page 7	Overall planning priorities table
Page 8	Public safety and policing, & Community garden
Page 9	Environment and bushcare
Page 10	Business Chamber & Tourism; Community Associations
Page 11	Seniors, housing & services
Page 12	Sports News; Health and Social Wellbeing networks.

Festivals

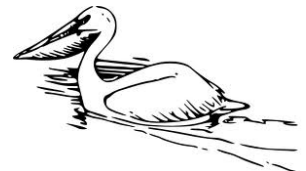
Part of the planning arising from the Creating Callala workshops, in the interests of recreation and tourism in the Callala-Myola area, suggested introduction of festivals. It was widely felt that this would be an exciting and encompassing idea.

What this may mean for Callala communities is that a community festival would:

- Celebrate the beautiful area we live in with a sense of community pride.
- Bring people in from outside our communities to support our businesses and share our facilities through activities that the community determines
- Promote our own community as a unique and wonderful place to live so that it is recognisable and distinct in our region.

The group setup to investigate this idea has come up with two proposals.

One proposal for winter, in the concept stage, was given the name "The Running of the Brumbies". The idea behind it is a family day with the kids creating their own hobby horse, of some description, and parading with prizes for various categories and culminating with various activities at the sports field and where various types of food and drink stalls would be present. It would also tie in our community's strong sporting club Callala District Soccer Club, more affectionately known as 'the Brumbies'. The Soccer club would look to support the festival through



involving its members and possibly holding a social function in conjunction with the event.

The second proposal, during warmer months to allow water events, is to hold an event called "Beach to Bay". On a larger scale, this would be an active outdoor sporting event festival based around our stunning foreshores and beach fronts. Ideally this would take place outside of peak tourism season. A number of events throughout the day such as foot races, swim races and kayak races from Callala Beach to Callala Bay, would culminate in a festival in the park by the sailing school, and an open air film showing in the evening.

Both these programs require a lot of planning and assistance as "many hands make light work", so volunteers for the committee and running these programs are needed.

Please come along to the next community forum or information event to provide your thoughts, ideas and most importantly your offer of help.

Shared paths and cycleways

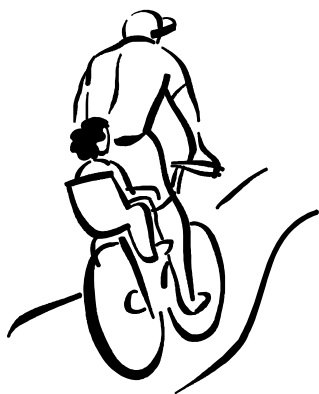
At last year's forums the community said: **We want better and safer Paths and Cycleways in Callala and Myola.**

Following those fantastic forums in 2012, the following objectives have repeatedly arisen from all of the great input provided by the people attending.

You want to:

- Improve the safety for cyclists and motorists
- Improve access and links to key locations
- Promote a healthy lifestyle in the area

Action and results already !



The Shared User Pathway subcommittee has been working on these objectives over the last year and is developing a long term strategy for the area. Fortunately Callala Bay Community Association was already working hard on these exact objectives.

Some quick results, such as the construction of the path along Emmett Street from the shops to the school,

were achieved thanks to the hard work of that group.

In addition the Callala Beach Progress Association has jumped right behind the proposed Myola to Callala Beach shared path and is doing great work on fund raising.

The current top priority projects are:

1. Extend the cycleway along Chisholm Street to complete a safe link to the Callala Public School and shopping area.

2. Construct a shared path around the Callala headland from Bicentennial Park to the end of Sheaffe Street.
3. Construct a shared path to link Myola to Callala Beach.

Current status on these projects is:

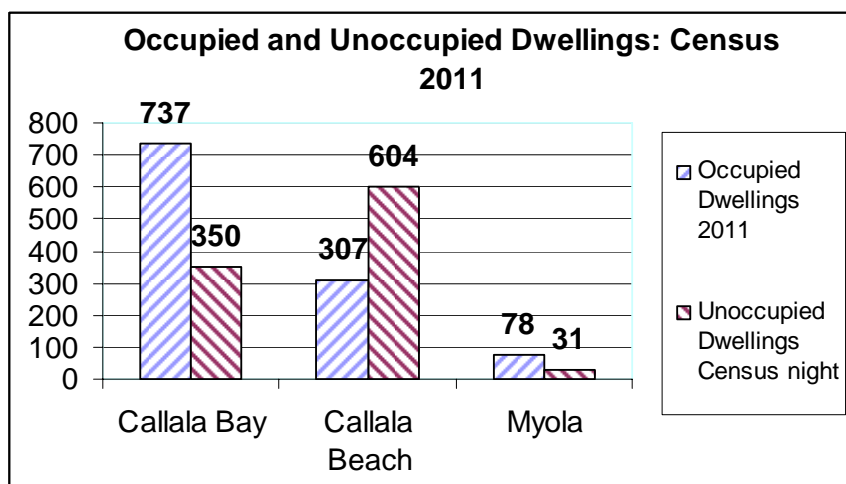
1. Council has committed some funds and prepared a design for a pathway along Chisholm Street. Details are being negotiated. Construction is to start soon.
2. Callala Bay Community Association has recently obtained an \$82,000.00 grant for Callala Point headland path – fantastic. Council has put a design out to the public for comments. The next stage is detailed design and construction.
3. Council has committed some funds to the Myola to Callala Beach shared path, and are currently checking the environmental impact of this proposed route. The Callala Beach Progress Association has already raised \$4,700.00 towards the project.

Other projects under consideration for 2014 are (1) a shared path on Callala Bay Road from the preschool down to Sydney St, and (2) the continuation of Sheaffe St path down to the existing path inside the sports reserve.

What will be next ?!

The next stage will involve construction of the paths and as funds are very tight we need **volunteers** who can help with formwork and concreting, and anything else you can do to help.

Come along and see the project proposals and give us your opinion and support. See how you can help with these great community projects.



Locality	% Total Pop'n	Persons
Callala Bay	71%	1914
Callala Beach	25%	681
Myola	4%	95
District Total	100%	2690



Overall strategies are summarised at pages 6-7.

Further detail is on-line at <http://creatingcallala.weebly.com/>

An electronic copy of this document is also available on-line at that site.

Contact for the Creating Callala group is creatingcallala@gmail.com

Bay Foreshores – focus of our lifestyle

Keeping foreshore areas intact from storm and human impacts has been given high priority by workshop participants and by this plan. Community and visitors alike highly value our attractive, accessible, clean, healthy and safe beaches and foreshores.

These beautiful natural areas giving access to Jervis Bay waters are the prime assets of Callala-Myola. They have drawn the early campers, more recent residents, and very many visitors.

The Issues

Public foreshore spaces – the beaches and dunes, rock shelves, park or reserve areas - are a very limited resource, subject to natural forces and the impacts of human uses.

Dramatic dune and beach damage mostly happens in storms at high tides. Most everyday foreshore activities and small facilities are low-impact, and compatible, even in seasonal traffic peaks.

All single-purpose facilities exclude other uses. Larger structures permanently change shoreline appearance and disrupt natural processes, often with damaging side-effects. So all foreshore proposals require thorough studies, to protect environmental values and preserve existing uses.



Urgent pressure points:

Beach dunes at Callala Beach and Myola have eroded after vegetation was worn away at un-formed access points through the dune, and by storm surges. Here, pedestrian access walkways improved dune stability and beach access, but ramps may require maintenance and restoration after storms.

The dune front and public park at Callala Bay is under pressure from severe storms, high human and vehicle uses, including boat launching traffic and parking, access to moored boats and pier, picnic and play areas, walkers, parties, dinghy activities. Much prime foreshore reserve is now given to vehicle traffic and to parking. The ramp/pier rock groyne causes silting to south, as well as erosion of dune and beach loss to the north. This is a critical urgent issue.

Myola's navigable creek waterfront is generally stable, protected by a trainer wall at the east, by

conserved wetland & mangrove, by boating speed limits and by vegetation further west. The Currumbene Ck boat ramp, west of Catherine St, is suitable, but the trainer wall & ramp accesses, manoeuvring and parking areas are not!

Medium and Later priorities:

The foreshore reserves between these main access points are either bushland or like strips of parkland. Medium term priorities include improved connecting pathways in some sections, toilets & showers at high use locations, seats, water and picnic tables, and guidance for visitors. (See "Pathways" section also.)

Some additional facilities for boat launching or loading, or mooring, were suggested. They may duplicate or improve. These are not yet analysed for feasibility, community benefits, or public priorities.

Suggestions of a foreshore restaurant, motel or marina (boat-harbour) were found to be very complex & controversial. The development process would be best suited to the private sector to propose. If to be sited on private, suitably zoned land, a development application would address planning and legal compliance, traffic issues, agreements with land owners, as well as the usual environmental impact statements. If proposed in public natural space (crown land or Marine Park waters) such commercial and industrial development proposals must go further, addressing loss of public values and amenity, wider social costs, legal and equity assessment, and much larger environmental damage. Governments & community would then evaluate the impacts and respond to the developer's ideas and research.

Partners in foreshore care:

In foreshore matters, primary partners will be Shoalhaven City Council, Marine Park Authority, and Crown Lands who are responsible for public intertidal and foreshore areas. These bodies and our community share urgent concern about how to stop silting and repair erosion of dunes & beach areas beside hard structures. Erosion or siltation problems are complex. Their remedies are costly to research, design, and construct. Forward budgeting and possibly state government grants will be required, as well as community support and energy.

Local associations and many individuals will be needed to achieve appropriate foreshore protection and enhancement measures. **You can be involved.**

Foreshore items are summarised at pages 6-7.

Further detail is on-line at <http://creatingcallala.weebly.com/>

Contact for group developing FORESHORE actions is Duncan on 44466266.

Strategic Plan Summary & Priorities / Timing

Short Term = 12months; Medium Term = 1-3yrs; Long Term = 3yrs +

Issue	Objectives (Goals)	Timeline
<u>Group - Sport and Health</u>		<u>Group - Sport and Health</u>
Benefits of social and health groups	To establish regular walking group and addressing different levels of fitness	Short
	To organise a chess club and book club meeting on a monthly basis	Short
	To extend sailing club facilities to include an ocean swim group	Short
	To extend participation in existing groups	Short
	To encourage opportunities for other interest groups to start	Short
Active Festivalsproposed (a) Running of the Brumbies, and (b) Beach to Bay	To Promote community involvement in healthy and fun activities - both summer and winter, To improve tourism in the area, to generate income to assist with funding other objectives	Medium
Community veggie gardens	To provide a community area to grow food, To connect the community, to share knowledge [Starting]	Medium
Other community spaces	To establish a recreational park	Medium
Sporting Complex	To establish a sporting complex consisting of - Soccer 2nd field & clubhouse, Cricket nets & pitch, Tennis courts, Netball courts, playground associated with sports fields	Long
Leisure / Gym Centre	To establish a gymnasium - that is accessible to the community, appropriately equipped, with hydrotherapy pool	Long
<u>Group - Foreshore</u>		<u>Group - Foreshore</u>
Keep foreshore intact - Beach, Park & Foreshore Reserve	To control erosion of foreshore, URGENTLY, with partners: (a) by analysis and design of beach, due, and park protection / restoration, (b) by government priority budgeting for protection / restoration measures	Short
Beach cleaning	To maintain beaches in safe, healthy & attractive state: to benefit residents, to increase and maintain tourists visitations, and to improve employment opportunities	Short
Beach, Park, and Foreshore Reserve new facilities:	To improve the amenity of the foreshore for all users: by 1. Footpaths; 2. Signs / guidance; 3. Parks Play Equip.; 4. Drinking water; 5. Showers (rinse after swim), 6. Picnic tables; 7. Benches only; 8. Barbeques; 9. Toilets	Medium
Beach access:	Safe access for (disabled) people to waterways, including beaches, through parks and dunes by wooden walk/ramp way onto beach, Wowly Creek, Watt Street, Sharpe Street	Medium
Boating facilities:	To improve facilities: 1. Boat ramps; 2. Jetty access depth; 3. Myola Ck launching	Medium
Responsible sustainable use or developments in or near foreshores	Proposals include: 1. Restaurant; 2. Motel; 3. Marina. As business & employment opportunities. These uses of public land & waters, & foreshores are controversial. To be initiated by proponents and evaluated by public.	Long
<u>Group - Environment</u>		<u>Group - Environment</u>
Preserving, promoting and educating for our natural environmental quality	To remove invasive weeds, and educate community about invasive weeds; to protect natural areas by fencing and to act against dumping in such areas; to encourage learning about sustainabler practices.	Short
Preserving, promoting and educating for our natural environmental quality	To protect Callala Wetlands and educate community about the value of these Wetlands; To construct a low-impact walkway through the Wetlands to give safe access for learning about the Wetlands.... [commenced]	Short
<u>Group - Public Safety & Policing</u>		<u>Group - Public Safety & Policing</u>
To enhance the reality and the perception of public safety	To increase the frequency and visibility of active policing in the area; to encourage reporting of all crime and also reporting of anti-social behaviour; to support a system of neighbourhood watching & reporting.	Short
To improve police links with this area for public safety	To make police operational managers aware of the needs and issues arising in our area that require attention from police..... [commenced and continuing]	Short

Strategic Plan Summary & Priorities / Timing

Short Term = 12months; Medium Term = 1-3yrs; Long Term = 3yrs +

Issue	Objectives (Goals)	Timeline
<u>Group - Changing Attitudes</u>		<u>Group - Changing Attitudes</u>
Negativity from some in community	To encourage residents' positive attitude & pride towards Callala and towards tourist services & development	Medium
Getting the local community to acknowledge tourism is our life blood.	To improve businesses' viability & sustainability	Medium
Business improvement & promotion	To improve and promote tourism, & To make the community aware that tourism is important to Callala	Medium
<u>Group - Promoting the area</u>		<u>Group - Promoting the area</u>
Media Advertising website	To promote Callala as a prime place to live or work or holiday	Medium
<u>Group - Seniors & Housing, Accommodation & Services</u>		<u>Group - Seniors & Housing, Accommodation & Services</u>
Mature Aged Citizens – Accommodation & Living Options	To make available accessible and adapted housing: independent, or assisted, or specialised residential care, on commercial, cooperative or non-profit basis	Short
More Housing Land or Lots - for all ages	To find more opportunities for new residential land, to make better use of large blocks, to adapt housing, to possibly provide residential care facility and/or in-home services.	Medium
<u>Group - Youth</u>		<u>Group - Youth</u>
Benefits of positive activities	To extend participation in existing groups & activities	Short
Benefits of positive activities	To encourage opportunities for other activities and interest groups to start	Short
<u>Group - Pathways</u>		<u>Group - Pathways</u>
"Universal paths", cycle or walk ways, that are safe, durable, well drained	To make safe pathway access for all between school and shops..... [undertaken]	Short
	To complete a safe pathway link through Chisholm St (From Sheaffe St to Emmett St) - school route	Short
	To improve safety for pedestrians, cyclists and motorists. To improve access to major locations and link villages. To promote walking and cycling as part of a healthy lifestyle.	Short
	To identify routes & destinations: Sign posting to existing cycleway from Beach to Bay	Short
"Universal paths", cycle or walk ways, that are safe, durable, well drained	To link Wowly Creek to Callala Beach by "foreshore" route	Medium
	Complete cycleway in Callala bay at end of Sheaffe Street	Medium
	Improve safety for cyclists and motorists. Improve access to major locations. Promote healthy lifestyle.	Medium
	Safety and linking of villages	Medium
"Universal paths", cycle or walk ways, that are safe, durable, well drained	To complete a constructed cycleway from Myola to Callala Beach, to link the villages in a safe route	Long
	To install a pedestrian crossing between playing fields & skate park and the shops	Long
	To install a safe widened shoulder on Callala Beach Road (wide enough to be usable as a path)	Long
	To complete a constructed cycleway between Bay & Beach via Emmett St & Callala Beach Rd	Long
	To install foreshore pedestrian bridges to Boorawine Ck and Wowly Ck	Long
	To extend a foreshore path from Myola north to Red Rock adjacent to foreshore	Long

Policing and Public Safety: What needs to be done?

The forums of March last year posed the question to the community as to what were the issues that needed to be addressed in the areas of Public Safety and Policing. The ensuing discussion resulted in a strong consensus.



Three main areas of concern were highlighted:

1. A lack of Police presence
2. Anti-social behaviour and a lack of unwillingness to report it
3. Need for a revamped form of the defunct Neighbourhood Watch Scheme

What has been done since?

Initially, an onsite meeting was organised with the District Commander Joe Cassar to get a Police perspective on the situation as well as some expert guidance on how to achieve our objectives. Some positive support was assured by Joe and a commitment to reassessing the patrol frequencies.

But by far the most definitive point to come out of this meeting is that Policing is now more than ever a numbers game. This, to a large degree, puts the onus on us as a community to make the effort to actually report all incidents no matter how insignificant it may seem or regardless of what negative sentiments may be rife.

Following on, Constable Scott Chapman presented the new and evolving "Project EyeWatch" to a meeting of the Callala Beach Progress Association. This program holds promise as a vehicle for providing vital feedback to Police via internet:

<http://www.facebook.com/ShoalhavenLAC>

Callala is back on the Police radar, so to speak, with a noticeable increase in patrols and a commitment to respond to incident reports.

Where to now?

Come along on May 19th and chat to Police. They will be there with the Mobile Command Centre which has onboard resources to demonstrate how the Policing System works and how you can help us get more of what you've asked for! SEE YOU THERE!

PS If you have some spare time and energy and an interest in Public Safety and Policing, and would like to be a part of this process, then just make yourself known to the committee on the day.

Community Garden

The Callala-Myola VISION is "Callala is a united community that values community well-being, respects its natural environment and supports sustainable lifestyles"

One of the ideas raised during the 2012 community workshops was the establishment of a community garden. This idea resonates strongly with the vision described by our Callala communities for our area with it providing for community well-being and supporting sustainable lifestyles.

A community garden is a single piece of land gardened collectively by a group of people. A community garden can provide a sense of collective purpose, a physical meeting point for like-minded people who have a common purpose, and place where knowledge can be shared and enjoyed by all age groups.



Benefits of a community garden include:

- An active pursuit yielding fresh food. By growing some of their own food, individuals and families have access to fresh, nutritious food and the mixed meals that support nutritional health;
- Because it involves physical activity, community gardening promotes physical fitness and health;
- Learning to grow plants is mentally stimulating and adds to an individual's knowledge and expertise;
- Community gardens are used by community education, TAFE and schools as learning venues;
- Gardens are used for community education such as waste minimisation and the recycling of wastes through composting and mulching;
- Community gardening is a social activity involving shared decision making, problem solving and negotiation, increasing these skills among gardeners;
- It's a places where people come together with a common purpose, community gardens are places where people get to meet others; and

- Community gardens can be used to build a sense of community and belonging.

Community gardens are publicly functioning in that they are typically owned in trust by not-for profit organisations and in terms of ownership, access and management. Land for a community garden can be held publicly or on private land.

At this stage investigations into the establishment of a community garden in Callala includes a tentative arrangement that may be possible on the grounds of Callala Public School, perhaps being able to foster gardening programs actively in the school itself. Discussions with Mark McCarthy, Principal of Callala Public, are being organised for this year and also with Bunnings for provision of materials for the garden.



We are calling for expressions of interest from the community in terms of who may be able to provide gardening expertise and person – power. If you would like to be a part of a community garden please contact Thelma Marr on 0423 383 583 or

thelmap@shoal.net.au

Environment - foundation of all we do

At our first Creating Callala public meeting in February 2012, you proclaimed the environment to underpin everything we do.

Our environment is a unique asset which provides lifestyle opportunities for local residents, and is a valuable resource underpinning local businesses by attracting tourist and seasonal residents year after year.

You thought the key issues were:

PRESERVATION

protecting and improving the natural areas around Callala/Myola

PROMOTION

informing the public about how to preserve the local environment

PREVENTION

education campaigns and fencing to limit dumping and damage in reserves



- using signage and information campaigns to minimise dumping in reserves
- attending workshops to promote waste-recycling and sustainability (Council is a great resource on composting, vegi. growing, natural cleaning and recycling)
- organizing the "Too Precious to Trash" campaign to educate locals about the value of the Callala Wetlands and how it can be preserved
- building a low impact walkway through the wetlands in the Callala Creek Bushland Reserve (A grant has been obtained and work will commence this month)

Callala Bushcare Group, with volunteers from the 3 villages, has been tackling these issues in the surrounding environment for the past 8 years. Over a thousand volunteer hours in the past year have been spent

- removing invasive weeds from Council-owned and -managed land
- informing households about invasive garden plants and assisting with their removal to reduce the spread of weeds into public reserves
- maintaining existing fencing to limit illegal access by trail bikes and 4WD vehicles
- submitting grant proposals for additional fencing in key locations

Please attend our stall for additional information and to share your ideas.

You can also contact Callala Bushcare directly: For details, see the Callala Bushcare site <http://www.callalabeach.org.au/bushcare.html> or contact John Hawksworth on 4446-4793 or email rjhawksworth@hotmail.com

In achieving our goals, primary partners will be local residents and businesses, Shoalhaven City Council, and NSW state agencies. Their forward budgeting of funds will be required, as well as community support and energy.

Local associations and many individuals will be needed to achieve our goals. **You can be involved.**

Overall strategies are summarised at pages 6-7.

Further detail of Creating Callala is on-line at <http://creatingcallala.weebly.com/>

An electronic copy of this document is also available on-line at that site.

Contact for the Creating Callala group is creatingcallala@gmail.com

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Contact Greg Westlake on 4423 5533

Email: gregw@pacificwestlake.com

Designing Your Future

Callala business

Some community workshop participants were business people, some specifically tourist business operators, some trade and professional service providers. Other business supporters were simply citizens aware of how business generally contributes to living in Callala-Myola, by providing services, employment and contract work, and by our scale of operations - the momentum or gravity of the village.

So repeated references to strengthening business links and support emerged from the workshops, and have been carried into several working groups.

Callala residents include many successful trade, professional and other business people, whose skills are vital to ensuring that Callala-Myola flourishes. Their practical, planning, financial and negotiating talents should return community benefits as well as personal.

Goals of the Chamber

Callala Business Chamber and Tourism Inc (CBC&TI or Chamber) was established to represent the local business community and encourage tourism in our pristine coastal villages. Starting in October 2011, the Chamber provided a commercial focus, and has brought lots of enthusiasm to promoting visitation and economic activity in the area.



By representing united interests to relevant authorities, it aims to benefit local businesses viability

and promote economic activity in the Callala and surrounding areas.

Chamber Events

The first high-profile event was "Carols at Callala" in late December 2011. Since late 2012, the Chamber's new "Fins and Sails" markets have been held every 3rd Sunday of the month (except January, which is already hectic!!). These markets offer local and hand-crafted goods in the shopping centre precinct.

Chamber meetings are Executive Committee Meetings, open to all members, are held on the 1st Friday of the month (except January). In achieving Callala-Myola's business and economic goals, primary partners will be local businesses, local resident business people, and resident and ratepayers generally rallying community support.

You can be involved.



Overall Creating Callala strategies are summarised at pages 6-7.

Further detail about the Chamber is on-line at <http://callalachamber.com.au/>

Contact for the Chamber is callala@callalachamber.com.au

Direct contact for Chamber (without being on-line) is PO Box 88, Callala Bay NSW 2540

Phone President Alfia on 0431 344 340, or Market Coordinator Karen on 4446 6669

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The CCB Associations

There are two resident and ratepayer organisations.

Shoalhaven City Council recognises these two officially as Community Consultative Bodies, or CCB's.

- Creating Callala's "parent" or auspicing body is Callala Bay Community Association (formerly "Progress Association").
- The representative body for "The Beach" and Myola is Callala Beach Progress Association.

Creating Callala workshop participants and Committee members have been drawn from all three localities: Myola, Beach, and Bay. There are no boundaries when we come to using the services, shops, and facilities we want !!

There have been discussions about merging the two Associations, amalgamating as in the Creating Callala planning process, and for strength of representation. However, that is still a moot suggestion.

Further detail about the Callala Bay Community Association is on-line at <http://callalabay.org.au/>

More about Callala Beach Progress Association is found at <http://www.callalabeach.org.au/>

Links to Creating Callala Committee and processes are also available on-line at those sites.

Contacts for the two Associations are also found on their web-sites and in their newsletters, which are usually available at either retail centre.

“Ageing in place”: getting older but staying here

Both workshops strongly reported a need for seniors services, seniors housing and for other developments in Callala-Myola. This has been confirmed in further community consultation. It's only natural, because this area is so popular with retirees!

A Mature Aged Citizens group are examining the multiple options, including services and possible accommodation sites. This is a community enquiry, not commercial or profit-driven.

Ask people what would suit ?

This is one of the very big questions.

Would people prefer and be able to stay in their present homes? Would it be possible and affordable with some changes to make them easier, and with services to support them there?

If moving to specially designed accommodation, what would people want to occupy? Would they want to buy or lease? What would they be able to afford, after considering any government supports?

To help find answers to those questions, some explorations have started. Census data and trends are being examined - with assistance from a volunteer professional analyst.

An interview questionnaire is proposed, to survey current residents or owners who are at or approaching retirement age, asking them

- what options they would consider suitable for living, and purchasing or leasing.
- what MODEL/s of housing delivery - commercial, institutional, community, cooperative....
- what scale or grouping or siting - possibly several small group sites, or a larger site with room for growth.

The answers should guide any new venture for retirement living in Callala-Myola, whether mobile services to adapted existing homes, OR accommodation provided by an existing provider, a developer, or by a community investment initiative.

Next steps are more asking !

Some Census data is in hand, more is being gathered for analysis.

Designing and applying the survey will be the next local project

- to ask about services needed in existing homes
- to ask about adapting existing home to suit age or disability needs
- to identify the class of housing solutions - seniors only or integrated or three level care
- to examine the type / types of housing units likely to be needed or affordable
- to put some realistic numbers to the need or demand
- to clarify need or preference for owned or leased
- to consider finance sources –for start-up, for individual unit provision, for operating.

What guidelines for seniors housing ?

Any viable options can be considered, including separate Torrens title, or community title on large lot(s), or "demountable village" but to an accessible standard of design.



It would be preferred to use a defined not-for-profit model: maybe an existing service provider, or a cooperative development model, or a local resident investment scheme.

Council's 2004 report looked at needs, trends, and some options: "A Place for Aging?". That report also looked at various state policies including the Seniors Living State Environmental Planning Policy (SEPP).

What may be possible ?

Retirement villages (seniors housing) are currently permissible in a range of urban zones throughout Shoalhaven. Council has not specifically zoned individual predicted sites for this purpose. Need is driven by many variable factors: demographics of a locality, landowner expectations, site suitability. So supply is owner or operator driven.

Some residential urban and rural zoned land in Callala Bay, with consent, would be suitable for seniors housing, as defined in current Shoalhaven Local Environment Plan (SLEP) 1985 and the draft SLEP 2013). Factors to consider (and for consent) in any site include relative distance from facilities/services, bushfire threat, threatened species impacts.

In achieving such goals, primary partners will be local residents and businesses, harnessing community support and energy. **You can be involved.**

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Overall Creating Callala strategies are summarised at pages 6-7.

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An electronic copy of this document and more will also available on-line at that site.

Contact for any Creating Callala group is creatingcallala@gmail.com

Direct contact (without being on-line) for this topic is Duncan 44 466 266

Sports News

Much of the work relating to sports within the Callala Bay, Callala Beach and Myola region focused on expansion of existing sporting fields. The community consultation meetings identified that this is a high priority item for the area to ensure that our communities have access to adequate open spaces and sporting fields and amenities to meet the needs of our residents.

Local goals and actions

Community discussions have identified a range of wanted sports and recreational facilities, which are noted under various headings in the summary table on pages 6 & 7.

These include soccer, cricket, netball, beach, boating, swimming, sailing and cycling facilities, as well as park and playground goals.

Looking for space for sports to grow

It has also become apparent that the existing sporting ground in the area is in high demand, which has resulted in a situation where the space is insufficient to meet current demand. This has been raised with the Shoalhaven Sports Board by residents of Callala who are involved in the local Soccer Club.

Shoalhaven Sports Board is Shoalhaven City Council committee that has delegated authority to make decisions about sporting facilities within the region. The issue of local sporting facilities and required expansion of the Callala Sporting Complex was raised with Sports Board in February 2012.

Sports complexity

This submission resulted in a resolution by the Committee to ensure that the Council Budget for 2012/13 reflects the need to complete the required assessments: first, assessing the existing location on Emmett Street for expansion; as well as identifying and assessing alternate locations if required. There was a requirement in the minutes that this be reported back to the next meeting of the Sports Board. Unfortunately, the item has not

appeared in the Agenda or Minutes of any subsequent meeting of the Sports Board.

In March 2013, Shoalhaven City Council were contacted to seek advice on any progress being made on this topic as it had been reported that an assessment had been made identifying that an expansion of the existing sporting complex was not possible. The response received indicates that an un-minuted discussion occurred at the last meeting of the Sports Board, which suggested that a hydrology assessment was currently being conducted and preliminary draft information suggested that expansion of the current location may not be feasible. It was further indicated that the report would be provided to the next meeting of the Sports Board after which it will become a public document.

Unfortunately, previous correspondence received from Council indicated that in July 2012 a consultant had been engaged to carry out the drain and hydrology assessment and it was reported that the results were expected to be forwarded to Council in August 2012. It was also suggested that a report of programs was expected to be presented to the next meeting of the Sports Board, but this did not occur either. It is apparent therefore that the information provided by Shoalhaven City Council on this topic has been inaccurate and tended to suggest that work is progressing when in fact this is not the case.

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Our Community's Health and Social Wellbeing

One concern and outcome of the public workshops was to generate ideas that would socially engage the people from this area. We looked at the possibility of coordinating all the local groups related to health and social wellbeing. Here are some groups identified so far to which everyone is invited and welcome at any time.

- Archery (Sat, 10:30-12:30).
- Belly Dancing (Tues 6:00-8:00pm);
- Bush Care (Tues, 8:00-10:00am);
- Craft (Tues 10:00-);
- Friends of Callala (CPSA branch)
- Folk Dancing (Tues 3:00-5:00pm);
- Meditation & Relaxation (Fri 10:00am);
- Simplicity Circle (www.ingridpoulson.com/)
- Tai Chi, (Mon am);
- Yoga (Thurs 6:00-7:30pm);
- Aqua Aerobics (Mon, Wed Fri, weather permitting);
- Walking (Wed 9:00- and Tues 9:00- once a month, informal gathering);

Being involved in Callala's community social networking will add to the quality of both your life and the lives of others in many ways. Being active enhances diverse existing skills, encourages the learning of new skills, makes new friends, and puts smiles on faces. In short, being active promotes well being, and all this is attained in our beautiful environment. Make our community more alive by becoming involved.



Great holidays. Lasting memories.

Jennie Dicker, Owner & Manager of Travelworld Nowra
35 years experience and part of the local community.

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Interest was expressed in developing other social and/or well being groups, for example,

- a Monthly Book Club and early morning and
- late evening Walking Groups.

Any new ideas or groups that have been omitted can be added to our list at our next Callala Community Gathering. Please come to the next Community Gathering so that we can obtain details of any existing group to which you belong, and/or bring ideas to start your new group.